Patterns of Vertical Specialization and Determinants of European Outward Processing Trade in the Mediterranean and Central and Eastern European Countries

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Abstract

In recent years, Central and Eastern European countries (CEEC) and Mediterranean countries have been increasingly involved in the internationalization process led by foreign firms particularly European ones, in search of different ways to fragmentize internationally the production process and gain competitiveness. The paper deals with Outward Processing Trade (OPT) and analyzes European activities in OPT in the two regions. In the OPT domain, competition between the two areas is significantly high since they possess similar characteristics both in terms of proximity to the EU market and low labor costs, allowing for a profitable delocalization of labor-intensive phases of EU production. In particular, the degree of competition is mostly attributable to similarity in products rather than of European markets. The econometric exercise performed through a gravity model with sectorial data in panel, allows not only to identify the determinants of EU OPT, but also to understand the pattern of competition between the two regions. The greater efficiency of the unrestricted model, with EU countries as cross-identifiers, suggests that the effects not explained by the model are probably due to the different productive specialization of EU countries that guide their delocalization strategy. Concerning the determinants, OPT flows seem positively related with low wages and transport costs, whereas trade, signalling the degree of development of the domestic industrial structure, is a complement of OPT in the higher value added industries. The econometric results point also to a complementarity of the two forms of vertical specialization, i.e. OPT and Foreign Direct Investment (FDI), at least in the more advanced sectors such as the mechanical industry. Especially in these sectors, OPT may be considered a preliminary model of economic integration able to accelerate the process of catching-up of Third-world economies, as confirmed by the positive correlation of OPT with trade in final goods.

نمط التخصص الرأسي ومحددات عملية التجارة الخارجية في الأقطار المتوسطية وأقطار وسط وشرق أوروبا

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ملخص

في السنوات الأخيرة دأبت دول شرق ووسط أوروبا وكذلك دول البحر الأبيض المتوسط على تكثيف نشاطاتها بشكل متزايد في عمليات التدويل التي تقودها الشركات الأجنبية وعلى وجه الخصوص منها الشركات الأوروبية، وذلك ابحث مختلف الطرق من أجل التقسيم الدولي لعمليات الانتاج واكتساب التنافسية. تتعالج هذه الورقة عملية التجارة الخارجية وتحلل الأنشطة الأوروبية المتعلقة بها في منطقتين، حيث أن المنافسة عالية بين المنطقتين في هذا المجال من حيث درجة تماثلهما بقرب المنازل والخصائص المتعلقة بالقرب من السوق الأوروبية، مما يسمح باعادة تمطين مربح لها لانتاج كثيفة العمل في الاتحاد الأوروبي. وبخصوص أن درجة المنافسة تعتمد في الغالب على التشابه المنتجات أكثر من كونها أسواقا أوروبية، إن التمرين الاقتصادي المعتمد من خلال نموذج الجاذبية باستخدام بيانات قطاعية لا يسمح فقط بتشخيص محددات عملية التجارة الخارجية في الاتحاد الأوروبي، فحسب، بل يفهم نمط المنافسة بين المنطقتين. إن الآثار غير المفسرة من قبل النموذج يمكن أن تعود إلى انتاجية مختلفة في التخصص لأقطار الاتحاد الأوروبي التي تقود استراتيجية التمطين. وفيما يتعلق بالمحددات، فإن تدفقات عملية التجارة الخارجية تبدو ايجابية لارتباطها بالأجور وتكاليف النقل المنخفضة وبمكان التجارة مما يشير إلى درجة التطور في هيكل الصناعة المحلية، وهي عملية مكملة لعملية التجارة الخارجية في الصناعات عالية القيمة المضافة. تشير النتائج التحليلية إلى تكاملية شكل التخصص الرأسي أي عملية التجارة الخارجية والاستثمار الأجنبي المباشر وذلك على الأقل في القطاعات الأكثر تقدما مثل الصناعة الميكانيكية. وفي هذه القطاعات على وجه الخصوص يمكن اعتبار عملية التجارة الخارجية كنموذج أولي للتكامل الاقتصادي من أجل عملية لحاق إقتصادات العالم الثالث بباقي الإقتصادات المتقدمة، حيث تم التأكيد على العلاقة الإيجابية لعملية التجارة الخارجية في المنتجات النهائية.

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Introduction

Economies of countries all over the world, have become increasingly integrated during the last twenty years. The importance of trade in terms of Gross Domestic Product (GDP) experienced at world level is growing. In addition to trade in final goods, a major component of the increasing interrelatedness among countries is the trade in intermediate goods, which proves to be a more interesting phenomenon since it can result from a number of internationalization processes involving, among others, vertical specialization and foreign direct investments (FDI).

This paper deals with a particular form of international involvement, the so-called Outward Processing Trade (OPT), that may be considered a subcontracting arrangement. This study analyzes European activities in OPT with the rest of the world. In particular, it focuses on neighboring countries involved in the currently undergoing enlargement and integration process, notably the Central and Eastern Europe Countries (CEEC) that are candidates for EU membership, and the Mediterranean countries, that participate in looser agreements.

OPT, astonishingly, has always been neglected by literature on internationalization and this, despite its economic relevance. OPT is a source of mutual advantage for both the contracting parties. The authors believe that OPT can play an important role in integrating Third countries with Europe both from an economic and a political perspective. It has been observed that trade in intermediate goods, as implied generically by international delocalization of production, may redefine the export structure of the trading partners in a way that magnifies their trade potential.[2] It may also be considered a means of "learning by doing" through the transfer of technology, qualitative standards and managerial skills, which can accelerate the transformation of Third-world economies into market-based systems. Besides, OPT seems a logical starting point for attracting FDIs in Third countries since it allows foreign firms to know the host market and gain confidence on its potentialities with limited sunk costs.

On the other hand, OPT has become an instrument of trade policy for EU countries, allowing mature European industries like textile and clothing, footwear and mechanical appliances, to improve their competitiveness and face strong competition from low-cost economies both at home and abroad, e.g. East-Asian countries. Moreover, OPT provides significant sets of data able to capture the wider dynamics of the rising integration of countries through international trade in intermediate products.

Internationalization of Production, Vertical Specialization and OPT

OPT makes it possible to export goods temporarily for processing and to import the compensating products with full or partial exemption from duties and levies. In other words, it consists of a temporary transaction implying the shifting of a production phase of the contractor's manufacturing activities to a foreign subcontractor, as a part of a vertically linked production system. The resulting product, once re-imported, will be sold by the contractor.

OPT encompasses a number of different ways to fragmentize the production process internationally. OPT is characterized by the formal status granted to it within the EU trade legislation. OPT being based on a system of licences granted by EU member states, as any other regulated regime, it imposes administrative and economic constraints, both on firms and national authorities. The administrative burden imposing licenses, border controls, recognition of the

[2] See Hoekman and Djankov, 1997.

merchandise and recording the temporary nature of the transaction, allows the exhaustive statistical recording in the European trade statistics of this kind of operations. Until 1994, the authorization fixed the maximum quantities of goods to be admitted to OPT on the basis of the assigned national quotas. Since then, Regulation 3036/94 implemented more restrictive rules. In particular, quotas were fixed at the community level, and attributed on the principle of "first come, first served" imposing that firms entering OPT need to produce at least 50% of their production in the EU for at least 3 years. In the previous legislation, no limits were fixed. This rule favors firms already operating in the market and discourages new firms from entering the OPT regime.

Only firms endowed with a licence and respecting some parameters (which include that the goods sent abroad for processing should originate in the EU), can temporarily export goods of community origin outside the EU customs territory. Precisely because of its juridical status, by implying the recording of the transactions made within this regime, it allows to capture at least part of the forms of internationalization that would otherwise be hidden under normal exports and imports of intermediate goods. Normal imports and exports refer to goods exported definitively (in the definitive regime) and released into free circulation.

Moreover, while not capturing the entire phenomenon, OPT statistics are a useful starting point for the analysis of a much currently debated issue like the effects of the internationalization of production on the domestic unemployment rate. The OPT regime itself contains provisions revealing the concern for the effects of the delocalization on EU employment. From 1994, OPT quantities have been kept constant only if firms maintained their production constant as well as their occupational level during the previous year. Otherwise, quantities are reduced proportionally. As alternative to OPT statistics, the study of this issue implies relying on input-output tables or on interviews made on a sample of multinationals or firms going international.[(3)] It is therefore important to define OPT with respect to the underlying phenomenon that it proxies and also to the alternative forms of internationalization of production. OPT concerns goods whose production process may be split into different phases that may be performed in different locations. It may therefore be classified as a subset of vertical specialization defined by Hummels, Rapoport and Yi (1998), since at least one stage implies a double crossing of an international border.

The definition of vertical specialization does not imply any kind of relationship linking the contractor and the subcontractor, the issues of control and ownership being immaterial. Therefore OPT, like vertical specialization, may involve FDIs in the case that the products processed abroad, using input from the parent company, are re-exported. However, re-exports must respect EU regulation on OPT that sets out strict rules concerning the circulation of the processed goods. In particular, the triangular exchange, i.e. the possibility of releasing the goods in OPT regime in a country different from that of the contractor, is allowed, but only in case of EU member states. When OPT is realized through market relationships, whether continuous or spot, without any participation of the contractor in the subcontractor's business activity, the transaction will be classified simply as vertical specialization (not implying FDI). OPT may not be considered as a form of outsourcing, since the latter differs from vertical specialization due to the fact that the intermediate goods cross international borders only once (see Figure 1). As an example, a transaction made by a cotton fabric-importing firm to manufacture shirts that will be sold on the domestic market is classified as outsourcing independently of the contractual relationship linking the two counterparts. Therefore, outsourcing could also refer to transactions involving direct control. Alternatively, if final products are sold abroad, this transaction enters again the domain of vertical specialization, like the delocalization of one or more production phases abroad (e.g. sewing) with consequent re-export. Therefore, although OPT is a kind of juridical label, it is able to proxy the underlying economic phenomenon of vertical specialization.

[(3)] See for example Barba Navaretti, Falzioni and Turrini, 1999.

