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The EU-Med partnership, the textile industry, and rules of origin

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I. Introduction

Since the Barcelona Declaration of 1995, the EU has been pursuing an active policy of trade liberalisation with the countries of the Southern Mediterranean. The twelve countries which form part of this Euromed partnership are : Algeria, Cyprus, Egypt, Jordan, Israel, Lebanon, Malta, Morocco, the Palestinian Authority, Syria, Tunisia and Turkey. The stated objective of this process is to facilitate the economic development of the Mediterranean countries by encouraging the development of competitive market economies, regional integration and cooperation between the Euromed countries. In practice the policy involves the signing of Association Agreements or Interim Agreements with these countries, as well as strongly encouraging moves towards greater regional integration among these countries themselves. The Association Agreements tend to focus on bilateral trade liberalisation through the reduction of tariffs, but also contain provisions on technical assistance and aid, as well as the harmonisation of standards and bureaucratic procedures[1]. As part of that process, in March 2002 at the EU-Mediterranean trade ministerial conference the decision was taken, in principle, to extend the « pan-European system of cumulation of rules of origin » to the Barcelona group of countries. Following that decision the new protocal on rules of origin was subsequently endorsed in July 2003 at the Palermo trade ministerial conference[2].

All preferential trading arrangments have detailed protocols on rules of origin. Those rules are needed in order to determine the geographic origin of goods and thus to determine the appropriate level of customs duty which should be applied. Take the example of three countries – the EU, Morocco and Tunisia, where the EU and Morocco have signed a bilateral free trade agreement. If Morocco imports an intermediate from Tunisia which is used in the production of a final good exported to the EU, the rules of origin are then used to determine whether the final good is deemed as truly 'originating' in Morocco or not. In this case only intermediates which come from either Morocco itself or from the EU (known as *bilateral* cumulation) can be counted/cumulated as originating, but not those from Tunisia. Now suppose that the EU also has an indentical bilateral trade agreement with Tunisia. Again when examining Tunisian exports to the EU only intermediates which come from either Tunisia itself or from the EU can be counted as originating, but not those from Morocco. The pan-European system of cumulation of

[1]The aim of the Euro-Mediterranean Association Agreements is to establish free trade areas in place of the current system whereby the Mediterranean countries hae tariff free access to the EU, but the converse is not true. Six agreements are in place (Israël in June 2000, Jordan in May 2002, Lebanon in March 2003, Morocco in March 2000, The Palestinain Territories in July 97, and Tunisia in January 96). Turkey has is part of a custom union with the EU since 1996.

[2] Since January 1997, the pan-European system includes : the EU, EFTA, Bulgaria, Estonia, Hungary, Latvia, Lithuania, the Czech Republic, Poland, Rumania, Slovakia, Slovenia and Turkey (since Jan 1999).

rules of origin allows for the *diagonal* cumulation of the use of intermediate inputs. Adopting the pan-European system would mean that Morocco could include the value of Tunisian intermediates in determining originating status, and Tunisia could include the value of Moroccan intermediates. Such diagonal cumulation is only possible if the participating countries sign free trade agreements among themselves and adopt identical rules of origin. Thus where a series of FTAs could result in a hub-and-spoke pattern with the EU, diagonal cumulation goes a long way to effectively making the participating countries part of a broader multilateral free trade area. Hence, The expectation is that the cumulation of rules of origin will result in a positive impact on trade and foreign direct investment within the EuroMed region.

There is a relatively small theoretical literature which suggests that rules of origin may also serve to restrict/suppress trade between countries, or to divert trade away from more efficient to less efficient suppliers. On the face of it this is perhaps surprising since rules of origin are typically formulated in the context of a process of trade liberalisation. However, it arises because rules of origin focus on the geographical sourcing of intermediate inputs by firms. Depending on how the rules are then formulated flexibility in the sourcing of intermediates from the cheapest suppliers may be restricted. In the literature there is very little empirical work on the impact of rules of origin on patterns of trade, nor on the impact of cumulation of rules of origin. In part this is no doubt due to the empirical difficulties of isolating the impact rules of origin regimes as they are typically implemented concurrently with the preferential trade agreements themselves. The introduction of the pan-European system in 1997, however, does provide an opportunity to examine the possible impact of the cumulation of rules of origin, and through this on the impact of rules of origin themselves. In this paper we build on earlier work (Augier, Gasiorek & Lai-Tong, 2003) to investigate empirically whether rules of origin, and the cumulation of those rules do matter. We do this in the context of the pan-European system of cumulation, and in contrast to our earlier work the analysis is at the sectoral level.

The paper is divided into two main parts. In the first part of the paper we first discuss in more detail some of the conceptual issues which arise when considering rules of origin, as well as summarising some of the key results which have emerged from the literature. Secondly we provide a discussion of key features of the Euromed economies, and their patterns of trade. If the rules of origin in place between the EU and its partner countries do indeed impact upon patterns of trade than one would expect that the introduction of the pan-European system of diagonal cumulation in 1997 would have affected trade flows. In the third section of this part of the paper we provide a preliminary exploration of this issue by looking, at a fairly detailed sectoral

level, at the pattern of imports over time. We provide evidence to suggest that the introduction pan-European cumulation in 1997 did indeed reorient trade towards the pan-European zone, and that this is particularly true for intermediate goods sectors. In the second part of the paper we turn to our principal empirical analysis. Here we explicitly derive an equation for estimating trade flows, on a cross section basis at the sectoral level. This is then applied to the textile industry where the analysis once again provides strong evidence for the role of cumulation. The textile industry was chosen because for many of the southern Mediterranean economies this is an important industry in terms of both production and trade, and because it is an industry which is often cited as one with particularly constraining rules of origin. The analysis explores the extent to which lack of cumulation may impact upon trade as well as the extent to which this is important for the Euromed partner countries.

Part 1 : Conceptual and Empirical Background

1.1 . Conceptual Background

Rules of origin and the cumulation of those rules are an important element in understanding the evolution of trade between countries especially in the context of preferential trading arrangements be they unilateral or multilateral. Where a country is granted preferences unilaterally, such as the EU's Generalised System of Preferences (GSP), the rules are there to ensure that non-benficiary countries are not routing their exports via a beneficiary country. In the case of a free trade the rules prevent imports from non-member countries from entering the free trade area via the country with the lowest external tariff (trade deflection). For the EuroMed countries with the reduction in their tariffs on EUexports following the Association Agreements, the rules serve to ensure that third countries which may have tariff free access to the EU market under the GSP do not trade deflect towards the Southern Mediterranean markets.

Clearly then, within the overall context of trade liberalisation rules of origin are neede in order to prevent trade deflection as described above. Typically one or more of three criteria are used in determining the originating status of a good : (a) whether or not the transformation of the good results in a different tariff classification line, (b) whether or not the value of the imported intermediate exceeds a certain percentage (often 40%) of the mill price of final good, (c) whether a particular specified production process has been employed or not. Nevertheless there are several reasons why rules of origin may result in a far less substantial degree of trade liberalisation than might be, on the face it, implied by the preferences which have been granted. First, there are the administrative and bureaucratic costs involved with administering rules of origin regimes.

