

September 2007, draft paper, not to be cited.

**Multilateralising Regionalism:
Relaxing Rules of Origin
or
Can those PECS be flexed?**

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Paper presented at the Conference on
Multilateralising Regionalism
Sponsored and organized by WTO - HEI
Co-organized by the Centre for Economic Policy Research (CEPR)

10-12 September 2007
Geneva, Switzerland

We gratefully acknowledge funding from the UK Department of Trade and Industry for this paper, and the usual disclaimers apply: the views expressed in this paper are those of the authors and not of the DTI, and responsibility for all errors and omissions is ours. We would also like to thank Stefania Lovo for her excellent research assistance on this paper.

Abstract

In this paper we first explain why rules of origin are a necessary feature of preferential trading arrangements, but why they also serve to distort trade and can therefore be used for protectionist purposes, and why they have a powerful natural impetus towards strengthening the spaghetti bowl effect in international trade. Secondly, we then examine the impact of the relaxation of the potential constraining impact of rules of origin in the European context which was achieved through the introduction of the Pan-European Cumulation system (PECS). We provide empirical evidence at both the aggregate and sectoral level which reveals the positive impact of the relaxation of rules of origin via the introduction of “diagonal cumulation” arrangements between the EU and its’ trading partners. Thirdly, the discussion turns to a consideration of appropriate policy options designed both to minimise the spaghetti bowl effect, and to maximise the benefits from regionalism for developing countries.

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I. Introduction:

Over the last fifteen years or so the world trading system has witnessed the dramatic emergence and rise of regional or preferential trading agreements (PTAs). This appears to be a significant shift away from the principle of multilateralism upon which, since the second world war, the world trading system has been built around. There are a number of posited reasons for this emergence of regionalism but which between them suggest that liberalising trade regionally may be easier to achieve than multilaterally, and that regional agreements may be able to “reach the parts that multilateralism cannot reach” – ie that they might be able to go significantly further in key policy areas.

Two inter-related central issues arise in considering this emergence of regionalism. The first is whether it is indeed the case that for the individual countries involved that such arrangement are likely to be welfare improving. There is a long literature which shows clearly that the answer to this question is inherently ambiguous. There is also a new and emerging literature which suggests that agreements which successfully combine elements of deep integration (i.e. the parts that multilateralism struggles to reach) may be significantly more welfare enhancing. The second issue concerns the inherent compatibility or lack of it between the multilateral system and regionalism – the extent to which regional agreements are “stepping stones” towards greater multilateralism or “stumbling blocks” – where stepping stones are much more likely to yield higher welfare gains than stumbling blocks. In particular there is serious concern about the growing spaghetti bowl of criss-crossing agreements distorting trade down bilateral channels.

For reasons that will be explained below, rules of origin (ROOs) are an extremely detailed and necessary feature of *all* preferential trading agreements (except customs unions). Essentially rules of origin imply constraints on firms as to from where they can source their intermediate inputs. By impacting on firms’ choices regarding their sourcing of intermediates, rules of origin have two consequences. First, they open up the possibility for ROOs to be used for protectionist purposes, and thus they can undermine the process of regional integration they were originally intended to support. Secondly, because the ROOs are complex and specific to each given RTA/PTA they have an extremely powerful natural impetus towards strengthening the spaghetti bowl effect.

The aim of this paper is to focus on the issue of rules of origin in the multilateral context. In the first part of the paper we detail why rules of origin are necessary, the forms that they take and explain why they can undermine the process of regional integration, and their relationship to the multilateral process of trade liberalisation. In 1997 the European Union “relaxed” the application of their rules of origin with regard to a group of countries, largely those of central Europe. This provides a natural experiment which enables us to identify the impact on trade of this change in policy. The second part of the paper summarises the empirical evidence from Augier, Gasiorek and Lai-Tong (2005) which identified the impact on aggregate trade of this policy change; and then we provide new empirical evidence at the sectoral level of the impact of this policy change. In the third part of the paper we turn to a discussion of

some possible policy options designed both to minimise the spaghetti bowl effect, and to maximise the benefits of regionalism for developing countries.

II. Why do we need rules of origin?

By their very nature preferential trading agreements (PTAs) grant reductions or exemptions on tariffs on imports from the preference receiving countries. Those preferences can either derive from the formation of a free trade area, or can be granted unilaterally under schemes such as the Generalised System of Preference, Everything but Arms, or the current preferences granted by the EU to the African, Caribbean and Pacific states, or by the US to a number of African Countries under the African Growth and Opportunity Act (AGOA).

Rules of origin are then needed in order to establish whether a given good is genuinely eligible for the preferential reduction or exemption from customs duties conferred by the PTA/RTA arrangements. Suppose the preferential tariff on the export of an Ethiopian good to the EU is zero. When the good is exported to the EU, the EU needs to assure themselves that the good really does originate from Ethiopia and is not being rerouted via Ethiopia by some third country which does not have the same degree of preferences. That rerouting of goods is known as trade deflection. In order to prevent trade deflection rules, which confirm the true originating status of the good, are required.

Hence, each regional or preferential trading agreement which is signed contains a protocol or chapter to the main agreement, which identifies the criteria which confer originating status on the exported good. Those criteria are typically identified at the HS 4-digit level (and sometimes HS 6-digit) level, such that the protocols detailing the applicable rules are typically over 100 pages long, and considerably longer than the main agreement itself. Rules of origin have long been perceived as being very technical, which appears to arise largely from high level of disaggregation at which they are defined and from the criteria combinations employed.

The principal for determining originating status is that *substantial transformation* needs to have occurred. The idea here is that for a good to be treated as being, say Ethiopian, that there has to have been a sufficient amount of processing in Ethiopia. Hence for example, it would not be enough to simply import a good from China, package it up, and then try and export it as an Ethiopian good.

Typically one or more of three criteria are used in determining whether there has been substantial transformation or not:

- (a) The *change in tariff classification rule*: whether the transformation of the good results in a different tariff classification line between the inputs and the manufactured product;
- (b) The *value content rule*: whether or not the value of the imported intermediate(s) exceed(s) a certain percentage of domestic value;

(c) The *specific production process rule*: whether a particular specified production process has been employed or not.

These criteria are often given singly for a given product category, but can also be employed together. In the latter case the rules will sometimes specify an either / or choice (eg.. to be granted originating status the producer must fulfill either criteria (a) or criteria (b)), and sometimes the rules may specify that both criteria need to be met.

What is clear from the above is that the objective of rules of origin is straightforward, and that they are needed in support of any preferential trading arrangement. The rules themselves, however, are very complex, and there are three different possible criteria for determining substantial transformation. It might well be asked, why there is a need for three different criteria, and why there is not just one which is used. As always, the answer is complex, no doubt in part being driven by differing producer interests applying pressure on governments in the formulation of the rules. However, each of the criteria has their inherent advantages and disadvantages. Discussion of this is deferred to the third part of this paper when we turn to the policy options.

The impact of rules of origin on patterns of trade

As rules of origin are formulated in the context of trade liberalising preferential agreements they are therefore, in principle, intended to support a process of (regional) trade liberalisation. Nevertheless, de facto, 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. There are two principal reasons for this. The first reason concerns the administrative and bureaucratic costs and difficulties involved with administering rules of origin regimes, and the second concerns the possible trade diverting or trade suppressing properties of rules of origin.

With regard to the former for a good to be granted originating status the exporting firm needs to be able to provide detailed documentary evidence in order to obtain the relevant certification. This requires firms to operate detailed and precise records of their use of intermediate inputs as well as requiring knowledge of the certification procedures. Evidence on the administrative costs range from about 3%-7%. There is also anecdotal evidence though not much formal empirical evidence to suggest that due to reasons of both costs or simply lack of organisational capacity certification may not be acquired even where there may be eligibility. In this context it is interesting to note that, for example, in 2005, tariffs were levied on 20% of all the products which were eligible to be preferentially exported duty free to the EU by Egypt.