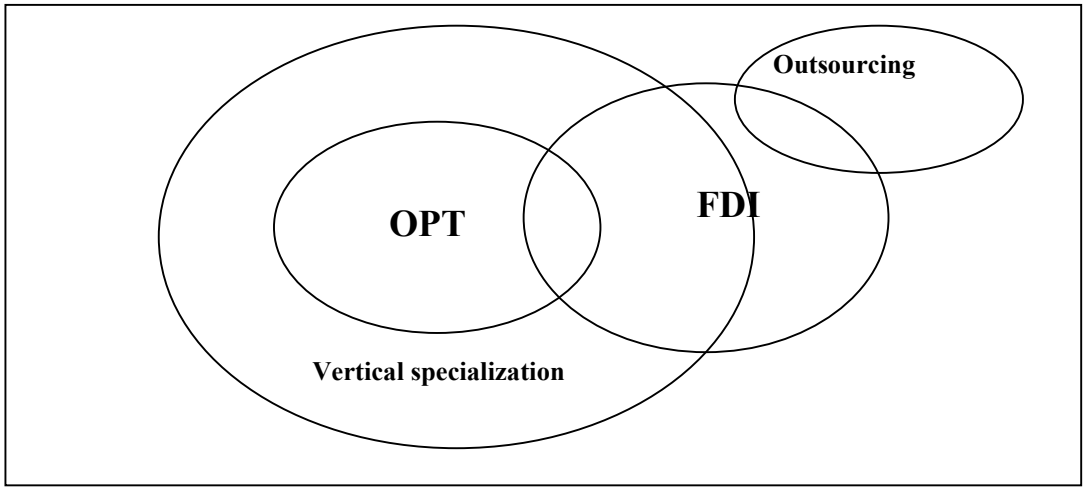

Figure 1. Relationship among different forms of internationalization of production

As a form of vertical specialization, OPT shares the same economic motivations driving firms international. In particular, OPT is a way for the contractor to face the economic cycle, and/or to exploit the specialization of the subcontractor and/or to benefit from production cost reduction. Furthermore, if OPT is realized without involving FDI, it allows the entry to a new market with limited costs, thus enhancing the possibility for the establishment of future deeper economic relationships like FDI. The first move of foreign firms delocalizing production is then likely to be OPT without FDI, even if this way of proceeding does not imply zero sunk costs. The latter could be related to transaction costs deriving from the transfer of production blueprints, the search of a suitable partner in the host country, the introduction of quality controls and the management of the logistical aspects of the system.

The special regime regulating OPT grants a preferential treatment with respect to normal trade. This is not only in terms of quotas, but also in terms of total or partial relief of import duties, since the tariff is applied only on the value added generated by the delocalization process and not on the gross value. Actually, the quotas have never been binding either for the CEEC or for the Mediterranean countries. The Community's legislation differentiates Fiscal OPT from Economic OPT, the former being regulated by the Custom Code and referring to all kind of commodities, the latter by Council Regulation No. 2473/86, which concerns only textile and clothing.

The tax effect, which is a kind of "liquidity premium" implied by the payment of the Value Added Tax (VAT), adds an additional benefit to OPT with respect to generic vertical specialization. Indeed, as in the case of import duties, the VAT on temporary exports has to be paid on the value added originating in the double transaction, whereas in the case of normal trade, it has to be paid on the total value of imports. The final net exposure towards the fiscal authorities in terms of VAT is necessarily the same for both OPT and normal trade. However, the former allows a temporary liquidity advantage, since the payment will be delayed over time with respect to normal trade, taking place at the fiscal periodical date of payment. For example, VAT payments in Italy are due quarterly.

The process of progressive liberalization implied by the EU enlargement and integration process, reduces the tariff advantages for EU firms to enter the OPT regime, while they still have to meet the burden of the special administrative requirements. Therefore, the removal of tariff barriers

will, on the one hand, progressively imply a decreasing recourse to OPT, thus reducing the ability of OPT to proxy the vertical specialization dynamics. On the other hand, it would result in an increased vertical specialization trade-based flows, due to the reduction of the multiple custom duty costs.(4)

This research paper is limited to the period 1988-1998. Trade statistics demand, on the average, a couple of years to become definitive. Therefore, presently, the last reliable data on trade cover until 1998. The phenomenon described above could be observed to some extent only starting from 1994, when the CEEC were granted zero-duty access to the EU market for the textile and clothing (TC) sector.

The EU OPT with the Rest of the World(5)

The dynamics of the geographical distribution of EU OPT identifies a well-defined pattern of delocalization of production (Table 1). Given that more than 40% of European OPT takes place in the CEEC - neighboring countries with low labor costs - the prevailing reason driving the delocalization process seems to be externalizing labor-intensive phases of production to reduce costs. The increasing emphasis on efficiency shared by EU firms and orienting their internationalization strategies, has been fostered not only by the rising competition coming from low-cost economies, but also by the progressive completion of the European single market, resulting in an enhanced competition among EU firms. The second reason by order of importance, has to be related to the know-how of the sub-contractor, since a remaining large part of EU OPT flows is directed to highly industrialized areas of the world, like the US or the European Free Trade Association (EFTA) presently consisting of Norway, Iceland, Switzerland and Liechtenstein).

Table 1. EU OPT by Area of Destination

		Regional OPT/Total EU OPT		*EU OPT/TT by Region*[1]	
		1988-92	1993-98	1988-92	1993-98
EFTA[2]	**EU Exports**	**11.1%**	**6.2%**	**0.64%**	**0.96%**
	Re-imports	**8.3%**	**5.0%**	**0.56%**	**0.72%**
Med12[3]	**EU Exports**	**10.6%**	**6.5%**	**2.02%**	**1.68%**
	Re-imports	**10.2%**	**7.5%**	**2.93%**	**2.81%**
CEEC[4]	**EU Exports**	**32.9%**	**38.8%**	**9.10%**	**8.77%**
	Re-imports	**38.5%**	**46.9%**	**12.49%**	**13.44%**
North America	**EU Exports**	**19.4%**	**14.8%**	**1.42%**	**1.56%**
	Re-imports	**19.2%**	**15.1%**	**1.46%**	**1.57%**
NIC[5]	**EU Exports**	**17.8%**	**17.4%**	**3.24%**	**3.39%**
	Re-imports	**15.7%**	**13.6%**	**2.80%**	**2.75%**
Others	**EU Exports**	**8.3%**	**8.5%**	**0.38%**	**0.57%**
	Re-imports	**8.0%**	**11.7%**	**0.34%**	**0.70%**

[1] In particular, it is the ratio between EU OPT exports and Total EU normal exports (TT is total trade). This is the same for imports. For reasons of homogeneity, the ratio weighs OPT flows to total normal trade flows generated with non-member countries, thus excluding intra-EU trade of normal goods as in the case of OPT for intermediate goods. It is calculated by region as an average over the period considered.
[2] Effective EFTA (European Free Trade Area) countries.
[3] Med12 includes the 12 countries involved in the Euro-Mediterranean Agreements: Morocco, Algeria, Tunisia, Egypt, Jordan, Gaza and West Bank, Israel, Lebanon, Syria, Turkey, Cyprus and Malta.
[4] CEEC includes: Poland, Hungary, Romania, Bulgaria and Albania for the whole period considered (1988-1997), DDR (1988-1990), Czechoslovakia (1988-1992) and Czech Republic and Slovakia thereafter (1993-1997), Latvia, Lithuania and Estonia (1992-1997), Yugoslavia (1988-1991. After 1991, the following independent Republics: Slovenia, Croatia, Bosnia (1992-1997) and Fyrom (1993-1997) were included.
[5] NIC (Newly Industrialised countries) includes South Korea, Hong Kong, Taiwan, Singapore, Thailand, Malaysia, Indonesia and the Philippines.

(4) See Hummels, Rapoport and Yi, 1998.
(5) For details on data used in this paper, see Appendix 1.

The CEEC's involvement in the EU OPT is not new since their share has always been relevant. This is even before opening to Western Europe and the disruption of the Council for Mutual Economic Assistance (COMECON) formed by USSR, most of the Soviet-influenced eastern European countries, Cuba, Mongolia and Vietnam with the aim to develop the member countries' economies. This quota has been increasing over time. However, a decreasing trend has started in 1997 and is expected to persist in the future due to the application of Association Agreements.[6]

Indeed, the removal of all import duties starting from 1 January 1997 for all goods coming from the CEEC and satisfying the Agreement's rules of origin,[7] implies that the OPT regime for firms delocalizing in the CEEC no longer fully assures the benefits granted in the past by the special tariff regime characterizing the OPT. A reduction in the rate of growth of OPT in the CEEC is the likely result, while it is expected that vertical integration process led by EU firms in this region will continue to develop. Indeed, the difference in the cost of labor between the CEEC and EU countries is so wide. Even considering their lower productivity and an expected increase in the level of prices and wages due to the integration process with the EU, the likely re-direction of OPT flows towards other regions, will take some time.

Other regions' performance differ sharply from that of the CEEC. In particular, the potentially direct competitors of the CEEC, i.e. the Mediterranean countries, both for distance from Europe and reduced labor costs, apparently lacked the capacity of attracting foreign firms, performing, with few exceptions, quite deceiving results during the last ten years and even negative growth rates.

The Evolution of OPT Traffic in the CEEC and the Mediterranean Region

The parallel analysis of the economic performance of the CEEC and that of the Mediterranean region is interesting because of their structural characteristics and the common knowledge that they are not direct competitors, at least from an economic perspective. The different factor endowments, showing a prevalence of unskilled labor and raw materials for the Mediterranean area and skilled labor and a quite developed industrial structure for the CEEC, seems to imply divergent productive specialization and therefore, divergent trade patterns. At the same time, there is a widespread consensus that for some time, the two areas have been competitors *vis-à-vis* the EU from a political perspective. Indeed, the European Agreements, followed by the decision to open negotiations for the accession of five CEEC to the EU, together with the Euro-Mediterranean Conference of Barcelona, clarified the relative position of the two groups of countries in the new political design of the EU. It then became clear that the CEEC as a group, had the option of becoming members of the EU, option that has instead been excluded for the Mediterranean countries as a group. Indeed, they were offered only the possibility to participate in the EU Free Trade Area, due by 2010.

A number of economic questions remain, nevertheless, still open. In particular, the literature devotes little attention to the investigation of the vertical disintegration process of production directed towards the two regions. In this domain, competition appears far from being low, since the

[6] The Agreements concluded with some CEEC in 1991 (Czech Republic, Slovakia, Hungary and Poland) and in 1993 (Romania and Bulgaria) are officially designated as Europe Agreements (EAs) to mark their specific nature. EAs aim to gradually eliminate trade restrictions and prepare for the creation of an integrated European market. See for example OECD, 1995.

[7] See Najouks and Schmidt, 1994.

two areas possess similar characteristics, both in terms of proximity to the EU market and also low labor costs, allowing for a profitable delocalization of labor-intensive phases of EU production.