Secondly, typically these rules are determined product by product at a very detailed level of disaggregation. In the EU context they are determined at the HS 6-digit level which hence covers 5142 products. There is increasing evidence to suggest that the rules may serve to protect certain sectors from the degree of liberalisation that might otherwise be implied by the free trade agreement, and in particular from competition from low-wage countries (Brenton & Machin (2002), Falvey & Reed (2002), Burfisher, Robinson & Thierfelder (2001), Hoekman (93)). For example, in the context of EU agreements it is typically the case for textile imports that the change in tariff classification rule is employed. However, as opposed to allowing a single change in the tariff classification line, the transformed good must have moved at least two tariff classification lines in order to be considered originating.

A second reason concerns the underlying restrictiveness of a given rule of origin. Consider the example given earlier : Prior to the FTA with the EU, Morocco imports intermediate goods from Egypt which comprise 50% of the value of the final good subsequently exported to the EU. The FTA with the EU specifies that the final good is deemed as originating from Morocco if the value of non-originating intermediates does not exceed 40% of the value of the final good. Unless the Moroccan firm changes its source of supply of intermediates or raises the final price of the good exported, it will not be able to benefit from the tariff free access to the EU market. If the changes its source of supply it has two choices. Either source more (or all) of the intermediate from domestic sources, or from the EU. In the case of the former we have trade suppression, and in the case of the latter trade diversion. Each of these involves using a higher cost intermediate than was the case prior to the application of the free trade agreement. These issues are discussed more fully in Krishna (2003), Krishna & Krueger (1995).

Inama (2003) provides some preliminary estimates of the possible impact of constraining and/or complex rules of origin. For the the total imports of Canada, the EU, Japan and the USA he calculates the rate of GSP utilisation. This is defined as the ratio of imports into these countries actually benefitting from preferential customs duties divided by the value of imports that in principle are entitled to GSP preferential treatment. This rate of GSP utilisation fell from 55.1% in 1995 to 38.9% in 2001. This low level of utilisation does suggest that even where there are GSP preferences developing countries appear to have difficulties in actually realising tariff free access to developed country markets.

Where industrial lobbies play an important role they can then influence the viability and nature of trade agreements (Dasgupta & Panagariya (2002), Grossman & Helpman (1995). For example, it is unlikely that the NAFTA agreement would have been signed without the support of the automobile and the textile industries, and each of thes were influential in the shaping of the NAFTA rules of origin and not surprisingly the rules for each of these sectors are extremely strict.

The adoption of the pan-European system of cumulation of rules of origin by the Barcelona countries implies not only a harmonisation of the underlying rules, but perhaps more importantly, the possibility of the *diagonal* cumulation of those rules. Currently both Morocco and Tunisia have signed Association Agreements with the EU, hence each of them can have tariff free access to the EU providing they can show that the good 'originated' in their respective countries. Even though Tunisian goods have tariff free access to the EU, if Morocco exports a good to the EU comprising Tunisian intermediates the value of those intermediates in the price of the product cannot be cumulated with the value of any Moroccan intermediates used or with Moroccan value added in determining originating status. In contrast if the intermediates used came from the EU their value could then be cumulated. This use of originating intermediates from a bilateral PTA partner is known as *bilateral* cumulation. Where countries are linked by a series of identical agreements *diagonal* cumulation allows for intermediates originating in any one of these countries to be included in determining originating status. Consider the following example : A final good exported to the EU by Morocco is comprised of intermediates from Tunisia (20%), Egypt (15%), EU(10%), China (10%), and Moroccan value added (45%). With a 40% value added rule the product cannot enter the EU market duty free as the total value of intermediates which qualify for originating status is 55%, whereas it needs to be at least 60%. With the pan-European system of (diagonal) cumulation the Moroccan firm is entitled to include the value of intermediates of all other countries which are part of the pan-European system. Thus if either Tunisia or Egypt were part of the pan-European system together with Morocco than the good could enter the EU market duty free. In the former case the value of originating intermediates would be 75%, and in the latter case 70%.

The example discussed above shows first, that preferential trade agreements with bilateral cumulation of rules of origin can in principle lead to trade diversion and/or trade suppression. This will depend whether on the degree of restrictivness of the underlying rules of origin, and on the trade-off which the exporters face between taking advantage of the tariff preferences and sourcing intermediates from the cheapest supplier. Secondly, in the context of a system of bilateral cumulation with constraining rules of origin, moving to a system of diagonal cumulation

of rules of origin widens the possible source of intermediate suppliers to all those countries which are part of that system of diagonal cumulation. Where constraining rules of origin led to either trade suppression and/or trade diversion, diagonal cumulation can thus lead to trade creation (importing more intermediates from either one of the partners or the rest of the world), and/or trade reorientation (switching imports from a less efficient to a more efficient partner or rest of the world supplier), as well as trade diversion with respect to non-partner countries[3]. Thirdly, in providing more scope for final goods producers to source cheaper intermediates there may be trade expansion in final goods arising from the lower costs of production and hence lower prices.

1.2 The EuroMed Economies – patterns of trade and production

In this section we take a brief look at some key statistics concerning the structure of production and trade of the EuroMed economies. If we turn first to Table 1.1 which gives the sectoral shares of value added and employment in manufacturing for six of the EuroMed economies. The bottom row gives total manufacturing value added, and shows that the largest economy was Turkey, followed by Israel, with the remaining economies being considerably smaller.

For each of the economies the three largest sectoral shares in terms of both value added and employment are shaded. Looking at these it can be seen that Food, Beverages and Tobacco is one of the three largest industries in terms of both employment and value added for each of these economies. The other sector which figures prominently is that of Textiles and Apparel. For Morocco, Tunisia & Turkey this is one of the most important sectors in terms of value added, and for all of the countries except Jordan it is one of the most important sectors in terms of employment shares. Indeed for Egypt, Morocco, Tunisia and Turkey this is the most important sector in this regard with the share of manufacturing employment ranging from 29.8% in Egypt, to 41.3% in Tunisia. Other sectors that are clearly important in terms of either value added or employment for at least three of these economies are Chemicals, Non-metallic minerals, and Metals. Overall the table shows there are some considerable similarities in production structure for most of these economies, in particular in the emphasis on Food, Beverages & Tobacco, and on Textiles and Apparel. Perhaps not surprisingly the country that differs the most significantly from this is that of Israel, where for example, the most significant sector in terms of value added is machinery.

[3] See Gasiorek et.al. 2002 for a fuller discussion.

