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The Origin of Goods – Rule of Origin in Regional Trade Agreements

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Rules of Origin (RoO) are among the most important instruments in the negotiation and functioning of Regional Trade Agreements (RTAs). Although they never make newspapers headlines, they are designed to determine the eligibility of goods for preferential treatment among RTA members. Ostensibly meant to prevent transshipment of imported products across RTA borders after only superficial assembly, they may act in practice as complex and opaque trade barriers. This book provides evidence strongly suggesting that they do so by intent rather than accidentally—in other words, that RoO are truly trade policy instruments.

Beyond the collection of new evidence and its interpretation in light of recent theory, the book's overall message for the policy community is that RoOs are a potentially powerful and new barrier to trade. Rather than being relegated to closed-door technical meetings, their design should hold center-stage in trade negotiations.

'One cannot understand today's multilateral trading system without understanding its web of Preferential Trade Agreements. And one cannot understand these agreements without understanding their Rules of Origin. This collection of original theoretical and empirical papers sheds considerable light on what may well be the most important instrument of trade policy of our times.' Gene Grossman, *Princeton University*

'Rules of Origin are among the least understood and most important elements of free trade agreements. This well organized study presents both a technical and political analysis of their uses and impacts and is a "must read" for anyone responsible for developing, negotiating, or implementing these rules.'
Carla A. Hills, *Former US Trade Representative*

'This book by some of the world's leading experts in the field is a state-of-the-art analysis of a complex and oft-neglected aspect of trade policy. With the growth of regionalism, Rules of Origin become more significant by the day, yet remain poorly understood. The present work goes a long way in remedying this deficiency. It comprises an enticing blend of economic theory and empirical study, together with political economy and development analysis.'
Patrick Low, *Director of Economic Research and Statistics, WTO Secretariat*

'Preferential trading arrangements are an increasingly important part of the international trade landscape and careful analysis, both theoretical and empirical, of their structure and effects is badly needed. Rules of Origin are a central feature of PTAs, and their use largely determines the effects of PTAs. This volume represents a significant contribution to our understanding of RoOs and their effects.'
Anne Krueger, *First Deputy Managing Director, International Monetary Fund*

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Cadot, Estevadeordal, Suwa-Eisenmann, and Verdier

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Rules of Origin in Regional Trade Agreements

CEPR

Olivier Cadot,
Antoni Estevadeordal,
Akiko Suwa-Eisenmann,
and Thierry Verdier

Part I: Rules of Origin: Theoretical Perspectives
1 Understanding Rules of Origin
2 The Impact of Rules of Origin on Strategic Outsourcing: an IO perspective

Part II: Rules of Origin in Regional Trade Agreements Around the World
3 Mapping and Measuring Rules of Origin Around the World
4 Rules of Origin for Services: Economic and Legal Considerations

Part III: The Political Economy of Rules of Origin
5 Rules of Origin as Export Subsidies
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7 Are Different Rules of Origin Equally Costly? Estimates from NAFTA
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Introduction

Olivier Cadot, Antoni Estevadeordal, Akiko Suwa, and Thierry Verdier

The spread of Preferential Trading Arrangements (PTAs) is rapidly altering the multilateral system created at Bretton Woods. The WTO reckons that if the sixty PTAs currently under negotiation are eventually formed, there will be in total twice as many of them as there are WTO members.[1] Just by themselves, the EU's future Economic Partnership Agreements[2] with ACP countries will cover over half of the WTO's membership. Seen from a different angle, the World Bank estimates that roughly one third of world trade takes place, at least nominally, on a preferential basis (World Bank 2005).[3] As encroachments to the MFN principle have multiplied—whether covered by GATT Article XXIV[4] or by particular waivers such as the one secured by the EU to cover the Cotonou Convention—new rules have gained prominence, among which those used to confer originating status to preferential exports, so-called Rules of Origin (RoOs).

The rise of regionalism has far-reaching implications not just for the multilateral trading system's philosophy but also for the day-to-day conduct of business. For good or for bad, preferential trading rules are of

[1] Two hundred and fifty-four PTAs have been notified so far, 124 to the GATT prior to 1994 and 130 to the WTO since 1995. In 2005, an estimated 300 will be in force. It should be kept in mind, however, that many of these agreements are essentially empty shells.

[2] The Economic Partnership Agreements (EPAs) currently under negotiation between the EU and the 77 African, Caribbean and Pacific (ACP) countries will replace the current Cotonou Convention (itself the successor of the Lomé Conventions) by end 2007. They will involve, *inter alia*, replacing the EU's unilateral preferences by a GATT-consistent free-trade zone.

[3] The proportion, however, drops to about 20% if one takes out lines for which MFN tariffs are zero.

[4] GATT Article XXIV allows WTO members to eliminate tariffs on a preferential basis provided that they do not simultaneously raise them against non-members and that 'substantially all trade' between preferential trading partners is liberalized, i.e. that they form a genuine free-trade area.

increasing relevance to traders on the ground.[5] To take but one example, a Mauritian garment today enjoys an average tariff preference of 11.9% on the European market provided that its originating status can be established. On the one hand, in a commodity sector this can mean a substantial cost advantage over MFN competitors. Moreover, tariff-free status combined with export-processing zone treatment in the source country speeds up customs clearance, adding to the cost advantage a time element that can prove critical in the garment industry's intense time-based competition. On the other hand, however, if RoOs impose the use of expensive local materials and burdensome administrative procedures to confer originating status, they can also render the preference margin worthless.

Thus, notwithstanding the classic debate about whether PTAs are good or bad for world welfare (i.e. whether they generate 'trade diversion' or 'trade creation'), how they are designed matters a lot if one is to understand how much market access they really confer. This is particularly important in view of the developmental justification often put forward in favor of North-South PTAs such as the United States' Africa Growth & Opportunity Act (AGOA) or the EU's Everything But Arms (EBA) initiative.

In parallel to the rise of preferential agreements, world trade has also been transformed by the rise of so-called 'vertical trade'. Anecdotal evidence supported by case studies[6] suggests that multinational companies have, over the last three decades, set up in many sectors and regions what Gordon Hanson called 'regional production networks', involving extensive outsourcing and the use of cross-border supply chains. Lesotho's garment industry, whose exports to the US have boomed at an annual rate of about 30% per year since the mid-1990s, is a case in point. Over 90% of Lesotho's exporting factories are owned and managed by East Asian nationals. They get large orders from US brands placed through company headquarters in Asia and use inputs provided by the parent companies in so-called CMT ('cut, make and trim') operations. A similar process, albeit on a less spectacular scale, is visible elsewhere in the world and provides much-needed employment for impoverished populations (in particular women in the case of the garment industry).[7] Overall Hummels *et al.*

[5] See the EU Commission's *Green Paper on Rules of Origin in preferential agreements* (CEC 2003) and part II of UNCTAD's report on trade preferences for LDCs (UNCTAD 2003).

[6] See, e.g., Ishii and Yi (1997) or Hummels, *et al.* (1998).

[7] Kenyan cut-flower exports to the EU have similarly boomed from $54 m to $139 m between 1997 and 2002. Early empirical studies (e.g. Feenstra and Hanson 1996, or Campa and Goldberg 1997) provided indirect evidence of these trends. Systematic statistical evidence of 'vertical trade' has been slower to emerge, as the necessary combination of trade and input-output data has become available only recently.

Table 1 Textile & Apparel exports under AGOA

	Exports to the US, HS61–62		AGOA util. rate 2003 (%)	Annual growth 1997–2003
	1997	2003		
Kenya	31.3	187.8	94	34.8
Lesotho	86.5	392.4	95	28.7
Mauritius	184.4	269.0	50	6.5
South Africa	70.9	231.8	54	21.8

Source: adapted from Stevens and Kennan (2004). Million US dollars.

(2001) estimate that 'vertical specialization accounts for up to 30% of world exports and has grown as much as 40% in the last twenty-five years' (p. 1).

Depending on their design, PTAs have the power to boost or hamper the development of these regional production networks. On the one hand, the experiences of Mauritius under Lomé and parts of sub-Saharan Africa under AGOA show that trade preferences can foster the emergence of North–South supply chains, in particular in the Textile and Apparel (T&A) sector (Table 1). On the other hand, stringent RoOs can prevent the smooth operation of these cross-border chains or foster the emergence of inefficient ones.

This volume brings together theoretical and empirical contributions to our understanding of how preferential RoOs affect trade flows and outsourcing decisions, how they vary across PTAs, why their legal form matters, and what political-economy forces shape them.

1. Theoretical perspectives

Pioneered by Grossman (1981),[8] the formal analysis of local-content protection is fairly recent, because it must draw on models of multistage production that are necessarily somewhat complex.[9] In the simplest possible setting, the combined effects of RoOs and tariff preferences on market access for the Southen partner of an FTA can be understood with

[8] Grossman (1982) studied so-called 'Offshore Assembly Provisions' (OAP) that, as their name indicates, grant special trade treatment to goods assembled offshore usually by domestic firms. The European Union for a while granted similar treatment to limited quantities of goods assembled in Central and Eastern Europe under the name of 'Outward Processing Treatment' (OPT) quotas. OAP and OPT have economic effects that are quite similar to those of Rules of Origin.

[9] The early work here is by Dixit and Grossman (1982).

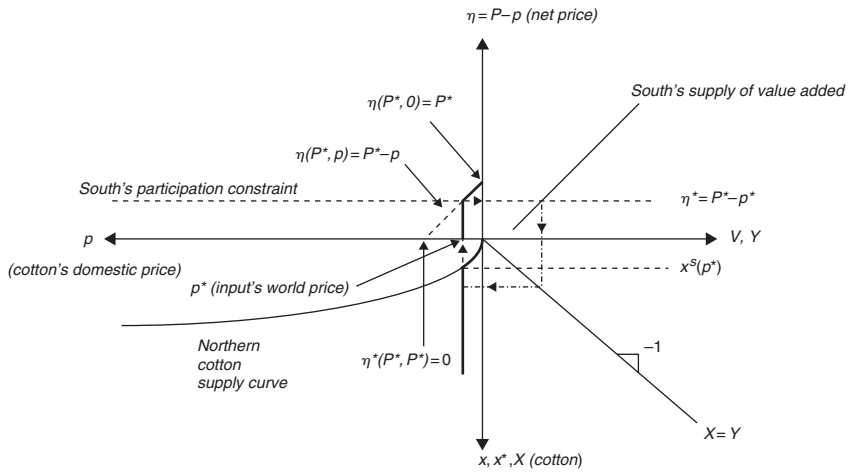

Fig. 1 Vertical trade in a two-stage framework.

the help of the four-quadrant diagram in Fig. 1. Consider a North-South FTA in which the South assembles shirts (Y) by combining value added (V) with cotton (X). The latter can be imported from either the Northern partner or the Rest of the World (ROW). The South does not produce cotton, whereas the North produces and protects both shirts and cotton, being import-competing in both sectors. Let x and x^* denote the South's use of Northern and ROW cotton respectively, so $x + x^* = X$. Southern shirt technology is Leontieff with a unit input-output coefficient, i.e. $Y = \min\{V, X\}$. In words, one shirt is made with unit of value added and one of cotton.

Value added is remunerated with what is left of sales revenue after subtracting the cost of cotton. Let P^* be the world price of a shirt and p^* that of a unit of cotton. At free trade, the 'net price' of a shirt (what is available to remunerate value added) is $\eta^* = P^* - p^*$. Let P and p be the domestic (intra-FTA) prices of shirts and cotton, respectively, and $\eta = P - p$ be the variable measured on the vertical axis of Fig. 1. Southern value added (or equivalently shirt output, as the two are by construction equal) is measured on the RHS's horizontal axis, and the curve in the first quadrant is the South's supply of value added (or, equivalently, of shirts).

Moving around clockwise, the induced demand for cotton is shown in the second quadrant as a 45° line (since $Y = X$ with a unit input-output coefficient). The vertical axis pointing downward thus measures the South's total cotton demand, from the US and from the ROW. With p, the

price of cotton, measured on the LHS's horizontal axis (pointing leftward), the curve in the third quadrant is the Northern supply of cotton. The quantity of Northern cotton bought by the South is just what the North can offer at world price p^*, $x^S(p^*)$, the rest being procured in the ROW. The proportion $x^S(p^*)/X$, which we will call r^* later on, is the South's *desired* regional value content.

The diagram is closed in the fourth quadrant by a line mapping the cotton price p into a net price η. To understand how it is constructed, start counterclockwise from the vertical axis by setting $P = P^*$ and $p = 0$. The net price is then $\eta = P^*$. Then raise p, i.e. slide to the left along the horizontal axis. As p goes up, the net price η goes down one-for-one, hence the downward-sloping line with slope -1 in the fourth quadrant. The line hits the horizontal axis when $p = P^*$.