This paper explores whether the two regions compete in the quality of preferred locations in the process of international fragmentation of production followed by European firms. A preliminary analysis of OPT data reveals that CEEC's volume of trade is much higher than that generated by the Mediterranean countries during the entire period. The gap, however, has started to widen in 1994 due to both CEEC's boosting and the Mediterranean region's falling performance. This result is partially influenced by Malta's peculiar trend that recorded a considerable increase of OPT at the beginning of the 1990s followed by a strong reduction in 1996-97 (Tables 2 and 3). Both areas experienced a decline in the rate of growth of OPT in the period 1993-1998. However, in the case of CEEC, the decrease may be attributed to the diffusion of other forms of internalization of production following the integration process in the EU, as confirmed by the decreasing importance of OPT traffic, both in absolute value (Table 3) and with respect to normal trade in 1998 (Table 2). With respect to other interpretations[(8)], the authors believe that the process of substitution of OPT with normal imports and exports of intermediate goods, is not directly connected to the evolution of FDI. In particular, FDI will increase due to the lower country-risk perceived by the investors (Corado, 1994), whereas the transformation of OPT in normal trade will occur due to the progressive removal of trade barriers. However, as previously explained, the two phenomena can coexist.

With the exception of 1998, CEEC's OPT flows with the EU continued to increase during the period under analysis. This implies that the normal trade's rate of growth has been higher than the corresponding one for OPT since at least 1994. This supports the view that European firms are progressively switching to different juridical forms of delocalization of production, rather than changing their specialization pattern.

In the case of the Mediterranean countries, after an initial period of relatively satisfying rate of growth, their performance shows a downward trend starting in 1995, despite the improved political climate generated by the modification in the EU Mediterranean policy implemented during the same year. The Conference of Barcelona marked an important change in the Euro-Mediterranean relationships, since it has transformed the original transitory Association Agreements of bilateral nature, mainly financially oriented, into preferential and permanent commercial and financial agreements of multilateral nature. In addition, for the first time, financial aids were subordinated to the respect of democracy and meeting minimum social standards. This could suggest that instead of benefiting from the changing European economic and political scenarios and of the growing demand of delocalization of production by European firms,[(9)] the Mediterranean countries have lagged behind with respect to the CEEC.

[(8)] See for example Corado, 1994.
[(9)] Trade in capital goods and in intermediate inputs represents a substantial share of total trade at world level. See Feenstra (1998) for a review.

Table 2. EU OPT in the Mediterranean Countries and the CEEC

(thousands of Ecu)

		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	88-92	93-98
Med12	EU Exports	338.021	587.010	688.279	811.896	910.932	949.326	1,028.097	1,028.247	759.308	711.259	716.277	667.228	865.419
	Exports rate of growth		73.7%	17.3%	18.0%	12.2%	4.2%	8.3%	0.0%	-26.2%	-6.3%	0.7%	30.27%	-3.21%
	Exports/ normal exports	1.28%	1.96%	2.05%	2.31%	2.49%	2.19%	2.34%	2.04%	1.34%	1.09%	1.06%	2.02%	1.68%
	Re-imports	365.089	669.482	830.070	879.748	1,027.733	924.124	1,130.120	1,142.958	871.371	796.206	862.493	754.424	954.545
	Re-imports rate of growth		83.4%	24.0%	6.0%	16.8%	-10.1%	22.3%	1.1%	-23.8%	-8.6%	8.3%	32.54%	-1.79%
	Re-imports / normal imports	1.92%	2.82%	3.12%	3.16%	3.64%	3.30%	3.70%	3.42%	2.47%	1.93%	2.04%	2.93%	2.81%
CEEC	EU Exports	1,291.113	1,565.835	1,914.766	2,450.906	3,042.325	3,688.113	4,414.483	5,277.221	6,055.495	6,257.618	5,720.232	2,052.989	5,235.527
	Exports rate of growth		21.3%	22.3%	28.0%	24.1%	21.2%	19.7%	19.5%	14.7%	3.3%	-8.6%	23.92%	11.66%
	Exports/ normal exports	7.90%	7.71%	8.89%	10.01%	11.00%	11.09%	10.93%	9.06%	8.55%	7.17%	5.81%	9.10%	8.77%
	Re-imports	1,853.058	2,201.780	2,667.129	3,354.889	3,902.881	4,455.353	5,354.924	6,238.685	6,933.038	7,070.373	6,728.945	2,795.947	6,130.220
	Re-imports rate of growth		18.8%	21.1%	25.8%	16.3%	14.2%	20.2%	16.5%	11.1%	2.0%	-4.8%	20.52%	9.86%
	Re-imports / normal imports	10.41%	10.57%	12.19%	14.17%	15.08%	16.64%	15.80%	13.25%	13.86%	11.70%	9.39%	12.49%	13.44%

Table 3. EU OPT with the Main CEEC and Mediterranean Countries

(thousands of Ecu)

		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Poland	EU exports	172.474	228.077	416.915	617.168	855.732	1.046.538	1.153.575	1.368.822	1.472.538	1.307.849	1.068.330
	Re-imports	270.203	348.014	566.704	838.861	1,122.730	1,406.993	1,685.374	1,881.485	1,933.954	1,671.788	1,400.806
Hungary	EU exports	230.107	284.490	358.094	483.401	617.583	681.454	715.485	840.629	980.478	1,006.352	855.837
	Re-imports	356.982	422.716	492.381	669.343	805.089	800.226	861.935	981.856	1,160.962	1,166.620	1,024.369
Czech Republic	EU exports	-	-	-	-	-	610.626	903.929	1,061.416	1,186.062	1,179.869	922.412
	Re-imports	-	-	-	-	-	601.192	796.790	968.068	1,034.614	995.945	829.418
Slowakia	EU exports	-	-	-	-	-	142.501	197.667	248.388	322.219	340.824	271.120
	Re-imports	-	-	-	-	-	156.300	225.432	286.589	346.886	372.239	300.448
Czechoslovakia	EU exports	58.431	68.523	85.583	281.962	558.716	-	-	-	-	-	-
	Re-imports	98.828	128.558	145.759	332.456	595.366	-	-	-	-	-	-
Romania	EU exports	171.651	189.612	189.848	206.486	280.500	422.976	567.699	717.140	849.535	1.007.217	1.023.181
	Re-imports	291.897	326.073	302.121	287.669	385.282	502.604	702.540	862.769	1,052.360	1,200.754	1,247.598
CEEC (total)	EU exports	1,291.113	1,565.835	1,914.766	2,450.906	3,042.325	3,688.113	4,414.483	5,277.221	6,055.495	6,257.618	5,720.232
	Re-imports	1,853.058	2,201.780	2,667.129	3,354.889	3,902.881	4,455.353	5,354.924	6,238.685	6,933.038	7,070.373	6,728.945
Morocco	EU exports	66.140	121.842	146.004	144.179	165.832	209.866	208.130	227.543	227.070	240.120	270.615
	Re-imports	89.465	159.525	207.165	192.353	205.447	202.387	226.452	249.901	248.363	275.974	330.382
Tunisia	EU exports	169.785	208.658	232.457	235.196	267.285	290.542	294.403	275.755	300.424	298.959	296.002
	Re-imports	190.786	223.546	248.801	243.082	280.949	276.335	291.784	283.383	315.240	330.447	361.138
Israel	EU exports	5.484	51.840	13.291	11.743	14.078	11.140	21.932	47.180	27.043	37.875	41.691
	Re-imports	4.673	30.759	16.279	12.687	11.229	4.160	6.533	9.040	14.932	27.705	22.191
Turkey	EU exports	25.401	46.993	69.882	89.126	94.960	94.450	91.910	115.541	94.252	86.714	59.807
	Re-imports	28.904	66.028	105.740	139.972	126.728	138.872	158.581	180.151	135.653	90.171	85.043
Malta	EU exports	54.581	148.721	217.060	323.850	360.579	333.892	399.785	342.117	93.965	30.816	29.270
	Re-imports	40.365	179.904	240.832	283.176	397.265	295.164	436.343	397.873	133.064	47.673	34.625
Med12 (total)	EU exports	338.021	587.010	688.279	811.896	910.932	949.326	1,028.097	1,028.247	759.308	711.259	716.277
	Re-imports	365.089	669.482	830.070	879.748	1,027.733	924.124	1,130.120	1,142.958	871.371	796.206	862.493

During the whole period considered, goods entering the EU after processing, amounted on the average, to only 2% of EU normal imports. The phenomenon takes a greater magnitude for Third countries and particularly for the CEEC, assuring them trade volumes comparable to 13% of total export flows to the EU, against 3% in the case of the Mediterranean countries (Table 4). On the whole, the performance of the Mediterranean region has been less satisfying than that of the CEEC. However, it can not be ignored that the former is a more heterogeneous area, showing highly differentiated performance by country. Tunisia, Morocco, and to some extent Malta, albeit with an irregular trend, are the only main subcontractors in the area. They are also quite unique since the remaining countries in the region are involved in OPT only to a limited extent, frequently recording irregular and very reduced flows despite their trade potential. Israel and Turkey, which are the least performing countries among those offering OPT, provide an example in this sense.

With respect to the other regional partners, Tunisia and Morocco seem to follow a quite divergent pattern. They appear to be able to face the competition coming from CEEC without losing significant EU market shares. They also have recovered, particularly in the last two years, from the stagnant situation shared by the entire area during the nineties (Table 3). When looking at the weight of OPT with respect to total trade on a country basis, the ratios are not so dissimilar, at least for the largest recipient countries in both regions. During the period considered, OPT as a ratio of total trade, amounts on the average, to about 12% for Poland against 10% for Tunisia, and this despite the different size of their economies. Other comparisons between pairs of countries of different regions fail to be meaningful, however. Hungary and Morocco, like Tunisia and Poland, provide a similar contribution to their respective regional OPT with the EU. However, it has to be stressed that lower importance of OPT with respect to total trade for Morocco, is influenced by the greater weight of raw materials in its export structure, that notably, are not a source of delocalization activities. Romania whose processing activities assure a considerable share of its total trade flows, amounting on the average, to 20% of its total imports and even more in terms of exports to the EU, has to be considered a sort of outlier. Indeed, for Romania, OPT appears to be, a precise choice of a specialization pattern through which to pursue a development strategy. If the case where OPT represents a precise economic policy choice is excluded, the existence of some objective limits in absorbing increasing shares of such activities with respect to total trade flows, should be taken into account. This seems to be the case of Morocco and Tunisia, showing modestly increasing capacities of absorption that partly explain their lower responsiveness to the growing demand of delocalization coming from EU firms.

On the other hand, the CEEC show a higher degree of homogeneity as a group, as confirmed by the lower concentration of OPT between countries. Outward processing may therefore be intended as a kind of integration strategy with Europe shared at the regional level. However, the same can not be said for the Mediterranean area as a whole when considering that countries like Algeria, Egypt and Turkey, seem to have adopted patterns of development and integration with the EU different from OPT. Nevertheless, this choice may also be the result of other factors orienting EU firms strategies, such as higher transport costs and lower control of international processing activities.

