Why OECD Countries should Reform Rules of Origin

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By

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Abstract

With preferential trading Agreements (PTAs) on the rise worldwide with multiple memberships, rules of origin-- which are necessary to prevent trade deflection --are attracting increasing attention. At the same time, preference erosion for GSP recipients is threatening the viability of the further multilateral negotiations. Drawing on different approaches, we show that the current system of rules of origin (RoO) in place for EU and US preferential trade agreements (including the GSP) which are representative of RoO practiced by OECD countries should be drastically simplified if developed countries really want to help developing countries integrate into the World Trading System. Besides diverting resources for administration, RoO regimes of the EU and US carry significant compliance costs. More fundamentally, it is becoming increasingly clear that RoO have often been designed to force the Southern partner to buy inefficient intermediate products from the Northern partner (the so-called 'double transformation rule' in textiles & apparel (T&A) is such an example) to 'pay for' preferential access for the final product. Evidence is also indicating that a significant fraction of the remaining rents (after accounting for increasing costs to comply with RoO requirements) associated with market access are largely captured by the Northern partner. Finally, we report evidence that the restrictiveness of RoO is beyond levels that would be justified to prevent trade deflection implying capture by special interest groups. The paper concludes by outlining alternative paths to reforms.

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1. Introduction

Rules of Origin (RoO) are an integral part of the proliferating Free Trade Areas (FTAs) –of which, according to a recent tally by the World Bank (2005, table 2.1) each country had an average of six– and non-reciprocal Preferential Trading Arrangement (PTAs) such as the Generalized System of Preferences (GSP).[1] Given the lack of progress on harmonization at the WTO and given that regionalism is here to stay, RoO are likely to be of increasing importance in the world trading system.

The primary justification of RoO in PTAs is to prevent "trade deflection", by which is meant that countries with low external tariffs or weak customs monitoring capacities could act as ports of entry for imports destined to more protected markets in the bloc (possibly after superficial conditioning or assembly). Beyond the –largely unimportant– issue of tariff revenue, what is at stake is the unwanted extension of preferences to out-of-bloc producers, which would erode the value of those preferences to eligible producers. Relatedly, the "developmental" justification of RoO in North-South PTAs is that they can help foster the emergence of integrated manufacturing activities in Southern partners.

However, by their complexity RoO impose substantial compliance costs on preferred producers. For instance, the EU has over 500 different Product-Specific Rules of Origin (PSRO).[2] As a result, RoO are increasingly difficult to administer in Least Developed Countries (LDC) where they divert scarce customs resources away from other tasks such as trade facilitation.[3] In North-South PTAs, forcing Southern producers to source relatively inefficient intermediate goods locally or in Northern partners (compared to most price-competitive sources in, say, Asia) spreads inefficiency and raises costs. The result is to reduce the value of preferences (compounding preference erosion in particular for Least Developed Countries) and to create rents for Northern producers. This potential of RoO to "export protection" was first observed by Anne Krueger (1993, published in 1998) during NAFTA negotiations, and applies to all PTAs including non-reciprocal preferential schemes granted by OECD countries to developing countries. Moreover, there is overwhelming evidence that this protectionist effect of RoO is not incidental but by design. Because RoO, unlike more traditional forms of trade protection like VERs or Anti-Dumping, have so far largely escaped WTO disciplines, they are thus, potentially, a choice instrument for creeping protectionism.

New evidence reported in this paper shows that the burden imposed by the RoO applied by the two main protagonists in PTAs –the EU and the US– is substantial whenever preferential margins are anything more than negligible. All told, the detailed evidence gathered in this paper suggests that the current system of RoO applied by developed countries is out of hand and defeats both the spirit of reforms

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[1] According to this same tally 45 developing countries having signed bilateral trading arrangements with a Northern partner, and of the 109 North-South (N-S) PTAs, 90 having been created since 1990.
[2] According to the EU Commission (TAXUD/1121/05Rev.1), there are currently 545 rules corresponding to 509 products plus 107 alternative rules.
[3] According to a survey administered by the World Customs Organization to Customs officials in developing countries reported by Brenton and Imawaga, 67% of respondents in SSA agree that dealing with RoO under overlapping trade agreements cause problems and a majority also agreed that RoO required more manpower. It is safe to state that administering RoO detracts from other objectives of tax collection and trade facilitation.

aimed at bringing greater transparency to the Multilateral Trading System and the development-friendly intent of preference schemes. In a recent Communication, the EU has decided to consider simplifying its current RoO. [4] However, other OECD countries have so far refrained from reforming their rules for conferring origin in preferential agreements, and have opposed any discussion of reform of preferential RoO at the WTO. The present paper is meant as a contribution to an overdue debate on how benign, transparent and WTO-compatible rules of origin should be designed.

The paper is organized as follows. Section 2 recounts briefly how Product-Specific Rules of Origin (PSRO) are defined in US and EU preferential schemes (more details are provided in the annex) and proposes an ordinal restrictiveness index summarizing their complexity. We then show that this index is correlated with US and EU MFN tariffs (and thus with the depth of trade preferences). Section 3 presents a simple framework to quantify the costs associated with RoO: distortionary, administrative, and rent-transfer. Section 4 provides direct evidence of their effect on preference use and rent sharing using preference utilization rates and unit values. Section 5 qualifies the direct evidence by considering the Asian exception and the natural experiment provided by a comparison of AGOA and EBA where preferential access margins are similar but RoO differ. Section 6 gives further indirect evidence. Section 7 draws policy implications from the paper's findings and makes recommendations for simplifying current RoO.

2. Rules of Origin: Definition and Measurement

RoO in PTAs have two components: a small set of regime-wide rules (essentially cumulation and *de minimis* thresholds), [5] and a large set of product-specific rules of origin (PSRO), typically defined at the Harmonized System's HS-6 level of disaggregation.[6] However, the Harmonized System (HS) was not designed as a vehicle for conferring origin, its purpose being to provide a unified commodity classification for defining tariff schedules and for the collection of statistics. As a result, devising methods for determining sufficient processing or substantial transformation has turned out to be very complex in all existing PTAs, notably for the two big players, the EU and the US. Three categories of criteria have been used to determine if sufficient transformation has taken place in activities requiring processing (i.e. excluding crude products): (i) a change of tariff classification (at

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[4] Because meeting the requirements is difficult and appears unnecessarily complex, in view of its objective to grant some preferential access to its market for GSP-eligible countries, the Commission adopted on 16.03 2004 Communication COM(2005) on "The Rules of Origin in preferential trade arrangements". The purpose of the Communication is to explore alternative RoO that would be simpler and more development-friendly. A key proposal under consideration would be to replace the current system of PSRO by the adoption of a single rule based on a minimum of originating value-added instead of the current multiplicity of different rules.

[5] The regime-wide rules include: (i) a tolerance (or de minimis) rule; (ii) an absorption (roll up) rule which allows non-originating materials to acquire origin and hence be excluded from the calculation of non-originating value-added: (iii) cumulation (from bilateral to diagonal and to full); (iv) different certification methods. See Cadot et al. (2006a, table 1 for a comparison across PTAs.

[6] The Harmonized System, to which all countries belonging to the World Customs Organization participate, classifies traded goods into (by increasing order of disaggregation) 21 sections (one digit), 99 chapters (HS 2, i.e. 2 digits), 1'417 items (HS 4), and 4'998 sub-items (HS 6). Beyond that (HS 8 and 10) classification systems are no longer harmonized across countries and are subject to frequent classification changes.

various levels of the HS system); (ii) a critical threshold for value-added (in short a 'value content' or VC rule); (iii) a specific manufacturing process (a so-called "technical requirement"). For crude products, the typical rule is "Wholly Obtained" (WH), although other rules apply in special cases such as fish products.