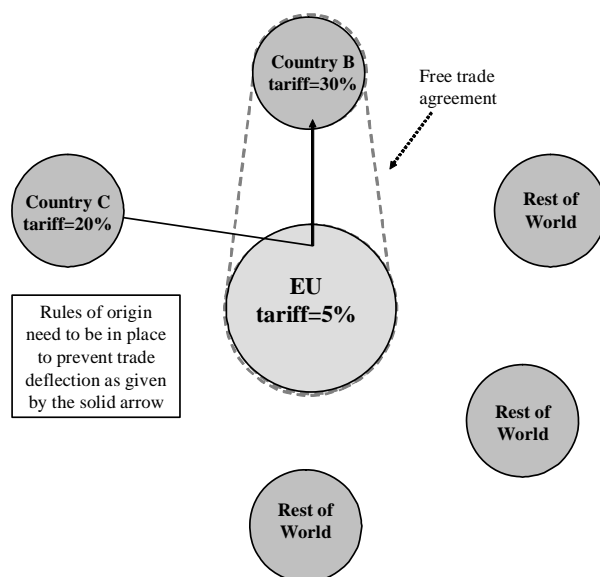
With regard to the latter the classical analysis of the impact of a preferential trading agreement focuses, of course, on the possibilities of trade creation and trade diversion. Trade creation arises when more efficiently produced imported goods from the new partner country replace less efficient domestically produced goods. Trade is “created” and yields welfare gains. Trade diversion occurs when sources of supply switch away from more efficient non-partner countries to less efficient partner countries. This arises because the less efficient partner countries have tariff free access within the

PTA and may be able therefore to undercut more efficient non-partner countries. Trade diversion therefore reduces welfare. The net welfare impact of a PTA will depend on the relative size of the two effects. These impacts arise because of the asymmetric preferences being granted to countries as part of the regional agreement.

There is a growing literature which shows that the ROOs underlying these agreements can also materially impact on trade flows - and thus can also be used for protectionist purposes. Hence in addition to the “classical” effects, there may be further significant trade diversion and/or trade suppression arising from the nature of the rules of origin, which are put in place. In effect where rules of origin are constraining or restrictive in this sense, their effect is to establish barriers to trade between the PTA countries and the non-PTA countries.

Consider the following simple characterisation as depicted in Figure 1: Suppose there are a number of countries - the EU, countries B and C and those making up the Rest of the World (ROW). In Figure 1, the EU is depicted as a hub, with trading relations with a number of spokes. Assume initially that country B exports shirts to the EU using intermediates (fabric) from country C, where the exports are subject to the EU’s tariff, set at 5%. Now, assume that the EU signs a PTA with country B with given rules of origin. Rules of origin are now necessary to ensure that country C does not export the fabric to country B but via the EU. If it could do so it would pay a 5% tariff on export to the EU, and the fabric could then be shipped on to country B with no further tariff.

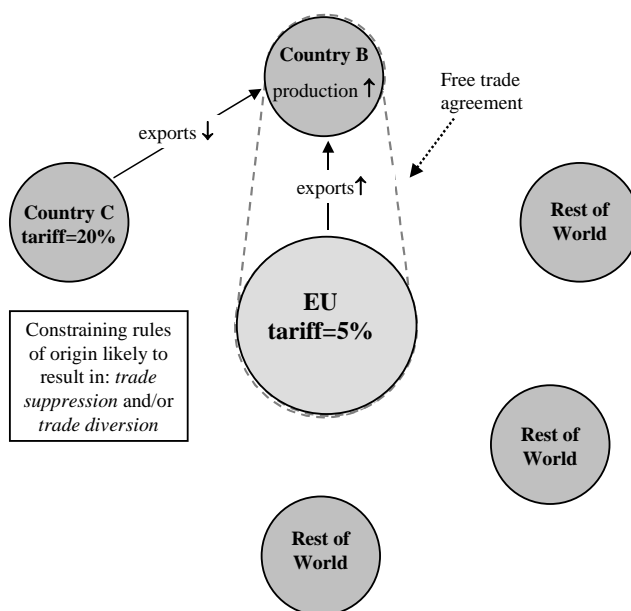
Figure 1: ROOs and Trade Deflection



Suppose now that under the rules of origin the shirt which B exports to the EU does not qualify as originating – either because the proportion of intermediates from C is too high, or because a required production process has not been utilised, or because there has not been the requisite change in the tariff heading. The producer in country B, now has a choice between (a) continuing to import the fabric from C in which case tariffs still have to be paid on export to the EU, or (b) to source the fabric from within the

FTA. Note that in the absence of the PTA with the EU, the preferred source of supply was country C, which in turn implies that country C is the more efficient supplier of fabric. The producer is therefore faced with a choice of using more expensive fabric, either locally produced (which implies trade suppression) or from the EU (which implies trade diversion) each of which is welfare reducing, and in return obtaining tariff free access to the EU; or to continue with the more efficient supplier (Country C), but then continue to face tariffs on exports to the EU. In the former case, the rules of origin have served to strengthen the bilateral trade link between country B and the EU, between the hub and the spoke, at the expense of trade between B and C - between the spokes. This is precisely the strengthening of the spaghetti bowl effect discussed earlier. In the latter case, the impact of the rules of origin is that the producer in country B is not able to take advantage of the preferences implied by the PTA.

Figure 2: The impact of constraining ROOs



The preceding highlights clearly that rules of origin are likely to either increase the exports of the intermediate from the EU to country B, or to increase the production of the intermediate within country B itself. Given that rules of origin are determined product by product at a very detailed level of disaggregation and given also their technical opacity it is then also clear that there is an incentive for firms/industries within the EU and country B to influence the underlying rule of origin in their favour (see for example, Dasgupta & Panagariya (2002), Grossman & Helpman (1995)). It is well known, for example, that in EU agreements the ROOs for textiles, and in US agreement the ROOs for textiles and automobiles are particularly restrictive and that this arose following intense lobbying from the industries themselves¹.

¹ In the context of the 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 similar rule applies with NAFTA but where instead of a double transformation rule, there is a triple transformation rule. Clearly a double or triple transformation rule is likely to offer more protection than a single transformation rule.

When are ROOs likely to matter more?

It is therefore clear that ROOs can impact on trade, and are therefore likely to be subject to protectionist pressure. If we go back to the earlier example, it is worth recalling that having signed a PTA between country B and the EU, the country B producer had a choice between increasing their costs, conforming to the rule of origin and thus obtaining improved access to the EU; or to continue sourcing the intermediate from the original supplier but in consequence not being able to take advantage of the possibility of increased access to the EU. The rule of origin does not per se force the supplier to change their source of supplier, only to change their source of supplier if it is in their interest to have originating status.

This in turn raises the question of what are the circumstances under which it is more likely that the rule of origin would tend to be constraining and have an impact on trade flows. In the first instance, given that rules of origin influence the sourcing of intermediate goods, the first order impact will be on intermediate goods trade. However, given that constraining rules of origin impact on firms' costs there will then be a second order impact on final goods trade. Bearing this in mind, there are then a number of criteria which can be identified where it is likely that rules of origin are most likely to be constraining. These are:

- The more restrictive the ROO in terms of either of the three rules identified above
- The higher the intermediate share in production
- The higher intermediate imports relative to final goods imports are in a given sector
- The higher the tariffs which would be applied if the ROO requirements for tariff free access are not met
- The lower the import tariffs between non-cumulating countries.
- The bigger the cost difference between cumulating (be this bilaterally or diagonally) and non-cumulating countries.
- The smaller the country – for small countries it may be more difficult to competitively source intermediates domestically.
- The higher the export share in the final good production
- The higher the share of exports of the final good destined for free trade area
- The greater the possibilities of sourcing substitute intermediates from within the free trade area.