Table 4. Evolution of EU OPT with the Main CEEC and Mediterranean Countries

		EU OPT Average Rate Of Growth			EU OPT/TT Average Value		Average Country's Weight on Regional OPT[1]	
		88-92	93-97	98	88-92	93-98	88-92	93-98
Poland	EU exports	50.4%	9.5%	-18.3%	8.0%	7.8%	20.60%	24.06%
	Re-imports	43.4%	9.2%	-16.2%	11.5%	14.8%	21.08%	27.59%
Hungary	EU exports	28.1%	10.4%	-15.0%	12.2%	9.6%	18.94%	16.31%
	Re-imports	22.8%	7.9%	-12.2%	17.7%	13.5%	19.50%	16.38%
Czech Republic	EU exports	-	19.2%	-21.8%	-	8.7%	-	18.62%
	Re-imports	-	14.3%	-16.7%	-	10.1%	-	14.20%
Slovakia	EU exports	-	25.0%	-20.5%	-	8.4%	-	4.76%
	Re-imports	-	24.9%	-19.3%	-	10.0%	-	4.51%
Czechoslovakia	EU exports	92.4%	-		5.0%		8.65%	
	Re-imports	62.7%	-		6.8%		8.36%	
Romania	EU exports	13.8%	29.7%	1.6%	20.3%	19.0%	10.59%	14.32%
	Re-imports	8.4%	25.8%	3.9%	18.3%	27.3%	12.07%	14.82%
CEEC 5[2]	EU exports						58.78%	78.06%
	Re-imports						61.01%	77.51%
CEEC total	EU exports	23.9%	15.7%	-8.6%	9.1%	8.8%	100%	100%
	Re-imports	20.5%	12.8%	-4.8%	12.5%	13.4%	100%	100%
Morocco	EU exports	29.5%	8.1%	12.7%	3.7%	4.7%	19.50%	27.65%
	Re-imports	27.0%	6.3%	19.7%	5.8%	6.0%	23.03%	27.55%
Tunisia	EU exports	12.3%	2.4%	-1.0%	8.0%	6.7%	35.57%	34.83%
	Re-imports	10.4%	3.4%	9.3%	11.3%	9.1%	34.12%	33.34%
Israel	EU exports	194.8%	37.7%	10.1%	0.4%	0.3%	3.08%	3.77%
	Re-imports	119.4%	36.6%	-19.9%	0.5%	0.3%	2.07%	1.60%
Turkey	EU exports	41.9%	-0.8%	-31.0%	0.9%	0.6%	9.41%	10.51%
	Re-imports	52.9%	-4.2%	-5.7%	1.6%	1.5%	11.75%	13.60%
Malta	EU exports	69.7%	-28.4%	-5.0%	16.9%	10.9%	30.50%	21.35%
	Re-imports	109.4%	-23.5%	-27.4%	33.2%	23.7%	27.56%	21.77%
MED 5[3]	EU exports						98.06%	98.12%
	Re-imports						98.53%	97.86%
Med 12 (total)	EU exports	30.3%	-4.0%	0.7%	2.0%	1.7%	100%	100%
	Re-imports	32.5%	-3.8%	8.3%	2.9%	2.8%	100%	100%

[1] It is calculated as an average of the annual ratios of national OPT on total OPT performed by the region. For example, in the case of Poland, it is calculated as the ratio of Polish OPT on total OPT performed by all CEEC.
[2] Referring to the five CEEC above.
[3] Referring to the five Mediterranean countries above.

As far as the EU member states are concerned, a common feature to the majority of countries, is the growing share of intermediate goods in total trade flows, as shown by the increasing importance of OPT with respect to total trade (Table 5). This measure has been calculated as a ratio of OPT flows to total trade flows generated with non-member countries, thus excluding intra-EU trade of final goods.

Table 5. Evolution of EU OPT by Member States

			Average Country's Weight on EU OPT by Region		National OPT/TT[1] by Region			National OPT/TT[1] with the Rest of the World		
			88-92	93-98	88-92	93-97	98		88-92	93-97
Austria	CEEC	Exports	-	5.2%	-	4.7%	3.5%	Exports		1.54%
		Re-imports	-	4.7%	-	7.3%	26.4%	Imports		2.31%
	Med12	Exports	-	0.3%	-	0.2%	0.1%			
		Re-imports	-	0.2%	-	0.1%	1.4%			
France	CEEC	Exports	7.2%	4.8%	6.3%	5.6%	4.0%	Exports	1.87%	2.44%
		Re-imports	5.6%	5.2%	7.4%	10.3%	3.1%	Imports	1.59%	3.63%
	Med12	Exports	28.9%	24.2%	2.3	19%	5.1%			
		Re-imports	37.9%	28.5%	4.8%	3.9%	3.8%			
Germany	CEEC	Exports	77.6%	64.8%	14%	14%	7.2%	Exports	2.77%	4.44%
		Re-imports	78.9%	65.5%	21.4%	19.3%	34.2%	Imports	1.89%	3.11%
	Med12	Exports	23.7%	30.6%	2%	2.2%	1.1%			
		Re-imports	22.8%	35.6%	2.9%	3.9%	7.9%			
Italy	CEEC	Exports	3.5%	11.7%	2.1%	6%	6.7%	Exports	1.20%	2.35%
		Re-imports	1.9%	11.0%	1.5%	9.8%	12.4%	Imports	1.45%	2.13%
	Med12	Exports	28.2%	22.2%	3.1%	2.6%	1.0%			
		Re-imports	23.5%	21.3%	3.5%	4.3%	1.7%			
Netherlands	CEEC	Exports	6.7%	3.9%	9.3%	6.8%	3.9%	Exports	2.16%	1.74%
		Re-imports	7.3%	5.6%	15.7%	15.4%	9.4%	Imports	2.66%	2.88%
	Med12	Exports	7.6%	10.4%	2.7%	3.3%	2.4%			
		Re-imports	5.5%	5.1%	2.1%	2.4%	1.5%			
United Kingdom	CEEC	Exports	1.5%	3.5%	2.2%	5.3%	5.4%	Exports	0.47%	0.79%
		Re-imports	2.7%	2.2%	4.4%	4.8%	5.2%	Imports	0.85%	1.32%
	Med12	Exports	0.4%	4.9%	0.1%	0.7%	1.5%			
		Re-imports	0.3%	4.2%	0.1%	0.8%	3.1%			

[1] TT is total trade

Nevertheless, European countries show a clear difference in the propensity to recur to the OPT economic practice. The OPT traffic involves only few countries for both historical and administrative reasons.

In the CEEC, Austria, France, Germany, Italy and the Netherlands account for about 90% of total flows generated by EU member states. Germany plays the leading role performing by far, the largest share of European OPT (more than 70% on the average), both in relative terms and in absolute values (Table 6). The German position may be explained, on the one side, by referring to its pioneering attitude toward the process of international delocalization of production; on the other side, to the more liberal attribution of licences with respect to other EU countries. However, its exposure to the CEEC should also be explained by their greater ability to respond to the increasing demand of deverticalization by German firms. Austria is another country which implemented the EU regulation on OPT in a quite liberal way. Indeed, in the last few years, it has experienced a sizeable increase of OPT with CEEC. Meanwhile, countries like France and Italy, have adopted a stricter interpretation of the regulation, granting authorizations only to manufacturing firms operating in the same sector as that of OPT. However, due to the need of relocalizing some national industries in recent years, they have become more permissive (Sanguigni, 1995).

Table 6. EU OPT by Selected Member States with the CEEC and the Mediterranean

(thousands of Ecu)

			1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Austria	CEEC	Exports	-	-	-	-	-	-	-	225.814	342.941	358.031	291.778
		Re-imports	-	-	-	-	-	-	-	215.872	378.336	372.783	300.640
	Med12	Exports	-	-	-	-	-	-	-	1.462	954	950	7.115
		Re-imports	-	-	-	-	-	-	-	593	507	1.137	8.226
France	CEEC	Exports	94.435	132.279	149.621	168.823	172.509	177.007	196.329	239.817	286.064	311.951	313.909
		Re-imports	98.773	134.747	150.010	182.908	218.673	235.162	262.162	318.418	351.325	379.281	354.353
	Med12	Exports	147.404	194.957	191.336	158.733	184.287	192.200	200.534	201.878	197.884	234.003	243.128
		Re-imports	195.266	274.770	314.217	262.390	281.680	275.837	270.982	291.042	269.797	283.287	291.779
Germany	CEEC	Exports	1,031.697	1,205.244	1,481.800	1,918.306	2,301.740	2,721.781	3,318.835	3,585.714	3,701.112	3,635.479	3,012.184
		Re-imports	1,476.668	1,731.840	2,121.112	2,702.380	2,967.936	3,320.059	3,929.998	4,126.043	4,279.488	4,277.162	3,798.138
	Med12	Exports	92.712	122.161	157.500	195.724	210.128	242.938	254.345	284.157	248.608	225.121	374.799
		Re-imports	95.111	131.235	178.771	224.561	219.523	253.144	306.063	328.849	336.171	313.303	615.499
Italy	CEEC	Exports	21.667	45.066	54.114	87.071	199.924	343.109	435.627	533.481	729.914	784.862	924.900
		Re-imports	9.971	27.579	30.896	78.071	168.940	290.757	478.773	576.351	842.766	949.448	1.062.934
	Med12	Exports	40.964	134.205	208.312	305.413	346.249	325.837	392.639	331.310	93.800	40.956	93.219
		Re-imports	11.263	156.330	213.305	254.519	375.003	284.157	426.871	361.170	115.028	46.871	100.765
Netherlands	CEEC	Exports	87.600	110.282	143.082	156.718	184.797	188.761	119.674	203.811	284.603	226.550	189.603
		Re-imports	132.738	162.442	214.244	225.812	288.314	313.380	341.309	398.425	381.974	348.006	230.846
	Med12	Exports	33.897	44.786	53.793	56.322	53.235	65.467	54.783	100.669	127.989	96.747	88.044
		Re-imports	30.544	32.640	33.359	46.088	52.687	40.318	65.402	80.841	62.777	28.341	28.500
United Kingdom	CEEC	Exports	24.589	24.824	19.589	28.433	55.819	85.919	119.582	110.243	225.307	338.575	269.585
		Re-imports	80.595	83.833	57.205	39.334	72.058	96.218	87.889	130.362	165.660	135.358	204.203
	Med12	Exports	1.602	1.638	2.402	1.760	4.291	12.981	40.111	33.827	43.252	58.137	62.676
		Re-imports	1.478	1.194	1.404	2.199	3.659	9.166	14.457	29.764	38.822	65.997	88.598

The high reactivity of CEEC originates from the higher rate of growth experienced with respect to the Mediterranean countries and also to the fact that historically, they moved first, adopting the vertical specialization pattern even before the end of the COMECON. Starting in 1996, a limited but progressive reorientation of the outward processing activities strategy has taken place in Germany, involving an increasing OPT traffic in the Mediterranean region, particularly in the best performers, i.e. Tunisia and Morocco, at the expense of the CEEC (with the exception of Romania). However, the authors do not believe that this apparent change in delocalization strategy will entail a diminishing German vertical specialization activities in the latter region. Rather, it has to be interpreted as a redirection of OPT towards the most convenient places that do not involve any modification of the industrial policy strategy.

