

MEASURING THE EFFECT OF INTERNATIONAL RELOCATIONS ON FRENCH ECONOMY

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As in many other developed countries, international relocations are currently a very hot topic in France. This can be readily concluded from the number of articles devoted by the French newspapers to this subject in 2004, compared to the preceding years (Table 1). A heated debate already took place in the early 1990s, culminating with the reports of Arthuis and Devedjian in 1993². Recently, the new enlargement of the European Union to Central and Eastern European countries (CEECs hereafter) and the suppression of quotas on textile imports, especially from China, have resumed fears about international relocations, which are assumed causing both employment losses and deindustrialisation of the French economy.

Table 1: Number of articles treating of international relocations in the French newspapers³

Research terms	2000	2003	2004
“Délocalisations”	215	879	4144
Of which “headlines”	10	53	453
“Délocalisations” + “chômage”	33	208	859
“Délocalisations” + “35 heures”	20	57	500
“Délocalisations” + “salaires”	30	138	709
“Délocalisations” + “chômage” + “salaires”	9	51	224
“Délocalisations” + “chômage” and/or “salaires”	54	295	1344

Translations: “Délocalisations” for international relocations, “Chômage” for unemployment, “35 heures” for the 35 hour working week and “salaires” for wages.

In this respect — at least up to recent months — the consequences of international relocations on labour force were viewed differently in France than in the United Kingdom or the United States. In these two latter countries, no strong labour market regulations prevent

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² Devedjian (1993) and Arthuis (1993).

³ Source: Lexis-Nexis Database

the divergence between skilled and unskilled wages⁴. Hence, international relocations are seen as exercising downward pressures on unskilled wages. In France, it is the growing unemployment of the unskilled labour force over the two last decades⁵ that is perceived by many citizens as resulting from French enterprises realising an increasing share of their activities *in* (or *with*) countries where labour costs are lower. However, this distinction is currently narrowing, as the public debate in the United States has been recently framed in terms of job losses and some French cases have received a huge amount of attention in the media and political circles about the possible adverse effects of international relocations on existing regulations. In the case of MetalEurope, the public was shocked to learn that an industrial firm was able to convince its workers of lengthening the 35-hour work week without any wage compensation, otherwise international relocation would occur. The current right-wing government is using the same argument to increase the support for structural reforms on the labour market.

While the debate is heated again, the underlying empirical data used by protagonists are mainly anecdotic evidence of very rough measures⁶. The goal of the present annex is to discuss and provide some empirical insights on the subject. First, we propose data on job losses in industrial sectors, corrected by temporary employment (interim) and domestic outsourcing. Second, we draw a review of empirical studies measuring the effects of international openness (including international relocations) on French employment.

Development of industrial French employment over 1970-2002

What sectors are suspected of having suffered from international relocations?

Three types of development are needed to isolate the sectors that might have suffered from international relocations: for a given sector, imports and the trade deficit must grow faster than domestic demand while its share in the total employment must decrease. In the INSEE classification, five sectors correspond to that description from 1978 to 2002: clothing

⁴ For a comparison between developed OECD countries, see ?. Both the United Kingdom and the United States emerge as countries where the wage inequalities between skilled and unskilled workers were widening over 1979-1994, contrasting strongly with France.

⁵ The unemployment rate for males with low education (and then assumed "unskilled") rose from 5.4 % in 1981 to 13.5 % in 1994. By contrast, the unemployment rate for males with high education (and then assumed "skilled") increased from 3 % in 1981 to "only" 5.9 % in 1994. The gap for female unemployment rates by education level is even larger: see Strauss-Kahn (2003).

⁶ For example, Direction Générale du Trésor et de la Politique Économique (2004) simply states that 3,4 % of all jobs in 2002 (796 000) are potentially threatened by service international relocations.

and leather products, fuel production, household equipment, electric and electronic equipment, and textile⁷. Leaving aside fuel production, the rise of imports in these “unskilled labour” from trade with developing countries is impressive, as can be seen in Figure 3.

⁷ Drumetz (2004).

Figure 1: French manufactured imports from ‘emerging industrial’ countries as a percentage of French GDP⁸