Cumulation and Rules of origin in a multilateral world

Currently we have an international trading system increasingly populated with preferential trading agreements each of which require rules of origin. However, as opposed to offering the same rules to partner countries across different agreements, typically each agreement involved negotiating a distinct set of rules of origin. Hence

not only do the rules of origin for a given PTA reinforce bilateral/regional trading relationships; the lack of compatibility between the rules of origin across different PTAs makes it incredibly difficult to harmonise across agreements – a further reinforcement of the spaghetti bowl.

In the 1990s, for the EU, this issue became increasingly significant as the EU engaged in bilateral agreements with a number of countries both from Central and Eastern Europe, and with the Southern Mediterranean. It became apparent that the EU's spaghetti bowl of criss-crossing agreements was restricting firms' ability to source intermediate goods from the cheapest source. In 1997 the EU introduced a common set of rules of origin, known as the Pan-European rules of origin, which in principle the EU wished to apply in all its preferential trade agreements with former Central and Eastern European countries and with regard to EU-Southern Mediterranean trade.

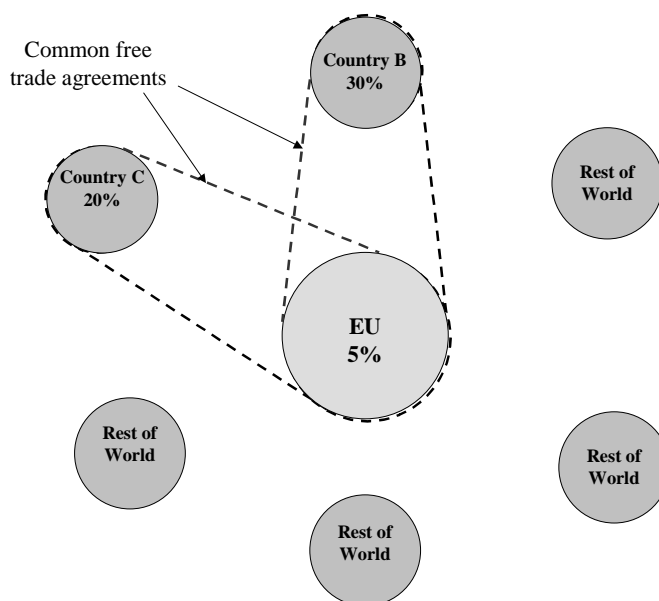
The big advantage of having a common set of rules of origin is that it is then possible to break down the barriers to spoke-spoke trade – and this can be achieved via something called *diagonal cumulation* (of rules of origin)². Diagonal cumulation was allowed for in the Pan-European rules. Essentially, ROOs typically provide some limit on the amount of intermediate inputs which a country can import from a non-PTA partner country. Diagonal cumulation makes it easier to import such goods and still satisfy the rules of origin. This is explained more fully below where we return to the example given earlier.

Suppose the EU signs two PTAs with two (sets of) countries denoted B and C. This is depicted in Figure 3 below. Shirts originating in B would have tariff free access to the EU, as would fabric originating in C. However, a shirt produced in B, using imported fabric from C, which does not meet the rules granting originating status for B's exporters to the EU, would then be subject to tariffs on exports to the EU. Hence note that the fabric directly exported from C to the EU would be granted preferential access, but a good exported from B using C's fabric would not. Such a system of bilateral hub-spoke agreements with constraining rules of origin is thus likely to greatly encourage hub-spoke trade at the expense of spoke-spoke trade.

² In principle there are three types of cumulation – bilateral, diagonal and full. These are described below:

- (i) *Bilateral cumulation*: Applies to trade between two trading partners. Bilateral cumulation means that materials originating in one country shall be considered as materials originating in the other partner country (and vice versa). All PTAs allow for bilateral cumulation;
- (ii) *Diagonal cumulation*: Applies to trade between three or more trading partners normally linked by FTAs with identical rules of origin. Under diagonal cumulation the participating countries bilaterally agree, in all the FTAs concluded among each other, that materials originating in one country shall be considered as materials originating in all the other countries. Hence, in terms of the example above suppose that the intermediate good imported by B was deemed to be originating in country C. Country B could *cumulate* its own value added with the intermediate input from C in determining originating status on the export of the final product to the EU
- (iii) *Full or total cumulation*. Again applies between three or more countries, but involving more flexibility than with diagonal cumulation. This is because it allows intermediate processing to be split in any way between all the parties to the preferential agreement provided that when added together all the materials/processing used throughout the area are sufficient to meet the origin rule. Returning again to our example used for diagonal cumulation. Suppose now that the intermediate input from country C did not qualify as originating from C. With full cumulation the producer in country B can cumulate the proportion of C's value added together with its own value added in determining originating status.

Figure 3: Hub and Spoke ROOs



An obvious way of resolving this quite arbitrary discrimination is to agree that if the fabric from country C would be granted originating status when exported to the EU, that fabric can be then used in the production of shirts in country B and the shirt will count as originating from country B, and can hence be exported to the EU duty free. Country B is thus allowed to *cumulate* its production with the intermediate input from C in determining originating status on the export of the final product to the EU. This is precisely the principle of diagonal cumulation, which is part of the Pan-European rules of origin introduced in 1997, and which we refer to in this paper as the Pan-European Cumulation system (PECS). In 2002 the EU decided to extend PECS to include the Barcelona countries, and 2003 the new protocol on rules of origin was endorsed at the Palermo trade ministerial conference³. So with respect to the EU, the picture is one of a group of EU partner countries (CEFTA, EFTA and the Baltic states) becoming part of a unified system of diagonal cumulation in 1997, and a group of other countries currently not part of the system but hoping to join in the near future⁴.

While the solution appears obvious in practice it requires certain conditions to be fulfilled in order for it to be applied. In particular in order to be able to participate in the PECS system of diagonal cumulation, the participating countries must sign free trade agreements between themselves, and those free trade agreements must be based on identically the same rules of origin as the PECS rules of origin. Hence, for country B to be able to use the fabric of country C, it must first sign an FTA with country C, and that FTA must contain the PECS rules of origin.

³ Note that in order to do so, a given Mediterranean partner is required to sign free trade agreements with all the other pan-European countries, and adopt identical (ie the pan-European) rules of origin. The recent signing of the Agadir Agreement (2004) between Jordan, Egypt, Morocco and Tunisia, has been in part stimulated by the desire to adopt the PECS, as is the case with the Morocco-Turkey FTA also signed in 2004.

⁴ With respect to non-EU preferential trading agreements diagonal cumulation is only present in the Canada-Israel agreement, and full cumulation is only present in ANZCERTA and SPARTECA. Outside of the EU therefore the norm is to allow only for bilateral cumulation

The logic behind this is quite simple, and is once again to prevent trade deflection. Assume that both countries B and C have signed an FTA with the EU, and with themselves, and all of the agreements have the PECS rules of origin. Suppose that in the PECS system in order for a fabric to be considered as being originating the producer must use domestic yarn. Hence, if country B imports fabric from country C which is produced using country C yarn, then the good is treated as originating in country C. Country B can then use that fabric in the production of shirts which are then exported to the EU duty free. If country C had used yarn from the rest of the world then the fabric would not have been considered as originating from country C; if the country B producer had then used that fabric to produce shirts, the shirts would not have been considered as originating in country B, and thus tariffs would be payable on exports to the EU.