The effect of tariff preferences in this diagram is straightforward (Fig. 2). Suppose that the price at which Southern shirt makers can sell in the North is now $P = P^* + \delta$, where δ is the difference between the North's MFN and preferential tariffs (the preference margin). The net price goes up by the amount of the tariff preference ($\eta = P - p^*$, so $\Delta\eta = \delta$) and the total demand for cotton goes up one-for-one with the supply of shirts. However, all the additional demand goes to ROW cotton, the price and supply of Northern cotton being unchanged at p^*. The slope of the dotted line in

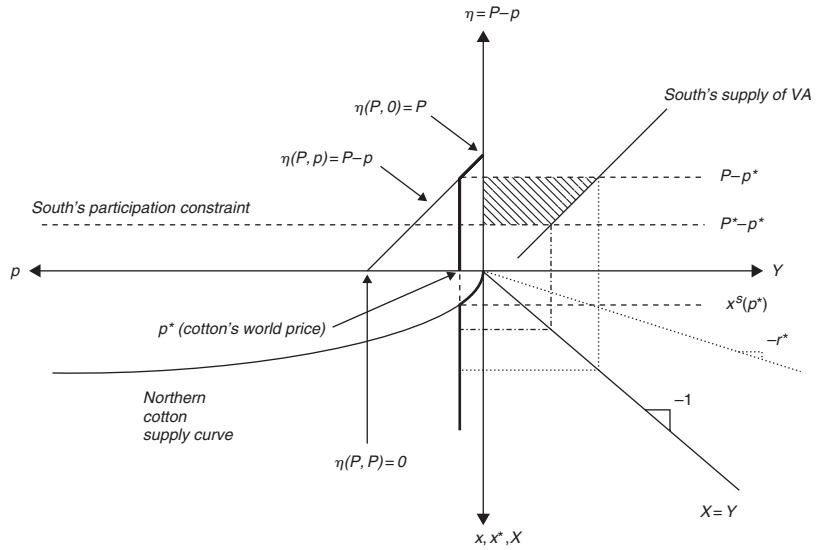

Fig. 2 The effect of tariff preferences.

the second quadrant gives the desired regional value content r^*, which has gone down as total cotton demand has gone up whereas local sourcing is unchanged. The hatched area in the first quadrant is the effect of the tariff preference on Southern producer surplus.

In this setting, a Regional Value Content (RVC), a particular form of RoO, can serve as a vehicle to force some of the additional cotton demand toward Northern suppliers (Fig. 3). Consider a new dotted line in the second quadrant with a slope $-r$ that is steeper than that of the 'desired' one (r^*). The 45° line would imply a 100% RVC, so rotating the dotted line clockwise (making it steeper) implies a more stringent RVC.

The action is now in the third quadrant, where the induced demand for Northern cotton forced by the RVC must be met at a higher domestic price p. The hatched area in that quadrant gives the additional producer surplus generated in the cotton sector by the RVC imposed in the downstream shirt sector. Abusing notation, take now the price of cotton used in the construction of the net price η on the vertical axis as the *average* price of the 'composite' cotton used by Southern producers, i.e. $\bar{p} = rp + (1 - r)p^*$. Thus $\eta = P - \bar{p}$, and the slope of η in terms of p is now $-r$ (measured leftward as before), at least as long as the RVC is binding, i.e. whenever $p > p^*$. This gives the line that closes the diagram.

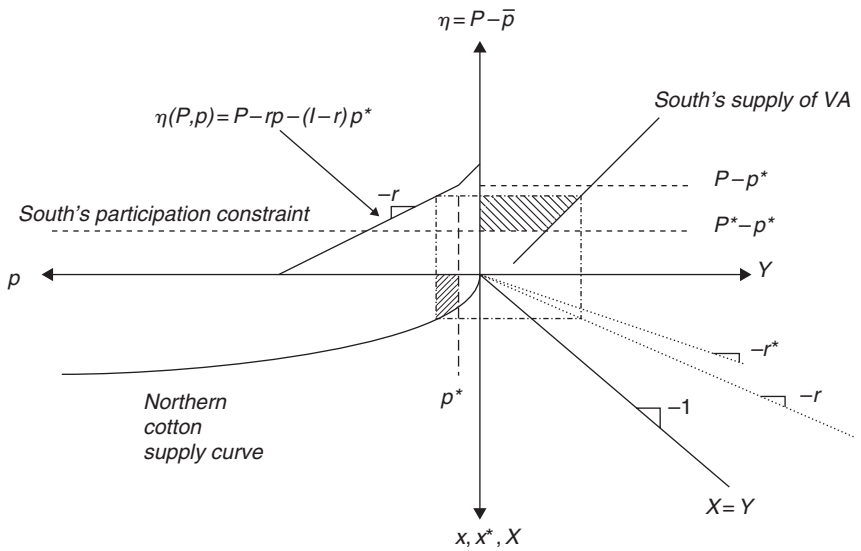

Fig. 3 Tariff preferences and RoO combined.

The interest of the diagram is that it highlights the RVC's twin effects: (i) partly offsetting the positive effect of tariff preferences on Southern producer surplus (see the reduction of the first quadrant's hatched area from Fig. 2 to Fig. 3); (ii) raising the surplus of upstream Northern producers (hatched area in the third quadrant of Fig. 3). In the extreme, the reduction in Southern producer surplus can eat up the whole benefit of tariff preferences, as indicated by the dotted 'participation constraint' line in Figs. 2 and 3.

At that point, as explained by Kala Krishna in the first chapter, a regime switch takes place and strange things happen. Drawing on her previous work with Jiandong Ju (Ju and Krishna 2002), she shows that as long as RoOs are not overly strict, tightening them raises the captive demand for local intermediates and hence their prices, as shown in Figs. 1–3. However when they become so strict as to make firms indifferent between using the preferential regime (tariff preferences cum RoO) or shipping under the MFN regime, tightening RoOs further reduces the number of exporters using the preferential regime and hence the price of intermediates, resulting in higher, not lower, imports. In her exhaustive survey of the analytics of RoOs, she also highlights several important theoretical laws; for instance the fact that they can shelter losers from the competitive effects of intrabloc trade.[10] Relatedly, she argues that the formulae upon which RoOs are based can make large differences on their impact.[11]

Matthias Thoenig and Thierry Verdier explore new territory with a game-theoretic analysis of the effect of RoOs on the outsourcing/relocation decisions of multinational companies, an issue that, as mentioned earlier, is at the heart of recent trends in international trade. Their analysis of strategic outsourcing is closely related to the classic industrial-organization literature on capacity investment. Using a model with a continuum of production stages a la Dixit–Grossman (1982), some or all of which can be outsourced, they show that competition induces oligopolistic firms to outsource too much from the point of view of their collective optimality. By putting mandatory limits on the proportion of

[10] This point was initially made by Krueger (1993), who noted that RoOs can 'export' trade protection from most to least protectionist FTA members. Cadot *et al*. (2001) also showed that RoOs segment the internal market of FTAs by preventing trans-shipment (and showed, incidentally, that they make it possible to generate welfare gains by selectively liberalizing member-state markets).

[11] Their legal form seems sometimes strikingly fine tuned to suit special interests. Brenton and Imagawa (forthcoming) note a particularly egregious case in which NAFTA's RoO for certain clothing products specifies that imported fabric must be 'of subheading 511111 or 511119, if hand-woven, with a loom width of less than 76 cm, woven in the United Kingdom in accordance with the rules and regulations of the Harris Tweed Association, Ltd, and so certified by the Association.' (p. 20)

the value chain that can be outsourced, RoOs can then act as commitment devices taking the oligopolists closer to their collusive solution. Good for them but not so, of course, for consumers. Thoenig and Verdier also show, interestingly, that in a world of incomplete contracts, RoOs can do some good by overcoming opportunism in subcontractor–client relationships.

2. The complexity of RoOs

Antoni Estevadeordal and Kati Suominen provide in chapter three a map guiding the reader through the maze of different RoOs. The difficulty of assessing the degree of stringency of this growing maze of rules explains, in part, the lack of solid empirical analysis on the economic effects of RoOs. One key distinction they make is between product-specific Rules of Origin (PSROs) and regime-wide rules. Prominent among the latter are 'cumulation' rules allowing the treatment of inputs from other PTA partners as originating. As for the former, they take myriad different forms.[12] A typical one is to require that the transformed good belong to a different tariff line or grouping than its imported inputs, but technical requirements, exceptions and so forth are plenty.[13] Estevadeordal and Suominen are able to compare the stringency of PSROs across PTAs by building on an index of PSRO restrictiveness first developed in Estevadeordal (2000) and based on a few simple classification principles.

Several observations emerge from their analysis. First and perhaps particularly strikingly, those PTAs that involve some of the most substantial intraregional trade flows, such as NAFTA and the EU's FTAs also tend to

[12] NAFTA's product-specific RoOs are so complex that Annex 301, where they are described, is over 300 pages long, whereas the Agreement itself is less than fifteen pages. The European Union's Single List of RoOs, which applies to all its preferential trade agreements (in order to make them compatible so that cumulation rules can be applied between all of them) is also quite complex. By contrast, some agreements, like the Latin American Integration Agreement (LAIA) or South & East Africa's COMESA, have simple rules applying across the board. AGOA is in the middle, with a uniform local-value-content requirement but very stiff yarn-forward rules applying to textiles and apparel (where they matter).

[13] Exceptions are often used to make RoOs selectively stringent in order to protect special interests. For instance, in her contribution to this volume Krishna cites a rule of origin of the Canada-US FTA on aged cheese according to which fresh milk is *not* an input conferring origin. Other examples are numerous. For instance, the EU's Single List confers origin to biscuits made of imported materials from any chapter *except* chapter eleven, which includes flour. Similarly, under NAFTA's RoOs, tomato ketchup qualifies as originating if it is made of imported inputs of any other chapter of the Harmonized System *except* subheading HS 200290 (tomato paste). This means that, in order to qualify, ketchup may contain imported fresh tomatoes but not imported tomato paste. This requirement is said to have been included in order to protect Mexican tomato-paste producers from Chilean competition (on this, see Brenton and Imagawa 2004 or Palmeter 1997).

have the highest restrictiveness values. Secondly, both NAFTA and the EU's PANEURO are characterized by PSROs that tend to be complex, heterogeneous, and more stringent for goods with roundabout production processes (where they do most harm).[14] This trend may become important also in most recent FTAs in Asia, where intraregional and intraindustry trade is particularly important. Meanwhile, PTAs formed among less-developed countries tend to have more uniform Rules of Origin across products and lower restrictiveness values overall.

Thirdly, they highlight, on the basis of data aggregated over all PTAs, a disturbing trend toward increasing stringency of PSROs. While the PTAs formed in the 1980s and early 1990s tended to employ relatively simple and non-restrictive PSROs and only few regime-wide rules, 'new-generation' PTAs have adopted stringent and selective regimes, although somewhat counterbalancing these features with facilitation provisions. However, recent agreements display high creativity in *ad hoc* mechanisms and instruments for the design and implementation of RoOs. For instance, the application of stringent PSROs can be temporarily suspended under 'short-supply' clauses allowing for lower regional value in cases of shortage of suitable intermediate products in the preferential area. Such clauses may bring welcome flexibility, but they may also encourage the use of otherwise stringent PSROs by creating a perception that not much damage can be done.

Estevadeordal and Suominen also develop a 'facilitation index' summarizing information on regime-wide rules. Many such rules, such as those permitting cumulation,[15] can somehow counteract the restrictiveness of

[14] However RoOs can also be extraordinarily complex for goods whose origin would appear at first sight straightforward to establish. The EU's RoO for fish under the Cotonou Agreement, for instance (which matters a lot for the Seychelles), requires not just that the fish be caught in the territorial waters of an eligible (ACP) country. In addition, the fish landing at an EU port should carry documentation establishing that the following criteria are met:

1. The vessel's captain, officers and at least 50% of its crew were nationals of an EU or ACP state;
2. It was registered in an EU or ACP state;
3. It sailed under the flag of an EU or ACP state;
4. It was at least 50% owned by nationals of an EU or ACP state (although under certain conditions leased or chartered vessels can qualify);
5. The chairman and the majority of the board members of the company owning the vessel were nationals of an EU or ACP state (Brenton and Imagawa 2004).

[15] 'Cumulation' can take three forms. Bilateral cumulation allows say a Mexican producer to use US inputs in the making of a product for re-export to the US. Diagonal cumulation would allow the use of Canadian inputs (third party within the preferential zone) under the same conditions. Full cumulation would allow non-originating inputs from the area (inputs themselves made from imported components *and* violating PSROs) to be treated as if they were originating provided that the last stage of transformation satisfies the PSROs.

product-specific RoO. For instance, the larger the area where a PTA member can cumulate value to its final goods subsequently exported to its PTA partners, the larger the pool of inputs and processes available for the country's producers, and the easier it becomes to comply with the product-specific RoO. This means that while restrictive product-specific RoO can be hypothesized to dampen trade, certain regime-wide RoO can compensate for it. Whereas higher values of the PSRO index mean more stringent rules, higher values of the facilitation index mean less restrictive cumulation rules.

Figure 4 shows a scatterplot of the two indices for the main PTAs currently in force. A loose correlation is apparent, suggesting that PTAs with generous cumulation rules tend, at the same time, to have stringent PSROs. This may suggest some political economy pressure by the export interests for loosening the RoO regime.