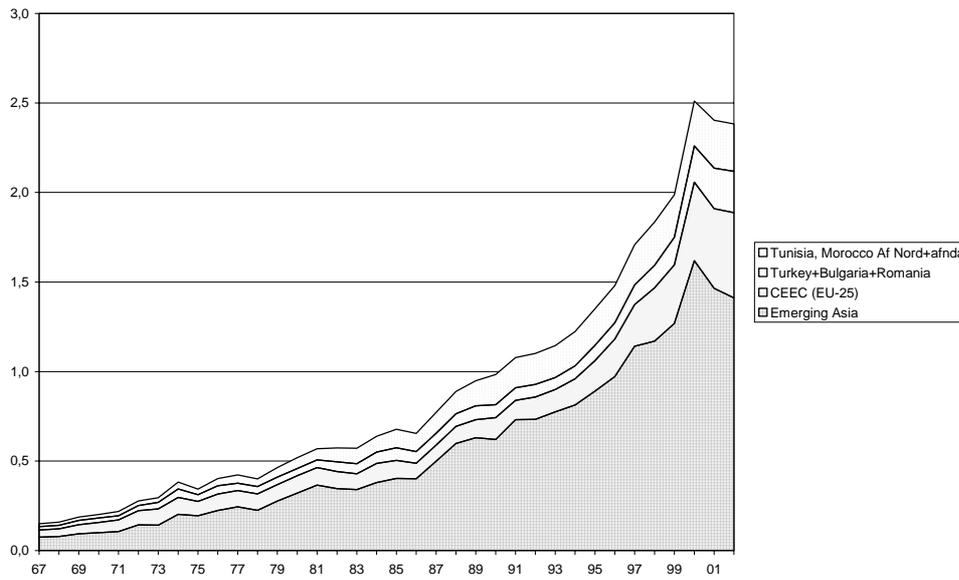
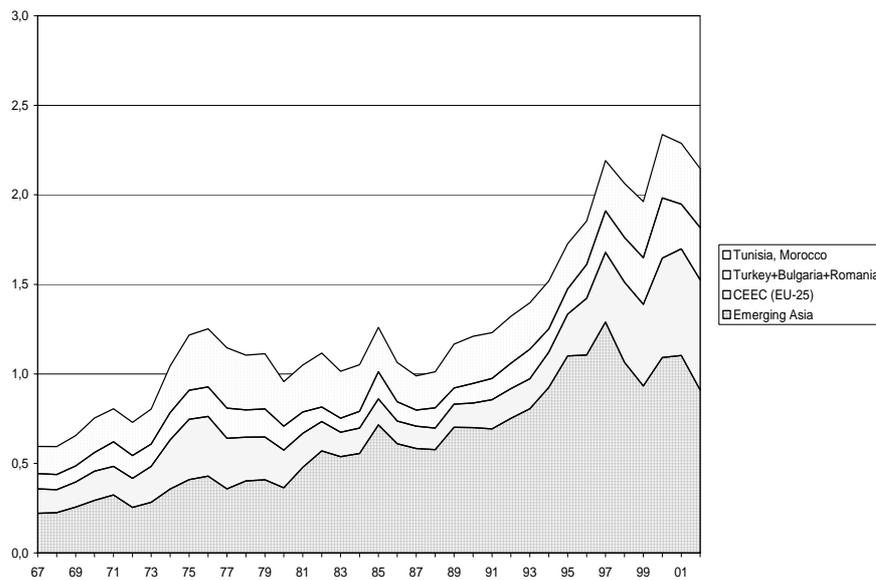
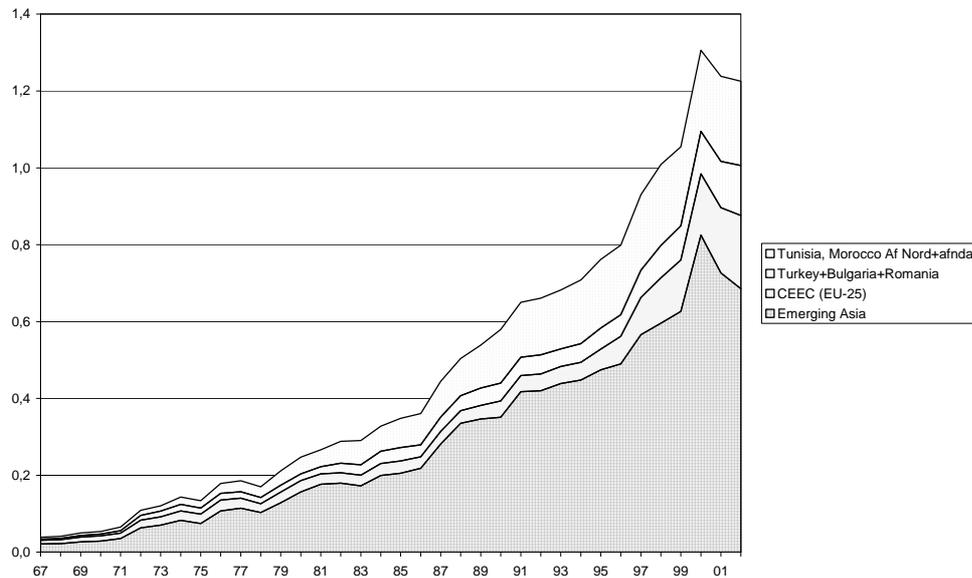


Figure 2: French manufactured exports to ‘emerging industrial’ countries as a percentage of French GDP



⁸ All figures are courtesy of Catherine Mathieu.

Figure 3: French selected imports from ‘emerging industrial’ countries as a percentage of French GDP



Source: CEPII-Chelem.

Emerging industrial countries: Asia outside Japan.

CEEC: Central and Eastern European Countries; 8 new member states (Poland, Slovenia, Hungary, Czech Republic, Slovakia, Estonia, Latvia, Lithuania)

Selected imports. Approximately: clothing and leather products, household equipment, electric and electronic equipment, and textile⁹.

A first measure of industrial job losses

Here, we will not explore deeper the trade data. Our focus will be on the employment data. A change in the INSEE classification of manufacturing makes it difficult to measure the job losses in these sectors from 1970 to 2002. To do that, we have to use an OECD database, STAN.

In France, while the growth rate of total employment was 18 % over 1970-2002, industrial employment declined by 30 % (Table 2). Put differently, the French economy created roughly 4 millions of jobs during 1970-2002, but the manufacturing sector as a whole lost nearly 2 millions of jobs. On a relatively high level of aggregation, all manufacturing sectors (except food industries) lose employment, with traditional sectors showing the most

⁹ Exactly: FP Electroménager; FQ Matériel électrique; Fr Fournitures électriques; Fm Electronique grand public; Gh Articles en plastique; Gi Articles en caoutchouc; DA Fils et tissus; DB Vêtements de confection; DC Vêtements de bonneterie; DE Cuir; EA Ouvrages en bois; FL Composants électroniques.

important losses. Especially, the "textiles and leather" sectors lose 670,000 jobs over 1970-2002¹⁰.

Table 2: French employment by sectors (thousand of engaged)