Alternatively, now suppose that the FTA between country B and C applies different rules of origin such that country B considers the fabric to be originating from country C even though the yarn comes from the rest of the world – on the basis that country C has, for example, used a particular production process. If country C exported the fabric directly to the EU it would not be originating and hence tariffs would be payable. However, if country C exported the fabric to country B, then country B would accept the good as originating, and could then try and export the shirt as an originating shirt to the EU without paying tariffs. Clearly this would not make sense, as we now have a situation where the intermediate when exported directly pays a tariff, but when used in another country's production process does not. Trade in fabrics is here being deflected to the EU, via country B.

In order to be applicable, therefore, diagonal cumulation, requires that all participating countries sign free trade agreements, and that those free trade agreements contain identical rules of origin. Under those circumstances, diagonal cumulation encourages the use of materials and processing within the preferential area(s) while maintaining a common standard for treating third country non-preferential inputs. It therefore gives countries a wider choice of suppliers – all those participating in the system of diagonal cumulation - from whom intermediates can be sourced.

If a system of diagonal cumulation is then introduced, then once again returning to our earlier example, there are a number of possible effects which can be identified, and which are summarised in Figure 4:

Spoke-spoke trade: (eg. between countries B and C). Here there is likely to be a combination of *trade creation* and *trade reorientation*. The former occurs as eg. country B is now able to source more intermediates from country C instead of supplying the good itself domestically. This reverses the trade suppression caused by the original ROO. The latter occurs as country B switches its supply of fabric away from the EU and towards country C. This reverses some of the trade diversion arising from the original ROO. Given the original impact of the constraining ROO, this is likely to be the most significant direct effect.

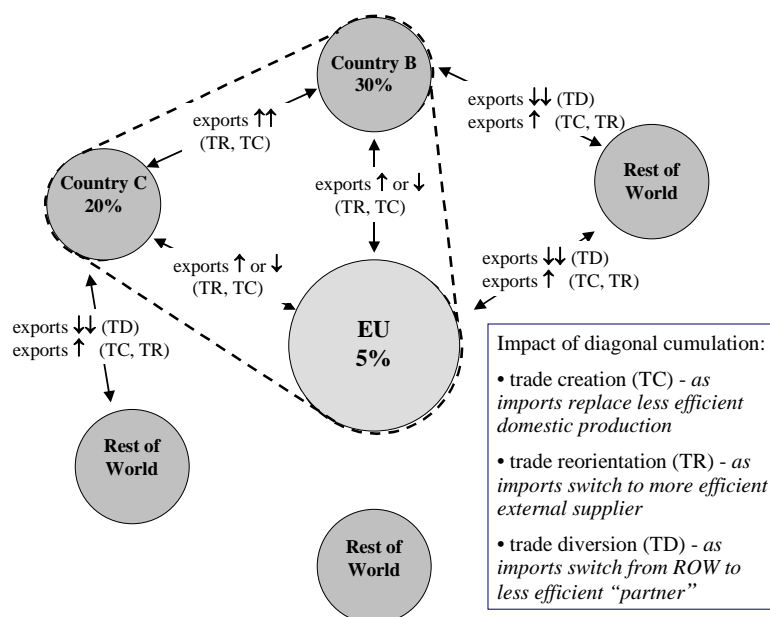
Hub-Spoke trade: Here it is important to distinguish between flows from the hub to the spoke, and from the spoke to the hub. With regard to the former, to the extent that country B reorients its' sourcing of fabric away from the EU to country C, then there

would be a negative impact on hub-spoke trade. With regard to the latter, it is possible that the EU could be reorienting its sourcing of intermediates towards country B for final goods destined for country C. Hence there could be some increase of spoke-hub trade flows.

Spoke-ROW trade: Here there are two possible effects. First, there may be trade diversion as country B chooses to import more from country C as opposed to from the ROW. The reason for so doing is that the country C intermediate inputs can be cumulated whilst, the ROW inputs cannot. Secondly, to the extent that country B increases the proportion of fabrics imported from country C, this may also enable it to import more intermediates from the ROW while still being granted originating status on export to the EU. If those imports replace more expensive partner country (eg. EU) imports then we have trade reorientation, if they replace domestic production then we have trade creation.

Hub-ROW trade: This case is analogous to spoke-ROW trade discussed above. There could be some trade diversion away from EU imports from the ROW if the EU switches to spoke suppliers. However, there could also be some trade creation or trade reorientation.

Figure 4: The impact of cumulation



III. The evidence on cumulation and rules of origin

The preceding discussion has shown that rules of origin are likely to materially impact on trade flows, and that allowing for diagonal cumulation is in turn likely to partially offset that impact. Empirically, it is extremely hard to obtain unambiguous results on the constraining or distortionary nature of rules of origin, and this is principally because rules of origin are de jure instigated at the same time as the very processes of regional integration they are designed to “support” and therefore it is extremely hard to disentangle the different effects.⁵

The introduction of the Pan-European system in 1997 gives us a natural experiment, which enables to directly focus on the possible impact of rules of origin. In Augier, Gasiorek and Lai-Tong (2005) we used this natural experiment in order empirically estimate the impact of the introduction of the PECS. The empirical methodology we employed was based on the gravity modelling framework where we took five years worth of data and examine the impact of the introduction of the PECS on the newly cumulating countries over time. The trade flows we focussed on were total trade in goods, trade in intermediate goods, and trade in manufactured goods. The results suggested that the introduction of cumulation served to increase trade between spokes by between 7% - 22%, and that trade was potentially lower between those countries which were not part of the PECS system by up to 70%.

For this paper we have undertaken an analogous analysis but this time estimating the impact of the PECS system at the sectoral level, and once again using the gravity modelling framework. In its' simplest forms the principle underlying the gravity methodology is that bilateral trade flows are a function of: the level of economic activity in both the exporting and the importing country, and trade costs between the two countries. Hence the larger is the exporting country the more it is likely to export. Similarly the larger is the importing country the more it is likely to import. Clearly

⁵ Many studies either cite Herin (1986) who calculated that MFN tariffs were paid on 21.5% of EFTA's imports from the EC, and 27.6% of EC imports from EFTA because of the failure to meet the origin requirements, or give anecdotal evidence. More recently there have been studies by Estevadeordal (1995), and Estevadeordal & Suominen (2002), Mattoo et.al. (2002), Brenton & Machin (2002), Gasiorek et.al. (2002), Augier, Gasiorek & Laitong (2004, 2005), Cadot, Estevadeordal & Susa-Eisenmann (2003), Flatters & Kirk (2003). In the context of the NAFTA agreement, Estevadeordal (1995) shows that ROOs tend to be more restrictive the greater the difference between US and Mexican tariffs; and that there is a strong correlation between restrictive ROOs and those sectors with long phase-out periods for tariff liberalisation. The conclusion therefore is that restrictive ROOs tend to be more prevalent in those industries which also seek greater tariff protection. Cadot et al (2003), also in the context of US-Mexico trade, show that rules of origin have a negative impact on the volume of preferential trade. Mattoo et.al. assessed the African Growth and Opportunity Acts and suggest that the benefits to Africa would have been approximately five times greater without the restrictive rules of origin that were in place (in particular with regard to yarn). Flatters & Kirk (2003) argue that the SADC rules of origin were heavily influenced by highly protectionist domestic industries, and then illustrate this with detailed examples from a number of sectors. Brenton and Machin (2002) show that with respect to the Baltic states exports to the EU tariffs are in reality paid on a substantial proportion of supposedly tariff-free GSP imports. They argue that a significant part of the explanation for this derives from the restrictive rules of origin applied by the EU. In a similar vein, 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 suggests that even where there are GSP preferences developing countries appear to have difficulties in actually realising tariff free access to developed country markets, and that a key explanatory factor lies with ROOs. Gasiorek et.al (2002) use a variety of methodologies (interviews, descriptive statistics, econometric modelling, CGE modelling) to assess the possible impact of the *cumulation* of rules of origin for the Barcelona group of countries. This work is then taken forward in Augier et. al. (2004,2005) where the impact of rules of origin and their cumulation is analysed in the context of a gravity modelling framework at both the aggregate and the sectoral level. The result suggest that rules of origin do indeed serve to restrict trade flows between countries and that trade between non-cumulating countries could be lower of the order of 50%-70%. They also identified that the introduction of the pan-European system of cumulation impacted positively on trade flows increasing them between partner countries by up to 22%.

those flows will also be affected by trade costs – be these tariffs, quotas or distance between the countries.