During the 1990s, the Mediterranean region has experienced a fall of interest on the part of its traditional investors. Since 1993, Italy has reinforced its position in the CEEC at the expense of its involvement in the Mediterranean basin. France appears to progressively lose its dominance in the same region in favor of the upward involvement of Germany. Only the United Kingdom has increased its presence in the Mediterranean region in recent years.

Competition Between Mediterranean Countries and CEEC in the EU market

The intensity of economic relations between EU countries and their Eastern and Southern partners needs to be analyzed on a more desegregated level in order to capture the patterns of commodity composition.[10] Table 7 and Table 8 show the evolution of the first ten merchandise-groupings and their contribution to total OPT performed by the CEEC and the Mediterranean

[10] See for example Chevallier and Freudenberg (1999).

regions respectively, during the period of 1988-1997. As may be seen in Table 7, outward shipments from CEEC to Europe are mostly concentrated on semi-finished goods, as shown by the importance of Chapters 61-62 (see Appendix 2 for the Harmonized System of commodity classification). Chapter 62 (articles of apparel and clothing accessories other than those knitted or crocheted) is by far, the most affected by vertical specialization as proxied by OPT. This accounts, for more than 50% of total OPT directed to the EU on the average. In the CEEC, its importance has been slowly declining through time. In the Mediterranean countries, the phase of decline has been followed by a growing trend starting in1994. Chapter 61 (articles of apparel and clothing accessories, knitted or crocheted) is the second most important sector of CEEC's OPT traffic with Europe since 1992, although the gap with Chapter 62 remains considerable. The process of diversification of OPT traffic happening in this area, is illustrated by the rising importance of electromechanical products, i.e. Chapter 85 comprised of electrical machinery and equipment and parts, telecommunications equipment, sound recorders, television recorders. It has leapt from the eighth to the third position, and by the downward trend recorded by Chapter 64 (footwear, gaiters and the like).

For most of the period under analysis, as shown in Table 8, the Mediterranean countries are characterized by a static ranking of sectors, but shows a higher degree of diversification in the CEEC. Mediterranean countries realize the major share of OPT traffic with Europe in the traditional textile and clothing (TC) industry, with semi-finished goods of Chapter 62 and Chapter 61 comprising between 50% and 66% of their total shipments during the last ten years. However, although with large swings, the electromechanical sector (Chapter 85) is more significantly involved in outward processing than in the CEEC, providing a higher share of total re-imports for Europe. The large decline of the value and quota of Chapter 85 in 1996 and 1997 is mainly due to the fall in semiconductors revenues supplied by Malta within the OPT regime.

The footwear industry, i.e. Chapter 64, and the mechanical sector, i.e. Chapter 84 comprised of nuclear reactors, boilers, machinery and mechanical appliances, computers, etc. play a limited but increasingly relevant role in OPT traffic.

To evaluate the real degree of competition existing between the two regions, the extent of competition has been examined in two characterizing dimensions. These are: (a) *geographical,* which refers to the direction of shipments toward the different national European markets and (b) *of product,* which refers to the types of products re-exported toward the EU independently from the national market they are conveyed to. Two countries should be considered as direct competitors only when the pattern records high values for both dimensions.

A priori, a low level of competition may be expected in similar EU markets, given the historical high geographical specialization of some EU countries towards these two regions. However, due to the progressive re-orientation of the German position in the Mediterranean basin, an increasing trend of the same indicator through time could be observed. Concerning the product dimension, an *a priori* convergence on the supply of similar intermediate goods would be expected. Indeed, the authors believe that the divergent specialization pattern originating from quite different regional factor endowments, is counterbalanced by the fact that both regions offer low transport and labor costs, making them specialize in similar goods. A low level of direct competition between the two areas in the European market may therefore be anticipated.

Table 7. Chapters Ranking of EU Re-imports from CEEC

(thousands of Ecu)

1988			1989			1990			1991			1992		
Chapter[1]	Value	of total OPT	Chapter	Value	of total OPT	Chapter	Value	of total OPT	Chapter	Value	of total OPT	Chapter	Value	of total OPT
62	1,135.872	61.6%	62	1,363.649	62.4%	62	1,683.977	63.3%	62	2,094.509	62.4%	62	2,135.648	56.6%
64	213.457	11.6%	64	236.007	10.8%	64	263.701	9.9%	64	300.271	8.9%	61	371.436	9.8%
61	145.619	7.9%	94	163.340	7.5%	61	202.505	7.6%	61	286.172	8.5%	64	306.671	8.1%
94	126.221	6.8%	61	152.318	7%	94	175.840	6.6%	94	141.723	4.2%	85	244.503	6.5%
87	52.079	2.8%	87	52.797	2.4%	42	55.392	2.1%	85	125.529	3.7%	94	146.804	3.9%
42	40.911	2.2%	84	48.547	2.2%	84	55.045	2.1%	84	110.578	3.3%	84	104.597	2.8%
84	37.953	2.1%	42	42.671	1.9%	85	49.051	1.8%	42	47.429	1.4%	87	95.722	2.5%
85	31.087	1.7%	85	40.116	1.8%	87	42.996	1.6%	87	44.802	1.3%	63	46.491	1.2%
73	7.065	0.4%	16	11.175	0.5%	16	26.395	1%	63	30.852	0.9%	42	44.759	1.2%
43	6.635	0.4%	73	9.620	0.4%	63	14.001	0.5%	16	21.795	0.6%	16	38.978	1%
1993			1994			1995			1996			1997		
Chapter	Value	% of total OPT	Chapter	Value	% of total OPT	Chapter	Value	% of total OPT	Chapter	Value	% of total OPT	Chapter	Value	% of total OPT
62	2,606.985	58.5%	62	3,082.066	57.6%	62	3,569.446	57.2%	62	3,806.816	54.9%	62	3,702.959	52.4%
61	457.673	10.3%	61	564.084	10.5%	61	756.819	12.2%	61	887.574	12.8%	61	934.378	13.2%
64	341.761	7.7%	64	380.348	7.1%	85	478.104	7.7%	85	661.073	9.5%	85	829.493	11.7%
85	297.996	6.7%	85	343.244	6.4%	64	300.821	4.8%	64	309.712	4.5%	64	392.419	5.5%
94	179.944	4%	94	218.829	4.1%	94	191.337	3.1%	84	181.045	2.6%	84	207.413	2.9%
84	86.446	1.9%	63	122.653	2.3%	63	172.435	2.8%	94	179.855	2.6%	63	140.053	2%
63	71.866	1.6%	84	103.853	1.9%	84	159.289	2.5%	63	176.414	2.5%	94	120.773	1.7%
87	63.493	1.4%	87	83.646	1.5%	87	64.270	1%	87	85.209	1.2%	87	98.326	1.4%
16	42.888	1%	16	42.263	0.8%	90	40.120	0.6%	39	66.995	1%	39	84.261	1.2%
42	33.992	0.8%	42	36.544	0.7%	39	38.214	0.6%	16	48.829	0.7%	90	52.909	0.7%

Note: of total in %.

[1] See Appendix 2 for the Harmonized System of commodity classification.

Table 8. Chapters Ranking of EU Re-Imports from Mediterranean Countries

(thousands of Ecu)

1988			1989			1990			1991			1992		
Chapter[1]	Value	% of total OPT	Chapter	Value	% of total OPT	Chapter	Value	% of total OPT	Chapter	Value	% of total OPT	Chapter	Value	% of total OPT
62	224.121	61.4%	62	332.414	49.6%	62	434.481	52.3%	62	457.379	52.0%	62	478.088	46.5%
61	42.462	11.6%	85	185.491	27.7%	85	250.857	30.2%	85	289.241	329%	85	409.160	39.8%
85	39.085	10.7%	61	58.027	8. 7%	61	58.198	7.0%	61	59.447	6.8%	61	72.640	7.1%
64	15.345	4.2%	88	23.450	3.5%	64	21.108	2.5%	64	23.752	2.7%	64	21.289	2.1%
84	12.120	3.3%	64	16.942	2.5%	84	15.257	1.8%	84	11.076	1.3%	84	11.504	1.1%
91	10.643	2.9%	84	16.935	2.5%	91	12.203	1.5%	88	9.552	1.1%	42	7.108	0.7%
42	4.180	1.1%	91	13.630	2.0%	88	9.045	1.1%	91	7.200	0.8%	91	6.532	0.6%
63	2.453	0.7%	42	4.033	0.6%	42	7.687	0.9%	42	6.897	0.8%	87	4.067	0.4%
90	1.951	0.5%	90	2.148	0.3%	90	3.573	0.4%	87	3.245	0.4%	88	3.332	0.3%
55	1.422	0.4%	87	1.806	0.3%	87	2.575	0.3%	90	2.941	0.3%	90	2.909	0.3%
1993			1994			1995			1996			1997		
Chapter	Value	% of total OPT	Chapter	Value	% of total OPT	Chapter	Value	% of total OPT	Chapter	Value	% of total OPT	Chapter	Value	% of total OPT
62	467.510	50.6%	62	501.814	44.4%	62	545.791	47.7%	62	524.911	60.2%	62	519.237	65.2%
85	301.539	32.6%	85	456.484	40.4%	85	440.863	38.6%	85	177.476	20.4%	85	85.787	10.8%
61	73.390	7.9%	61	75.792	6.7%	61	65.088	5.7%	61	70.544	8.1%	61	72.243	9.1%
84	19.031	2.1%	84	22.362	2.0%	84	20.707	1.8%	84	29.285	3.4%	84	40.582	5.1%
64	18.085	2.0%	64	19.897	1.8%	64	20.606	1.8%	64	21.531	2.5%	64	27.298	3.4%
42	8.188	0.9%	42	8.721	0.8%	59	7.244	0.6%	90	10.745	1.3%	90	14.595	1.8%
87	6.276	0.7%	63	7.936	0.7%	42	6.294	0.5%	63	5.743	0.7%	88	8.371	1%
91	5.427	0.6%	90	6.780	0.6%	63	5.769	0.5%	87	5.199	0.6%	63	7.003	0.9%
63	4.710	0.5%	91	6.660	0.6%	90	5.199	0.5%	59	4.370	0.5%	42	4.469	0.6%
90	4.615	0.5%	87	3.998	0.3%	91	4.401	0.4%	91	4.242	0.5%	65	3.153	0.4%

[1] See Appendix 2 for the Harmonized System of commodity classification.

Two different indicators are used. The first indicator evaluates the market similarity of OPT flows and measures the extent to which the Mediterranean's and CEEC's re-exports are concentrated in the same European markets.