Table 1.1: Sectoral Shares in Value Added and Employment

Sectors	Egypt		Israel		Jordan		Morocco		Tunisia		Turkey	
	1997		1996		1997		1999		1999		1999	
	VA	Emp	VA	Emp	VA	Emp	VA	Emp	VA	Emp	VA	Emp
Food, Bev.& Tob.	18.5	20.3	12.4	15.2	27.9	20.8	32.7	20.2	17.4	14.2	13.2	16.7
Textiles & apparel	12.9	29.8	7.9	15.0	4.4	9.1	15.9	38.3	27.8	41.3	16.2	31.8
Leath. & Footwear	0.4	1.2	0.7	1.4	1.3	2.2	1.1	3.0	5.1	4.4	0.8	1.5
Wood & furniture	0.5	1.9	2.7	4.1	3.8	8.9	1.6	2.1	6.6	3.5	1.6	2.6
Paper & printing	3.0	4.0	7.3	7.8	5.8	7.6	4.2	3.2	2.9	3.2	3.0	3.0
Chemicals	18.1	9.3	5.2	2.4	17.2	11.5	15.0	6.6	9.8	3.9	10.7	5.2
Petroluem	13.7	2.2	5.7	3.5	7.9	4.0	0.0	0.0	6.3	0.4	15.6	0.8
Rubber & plastic	1.9	2.2	6.0	5.5	3.6	5.2	2.5	2.8	2.5	3.7	3.8	3.6
Non-met. Minerals	10.4	8.2	4.4	3.4	15.4	13.5	8.9	7.7	7.3	8.0	7.3	6.8
Metals	7.9	10.1	13.4	15.2	7.4	10.5	5.9	5.5	4.7	5.8	10.3	10.4
Mach. not elec.	4.3	4.2	3.1	3.2	2.3	3.1	4.1	3.7	0.4	2.4	4.6	5.2
Machinery, electric	3.9	2.6	22.5	14.8	1.5	1.5	3.1	3.1	5.4	4.9	5.4	4.6
Transp. equipment	3.9	3.1	6.1	5.4	0.8	0.9	4.7	3.5	2.5	3.1	6.4	6.4
Prof., Sc. & other	0.6	0.9	2.5	3.1	0.7	1.4	0.3	0.3	1.3	1.2	1.1	1.3
Total manuf. ($M)	6767.8		14107.7		1066.2		5660.8		3935.9		31295.7	

Source : UNIDO Industrial Statistics Database, Rev.2, 2002

Tables 1.2 focusses on the the sectoral breakdown of imports and exports. For each of the six EuroMed countries included we have calcululated the share of imports and exports at the 2-digit SITC rev.3 level. The table then gives for each of these countries the five largest imports (M) and export (X) industries. The last two rows give the aggregate shares of the five and ten largest industries. In aggregate the five largest import industries account for between 30%-49% of all imports, and the ten largest between 48% and 64% of all imports. For exports the five largest account for between 48% and 68%, and the ten largest for between 65% and 84% of all exports. This suggests a high degree of specialisation particularly with regard to exports. Each country (except Egypt) has at least one industry which comprises more than 10% of all imports, and more than 20% (except Jordan) of all exports. In terms of imports there are five sectors which are one of the top five industries for three or more countries - cereal (SITC 04), petroleum (SITC 33), textile yarn (SITC 65), electrical machinery (SITC 77), and road vehicles (SITC 78). In terms of exports there are three such sectors – vegetables & fruit (SITC 05), electrical machinery (SITC 77), and clothing etc (SITC 84).

In terms of the SITC 2-digit industries listed above textiles comprises most of industries 26 (Textile fibres), 65 (Textile yarn) and part of 84 (Clothing etc). Taking these in aggregate it is clear that textiles and clothing are significant import and export industries for the EuroMed countries. Textile yarn comprises 4.64% and 6.25% of imports for Turkey and Jordan, and 12.71% and 16.01 percent respectively for Morocco and Tunisia. On the export side, textile yarn comprises

6.96 of Egyptian exports, and 12.58 of Turkish exports, while Clothing etc comprises 5.75% of Egyptian exports, 12.92% fo Jordan, 21.26 for Turkey, and rising to 32.78% and 40.12% for Morocco and Tunisia. These are substantial figures and emphasise again the importance of the textile industry for these economies. It is also interesting to note for example the importance of textile yarn imports (ie intermediates) into Jordan, Morocco, Tunisia coupled with high export levels of clothing etc (ie most likely the transformed final good) for the same economies.

Table 1.2 : The Sectoral Breakdown of Trade

	Description	Egypt		Israel		Jordan		Morocco		Tunisia		Turkey	
		M	X	M	X	M	X	M	X	M	X	M	X
03	Fish etc								11.54				
04	Cereals etc	9.73				4.98		7.00					
05	Veg & fruit						5.95		7.44				6.84
26	Textile fibres		4.74										
27	Crude fertilisers						14.89						
33	Petroleum etc		37.59	6.36		13.51		13.71			7.48	11.29	
51	organic chemicals				3.21								
52	Inorganic chemicals								6.35		4.14		
54	Med. Products						8.43						
56	Fertilisers										4.45		
65	Textile yarn etc		6.96			6.25		12.71		16.01		4.64	12.58
66	Non-metallic min			20.82	31.20								
67	Iron & steel	4.88											7.98
71	Power generating mach.											4.73	
72	Special indust. mach	4.90											
74	General indust. mach	4.47								5.43			
75	Office machinery			4.94									
76	Telecom. equip.				13.65	4.71							
77	Elec. Mach			10.36	11.40			5.61	9.23	7.56	12.23	5.18	
78	Road vehicles			6.67		8.95	6.22	4.67		6.89		4.38	7.33
84	Clothing etc		5.75				12.92		32.78	5.57	40.12		21.26
89	Misc. manuf.				3.68								
93	Transactions n.e.s.	6.83	7.04										
	Total (5)	30.81	62.08	49.15	63.14	38.40	48.41	43.70	67.34	41.46	68.42	30.22	55.99
	Total (10)	48.60	78.74	64.60	77.02	54.88	65.24	60.13	86.61	58.84	82.12	52.14	72.47

While there are clearly some similarities in the import and export structure across the EuroMed countries as discussed above – overall the table does not suggest a substantial degree of overlap in the specialisation of trade. In order to explore this issue more carefully we have computed Finger-Kreinin indices of export and import similarity for these countries. The FK index provides a means for assessing the similarity of trade of a given pair of countries. Formally the index is defined as:

$$FK_{ab} = \sum_i \left[\min(S_{ia}, S_{ib})\right] * 100$$

where S_{iac} denotes the share of commodity *i* exports by country *a*; and correspondingly S_{ibc} denotes the share of commodity *i* exports by country *b*. Since the index sums only the minimum value of export shares between the two countries it ranges from 0 to 100. An index of 100 represents complete overlap in exports, whereas an index of 0 represents no overlap. Table 1.3 gives the computed FK index with respect to the countries' total imports (dark shaded, top-right) and total exports (light shaded, bottom left). The index was calculated for 2001 on the basis of 2-digit SITC trade flows.