Table 1 tabulates PSRO criteria in NAFTA (also used in other US PTAs) and in the PANEURO system applying to all of the EU's PTAs. Both regimes use a large list of criteria, including technical requirements such as the "triple transformation" requirement in textiles and apparel (T&A), which requires apparel to be woven from originating fabric *and yarn*. Criteria also include exceptions (making them more stringent) and allowances (making them *less* stringent). NAFTA relies more heavily on changes of tariff classification (CTC), though often in combination with other criteria. PANEURO relies mostly on VC and WH criteria (the latter is prevalent for GSP and ACP exports of primary products with little processing).

Table 1 here : Distribution of PSRO under NAFTA and PANEURO

As pointed out by Krishna (2006), when it comes to analyzing RoO, the devil is in the details, because it is precisely the complexity of RoO that provides opportunites for special interests to influence their design and administration. Whereas the theory of RoO dates back to the work of Grossman (1981) and Krueger (1998), the rigorous empirical exploration of their effects has been hampered by two difficulties.

First, data on preference utilization (one minus the rate of preference utilization is the proportion of importers who use the MFN status when preference margins suggest they should claim preferential status, a key measure of the preferences' hidden costs) has been made freely available to the public only recently for the US and not yet for the EU (see e.g. Brenton and Manchin 2003 and the studies collected in Cadot et al., eds, 2006).

Second, because RoO are a set of complex, heterogeneous legal rules, it has proved difficult to elaborate a reliable measure of their restrictiveness that might serve as a synthetic indicator (much like effective rates of protection are a synthetic indicator of the restrictiveness of a country's trade regime). However, Estevadeordal (2000) proposed an ordinal index of PSRO restrictiveness (henceforth the R-index) taking values between one and seven, with higher values corresponding to more restrictive PSRO. The index, constructed at the HS 6 level where PSRO are defined, is based on a simple observation rule (see the description in appendix A1). Though not amenable to quantification like effective rates of protection, the R-index plays the same analytical role: it is intended as an overall indicator of how trade-inhibiting are the requirements that must be met by a product to obtain originating status.

Table 2 gives preliminary evidence that hidden compliance costs are associated with the use of preferences, and that those compliance costs may have something to do with RoO. Table 2a shows evidence for the T&A sector under NAFTA, the EU's GSP, and the Cotonou Convention which grants tariff-free access to most ACP products on the EU's market. It can be seen that although NAFTA's and Cotonou's preference margins are equivalent at 10.4 percentage points, their utilization rates are widely different: 50% for Cotonou against 79.9% for NAFTA (GSP beneficiaries account for 80% of preferential-eligible imports in the EU, but have very shallow preferences in

T&A–see the last column of Table 2a).[7] Cotonou's low rate of preference uptake in the face of deep preferences, in particular, is suggestive of hidden barriers.[8]

Table 2b shows that the evidence of hidden costs goes beyond the T&A sector, where differences in uptake at similar margins may reflect composition effects. Define the preferential margin τ by the normalized difference between MFN and preferential tariffs:

$$\tau_i = \frac{t_i^{MFN} - t_i^{PREF}}{1 + t_i^{MFN}}. \tag{0.1}$$

Table 2b shows that, contrary to expectations, when τ rises, utilization rates *fall* for NAFTA. This suggests that an omitted variable is positively correlated with tariffs but negatively with preference utilization–RoO being obviously the choice culprit.

Table 2 here: Preliminary Evidence: Preferences, utilization rates, and Protection in the NAFTA and EU markets

Table 2c) shows indeed that lines with tariff peaks (lines with tariffs over three times the average), where preferential margins are highest, do indeed have higher R-index values than those with low tariffs. This relationship holds for both NAFTA and PANEURO.

Figure 1 confirms the patterns in Table 2: utilization rates do not really increase as preferential margins increase. Indeed, in the case of NAFTA, owing to the importance of T&A for products with high preference margins accompanied by stringent RoO, utilization rates fall as preferential margins increase.

Figure 1: Average utilization rates for different thresholds of preferential margin rates

3. Quantifying the effects of RoO

Although PSRO take, as already noted, a variety of legal forms (changes of tariff classification, value content, technical requirement etc.) they can all be represented conceptually as floors on domestic value added. To see this, suppose that a producer in Madagascar wishes to sell a shirt under preferential access in the EU. This shirt is made with both originating intermediates (i.e. with intermediates that are either

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[7] As a reference, the average preferential margin (computed over tariff lines with positive tariffs) was 4.5% for NAFTA (almost all tariffs had been eliminated on NAFTA trade by 2001), 2.4% for GSP-eligible countries and 4.6% for ACP countries (not eligible for EBA status). For the EU data is for 2004, when 62% of trade for GSP-eligible countries took place at zero tariffs and over 80% for ACP countries (some ACP also benefiting from EBA status at zero tariffs in the EU market).

[8] Regarding RoO, the regime-wide rule for ACP countries, benefit from full cumulation rather than diagonal cumulation (i.e intermediate purchases from all partners qualify as originating), and a more favorable tolerance rule (15% tolerance for all tariff lines instead of 10% and an exclusion of access to the tolerance rule for chapters 50 to 63 which cover textiles and apparel (T&A) for the group of 92 GSP-eligible countries).

local, EU-made, or imported from other qualifying countries, *as per* cumulation rules), and non-originating intermediates, say from Bangladesh, India or China. Now assume that to satisfy origin requirements (whatever those are–change of tariff classification, VC or technical requirement), the Malagasy producer must use a higher proportion of originating inputs than he would like to in the absence of PSRO (indeed, that is precisely the rule's purpose). Let stars denote initial unconstrained (optimal) choices, and superscripts "*c*" constrained ones. Unrestricted (resp. restricted) value-added is $va_i^*\left(va_i^c\right)$, and a RoO content boils down to $va_i^c > va_i^*$, whether or not it *explicitly* takes the form of a VC. Thus, conceptually value contents can be thought of as a "generic" rule that can play the role of all others by quantifying the objective common to all.

In order to understand the relationship between RoO restrictiveness and preference utilization rates, a bit of arithmetic is in point. As shown in Annex A2, forcing the Malagasy producer to use a larger share of originating inputs raises his unit production costs through two channels: a "distortionary" component and an administrative-costs component associated with the paperwork needed to certify origin. Let π_R and π represent the profits of our Malagasy producer if he complies with PSRO and if he doesn't respectively, c his production costs, c_R the combined compliance cost (administrative and distortionary), $p*$ the world price of his shirt, and t the EU's MFN tariff on shirts. If he does not comply with the PSRO on shirts and ships under the MFN regime, the tariff is paid and he receives the world price. That is,

$$\pi = p*-c. \tag{0.2}$$

If he complies, he enjoys tariff-free access whereas his (say, Chinese) competitors must pay the MFN tariff at rate *t*. With full pass-through, he would raise his price to $p*+t$ and appropriate the whole rent. In practice, this is unlikely to happen given that he faces powerful purchasers in the EU, so he will typically raise his price only to $p*+\mu t$, where the pass-through parameter μ has been estimated empirically to be around one third to one half (see Olarreaga and Ozden 2005 or Cadot, Carrère and de Melo 2006). Thus,

$$\pi_R = p*+\mu t - c - c_R \tag{0.3}$$

and the net benefit of the preferential treatment, once RoO costs c_R and incomplete pass-through μ are factored in, is

$$b = \pi_R - \pi = \mu t - c_R. \tag{0.4}$$

Note that tariff-free access means that we do not have to bother with expression (0.1): the MFN tariff *is* the preference margin. What these equations mean for observed preference-utilization rates is illustrated in Figure 2.