The figure, in which 'better' PTAs (characterized by light PSROs and generous regime-wide rules) lie to the Northwest, also illustrates the observation made earlier that neither NAFTA nor the EU's PANEURO look very good in terms of the mixture of PSRO and regime-wide rules they offer, by comparison with other PTAs.

Figure 4 shows the average level but not the dispersion of PSRO restrictiveness across sectors. It turns out that the most restrictive PTAs in terms of average level are also those with the greatest sectoral selectivity in PSROs. That the 'peak RoO stringency levels' tend to fall on the agricultural, food, and textile & apparel sectors suggests that RoO may not be

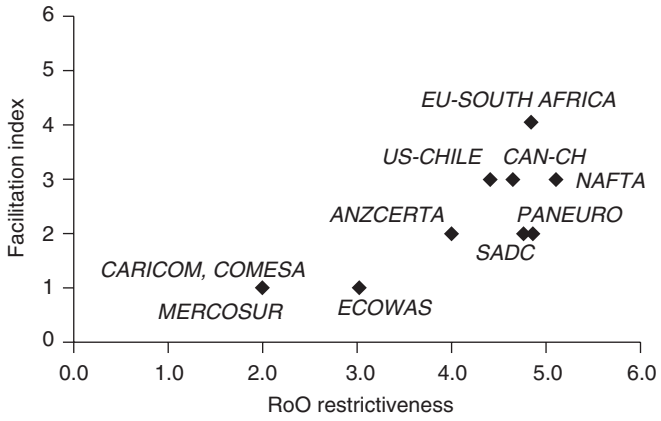

Fig. 4 PSRO restrictiveness and regime-wide facilitation, selected PTAs.

Source: Authors calculations.
RoO restrictiveness averages are simple averages.

a neutral instrument of preferential trade, but, rather, be driven by some of the same political-economy dynamics as other trade-protectionist instruments.

The issue raised by the proliferation of PTAs is not just the accompanying spread of restrictive RoO regimes around the world, but also their potential divergence. The more different regimes are from each other, the harder it will be to interlink existing PTAs with each other in the future—which, in turn, raises the risk of trade-diverting PTA blocs developing at the expense of global free trade. Abolishing RoO altogether (for example by bringing MFN tariffs to zero globally) would be the simplest means to counteract the potential negative effects of RoO. However, the politically more palatable option would be to harmonize preferential RoO at the global level. A good start might be limiting the types of RoO that can be employed in PTAs—in essence, setting RoO within a global band—and incorporating further facilitation mechanisms to the application of RoO regimes, for example, through generous cumulation provisions.

Interestingly, Americo Zampetti and Pierre Sauvé find that the RoOs applying to the producers of tradeable services tend to be less heterogeneous and opaque than those applying to goods, suggesting that rules for services have not (yet) become a battleground for special interests. However, they note that the rising importance of business-process outsourcing and other forms of service trade can quickly change the picture.

3. Rules of Origin and special interests

The value of RoOs as a protectionist device means that they can be endogenously determined by special interests. In their analysis of the political feasibility of FTAs, Grossman and Helpman (1995) focused on the exclusion of sensitive sectors and the length of phase-out periods. As noted by Duttagupta and Panagaryia (2003), RoOs are alternative instruments to win over special-interest support in favor of regional agreements.

Olivier Cadot, Antoni Estevadeordal and Akiko Suwa take some of the points raised by Anne Krueger and Kala Krishna to the test of structural estimation. If RoOs provide captive markets for upstream intermediates, they reason, lobbying by producers of those intermediates should have something to do with the observed pattern of product-specific RoOs. Using the classic common-agency approach to model influence activities, they derive the relation between endogenous tariffs and RoO stringency

implied by influence activities upstream. Then, combining Estevadeordal's index with input-output data, they test for this relationship and find that the stringency of NAFTA's RoOs indeed reflects a systematic pattern of influence by US producers of upstream intermediates. The benefit of tariff preferences for Mexican exporters being taken back by cost-raising RoOs, the system's beneficiaries and losers are respectively US intermediate-good makers and taxpayers. In other words, the combination of tariff preferences and RoOs replicates the effect of an export subsidy for intermediates, going around the prohibition of such subsidies under GATT rules.

The econometric evidence is, in this regard, consistent with the historical evidence on NAFTA's negotiations discussed by I. Mac Destler, who notes that NAFTA's RoOs in the automobile sector were the result of a fine balancing act between the interests of Detroit's car-makers who differed in their level of outsourcing. In textile, a 'triple transformation test' was elaborated. It required that to be treated as a North American product, a piece of apparel must have undergone three basic processes (fiber, cloth, clothing). This tight rule of origin seduced US mills in North and South Carolina by opening for them a captive market in Mexico, and thus, they gave up their traditional alliance with the domestic apparel industry.

As Destler notes, the rise of RoOs as an indirect tool of trade protection reflects both the increasing constraints weighing on the use of more traditional instruments and the slow erosion of the bipartisan consensus on free trade that dominated US postwar politics. To take the words of A. Spilimbergo, Rules of Origin are part of a Faustian pact, made to win the approval of a FTA from an originally reluctant constituency.

4. Measuring the impact of RoOs

Céline Carrère and Jaime de Melo take the econometric treatment of RoOs one step closer to what is arguably *the* key empirical question: how much do they cost? Their approach consists of extracting information on the cost of complying with RoOs by looking at preference utilization rates. Using simple assumptions on the relationship between utilization rates and compliance costs, they derive an *ad valorem* equivalent of 3.2% for NAFTA's RoOs. This may not seem terribly high but the figure is substantially higher for textile & apparel products, where tariff lines with 100% NAFTA utilization rates, which enjoy average tariff preferences of

9.7%, bear estimated RoO compliance costs of 5.6%.[16] Interestingly from a policy perspective, Carrère and de Melo's estimates suggest that technical requirements are the costliest forms of RoOs, no doubt because their opacity makes them easily to manipulate.

Pablo Sanguinetti and Eduardo Bianchi's analysis of Mercosur's RoOs is one of the few analyses available of South-South PTAs (together with the analysis of SADC by Flatters and Kirk later in this volume). The Free Trade Agreements (FTAs) signed by Chile and Bolivia with Mercosur (itself a Customs Union) provide a quasi-laboratory to analyse how FTA–CU differences affect the design of RoOs.[17] Sanguinetti and Bianchi also use the fact that external-tariff harmonization is imperfect in Mercosur to assess how external-tariff differences affect RoO stringency on the basis of an index à la Estevadeordal. As it turns out, large differences between external tariffs are associated with stiff RoOs, especially when the high-tariff country is Brazil, suggesting that the latter's political weight was prominent in the design of Mercosur's RoOs.

Joseph Francois departs from the usual analytical setting (in which inputs from different sources are perfect substitutes) by introducing a model à la Ethier in which input diversity raises productive efficiency. In this framework, RoOs reduce intra-FTA trade in final goods (because the cost of producing goods for export in the FTA is raised by RoOs) whereas the opposite is true for trade in intermediate products (because RoOs create a captive market for them). These effects are not at play in Custom Unions where RoOs are unnecessary. Francois takes these hypotheses to the data using automobile trade across a variety of PTAs, including NAFTA and the Turkey-EU Customs Union. He finds evidence that trade patterns are affected by RoOs in just the way predicted by the theory; in particular that NAFTA results in substantial trade diversion in intermediates.

Frank Flatters and Robert Kirk offer a detailed account of how the RoOs of the South African Development Community (SADC), initially simple and homogenous, have been progressively transformed by special-interest influence into a complex and *ad hoc* system. Their account of the negotiations interestingly highlights one of the running themes of this

[16] Carrère and de Melo's econometric estimates are in line with earlier, non-parametric estimates by Anson *et al.* (2005) that placed administrative costs at 1.8% and costs related to increased input prices at 4.4%.

[17] One of the primary justifications of RoOs is to prevent the trans-shipment of imported goods across a free-trade area's internal borders. Otherwise, member states with low external tariffs would act as ports of entry for the whole area and would deprive others of tariff revenue. However, in a CU, agreement on a Common External Tariff eliminates this problem and hence the need for RoOs. Their presence in Mercosur is thus in and by itself suggestive of other, presumably political-economy driven, motivations.

volume, namely the linkage between lobbying for RoOs and lobbying for other forms of protection (such as long tariff phase-outs). They also take argument with widespread developmental justifications for RoOs, showing for instance how SADC member countries with established processed-food manufacturers sometimes push for stiff RoOs knowing full well that other member countries have no production at all of the relevant upstream intermediates. The result is then to establish monopoly positions for the processed-food manufacturers and preclude intra-SADC trade.[18]

Finally, Paul Brenton and Takako Ikezuki examine the non-reciprocal preferences granted by the US, EU and Japan to the Least Developed Countries (LDCs). Assessing the 'value of preferences' on the basis of coverage,[19] preference margins and utilization rates, they find that it varies considerably across exporter countries and sectors. US preferences on Textile & Apparel appear most valuable to Lesotho, Kenya and Swaziland, whereas EU preferences appear most valuable to Swaziland, Malawi, Mauritius and the Seychelles, primarily on account of the sugar protocol (except for the Seychelles for which it is fish that matters). For most of the rest of sub-Saharan Africa, the value of preferences is only marginal, the reason being essentially the cost of complying with RoOs. Using an approach close to that of Anson *et al*. (2005)—namely using the average tariff-preference margin for lines with utilization rates strictly between zero and 100% as a proxy for RoO costs—they put the price tag of complying with RoOs at 6.7% in *ad valorem* equivalent for US-bound exports, 8.4% for EU-bound, and 5.6% for Japan-bound.

5. Concluding remarks

Where does this all leave us? As Destler notes, constraints weighing increasingly heavily on the use of traditional instruments of trade protection have led to a search for GATT-compatible substitutes. Those

[18] They cite the edifying example of ongoing negotiations on wheat flour, where South Africa is asking for a stiff local-content requirement, although this would essentially preclude flour trade among SADC members because wheat production is marginal in the area. The reason officially invoked on the South African side is to offset the high cost of local wheat, itself due to wheat protection. But, because millers have market power, they buy wheat from farmers at close to its world price. Thus, the wheat tariff as a matter of fact does *not* protect farmers and only serves as convenient justification for a stiff RoO that would reinforce the millers' market power.

[19] A preference scheme with given coverage can have very different implications for different exporting countries depending on their prior trading structures, as eligible tariff lines can be high-volume ones for a country and low-volume ones for another. Of course, once preferences are in place trading structures tend to adjust endogenously to take advantage of them.

include all forms of contingent protection (anti-dumping, safeguard and countervailing duties) but also made-to-measure Rules of Origin.

In a way, RoOs were the perfect protectionist instrument. Because their determination is a very technical exercise, it naturally calls for input from companies with interest in the outcome. The result is, unsurprisingly, often hard-wired. This has largely gone unnoticed because, for quite a while, RoOs have been allowed to grow and gain force behind the veil of technicality and expert-confined negotiations.

This book is an attempt to bring the issue closer to public scrutiny. RoOs, all contributors argue, can do substantial damage to economic efficiency; they can also make market-access promises largely empty. The evidence suggests that, pretty much as uniform tariffs were promoted in the 1980s by Washington-based institutions to put an end to the fine tuning of tariffs to suit special interests, clear, uniform and moderate RoOs should be the goal of future negotiations. The South, in particular, stands to be hurt by rules that can be easily manipulated to render vacuous market-access promises made by the North in the course of bilateral negotiations. At least for as long as regionalism stays in fashion, putting demands for clear and transparent RoOs at the center of ongoing and future market-access negotiations should be a priority for Southern countries. Conversely, negotiators in South-South agreements should resist the temptation of opening the Pandora's box of tailor-made RoOs.

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3

Mapping and measuring Rules of Origin around the world

A. Estevadeordal and K. Suominen

3.1 Introduction

Preferential trading agreements (PTAs) have proliferated spectacularly around the world over the past decade.[1] The wave of PTA formation has carried with it a colorful mosaic of trade disciplines—such as provisions on market access for goods and services, standards, safeguards, government procurement, and investment—to govern economic relations between the PTA partners. These various rules dispersed through PTAs are hardly inconsequential given that more than a third of global commerce takes place within PTAs.[2] Moreover, reverberating to firms' export, outsourcing, and investment decisions around the world, PTA disciplines arbitrate both actual and potential trade and investment flows within PTAs—and between PTAs and the rest of the world (ROW).

Yet, the richness of the PTA universe notwithstanding, there are astonishingly few rigorous efforts to disaggregate PTA agreements in order to analyse the operation and effects of the various rules they carry.[3] This,

[1] PTAs include free trade agreements, customs unions, common markets, and single markets. Some 250 PTAs had been notified to the World Trade Organization (WTO) by the end of 2002; of these, 130 were notified after January 1995. The WTO expects the number of PTAs to soar to nearly 300 by the end of 2005.