Table 1.3 : Finger-Kreinin Indices of trade similarity

	Egypt	Israel	Jordan	Morocco	Tunisia	Turkey
Egypt		51.57	68.53	63.52	61.81	66.19
Israel	21.10		63.31	60.28	60.49	59.70
Jordan	32.36	35.21		77.34	67.77	70.14
Morocco	29.49	25.17	46.66		76.27	71.29
Tunisia	33.84	31.50	43.69	71.90		64.86
Turkey	39.42	35.56	55.17	46.87	49.62	

There are several features which emerge clearly from this table. First, these indices do not suggest that in general there is an overly high degree of similarity in trade patterns for these economies. For imports the highest index is between Morocco and Tunisia (76.27), and the lowest is between Egypt and Israel (51.57). The average for all the bilateral pairings is 66.7%. On the export side most of the indicess are below 50, with the lowest again being between Israel and Egypt (21.1) and the highest between Morocco and Tunisia (71.9), and the average index is 44.1. In comparison the average import index for all the bilateral pairings between the CEFTA countries and the Baltic states is 72.3, and the average export index is 48.9. Secondly, there is clearly greater similarity in imports than in exports as evidenced by the average indices given above. Thirdly, there is one pairing which stands out as having a much higher degree of similarity across both imports and exports and that is between Tunisia and Morocco.

We now turn to the geographical pattern of trade for these economies. Table 1.4 details the share of imports and exports by partner 'country' at the aggregate level and for the textile industry. For purposes of comparability with our empirical analysis later in the paper, here we have defined the textile industry more narrowly (ie excluding apparel) as defined by the ISIC rev.3 classification[4]. The partner countries we consider are the EU15, the remaining members of the Pan-European system (ie the CEFTA and EFTA countries, and the Baltic states) which we call the PanEU, the

[4] The figures here are calculated by using the correspondance between the ISIC rev.3 and the SITC rev.3 at the SITC 5-digit level of classification.

EuroMed countries, and the Rest of the World. In order to prevent any anomalies which might arise from one year's data we have taken the average shares over 1993-1995, and 1999-2001.

Table 1.4 : Trade by geographical origin

		Total Trade				Textile Trade			
		Imports		Exports		Imports		Exports	
Reporter	Partner	1994	2001	1994	2001	1994	2001	1994	2001
Egypt	EU15	37.65	32.86	44.59	30.91	29.70	17.94	66.21	57.40
	Pan-EU	5.57	4.58	2.78	1.14	3.10	0.86	2.97	1.67
	EuroMed	2.35	3.06	13.10	13.45	5.11	5.44	6.05	2.94
	Rest of World	54.43	59.50	39.52	54.50	62.09	75.76	24.76	38.00
Israel	EU15	50.94	45.63	30.18	28.53	58.77	39.66	57.13	49.73
	Pan-EU	7.75	6.59	3.87	3.27	5.46	4.19	1.05	1.05
	EuroMed	0.81	1.01	1.02	1.69	4.71	6.26	1.13	3.56
	Rest of World	40.50	46.77	64.93	66.51	31.06	49.89	40.69	45.67
Jordan	EU15	32.85	31.42	8.61	4.87	25.48	12.14	10.17	4.87
	Pan-EU	3.92	2.87	0.74	0.74	4.46	0.45	0.48	0.07
	EuroMed	7.34	7.65	9.19	14.08	11.86	35.71	8.17	16.53
	Rest of World	55.89	58.06	81.46	80.31	58.19	51.69	81.18	78.53
Morocco	EU15	54.92	57.51	62.55	73.49	84.70	87.30	80.68	92.02
	Pan-EU	3.94	2.51	2.06	1.55	1.23	0.36	0.56	0.15
	EuroMed	3.29	3.43	4.42	1.90	2.01	1.81	3.49	0.21
	Rest of World	37.85	36.56	30.97	23.05	12.05	10.54	15.28	7.61
Tunisia	EU15	72.64	70.66	77.40	80.32	93.66	91.87	81.58	90.24
	Pan-EU	2.80	2.86	1.34	0.86	0.60	0.42	0.56	0.22
	EuroMed	3.96	3.90	5.93	3.34	0.81	1.22	1.41	0.27
	Rest of World	20.60	22.59	15.33	15.49	4.92	6.50	16.45	9.27
Turkey	EU15	45.35	48.56	48.39	52.56	31.46	47.76	62.51	63.61
	Pan-EU	5.73	5.93	5.89	5.22	2.90	2.80	7.80	5.66
	EuroMed	2.48	4.70	6.58	7.91	1.84	1.40	3.52	4.87
	Rest of World	46.44	40.82	39.14	34.31	63.80	48.03	26.18	25.87

Note : For Israel the figures are for 2000. For Egypt and Jordan the figures for the textile industry are for 1999.

If we consider first total trade we can see that over 1993-95 the EU is the principal supplier of imports for Israel, Morocco and Tunisia with the respective shares of imports being 50.9%, 54.9% and 72.64%. Similarly over 1999-2001 the EU is the principal supplier for Morocco (57.5%), Tunisia (70.6%), and Turkey (48.6%). On the side of exports the EU is by far the principal destination market for Egypt, Morocco, Tunisia, and Turkey over 1993-95 and for the latter three countries over 1999-2001, whereas the rest of the world is the more important destination for the remaining economies. There are some interesting changes over time. With regard to both imports and exports three countries – Egypt, Israel and Jorden see a reorientation away from the EU and towards the Rest of the World. This is most marked for Egypt where the EU import share declined from 37.6% to 32.8%, and the export share from 44.6% to 30.9%. In contrast, Morocco and Turkey see the EU import share rise (while Tunisia experiences a small

fall), while each of these economies see a rise in the share of exports going to the EU which is most marked for Morocco (from 62.5% to 73.5%).

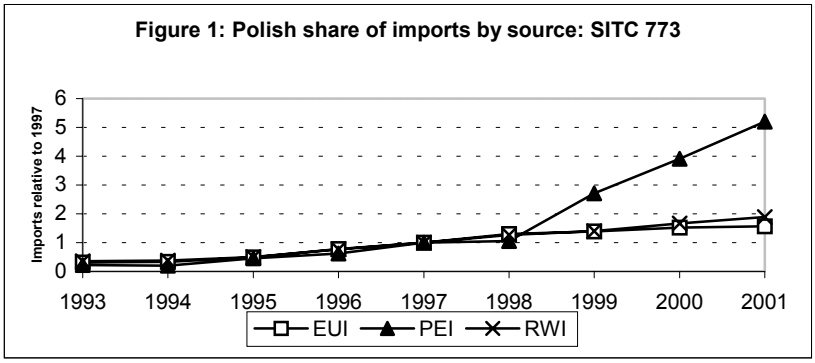
It is worth noting that small import shares are accounted for by either the PanEU countries, or by the EuroMed countries. For the latter the import share from the other EuroMeds over 1993-95 ranges from 0.8% for Israel, 2.5% for Turkey, to 7.8% for Jordan. Except for Turkey where the share rises to 4.7% by 2001, these shares remain relatively stable over time. With regard to exports there is greater variation in the share accounted for by the EuroMed countries. Hence over 1993-95 13.1% of Egyptian exports went to other EuroMed countries, while for Israel the figure was 1.02%. Over time the biggest change in these shares is experienced by Jordan (from 9.2% to 14.1%), while Turkey also sees a rise (from 6.6% to 7.9%). In contrast Morocco sees a large fall (from 4.4% to 1.9%) and Tunisia a slightly smaller one (from 5.9% to 3.3%).