	1970	1975	1980	1985	1990	1995	2000	2002	1970-2002	1985-2002	1970-2002	1985-2002
GRAND TOTAL	21,051	21,563	22,191	21,845	22,851	22,682	24,308	24,887	+18%	+14%	+3,837	3,042
AGRICULTURE, HUNTING, FORESTRY & FISHING	2,946	2,301	1,948	1,634	1,348	1,112	1,034	1,015	-66%	-38%	-1,931	-620
TOTAL MANUFACTURING	5,365	5,501	5,231	4,610	4,396	3,874	3,811	3,789	-29%	-18%	-1,576	-821
FOOD PRODUCTS, BEVERAGES & TOBACCO	613	613	621	626	613	597	632	641	+4%	+2%	+27	+15
TEXTILES, TEXTILE PRODUCTS, LEATHER & FOOTWEAR	904	808	680	545	444	333	260	234	-74%	-57%	-670	-310
WOOD & PRODUCTS OF WOOD & CORK	144	144	140	112	114	100	90	91	-37%	-19%	-53	-21
PULP, PAPER, PAPER PRODUCTS, PRINTING & PUBLISHING	355	363	357	344	366	332	326	320	-10%	-7%	-35	-24
CHEMICAL, RUBBER, PLASTICS & FUEL PRODUCTS	555	600	587	539	529	475	461	466	-16%	-13%	-88	-73
OTHER NON-METALLIC MINERAL PRODUCTS	320	299	272	219	210	184	171	170	-47%	-22%	-151	-49
BASIC METALS & FABRICATED METAL PRODUCTS	848	874	795	649	633	547	553	553	-35%	-15%	-295	-96
MACHINERY & EQUIPMENT	864	964	931	843	818	735	742	731	-15%	-13%	-133	-113
TRANSPORT EQUIPMENT	521	575	572	499	440	373	379	385	-26%	-23%	-136	-114
MANUFACTURING NEC; RECYCLING	240	261	275	234	230	199	199	199	-17%	-15%	-41	-36
ELECTRICITY, GAS & WATER SUPPLY	153	159	175	198	192	191	192	192	+25%	-3%	+38	-6
CONSTRUCTION	2,070	1,970	1,917	1,590	1,663	1,433	1,430	1,493	-28%	-6%	-578	-97
WHOLESALE & RETAIL TRADE; RESTAURANTS & HOTELS	3,281	3,409	3,587	3,628	3,913	3,819	4,142	4,312	+31%	+19%	+1,031	+685
TRANSPORT & STORAGE & COMMUNICATION	1,115	1,179	1,256	1,291	1,328	1,334	1,480	1,545	+39%	+20%	+430	+254
FINANCE, INSURANCE, REAL ESTATE & BUSINESS SERVICES	1,574	1,934	2,283	2,497	3,097	3,275	3,995	4,193	+166%	+68%	+2,619	+1,696
COMMUNITY SOCIAL & PERSONAL SERVICES	4,546	5,110	5,792	6,399	6,913	7,644	8,224	8,350	+84%	+30%	+3,804	+1,951
TOTAL SERVICES	10,517	11,632	12,919	13,814	15,251	16,073	17,841	18,400	+75%	+33%	+7,883	+4,586

Source: OECD, STAN.

As a result of the so-called "desindustrialisation" of the French economy, the share of manufacturing employment in total employment decreased from 25.5 % in 1970 to 15.2 % in 2002, that is by 10 percent points in three decades (Table 3). The "textiles and leather" sectors moved from 4.3% of total French jobs in the 1970s to less than 1% now. This development in manufacturing sectors sharply contrasts with the one in service sectors.

¹⁰ To a higher level of disaggregation, a few manufacturing sectors show an increase of employment over 1987-2002 (figures not reported in Table 2): "pharmaceuticals (+11.5 %)", "offices, computing and accounting" (+11.4 %), "rubber and plastic products" (10.1 %), "building and repairing of ships and boats" (+3.7 %).

Table 3: French employment by sectors (in % of total employment)

	1970	1975	1980	1985	1990	1995	2000	2002	1970-2002	1985-2002
AGRICULTURE, HUNTING, FORESTRY & FISHING	14,0	14,0	8,8	7,5	5,9	4,9	4,3	4,1	-71%	-46%
TOTAL MANUFACTURING	25,5	25,5	23,6	21,1	19,2	17,1	15,7	15,2	-40%	-28%
FOOD PRODUCTS, BEVERAGES & TOBACCO	2,9	2,9	2,8	2,9	2,7	2,6	2,6	2,6	-12%	-10%
TEXTILES, TEXTILE PRODUCTS, LEATHER & FOOTWEAR	4,3	4,3	3,1	2,5	1,9	1,5	1,1	0,9	-78%	-62%
WOOD & PRODUCTS OF WOOD & CORK	0,7	0,7	0,6	0,5	0,5	0,4	0,4	0,4	-47%	-29%
PULP, PAPER, PAPER PRODUCTS, PRINTING & PUBLISHING	1,7	1,7	1,6	1,6	1,6	1,5	1,3	1,3	-24%	-18%
CHEMICAL, RUBBER, PLASTICS & FUEL PRODUCTS	2,6	2,6	2,6	2,5	2,3	2,1	1,9	1,9	-29%	-24%
OTHER NON-METALLIC MINERAL PRODUCTS	1,5	1,5	1,2	1,0	0,9	0,8	0,7	0,7	-55%	-32%
BASIC METALS & FABRICATED METAL PRODUCTS	4,0	4,0	3,6	3,0	2,8	2,4	2,3	2,2	-45%	-25%
MACHINERY & EQUIPMENT	4,1	4,1	4,2	3,9	3,6	3,2	3,1	2,9	-28%	-24%
TRANSPORT EQUIPMENT	2,5	2,5	2,6	2,3	1,9	1,6	1,6	1,5	-38%	-32%
MANUFACTURING NEC; RECYCLING	1,1	1,1	1,2	1,1	1,0	0,9	0,8	0,8	-30%	-26%
ELECTRICITY, GAS & WATER SUPPLY	0,7	0,7	0,8	0,9	0,8	0,8	0,8	0,8	6%	-15%
CONSTRUCTION	9,8	9,8	8,6	7,3	7,3	6,3	5,9	6,0	-39%	-18%
WHOLESALE & RETAIL TRADE; RESTAURANTS & HOTELS	15,6	15,6	16,2	16,6	17,1	16,8	17,0	17,3	11%	4%
TRANSPORT & STORAGE & COMMUNICATION	5,3	5,3	5,7	5,9	5,8	5,9	6,1	6,2	17%	5%
FINANCE, INSURANCE, REAL ESTATE & BUSINESS SERVICES	7,5	7,5	10,3	11,4	13,6	14,4	16,4	16,8	125%	47%
COMMUNITY SOCIAL & PERSONAL SERVICES	21,6	21,6	26,1	29,3	30,3	33,7	33,8	33,6	55%	15%
TOTAL SERVICES	50,0	50,0	58,2	63,2	66,7	70,9	73,4	73,9	48%	17%

Sources: OECD, STAN.

