Investigaciones Regionales
asociación española de ciencia regional

N.º 22 • Primavera 2012
ISSN: 1695-7253

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Sección ARTÍCULOS

Investigaciones Regionales

Delocation in the manufacturing sectors in the EU. A regional overview

M.ª Elisa Álvarez López *, Rafael Myro Sánchez ** y Josefa Vega Crespo *

ABSTRACT: The question of delocation in main industrial regions across the EU is approached here, and its effects on job losses estimated. Seventy five regions are selected following the double criteria of size of the manufacturing industries and high per capita income levels. Delocation affected half of them in the period 2000-2005 when competition in the international markets rose and is of higher intensity in most of the British, French and Italian regions although its aggregate effect on employment seems to have been offset by growth in the other sectors. On the other hand, regions located in the continental area with more market potential have the highest concentration of location effects. Therefore delocation has changed the location of European manufacturing industry, benefitting those latter regions and perhaps bringing higher spatial concentration.

JEL Classification: L6, R3, O4.

Keywords: manufacturing industry, delocation, regions, European Union.

Deslocalización en los sectores manufactureros de la UE. Un panorama regional

RESUMEN: En este trabajo se evalúa la incidencia de la deslocalización, en términos de empleo afectado, en las principales regiones industriales de la Unión Europea, confrontando lo ocurrido en cada una de ellas con lo acontecido en el plano nacional. Los resultados obtenidos, relativos al periodo 2000-2005, muestran que los efectos de deslocalización han sido especialmente intensos en regiones situadas en Francia, Reino Unido e Italia, en tanto que las regiones finesas y algunas de las alemanas y holandesas son las que presentan efectos de localización de mayor magnitud.

Clasificación JEL: L6, R3, O4.

Palabras clave: industria manufacturera, deslocalización, regiones, Unión Europea.

* Universidad de Valladolid, Departamento de Economía Aplicada, Avda. Valle Esgueva 6, 47011 Valladolid (e-mail: *elsa@eco.uva.es; josefa@eco.uva.es*).

** Universidad Complutense de Madrid, Departamento de Economía Aplicada II, Campus de Somosaguas s/n, Pozuelo de Alarcón, 28223 Madrid (e-mail: *R.myro@ccee.ucm.es*).

Recibido: 19 de noviembre de 2010 /Aceptado: 24 de noviembre de 2011.

1. Introduction

Throughout the last decade delocation of manufacturing activities has increased very rapidly, mainly in the developed countries due both to a more globalized and competitive international environment and the emergence of China, India and other big countries as new industrial powers with the help of a large list of multinational corporations which have been locating new plants in their territories since around 1990.

We give the name «delocation» to a process going beyond the process of moving companies offshore, as it also includes the closure of plants as a result of fierce competition, following the idea suggested by Baldwing and Robert-Nicoud who defined delocation as «a loss of manufacturing jobs to trading partners» in the presence of a process of opening up to foreign competition (Baldwin and Robert-Nicoud, 2000). In our view, delocation refers to manufacturing activities as a whole, not only to companies exporting jobs, as offshoring does.

While offshoring of companies has received great attention from researchers in the last years (Antràs and Helpman, 2005; Olsen, 2006; Helpman *et al.*, 2008), delocation of manufacturing activities has not, perhaps because the latter is not shown as different from the changes in production and trade patterns deriving from extended international trade (Bhagwathi *et al.*, 2004; Grossman and Rossi-Hansberg, 2006), or can just be considered as a special case of the location theory, now arising with the development of economic geography following the seminal work by Krugman and Venables (1990), Krugman (1999), Fujita *et al.* (1999) and Puga (1999) [1].

The aim of this paper is to measure the effect on labour employment of the delocation process in the manufacturing sectors throughout the main industrial regions in the EU, from 2000 to 2005. As such a process affects each manufacturing section in a very different way, the branch-by-branch analysis is indicated but data availability is an obstacle to taking this path, suggesting instead an initial view at the aggregate level. Even with that restriction, it will be an important task to obtain the required data.

In order to register the delocation patterns in European regions this paper takes as reference those territories with a strong industrial sector, high level of economic development and homogeneous space dimension. So the sample contains only geographical areas at NUTS 2 level [2], whose industrial production represents, at least, 0.4% of total EU manufacturing GVA and, at the same time, has a per capita income of over 90% of the EU-15 average. Therefore, they are developed regions that have a powerful industry at the Community level.

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[1] The relationship between new geography and location is summarized in Puga (2002).

[2] The term NUTS corresponds to the French acronym for Nomenclature of Statistical Territorial Units used by the European Union. This classification has a hierarchical structure at three levels which, among other factors, comes from demographic thresholds. In particular, the NUTS2 level covers regions of an average size between 0.8 and 3 million inhabitants. In Spain, the nineteen units included in this level coincide with the different AACC more than Ceuta and Melilla.