If we look at textile trade the EU is the principal source of imports over both 1993-95 and 1999-2001 for Israel, Morocco and Tunisia – with the Moroccan and Tunisian shares being as high as 84.7% and 93.7% respectively in the earlier period, and 80.1% and 81.6% respectively in the latter period. The EU is also the principal export market over the period for Egypt, Israel, Morocco, Tunisia, and Turkey. Once again the shares of imports and exports with the other PanEU countries, and with the EuroMed countries is extremely low. Interesting also are the changes over time. Egypt, Israel and Jordan all see a substantial reorientation of textile trade away from the EU and either towards the rest of the world (for Egypt and Israel) or towards the other EuroMed countries (for Jordan). In contrast Morocco, Tunisia and Turkey all see a reorientation of textile trade towards the EU and this is generally true of both imports and exports. Noticeable also is the decline in imports coming from other EuroMed countries for Morocco and Turkey, and the decline in exports going to the EuroMed area for Egypt, Morocco, Tunisia and Turkey.

1.3. Trend analysis of the 1997 extension of the Pan-European system

The aim of this analysis is to establish whether there is any prima facie evidence on the impact of cumulation from the trade data following the introduction of the pan-European system in 1997. Prior to 1997 diagonal cumulation applied between the EU and EFTA. After 1997 the system was extended to the countries of Central and Eastern Europe and the Baltic states. If cumulation were to impact upon trade flows in the first instance one would expect this to be true principally within intermediate sectors than final goods sectors, and secondly one would expect a re-direction of trade towards imports from either the EU or the other pan-EU countries relative to the rest of the world.

Consider figure 1 below, which for SITC 773 (Electrical distribution equipment) plots Polish imports from three sources – the EU, the other Pan-European countries (labelled PanEU) and the rest of the world (ROW). To make comparison easier for each series in the figure the imports are plotted in index form (ie imports relative to the value of imports in 1997). Hence EUI gives the value of Polish imports in each year from the EU relative to imports from the EU in 1997. PEI gives the index for imports from the other pan-EU countries, and RWI from the rest of the world. From the figure we can see that imports of 773 from the other Pan-European countries increased sharply in the post 1997 period, both in comparison to prior to 1997, and in comparison to imports from the EU or from the rest of the world.



Of course this is but one example for one industry and one country. To examine this more formally we have taken the 20 most important SITC 3-digit industries[5] by value of world imports for the non-EU panEU economies. We then calculated these indices for each of these industries and for each of these countries for which we had reliable data over this time period. The countries covered include Czech Republic, Hungary, Latvia, Lithuania, Romania, Slovakia, Slovenia, Poland, Iceland, Norway and Switzerland, and the 20 industries comprise about 34% of the total world imports of these countries in 1999. We then take the ratios PEI/RWI, and EUI/RWI and run a simple time-trend panel regression from 94 to 2001. Specifically the equations that we have estimated for each of the industries are:

$$1) \quad \frac{PEI}{RWI} = \alpha_0 + \alpha_1 T + \alpha_3 D + \alpha_4 D*T$$

$$2) \quad \frac{EUI}{RWI} = \alpha_0 + \alpha_1 T + \alpha_3 D + \alpha_4 D*T$$

ie where T is a time trend, and D is a dummy which is zero prior to 1997, and 1 after 1997, and then D*T is a standard interaction term. If lack of cumulation was indeed important than one would expect the coefficient on *D*T* to be positive and statistically significant. This would

represent a reorientation of trade towards either the panEU economies, or the EU itself and in each case away from the Rest of the World.

Table 1.5 below, gives the results for the 20 industries for each of the above regressions where we focus on the results for the interaction term as this is the variable of interest. The third column of the table gives the BEC classification for each of the industries which divides the industries into final use categories, where I=intermediates, C=capital goods, and F-final consumption goods. Out of the the 20 industries in 10 cases the coefficient on the interaction term is positive and statistically significant with regard to imports (relative to imports from the rest of the world) from the pan-European countries, and in four of these cases it is also statistically significant with regard to EU imports. In only one case do we have a negative coefficient with regard to both Pan-EU and EU imports but this is not statistically significant.

Table 1.5 : Trend Regression Results

Industry		BEC	EUI/RWI		PEI/RWI	
SITC	Description		D*Trend	p-value	D*Trend	p-value
781	Passenger Motor Vehicles	I/F	0.281*	0.058	2.083***	0.000
542	Medicaments	F	-0.046	0.622	0.153	0.244
764	Telecommunications equipment	C	0.054	0.522	0.915*	0.061
752	Automatic data processing equip.	C	0.071	0.317	0.517**	0.036
784	Part, tractors, motor veh.	I	0.587*	0.055	0.589***	0.007
776	Transistors, valves etc	I	0.064	0.532	0.852**	0.043
772	Electrical switching, relay circuits	I	-0.088	0.425	0.049	0.739
778	Electrical Machinery	I/F/C	-0.002	0.974	0.083	0.402
759	Parts for office Machines	I	0.266**	0.010	0.920***	0.000
893	Articles nes plastics	I/F	0.050	0.514	0.095	0.440
699	Manuf. base metals	I	-0.076	0.103	-0.016	0.842
821	Furniture etc.	F	0.049	0.513	0.182	0.240
641	Paper & paper board	I	0.184	0.142	0.268*	0.052
728	Other machine parts	C/I	0.220	0.250	0.277	0.126
713	Internal combustion engines	I/F/C	0.332	0.503	0.687**	0.017
541	Medicines	I	0.250***	0.008	0.201*	0.056
684	Aluminium	I	0.062	0.561	0.050	0.677
515	Organo-Inorganic compounds	I	0.519	0.181	1.210*	0.088
874	Measure, constrol, instruments	C/I	0.153	0.218	0.644	0.127
792	Aircraft associated equip.	C/F/I	10.630	0.260	0.695	0.772

In other words for 10 of the CEECs most important import industries there was a statistically significant shift towards greater imports from other Pan-European partners after 1997. In and of itself this is an interesting result which suggests that changes in the cumulation of rules of origin may be an important part of the explanation. Secondly, if we consider the relevant BEC

[5] Except SITC 3 (fuels, lubricants, etc.) and 9 (goods not classified by kind).

categories for these industries we can see that six of these industries are purely intermediate goods industries, two of them are mixed sectors, and two of them are capital goods industries. Clearly there are many factors which impact upon trade flows. Nevertheless it is somewhat striking that after the introduction of cumulation of rules of origin there was a marked reorientation of trade towards the Pan-European economies, and partially also towards the EU in 14 of the 20 most important sectors almost all of which are intermediate goods sectors. This would therefore appear to suggest that there is a prima facie case that allowing for cumulation impacted upon patterns of trade. We now turn to a more detailed and more explicit analysis.