Figure 2 here: PSRO restrictiveness and preference utilization

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In the upper panel, the vertical axis measures the MFN tariff t and hence the preference margin for goods eligible for tariff-free access (like the Malagasy shirt). The horizontal axis measures the compliance cost c_R associated with PSRO. In the lower panel, the graduated vertical axis measures the R-index value downward. The two dashed lines in the lower panel map R-index values into compliance costs: the one for firm A indicates that it incurs smaller compliance costs than firm B, e.g. because it is larger or more formal. As a result, at an R-index value of 4 (shown as the horizontal semi-dashed line in the lower panel), firm A incurs a compliance cost of c_R^A, lower than c_R^B. Consider now the upper panel. Equation (0.4) indicates that the preferences' benefit b is zero when $\mu t = c_R$ or $t = c_R / \mu$, which gives the upward-sloping dashed line. Above it, preferences are attractive; below it (the hatched area) they are not. Observe now that given the R-index value of 4 and their respective compliance-cost functions, firms A and B straddle the zero-benefit line: firm A will use the preferences because her combination of (t, c_R), at point A, is above the critical line, whereas firm B won't because her combination of (t, c_R), at point B, is below. So with two firms, we have a 50% utilization rate. If there were 2 type-A firms and one type-B, we would have a two-thirds utilization rate, and so on.

Now observe also (by inspection) that if the R-index were to rise (move *down* in the figure) to, say, 6, both firms would forsake the preferences so the utilization rate would fall to zero. Similarly, if the preference margin t were to move down to, say, 5% instead of 10% (the lower tick-mark on the vertical axis), again both firms would forsake the use of the preferences. Simplified or more transparent PSRO involving lower compliance costs at given restrictiveness levels would rotate the dashed lines in the lower panel counterclockwise, leading to improved utilization rates. Finally, a lower pass-through parameter (which typically characterizes LDCs whose exporters have little bargaining power) rotates the dashed line in the upper panel counterclockwise, leading to worsened utilization rates. Thus, a given combination of tariff preferences and PSROs is likely to affect the uptake of preferences differently depending on market structure and, hence, on levels of development. This would not be the case without the compliance cost associated with RoO, which accordingly act to "deny preferences" for LDC producers characterized by a combination of low bargaining power and high compliance costs.[9]

The upshot of this analysis can be summarized as follows:
1. For a given preference margin and otherwise ceteris paribus, a higher R-index translates into a lower utilization rate, and conversely;
2. For a given R-index and otherwise ceteris paribus, a higher tariff preference margin translates into a higher utilization rate, and conversely;
3. The compliance decisions of individual firms are binary (yes or no); how they aggregate into industry-wide utilization rates depends on the unobserved distribution of compliance costs;
4. A lower pass-through of preferences for LDCs (due to low bargaining power) implies, ceteris paribus, lower uptake of preferences;

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[9] This suggests a problem of policy coherence between the (trumpeted) development value of the Northern countries' preferences and their rules for the certification of origin in PTAs. This is part of a broader problem recognized by the European Commission in other policy areas as well, like e.g. anti-dumping regulations.

5. Improvements in the uptake of preferences can be obtained from either reductions in the restrictiveness of PSROs or from cost-reducing administrative simplifications (like the adoption of a transparent and uniform criterion).

Observation 3 implies that the statistical relationship between R-index values, preference margins and utilization rates can only be a noisy one at the aggregate (product-line) level. But notwithstanding the noise introduced by unobserved firm characteristics (a black box that could be opened up only with firm-level data that is not currently available), Figure 2 suggests an unambiguous relationship between our three variables of interest. It also suggests that attempting to evaluate the effect of tariff-preference margins on the uptake of those preferences is liable to "omitted-variable bias" in the absence of a proxy, like the R-index, for PSRO restrictiveness.

Keeping in mind that this framework only captures some of the effects associated with Roo, several observations are in order.[10] First, administrative costs act like a technical barrier to trade: they result in resource waste and in the welfare calculus of the effects of RoO they are 'rectangles' rather than 'triangles', i.e. they are more costly than the usual deadweight losses. Second, compliance costs are particularly high for differentiated products. Because part of these costs will be passed on to consumers in the countries that determine the RoO, observing high utilization rates does not necessarily imply that RoO have small effects, as confirmed by the evolution of T&A exports under AGOA and EBA. Third, if there are indeed costs associated with certification, one should not observe requests for preferential status when preference margins are low.

4. Direct evidence

Even if differences in patterns of utilization rates are not synonymous with cost differences, as suggested in the analysis of Figure 2 isolating the correlates of utilization rates is confronted with the absence of data to control for the heterogeneity of firms that export at the HS-8 level. Thus one observes a distribution of utilization rates at the most disaggregated HS-8 level. Since there is no data to match firms with utilization rates, the estimation of utilization rates and their correlates in effect assumes that all firms exporting at the HS-8 level are in effect, identical.

Carrère and de Melo (2006) assume that the utilization of preferences for product line i is a positive function of the difference between the tariff preference margin, τ_i (we relax the assumption made in section 3 that preferential access meant tariff-free access) and (unobserved) total compliance costs, c_i^R (expressed as a percentage of unit price) associated with applying the RoO criteria. That is, they suppose that $u_i = f(\tau_i - c_i^R), \quad f'(.) > 0$, and that $c_i^R = g(RoO_i), \quad g'(.) > 0$. These assumptions lead to an estimable relation of the form:

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[10] Krishna (2006) discusses other effects that are more difficult to quantify: effects such as RoO-jumping investment, and effects on intermediate prices. Thoenig and Verdier (2006) also consider the implications of RoO for multinationals confronted with outward-processing decisions.

$$u_i = \lambda + \alpha \tilde{\tau}_i + \sum_k \theta_k RoO_{ik} + \varepsilon_i \qquad (0.5)$$

where RoO_{ik} is a vector of dummy variables capturing the presence of PSRO (technical requirements, change of tariff classifications, exceptions). Results from estimating (0.5) on data from NAFTA by the authors (and by Cadot et al. (2006a) for the EU) indicates that utilization rates are positively related to preferential margins and negatively to the presence of PSRO. Carrère and de Melo combined their estimates with R-index values to compute an estimated ad-valorem equivalent of total ROO compliance costs (administrative and due to higher input costs). Their estimates range from 3.5% for a change of chapter to over 15% for combinations of ROOs involving technical requirements.

Even if the estimates are robust to a range of specifications, it is difficult to gather a sense of robustness from estimates derived from a relation like (0.5) because there is so much heterogeneity and "unobservables" influencing preference uptake, so that estimates are quite sensitive to the inclusion of dummy variables controls (this is especially the case for estimates based on GSP preferences extended by the EU to many trading partners). Also, the presence of RoO is only captured by so-called "dummy" variables taking values of zero or one.

An alternative is to restrict analysis to products where a value-content criterion is the sole criterion used to determined origin. Drawing on the variation in EU value-content (vc) criteria across product lines, and restricting themselves to product lines where a vc criterion is the only rule to confer origin, Cadot et al. (2006c) estimate an equation similar to (0.5) but in which the dummies for RoO are replaced by the continuous vc values.[11] In a formulation where section dummies are added to control for heterogeneity, and where administrative costs are taken into account by restricting the sample to to tariff lines with preferential margins in excess of 2% or 5%, they find that utilization rates are an increasing function of preferential margins, but also that they are positively related to the maximum foreign content value allowed.

Since a move towards a single criterion based on a value content (VC) is a serious candidate for reform, table 3 reports on two illustrative simulations based on these estimates. The simulation consists in reducing the requirement on the RVC by 10 percentage points (the mean RVC is 58% for this sample of products). As shown in table 3, the mean preferential margin for these commodities is between 3% and 5% depending on the sample and the mean utilization rates are rather low (between 12% and 22%). These low utilization rates reflect high compliance costs relative to preferential access.

Table 3 here: Estimated Effects on preference utilization and rent transfer of Relaxing a Value Content Requirement

The bottom of the table shows the first-round effects (no supply response is factored in) of reducing the RVC by 10 percentage points. Utilization rates increase by between

[11] The US rarely uses a VC criterion as a sole requirement for origin and they tend to rely on a single 40% foreign content when applied. The EU has VC criteria ranging from 50% to 15% of domestic value-added.