A better measure of job losses

At least a part of the industrial job losses is due to changes in the employment structure of industry, with the rise of temporary employment (interim) and of domestic outsourcing. Then, from a statistical viewpoint, an increasing number of jobs are classified in services sectors.

A first breakdown of temporary workers by sectors gives interesting insights. Temporary employment developed strongly in France, especially during the second part of 1990s characterised by a strong economic recovery: the number of temporary workers has increased from 232,000 in 1990 to 290,700 in 1996 to reach 554,900 in 2003, after culminating to 604,300 in 2000. Moreover, over this period, between 45 and 55 % of temporary workers were working in manufacturing sectors and 20 % in construction. The temporary rate — that is the share of temporary employment in total employment — was, on average, 6.9 % for all manufacturing sectors in 2003 against 4.0 % in 1995 (when evaluated in full-time equivalents as in Table 4). Sectors with the largest temporary rate are the automobile industry (11 % in 2003), chemical sectors (8.5 %) and electric and electronic components (7 %). The wearing

apparels and leather products sectors, in which international relocations are suspected quite large, have the lowest temporary rate (1.8 % in 2003).

As reported in Table 4, the use of temporary rates allows the calculation that the manufacturing sector (including energy), instead of losing 169,400 jobs between 1995 and 2003, lose “only” 57,300 jobs. The picture of French desindustrialisation is then over-evaluated by 115,000 jobs when temporary employment is not taken into account. Even job losses in the textile and leather sectors, with small temporary rates, are over-evaluated by 2,200 jobs over 1995-2002: they would be “only” 91,600¹¹. Surely, while the sector of household equipment recorded also substantial job losses (-13,660 jobs over 1995-2002), other sectors intensive in low-skilled labour and currently suspected of international relocations have created jobs: mechanical equipment (+6,700 jobs), electronic and electric equipment or components (+22,500 jobs), metal products (+24,700 jobs). Note that French employment in automobile sectors has gained near 28,900 jobs between 1995 and 2003 (with more than 1,000 jobs between 2002 and 2003) at a time where international relocations in CEECs was perceived as growing fast.

¹¹ This figure derives from 68,100 job losses in sectors of wearing and leather products, plus 23,500 in textile industry.

Table 4: Over-evaluation of industrial employment losses

(salary employment, full-time equivalent, in thousands)

	Employment			Temporary rate (in %) ¹²		Total employment (including temporary workers)			Over-evaluation
	1995	2002	1995-2002	1995	2002	1995	2002	1995-2002	1995-2002
Food industries	501.7	540	38.3	4.2	7.2	523.7	581.6	57.9	-19.6
Consumption goods	723.4	635.8	-87.6	2.7	5.0	743.6	669.0	-74.5	-13.1
Wearing & leather products	185.5	116.9	-68.6	0.8	1.7	187.0	118.9	-68.1	-0.5
Printing & publishing	214.8	210	-4.8	1.5	2.5	218.0	215.5	-2.5	-2.3
Chemicals & chemical products	112.3	116.2	3.9	4.9	9.1	118.1	127.9	9.8	-5.9
Household equipment	210.8	192.7	-18.1	4.4	6.8	220.4	206.8	-13.7	-4.4
Automobile industry	250.6	260.7	10.1	5.5	11.0	265.2	293.0	27.8	-17.7
Good equipment	724.4	732.3	7.9	4.7	6.4	760.2	782.2	22.0	-14.1
Ship, aircraft & railroad equipment	116.3	117.8	1.5	2.9	5.9	119.8	125.2	5.4	-3.9
Mechanical equipment	414.6	413.4	-1.2	5.4	7.1	438.3	445.0	6.7	-7.9
Electric & electronic equipment	193.5	201.1	7.6	4.3	5.2	202.2	212.1	9.9	-2.3
Intermediate industries	1365.1	1332.1	-33.0	4.4	7.7	1427.3	1443.5	16.2	-49.2
Mineral products	173.5	159.8	-13.7	3.6	6.5	180.0	170.8	-9.2	-4.5
Textile industry	127.4	102.2	-25.2	2.3	4.4	130.3	106.9	-23.5	-1.7
Wood and paper	180.6	167	-13.6	3.8	7.2	187.6	180.0	-7.6	-6.0
Chemicals, rubber & plastics	306	308.5	2.5	5.0	9.6	322.0	341.2	19.1	-16.6
Basic metals & metal products	408.1	419	10.9	5.1	9.9	430.1	454.8	24.8	-13.9
Electric & electronic components	169.5	175.6	6.1	4.3	7.5	177.2	189.8	12.6	-6.5
INDUSTRIE (excluding energy)	3 565.2	3 500.9	-64.3	4.2	7.1	3720.0	3769.4	49.3	-113.6
Energy	235	213.4	-21.6	1.5	2.6	238.7	219.1	-19.6	-2.0
Energy producing materials	46.3	31.4	-14.9	1.7	3.8	47.1	32.6	-14.5	-0.4
Electricity, gas & water	188.7	182.0	-6.7	1.5	2.4	191.6	186.4	-5.1	-1.6
INDUSTRIE (including energy)	3 800.2	3 714.3	-85.9	4.0	6.9	3958.7	3988.5	29.8	-115.7

Source: INSEE and DARES databases, and authors' computation¹³.

However, the resort to temporary workers is largely linked to the general dynamism of the economy as illustrated by the end of 1990s. Moreover, no data is available to measure temporary employment before 1995.

To get a longer-term view, we have to look into outsourcing of services in general — including temporary workers. Many activities previously realised by employees of industrial firms are currently realised by services firms: cleaning, logistic, retail, R&D activities etc.¹⁴ This results in an artificial decrease of the employment share of manufacturing. The importance of this phenomenon is confirmed by the rise of the ratio between the value added of different sectors and the value of intermediate consumption from the business services (see Table 5). The growth of externalisation was particularly impressive in the 1990s, reaching up 50% in some sectors.