Part 2 : Cumulation and the Textile industry – a sectoral 'Gravity' Model

In this part of the paper we explore the possible impact of cumulation for a given sector – that of textiles. The estimating equation is formally derived from underlying theory, and provides a means for a cross-section analysis of trade flows. The reader will note that the derived equation is analogous in many ways to the gravity model which has been widely used for analysing aggregate trade flows. The standard gravity models is, however, unsuitable for sectoral level analysis, and hence the need for an alternative[6]. The remainder of this section first details the model and the underlying data, and then we turn to a discussion of our results.

2.1 : The Model

Assume there is a representative consumer in each economy who faces an overall budget constraint, M_j which is given by,

3) $$M_j = U_j E_j$$

where U_j is the utility function, and E_j is the unit expenditure function in country j. Each of these is represented by a Cobb-Douglas aggregator and take the following form,

4)

5)

where X_j^k represents the sub-utility function over individual product varieties produced in industry *k* in country *j*, and P_j^k represents the aggregate price index. We assume a two-stage budgeting procedure. In the first stage consumers maximise their utility subject to their

[6] At the *aggregate* level it may be reasonable to suppore that trade between pairs of countries depends on each countries' GDP, population, distance, trade barriers etc. However, at the detailed sectoral level one would expect that determinants of comparative advantage would also play an important role.

overall budget constraint, and allocate expenditure between different the *k* industries. The β_j^k's represent the shares in total expenditure. In the second stage consumers maximise the sub-utility function over individual product varieties, given by X_j^k , subject to the budget allocated to that industry. Hence, expenditure is divided within each group on individual product varieties.

The sub-utility function over individual product varieties is assumed to be a constant elasticity of substitution aggregator, with elasticity of substitution common to all countries denoted ε^k. The sub-utility function takes the following form,

6) $$X_j^k = \left[\sum_{i=1}^{j} \sum_{l=1}^{n_i} \left(x_{ijl}^k \right)^{\frac{\varepsilon^k - 1}{\varepsilon^k}} \right]^{\frac{\varepsilon^k}{\varepsilon^k - 1}}$$

x_{ijl}^k is the output of a single variety of a good in industry *k*, produced in *i* and sold in *j* by firm *l*. Hence consumers demand each variety produced from all sources. Each industry contains a number of firms, with n_i^k denoting the number of firms in industry *k* located in country *i*. In order to simply the above it is assumed that for a particular industry and country all firms are symmetric: Equation 6 can then be simplified to,

7) $$X_j^k = \left[\sum_{i=1}^{j} n_i^k (x_{ij}^k)^{\frac{\varepsilon^k - 1}{\varepsilon^k}} \right]^{\frac{\varepsilon^k}{\varepsilon^k - 1}}$$

Consumer demands for the aggregate quantity indices are derived (by Shephard's lemma) by partial differentiation of the expenditure function. The sub-utility function over differentiated products can then be interpreted as a quantity index. Analogously, and dual to the quantity index, P_j^k, represents the aggregate price index for all varieties of industry k consumed in country j. The form of P_j^k is given by,

8) $$P_j^k = \left[\sum_{i=1}^{j} n_i^k (p_{ij}^k)^{1-\varepsilon^k} \right]^{\frac{1}{1-\varepsilon^k}}$$

p_{ij}^k and x_{ij}^k denote the price and quantity of a single product variety of industry *k* produced in country *i* and consumed in country j. The expenditure function over differentiated products is then given by,

9) $$E_j^k = X_j^k P_j^k$$

Demand for individual varieties of any given product, x_{ij}^k, is again given by Shephard's Lemma, by differentiation of the expenditure function with respect to individual prices, p_{ij}^k,

$$10) \qquad x_{ij}^k = X_j^k \left(\frac{P_j^k}{p_{ij}^k} \right)^{\varepsilon^k}$$

dropping industry superscripts, using equation 9, and rearranging gives :

$$11) \qquad p_{ij} x_{ij} = E_j \left(\frac{P_j}{p_{ij}} \right)^{\varepsilon - 1}$$

This equation can then be rearranged to yield the following :

$$12) \qquad X_{ij} = n_i p_{ij} x_{ij} = Q_i E_j \frac{\left(P_j (1 - t_{ij})^{-1} \right)^{\varepsilon - 1}}{\sum_j E_j \left(P_j (1 - t_{ij})^{-1} \right)^{\varepsilon - 1}}$$

where: Q_i is the value of production in country *i* in the sector, E_j is the value of expenditure on the sector in country *j*, t_{ij} are the (ad valorem) "costs" of trade between i and j (eg. transport costs, tariffs…) and P_j is the price index defined earlier. Hence, exports from one country to another country in a given sector depend on: production in the exporting country; demand in the importing country; and the price index in the importing country relative to the price index (weighted by expenditure) in all other countries; as well as the costs of trade between the exporting and the importing country, relative to the costs of trade between all other countries.

2.2. Estimating equation and results

Based on the above, the equation which we actually estimate, using a Tobit estimation procedure, takes the following form[7] :

$$Ln(X_{ij}) = \alpha_0 + \alpha_1 Ln(Q_i) + \alpha_2 Ln(E_j) + \alpha_3 Ln(RUV_j) + \alpha_4 Ln(tariff_{ij}) + \alpha_5 Ln(Dist_{ij}) + \alpha_6 PTA_{ij} + \alpha_7 Border_{ij} + \alpha_8 Language_{ij} + \alpha_9 Quota_{ij} + \alpha_{10} ROO_{ij}$$

where :

X_{ij} : represents exports of textiles from country *i* to country *j* (in millions of $). The source for this data is the UN PC-TAS database.

[7] Strictly speaking because trade values are bounded from below by zero a Tobit procedure is the correct one to use. In practice in most cases there is little difference in the results between using the Tobit methodology and a standard OLS procedure.

Q_i : represents total production of textiles in country *i.* (in millions of $), where the source was the Unido Industrial Statistics Database. We would expect the coefficient on this to be positive, as the greater is the level of production the higher would be the expected level of exports.

E_j : represents total apparent consumption of textiles in country *j* $(Q_j+M_j-X_j)$, where M_j and X_j are the total imports and exports of textiles in country *j*. Again we would expect the coefficient to be positive as the greater is consumption in a given country, the higher would be the expected level ov imports.

RUV_{ij} : are relative unit values which are used to proxy the price terms in equation 12, we have used unit values[8]. The higher is the price of a given exporter relative to the average price of all other exporters the lower would be the expected level of exports. We would therefore expect this coefficient to be negative.

$Tariff_{ij}$:Gives the bilateral MFN or preferential average tariffs between countries.

$Dist_{ij}$: Gives the distance between the economic centre of gravity of the respective countries.

As is now standard in gravity modelling, in addition to the above we supplement the above with dummy variables in order to try and capture other factors, and in particular institutional arrangements between countries which are typically expected to impact upon trade flows. These include regional trading arrangements (PTA_{ij}), or dummies to capture other affinities between countries such as a common language ($language_{ij}$) or a common border ($border_{ij}$). We also include a dummy in order to capture quotas between countries ($Quota_{ij}$).