2% and 5% (row 6). The total estimated rent transfer resulting from this increase in utilization of preferences is estimated at between 21 and 37 million Euro for a mean value of imports in the range 1.5-3.0 billion €.

As shown by (0.4), to get a handle on the welfare effects of RoO, one has to factor in the rent element associated with preferences and their distribution between the exporting and importing country. This implies estimating the pass-through effect of tariffs on consumer prices (i.e. the extent to which preferences translate into a higher producer price for exporters). Olarreaga and Özden (2005) for AGOA preferences, and Özden and Sharma (2006) for CARICOM preferences estimate that between one-third and one half of tariff reductions are passed on to producers.

However, part of the border price increase could just reflect an increase in the compliance costs discussed above. Relying on a model of monopolistic competition in differentiated products, in which Mexican exporters can export an HS-8 product j either to the rest of the world under MFN status or to the US under NAFTA preferential status, with corresponding prices $\left(p_j^M, p_j^N \right)$, Cadot et al. (2005) estimate:

$$ \frac{p_j^N - p_j^M}{p_j^M} = \alpha_0 + \alpha_1 \tau_j + \alpha_1 CC_j + \alpha_3 TECH_j + \varepsilon_j \tag{0.6} $$

where $\left(CC_j \right)$ is a dummy variable capturing the presence of a change of tariff classification at the chapter level and $\left(TECH_j \right)$ captures the presence of a technical requirement.

When estimated at the product line level, expression (0.6) comes as close one can hope for to compare prices obtained for sales in different markets. With complete pass-through ($\mu = 1$ in equation (0.4)) the estimated coefficient for α_1 would be close to one; but they find it to be substantially below . They also obtain negative and significant estimates for $\left(\alpha_2, \alpha_3 \right)$ indicating increases in costs caused by RoO. They estimate that once RoO are taken into account, the pass-through effect falls from 80% to about 50%. Using a similar formulation, they also show that US producers of intermediates are able to retain a substantial share of the rents generated by Mexican tariff preferences.

4. An Exception and a Quasi Natural Experiment

The co-variation of utilization rates and margins does not exhaust the effects of RoO. Case studies such as those reported in Cadot et al. (2006c) and Stevens et al. (2006) provide useful complementary evidence, although they inevitably come up with the conclusion that each case is different, thereby explaining if not justifying the current maze. Here we draw on an exception and a quasi-natural experiment, both of which suggest that RoO are, as they stand, unnecessarily restrictive.

In a world where RoO are cumbersome and complicated (as they are –see Estevadeordal and Suominen (2006) for a detailed description), AFTA, ACFTA and ASEAN are the PTAs that stand out as an exception. To obtain originating status (i.e. to fulfil the criterion of sufficient processing), either the "wholly obtained" criterion is used for a few agricultural products or, for the vast majority of products, a single value content rule requiring that 40% of the value of the final product must originate from the countries belonging to the FTA (i.e non-originating imports cannot exceed 60% of the value of the final product). This rule is used in combination with diagonal cumulation which, in effect, amounts to full cumulation, and when countries have found this requirement difficult to meet, it has been relaxed by allowing a choice between criteria. For example, under ACFTA, a change of tariff classification (CTC) is an alternative criterion for obtaining origin in the case of leather articles, and some specific process criteria are also accepted for some textile products[12]

So why are RoO in AFTA apparently less stringent than elsewhere? First, until recently Asian regionalism has been more about cooperation than about preferential trade (APEC under the aegis of the US was specifically set up to avoid preferential trade and the formation of an 'Asian trade bloc'), with much of the region's integration in the world economy driven by unilateral tariff reductions. Second, much of the regional trade has been part of the development of the 'Asian manufacturing matrix' whereby labor-intensive stages of production initially carried out in Japan and later in Korea have been outsourced to the lower-wage countries in the region for final export to EU and US markets.

This "Asian exception" has been conducive to the successful development of Asian countries who have been fully participating in the verticalization of trade, by which is meant that multinationals firms distribute segments of the value chain around the region according to comparative advantage. In this unusual set-up relative to the other global trading patterns, intra-regional trade in politically-sensitive final products where protection is highest was insignificant. Hence, the political-economy forces that would usually lead to lobbying activity resulting in the complex RoO observed elsewhere, so far has not been observed, and low-income countries like Cambodia and Laos have been participating in the fragmentation of production according to comparative advantage.[13] Arguably, the simple and uniform RoO requirement in the Asian region is an indicator of the kind of RoO that would be development-friendly.

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[12] Under diagonal cumulation, countries tied by the same PTA can use materials that originate in *any* member country as if the materials were originating in the country where the processing is undertaken (see appendix A1 for a definition of cumulation). However, since the domestic content can be an aggregate of value-added in any ASEAN member state, AFTA provides in effect for full cumulation although, as noted by Brenton (2006), the rules stipulate that the final stage of manufacture must be carried out in the exporting member state (what constitutes 'the final process' is not defined). Because vertical linkages and outsourcing are very important in Asia (see below), full cumulation relaxes considerably the requirements of satisfying origin.

[13] To drive home the importance of trade in intermediates, consider the following example recalling that Japan is not currently a member of AFTA. According to the Asian input-output data provided in Baldwin (2006, table 1), for all the middle-income countries (Indonesia, Philippines, Malaysia, Thailand), on average 35%- 40% of intermediates are sourced from outside the AFTA group. Take then an activity with a 10% value-added (this low value-added figure is consistent with the deepening of inter-industry flows) and 40% intermediates non-originating. Then, originating value for this activity would be, 64%. But for activities where 60% of materials would be non-originating, originating value would fall to 46%, barely above the stipulated 40% minimum requirement stipulated in AFTA.

In the T&A sector, the choice area of deployment of obscure and trade-inhibiting PSROs, the one notable exception is the US preferences granted to 15 SSA LDCs under AGOA. Thus, a comparison of SSA apparel exports to the US and EU provides a quasi-experimental situation in which the effects of RoO on the uptake of trade preferences can be analyzed. This quasi-experimental situation, first picked up by Brenton and Özden (2005), comes from the combination of different RoO with very similar rates of preference margins (T&A receive approximately the same protection in the EU and US markets: In 2001, the EU-15's MFN tariff was 10.1% against 11.7% for the US, and duty-free access applied to both EBA-eligible and the 34 AGOA-eligible SSA countries).

To qualify for preferential access in the US market, any exporter benefiting from preferential market access must prove that T&A is produced, cut and sewn in the area benefiting from preferential access (here AGOA) while for cotton products, they must be made from originating fabric, yarn and thread, with diagonal cumulation somewhat relaxing the requirement since fabric originating in other member countries qualifies. However, this rule, known as "the triple transformation" rule, was relaxed for 15 LDCs that also qualified for EBA preferences by the end of 2004, in the so-called 'special regime' (SR) which allows for third-country fabric in effect giving rise to a single transformation requirement (from fabric to garment). The SR has recently been extended until 2015 for the 22 qualiiying countries (See figure 3 for the list of countries).

On the other hand, no such exceptions apply for exports to the EU market under either Cotonou or EBA preferences, as EU rules of origin for apparel require production from yarn. This entails that a "double transformation" process must take place in the beneficiary country with the yarn being woven into fabric (first transformation) and the fabric cut and made-up into clothing (the second transformation).

The EU's "double-transformation" rule obviously makes compliance difficult for countries that do not have a textile industry, particularly so for the woven-wear sector (HS 62=119 products), though also for the knitwear sector (HS 61=117 products). Small or poor countries that cannot profitably produce fabric (weaving is a capital-intensive activity involving expensive machinery, particularly for woven products) cannot –and should not, from an economic-efficiency viewpoint– set up the vertically-integrated local value chains that would satisfy the double-transformation rule.