The resulting equation which is then estimated typically describes bilateral aggregate trade flows between two countries, i and j , as a function of: the levels of GDP in countries i and j , and the distance and/or trade costs between i and j . Typically, the standard model is then augmented in one or more of several ways. As well as using GDP to capture activity levels, usually the respective populations of countries i and j are included. This serves to capture not simply economic size, but also per capita income levels. Gravity models are usually also supplemented 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 (eg. regional trading arrangements), or dummies to capture cultural affinities between countries such as a common language. In our work we have added a further dummy variable to the standard gravity model in order to evaluate the potential impact of the cumulation of rules of origin. The aim here is to explore whether the introduction of cumulation arrangements served to increase trade flows between the newly cumulating countries.⁶

It is important to note that when dealing with aggregate trade flows the appropriate activity variables to include are the respective GDPs and populations of both the importing and the exporting country. This is no longer the case when dealing with sectoral regressions. As shown in Augier and Gasiorek (2005a), the appropriate activity variables at the sectoral level are production in the exporting country and consumption (production + imports – exports) in the importing country. In order to do this it is necessary to reconcile trade and production data at the appropriate sectoral level. Here we have taken the production data as reported by UNIDO, which as at the 3-digit ISIC rev.2 level, and reconciled this with trade data obtained from COMTRADE. However, although both sets of data in principle come at the ISIC level it is important to note that the underlying basis of trade and production data is somewhat different. The consequence of this is that it can be problematic to obtain coherent and consistent trade and production data at the sectoral level. For example, there are cases where domestic consumption which we define as production + imports – exports appears negative. Considerable effort has been undertaken therefore to ensure that the data is as consistent and coherent as possible in order to avoid these sorts of anomalies. Nevertheless, in recognition of the problem, in our regressions we have run two types of models. First we run the regressions where we use production and consumption of the exporting and importing country respectively. Secondly, we run a second set of regressions where we use the production of the exporting country and the GDP and population of the importing country as our activity variables.

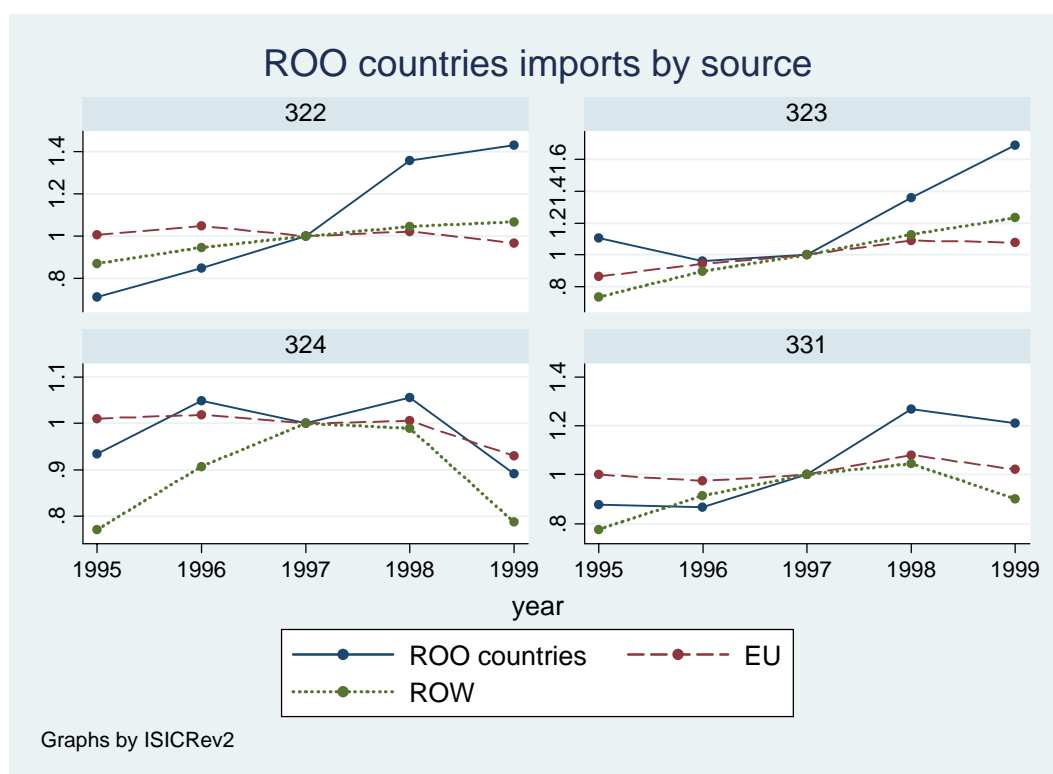
Panel Estimation: difference in difference

The statistical analysis we use to establish a lower bound on the impact of ROOs is a technique called difference-in-difference analysis. This compares the behaviour of two groups of bilateral trade flows. The ‘treatment’ group includes all the bilateral trade flows that should have been boosted by the PECS. The ‘control’ group is made

⁶ It is worth noting that Estevadeordal & Suominen (2004) also use a gravity model in their estimates of the impact of rules of origin. Unlike our work however, they construct a restrictiveness index which ranges between 1-7 designed to capture differing degrees of restrictiveness across a range of different PTA. Their results also suggest that rules of origin restrict trade flows.

up of the bilateral trade flows that should not have been affected by the PECS. In essence, the procedure is to compare how much treatment-group trade flows rose as a result of cumulation (this is the first difference) and compare this with the change in flows for the control group (the second difference) - hence the term difference-in-differences.

Consider the graphs below. Here we are plotting the imports relative to imports in 1997 between those countries which could have been directly affected by the cumulation of rules of origin, and their imports from other sources. We do this for four sample industries. If the cumulation of rules of origin indeed had an impact than we would expect trade between newly cumulating countries to rise by more that trade between these countries and third countries. The graph is quite striking as it suggest that in at least 3 cases – 322, 323, and 331 that there was indeed a difference in the evolution of trade between the newly cumulating countries.



Of course, the introduction of cumulation was not the only thing that changed between the pre-1997 and post-1997 periods, hence we use the gravity model to control for other factors. Additionally, we control for all sorts of unobservable pair-specific factors (e.g. historical ties, business networks, etc.) by employing a statistical technique called fixed effects at the country-pair level. We also hope that this goes some way to correcting for the issue of reverse-causality (namely, the idea that membership in PECS may have been more likely for nations with high spoke-spoke trade flows, so trade is influencing PECS membership rather than vice versa).

Our statistical method therefore compares the change in trade flows for the treatment group – ie those countries where spoke-spoke trade is most likely to be affected; with the change in trade flows for a control group – ie those countries where we would not expect cumulation to impact on trade flows. There are different ways in which the

control group can be defined, and hence we explore the sensitivity of the results to three difference control groups.

The first group comprises all bilateral trade flows in our sample that are not in the treatment group. Note that this includes exports by the rest of the world (RW) to the spokes, as well as trade between PECS and non-PECS spokes (e.g. between Morocco and Poland). As discussed earlier in the context of the impact on RW-Spoke trade, the net effect on these flows of improved cumulation arrangements is ambiguous due to secondary effects, it is possible that these flows are indirectly affected by the PECS and so should not be viewed as proper controls.