¹² Interim workers divided by total salaries workers (including interim workers, both in full time equivalents).

¹³ See also Fontagné & Lorenzi (2005), p. 36, Gonzales (2002) and Mihoubi (2002).

¹⁴ Note that growing externalisation by sectors not belonging to manufacturing sectors (e.g. construction) contributes also to the bias in favour of employment in services sectors (or "tertiarisation" of the French economy).

Table 5: Intermediate consumption of business services by manufacturing sectors
(in % of value added)

	1980	1990	1995	2000	2002	Changes between 1995 and 2002
Food industries	14,1	28,3	34,9	46,0	42,1	21%
Consumption goods	..	..	33,8	46,9	45,4	34%
Wearing & leather products	..	..	23,2	31,6	32,2	39%
Printing & publishing	..	..	25,9	36,0	34,1	32%
Chemicals & chemical products	24,4	38,6	47,7	61,6	59,3	24%
Household equipment	29,1	63,7	35,8	50,9	47,6	33%
Automobile industry	11,9	28,8	49,8	54,0	46,8	-6%
Equipment goods	21,0	33,4	37,8	47,2	47,1	25%
Ship, aircraft & railroad equipment	24,0	42,5	37,4	54,0	47,4	27%
Mechanical equipment	26,2	41,6	34,7	40,8	43,2	24%
Electric & electronic equipment	14,8	23,8	42,6	52,9	52,8	24%
Intermediate industries	15,6	11,9	20,8	27,1	28,0	34%
Mineral products	13,5	17,8	15,4	19,8	19,2	25%
Textile industry	..	..	26,1	31,6	30,9	18%
Wood and paper	..	..	10,1	11,7	12,3	22%
Chemicals, rubber & plastics	11,1	9,5	31,8	40,4	41,8	31%
Basic metals & metal products	..	..	12,8	18,4	18,1	41%
Electric & electronic components	..	..	30,9	40,7	48,1	56%
INDUSTRIE (excluding energy)	..	..	30,8	39,7	39,0	26%
Energy	..	..	23,6	24,9	26,9	14%

Source: INSEE national accounts.

In first approximation, such a bias in favour of services can be corrected by measuring the development of employment in the business services sector. According to the INSEE, it has increased from 1,500,000 in 1980 to 3,100,000 in 2002¹⁵. By weighting these figures with the share of intermediate consumption of business services by industrial sectors in the production of the business sector as a proxy of a number of jobs externalised by industrial sectors, we find that the total employment losses of the manufacturing sector are overvalued by 315,000 jobs over 1980-2002 (or 193,000 over 1995-2002), or 22,5% of the total (1,400,000 from 1980 to 2002). This is probably an under-valuation of the effect of outsourcing, as the rise of temporary employment by itself, simply between 1995 and 2002 was 115,000: that suggests that only 78,000 jobs were outsourced beside temporary employment. However, the national accounts do not give a readily way of dispatching the jobs of the business service sector in its consuming sectors, as the Input-Output table only exist in terms of consumption, not value-added or jobs; the only possible conclusion is that the “true” manufacturing job losses from 1980 to 2000 were probably less than 77,5% of the directly measured ones, or less than 1,085,000

¹⁵ See also Mihoubi (2002).

This is still a sizeable number. It is certain that not all losses were linked to international relocation — or even, more generally, to trade. Technical progress and shifts in demands are other obvious suspects. The next part will present the studies that try to compare the responsibility of these different effects.

Existing studies

First, it must be underlined that it is not possible to measure the effects of international relocation *per se*. The data available are very recent, and they do not allow to isolate the whole phenomenon. The European Monitoring Centre on Change (EMCC) — which analyses the causes of enterprises restructurings in Europe since 2002 — indicates, international relocations account for a small part of (actual or planned) employment losses: 6.3 % for France and 9 % for Europe as a whole. By contrast, internal restructuring and bankruptcy (and closure) are the main sources of employment losses (more than 85 % for both France and Europe)¹⁶. Of course, one would like to know how many bankruptcies are caused by international competition... which brings the subject of the study of the whole effect of international trade.

Second, North-North trade has different effects than North-South trade, and we would like to isolate the latter. However, that is difficult as part of the evolution of North-north trade is caused by North-South trade between third parties.

Hence, most of the studies we present try to measure the effect of international trade, as a whole, on French employment:, even if we will try to isolate what they have to say on the effect of North-South trade whenever possible. Three types of studies exist and will be studied in turn:

- (1) studies on the job content of trade
- (2) econometric studies
- (3) general equilibrium models

To our knowledge, no study is based on micro-data survey over a long time period — in contrast with what exists for Germany¹⁷. Furthermore, most studies focus on the effect of trade on employment rather than wages because of the notion that the French labour market is regulated in such a way that competitive pressures should have quantity effects rather than price effects.

¹⁶European Monitoring Centre on Change (2005).

¹⁷Marin (2004).

Job content of trade

The "job content of trade" is by far the most widely used method for evaluating the impact of international trade on French employment. The basic idea is that exports constitute additional production for the domestic economy, and hence induce job creation, while imports are substitutes to domestic production and hence induce job losses. The difference between "job creation" and "job losses" is then attributed to international trade. Empirical estimates consist thus in computing the average "job content" — i.e. labour requirement of production *in the domestic country* — of both exports and imports. For exports, most of studies not only consider direct employment embodied in production but also indirect employment embodied in the production of intermediate inputs.

For imports, the usual assumption is that of a substitution between domestic and foreign production in *value* — i.e. one euro of imports substitutes to one euro of domestic production — rather than in *volume*¹⁸ — i.e. a pair of foreign shoes substitutes to a pair of domestic shoes. The assumption of substitution in value is not really restrictive as long as international trade of France is predominantly oriented towards developed countries: in that case, the unitary price and quality of goods imported from abroad and produced domestically is roughly similar. As, in 1997, developed countries account for 79 % of French imports (75 % of French exports), with figures reaching 90 % in many sectors, the value hypothesis is not too much of a problem to measure the global effect of international trade. However, the value hypothesis is much more a problem when one tries to measure the effect of French trade with developing countries. Due to price differentials, substitution in volume is much more plausible. In so far as we are looking primarily into these effects, we should favour this latter hypothesis.