Consistently, the resulting list from applying to the set of EU-27 territories the three already mentioned selection criteria includes a total of seventy-five regions of thirteen Member States, distributed as follows: 23 from Germany, 14 the United Kingdom, 10 from France, 7 from Italy, 4 Holland, 4 Sweden, 3 Spain, 2 from Austria, Belgium, Denmark and Finland, 1 Greek and 1 Irish. On the whole, they accounted for 64% of real GVA in 2005 and almost three-fifths of manufacturing employment in the EU-15 (60 and 45%, respectively, taking as reference the EU-27). The complete catalogue of regions grouped by country and their characteristics are set out in Appendices 1 and 2. As is shown there, regions included in the sample are principally in sizes over 0.5% of EU-15 industrial production and above the average EU-15 per capita income, although a significant number of them lie below those levels, particularly in the per capita income. Looking more closely at the industrial size, we see that although most of the NUTS 2 examined move in around 0.5% there is a group of fifteen regions located in Italy, Germany, Ireland, France and Spain with a strong industrial sector (more than 1%), among them Lombardy, in Italy, with about 4% of total EU-15 manufacturing GVA.

After this first introductory section, the paper is organized as follows. In a second section, the model to capture the delocation patterns is introduced. Then, in a third section, the data sources are commented on. In section four we try to assess the impact of delocation in each region in terms of jobs affected and examine whether their location patterns have altered its position in the European industrial scene, contrasting country trends with regional performances. Concluding remarks round up the paper.

2. Measuring delocation

As was posed in the introduction, following Baldwin and Robert-Nicoud (2000), delocation of manufacturing activities has to be assessed in terms of losses of productive activity within each region. The variables which approximate these losses are gross added value and number of jobs or total manufacturing employment. The first one is the most suitable, since the latter is dependent on advances registered in labour productivity, mainly in the face of strong competitive pressures forcing companies to achieve greater efficiency gains.

In spite of that, jobs continue to be a useful measure since their calculation is simpler and is often more reliable. In addition this indicator has received greater attention and is more easily interpreted by the analysts and, especially, the social partners.

Nevertheless if evolution of jobs is chosen as a measure of delocation, it is necessary to discount the effect on it of an increase in labour productivity (which reduces the need for labour) and of the economic cycle (which may reduce or expand the existing employment). The remaining reduction in the number of jobs measures the delocation effect on employment.

Furthermore, when average values for quite a long time interval are taken, it is possible to ignore almost completely the impact of the cycle that, otherwise, would

be estimated using econometric techniques to isolate the trend. In this way, the delocation effect can be just approximated after deducting the change in jobs caused by the increase in labour productivity. All in all, the possible incidence of the cycle on variation in manufacturing employment stemming from the evolution of industrial value will be seen.

Therefore, the change in total manufacturing employment may be split up into two effects, one of them due to the increase in manufacturing labour productivity and the other to a location effect —delocation if it is negative—. Box 1 shows that decomposition.

Box 1

GVA = Labor Productivity · Employment

$$GVA = \pi \cdot N$$

where π represents productivity and N employment

$$N = \frac{GVA}{\pi}$$

$$\widehat{N} = \widehat{GVA} - \widehat{\pi},$$

where a hat over the variable denotes its rate of change

$$\Delta N = \widehat{N} \cdot N(0)$$

$$\Delta \boldsymbol{N} = \underbrace{\widehat{\boldsymbol{GVA}} \cdot \boldsymbol{N(0)}}_{\text{Delocation Effect}} - \underbrace{\widehat{\boldsymbol{\pi}} \cdot \boldsymbol{N(0)}}_{\text{Productivity Effect}}$$

In fact, the location effect reflects the impact on jobs of an increase or decrease in manufacturing value added estimated through the primitive rate of labour productivity, and, as has been mentioned above, may be positive (location) or negative (delocation). In the first case, an expansion in activity has taken place, while, in the second, a reduction of the productive scope has occurred.

Delocation of activities that can result from this calculation is compatible with the absence of offshoring companies, and it may be due, as noted above, to the closure of establishments as a result of their being uncompetitive. In the same way, the location of activities in a territory is compatible with the offshoring of companies.

Thus, analysis of delocation does not necessarily tell us much about the importance of firms' offshoring, a matter that has to be studied on a different basis. However, when offshoring reaches a large-scale dimension it affects the extension of manufacturing industries.

Moreover, the work will also examine whether regions which have witnessed a fall in employment in manufacturing have been able to offset this loss by creating jobs in other areas of activity or not. Thus, the aim is to ascertain which regions have shown themselves to be the most active ones in dealing with delocation, either by replacing industrial employment by employment in other sectors, restructuring their manufacturing sector via productivity increases or both of these concurrently.