To deal with this, we set up a second, more narrowly defined control group by taking out these bilateral trade flows. This second control group almost certainly captures the impact of cumulation more accurately. Finally, it is also possible that cumulation may have impacted upon sales from the EU (the hub) to the spokes, again due to secondary effects. To address this possibility, we created a third, even narrower control group that excludes all Hub-Spoke flows as well as all RW-to-Spokes flows. Thus it includes only intra-EU flows, intra-RW flows and flows between the EU and the rest of the world. As with the second control group, this is more likely to correctly capture the impact of cumulation on intra-Spoke trade – which is precisely where the theory predicts the most unambiguous results. The three sets of regressions are respectively labelled Control 1, Control 2, and Control 3 in Table 2 below.

Data sample. Our estimations are based on trade flows between 38 countries - all of the EU countries, 3 EFTA countries (Iceland, Norway and Switzerland), the CEFTA countries, the Baltic States, 6 countries taking part in the Barcelona process (Turkey, Jordan, Israel, Egypt, Tunisia, Morocco), as well as the US, Canada, China, Japan and Australia. The regressions were carried out using total trade, manufacturing trade, and intermediate goods trade for the years 1995-1999. For full details concerning the data please contact the authors.

Results:

The results can be seen in Tables 1 and 2, where we report only the coefficient on the rules of origin variable which most directly identifies the impact of cumulation on spoke-spoke trade. Recall that earlier we discussed that we run two variants of the model – one where the activity variables are production and consumption of the exporting and importing country respectively (we call this experiment 1), and one where the activity variables are given by production in the exporting country, and GDP and population of the importing country (which we call experiment 2). Hence Tables 1 and 2 give the results by sector for experiments 1 and 2 respectively.

If we look at Table 1, we see the results for each industry and across the three different control groups. There are 28 industries for which we have run the regressions and the coefficient is positive in 13-18 cases across the control groups. The industries where the coefficient is consistently positive are: Food manufacturing, Textiles, Wearing Apparel, Leather and Products of Leather, Furniture, Other Chemical Products, Rubber products, Plastic Products, Non-ferrous Metal Basic Industries, Fabricated Metal Products, Electrical Machinery, and Transport Equipment. The percentage equivalent of these dummies can be found by taking

$[\exp(\text{dummy})-1]*100$. Applying this suggests that cumulation served to increase trade by between 14% - 72% across the different industries and control groups. The biggest impact of cumulation is on Wearing Apparel, Leather Products, Fabricated Metal Products, and Electrical Machinery.

Table 1: ROO dummy by industry – Experiment 1

ISIC	Industry	Control 1	Control 2	Control 3
311	Food manufacturing	0.315***	0.381***	0.330***
313	Beverage industries	0.013	0.059	0.007
314	Tobacco	0.380	0.418	0.483
321	Textiles	0.389***	0.377***	0.348***
322	Wearing apparel, except footwear	0.482***	0.500***	0.443***
323	Leather and products of leather,	0.454***	0.461***	0.545***
324	Footwear	0.132	0.135	0.158
331	Wood and wood and cork products	0.190	0.203*	0.217**
332	Furniture and fixtures, except prim	0.213*	0.224**	0.244***
341	Paper and paper products	-0.010	0.040	0.143
342	Printing, publishing	0.052	0.072	0.110
351	Industrial chemicals	0.039	0.066	0.064
352	Other chemical products	0.267***	0.257***	0.273***
353	Petroleum refineries	0.104	0.127	0.136
355	Rubber products	0.263**	0.305***	0.405***
356	Plastic products	0.360***	0.393***	0.349***
361	Pottery, china and earthenware	0.035	0.040	0.211*
362	Glass and glass products	0.222*	0.243**	0.152
369	Non-metallic mineral products	-0.048	-0.040	0.030
371	Iron and steel basic industries	0.204	0.160	0.354***
372	Non-ferrous metal basic industries	0.258*	0.274**	0.360***
381	Fabricated metal products	0.434***	0.465***	0.471***
382	Machinery except electrical	0.037	0.021	0.031
383	Electrical machinery apparatus	0.481***	0.470***	0.522***
384	Transport equipment	0.434***	0.441***	0.449***
385	Professional and scientific	0.108	0.111	0.133*
390	Other manufacturing	0.125	0.137	0.177**

It is also important to note, that a priori one would not expect ROOs to be constraining in all sectors, and we should not therefore expect a positive coefficient for all sectors. Consider an industry where the EU's MFN tariff rates is zero – there is then no need for a rule of origin (as there is no “penalty” for failing to meet that rule), and hence one would not expect the ROO to be then constraining. By extension therefore where EU MFN tariffs are “low” one would expect the impact of cumulation to be lower. This issue is taken up again below.

In Table 2 we give the results for experiment 2. Here we are again reporting on the ROO dummy, but this time where the activity variables are production in the exporting country, and GDP and population in the importing country. Once again we see that there are 10-17 industries across the different control groups which consistently show a positive impact on trade arising from improved cumulation arrangements with the EU. The increase in trade arising from cumulation ranges from

just over 26% (for Fabricated Metal Products), to just over 70% (for Leather Products). Across the two sets of experiments it is the same industries which show an impact of cumulation. What we see therefore is that there is clear evidence that cumulation has materially impacted on trade flows, and that therefore the underlying rules of origin were restricting trade between the newly cumulating countries.

Table 2: ROO dummy by industry – Experiment 2

ISIC	Industry	Control 1	Control 2	Control 3
311	Food manufacturing	0.345***	0.381***	0.307***
313	Beverage industries	-0.070	-0.046	-0.078
314	Tobacco	0.159	0.162	0.177
321	Textiles	0.380***	0.408***	0.389***
322	Wearing apparel, except footwear	0.478***	0.480***	0.488***
323	Leather and products of leather,	0.444***	0.445***	0.532***
324	Footwear	0.183	0.171	0.174*
331	Wood and wood and cork products	0.079	0.102	0.204**
332	Furniture and fixtures, except prim	0.128	0.140	0.222**
341	Paper and paper products	-0.099	-0.050	0.138
342	Printing, publishing	0.063	0.111	0.175**
351	Industrial chemicals	0.006	0.024	0.057
352	Other chemical products	0.256***	0.290***	0.329***
353	Petroleum refineries	0.134	0.171	0.225
355	Rubber products	0.274**	0.287***	0.430***
356	Plastic products	0.236**	0.247***	0.304***
361	Pottery, china and earthenware	0.070	0.056	0.187*
362	Glass and glass products	0.077	0.090	0.102
369	Non-metallic mineral products	-0.102	-0.104	0.012
371	Iron and steel basic industries	0.109	0.056	0.282**
372	Non-ferrous metal basic industries	0.201	0.194	0.295**
381	Fabricated metal products	0.233**	0.254***	0.314***
382	Machinery except electrical	0.019	0.021	0.080
383	Electrical machinery apparatus	0.298***	0.320***	0.428***
384	Transport equipment	0.432***	0.418***	0.490***
385	Professional and scientific	0.092	0.078	0.129
390	Other manufacturing	0.016	0.051	0.120