There are other difficulties. The results are strongly influenced by the sign of the trade balance. As a result, trade balance disequilibria are sometimes corrected to compute only the structural effect of external trade on domestic employment. When this is the case, estimates are based on theoretical balanced trade flows. Finally, the counterfactual situation used for comparison is "autarky". The definition of autarky is very restrictive: it is assumed to have no impact on the nature of goods produced, prices, wages, productivity and consumption. To sum up, while this method has the advantage of simplicity, its drawbacks are numerous: lack of strong theoretical grounds, problems related to the counterfactual situation, assumption of

¹⁸ This opposition between value and volume is different from the usual one which takes into account the evolution of prices through time.

homogeneity between foreign and domestic goods, use of an average coefficient rather than a marginal coefficient etc¹⁹.

Table 6: Studies using the “job content of trade” method

Source	Data	Methodology	Estimation	Results
Gallais & Gautier (1994)	France 1993	Job content of trade	Role of trade in the development of employment	1993 : + 270,0
Vimont & Farhi (1997)	France 1991, 1993 and 1996	Job content of trade in manufactured goods	Role of trade in the development of employment	1991: -219,0 1993: + 59,0 1995: + 115,0
Cortes & Jean (1997b)	France 1993	Job content of trade in manufactured goods	Role of trade in the development of employment	1993: +122,0
Guimbert & Levy-Bruhl (2002)	France 1983-1997	Job content of trade in manufactured and agricultural goods (compares with older studies) (Substitution in value for almost sectors) (average coefficient of exporting firms)	Role of trade in the development of employment	1983-1990 : -441,000 jobs 1990-1997 : + 492,000 jobs 1997:+550,000
Bonnaz, Courtot & Nivat (1994)	France 1991	Job content of trade in manufactured goods (only six sectors taken into account in imports) (trade with developing countries)	Role of trade with developing countries in the development of employment	If substitution in value: + 130,0 If substitution in volume: -330,0
Messerlin (1995)	France 1980-1992	Job content of trade (Substitution in volume for almost all sectors)	Role of international trade on employment	All trade 1980-1992: +0,8 % Intra-EC trade 1987-1992: +0,28% Extra-EC trade 1987-1992: -0,5%
Kucera & Milberg (2003)	1978-1995 for 10 OECD countries (including France)	Job content of trade in manufactured goods (substitution in volume)	Role of total trade ; trade with OECD countries and trade with non-OECD countries on employment	Whole trade :-110,0 (-2 % relative to 1978-80) OECD trade : 112,0 Non-OECD trade : -222,0

The seven empirical studies based on "job content of trade" method as reported in Table 6 differ in terms of sample (period, total *versus* manufactured trade, all *versus* developing partners) and methodology (substitution in value *versus* volume, treatment of trade balance disequilibrium etc.). Nevertheless, it is possible to summarize their main results as follows. First, in all cases, the estimated net impact of international trade on total French employment is *modest* and, on average, *positive*. That is, international trade tends to be a net creator of jobs over a long time period, even if the net creation of jobs accounts for less than 1 % of total employment. Second, the negative net impact of international trade on jobs is generally concentrated on the end of 1980s/beginning of 1990s and due to trade with developing countries. After 1992, all the studies agree to indicate the positive impact of trade on French employment. Third, different sectors are unevenly affected by international trade. Most losses are concentrated in traditional industries (shoes and hosiery) and some in natural-resources intensive industries. That seems to suggest that, even if the net impact of international trade

¹⁹ See, for instance, Messerlin (1995) or Jean (2001) for a discussion.

on French labour is positive in the long-run, temporary job losses can occur following an "openness" shock with developing countries, as in 1987²⁰.

Only three studies compute the specific effect of trade with developing countries — with different definitions of these countries. They suggest this trade caused 150,000 to 330,000 job losses. However, these results need to be confirmed by more robust methods. This can be done either in an empirical way or a theoretical way.

Theoretical models

It is possible to build models taking into account all the different effects that make a simple job content evaluation unreliable. We know of two examples in the case of France, shown in Table 7.

Table 7: Studies using models

Source	Data	Methodology	Estimation	Results
Mathieu & Sterdyniak (1994)	France 1973-1991	Macroeconomic model for general equilibrium effects. Alternative scenario: developing Asia growth at the same speed than the OECD	Role of trade with developing Asia on the development of unemployment	+0.5/+0.6 points of unemployment
Jean (1999), p. 154-155²¹	France 1977-1993	Computable General Equilibrium Model taking into account North-South trade, technical progress and qualification development in the population	Role of the increase of French trade from 1977 to 1993 on unemployment	+ 2 points of unemployment Trade with the South : < +1 point

It is worth mentioning that, despite the differences in methods, both studies find similar orders of magnitude for the effect of trade with developing countries on unemployment: a rise of at least 150,000 and probably at most 300,000.

Econometric studies

Another approach is mainly empirical²². Three main factors can explain employment changes — either the decrease of the share of industrial production in total employment or of the share of unskilled workers in total employment — in developed countries: technical progress; changes in demand and international trade. Econometrical studies presented in Table 8 try to isolate the true impact of international trade, including outsourcing activities, on employment. To analyse the different causes, the assumptions are that technological progress explains the shifts of labour demand towards skilled workers *within* industries; changes in

²⁰ The share of developing countries in world trade was doubled from 1987 to 1997.

²¹ See also : Jean (2001), p. 13, Jean & Bontout (1999), Cortes & Jean (1997a), Jean (2002).

²² We only mention here macro-econometric studies. The only microeconomic study we are aware of that does compute a microeconomic, firm-level, effect of international trade on employment: Biscourp & Kramarz (2003).

domestic demand explain the shifts of labour demand towards skilled workers *between* industries; and finally, international trade is assumed to be detrimental to unskilled workers as soon as France imports from developing countries, where labour costs are lower. Controlling for *internal* factors allows for more accurate estimates of the true impact of *external* factors on French employment.