[2] When unilateral preferential schemes such as the Generalized System of Preferences (GSP) are accounted for, no less than 60 per cent of world trade is estimated to be conducted on a preferential basis. Importantly, the unilateral preferential programs carry many of the same disciplines as PTAs.

[3] The few mappings of PTA disciplines include WTO (1998, 2002a,b), IADB (2002), and Suominen (2004) produced in tandem with this chapter. The few existing rigorous, scholarly studies on the determinants of PTA provisions (beyond the contributions on Rules of Origin

in turn, implies that (1) very little is known about the compatibility of PTA agreements with one another or with the multilateral WTO Agreements; (2) the political economy sources of the divergent contractual formats of PTAs remain unexplored; and (3) analysts have yet to disentangle the respective economic effects of the different PTA disciplines from each other, let alone from the effects of variables beyond PTAs. The lack of understanding of the various component parts of the rapidly burgeoning PTA universe severely undercuts the credibility and usefulness of the arguments of both those who view PTAs as discriminatory instruments, hostage to protectionist interests that work to obstruct global trade liberalization, and those who regard PTAs as containing a liberalizing logic conducive to multilateral opening.

The purpose of this chapter is to break new ground in dissecting PTAs by focusing on Rules of Origin (RoO), a crucial yet poorly understood market access discipline included in virtually every PTA. The economic justification for RoO is to curb trade deflection—to avoid products from non-PTA members from being trans-shipped through a low-tariff PTA partner to a high-tariff one. As such, RoO are an inherent feature of free trade agreements (FTAs) where the member states' external tariffs diverge and/or where the members wish to retain their individual tariff policies *vis-à-vis* the ROW. RoO are also widely used in customs unions (CUs), either as a transitory tool in the process of moving toward a common external tariff (CET), or as a more permanent means of covering product categories where reaching agreement on a CET is difficult, for instance due to large tariff differentials between the member countries. Thus, basically all PTAs contain rules for establishing the origin of goods.[4] RoO are not only a central facet of preferential trading today, but also at the heart of many ongoing PTA negotiations, such as the 34-country talks to establish the Free Trade Area of the Americas (FTAA), and the European Union-Southern Common Market (Mercosur) negotiations to connect the world's two largest customs unions. In addition, RoO are gaining growing policy attention at the multilateral level: in preparation for the Doha Trade Round, the WTO's Committee on Regional Trade Agreements has for the

in this volume) tend to center on a single PTA and examine intersectoral variation in its market access provisions. See Milner (1997); Kowalczyk and Davis (1998); Olarreaga and Soloaga (1998); and Estevadeordal (2000). For the effects of PTAs' market access provisions, see Estevadeordal and Robertson (2002) and Ghosh and Yamarik (2003).

[4] The Asia-Pacific Cooperation (APEC) forum is a prominent exception, with its members employing their respective domestic RoO. APEC is based on a principle of open regionalism—extending tariff preferences on an MFN basis—which renders the need for preferential RoO obsolete.

first time raised preferential RoO to a systemic issue in the negotiation agenda.

Since a failure to meet the RoO disqualifies an exporter from the PTA-conferred preferential treatment, RoO can and must be seen as a central market-access instrument reigning over preferential trade. Notably, the relevance of RoO as gatekeepers of commerce can accentuate over time: RoO remain in place even after preferential tariffs have been phased out. But what renders RoO particularly relevant is that they are hardly a neutral instrument: given that RoO can serve as an effective means to deter transshipment, they can tempt political-economy uses well beyond the efforts to avert trade deflection. Indeed, RoO are widely considered a trade-policy instrument that can work to offset the benefits of tariff liberalization.[5] Often negotiated at up to 8- or 10-digit levels of disaggregation, RoO, like the tariff, make a superbly targetable instrument. Moreover, that RoO are generally defined in highly technical terms rather than assigned a numerical value entails that they can be tailored for each individual product differently, and that they are not nearly as immediately quantifiable and comparable across products as the tariff is.

It is the use of RoO as a political economy instrument that helps account for the choice of RoO to govern preferential economic exchange—for the integrating governments' willingness to expend time and resources on the tedious, technical, and often highly contentious crafting of RoO protocols. After all, governments could completely forego using RoO by entering into a CU or by excluding the potentially trade-deflecting economic sectors from the PTA's coverage. Yet, the bulk of PTAs employ RoO, and RoO of widely different types and combinations.

Notwithstanding RoO's function of refereeing preferential market access, potential uses for distributive purposes, complexity in existing PTAs and centrality in ongoing PTA negotiations, and increasing relevance on the multilateral agenda, the global RoO panorama remains largely unexplored.[6] It is the task of this chapter to mend this gap. We present a

[5] Most prominently, RoO can be employed to favor intra-PTA industry linkages over those between the PTA and the ROW, and, as such, to indirectly protect PTA-based input producers *vis-à-vis* their extra-PTA rivals (Krueger 1993; Krishna and Krueger 1995). As such, RoO are akin to a tariff on the intermediate product levied by the importing country (Falvey and Reed 2000; Lloyd 2001), and can be used by one PTA member to secure its PTA partners' input markets for the exports of its own intermediate products (Krueger 1993; Krishna and Krueger 1995). Furthermore, given that RoO hold the potential for increasing local sourcing, governments can use RoO to encourage investment in sectors that provide high value added and/or jobs (Jensen-Moran 1996; Hirsch 2002).

[6] The exceptions are WTO (2002a), Estevadeordal and Suominen (2003), and Suominen (2004) produced in tandem with this chapter.

global mapping of the existing RoO regimes, and put forth an analytical coding scheme for the types of product-specific and regime-wide RoO employed in these regimes. The most immediate contribution of this chapter is to advance the understanding of the RoO regimes around the world. Except for Suominen (2004) produced in tandem with this chapter, there are no comparable mappings; the contribution here is the first of its kind.[7] The analytical tools developed here are already employed in empirical work, both in our efforts to capture the global trade effects of RoO,[8] and in Estevadeordal, López-Córdova and Suominen (2005). The Impact of NAFTA's Market Access Provisions on the Location of Foreign Direct Investment in Mexico. Mimeograph.] of this book that focuses on RoO's effects on investment. This chapter also strives to inspire further work aimed at disaggregating preferential trading arrangements into their component parts—a task that is absolutely crucial for understanding the implications of regionalism for the global economic system, as well as for crafting nuanced, well-informed, and fruitful policy prescriptions concerning PTAs.

The first section of this chapter presents the different types of product-specific and general RoO used in RoO regimes. The second section examines the prevalence of the different types of RoO in a hundred integration schemes in the world. Section three puts forth a methodology for developing analytical measurements of the degree of restrictiveness of product-specific RoO and flexibility provided by regime-wide RoO, and uses these measures to draw comparisons within and across RoO regimes as well as over time. The fourth section discusses the RoO innovations. Section five concludes.

3.2 Types of Rules of Origin in FTAs

There are two types of Rules of Origin, non-preferential and preferential RoO. Non-preferential RoO are used to distinguish foreign from domestic products in establishing anti-dumping and countervailing duties, safeguard

[7] WTO (2002a) does provide a charting of various features of RoO regimes. However, this chapter goes well beyond the WTO's study by including a greater number of regimes, analysing in much greater detail the universe of product-specific RoO, examining a broader range of regime-wide RoO, discussing RoO innovations, and, perhaps most importantly, developing methodologies for capturing the relative restrictiveness of RoO and RoO regimes.

[8] See Estevadeordal and Suominen (2004a) and Suominen (2004) for trade effects; see Estevadeordal (2000) and Suominen (2004, 2003) for the political economy of restrictiveness of RoO.

measures, origin-marking requirements, and/or discriminatory quantitative restrictions or tariff quotas, as well as in the context of government procurement. Preferential RoO, meanwhile, define the conditions under which the importing country will regard a product as originating in an exporting country that receives preferential treatment from the importing country. PTAs, in effect, employ RoO to determine whether a good qualifies for preferential treatment when exported from one member state to another.

Both non-preferential and preferential RoO regimes have two dimensions: sectoral, product-specific RoO, and general, regime-wide RoO. We discuss each in turn.

A. Product-specific RoO

The Kyoto Convention recognizes two basic criteria to determine origin: wholly obtained or produced, and substantial transformation.[9] The wholly obtained or produced-category applies only to one PTA member, and asks whether the commodities and related products have been entirely grown, harvested, or extracted from the soil in the territory of that member, or manufactured there from any of these products. The rule of origin is met through not using any second-country components or materials. Most countries apply this strict and precise definition.

The substantial-transformation criterion is more complex, involving four main components that can be used as standalone or in combinations with each other. The precision with which these components define RoO in PTAs today contrasts sharply with the vagueness of the substantial transformation-criterion as used by the United States since 1908 until the inception of the Canada-US Free Trade Agreement (CUSFTA) in 1989 and, subsequently, the North American Free Trade Agreement (NAFTA) in 1994 (Reyna 1995: 7).[10]

The first component of the substantial transformation criterion is a change in tariff classification (CTC) between the manufactured good and the inputs from extra-PTA parties used in the productive process. The CTC may require the product to alter its chapter (2 digits under the Harmonized

[9] The Revised Kyoto Convention is an international instrument adopted by the World Customs Organization (WCO) to standardize and harmonize customs policies and procedures around the world. The WCO adopted the original Convention in 1974. The revised version was adopted in June 1999.

[10] The old criterion basically required the emergence of a 'new and different article' from the manufacturing process applied to the original article. It was, however, much criticized for allowing—and indeed requiring—subjective and case-by-case determinations of origin (Reyna 1995: 7).

System), heading (4 digits), subheading (6 digits) or item (8–10 digits) in the exporting PTA member.

The second criterion is an exception attached to a particular CTC (ECTC). ECTC generally prohibits the use of non-originating materials from a certain subheading, heading, or chapter.

The third criterion is value content (VC), which requires the product to acquire a certain minimum local value in the exporting country. The value content can be expressed in three main ways: as the minimum percentage of value that must be added in the exporting country (domestic or regional value content, RVC); as the difference between the value of the final good and the costs of the imported inputs (import content, MC); or as the value of parts (VP), whereby originating status is granted to products meeting a minimum percentage of originating parts out of the total.

The fourth RoO component is technical requirement (TECH), which requires the product to undergo certain manufacturing operations in the originating country. TECH essentially prescribes or prohibits the use certain input(s) and/or the realization of certain process(es) in the production of the good.[11] It is a particularly prominent feature in RoO governing textile products.

The change-of-heading requirement is the staple of PTAs. It is used either as standalone or in tandem with other RoO criteria. Also frequently used are the import content (usually ranging from 30 to 60 per cent), value of parts, and technical requirements. Adding analytical complexity, albeit administrative flexibility, is that many RoO regimes provide two alternative RoO for a given product, such as a change of chapter or, alternatively, a change of heading plus RVC.

B. Regime-wide RoO

Besides product-specific RoO, RoO regimes vary by the types of general RoO they employ—including in the degree of *de minimis*, the roll-up principle, and the type of cumulation.

First, most PTAs contain a *de minimis* rule, which allows for a specified maximum percentage of non-originating materials to be used without affecting origin. The *de minimis* rule inserts leniency in the CTC and TECH criteria by making it easier for products with non-originating inputs to qualify.

[11] TECH can be highly discretional due to complicating and evaluation of sufficient transformation in the production of the good.

Secondly, the roll-up or absorption principle allows materials that have acquired origin by meeting specific processing requirements to be considered originating when used as input in a subsequent transformation. That is, when roll-up is allowed, non-originating materials are not taken into account in the calculation of the value added of the subsequent transformation.

Thirdly, cumulation allows producers of one PTA member to use materials from another PTA member (or other members) without losing the preferential status of the final product. There are three types of cumulation. Bilateral cumulation operates between the two PTA partners and permits them to use products that originate in the other PTA partner as if they were their own when seeking to qualify for the PTA-conferred preferential treatment in that partner. Basically, all RoO regimes apply bilateral cumulation. Under diagonal cumulation, countries tied by the same set of preferential origin rules can use products that originate in any part of the common RoO zone as if they originated in the exporting country. Full cumulation extends diagonal cumulation. It provides that countries tied by the same RoO regime can use goods produced in any part of the common RoO zone even if these were not originating products: any and all processing done in the zone is calculated as if it had taken place in the final country of manufacture. As such, diagonal and full cumulation can notably expand the geographical and product coverage of a RoO regime.[12] Table 3.2 illustrates the frequency of general RoO provisions around the world.

Whereas *de minimis*, roll-up, and cumulation allow for leniency in the application of RoO, there are three provisions that may have the opposite effect and increase the stringency of RoO.[13]

First, most PTAs contain a separate list indicating the operations that are in all circumstances considered insufficient to confer origin, such as preservation during transport and storage, as well as simple operations of cleaning, sorting, painting, packaging, assembling, and marking and labelling.

Secondly, many PTAs prohibit duty drawback—preclude the refunding of tariffs on non-originating inputs that are subsequently included in a

[12] In bilateral cumulation, the use of the partner-country components is favored; in diagonal cumulation, all the beneficiary trading partners of the cumulation area are favored. Full cumulation is more liberal than diagonal cumulation by allowing a greater use of third-country materials. However, it is rarely allowed in RoO regimes.