Data on utilization rates show high rates of utilization of preferences under EBA (or Cotonou which have the same market access as EBA for apparel) and under AGOA. The utilization rates of preferences for apparel in 2004 were 97.36 % for AGOA and 94.9% for EBA or Cotonou.

In spite of high utilization rates under both schemes, export volumes evolved quite differently. Figure 3 shows a substantial increase in value of apparel exports from the 15 LDCS that benefited from the simple transformation rule under AGOA with the timing of the growth coinciding with the entry into force of AGOA in 2000. By contrast, the value of exports by this same group of countries did not rise following the adoption of EBA (in fact it fell slightly). Since all these countries benefited

already from Cotonou preferences which give almost as much access as EBA (with slightly more lenient rules on cumulation), it should not come as a surprise that the value of exports stayed flat: in effect nothing changed under EBA for these countries, whereas relaxing the RoO under AGOA gave a definite boost to the exports of this group of countries (essentially Madagascar and Lesotho) under AGOA. SSA countries, along with all other ACP countries, largely continued to request Cotonou status, with which they were familiar, rather than EBA status.

Figure 3 here: Exports from SSA LDCs to the EU (EBA/Cotonou) and the US (AGOA)

Since the data in Figure 3 are computed at the HS 6 product level, it is safe to assume that that much of the heterogeneity in the composition of exports to different destinations is controlled for. In a model where he controls for differences in preference margins and for demand shifters in the US and EU market, Portugal-Perez (2007) finds that relaxing RoO for apparel (captured by a dummy variable corresponding to the introduction of the AGOA's SR) raised apparel exports significantly for the countries benefiting from that regime. Since the SR was not introduced the same year for all countries, these results are strongly suggestive that differences in RoO accounted for differences in performance.

Finally, as noted earlier one of the stated objectives of preferential access for LDCs is to encourage industrialization. Increasing product diversification (or growth of the extensive margin of trade) is one measure of industrialization, particularly so at early stages of the economic development process (on this, see Cadot, Carrère and Strauss-Kahn 2006 and references therein). Controlling for other factors, countries that have a more diversified industrial base enjoy less volatile growth, being better poised to absorb shocks. In all of SSA, three countries, Madagascar, Lesotho, and Senegal exported more than 50 products to one of the two large Northern markets, the EU and US. While new products were exported to both countries (an active extensive margin), the rate of new products increase was several orders of magnitude higher for the US destination than for the European one.[14]

Taken together, the Asian exception and the comparison of AGOA with EBA suggest that RoO should be simplified if low-income countries are to effectively benefit from market access opportunities in the labor-intensive protected manufacturing activities in OECD countries. More perniciously, the analysis shows that high rates of preference uptake do not imply that RoO are not costly, complicating the assessment of RoO based on direct analysis of the correlates of utilization rates.

5. Indirect Evidence

Taking inspiration from early work by Herin (1986) for EFTA, Cadot et al. (2006d) applied revealed-preference arguments to get estimates of upper and lower bounds of compliance costs. Arguably, this non-parametric approach could be more robust than the parametric evidence reported above. By revealed preference, in the absence of

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[14] During the period covering 1996 to 2004, the number of products increased for Lesotho and Madagascar to both destinations, but mostly to the US. Lesotho increased the number of products exported to the US from 24 to 94 and to the EU from 6 to 12. Madagascar increased the number of products sold to the US from 24 to 94 and to the EU from 114 to 145.

errors in reporting and ignoring the firm heterogeneity discussed in Figure 2, for items with 100% utilization rates, the net benefit of preferences (*b* in section 3) is positive for all firms; so, using equation (0.4) with the average preference margin $\overline{\tau}_i$ playing the role of the MFN tariff *t*, clearly the compliance cost cannot be higher than $\overline{\tau}_i$, even with full pass-through ($\mu = 1$). Thus, $\overline{\tau}_i$ is an "upper-bound" for compliance costs. Conversely, for items with 0% utilization rates, the preference margin gives a lower bound of compliance costs. For the remaining sectors (those with $0\% < u_i < 100\%$) assumptions must be made. Cadot et al. argued that, firm heterogeneity notwithstanding, the average exporter (in terms of compliance costs) was "not too far" from indifference between the preferential and the MFN regimes. Under this assumption, the average rate of tariff preference computed for those sectors (i.e. on the sub-sample $0\% < u_i < 100\%$) provides a non-parametric approximation to the "revealed" compliance cost. Applying this reasoning gave trade-weighted ad-valorem estimates ranging between 4.7% and 8.2% (depending on sectors) for PANEURO and 1.8%-1.9% for NAFTA.

How then should one interpret requests for preferential status when tariff preferences are nil? Beyond (likely) errors in data transcription, the logical possibility would be that administrative costs are negligible, but this is in contradiction with the evidence (the nonparametric approach described in the previous paragraph gave estimates of pure administrative costs slightly above 3% in ad-valorem form). Francois et al. (2006) elegantly addressed this problem by modeling the determinants of utilization rates for EU trade with ACP countries in a switching-regression framework where the relationship between the variable of interest (utilization rates) and control and explanatory variables itself varies between two regimes: one characterizing low-margin sectors, and one characterizing high-margin ones. The cutoff between the two regimes is determined by the data using an algorithm due to Hansen (2000).[15] They found that exporters start requesting preferences when preferential margins are in the 4%-4.5% range, a result that is broadly consistent with the nonparametric estimates of compliance costs reported above.

Other evidence using aggregate bilateral trade data also suggests costs associated with the presence of RoO. Using a gravity model of bilateral trade, Anson et al. (2005) find that, after controlling for the other determinants of the volume of bilateral trade including the presence of FTAs, the intensity of bilateral trade is inversely related with the values taken by the R-index. Using a similar framework, Augier et al. (2006) find that the volume of bilateral trade is lower when cumulation is on a bilateral rather than a full cumulation basis leading them to suggest that RoO should be relaxed to allow for full cumulation.

The evidence reported so far in this paper is overwhelming: RoO are burdensome and foster economic inefficiency. Yet we also argued that they have a role to play in combating trade deflection, so saying they is not enough. If one is to make progress in the design of "clean" RoO, a key part of the argument must be to tell apart, in their current characteristics (and in particular their restrictiveness) how much is attributable to their anti-deflection role vs. how much is just capture by special

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[15] The algorithm is in essence a grid search over cutoffs whose criterion is the minimization of the concentrated sum of squared errors of the OLS regressions in the two regimes.

interest. This was done by Portugal-Perez (2006a) who decomposed variations in the value of the R-index into a component attributable to trade deflection (TD) and one associated to lobbying or political-economy (PE) motives. He estimated his decomposition for T&A Mexican exports to the US under NAFTA using the following equation:

$$RoO_i = \beta[TD_i] + \gamma[PE_i] + \varepsilon_i \qquad (0.7)$$

where (RoO_i) is R-index values at the HS-6 level. The regressors are the TD vector which includes a proxy for the extent of product differentiation (the more homogenous the product, the easier it is to deflect trade) and the difference in the MFN tariff of the partners (the greater the difference, the greater the incentive to deflect trade). Political-economy variables include the height of the US MFN tariff (a proxy for lobbying power), revealed comparative-advantage indices, and the extent of Mexican exports to the rest of the world (a proxy for potential penetration in the US market).

Portugal-Perez finds strong and quite robust correlations, suggesting that both factors are at work in explaining cross-sectoral variations in the R-index values. Using estimated parameter values, he constructs counterfactual distributions of R-index values in the absence of political-economy correlates for a 'representative' good with mean sector characteristics. The two distributions reported in Figure 3 show that political-economy concerns contribute to the overall restrictiveness of RoO. Drawing on earlier estimates by Carrère and de Melo based on (0.5) , he concludes that capture by special interests may have raised the costs of RoO, on average, from 3.5% to 11% of good value, a very steep increase in the face of the shallow preferences that are generally granted.