Following our earlier work (Gasiorek et.al. 2002, Augier, Gasiorek & Lai-Tong, 2003) we also include a dummy variable designed to capture the impact of the effects of cumulation. In particular the aim is to explore whether the lack of cumulation between countries may act as a constraint on trade between them. Specifically, the objective is to determine whether trade is lower in those cases where an importing country (eg. Tunisia) has a PTA with the EU but there is

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[8] As is well known the use of (aggregate) unit-values to represent prices is not straightforward. For this analysis we have taken great care (and time) in constructing these data. First, we calculated the unit values in each import market at the 5-digit SITC level. We then examined this data both for missing values and for clearly anomalous results. Where necessary we interpolated any anomalies by taking the average unit value in any given import market at the five-digit level of aggregation. The aggregate unit values were then constructed on the basis of import weights. Hence, the formula for the relative unit value is : $RUV_j = \sum_s \frac{UV_{ijs}}{UV_{wjs}} \times \frac{X_{ijs}}{\sum_s X_{ijx}}$, where UV stands for unit value, *X* are exports, *i* is the exporting country, *j* is the importing country, *w*, represents the world, and *s* represents a given 5-digit SITC category.

no diagonal cumulation between that importing country and the exporting country (eg. Poland). Note that, when considering the role of diagonal cumulation, one is considering the relationship between three countries or country groupings: the exporting country, the importing country, and those countries forming the system of diagonal cumulation (in this case the Pan-European system). Given this three-part relationship which underlies diagonal cumulation the ROO_{ij} dummy takes a value of 1, if the importing country has a preferential trading agreement with the EU without diagonal (Pan-European) cumulated rules of origin with the exporting country, and a value of 0 otherwise. If cumulation impacts upon trade flows we would thus expect a negative sign on the rules of origin dummy variable.

The analysis is then carried out for the textile industry, ISIC (rev.3) 17 for the years 1995 and 1999, and where our estimations are based on trade flows between 37 countries - all of the EU countries, 3 EFTA countries (Iceland, Norway and Switzerland), the CEFTA countries, the Baltic States, 5 countries taking part in the Barcelona process (Turkey, Jordan, Israel, Egypt, Tunisia), as well as the US, Canada, China, Japan and Australia)[9].

Table 2.1 gives the results for four sets of regressions. In the left-hand (shaded) panel we give the results where we work with aggregate PTA, ROO and tariff matrices. In the right-hand panel we then disaggregate these into key country groupings. Consider first the left-hand panel - all our key variables have the expected sign and are statistically highly significant. The coefficients on production in the exporting country, and consumption in the importing country are positive, and the coefficient on relative prices (unit values) is negative. Similarly distance is negative, and a common language is positive and in all cases statistically significant. In aggregate we can see also that the PTA and tariff dummies have the expected sign and are highly significant. The coefficient on tariffs suggests that a 1% point increase in a tariff, reduces trade by ….? Interestingly the coefficient on quotas is positive for both years, and statistically significant for 1995. In principle one would expect quotas to restrict trade and so one might expect this coefficient to be negative. However, this will depend on a couple of factors. First, it will depend on whether the quotas materially restrict trade. It is hard to get clear information on. The available information on quota utilisation rates (in particular with regard to the EU) suggests that in many instances these are well below 100%. This suggests that quotas in place for the countries in our sample may not be restricting trade. Secondly, even if quotas do restrict trade for the countries in our sample, the quotas are in place vis-à-vis the principle textile exporting countries.

[9] Note that there are two countries 'missing' here - Bulgaria and Morocco. This arises from the lack of data in the underlying data set.

Our quota dummy is thus identifying who are the principle textile exporters, and it is not surprising then that the coefficient is positive.

Table 2.1 : Sectoral 'gravity' regression

	1995		1999		1995		1999	
Constant	-16.51	***	-17.70	***	-16.32	***	-17.86	***
Ln(Q_i)	1.30	***	1.41	***	1.29	***	1.41	***
Ln(E_j)	0.99	***	1.00	***	1.00	***	1.01	***
Ln(RUV_{ij})	-0.83	***	-0.80	***	-0.81	***	-0.79	***
Ln($Dist_{ij}$)	-1.12	***	-1.14	***	-1.15	***	-1.13	***
PTA_{ij}	0.44	***	0.29	***				
EU_{ij}					0.26	**	0.20	*
$EFTA_{ij}$					4.90	***	4.38	***
$CEFTA_{ij}$					2.18	***	0.39	
$Border_{ij}$	0.39		0.12		0.27		0.13	
$Language_{ij}$	0.66	***	0.65	***	0.64	***	0.63	***
$Quota_{ij}$	0.57	***	0.18		0.55	**	0.09	
$Tariff_{ij}$	-0.05	***	-0.06	***				
ROO_{ij}	-1.31	***	-1.66	***				
Tariff - CefBal					-0.06	***	-0.03	
Tariff - EuroMed					-0.03	***	-0.05	***
Tariff - Rest					-0.05	***	-0.07	***
ROO - CefBal					-1.54	***	-2.35	***
ROO - EuroMed					-1.94	***	-1.96	***
ROO - Rest					-0.85	***	-1.15	***

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively

If we now turn to the ROO dummies we can see that this variable is negative and statistically significant in all the estimations. The size of the coefficient rises between 1995 and 1999 for each category of trade. The percentage equivalent of these dummies can be found by taking [exp(dummy)-1]*100. Applying this suggests that in aggregate the lack of cumulation implies trade being lower by up to 73% in 1995, and 81% in 1999.

Looking at the disaggregated results once again the coefficients have the expected sign and are generally significant. If we focus on the ROO dummies, the biggest impact of the lack of cumulation in 1995 is for the EuroMed economies where the results suggest that trade with non-cumulating countries was up to 86% lower than it would otherwise have been, with a very similar figure applying in 1999. In 1999 the lack of cumulation would appear to have the biggest impact on the Cefta+Baltic countries, which also experience the biggest change in the ROO coefficient between 1995-1999. In contrast there is very little change in the EuroMed coefficient over this period. These changes are interesting and highly consistent with the changes in rules of origin

over this period. The Cefta and Baltic countries became part of the pan-European system of cumulation in 1997, and therefore one would expect a change in the coefficient as the lack of cumulation now applies to a different set of partner countries. The rise in the coefficient suggests that the lack of cumulation is more significant with regard to the CEFTA and Baltic countriess' trade with the rest of the world and the EuroMed countries, than with the EU and EFTA.. Similarly as there was no substantial changes in the rules of origin regimes facing the EuroMed countries, one would expect this coefficient to be relatively stable over time.