Table 8: Studies using an econometric method

Source	Data	Methodology	Estimation	Results
Bazen & Cardebat (2001)	France 1985, 1989 and 1992	Econometric study per sector	Role of international trade (measured as relative import prices) on relative unskilled employment	1985-1989: Trade => Decline in relative unskilled employment, not wages 1989-1992: Trade => Decline in relative unskilled wages, not employment
Strauss-Kahn (2003)	France, 1977-1993.	Econometric study per sector	Role of international vertical specialization (defined as the share of imported inputs in production) in the decline of unskilled workers (in total manufacturing employment)	Share of imported inputs in production: from 9 % (in 1977) to 14 % (in 1993) Shift away from unskilled labour : 0.65-0.7 percentage points/year (0.5-0.6 for manufacturing sectors) Contribution of international vertical specialisation in the decline of unskilled workers in manufacturing employment : 11-15 % over 1977-1985 and 25 % over 1985-1993.
Boulhol (2004)	1970-2002 for 16 OECD countries (including France)	Econometric study, including GDP/head; (GDP/head) ² ; Investment/GDP; Industrial trade balance; firms' outsourcing rates.	Role of emerging countries' industrial imports in the change of the industrial share of employment	No break in the data. FMI method (Rowthorn & Ramaswamy (1999)): 10 % for France (15 % for the average OECD countries) New method (correction of autocorrelation): 1,9 % for France (3.4 % for the average OECD countries)

Bazen and Cardebat (2001) show that the effect of trade with low-cost partners (proxied by the changes of relative import prices) changed in the late 1980s: from job-destroying influence to a wage-depressing one. However, they do not provide enough elements to estimate the total effect of trade on the unskilled share of employment and relative wages.

Strauss-Kahn (2003) tests econometrically to which extent international vertical specialization explains the decline in the relative demand for unskilled labour in the French manufacturing sector over 1977-1993. Vertical specialization is the completion of the different production stages of a good in different countries. Strauss-Kahn measures it as the value of directly imported inputs embodied in goods produced, using data from input-output tables. As she uses French statistical aggregates, she has to divide workers in the French manufacturing sector following occupation rather than education. This produces a division between skilled and unskilled workers that is roughly equivalent to the US white-collar/blue collar division. She finds that, while international vertical specialisation has increased from 9 % in 1977 to 14 % in 1993, its contribution to the observed decline in the relative demand of

unskilled workers was relatively low. Nevertheless, this contribution increases over the time sample, from 11-15 % in 1977-1985 to 25 % in 1985-1993²³.

The Fontagné and Lorenzi report²⁴ has given a lot of publicity to the results of Boulhol (2004). He tests econometrically to which extent (industrial) imports from emerging countries contribute to "desindustrialisation" (that is, changes of industrial employment in total employment) for 16 OECD countries over 1970-2002. Moreover, he is interested in testing if the acceleration of imports from emerging countries observed since 1987 has changed the value of estimated parameters. Following Rowthorn and Ramaswamy (1999), the dependent variable is the variation of the share of industrial production in total employment. The explanatory variables are GDP per capita, the square of GDP per capita, industrial imports from emerging countries in percentage of GDP, investment in percentage of GDP, the trade balance for industrial goods and the rate of externalisation by firms measured as the share of inputs in production. In a first application of this method, he shows that the imports from emerging countries contribute to 15 % of the decline in industrial employment for OECD sample, and to only 10 % for France. Correcting for autocorrelation yields even smaller estimates: respectively 3,4 % and 1,9 %. Moreover, the coefficient of imports is constant between the pre-1987 period and the post-1987 period. However, due to the acceleration of imports from developing countries in 1987, the losses of industrial employment caused by imports are larger after 1987 than before 1987. Finally, he concludes that the decline of industrial employment in France is mainly due to internal factors, e.g. the low rate of investment in France compared to the United States.

Rowther and Ramaswamy (1999) explain 150,000 manufacturing job losses by trade with developing countries. If Boulhol is right, these losses only numbered 30,000. This is the lowest estimation we have found so far. Without going into the precise examination of the econometrics, it is possible that part of the decline in French investment is due to international relocation outsourcing.

Conclusion

One difficulty in drawing conclusions from this review is that few estimates are based on recent data. Most of studies do not cover the ten last years. That makes drawing robust

²³ This result is consistent with Goux & Maurin (2000) who find that around 2/3 of the decline of the unskilled labour is due to changes in the industry composition of domestic demand for goods and services and that international trade (and technical progress) have played only a minor role.

²⁴ Fontagné & Lorenzi (2005).

conclusions and extracting insights for future developments of the French labour markets difficult. Estimation of the job losses due to trade with developing countries vary between 150,000 and 300,000, with an outlier at only 30,000. That represents only between 10 and 20% of the total industrial job losses since thirty years (between 15 and 30% if one excludes domestic outsourcing and temporary employment).

However, trade with a group of countries cannot be taken in isolation: trade between the developed and developing countries in general can have an impact on trade between France and other developed countries and should hence be taken into account. The review suggests that most French employment developments were not related to international trade as a whole — including international relocations and trade with developing countries — but had domestic causes: low investment, skill-biased technological process and demand shifts. Hence, technical progress and internal factors explain the bulk of the decrease in industrial production and employment that frightens the public so much.

This does not mean that trade cannot have a temporarily negative effect on employment, as happened in the late 1980s. It does not mean either that some categories do not suffer particularly because of trade, as did unskilled workers. Nevertheless, if we assume that the contribution of international trade to French employment developments over the 1980-95 period is representative of effects of a growing openness to trade, the following prospective features emerge: first, even the temporary adverse effect in the future of deeper integration with CEECs, including vertical foreign direct investment, will be limited since both European Association Agreements and foreign direct investment liberalisation in the 1990s have already induced most of adjustments. However, stronger trade flows with emerging countries (China, India, etc.) will have probably an adverse impact on French labour market in the next few years, especially for unskilled workers in specific sectors. The traditional sectors, like textiles, are already much reduced compared to what they were in the 1970s, and they will probably not disappear completely as some niche markets can be developed: other sectors may be threatened. There will be individual, sectoral and territorial net losses that warrant cushioning from the community, maybe as a redistribution of part of the sizeable gains offered by trade for consumers.