Figure 4 here: Counterfactual distribution for R-Index

Simulation methods are another way of obtaining orders of magnitude of RoO effects on trade. Francois et al. use their estimate of compliance costs to simulate the effects of trade liberalization by developed countries on low-income countries in multi-regional trade model. They show (table 3) that in spite of preference erosion low-income countries gain instead of losing from trade liberalization by the EU because the 'rectangle' deadweight losses associated with compliance costs are eliminated.

Table 4 provides alternative estimates from a partial-equilibrium perspective taking, as an illustrative example, a GSP country benefiting from a 10% preferential margin (row 1), but forced to raised his minimum local content (MLC) from the value in row 3 (usually 40%) to the value given in row 4 (usually 50%). When present, administrative costs, also expressed as a percent of the unit price, are given in row 2. The bottom three rows in the table show the effects on equilibrium prices and exports.

Table 4 here: Exports, unit costs and prices under preferential market access and a binding Minimum Local Content (MLC)

Column 1 shows the benefits that accrue to the GSP producer from receiving a 10% preference margin with no constraint on the sourcing of inputs. For this constellation of elasticities (all are on the high side to reflect the likelihood that products from different origin are pretty close substitutes, whether at the intermediate- or final-good level), the pass-through is 2.9% out of a preference margin of 10%, in line with econometric estimates mentioned in section 4. Exports increase by 16% and there is no increase in costs since inputs are bought at constant world prices.

Column 2 shows what happens when this GSP producer must reduce his consumption of non-originating materials to meet a VC of 50% (a 25% increase from the value in column 1). The result is a lower export volume and a 1.9% increase in unit costs passed on to EU/US consumers. Matters get worse if substitution possibilities for materials from different origins are low (simulation in column 4) which would be representative of industries where there is a lot of transformation and many production stages. Realistically, this case represents a situation where the GSP producer would not claim preferential status (the model is calibrated so that the beneficiary will continue to find it profitable to ask for preferences).

Column 4 reverts to the case in column 2, but adds administrative compliance costs of 2.5%. This further penalizes the GSP producer, even though part of this cost increase can again be passed on to consumers in the importing country. Of course, if GSP producers were competing with close substitutes, they would be unable to pass on the price increase.

Finally, column 5 considers a simulation that might fairly representative of an industry with enough VC that the shift to, say a 40% MLC would not affect producers much. The results suggest that the net price to producers might go up by about a third of the preference margin, resulting in a modest supply response of about 10%.

7. Implications for Reforms

If Rules of Origin (RoO) have a legitimate justification in preventing trade deflection by mandating that sufficient processing take place in the preferential zone, the accumulated evidence indicates that they have gone largely beyond that role to become akin to technical barriers to trade. Various estimates suggest that the compliance costs associated with meeting origin requirements in PTAs range between 3% and 5% of final product prices, a very stiff price tag for preference margins that are often thin given that MFN tariffs are themselves low in most sectors except T&A. Controlling for preferential margins, utilization rates are lower in tariff lines with more restrictive RoO and also when producers are limited in the sourcing of their intermediate purchases.

Because of their trade-inhibiting effects, RoO hinder the integration of preference-receiving LDCs in the world economy and thus work at cross-purposes with the development-policy goals of US and EU preferences. In the case of sub-Saharan African (SSA) countries supplying T&A products to the US and the EU, even high utilization rates hide obstacles to export growth caused by the double-transformation criterion prevailing in that sector.

The paper also shows that in the case of the EU and the US, the two largest users of PTAs, RoO are stricter for products with tariff peaks where preferences could be most valuable. The correlation between the presence of tariff peaks and that of highly restrictive RoOs is suggestive of capture by protectionist interests, a hypothesis that is largely confirmed by political-economy theory and evidence. Moreover, because RoO have so far escaped WTO disciplines whereas other, more traditional trade-policy instruments are brought under increasingly stringent ones, they stand as a choice candidate for creeping protectionism.

In spite of the prevalence of capture by special interests, two quasi-natural experiments point to broad directions for reform. First, the relaxation of the US's triple-transformation requirement in T&A for SSA producers under AGOA has proved to strongly encourage export diversification and growth in comparison with exports destined to the EU which are subject to stricter rules under the EBA arrangement (which otherwise features similar preference margins). Second, low-income Asian countries operating under simple and benign RoO have been able to rapidly integrate themselves into cross-border supply chains and have, as a result, tremendously benefited from the verticalization of world trade.

These observations suggest that a multilateral agenda for preferential RoO reform, a key step in bringing preferential trade agreements under WTO disciplines, would have to move along three dimensions: (i) harmonization, (ii) simplification (iii) relaxation. Harmonization between trading blocs, although unlikely to be attained anytime soon, is desirable in view of the 'spaghetti bowl' of PTAs, and is a prerequisite for the establishment of simple and mutually consistent cumulation rules. The EU has set an example in this regard with the PANEURO system, precisely designed to facilitate cumulation across preferential zones.

As for the second objective (simplification), arguments in favour of a single, across-the-board rule are much like those in favour of uniform tariffs –viz., foster transparency and mitigate capture. Clearly, technical requirements should be targeted for elimination in priority, being the most opaque, difficult to harmonize, and capture-prone instruments. Leaving aside agricultural products that could still operate under the 'wholly obtained' criterion, and keeping in mind that any uniform rule will affect industries and countries differently, two avenues could be considered: (i) a simple change of tariff classification (CTC), say at the subheading (HS 6) level so that it is not too restrictive); (ii) a uniform value-content (VC) rule.

Some information can be gleaned in this regard from the EU's recent review. The CTC criterion has the advantage of simplicity, transparency, and low administrative costs. But the HS tariff nomenclature was designed to collect trade statistics, not to separate products and confer origin, so defining the CTC at a uniform level would produce erratic results across sectors. This would call for exceptions to uniformity, opening up the Pandora Box of special deals. Moreover, a CTC criterion would not lend itself easily to differential treatment for LDCs, should that be an objective (see below).

As for a VC rule, notwithstanding its *conceptual* clarity, it may be less than straightforward to apply in practice.[16] It may increase producer risk due to the

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[16] The authors of this paper are aware of concerns voiced by the private sector in the course of the EU review about the practical difficulty of a VC criterion for small firms and, if based on costs, its potential

sensitivity of costs to exchange-rate, wage and commodity-price fluctuations and is also burdensome to apply for customs officials. However, it is simple to specify, transparent, and allows for differential treatment of LDCs. All told, if specified properly it probably stands out as the best candidate for an across-the-board criterion, ideally in combination, at the exporter's choice, with a CTC.

If the slow pace of harmonization talks at the WTO is any indication, the reform agenda described above may be over-ambitious by several orders of magnitude, although it is to be hoped that if the European Commission manages to get its reform ahead, 'competition between systems' may trigger similar rounds of simplification elsewhere as well. However, the outcome of the EU reform process is highly uncertain at this stage; moreover, even if the plan to adopt an across-the-board VC criterion survives, it is not clear that the *rate* of this VC would be uniform. Nor is it certain (perhaps even less) that it would represent a relaxation from the average restrictiveness of the current system.

More immediate, win-win steps may be a better way to proceed. A simple first step in the reform would consist of eliminating RoO requirements for tariff lines with preferential margins below 3% or perhaps even 5% (the rate could be agreed upon in the context of multilateral negotiations at the WTO). This would be an all-round winning proposition since resources would be freed for other purposes, especially in developing countries, but also for consumers in developed countries who would no longer bear part of the increased costs associated with compliance. A second step would be to allow for differential treatment not across sectors, but across beneficiaries, with low VC requirements for LDCs reflecting the empirical observation that the 'slices' of value added performed in LDCs in cross-border production networks are generally thin. In this regard, the experience with the US's 'special regime' granted in T&A to African producers under AGOA is most encouraging.