[13] To be sure, non-members to a cumulation area may view the cumulation system as introducing another layer of discrimination by virtue of its providing incentives to the member countries to outsource from within the cumulation zone at the expense of extra-zone suppliers.

final product that is exported to a PTA partner. Many developing countries employ drawback in order to attract investment and to encourage exports; however, drawback in the context of a PTA is viewed as providing a cost advantage to the PTA-based producers who gear their final goods to export over producers selling their final goods in the domestic market.[14] The end of duty drawback entails an increase in the cost of non-originating components for PTA-based final-goods producers. As such, the end of drawback in the presence of cumulation may encourage intra-PTA producers to shift to suppliers in the cumulation area (WTO 2002a).

Thirdly, a complex method of certifying the origin of goods can impose high administrative costs on exporters. The main certification methods are self-certification by exporters, certification by the exporting country government or an industry umbrella group to which the government has delegated the task of issuing the certificate, and a combination of the 'private' self-certification and the 'public' governmental certification. The more numerous the bureaucratic hurdles and the higher the costs for an exporter to obtain an origin certificate, the lower the incentives to seek PTA-conferred preferential treatment.

3.3 Rules of Origin around the world

This section turns to examining the great variety of combinations of product-specific and regime-wide RoO used in selected PTAs in Europe, the Americas, Asia-Pacific, Africa, and the Middle East, as well as in PTAs between these regions. We subsequently discuss the structure of non-preferential RoO. The latter part of this section presents an analytical, comparative assessment of (1) the relative restrictiveness of the product-specific RoO governing different economic sectors in the different RoO regimes; and (2) the degree of flexibility instilled in the various RoO regimes by the regime-wide RoO.

A. Comparing the structure of RoO regimes in five regions

i. Europe: expansion of the PANEURO system

The RoO regimes employed across the EU's FTAs are highly uniform *vis-à-vis* each other. This is due largely to the European Commission's recent

[14] Cadot *et al.* (2001) show that duty drawback may have a protectionist bias due to reducing the interest of producers to lobby against protection of intermediate products.

drive to harmonize the EU's existing and future preferential RoO regimes in order to facilitate the operations of EU exporters dealing on multiple trade fronts, and to pave the way for particularly the EU's East European FTA partners to draw greater benefits from the EU-provided preferential treatment via diagonal cumulation—that was previously precluded by the lack of compatibility among the EU's RoO regimes. The harmonization efforts pertained to product-specific and regime-wide RoO alike. They extended to EU's RoO protocols with the European Free Trade Association (EFTA) countries that dated from 1972 and 1973, as well as across the EU's FTAs forged in the early 1990s in the context of the Europe Agreements with Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Romania.[15] The work culminated in 1997 in the launch of the Pan-European (PANEURO) system, which established identical RoO protocols and product-specific RoO across the EU's existing FTAs, thereby providing for diagonal cumulation among the participating countries. The Commission's regulation 46 of January 1999 reiterates the harmonized protocols, outlining the so-called single-list RoO. Overall, the PANEURO RoO are highly complex, combining CTC mainly at the heading level with exceptions, VC, and TECH, and varying markedly across products.[16]

Since 1997, the PANEURO model has become incorporated in the EU's newer FTAs, including the Euro-Mediterranean Association Agreements, the Stabilization and Association Agreements with Croatia and the Former Yugoslav Republic of Macedonia, the EU-Slovenia FTA, as well as the extra-regional FTAs with South Africa, Mexico, and Chile. Also, the RoO of the EU's generalized system of preferences (GSP) and the 2000 Cotonou Agreement with the African, Caribbean, and Pacific (ACP) developing countries approximate the single-list, PANEURO model. EFTA's recently concluded FTAs with Mexico and Singapore follow the PANEURO model, albeit providing an additional alternative rule in selected sectors—such as plastics, rubber, textiles, iron and steel products, and some machinery products.

[15] See Driessen and Graafsma (1999) for a review.

[16] The harmonized RoO do not represent a dramatic break with those of the pre-1997 era. For example, the RoO in nearly 75 per cent of the products (in terms of tariff subheadings) in PANEURO and the original EU-Poland RoO protocol published in 1993 are identical. Both the new and the old versions combine CTC with VC and/or TECH. Indeed, EU RoO feature remarkable continuity: the RoO of the European Community-Cyprus FTA formed in 1973 are strikingly similar to the PANEURO model used today. One notable difference between the older and the newer protocols is that the latter allow for an optional way of meeting the RoO for about 25 per cent of the products, whereas the former specify mostly only one way of meeting the RoO. The second option, alternative RoO, much like the first option RoO, combines different RoO criteria; however, the most frequently used alternative RoO is a standalone import-content criterion.

Importantly, the EU's eastward enlargement 1 May 2004 terminated the FTAs forged among the 10 new member states and also between them and the EU. The new members became incorporated in the EU customs union; as such, they set out to apply the EU's CET, with their overall external tariffs dropping from nine to four per cent, and also assumed the rights and obligations of the FTAs that the EU has in place with non-member countries.

ii. The Americas: four RoO families

There is much more variation across RoO regimes in the Americas. Nevertheless, distinct RoO families can be identified (Garay and Cornejo 2002). One extreme is populated by the traditional trade agreements such as the Latin American Integration Agreement (LAIA), which uses a general rule applicable across the board for all tariff items (a change in tariff classification at the heading level or, alternatively, a regional value content of at least 50 per cent of the FOB export value of the final good). The LAIA model is the point of reference for RoO used in the Andean Community (CAN) and Caribbean Community (CARICOM). At the other extreme lie the so-called new-generation PTAs such as NAFTA, which is used as a reference point for the US–Chile, US–Central America and Dominican Republic (CAFTA), Mexico–Costa Rica, Mexico–Chile, Mexico–Bolivia, Mexico–Nicaragua, Mexico–Northern Triangle (El Salvador, Guatemala, and Honduras), Chile–Canada, and Mexico–Colombia–Venezuela (or G-3) FTAs. The RoO regimes in these agreements may require a change of chapter, heading, subheading or item, depending on the product in question. In addition, many products combine the change of tariff classification with an exception, regional value content, or technical requirement. The NAFTA model, particularly the versions employed in the US–Chile FTA and CAFTA, is also widely viewed as the likeliest blueprint for the RoO of the Free Trade Area of the Americas (FTAA).

Mercosur RoO, as well as RoO in the Mercosur–Bolivia and Mercosur–Chile FTAs fall between the LAIA–NAFTA extremes. They are mainly based on change of heading and different combinations of regional value content and technical requirements. The Central American Common Market's (CACM) RoO regime can be seen as being located between those of the Mercosur and NAFTA: it uses chiefly change in tariff classification only, but in more precise and diverse ways than Mercosur due to requiring the change to take place at either the chapter, heading, or subheading level, depending on the product in question. The recently concluded CAFTA will, once ratified by all parties, coexist with the CACM's market access mechanisms under the so-called multilateralism principle, which allows

Central American producers to choose between the CACM and CAFTA market access regimes when exporting to the other Isthmus markets.

Notably, unlike the EU's extra-European FTAs that follow the PANEURO system, US bilateral FTAs with extra-Hemispheric partners—Jordan and Israel—diverge markedly from the NAFTA model, operating on VC alone. However, the RoO of the US–Singapore FTA are again more complex, resembling the NAFTA RoO. Similarly, the RoO of the recently forged Chile–South Korea FTA also feature a high degree of sectoral selectivity à la NAFTA, and, indeed, the US–Chile FTA. Nonetheless, the RoO of the Chile–Korea regime are overall less complex than either NAFTA or US–Chile RoO, and also more reliant on the change in heading criterion than NAFTA, which has an important change in chapter component, and US–Chile FTA, which features an important change in subheading component.

iii. Africa, Asia, Middle East: toward sectoral selectivity?

The relative complexity of RoO in Europe and the Americas stands in contrast to the generality of RoO in many Asian, African, and Middle Eastern PTAs. Some of the main integration schemes in these regions—the ASEAN Free Trade Area (AFTA), Australia–New Zealand Closer Economic Relations Trade Agreement (ANZCERTA), Singapore–Australia Free Trade Agreement (SAFTA), and South Pacific Regional Trade and Economic Cooperation (SPARTECA) in Asia–Pacific; the Economic Community of West African States (ECOWAS), Common Market for Eastern and Southern Africa (COMESA), and Namibia–Zimbabwe FTA in Africa; and the Gulf Cooperation Council (GCC) in the Middle East—are based on an across-the-board VC rule that, when defined as RVC, ranges from 25 per cent (in Namibia–Zimbabwe FTA) to 50 per cent (ANZCERTA). Some of the agreements allow, or, indeed, require, RoO to be calculated on the basis of import content. Most of these regimes also specify an alternative RoO based on the CTC criterion; most often the alternative involves a change in heading or, in the case of ECOWAS that has a relatively low RVC requirement of 30 per cent, change in subheading.

However, the more recent RoO regimes in both Africa and Asia-Pacific carry RoO of high degrees of sectoral selectivity. The Southern African Development Community (SADC) RoO approximate the PANEURO model both in the **types** of sectoral RoO and in sectoral selectivity. Moreover, there have been some initiatives to renegotiate COMESA RoO; such attempts may well eventually lead to regimes of greater complexity. On the Asian front, the RoO of the Japan-Singapore Economic Partnership Agreement (JSEPA) are also complex, as evinced by the more than

200-page RoO protocol. However, much like in the Chile-Korea FTA, nearly half of JSEPA RoO are based on a simple change in heading criterion, which makes the regime much less complex than the PANEURO and NAFTA models. Furthermore, for many products JSEPA introduces an alternative, usually PANEURO-type, free-standing VC rule, which instills generality and flexibility to the agreement.

The intercontinental RoO regimes of the US–Singapore and Chile–Korea FTAs have delivered additional complexity to the Asia–Pacific RoO theater. RoO in these agreements tend to follow the NAFTA model yet be notably less complex overall, featuring a strong change of heading component. The future Mexico–Singapore, Canada–Singapore, Mexico–Korea, Mexico–Japan, and US–Australia FTAs, among others, will likely compound this trend. Meanwhile, further European overtures to the Asian front will likely bring the PANEURO model to accompany the NAFTA model in the region.

B. Non-preferential RoO

Non-preferential RoO are used for purposes distinct from those of preferential rules. Even if a country did not use preferential RoO, it would still apply some type of non-preferential RoO. Unlike preferential RoO that have thus far escaped multilateral regulation, non-preferential RoO have been under a process of harmonization since 1995 as mandated by the Uruguay Round's Agreement on Rules of Origin (ARO). The harmonization work, propelled precisely by growing concerns about the divergent national RoO's effects on trade flows, has been carried out under the auspices of the Committee on Rules of Origin (CRO) of the World Trade Organization (WTO) and the Technical Committee on Rules of Origin (TCRO) of the Brussels-based World Customs Organization. The latter has been responsible for the technical part of the work, including discussions on the RoO options for each product.

The harmonization drive was initially scheduled for completion by July 1998. However, the deadline has been extended several times since then. The Technical Committee's work was concluded in 1999, with about 500 pending issues that could not be solved at the technical level being sent to the CRO in Geneva. As of July 2003, the process at the WTO had yet to reach a solution to 94 core policy issues; these affect an estimated fifth of the tariff subheadings of the entire tariff universe. The General Council at the time extended the deadline for completion of the issues to July 2004, and agreed that following resolution of these core policy issues, the CRO would complete its remaining work by the end of 2004. In their current

structure, the non-preferential RoO approximate the PANEURO and NAFTA models in sectoral specificity, yet are less demanding than either of the two main RoO regimes. However, since several issues are still contested at the WTO, the final degree of complexity and restrictiveness of the non-preferential RoO remains to be gauged.

C. Depicting product-specific RoO around the world

Figure 3.1 focuses on the first RoO component, the CTC criterion, in the RoO regimes of 29 PTAs around the world. These are three of the EU's PTAs (PANEURO—where the RoO are basically fully identical to those of the EU–South Africa FTA—and the EU–Mexico and EU–Chile FTAs); EFTA-Mexico FTA where RoO approximate the EU–Mexico RoO model; seven FTAs drawing on the NAFTA RoO model that is gaining prominence in the Western Hemisphere (NAFTA, US–Chile, CAFTA, Group of Three, and Mexico–Costa Rica, Mexico–Bolivia, and Canada–Chile FTAs); CACM-Chile FTA; Mercosur–Chile and Mercosur–Bolivia FTAs; LAIA; seven PTAs in Asia–Pacific (ANZCERTA, SAFTA, SPARTECA, AFTA, Bangkok Agreement, JSEPA, and Chile–Korea FTA); four PTAs in Africa (ECOWAS, COMESA, Namibia–Zimbabwe FTA, and SADC); the Gulf Cooperation Council in the Middle East; and US extrahemispheric FTAs with Jordan and Israel. The two final sets of bars depict two potential outcomes of the harmonization process of the non-preferential RoO (as set to their 'lowest' and 'highest' levels of stringency, which will be discussed in the next section).[17]

The change-of-heading criterion dominates EU RoO, whereas the RoO built upon the NAFTA RoO regime are based on change of heading and change of chapter criteria at relatively even quantities. The US–Chile FTA and CAFTA stand somewhat apart from the NAFTA format for requiring only change in subheading for a substantial number of tariff lines. Meanwhile, the Chile-CACM FTA diverges from the NAFTA model due to its marked change in heading-component, as do the Japan–Singapore and Chile–Korea FTAs. The other Asian PTAs considered here stand out for their generality—for using an across-the-board value-content requirement exclusively. Except for the SADC, African RoO regimes are also marked by general, across-the-board CTC RoO, as are LAIA and Mercosur's FTAs with Chile and Bolivia that employ the change-of-heading criteria across the RoO universe. In contrast to the PANEURO and NAFTA models, non-preferential RoO feature also a prominent change-of-subheading component.