Market similarity (MS) has been calculated as follows:

$$MS^{t}_{XY} = \sum_{j=1}^{14} \min \left(\frac{\sum_{i=1}^{99} X^{t}_{ij}}{\sum_{j=1}^{14}\sum_{i=1}^{99} X^{t}_{ji}} ; \frac{\sum_{i=1}^{99} Y^{t}_{ij}}{\sum_{j=1}^{14}\sum_{i=1}^{99} Y^{t}_{ji}} \right) \qquad \text{(Equation 1)}$$

where:
X^t = CEEC re-exports at period *t*
Y^t = Mediterranean countries re-exports at period *t*
i = two-digit HS (Harmonized System) classification of products (99 chapters)[(11)]
j = European countries markets[(12)]

Each ratio is the percentage share of EU market *j* (e.g. France) in total OPT traffic of each region with Europe. The denominator represents total EU re-imports from each region. This indicator can take on values between zero and one hundred. Zero represents a full geographical differentiation, suggesting that CEEC and Mediterranean OPT flows are directed to different EU markets, whereas one hundred indicates identical export structure, i.e. the entire production of both regions is directed towards the same EU markets. For example, low values of the indicator may be associated to a situation where CEEC re-exports are directed to Germany and Austria, whereas Mediterranean OPT flows go to France and Italy. High values of the index could indicate a situation where significant shares of total re-exports of both regions go to Germany and Italy. This index, although at an aggregate level, gives an initial idea whether the principal European export markets coincide for the two regions under analysis.

The second index evaluates sectorial similarity (SS) and measures the extent of competition between the two regions in the 99 sectors of the two-digit HS classification of products. As indicated earlier, the indicator ranges between zero and one hundred. Zero represents perfect differentiation, meaning that the two regions are exporting radically different goods to the EU market. Hence, the two regions are operating in different two-digit sectors. One hundred indicates perfect similarity of sectorial patterns, i.e. the processing activity of the two regions is concentrated in the same sectors, but not necessarily on the same EU markets).

SS has been calculated as follows:

$$SS^{t}_{XY} = \sum_{i=1}^{99} \min \left(\frac{\sum_{j=1}^{14} X^{t}_{ji}}{\sum_{j=1}^{14}\sum_{i=1}^{99} X^{t}_{ji}} ; \frac{\sum_{j=1}^{14} Y^{t}_{ji}}{\sum_{j=1}^{14}\sum_{i=1}^{99} Y^{t}_{ji}} \right) \qquad \text{(Equation 2)}$$

(11) See Appendix 2 for further details.
(12) Belgium and Luxembourg are taken together.

where:
X^t = CEEC re-exports at period *t*
Y^t = Mediterranean countries' re-exports at period *t*
i = two-digit HS classification of products (99 chapters)
j = European countries markets[13]

Figure 2 tracks the evolution of the two indicators during the period under analysis. While the trend of SS appears quite regular except for a strong increase recorded in the last two years, MS shows a strong upward trend through time, except for the decline in 1997. This phenomenon could have been caused by the peculiar behavior of Malta, as previously noted.

The upward trend of SS starting in 1998 is mainly due to a higher degree of competition between the two regions recorded in the TC industry (Chapters 61 and 62) and, to a lesser extent, in the electromechanical sector (Chapter 85). The increase in MS may be explained by the growing importance of the German market for the Mediterranean countries and of Italian and French markets for the CEEC.

Figure 2 suggests that the degree of sectorial competition (SS) is always higher than that measured in geographical terms (MS), even though the gap shrinks during the period. However, this conclusion should be taken with caution, considering the way in which indicators are constructed. In principle, MS should be higher than SS. This is because as the number of partitions, i.e. the number of parts in which total trade is subdivided to calculate the two indicators of competition, is larger when calculating the sectorial dimension of competition (99 chapters) than when calculating the geographical one (14 EU countries). In this case, however, the contribution to the value of the SS is almost totally concentrated in 6 sectors (61, 62, 64, 84, 85 and 94). In the case of the MS, France, Germany, Italy, Netherlands and Austria absorb almost the entire OPT traffic for both CEEC and Mediterranean regions. Therefore, the number of significant partitions being similar, the constant higher value of SS with respect to MS, correctly indicates that the two regions' processing activities are more similar than the markets towards which their OPT flows are directed.

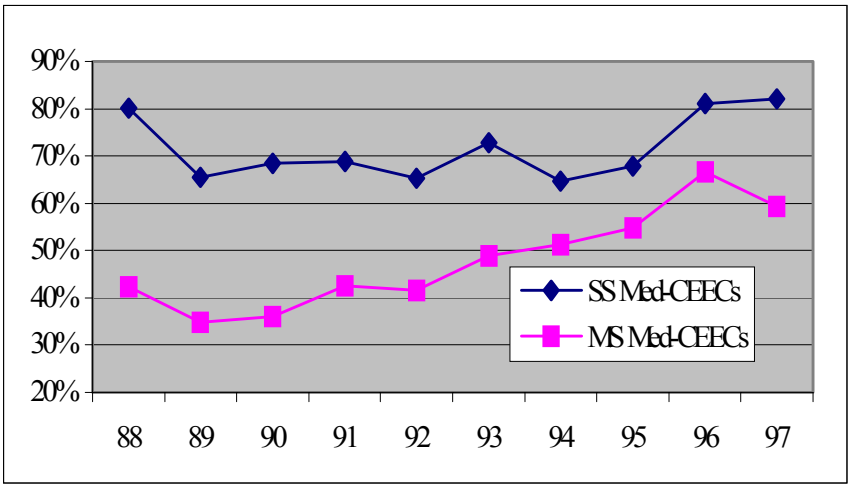

Figure 2. Indicators of market and sector similarity of CEEC and the Mediterranean countries.

In principle therefore, the two regions enjoy a comparative advantage in similar sectors. However, they direct their production to different EU markets. The emerging pattern of competition is traditionally explained by the permanence of historical and political ties between

[13] Belgium and Luxembourg are taken together.

Third economies and EU countries. Nevertheless, this does not explain why the CEEC and the Mediterranean countries, being specialized in similar products, have not adopted a more aggressive strategy to expand to other EU markets historically occupied by other suppliers. Even considering that the two regions, while offering similar products, could be positioned in different segment of quality, the issue remains open.[14] Such a phenomenon is likely to be explained by the fact that the comparative advantage is imposed by EU firms according to their own specialization. This would justify the repartition of the EU market from a functional perspective. There has been no competition between regions in the same market because they intervene in quite different phases of production according to the delocalization needs of EU countries. In particular, Baldone, Sdogati and Tajoli (2000) show that the relationship between the contractor and the subcontractor for European OPT may be characterized with reference to two models. The first is the Dutch-German model which results in the delocalization of a large number of segments of the production process, and sends abroad semi-finished products for completion. The other is the French-Italian model which deverticalizes only the final segments of production, sending abroad products at an advanced stage of production. Indeed, when calculating the ratio between the share of textiles exported in OPT regime with respect to the share of apparels re-imported, Baldone et al. (2000) show that such a ratio is lower for France and Italy with respect to the rivalry for Germany and the Netherlands. France and Italy show instead a higher ratio between the share of apparel exported in OPT and those re-imported, suggesting that their deverticalization process is likely to occur in the final phases of production.

The use of a more detailed partition of trade flows (for example from two-digit sectors to four-digit subsectors), at least to the extent that a further desegregation does not conflict with the economic significance, broadly confirms the result obtained at more aggregate level. If four-digit subsectors include products (of different six or eight-digit sub-sectors) that are substitutes among themselves, then it becomes useless to consider a higher level of detail. Indeed, in another paper (Fabbris and Malanchini, 2000) focussing on the five sectors singled out above (Textile and Clothing-61, 62- Footwear–64- Mechanical-84- Electromechanical- 85), the authors mixed the geographical and product dimensions of competition and performed a more detailed analysis of the trade flows. It emerges that the degree of geographical competition at sectorial level- measuring the extent to which four-digit OPT traffic of the two areas converge to similar EU markets is lower than the rivalry calculated on the basis of the desegregation by products. Therefore, the view that the two regions tend to differ more in terms of markets than in terms of the nature of the goods they process, is supported also when the analysis is conducted at a further significant level of desegregation.

Determinants of EU OPT: Econometric Evidence

To capture the determinants of EU OPT in the CEE and Mediterranean countries, a gravity model with data in panel for the period 1992-97 has been estimated.[15] The panel consists of bilateral OPT flows (re-export) between Third countries' best performers (Czech Republic, Hungary, Poland and Romania for the CEEC; Morocco, Tunisia and Turkey for the Mediterranean countries) and the European countries most involved in OPT (France, Germany, Italy and the Netherlands). The model has been tested for the two main industries that constitute the bulk of competition of OPT between the two areas on the EU market, i.e. TC and footwear sectors (Chapters 61, 62 and 64) and the mechanical and electromechanical sectors (Chapters 84 and 85).

[14] In another paper (Fabbris and Malanchini, 2000), the authors have shown that indeed the Mediterranean countries are positioned in a higher quality segment with respect to the CEEC in OPT since the (weighted) unit values of the former result higher.

[15] See Bergstrand (1985, 1989) for an introduction to gravity models.

In particular, the model has been estimated using a SUR (Seemingly Unrelated Regressions), given that the test for contemporaneous correlation of residuals rejects the null hypothesis of a diagonal covariance matrix. In this case, the SUR is more efficient in that it takes into account possible contemporaneous correlations among the individual equations included in the panel.

Together with the traditional control variables included in a gravity model (market dimension, economic similarity, transport costs and barriers to trade), the correlation among different forms of production delocalization was tested by including the bilateral FDI flows and the dependence of OPT from normal trade flows.

The estimated equation takes the form of the following:

$$OPT_{i,j,k,t} = \alpha_k + \beta\,\text{COUNTRYSPEC}_{i,t} + \chi\,\text{RELATION}_{i,j,T} + \delta\,\text{SECTOR}_{i,j,k,t} + \varepsilon_{i,j,t}$$

where:
i = CEEC and Mediterranean countries (i=1…7)
j = EU countries (j=1…4)
k = industrial sector (k=1,2)
t = 1992-1997 (t=1…5)

COUNTRY SPEC includes specific characteristics of the single host country *i*. These are: (a) the market dimension as proxied by GDP; (b) an indicator of the institutional, legal and business environment as proxied by a composite index (ORI) ranging from 0 to 100, with 0 indicating instability and underdeveloped business environment and 100 perfect stability and very developed business environment.

The factors chosen to explain trade and business relationships between countries *j* and *i*, are: (a) the existence of a long period commitment on the part of the EU countries as proxied by FDI flows in the host country; (b) geographical proximity; and (c) the difference in labor costs between EU and Third countries (various measures have been used).