3. Database

As was said before, to achieve aggregate data on manufacturing activities by regions, even just those of real GVA and total employment, has demanded a laborious task of collecting information provided by Eurostat (REGIO database) and the National Statistical Offices of member countries to which the different regions belong, as well as the estimation, in most cases, of the product in real terms.

Looking first at the GVA, since the data offered by REGIO include those related to energy and mining, only access to the National Statistics of every member country has allowed us to isolate the manufacturing sectors. Nevertheless, additional work has been applied to transform the data of manufacturing GVA into real values, as only Germany, Spain, Finland, Holland and Italy provide such information or at least indexes of volume. In the rest of the countries real values of manufacturing GVA have been estimated by applying the national price deflators to the regional series at current values.

As regards total manufacturing employment, significant discrepancies between the data published by Eurostat and that country itself (particularly in the United Kingdom) are found, as well as the gaps found in several NUTS 2 of some Member States, such as in Germany, where they are obliged to complete regional series and correct such deficiencies with the help of the information coming from the National Statistics Offices.

To sum up, most of the information used, (especially production data), comes from National Statistical Offices, but this is commonly close to the Eurostat database, as this is constructed mainly with data coming from the regional accounts of each country.

Incidentally, one of the problems arising from taking the National Statistics as the main source of data is that the time intervals for which they provide information do not always coincide. That explains the fact that, despite having more recent data from some areas, the analysis must conclude in 2005.

4. Delocation of manufacturing industries in European regions

As noted above in the introduction, the group of regions examined reached just over 64% of EU-15 industrial GVA and about 60% of jobs in 2005, figures slightly lower than

in 2000. Thus, despite nearly half of regions' industrial output at constant prices having achieved positive growth rates, the group accumulated throughout the period a decrease of about 1%, similar to EU-15 average [3]. Regarding employment, the evolution has been even more negative. Throughout the first five years of the current century, destruction of jobs in the aggregate industry has been a common feature in the vast majority (90%) of the seventy-five NUTS 2 examined, as well as for each of the Member States where they are located, except Spain, accumulating the total sample a decline of close to 8%.

Focusing on manufacturing employment, the most dynamic areas are located mostly in France, Spain and Austria, while the Netherlands and especially the British regions show the largest job losses (table 1).

Table 1. Importance of manufacturing delocation in European regions, 2001-2005 (Decomposition of change in employment)

Regions		*Number of jobs (thousands)*			*Percent share of 2000 employment*		
		Total effect	*Productivity effect*	*Location effect*	*Total effect*	*Productivity effect*	*Location effect*
at22	Steiermark	3.72	–1.08	4.80	3.6	–1.1	4.7
at31	Oberösterreich	0.97	–8.37	9.34	0.6	–5.6	6.2
	Austria	*–11.04*	*–26.49*	*15.45*	–1.8	–4.2	2.5
be21	Prov. Antwerpen	–10.10	0.79	–10.89	–7.0	0.5	–7.5
be23	Prov. Oost-Vlaanderen	–7.50	–6.27	–1.23	–7.4	–6.1	–1.2
	Belgium	–57.40	*–22.19*	*–35.21*	–8.4	–3.2	–5.1
de11	Stuttgart	–31.57	–82.44	50.87	–4.8	–12.5	7.7
de12	Karlsruhe	–20.36	–35.85	15.50	–5.7	–10.1	4.4
de13	Freiburg	–12.91	–13.01	0.11	–4.5	–4.5	0.0
de14	Tübingen	–5.85	–18.05	12.19	–2.3	–7.2	4.9
de21	Oberbayern	–16.30	–79.76	63.46	–3.7	–17.9	14.2
de22	Niederbayern	–4.90	–32.70	27.81	–3.3	–21.8	18.6
de23	Oberpfalz	–5.38	–17.16	11.78	–3.8	–12.0	8.3
de24	Oberfranken	–19.57	–31.31	11.75	–11.6	–18.6	7.0
de25	Mittelfranken	–11.84	–17.70	5.86	–5.3	–8.0	2.6
de26	Unterfranken	–8.19	–31.57	23.38	–4.9	–18.9	14.0
de27	Schwaben	–9.32	–33.35	24.03	–4.1	–14.8	10.6
de60	Hamburg	–7.60	–12.22	4.63	–6.0	–9.7	3.7

[3] It must be noted that the EU average has been calculated from the aggregate industrial GVA at constant prices of thirteen countries included in the sample. Thus, Portugal and Luxembourg have been excluded and the values from other countries have been estimated by adding figures of all their regions. So, the above mentioned growth rate differs from that provided by Eurostat, exhibiting a positive increase of 4,6%.