[17] The figure is based on the first RoO only when two or more possible RoO are provided for a tariff subheading.

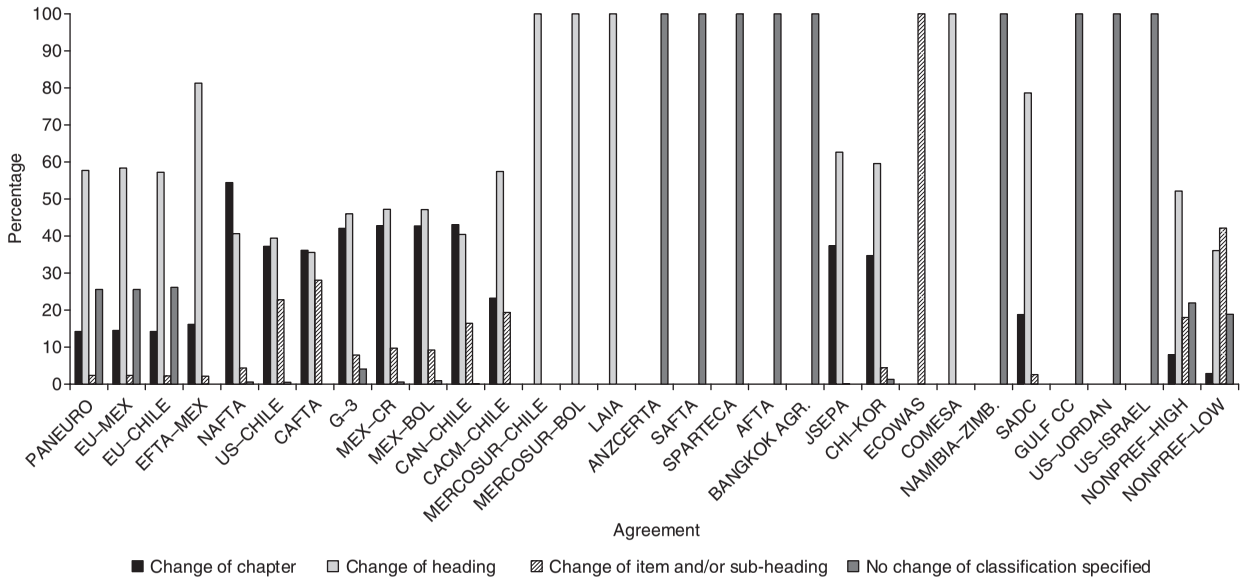

Fig. 3.1 Distribution of CTC criteria by agreement.

Source: Authors' calculations on the basis of PTA texts.

Another notable difference between the various PTAs is that some, such as ANZCERTA, employ the VC criterion across sectors, completely foregoing the use of the CTC-criterion. The EU does this in about a quarter of its RoO; the bulk (more than 80 per cent) of these RoO are based on the wholly obtained criterion used particularly in agricultural products, or on the import-content rule that imposes a ceiling of 40–50 per cent to non-originating components of the ex-works price of the final product. The standalone import content RoO are used particularly frequently for optics, transportation equipment, and machinery and electrical equipment. Another idiosyncrasy of the EU RoO, yet one that escapes the figure here, is the use of the so-called 'soft RoO' in more than a quarter of the RoO requiring a change of heading and about a sixth of the RoO requiring a change of chapter. Soft RoO allows the use of inputs from the same heading (or chapter) up to a certain share of the price of the final product even when the RoO requires a change of heading (or change of chapter). The share is generally between 5 and 20 per cent.

Table 3.1 centers on the tariff subheadings governed by VC (including combinations of VC with CTC, and VC when employed as an alternative to a CTC criterion) in various RoO regimes, and, in particular, on the level of the VC criterion. The most usual level of VC is 40–50 per cent, whether defined as MC or RVC. However, in the US–Chile FTA, CAFTA, and Chile–CACM FTA, RVC is generally set at lower levels of 30–35 per cent; at the other extreme, for some products in the PANEURO and SADC regimes, the permitted value of non-originating inputs of the price of the final product is as low as 15–30 per cent. The table also displays the various bases for calculation of the VC. Differences in the method of calculation can have crucial implications to the exporters' capacity to meet the RoO. The PE model that is separated here for analytical purposes essentially involves the same product-specific RoO as the PANEURO model, while diverging somewhat from the PANEURO in the regime-wide RoO. It applies to a handful of European FTAs, particularly to those forged by the EU and East European countries with Israel (WTO 2002a).

Capturing the full scale of variation in the RoO regimes requires a look at the various combinations of RoO components. Table 3.2 displays the RoO combinations in selected FTAs around the world. It considers the entire tariff universe in each RoO regime, and shows the percentage shares of all possible RoO types and combinations thereof in each respective regime. Particularly notable is the high degree of selectivity of PANEURO, NAFTA, and non-preferential RoO.

Table 3.1 VC criteria by agreement

PTA	Value-content criterion (%)		Basis for calculation
	MC	RVC	
PANEURO	50–30		Ex-works price[i]
PE	50–30		Ex-works price
EU–South Africa	50–30		Ex-works price
EU–Mexico	50–30		Ex-works price
EU–Chile	50–30		Ex-works price
EFTA–Mexico	50–30		Ex-works price
NAFTA		50–60	50 net cost; 60 transaction value[ii]
US–Chile		35–45	35 build-up; 45 build-down[iii]
CAFTA		35–45	35 build-up; 45 build-down
Canada–Chile		50–60	50 net cost; 60 transaction value
G–3		50–55[iv]	Transaction value
Mexico–Costa Rica		41.66–50	41.66 net cost; 50 transaction value
Mexico–Bolivia		41.66–50	41.66 net cost; 50 transaction value
Mexico–Chile		40–50	40 net cost; 50 transaction value
CACM		N/A	Transaction value
CACM–Chile		30	Transaction value
Mercosur	40	60	Fob export value[v]
Mercosur–Chile	40		Fob export value[vi]
Mercosur–Bolivia	40		Fob export value
Andean Community	50[vii]		Fob export value
Caricom–Dom. Rep.		N/A	Transaction value
LAIA	50		Fob export value
ANZCERTA		50	Factory cost[viii]
SAFTA		30–50	Factory cost
SPARTECA		50	Factory cost
AFTA		40	Value of content
Bangkok Agreement		40	Ex-works[ix]
Japan–Singapore	40	60	Export value[x]
US–Singapore		30–65	30–35 build-up; 45–65 build-down
Chile–Korea		30–45	30 build-up; 45 build-down
COMESA	60	35	60 value of materials; 35 ex-factory cost[xi]
ECOWAS		30	Factory cost
Namibia–Zimbabwe		25	N/A
SADC	70–35		Ex-works price
Gulf Coop. Council		40[xii]	Ex-works price
US–Jordan		35	Value of materials/processes[xiii]
US–Israel		35	Value of materials/processes
Mexico–Israel		35–45	35 net cost; 45 transaction value
Non-preferential RoO	60–40		Ex-works price

Source: Authors' classification based on PTA texts.

D. Regime-wide RoO

Besides sectoral RoO, the different RoO regimes can be compared by their regime-wide RoO. Table 3.3 contrasts the various RoO regimes by their general, regime-wide RoO—*de minimis*, roll-up, cumulation, and drawback.

First, EU's RoO regimes feature a higher *de minimis* (at 10 per cent) than NAFTA and many other FTAs in the Americas; the exceptions are US–Chile FTA and CAFTA, where *de minimis* is the same as in PANEURO. Meanwhile, there is no *de minimis* rule in Mercosur's FTAs and various FTAs in Asia and Africa. However, the principle does have exceptions in most regimes: for example, EU's *de minimis* does not apply to textiles and apparel, except for allowing an 8 per cent *de minimis* of the total weight of textile materials in mixed textiles products. In the EU–South Africa FTA, *de minimis* is set at 15 per cent but excludes fish and crustaceans, tobacco products, as well as certain meat products and alcoholic beverages. NAFTA *de minimis* does not extend to the production of dairy produce; edible products of animal origin; citrus fruit and juice; instant coffee; cocoa products, and some machinery and mechanical appliances, such as air conditioners and refrigerators (Reyna 1995: 115–117).

Secondly, the roll-up principle is widely used around the world. For example, in NAFTA, a good may acquire originating status if it is produced in a NAFTA country from materials considered as originating (whether such materials are wholly obtained or have satisfied a CTC or RVC criterion) even if no change in tariff classification takes place between the intermediate material and the final product. Similarly, the EU–Mexico FTA stipulates that 'if a product which has acquired originating status by fulfilling the conditions . . . is used in the manufacture of another product, the conditions applicable to the product in which it is incorporated do not apply to it, and no account shall be taken of the non-originating materials which may have been used in its manufacture.'

Thirdly, the EU's Pan–European system of cumulation applied since 1997 draws a clear distinction between the EU RoO regimes on the one hand, and most RoO regimes elsewhere in the world, on the other. The foremost diagonal cumulation regime in the world, the Pan–European system incorporated 16 partners and covered no fewer than 50 FTAs prior to the EU's eastward enlargement.[18] In concrete terms, the system enables producers to use components originating in any of the participating countries without losing the preferential status of the final product. The European Economic Association (EEA) agreement between EU and EFTA permits full cumulation. The EU–South Africa FTA allows both parties to cumulate diagonally with the ACP states. In addition, it incorporates the

[18] The participants in the PANEURO system of cumulation prior to the eastward enlargement were the EU, Bulgaria, Czech Republic, Estonia, Hungary, Iceland, Latvia, Liechtenstein, Lithuania, Norway, Poland, Romania, Slovak Republic, Slovenia, Switzerland, and Turkey. Eight of these countries—Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia—entered the EU in May 2004.

Table 3.2 Distribution of RoO combinations, selected PTAs (1st RoO only)