In Table 2.2 we provide further evidence of the possible impact of cumulation by disaggregating the ROO coefficient for each of the EuroMed countries in the model[10]. Given the relative significance and stability of the PTA and tariff coefficients, and in order to focus on the role of rules of origin we work with the aggregate coefficients for these variables. From the table we can immediately see that there are substantial differences across the countries. For 1995 the largest coefficients are for Tunisia and Turkey, and the smallest for the Rest and for Egypt (though the latter is not significant). In 1999 the biggest impact is again for Tunisia, Israel and Turkey and once again the smallest is for Egypt and the rest. A priori one would expect that the greater is the degree of trade liberalisation (eg. tariff reductions), the greater would be any constraining impact of rules of origin. This is simply because where there are high tariffs it is more likely that these will be serving to restrict trade irrespective of the rules of origin regime. This issue is explored more fully below, but the results in this table lend support to this - the largest impact on trade from lack of cumulation appears to be for those economies – Tunisia, Turkey and Israel - who have liberalised trade with the EU the most. Note, however, that there is a substantial change in the Turkish coefficient which declines from –1.85 to –1.57 from 1995-1999. Once, again this is highly consistent with the changes in the rule of origin regimes. Turkey, joined the PanEU system in 1999, and hence cumulation was then possible with the CEFTA, Baltic and EFTA countries. The decline in the coefficient would thus suggest that the lack of cumulation was more significant with regard to these countries for Turkey, than with regard to the EuroMed countries and the rest of the world.

Table 2.2: Cumulation and the EuroMed countries

	1995		1999	
Constant	-15.82	***	-17.10	***
Ln(Q_i)	1.28	***	1.39	***
Ln(E_j)	0.98	***	0.98	***
Ln(RUV_{ij})	-0.85	***	-0.81	***

[10] Note that Jordan is not included in 1999 due to lack of data.

Ln(Dist$_{ij}$)	-1.17	***	-1.16	***
PTA$_{ij}$	0.48	**	0.31	**
Border$_{ij}$	0.36		0.12	
Language$_{ij}$	0.61	***	0.61	***
Quota$_{ij}$	0.45	**	0.09	
Tariff$_{ij}$	-0.04	***	-0.05	***
ROO - CefBal	-1.48	***	-2.12	***
ROO-Turk	-1.85	***	-1.57	**
ROO-Jor	-1.12			
ROO-Is	-1.30	***	-2.18	***
ROO-Eg	-1.04		-1.47	***
ROO-Tun	-2.82	***	-2.22	***
ROO-Rest	-0.77	***	-1.13	***

We now turn to two further sets of experiments where we investigate first the interaction between tariffs and the lack of cumulation, and secondly we explore whether trade rose between those countries, which became part of the system of PanEU cumulation in 1997. The results for the former are given in the left hand (shaded) panel of table xx, and for the latter in the right-hand panel.

As previously mentioned there are likely to be important interactions between the lack of cumulation, and the impact of tariffs – the higher the tariffs the more likely it is that these are restricting trade as opposed to the lack of cumulation. In order to focus on this we divide the ROO matrix into two sub-matrices - ROO^{HIGH} and ROO^{LOW}. ROO^{HIGH} then includes all the cases where tariffs are equal to or above a certain threshold, and ROO^{LOW} all the cases where tariffs are below that threshold. However, as we do not know the appropriate level of the threshold we proceed by using an iterative procedure. The model was estimated by fixing a threshold level for different values in a range 0.5%-20% with a step size of 0.5. The threshold level selected is then the one, which provides the highest maximum log likelihood.

Table 2.3: Tariffs and Cumulation

	The interation between tariffs & Cumulation				***Trade & the 1997 PanEU entrants***			
	1995		**1999**		**1995**		**1999**	
Tariff Threshold	*8.50*		*4.50*					
Constant	-16.15	***	-17.50	***	-17.23	***	-17.37	***

Ln(Q_i)	1.30	***	1.41	***	1.29	***	1.36	***
Ln(E_i)	0.97	***	0.99	***	1.09	***	1.12	***
Ln(RUV_{ij})	-0.82	***	-0.79	***	-0.66	***	-0.69	***
Ln($Dist_{ij}$)	-1.11	***	-1.14	***	-1.25	***	-1.37	***
PTA_{ij}	0.44	***	0.29	**	0.64	***	0.37	**
$Border_{ij}$	0.43		0.10		0.04		-0.18	
$Language_{ij}$	0.60	***	0.65	***	0.73	***	0.68	***
$Quota_{ij}$	0.78	**	0.41		0.61	***	0.15	
$Tariff_{ij}$	-0.05	***	-0.06	***	-0.05	***	-0.08	***
ROO^{LOW}	-1.70	***	-2.31	***				
ROO^{HIGH}	-1.04	***	-1.41	**				
ResROO					0.06		0.46	**

The results of this are given in the left-hand panel of Table 2.3here the third row gives this tariff threshold. Hence consider the first column of results. Here we see that the threshold tariff level for 1995 is 8.5%. Where tariffs are less than this the impact of the lack of cumulation between countries is high (ROO^{LOW} = -1.7), and where tariffs are greater than or equal to this the impact of the lack of cumulation is much lower (ROO^{HIGH} = -1.04). In 1999 the threshold tariff is lower (4.5%) and the pattern of results is very similar. These results suggest that the height of the tariff does indeed significantly affect the impact of the lack of cumulation – and that the higher the tariff, the smaller the impact.

In the right hand panel of the table we explore what can be deduced by formally comparing 1995 and 1999. The introduction of the pan-European system of cumulation was introduced in 1997 and if the rules for textiles were constraining trade, than one would expect trade between the newly cumulating countries to rise. We proceed, therefore, by running a regression for each of the years, where we include a dummy variable (RESROO) for all those 1995 countries who became part of the Pan-European system in 1997[11]. The expectation therefore is that trade between these countries would thus have risen as a result of cumulation, and that the net change in this coefficient would be positive. The results show a small positive though insignificant coefficient (0.06) for 1995, and a positive significant coefficient (0.46) for 1999. This would appear to indicate clearly that trade between those countries that became part of the pan-European system of cumulation (principally the CEFTA countries and the Baltic states) rose relative to their trade with other countries between 1995-1999.

Conclusions.

This paper has addressed a key issue which is proving of increasing concern. That issue concerns the way in which rules of origin and lack of cumulation of such rules can serve to distort patterns of trade and production. Rules of origin are formulated, in principle, in the context of a process of unilateral, bilateral or multi-lateral trade liberalisation. However, as this paper has argued the extent and impact of that process of liberalisation may well be distorted or lessened by the application of rules of origin. Rules of origin are by their nature sector specific. Hence in this paper we have addressed this issue by providing prima facie time series evidence of the impact of rules of origin and their cumulation for the Pan-Europe countries after 1997. More fundamentally in this paper we have developed a framework by which the impact of lack of cumulation of rules of origin can be applied at the sectoral level. We then apply this model to the case of the textile industry which is a key industry in terms of production and employment for the EuroMed partner countries. Our empirical analysis highlights the potential impact of the lack of cumulation in the textile industry, which clearly serves to significantly restrict trade between non-cumulating countries.

[11] Note that we do not include a ROO dummy variable here. This is because the RESROO variable is a subset of the aggegate ROO dummy for 1995, but not for 1999. Including the ROO variable makes it difficult therefore to compare the coefficients across the two regressions.

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