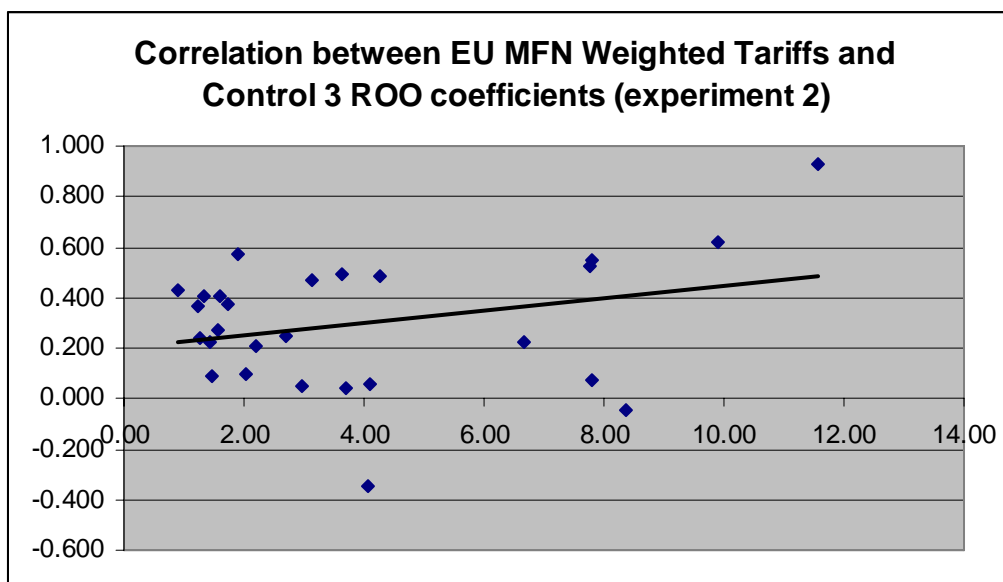
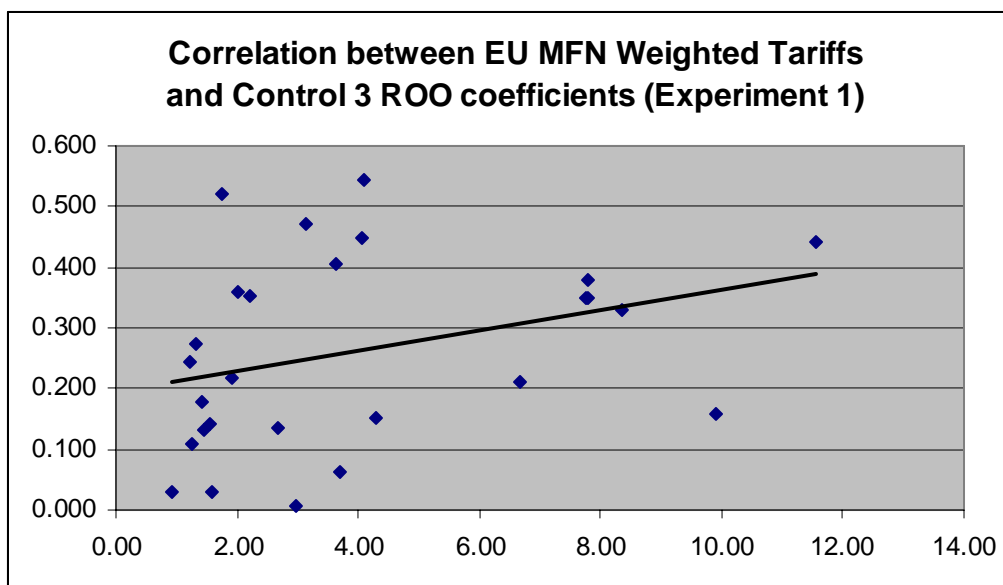
Identifying when cumulation is likely to matter

As already discussed earlier, a key criterion relates to the “penalty” that is incurred if the ROO is not met. That penalty is the underlying EU MFN tariff for each industry. Those tariffs for 2000 – both unweighted and weighted are given in Table 5 below.

Table 3: EU MFN Tariffs, 2000

ISIC	Industry	Unweighted	Weighted
311	Food manufacturing	8.36	8.36
313	Beverage industries	4.40	2.97
314	Tobacco	7.51	7.79
321	Textiles	11.25	11.56
322	Wearing apparel, except footwear	2.97	4.09
323	Leather and products of leather,	9.32	9.90
324	Footwear	2.91	1.91
331	Wood and wood and cork products	1.78	1.22
332	Furniture and fixtures, except prim	3.17	1.56
341	Paper and paper products	2.25	1.26
342	Printing, publishing	4.54	3.69
351	Industrial chemicals	2.78	1.33
352	Other chemical products	1.53	2.69
353	Petroleum refineries	3.16	3.16
354	Misc products of petroleum	3.47	3.62
355	Rubber products	7.98	7.77
356	Plastic products	6.07	6.68
361	Pottery, china and earthenware	4.48	4.28
362	Glass and glass products	1.82	1.59
369	Non-metallic mineral products	2.26	2.21
371	Iron and steel basic industries	2.70	2.02
372	Non-ferrous metal basic industries	3.12	3.14
381	Fabricated metal products	1.71	0.91
382	Machinery except electrical	2.47	1.74
383	Electrical machinery apparatus	3.99	4.06
384	Transport equipment	2.44	1.46
385	Professional and scientific	2.82	1.42

In order to explore whether there is any prima-facie evidence that the industries with higher MFN tariffs have a larger impact on cumulation we have done some simple scatter plots (together with a trend line), where we are correlating the EU simple MFN tariff with ROO dummies (Control 3), for both sets of experiments. These scatter plots can be seen the figures below. From the figures it can be clearly seen that there does appear to be a positive relationship between the height of the EU tariff, and the underlying effective degree of restrictiveness of the rule of origin.



IV. Minimising the negative impact of rules of origin

It is worth recalling that rules of origin are a necessary feature of preferential trading arrangements and are, in principle, there in order to support the process of greater regional integration. However, there are two interrelated fundamental problems, which they engender. The first, is that constraining rules of origin are likely to distort trade in addition to the classic trade creating and trade diverting impact of a given process of regional integration. Secondly, because the rules are specific to each preferential trading arrangement they contribute very strongly to the spaghetti bowl effect – encouraging trade between partner countries, at the expense of non-partner countries. In other words rules of origin are likely to contribute to regional trading arrangements as stumbling blocks as opposed to stepping stones towards multilateral liberalisation.

Are there therefore ways of minimising the potential negative impact of rules of origin – in terms of their potential distortionary impact, and in terms of their

reinforcing of the spaghetti bowl effect. In terms of the former, one way of approaching this question is to consider the relative merits and demerits of the underlying rules themselves – the change in tariff classification rule, the value content rule, and the specific production processes rule. For any given regional trading arrangement this is an important issue, and we discuss this below, however it does not really address the question of regional trading arrangements reinforcing the spaghetti bowl effect. In order to address this question one needs to consider whether there are ways in which rules of origin can be formulated which do not provide additional or unnecessary obstacles to inter-regional trade flows, ways in which the stumbling blocks can be removed. In the context of this paper the question here is the extent to which cumulation can be multilateralised or not. We first turn to a brief consideration of ways in which rules of origin and their application could be relaxed, then to the issue of multilateralising cumulation.

Simplifying or relaxing rules of origin

In considering the possibilities for simplifying rules of origin, a key issue which arises concerns the advantages and disadvantages of the three principal criteria for determining origin, and therefore whether a change of criteria might reduce the distortionary impact. There are a number of issues here which are typically raised in the literature:

- **Tariff-classification rule:** The advantages of the tariff classification rule are that it is seen as transparent, predictable and has supposedly lower administrative costs associated with it. However, on the other hand tariff schedules were not designed in order to determine issues of origin, and goods can undergo substantial transformation, in particular in processing and assembly operations, yet remain in the same tariff heading. This can be particularly true as production processes and the development of new products change more rapidly than the updating of tariff schedules.
- **The value-content rule** essentially specifies a minimum amount of domestic value added that is required in order to assure that substantial transformation has taken place. By focussing on the proportion of domestic value added (which may vary across industries) the value-content rule avoids some of the arbitrariness inherent in the tariff classification rule. Critics of the value added rule point to difficult and complex accounting procedures required to prove origin, which make the system more costly; that it may discourage local final goods producers from reducing their costs as this then raises the proportion of (imported) intermediate inputs; and the uncertainty, which can be generated by changes in input costs and exchange rate changes.
- **Under the specific-production processes rule** the rules of origin are determined in terms of specific industrial operations, and this is sometimes referred to as a “technical test” for proof of originating status. Again, this criterion is relatively transparent and predictable, however has the potential disadvantage of obsolescence – as developments in production techniques overtake the specified rules.