	EUROPE					AMERICAS								
Requirement	PANEURO	EU-MEX	EU-CHI	EU PRE-97	EFTA-MEX	NAFTA	US–CHI	G3	MEX–CR	MEX–BOL	CAN–CHI	CACM–CHI	MERC–CHI	LAIA
NC	0.39	0.39	0.39	0.20		0.54	0.51	4.05	0.55	0.95	0.04			
NC + ECTC	2.39	2.04	2.39	2.36										
NC + TECH	1.39	1.39	1.39	0.72			0.02							
NC + ECTC + TECH														
NC + VC	11.46	10.91	11.90	11.08					0.02					
NC + ECTC + VC	1.57	1.57	1.57	1.61										
NC + VC + TECH	0.08	0.20	0.20											
NC + WHOLLY OBTAINED CHAPTER	7.62	7.62	7.62	3.24										
NC + WHOLLY OBTAINED HEADING	0.70	0.70	0.70	0.70										
SUBTOTAL	*25.60*	*24.82*	*26.16*	*19.91*	*0.00*	*0.54*	*0.53*	*4.05*	*0.54*	*0.95*	*0.04*	*0.00*	*0.00*	*0.0*
CI											0.99			
CI + ECTC						0.02				0.04	0.23			
CI + TECH					2.17						0.02			
CI + ECTC + TECH														
CI + VC														
CI + ECTC + VC						0.02								
CI + VC + TECH														
SUBTOTAL	*0.00*	*0.00*	*0.00*	*0.00*	*2.17*	*0.04*	*0.00*	*0.00*	*0.04*	*0.00*	*1.24*	*0.00*	*0.00*	*0.0*
CS	0.20	0.20	0.20	0.12		1.29	16.56	1.54	2.99	2.94	10.52	19.16		
CS + ECTC						2.52	5.57	0.73	2.14	1.32	4.13	0.20		
CS + TECH	1.90	1.90	1.78	1.89		0.04	0.14	0.10		0.02	0.11			
CS + ECTC + TECH						0.40	0.04	0.04	0.23	0.43	0.26			
CS + VC	0.27	0.27	0.27	0.37			0.42	4.60	4.25	4.24	0.06	0.03		
CS + ECTC + VC						0.10	0.04				0.10			
CS + VC + TECH								0.04		0.26				
CS + ECTC + VC + TECH								0.83						
SUBTOTAL	*2.37*	*2.37*	*2.25*	*2.38*	*0.00*	*4.35*	*22.77*	*7.88*	*9.66*	*9.21*	*15.18*	*19.39*	*0.00*	*0.0*
CH	32.99	32.99	32.86	38.00	58.79	17.09	23.70	16.45	24.32	17.00	17.42	57.15	46.00	100.0
CH + ECTC	4.60	5.13	4.56	4.10	7.22	19.18	11.19	13.45	19.66	14.27	18.72	0.26		
CH + TECH				0.86		0.02	0.34	0.97		0.22	0.17		20.04	
CH + ECTC + TECH	6.66	6.66	6.66	6.66	9.04	0.14	0.44	0.26		1.74	0.09			
CH + VC	13.01	12.68	12.78	13.56	6.1	3.54	3.25	2.01	2.67	2.17	3.52		9.99	
CH + ECTC + VC	0.37	0.86	0.37	0.42	0.08	0.58	0.48		0.52	0.85	0.52			
CH + VC + TECH						0.10		0.06	0.02	10.01			23.97	
CH + ECTC + VC + TECH	0.02	0.02	0.02	0.02	0.03			4.82		0.89				
SUBTOTAL	*57.65*	*58.34*	*57.25*	*63.62*	*81.26*	*40.65*	*39.40*	*46.02*	*47.19*	*47.15*	*40.44*	*57.41*	*100.00*	*100.0*
CC	2.16	2.16	2.16	2.28		30.95	23.18	21.09	31.05	21.80	29.20	22.94		
CC + ECTC	1.02	1.02	1.02	0.74	0.7	17.71	5.83	5.90	5.65	5.67	8.08	0.26		
CC + TECH	0.04	0.04	0.04	0.04	0.05	0.02	0.06	5.43		6.30	0.04			
CC + ECTC + TECH	11.02	11.25	11.02	11.02	15.41	5.76	8.08	6.65	5.81	6.24	5.74			
CC + VC							0.06	0.14	0.26	0.43				
CC + ECTC + VC														
CC + VC + TECH								2.67		1.24				
CC + ECTC + VC + TECH								0.20						
SUBTOTAL	*14.24*	*14.47*	*14.24*	*14.08*	*16.16*	*54.44*	*37.21*	*42.08*	*42.77*	*42.68*	*43.06*	*23.20*	*0.00*	*0.0*
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes: NC = No change in tariff classification required; CI = Change in tariff item; CS = Change in tariff subheading; CH = Change in tariff heading; CC = Change in tariff chapter; ECTC = Exception to change in tariff classification; VC = Value content; TECH = Technical requirement. Calculations at 6-digit level of the Harmonized System.
Source: Author's calculations on the basis of PTA texts.

ASIA/PACIFIC							AFRICA					MIDDLE EAST			NON-PREF	
ANZCERTA	SAFTA	SPARTECA	AFTA	BANGKOK	JSEPA	CHI-KOR	ECOWAS	COMESA	NAM-ZIMB	SADC	GULF CC	US-JORDAN	US-ISRAEL	HIGHEST	LOWEST
						0.51									
														0.72	9.62
100	100	100	100	100		0.78			100		100	83.94	100	11.48	0.06
														0.34	0.5
												10.06		9.39	3.7
					0.42										
100.00	*100.00*	*100.00*	*100.00*	*100.00*	*0.42*	*1.29*	*0.00*	*0.00*	*100.00*	*0.00*	*100.00*	*100.00*	*100.00*	*21.93*	*18.88*
														3.54	6.18
														0.12	0.12
										1.39				0.03	3.09
0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*1.39*	*0.00*	*0.00*	*0.00*	*3.84*	*9.39*
						1.68	100			1.16				13.53	30.42
					0.05	0.47								0.64	0.92
															1.41
						2.11									
						0.16									
0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.05*	*4.42*	*100.00*	*0.00*	*0.00*	*1.16*	*0.00*	*0.00*	*0.00*	*14.17*	*32.75*
					45.81	46.87		100		58.65				40.13	33.88
					14.46	9.12				3.35				11.64	2.22
					0.58	0.17								0.36	
										6.52					
					1.66	2.95				0.13					
					0.10	0.49									
										0.03					
0.00	*0.00*	*0.00*	*0.00*	*0.00*	*62.61*	*59.57*	*0.00*	*100.00*	*0.00*	*78.65*	*0.00*	*0.00*	*0.00*	*52.13*	*36.10*
						22.49				0.68				7.86	2.78
					37.35	4.71								0.1	0.1
						0.08									
						5.67				18.09					
						1.80									
0.00	*0.00*	*0.00*	*0.00*	*0.00*	*37.35*	*34.75*	*0.00*	*0.00*	*0.00*	*18.77*	*0.00*	*0.00*	*0.00*	*7.96*	*2.81*
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 3.3 Regime-wide RoO in selected PTAs

PTA	*De minimis* (percentage)	Roll-up	Cumulation		Drawback allowed?[vi]
			Bilateral	Diagonal	
PANEURO (50)	10	Yes	Yes	Yes (full in EEA)	No
PE (15)	10	Yes	Yes	Yes	No[xiv]
EU–South Africa	15	Yes	Yes	Yes with ACP (full with SACU)	Not mentioned
EU–Mexico	10	Yes	Yes	No[xv]	No after 2 years
EU–Chile	10	Yes	Yes	No	No after 4 years
EFTA–Mexico	10 (not chs. 50–63)	Yes	Yes	No	No after 3 years
NAFTA	7 (exceptions in agric. and ind. products; 7% of weight in chs. 50–63)	Yes except automotive	Yes	No	No after 7 years
US–Chile	10 (excep. in agric. and processed agric. products)	Yes	Yes	No	No after 12 years
CAFTA	10 (excep. in agric. and ind. products; 7% of weight in chs. 50–63)	Yes	Yes	Yes (in ch 62 w/Mexico & Canada)	Not mentioned
G3	7 (7% of weight in chs. 50–63)	Yes	Yes	No	Not mentioned
Mexico–Costa Rica	7 (excep. in chs. 4–15 and headings 0901, 1701, 2105, 2202)	Yes	Yes	No	No after 7 years
Mexico–Chile	8 (excep. in agric. and ind. products; 9% of weight in chs. 50–63)	Yes	Yes	No	Not mentioned
Mexico–Bolivia	7 (not chs. 1–27 unless CS; not chs. 50–63)	Yes	Yes	No	No after 8 years
Canada–Chile	9 (excep. in agric. and ind. products; 9% of weight in chs. 50–63)	Yes	Yes	No	Not mentioned
CACM–Chile	8 (not chs. 1–27 unless CS)	Yes	Yes	No	Not mentioned
CACM	10 until 2000; 7 from 2001 on (7% of weight in chs. 50–63)	N/A	Yes	No	Yes

Mercosur	Not mentioned	Yes except automotive	Yes	No	Yes (except automotive imports from Arg. and Braz.)
Mercosur–Chile	Not mentioned	Yes	Yes	No	No after 5 years
Mercosur–Bolivia	Not mentioned	Yes	Yes	No	No after 5 years
Caricom	Not mentioned	Not mentioned	Yes	No	Possibly[xvi]
Caricom–DR	7	Not mentioned	Yes	No	Not mentioned
ANZCERTA	2	Yes	Yes	Yes (full)	Yes
SAFTA	2	Yes	Yes	No	Not mentioned
SPARTECA	2	Yes	Yes[xvii]	Yes (full)	Yes
AFTA	Not mentioned	Not mentioned	Yes	No	Yes
Bangkok Agreement	Not mentioned	Yes	Yes[xviii]	No	Possibly[xix]
Japan–Singapore	To be determined	Yes	Yes	No (OP allowed)	Not mentioned
US–Singapore	10 (excep. in various agric. products; 7% of weight in chs. 50–63)	Yes	Yes	No (OP & ISI allowed)	Not mentioned
Chile–Korea	8 (not chs. 1–24 unless CS; 8% of weight in chs. 50–63)	Yes	Yes	No	Not mentioned
COMESA	2[xx]	Yes	Yes	No	No after 10 years
ECOWAS	Not mentioned	Not mentioned	Yes	No	Not mentioned
SADC	10 (not chs. 50–63, 87, 98)	Yes	Yes	No	Not mentioned
Gulf CC	Not mentioned	Not mentioned	Yes	No	Not mentioned
US–Jordan	Not mentioned	Not mentioned	Yes	No	Not mentioned
US–Israel	Not mentioned	Yes	Yes	No	Yes
Canada–Israel	10 (excep. in agric. and ind. products; 7% of weight in chs. 50–63)	Yes	Yes	Yes (w/ a 3rd party with which both have FTA)[xxi]	Not mentioned
Mexico–Israel	10 (excep. in agric. and ind. products; 7% of weight in chs. 50–63)	Yes	Yes	No	Not mentioned

Source: Authors' classification on the basis of PTA texts.

'single territory' concept, whereby South Africa can calculate working or processing carried out within the Southern Africa Customs Union (SACU) area as if these had been performed in South Africa (but not in the EU).

Other cumulation schemes include the ANZCERTA model, which provides for full cumulation, and the Canada–Israel FTA, which permits cumulation with the two countries' common FTA partners, such as the United States. Singapore's FTAs incorporate the outward processing (OP) concept tailored to accommodate Singapore's unique economic features and its access to low-cost processing in neighboring countries. The US–Singapore FTA also incorporates the integrated sourcing initiative (ISI), which provides further flexibility for outsourcing. OP and ISI will be detailed in Section 3.4. CAFTA stands out in the Americas for providing for diagonal cumulation with Canada and Mexico. However, the clause covers only materials used for producing goods in chapter 62, and so only up to a limited amount of imports to the US market and only after Canada and Mexico agree on the clause.

Fourthly, EU's FTAs and FTAs in the Americas tend to explicitly preclude drawback. Nonetheless, both have allowed for phase-out periods during which drawback is permitted. For instance, the EU–Mexico FTA permitted drawback for the first two years, while the EU–Chile FTA allows drawback through 2007, the fourth year of the FTA. NAFTA allowed for drawback for the first seven years; however, drawback in the bilateral trade between Canada and the United States under the agreement was valid for only two years. Importantly, NAFTA does provide leniency in the application of the no-drawback rule by putting in place a refund system, whereby the producer will be refunded the lesser of the amount of duties paid on imported goods and the amount of duties paid on the exports of the good (or another product manufactured from that good) upon its introduction to another NAFTA member. AFTA, ANZCERTA, SPARTECA, the US–Israel FTA, CACM, and Mercosur's FTAs stand out for not prohibiting drawback. However, in Mercosur *per se*, there is a no-drawback rule governing Argentine and Brazilian imports of intermediate automotive products when the final product is exported to a Mercosur partner; this should help place Paraguay and Uruguay at a par with the two larger economies in attracting investment in the automotive sector.

E. Administration of RoO

The various RoO regimes diverge in their administrative requirements, particularly in the method of certification (Table 3.4).

Table 3.4 Certification methods in selected PTAs

PTA	Certification method
PANEURO	Two-step private and public; limited self-certification
PE	Two-step private and public; limited self-certification
EU–South Africa	Two-step private and public; limited self-certification
EU–Mexico	Two-step private and public; limited self-certification
EU–Chile	Two-step private and public; limited self-certification
NAFTA	Self-certification
US–Chile	Self-certification
CAFTA	Self-certification
G3	Two-step private and public
Mexico–Costa Rica	Self-certification
Mexico–Bolivia	Self-certification (two-step private and public during first 4 years)
Canada–Chile	Self-certification
CACM–Chile	Self-certification
CACM	Self-certification
Mercosur	Public (or delegated to a private entity)
Mercosur–Chile	Public (or delegated to a private entity)
Mercosur–Bolivia	Public (or delegated to a private entity)
Andean Community	Public (or delegated to a private entity)
Caricom	Public (or delegated to a private entity)
Caricom–DR	Public (or delegated to a private entity)
LAIA	Two-step private and public
ANZCERTA	Public (or delegated to a private entity)
SAFTA	Public (or delegated to a private entity)
SPARTECA	Not mentioned
AFTA	Public (or delegated to a private entity)
Bangkok Agreement	Public (or delegated to a private entity)
Japan–Singapore	Public (or delegated to a private entity)
US–Singapore	Self-certification
Chile–Korea	Self-certification
COMESA	Two-step private and public
ECOWAS	Public (or delegated to a private entity)
SADC	Two-step private and public
US–Jordan	Self-certification

Source: Authors' classification on the basis of PTA texts.

The EU RoO regimes require the use of a movement certificate, EUR.1, that is to be issued in two steps—by the exporting-country government once application has been made by the exporter or the exporter's competent agency, such as a sectoral umbrella organization. However, the EU regimes provide for an alternative certification method, the invoice declaration, for 'approved exporters' who make frequent shipments and are authorized by the customs authorities of the exporting country to make invoice declarations.