SECTOR includes variables able to explain OPT flows between country *j* and *i* at sectorial level. In particular, the degree of development and competitiveness of the domestic industrial sector as proxied by (normal) trade flows directed to the EU in the same sector, has been considered.

The first regression (Table 9) investigates the determinants of OPT traffic in the TC and footwear sectors.

The fixed-effects model is preferred to the restricted model specification as provided by pooling, since the F-test rejects the null hypothesis. The greater efficiency of the unrestricted model, with EU countries as cross-identifiers, helps to draw the first relevant point concerning the nature of OPT flows between Europe and Third countries. The delocalization determinants are common to all EU producers, i.e. they share the same motivations to go international. However, there are effects not explained by the model, attributable to differences of behavior among EU countries. This first result suggests that the localization choice of European countries may be guided not only by the specialization of the host country but also by their own characteristics, i.e. their productive specialization. In addition, it backs the idea that EU countries have different strategies of delocalization that they implement in different countries. This explanation proves to be interesting, in that it allows to explain why the CEEC and Mediterranean countries are not direct competitors, addressing their OPT flows basically in different EU markets.

The regression results indicate that OPT flows are negatively correlated with transport (proxied by geographical distance between the capitals of the two countries) and labor costs. OPT flows show a negative and significant correlation also with the business environment (ORI) suggesting that the lower the similarity between the institutional, legal and administrative features between the economies, the higher the OPT traffic. This result is quite consistent with the traditional strategy of delocalization of activities in the labor intensive sectors, such as TC, aimed at exploiting the lower production costs, no matter what the origin is (low labor protection, longer working hours, etc.).

OPT is positively correlated with the host country market dimension, as proxied by GDP. This result supports the view that GDP may be intended as a measure of the capacity of absorption of the delocalization demand coming from abroad.

Normal trade is not significantly correlated with OPT. The same applies to FDI, suggesting that OPT and FDI are not strictly correlated. This is not surprising when considering that OPT in the TC industry, as shown by the negative correlation with the business environment (ORI), does not completely share the traditional motivations driving FDI (political stability, clear legal framework, etc). However, FDI flows are not desegregated on a sectorial basis, due to data unavailability. Therefore, aggregate data for FDI may concern very different sectors, such as services for example, with only a part of them directed to the TC sector.

The second regression is relative to the mechanical and electro-mechanical sectors (Chapters 84 and 85). Similar to the TC industry, the unrestricted model with fixed effects for the European countries is better suited to explain the determinants of EU OPT. This specification suggests again that the characteristics of European countries are more important in influencing the nature of OPT flows than the specialization, i.e. the comparative advantage, of the partner countries in the CEEC and Mediterranean regions.

The results of the regression (Table 9) indicate that the determinants of the European OPT in the mechanical and electro-mechanical sectors are somehow different from those orienting the delocalization process in the TC and footwear industries. Firstly, normal trade in the same sector is positively and significantly related to OPT, suggesting that they are complementary phenomena. The observed result could be explained considering that the choice of the location is influenced by the degree of development of the local industrial structure, as confirmed by an autonomous domestic production and capacity to export final goods in the EU market. However, this result could also be due to the fact that OPT in these sectors promote the development of local production that becomes, during time, able to face competition of European goods in the European market. Secondly, ORI, which proxies the domestic business environment, is positively correlated with OPT, contrary to TC sector's result. This is probably due to the higher sunk costs implied by OPT in the mechanical and electro-mechanical sectors compared to the TC industry: the greater investment of resources makes a safer and more efficient business environment preferable for EU producers.

Table 9. Regression Results of Fixed-Effects Models

TC and Footwear Sectors (Chapters 61. 62 and 64)				
Dependent Variable: OPTTC				
Method: Seemingly Unrelated Regression				
Sample: 1 48				
Included observations: 42				
Number of cross-sections used: 4				
Total panel (unbalanced) observations: 164				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRTC	-0.022	0.025	-0.862	0.390
FDIF	0.060	0.039	1.556	0.122
DIST	-0.111	0.020	-5.586	0.000
ORI	-9.827	2.053	-4.785	0.000
LCPH	14.018	6.774	2.069	0.040
GDP	0.000	0.000	2.382	0.018
REG	112.511	31.23	3.602	0.000
Fixed Effects				
F—C	406.347			
I—C	374.810			
G—C	497.311			
N—C	349.452			
Unweighted Statistics				
R-squared	0.612	Mean dependent var		110.362
Adjusted R-squared	0.587	S.D. dependent var		177.086
S.E. of regression	113.842	Sum squared resid		1982888

Mechanical and Electro-mechanical Sectors (Chapters 84 and 85)				
Dependent Variable: OPTM				
Method: Seemingly Unrelated Regression				
Sample: 1 48				
Included observations: 42				
Number of cross-sections used: 4				
Total panel (unbalanced) observations: 164				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRM	0.036	0.007	4.769	0.000
FDIF	0.025	0.010	2.532	0.012
DIST	-0.019	0.003	-6.715	0.000
ORI	1.335	0.380	3.510	0.001
RLCPH	-1.793	1.013	-1.773	0.078
Fixed Effects				
F—C	-11.598			
I—C	-44.471			
G—C	15.033			
N—C	-20.084			
Unweighted Statistics				
R-squared	0.641	Mean dependent var		19.380
Adjusted R-squared	0.622	S.D. dependent var		48.601
S.E. of regression	29.863	Sum squared resid		138226.3

Legend of the regression variables	
OPTTC	OPT (re-imports) in the TC and footwear sectors.
TRTC	Normal trade (import) in the TC and footwear sectors
FDIF	Flows of foreign direct investments from European country to host country
DIST	Distance between capitals
ORI	An indicator of the institutional, legal and business environment.
LCPH	The difference between European country and Third country labor cost per hour.
GDP	Gross domestic product
REG	A regional dummy that takes value 1 for Med countries and value 0 for CEEC
OPTTM:	OPT (re-imports) in the mechanical and electro-mechanical sectors
TRM:	Normal trade (import) in the mechanical and electro-mechanical sectors
RLCPH:	Relative labor cost per hour. The ratio of Third country labor cost per hour on the equivalent for European country
F:	France
I:	Italy
G:	Germany
N:	Netherlands

Different from the TC sector, OPT and FDI are complementary phenomena. Indeed, OPT is positively and significantly correlated with bilateral FDI flows at the same time-period. However, it has to be considered that such a process is dynamic and that more OPT at present may imply more FDI in the future. As shown in Figure 1, this implies that the contemporaneous presence of the two activities is probably relevant. While the causality relation between OPT and FDI is not yet clear and should be investigated in depth, it seems that OPT may be intended as a form of "learning" of the host economic environment without high sunk costs. The knowledge so acquired would allow to promote the development of more stable form of foreign involvement such as FDI, with which OPT can coexist.

The positive relationship with lower labor costs and distance (at 10% level of confidence), qualifies them as common factors guiding the delocalization strategy of European firms.

Conclusions

There is wide consensus on the fact that the degree of trade competition between Mediterranean and CEEC is quite reduced. This is due to different factors, endowments and the strong geographical orientation of some European countries, like Germany and France, in the two regions.

This view seems no longer true when analyzing outward processing activities. Indeed, in the OPT domain, competition appears far from being low since the two regions possess similar characteristics, both in terms of proximity to the EU market and also low labor costs, allowing for a profitable delocalization of labor-intensive phases of EU production. Whereas it appears that the degree of competition is mostly attributable to similarity in products rather than of European markets, the two regions seem increasingly orienting their re-exports to similar EU countries. The re-direction of Germany in the Mediterranean region and Italy and France in the CEEC helps to explain the rising convergence of markets.

European firms deverticalize production mainly in the traditional TC industry, footwear, mechanical and electromechanical sectors, which by their own nature, may be profitably delocalized in low-cost neighboring countries.

On the whole, the performance of the Mediterranean region appears less satisfying than that of the CEEC. The CEEC are characterized by a higher reactivity to the increase of the vertical specialization process coming from Europe. This may be due to the higher rate of growth they experience with respect to the Mediterranean countries and also to the fact that historically, they moved first adopting the vertical specialization pattern even before the end of the COMECON. Furthermore, they do not only show a higher degree of homogeneity as a group, as confirmed by a more equal distribution of OPT between countries, but also share a common view of outward processing as a kind of integration strategy with Europe.

On the other hand, the Mediterranean region appears more heterogeneous, showing highly differentiated performance by country. In particular, Tunisia and Morocco seem to follow quite a divergent pattern with respect to the other regional partners. The two countries are not only able to face competition coming from CEEC without losing significant EU market shares, but also to recover from the stagnant economic situation shared by the entire area during the 1990s. This is demonstrated particularly by Morocco in the last two years. Moreover, the objective limits in absorbing increasing shares of OPT activities that Morocco and Tunisia have shown through time,

may be explained considering that OPT does not represent for them a precise economic policy choice as in the case of Romania for example. Their modestly increasing capacities of absorption could partly explain their lower responsiveness faced to the growing demand of delocalization coming from EU firms, and the EU preference toward the CEEC.

The deepening of the integration process with the CEEC does not seem to have seriously damaged the Mediterranean interests as far as OPT is concerned. This is true at least in the case of the high performers Tunisia and Morocco, since the re-orientation of Italy and France toward the CEEC has, as a counterpart, the recent re-direction of Germany towards the Mediterranean region. Despite the different trade volume generated, the Mediterranean countries increasingly show the ability not only to compete in the traditional sectors, like the TC industry, offering a higher quality than CEEC, but also to successfully enter more technologically advanced sectors, like the mechanical and electromechanical ones.

In the OPT domain, the degree of competition results mostly attributable to similarity in products rather than of European markets. The econometric exercise performed through a gravity model with sectorial data in panel, allows not only to identify the determinants of EU OPT, but also to understand the pattern of competition between the two regions. The greater efficiency of the unrestricted model, with EU countries as cross-identifiers, suggests that the effects not explained by the model are probably due to the different productive specialization of EU countries that guide their delocalization strategy. This interpretation supports the idea that EU countries have different strategies of delocalization that they implement in different countries. This allows to explain why the CEEC and Mediterranean countries are not direct competitors in the EU market.

Concerning the determinants, OPT flows seem positively related with low wages and transport costs in all sectors examined, supporting the view that the delocalization of production takes place in order to reduce production costs. The econometric results also point to a positive relationship between OPT and FDI at least in the mechanical sector. This suggests a complementarity of the two forms of vertical specialization, at least in the higher value added industry. OPT, as a form of vertical specialization, does not imply any relationship in terms of control and ownership between the contractor and the subcontractor. Although the causality relation between OPT and FDI is not yet clear, in principle, there should be a temporal relation between OPT and FDI. At the beginning, OPT without FDI is the more likely way to enter Third countries' markets, collecting information on their business environment, infrastructure, industrial structure without excessive sunk costs. Indeed, OPT implies a lower transfer of technology, know-how, business procedures, capital formation and probably simpler production phases (with limited value added) with respect to FDI. FDI could follow in a later stage, once the Third country's market has been considered safe, politically stable and the issue of control becomes relevant for the contractor. In this sense, the authors believe that vertical specialization is useful to attract future foreign investments.