Hence the tariff classification and specific production processes rules have the advantage of greater transparency, and are probably less costly to implement.

However, they do have some major drawbacks. Clearly the specific production processes rule is not one which can be widely applied across a range of industries primarily on the grounds of obsolescence, and the complications of detailing all possible acceptable production processes. A major drawback of the tariff classification rule is the oft-mentioned one that tariff schedules were not designed with origin issues in mind.

However, more importantly the change of tariff classification rule is hard to implement where there are more complex production processes, involving more than one imported intermediate input. Suppose a given firm imports two intermediates one which meets the change in tariff classification rule and the other does not. It would clearly not be sensible to have a rule that states that all intermediates need to meet the rule, as the contribution of the intermediate not meeting the rule to the production process could be very small. Equally it would not be sensible to have a rule which simply stated that just one of the imported intermediates needed to meet the rule. Hence, one then needs another criteria, such as the value added rule, to be applied in these more complex cases. Hence the tariff jumping rule is not well suited for more complex production systems.

The potential big disadvantage of the value added rule is the higher costs typically associated with it. However, there in addition to the rule avoiding the problem of arbitrariness, there is another important advantage: In principle the value-content thresholds can be varied and hence are negotiable. In the same way that successive tariff cutting rounds have reduced tariffs, with a value-content rule it is possible to negotiate over the thresholds. This is typically not possible with the change of tariff classification rule, or the specific production processes rule. It is also the case that if the value content rule were applied more widely, this opens the possibility of multilateralising cumulation, and this is discussed more fully below.

Finally, there is another simplification of the application of rules of origin which it is important to mention. Where the partner country (eg. Nigeria) has a lower import tariff than e.g. the EU's MFN tariff, than ROOs are necessary to prevent trade deflection. Logically therefore, if the partner country tariffs are higher than the EU tariffs, then there is no incentive for trade deflection and therefore no need to apply rules of origin. Hence, trade deflection only matters when the tariff levied by the preference receiving countries is lower than the tariff of the partner country. Hence, one simplification is that wherever the preference receiving country has a higher tariff on the intermediates used in the production of the exported good, there should be no need to prove originating status, and hence ROOs should not even be an issue. Note that in practice for most developed countries signing agreements with developed countries it will usually be the developing country with the higher tariff. Hence applying this principle could potentially be a major step towards making rules of origin more "development friendly". Of course the developing country may still be concerned about the ROO as applied to imports from the developed country. However, such asymmetry should not be too problematic as the developed country firms should be able to meet the administrative burden of ROOs more easily than developing countries.

The point is that trade deflection only matters, therefore, when the tariff levied by the preference receiving countries is lower than the tariff of the EU. How frequently is

this the case? Across 31 developing countries, and 88 4-digit HS trade categories which comprise the countries' principal exports to the EU, the table shows the frequency with which the partner country tariff is greater than that of the EU. The table shows that in low and lower middle income countries there are a large number of cases where this is the case and where suspension of the origin rules could make a substantial difference.

Table 4. Incidence of tariff greater than the EU tariff⁷

	Low income	Lower-middle income	Middle and high income	Total
Fruit and vegetables	7	16	13	36
Chocolate	0	3	1	4
Plastics	12	10	11	33
Hides, leather & articles	0	14	27	41
Wood & articles	4	13	21	38
Basketware	1	1	7	9
Paper articles	4	6	4	14
Textiles	12	36	33	81
Clothing	37	87	207	331
Footwear	11	15	13	39
Porcelain	2	5	3	10
Jewellery	1	3	6	10
Metalware	5	15	13	33
Machinery	16	23	18	57
Vehicles	2	4	1	7
Furniture	4	8	13	25
Lights	3	8	15	26
Leisure goods	3	4	8	15

Multilateralising cumulation?

The main issue/distortion for the multilateral system arising from ROOs is that they serve to strengthen the spaghetti bowl effect and make it very inflexible. The evidence from this paper on PECS is that cumulation can potentially make a big difference (ie in relaxing the constraints). The question then is, how easy is it to generalise this across different regional trading arrangements. The short answer to that is that trying to multilateralise cumulation, *under current arrangements* would be extremely difficult. The reason for this is quite simple: Diagonal cumulation as applied in the PECS is only possible if the regional trading agreements have identical rules of origin. Hence, in the Pan-European context it was conceivable that the Central and Eastern European countries, and the countries of North Africa would agree to have the same rules of origin in their agreements with the EU and with themselves. However, it is hard to imagine, for example, the US in their agreements and the EU in their agreements, using the same rules of origin.

There is, however, an alternative solution, which is still difficult but more feasible - and involve three stages: first switching to using the value added rule in rules of origin; secondly introducing “full” as opposed to diagonal cumulation (see footnote 2); and thirdly allowing for the possibility of “value-added tariffs”. Cumulation would then possible even if countries had different underlying value-added ROOs.

⁷ Table taken from Gasiorek and Stevens (2006)

1. Switch to a value-added rule.
2. The use of a value-added tariff rule in determining tariffs, if any, to be levied. This is a proposal first made by Lloyd (1993). The principle is that the tariff is levied in proportion to the amount of non-originating inputs. For example suppose the EU signs a PTA with country B, where country B used non-originating intermediates which comprised 60% of the final price of the good. The good would thus be subject to the export tariff (on the final good) weighted by the 60% share of non-originating intermediates. Hence if the tariff were 10%, the tariff levied would be 6%. In the original Lloyd formulation tariffs would be paid on any portion of the non-originating intermediate inputs. However, this rule could easily be combined with a minimum value-added rule, which confers originating status. Failure to meet the minimum originating requirement would no longer result in such a binary penalty system, thus giving producers greater incentive to source their intermediates from the cheapest suppliers.
3. The introduction of full as opposed to diagonal cumulation. With diagonal cumulation countries are required to have identical rules of origin and identical PTAs. This does not apply to full cumulation with the application of a value-added tariff. It is entirely possible for countries B and C to have a different minimum value content rule, which confers originating status, to that between either B or C and the EU. Ultimately, whether a tariff or not is levied on export to the EU will depend on the relevant proportions of value added from the different suppliers.

The proposal outlined here would be transparent, flexible and negotiable. Importantly it would both minimise the distortionary impact of ROOs as well as deal with the multilateral problems arising from the increasingly overlapping nature of regional trade agreements. This would seem to be the most effective, if not the only, way of multilateralising cumulation and hence multilateralising regionalism.

V. Conclusions

In this paper we have outlined the ways in which rules of origin can constrain firms' choices with regard to the sourcing of intermediate inputs and hence can serve to distort trade. The paper has also provided empirical evidence at the sectoral level of that distortionary impact. Hence both formal empirical evidence as well as anecdotal evidence strongly suggests that rules of origin materially impact on trade flows. In so doing it is also clear that they are key component of the spaghetti bowl phenomenon which makes it less likely for countries which are not party to the same trade agreement to trade with each other. If agreement could be reached on identical rules of origin across trade agreements than diagonal cumulation could be used to relax the constraining impact of those ROOs – however only within the countries, which are party to those trade agreements. This is unlikely to happen. A better alternative is to switch to the more widespread use of the value added rule, to introduce the application of value-added tariffs, and to allow for full cumulation. We argue that this would go a long way to reducing the spaghetti bowl phenomenon.

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