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to force unwanted disclosure of strategic information to powerful EU buyers that would enhance their ability to squeeze rents from Southern producers.

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Tables and figures to
Why OECD Countries should Reform Rules of Origin

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Table 1: Distribution of PSRO under NAFTA and PANEURO

Table 2: Preliminary Evidence: Preferences, utilization rates and Protection in the
NAFTA and EU market
    2a: Preferences and utilization rates
    2b: Tariff Peaks and the PSRO index
    2c: Preferences and Utilization Rates in Textiles & Apparel (HS-11)

Table 3 : Simulating a relaxation of the VC criterion for EU Preferential Schemes

Table 4: Exports, unit costs and prices under preferential market access and a
binding Minimum Local Content (MLC)

Table 1. Distribution of PSRO under NAFTA and PANEURO

% of tariff lines	"No other requirement" or "EXC"		"TECH" or "TECH+EXC"		"VC" or "VC+EXC"		"TECH+VC" or "TECH+VC+EXC"		"Wholly obt'd" (WH)		Other addit. Requir.		SUBTOTAL	
	NAF.	PAN.	NAF.	PAN.	NAF.	PAN.	NAF.	PAN.	NAF.	PAN.	NAF.	PAN.	NAF.	PAN.
No CTC	0.5	0.6	0.0	2.6	0.0	13.0	0.0	0.2	0.0	8.1	0.0	7.0	0.5	31.5
CI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CS	3.8	0.1	0.4	0.0	0.1	0.4	0.0	0.0	0.0	0.1	0.0	0.4	4.4	1.0
CH	36.3	16.5	0.2	7.8	4.1	12.8	0.1	0.1	0.0	0.3	0.0	13.9	40.7	51.3
CC	48.7	0.0	5.8	7.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	54.4	7.7
Altern.												8.7	0.0	8.7
Total	89.3	17.2	6.4	17.7	4.2	26.1	0.1	0.4	0.0	8.5	0.0	30.1	100	100

Notes:

Classification is carried out at the HS-6 tariff line level (#5595 lines for the EU and # XXX for NAFTA). Each cell is the percentage of tariff lines that have the ROO in the corresponding row and in the corresponding column.

CTC = change in tariff classification with CC = Change in Chapter / CH = Change in Heading / CS = Change in Subheading / CI = Change in Item;

EXC = Exception to change of tariff classification;

VC = Regional Value Content; TECH = Technical Requirement.

Altern. = Lines for which importers can choose between alternative criteria.

Source: Cadot et al. (2006a), table 2

Table 2. Preferences, utilization rates, and Protection in the NAFTA and EU markets

Table 2a. Preferences and Utilization Rates in Textiles & Apparel (HS-11)

	#Observations[e]	Utilization rate	Preferential Margin
NAFTA (2001)	618	79.9	10.4
GSP (2004)	16555(HS-8) 12920 (HS-6)	52.2	1.8
ACP (2004)	1370 (HS-8) 1175(HS-6)	50	10.4

Notes: unweighted averages
Source: Cadot et al. (2006d), table 4

Table 2b. Preferences and utilization rates (un-weighted data)

	GSP(92)[b]	ACP(37)[b]	NAFTA[c]
$\tau \geq 4\%$ [a]	50.2% (1297)[d]	92.5% (1627)[d]	87.0% (1239)[d]
$\tau \geq 8\%$ [a]	52.5% (91)	94.3% (892)	86.0% (558)
$\tau \geq 12\%$ [a]	66.2% (44)	96.4% (566)	82.8% (287)

Notes: Number of countries qualifying for preferential market access under EU preferential schemes in parenthesis. Computations based on 2004 data for GSP and ACP countries and for 2001 for NAFTA.

[a] $\tau_i = \left(t_i^{MFN} - t_i^{PREF} \right) / \left(1 + t_i^{PREF} \right)$ is the preference margin.
[b] Computed at the HS-8 tariff line level for GSP and ACP.
[c] Computed at the HS-6 tariff line level for NAFTA.
[d] Number of tariff lines between brackets.

Source: Authors' calculations

Table 2c. Tariff Peaks and the PSRO index

	R-Index value[a,b]	
	NAFTA	PANEURO
Tariff peaks[c]	6.2 (257)	5.2(780)
Low tariffs[d]	4.8 (1432)	3.9(3241)
Total number of tariff lines	3'555	4'961

Tariff peaks (low tariffs) are calculated for all tariff lines that exceed 3 times (one third of) the average GSP tariff level. ROO indexes are unweighted.

Source: Cadot et al. (2006a), table 3

Table 3. Estimated Effects on preference utilization and rent transfer of Relaxing a Value Content Requirement

	Row	$(\tau_i \geq 2\%)$	$(\tau_i \geq 5\%)$	$(\tau_i \geq 2\%)$	$(\tau_i \geq 5\%)$
		ACP + GSP	ACP+ GSP	GSP	GSP
Number of Obser.	1	19'261	5'958	13'448	4'305
Mean preferential margin $(\overline{\tau})$	2	3.74	5.14	3.79	5.22
Mean Utilization Rate	3	0.12	0.17	0.17	0.22
Mean regional value content (rvc)	4	58.8	58.2	58.9	58.6
Mean value of Imports [EUR]	5	1'475'182	2'376'301	1'986'979	3'059'694
Simulation : $rvc_i^1 = rvc_i^0 - 10$					
$\Rightarrow \Delta u_i$	6	2.0%	5.2%	2.5%	1.7%
Total rent transfer from increased utilization [a/] [million €]	7	21. 7	37. 4	25.3	11.6

Source: Authors' Computations based on Cadot et al. (2006d, table 6)
See text.
rvc= regional value content expressed as percentage of unit price
[a/] Evaluated at the mean value of imports

Table 4. Exports, unit costs and prices under preferential market access and a binding Minimum Local Content (MLC)

|	Row #	(1)	(2)	(3)[a]	(4)	(5)
Preference margin	1	10	10	10	10	10
C[A]	2	0%	0%	0%	2.5%	1.0%
Unconstrained (MLC)[b]	3	40	40	40	40	36
Constrained (MLC)[b]	4		50	50	50	40
Exports[c]	5	15.9%	11.1%	-0.15%	7.1%	10.7%
Unit costs[c]	6	0%	1.9%	6.7%	1.9%	0.4%
Unit net price[c]	7	2.9%	3.0%	3.4%	2.2%	2.1%

Notes: Author's calculations adapted from model presented in Cadot et al. (2005).
a. Same as column 2 but with low value for the elasticity of substitution between originating and non-originating materials (0.5 instead of 2)
b. MLC=Minimum local content expressed as percentage of unit price
c. Percentage change from a solution with no preferential access

Figure 1. Average utilization rates for different preferential margin thresholds [a]
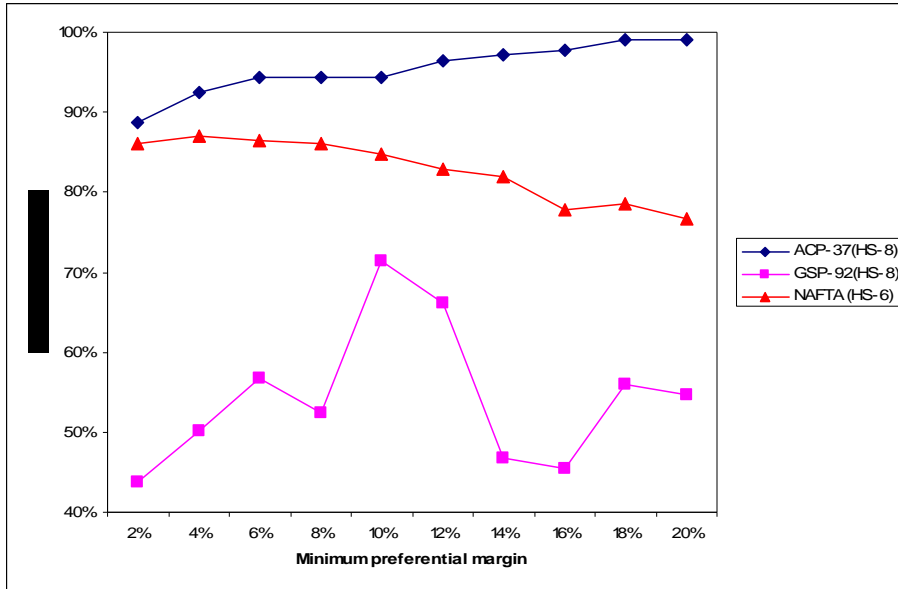
Notes: [a] Unweighted averages computed at the most disaggregated tariff line level (see table 2)
Averages based on over 100 observations except for GSP (minimum of 27 observations for $\tau_i \geq 20\%$)
Source: Cadot et al. (2006c)