The example provided by the CEEC is significant. Due to its nature of short-term relationship, OPT has proved to be a very flexible form of production delocalization, allowing EU firms to enter even closed markets such as those of the CEEC before the end of COMECON. Furthermore, by increasing the knowledge of the markets and helped by the national governments' favorable attitude *vis-à-vis* the foreign presence, OPT seems to have fostered the massive inflows of FDI in the region.

Trade flows (normal trade) play a different role depending on the sector considered. Normal trade is a complement of OPT in the mechanical sector, signalling that the degree of development of the domestic industrial structure is much more relevant than in the TC sector. This may be due to

the higher physical capital endowment and specialization that the mechanical sector requires. Therefore, especially in the higher value added industries (for example the mechanical and electro-mechanical sectors), OPT could promote the upgrading of local production, as confirmed by the positive correlation with trade in final goods. FDI as the next step, may amplify this upgrading, through the transfer of know-how and managerial skills.

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Appendix 1 - Sources of data

Data on OPT and normal trade used in this article come from a database originally assembled and managed by the authors, starting from the Eurostat data-base COMEXT (Intra and Extra European Union trade). COMEXT includes information on value, quantities and statistical regime of European Union's members trade with each other and with the rest of the world. Statistical data on trade are in Ecu, which was the former European currency before the Euro was introduced in 1999.

The sources of the remaining data used in the regressions are the following:

- European Union Direct Investment Yearbook, 1998 for data on FDI
- ORI is an indicator developed by S.A. Beri
- IMF's International Financial Statistics (IFS) for GDP data and exchange rates
- Economic Intelligence Unit (EIU) of "The Economist" and various national statistical sources for data on labor costs.

Appendix 2. The Harmonized System

The Harmonized System (HS) is an international commodity classification (six digit) developed under the auspices of the Customs Cooperation Council. It was extended to ten digits for imports to serve as the basis for customs tariffs and international trade statistics. This system represents an alternative to other classifications such as the Standard International Trade Classification (SITC) system.

HS is based on the fundamental principle that goods are classified by what they are and not according to their stage of fabrication, use or any other such criteria. The HS nomenclature is logically structured by economic activity or component material. The nomenclature has a hierarchical structure and is divided into 21 sections. Each section is comprised of one or more Chapters (two digit), with the entire nomenclature being composed of 98 Chapters. Chapter 77 is reserved for possible future use. Two final chapters, i.e. 98 and 99, are reserved for national use by individual countries, e.g., special tariff programs and temporary duty suspensions or increases.[16] Each chapter includes different headings (four digits) which, where deemed appropriate, are further subdivided into narrower categories as follows: subheading (six digit), tariff item (eight digit) and statistical annotation (ten digit).

2-digit HS Classification

Section I: Animals and Animal Products
Chapter 1 Live animals
Chapter 2 Meat and edible meat offal
Chapter 3 Fish, crustaceans and aquatic invertebrates
Chapter 4 Dairy produce, birds, eggs, honey and other edible animal products
Chapter 5 Other products of animal origin
Section II: Vegetable Products
Chapter 6 Live trees, plants, bulbs, roots, cut flowers and ornamental foliage
Chapter 7 Edible vegetables and certain roots and tubers
Chapter 8 Edible fruit and nuts, citrus fruit or melon peel

[16] Eurostat uses only chapter 99.

Chapter 9 Coffee, tea, mate and spices
Chapter 10 Cereals
Chapter 11 Milling products, malt, starch, inulin and wheat gluten
Chapter 12 Oil seeds and oleaginous fruits, miscellaneous grains, seeds and fruits, industrial or medicinal plants; straw and fodder
Chapter 13 Lac, gums, resins and other vegetable sap and extracts
Chapter 14 Vegetable plaiting materials and other vegetable products

Section III: Animal Or Vegetable Fats

Chapter 15 Animal or vegetable fats and oils and their clevage products, prepared edible fats, animal or vegetable waxes

Section IV: Prepared Foodstuffs

Chapter 16 Edible preparations of meat, fish, crustaceans, molluscs or other aquatic invertebrates
Chapter 17 Sugars and sugar confectionary
Chapter 18 Cocoa and cocoa preparations
Chapter 19 Preparations of cereals, flour, starch or milk and bakers' wares
Chapter 20 Preparations of vegetables, fruit, nuts or other plant parts
Chapter 21 Miscellaneous edible preparations
Chapter 22 Beverages, spirits and vinegar
Chapter 23 Food industry residues and waste and prepared animal feed
Chapter 24 Tobacco and manufactured tobacco substitutes

Section V: Mineral Products

Chapter 25 Salt, sulfur, earth and stone, lime and cement plaster
Chapter 26 Ores, slag and ash
Chapter 27 Mineral fuels, mineral oils and products of their distillation, bitumin substances and mineral wax

Section VI: Chemical Products

Chapter 28 Inorganic chemicals, organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements and of isotopes
Chapter 29 Organic chemicals
Chapter 30 Pharmaceutical products
Chapter 31 Fertilizers
Chapter 32 Tanning or dyeing extracts, tannins and derivatives, dyes, pigments and coloring matter, paint and varnish, putty and other mastics and inks
Chapter 33 Essential oils and resinoids, perfumery, cosmetic or toilet preparations
Chapter 34 Soap, waxes, polish, candles, modelling pastes, dental preparations with basis of plaster
Chapter 35 Albuminoidal substances, modified starch, glues and enzymes
Chapter 36 Explosives, pyrotechnic products, matches, pyrophoric alloys, certain combustible preparations
Chapter 37 Photographic or cinematographic goods
Chapter 38 Miscellaneous chemical products

Section VII: Plastics And Rubber

Chapter 39 Plastics and articles thereof
Chapter 40 Rubber and articles thereof

Section VIII: Hides And Skins

Chapter 41 Raw hides and skins (other than furskins) and leather
Chapter 42 Leather articles, saddlery and harness, travel goods, handbags and similar articles of animal gut (not silkworm gut)
Chapter 43 Fur skins and artificial fur manufactures thereof

Section IX: Wood And Wood Products

Chapter 44 Wood and articles of wood and wood charcoal
Chapter 45 Cork and articles of cork
Chapter 46 Manufactures of straw, esparto or other plaiting materials, basketware and wickerwork

Section X: Wood Pulp Products

Chapter 47 Pulp of wood or of other fibrous cellulosic material, waste and scrap of paper and paperboard
Chapter 48 Paper and paperboard and articles thereof, paper pulp articles
Chapter 49 Printed books, newspapers, pictures and other products of printing industry, manuscripts, typescripts and plans

Section XI: Textiles And Textile Articles

Chapter 50 Silk, including yarns and woven fabric thereof
Chapter 51 Wool and animal hair, including yarn and woven fabric
Chapter 52 Cotton, including yarn and woven fabric thereof
Chapter 53 Other vegetable textile fibers, paper yarn and woven fabrics of paper yarn
Chapter 54 Manmade filaments, including yarns and woven fabrics
Chapter 55 Manmade staple fibres, including yarns and woven fabrics
Chapter 56 Wadding, felt and nonwovens, special yarns, twine, cordage, ropes and cables and articles thereof
Chapter 57 Carpets and other textile floor coverings
Chapter 58 Special woven fabrics, tufted textile fabrics, lace, tapestries, trimmings and embroidery
Chapter 59 Impregnated, coated, covered or laminated textile fabrics and textile articles for industrial use
Chapter 60 Knitted or crocheted fabrics
Chapter 61 Apparel articles and accessories, knitted or crocheted
Chapter 62 Apparel articles and accessories, not knitted or crocheted
Chapter 63 Other textile articles, needlecraft sets, worn clothing and worn textile articles and rags

Section XII: Footwear and Headgear

Chapter 64 Footwear, gaiters and the like and parts thereof
Chapter 65 Headgear and parts thereof
Chapter 66 Umbrellas, walking-sticks, seat-sticks, riding-crops, whips, and parts thereof
Chapter 67 Prepared feathers, down and articles thereof; artificial flowers and articles of human hair

Section XIII: Articles Of Stone, Plaster, Cement and Asbestos

Chapter 68 Articles of stone, plaster, cement, asbestos, mica or similar materials
Chapter 69 Ceramic products
Chapter 70 Glass and glassware

Section XIV: Pearls, Precious Or Semi-Precious Stones and Metals

Chapter 71 Natural or cultured pearls, precious or semiprecious stones, precious metals and metals clad therewith and articles thereof; imitation jewellery and coin

Section XV: Base Metals And Articles Thereof

Chapter 72 Iron and steel
Chapter 73 Articles of iron or steel
Chapter 74 Copper and articles thereof
Chapter 75 Nickel and articles thereof
Chapter 76 Aluminium and articles thereof
Chapter 78 Lead and articles thereof
Chapter 79 Zinc and articles thereof

Chapter 80 Tin and articles thereof
Chapter 81 Other base metals, cermets and articles thereof
Chapter 82 Tools, implements, cutlery, spoons and forks of base metal and parts thereof
Chapter 83 Miscellaneous articles of base metal

Section XVI: Machinery And Mechanical Appliances

Chapter 84 Nuclear reactors, boilers, machinery and mechanical appliances and parts thereof
Chapter 85 Electric machinery, equipment and parts, sound equipment and television equipment

Section XVII: Transportation Equipment

Chapter 86 Railway or tramway, locomotives, rolling stock, track fixtures and parts thereof; mechanical and electro-mechanical traffic signal equipment
Chapter 87 Vehicles, (not railway, tramway, rolling stock), parts and accessories
Chapter 88 Aircraft, spacecraft and parts thereof
Chapter 89 Ships, boats and floating structures

Section XVIII: Instruments – Measuring and Musical

Chapter 90 Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments/apparatus parts and accessories
Chapter 91 Clocks and watches and parts thereof
Chapter 92 Musical instruments, parts and accessories thereof

Section XIX: Arms And Ammunition

Chapter 93 Arms and ammunition, parts and accessories thereof

Section XX: Miscellaneous

Chapter 94 Furniture; bedding, mattresses, cushions, etc, other lamps and light fitting, illuminated signs and nameplates, prefabricated buildings
Chapter 95 Toys, games and sports equipment, parts and accessories
Chapter 96 Miscellaneous manufactured articles

Section XXI: Works Of Art

Chapter 97 Works of art, collectors' pieces and antiques

Section XXII: Special Classification Provisions

Chapter 98 Reserved for national use
Chapter 99 Special Classification; Temporary Changes; Additional Import Restrictions