Bibliography

ARTHUIS, J., 1993: *Rapport d'information sur l'incidence économique et fiscale des délocalisations hors du territoire national des activités industrielles et de service*, Sénat. 231 p.

BAZEN, S., & J.-M. CARDEBAT, 2001: "The Impact of Trade on the Relative Wages and Employment of Low Skill Workers in France". *Applied Economics*, Vol. 33, n° 6, p. 801.

BISCOURP, P., & F. KRAMARZ, 2003: "Internationalisation des entreprises industrielles et emploi: une analyse sur la période 1986-1992". *Économie et Statistique*, n° 363-364-365, p. 69-95.

BONNAZ, H., N. COURTOT, & D. NIVAT, 1994: "Le contenu en emplois des échanges industriels de la France avec les pays en développement". *Économie et Statistique*, n° 279-280.

BOULHOL, H., 2004: "What is the impact of international trade on deindustrialisation in OECD countries?" *Flash CDC IXIS Capital markets*, p. 1-23.

CORTES, O., & S. JEAN, 1997a: "Progres technique, commerce international et inegalites. (Technological Progress, International Trade and Inequalities. With English summary.)". *Economie Internationale*, Vol. 0, n° 71, p. 169-81.

CORTES, O., & S. JEAN, 1997b: *Quel est l'impact du commerce exterieur sur la productivite et l'emploi?* CEPII research center, Working Papers, 1997.

DEVEDJIAN, P., 1993: *Le libre-échange, une chance pour la France*, n° 774, Assemblée Nationale.

DIRECTION GÉNÉRALE DU TRÉSOR ET DE LA POLITIQUE ÉCONOMIQUE, 2004: "Les délocalisations d'activités tertiaires dans le monde et en France". *DP - Analyses Économiques*, n° 55, p. 1-9.

DRUMETZ, F., 2004: "La délocalisation". *Bulletin de la Banque de France*, n° 132, p. 27-42.

EUROPEAN MONITORING CENTRE ON CHANGE, 2005: *European Restructuring Monitor*, à: <http://www.emcc.eurofound.eu.int/erm/>.

FONTAGNÉ, L., & J.-H. LORENZI, 2005: *Désindustrialisation et délocalisations*, Conseil d'Analyse Économique. 127 p.

GALLAIS, & GAUTIER, 1994: *Échanges internationaux, délocalisations, emploi*, Notes Bleues de Bercy.

GONZALES, L., 2002: "L'incidence du recours à l'intérim sur la mesure de la productivité du travail des branches industrielles". *Économie et Statistiques*, n° 357-358, p. 103-133.

GOUX, D., & E. MAURIN, 2000: "The Decline in Demand for Unskilled Labor: An Empirical Analysis Method and Its Application to France". *Review of Economics and Statistics*, Vol. 82, n° 4, p. 596-607.

GUIMBERT, S., & F. LEVY-BRUHL, 2002: "La situation de l'emploi en France face aux échanges internationaux. (The Employment Situation in France in Relation to International Trade. With English summary.)". *Economie et Prévision*, Vol. 0, n° 152-153, p. 189-206.

JEAN, S., 1999: *Commerce international et marché du travail*. PhD Thesis, University Paris-I.

JEAN, S., 2001: *The Impact of Globalisation on Employment in Industrialised Countries: a Survey*, n° DSTI/EAS/IND/SWP(20001)7, Direction de la Sciences, de la Technologie et de l'industrie; Comité de l'industrie et de l'environnement de l'entreprise; OECD. 1-23 p.

JEAN, S., 2002: "L'impact du commerce international sur l'élasticité-prix de la demande de travail. (The Impact of International Trade on Price-Elasticity of Demand for Labour. With English summary.)". *Economie et Prévision*, Vol. 0, n° 152-153, p. 17-28.

JEAN, S., & O. BONTOUT, 1999: "Sensibilité des salaires relatifs aux chocs de commerce international et de progrès technique: Une évaluation d'équilibre général. (Sensitivity of Relative Wages to International Trade and Technical Progress Shocks: A General Equilibrium Assessment. With English summary.)". *Revue d'Economie Politique*, Vol. 109, n° 2, p. 241.

KUCERA, D., & W. MILBERG, 2003: "Deindustrialization and Changes in Manufacturing Trade: Factor Content Calculations for 1978-1995". *Review of World Economics/Weltwirtschaftliches Archiv*, Vol. 139, n° 4, p. 601.

MARIN, D., 2004: "A Nation of Poets and Thinkers. Less so with Eastern Enlargement? Austria and Germany". *CEPR Discussion Paper*, n° 4358.

MATHIEU, C., & H. STERDYNIK, 1994: "L'émergence de l'Asie en développement menace-t-elle l'emploi en France?" *Revue de l'OFCE*, n° 48, p. 55-106.

MESSERLIN, P. A., 1995: "The Impact of Trade and Capital Movements on Labour: Evidence on the French Case". *OECD Economic Studies*, Vol. 0, n° 24, p. 89-124.

MIHOUBI, F., 2002: "Intérim, travail externalisé et mesure de la productivité du travail dans l'industrie". *Économie et Statistiques*, n° 357-358, p. 134-137.

ROWTHORN, R., & R. RAMASWAMY, 1999: "Growth, Trade, and Deindustrialization". *IMF Staff Papers*, Vol. 46, n° 1, p. 18-41.

STRAUSS-KAHN, V., 2003: *The Role of Globalization in the Within-Industry Shift Away from Unskilled Workers in France*, National Bureau of Economic Research, Inc, NBER Working Papers: 9716, 2003.

VIMONT, C., & F. FARHI, 1997: *Concurrence internationale et balance en emplois: les échanges de produits industriels*, *Economica*, 211 p.