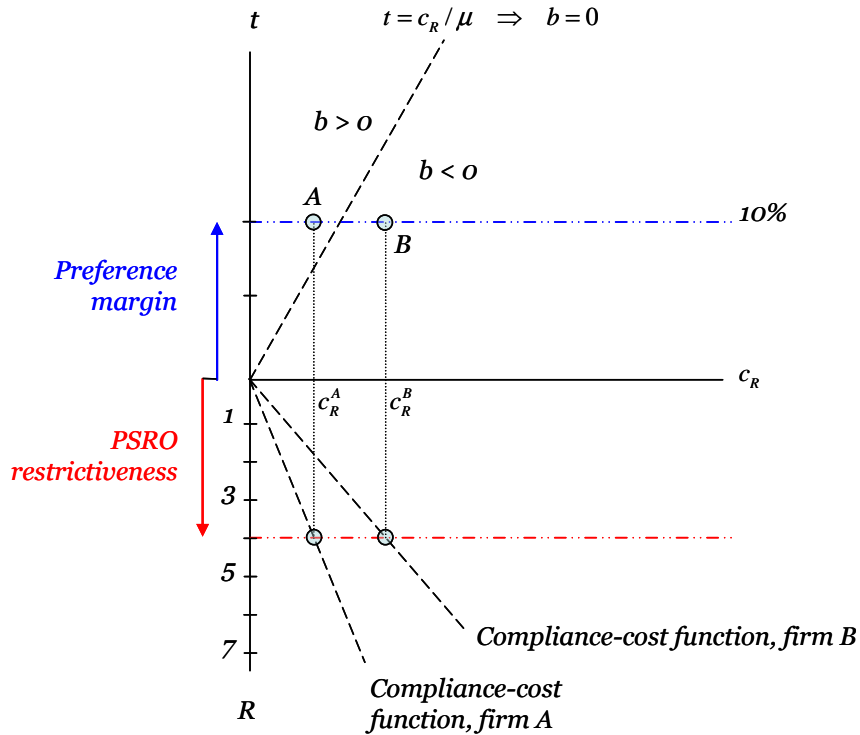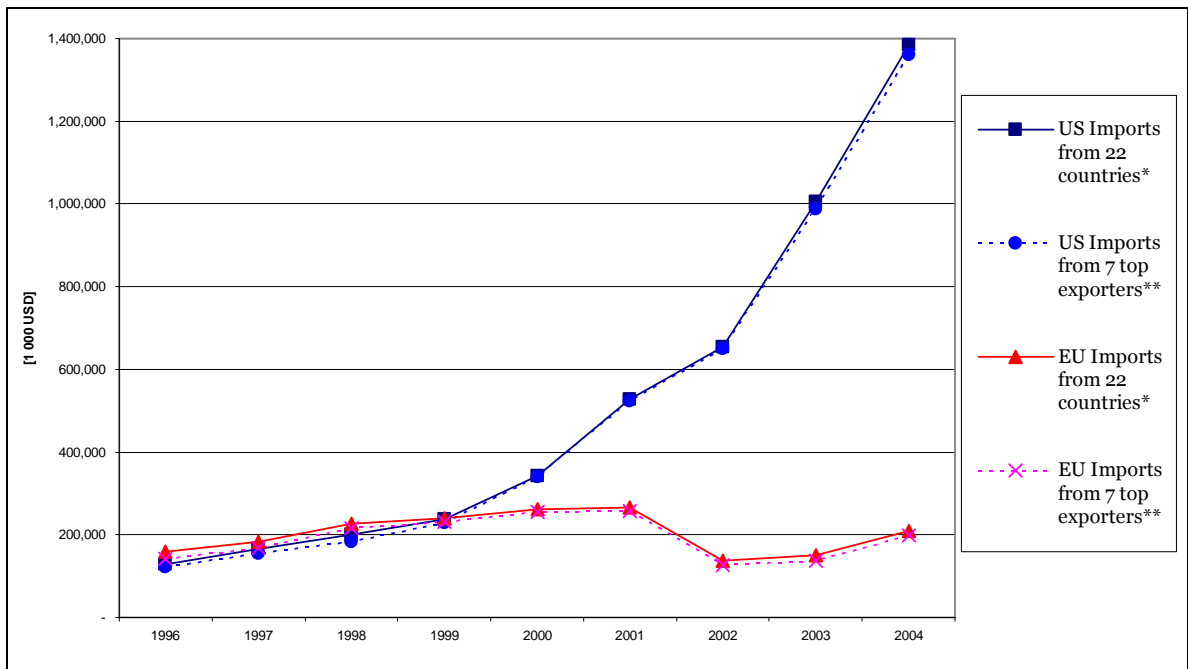Figure 2. R-index, tariff preferences, and preference utilization

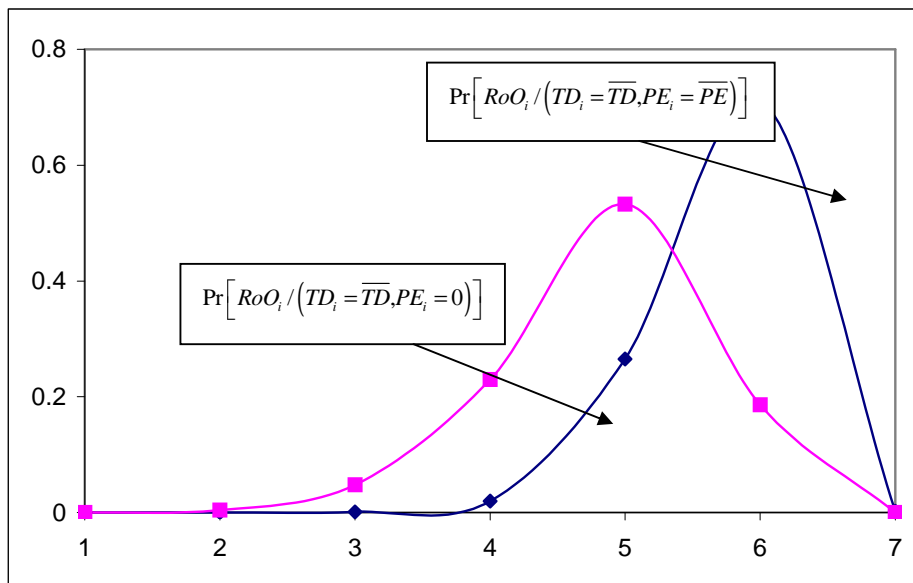Figure 3:Apparel exports of 22 countries benefiting from AGOA-SR by 2004

*The 22 countries are: Benin, Botswana, Cameroon, Cape Verde, Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Swaziland, Tanzania, Uganda, and Zambia.
**The top 7 exporters are : Botswana, Cameroon, Ghana, Kenya, Lesotho, Madagascar, Namibia, Nigeria, and Swaziland
Source: Portugal-Perez (2007) : calculations from WTO Integrated Data Base

Figure 4. Counterfactual distribution for R-Index

Source: Portugal-Perez (2006)