Meanwhile, NAFTA and a number of other FTAs in the Americas as well as the Chile–Korea FTA rely on self-certification, which entails that the exporter's signing the certificate suffices as an affirmation that the items

covered by it qualify as originating. In CAFTA, the importer rather than the exporter claiming preferential tariff treatment is the party ultimately responsible for seeing that the good is originating.[19] In Mercosur, Andean Community, Caricom, AFTA, ANZCERTA, SAFTA, the Bangkok Agreement, JSEPA, and ECOWAS require certification by a public body or a private umbrella entity approved as a certifying agency by the government. However, unlike in the two-step model, the exporter is not required to take the first cut at filling out the movement certificate, but, rather, to furnish the certifying agency with a legal declaration of the origin of the product.[20]

The self-certification model can be seen as placing a burden of proof on the importing-country producers; as such, it arguably minimizes the role of the government in the certifying process, entailing rather low administrative costs to exporters and governments alike. In contrast, the two-step system requires heavier involvement by the exporting-country government and increases the steps—and likely also the costs—that an exporter is to bear when seeking certification.

3.4 Analytical coding methodology for RoO Rules of Origin in FTAs

This section presents a methodology for measuring (1) the relative restrictiveness of the product-specific RoO governing different economic sectors in the different agreements; and (2) the degree of flexibility instilled in the various RoO regimes by the various regime-wide RoO, such

[19] The CAFTA certification of origin can be prepared by the importer, exporter, or the producer of the good; alternatively, the importer can claim origin through his/her 'knowledge that the good is an originating good'. Verification of origin can be made via written requests or questionnaires to the importer, exporter, or producer, or by visits by an importing-country authority to the exporting-party territory. Similarly, in the US-Chile FTA, the importer is to declare the good as originating and can also certify origin; however, verification can be made by the customs of the importing member 'in accordance with its customs laws and regulations.' In contrast, in NAFTA, the exporter or producer are parties in charge of certifying origin, and verification of origin is conducted through written requests or visits by one NAFTA member to the premises of an exporter or a producer in the territory of another member.

[20] The certificate in NAFTA, G3, and CACM-Chile FTA will be valid for a single shipment or multiple shipments for a period of a year; in ANZCERTA and SAFTA, the certificate will be valid for multiple shipments for two years. In ECOWAS, the certificate is not required for agricultural, livestock products and handmade articles produced without the use of tools directly operated by the manufacturer. In ANZCERTA, SAFTA, and Mercosur–Chile, Mercosur–Bolivia, and CARICOM-DR FTAs, the certificate needs to be accompanied by a legal declaration by the final producer or exporter of compliance with the RoO. In CAN and CARICOM, declaration by the producer is required. In CARICOM, the declaration can be completed by the exporter if it is not possible for the producer to fill it.

as *de minimis* and drawback. We subsequently compare RoO regimes by the values yielded by these two analytical measures.

A. A comparative analysis of the levels of restrictiveness of product-specific RoO

The NAFTA RoO family is based on the change of chapter rules, whereas the change of tariff heading component figures prominently in the EU and most Asian and African RoO models. As such, these regimes will entail somewhat divergent demands on exporters. However, understanding the implications of membership in the different types of regimes for an exporter operating in a particular industry requires both (1) a measure of the restrictiveness of RoO that allows for a more nuanced sectoral analysis of the requirements imposed by RoO; and (2) an indicator of the overall flexibility instilled in a RoO regime by the various regime-wide RoO. This section presents two such measures: a restrictiveness index, and a facilitation index.

i. Restrictiveness of RoO

The manifold RoO combinations within and across RoO regimes present a challenge for cross-RoO comparisons. This chapter seeks to draw such comparisons through an index grounded on the plausible restrictiveness of a given type of RoO. Estevadeordal (2000) constructs a categorical index ranging from 1 (least restrictive) to 7 (most restrictive) on the basis of NAFTA RoO. The index can be conceptualized as an indicator of how demanding a given RoO is for an exporter. The observation rule for the index is based on two assumptions: (1) change at the level of chapter is more restrictive than change at the level of heading, and change at the level of heading more restrictive than change at the level of subheading, and so on; and (2) VC and TECH attached to a given CTC add to the RoO's restrictiveness (see Appendix I for details).[21]

Figure 3.2 reports the restrictiveness of RoO as calculated at the six-digit level of disaggregation in selected FTAs. The EU RoO regimes are again strikingly alike across agreements. The RoO regimes based on the NAFTA model, such as the G-3, are also highly alike. The Mercosur model pertinent to Mercosur–Chile and Mercosur–Bolivia FTAs is more general, yet

[21] Given that the degree of restrictiveness is a function of *ex ante* restrictiveness rather than the effective restrictiveness following the implementation of the RoO, the methodology—much like that of Garay and Cornejo (2002)—is particularly useful for endogenizing and comparing RoO regimes. The methodology allows RoO to be analysed in terms of their characteristics rather than their effects.

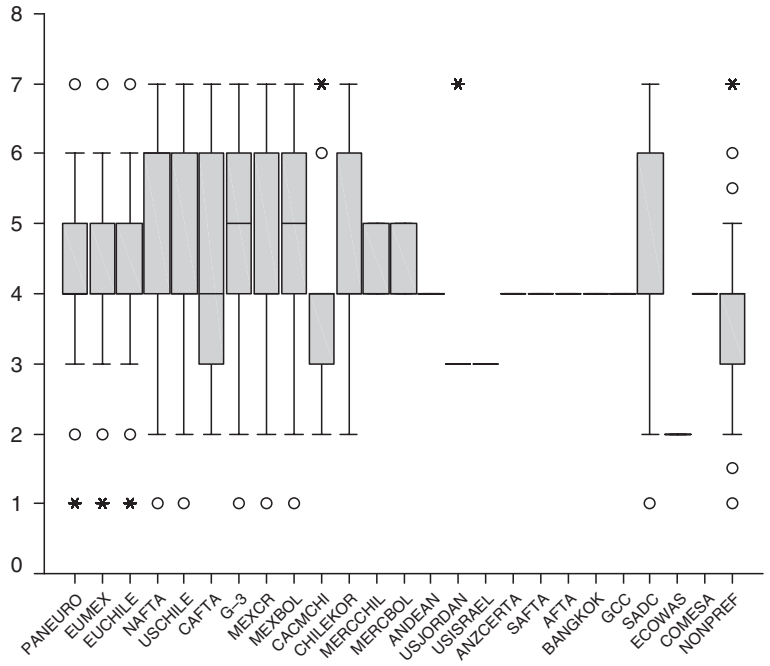

Fig. 3.2 Restrictiveness of RoO in selected PTAs.

Note: Boxplots represent interquartile ranges. The line in the middle of the box represents the median 50th percentile of the data. The box extends from the 25th percentile to the 75th percentile, or through the so-called inter-quartile range (IQR). The whiskers emerging from the boxes extend to the lower and upper adjacent values. The upper adjacent value is defined as the largest data point less than or equal to $x(75) + 1.5$ IQR. The lower adjacent value is defined as the smallest data point greater than or equal to $x(25) + 1.5$ IQR. Observed points more extreme than the adjacent values are individually plotted (outliers and extreme values are marked using '*' and 'o' symbols, respectively).

Source: Authors' calculations on the basis of codes generated per methodology in Appendix I.

still exhibits more cross-sectoral variation in the restrictiveness of RoO than the LAIA model marked by the across-the-board change of heading RoO. The generality of the LAIA model is replicated by most Asian and African RoO regimes. However, some newer PTAs—such as Chile–Korea FTA and SADC—feature high levels of cross-sectoral variation in RoO.

iii. Comparing the restrictiveness of sectoral RoO

To what extent does the restrictiveness of RoO vary across economic sectors? Are some sectors more susceptible to the potential negative trade and investment effects of restrictive RoO than others?

We explore these questions by focusing on twelve RoO regimes with intersectoral variation in RoO. Table 3.5 reports the restrictiveness values in these regimes, as aggregated from 6-digit values by section of the Harmonized System. The average restrictiveness and the standard deviation values at the bottom of the table are based on calculations at the 6-digit level.

The data reveal that agricultural products and textiles and apparel are marked by a particularly high restrictiveness score in each regime, which suggests that the restrictiveness of RoO may be driven by the same political economy variables that arbitrate the level of tariffs particularly in the EU and the United States. Non-preferential RoO exhibit similar patterns across sectors, communicating the operation of political economy dynamics also at the multilateral level. Weighting the sectoral restrictiveness values with trade produces very similar results—which may in and of itself be an indication that stringent RoO stifle commerce.

B. Comparing regime-wide RoO: a facilitation index

Product-specific RoO in complex PTAs—PTAs not carrying across-the-board RoO—can impose highly divergent requirements to the exporters of different goods. Even an across-the-board rule will undoubtedly have more striking implications in some sectors than in others, depending on the product-specific features. However, as discussed above, RoO regimes employ several mechanisms to add flexibility to the application of the product-specific RoO. We strive to capture the combined effect of such mechanisms by developing a regime-wide 'facilitation index'. The index is based on five components: *de minimis*, diagonal cumulation, full cumulation, drawback, and self-certification. The maximum index value of 5 results when the permitted level of *de minimis* is 5 per cent or higher and when the other four variables are permitted by the RoO regime in question.

Figure 3.3 graphs the 'facil index' values for PTAs. The PANEURO and NAFTA models are nearly on a par; the difference here is produced by coding NAFTA as allowing drawback, as it did for the first seven years. The EU–South Africa and the Canada–Israel are the most 'permissive' regimes, the former thanks to drawback and diagonal and full cumulation, and the latter because of self-certification, drawback and cumulation with any of the party's common FTA partners. Meanwhile, many regimes with an across-the-board RoO neither provide for

Table 3.5 Sectoral restrictiveness of sectoral RoO in selected PTAs

HS Section	PAN–EURO	EFTA–MEX	NAFTA	US–Chile	CAFTA	CR–MEX	G-3	Chile–CACM	JSEPA	Chile–Korea	SADC	Non-pref. avg.
1. Live Animals	7.0	5.3	6.0	6.0	6.0	6.0	5.4	5.9	7.0	6.0	7.0	6.2
2. Vegetable Products	6.6	4.0	6.0	6.0	5.9	6.0	6.7	5.6	7.0	6.1	6.6	6.6
3. Fats and Oils	4.7	4.0	6.0	6.0	6.0	6.0	3.5	3.0	7.0	7.0	7.0	4.0
4. Food, Bev. & Tobacco	5.0	4.4	4.7	5.7	5.7	5.4	4.8	3.7	6.8	5.2	5.4	4.6
5. Mineral Products	3.5	3.5	6.0	3.9	4.0	5.7	5.7	5.3	6.6	5.4	4.0	4.8
6. Chemicals	3.9	3.8	5.3	2.6	2.5	3.8	3.9	2.6	3.7	4.0	4.0	2.5
7. Plastics	4.9	4.9	4.8	3.7	3.6	4.2	4.2	3.2	4.0	4.1	4.7	4.0
8. Leather Goods	3.3	3.5	5.6	5.0	4.5	5.5	5.5	3.7	4.0	4.9	3.8	3.4
9. Wood Products	2.9	2.9	4.0	4.1	4.1	4.7	4.6	3.2	4.0	4.1	4.8	3.3
10. Pulp and Paper	4.4	4.6	4.8	4.9	4.9	6.0	6.2	4.1	4.0	4.3	4.3	3.9
11. Textile and App.	6.1	6.1	6.9	5.9	5.9	5.8	5.8	4.5	6.0	5.5	6.1	3.4
12. Footwear	2.8	4.1	4.9	4.8	3.8	4.8	4.3	3.5	4.3	4.7	2.6	3.7
13. Stone and Glass	3.7	3.7	4.9	4.4	4.4	4.9	5.0	4.2	4.0	5.0	3.7	3.5
14. Jewellery	3.7	3.7	5.3	5.2	4.9	5.4	5.4	4.0	4.0	5.4	3.7	3.4
15. Base Metals	4.2	4.2	4.6	4.6	4.6	4.6	4.7	3.8	4.0	4.5	3.9	3.4
16. Mach. & Elec. Eq.	4.8	4.0	3.2	2.9	2.8	3.7	4.5	4.3	6.0	3.8	4.1	3.6
17. Transportation Eq.	4.7	4.2	4.8	4.2	3.7	4.2	3.3	3.4	4.0	4.3	3.8	3.8
18. Optics	5.0	4.4	4.0	4.5	4.1	3.8	4.8	4.0	4.0	4.3	3.9	3.5
19. Arms & Ammun.	4.0	4.0	4.7	5.5	5.5	5.5	5.9	4.0	4.0	4.8	3.1	4.0
20. Works of Art, Misc.	4.1	4.1	5.1	5.3	5.2	5.8	6.0	3.6	4.6	4.7	4.0	3.3
Average	*4.5*	*4.2*	*5.1*	*4.8*	*4.3*	*4.8*	*4.9*	*4.0*	*4.9*	*4.9*	*4.5*	*3.9*
Complexity (Stand. Dev.)	*1.4*	*1.2*	*1.2*	*1.6*	*1.6*	*1.3*	*1.5*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*

Source: Authors' calculations on the basis of codes generated per methodology in Appendix I.

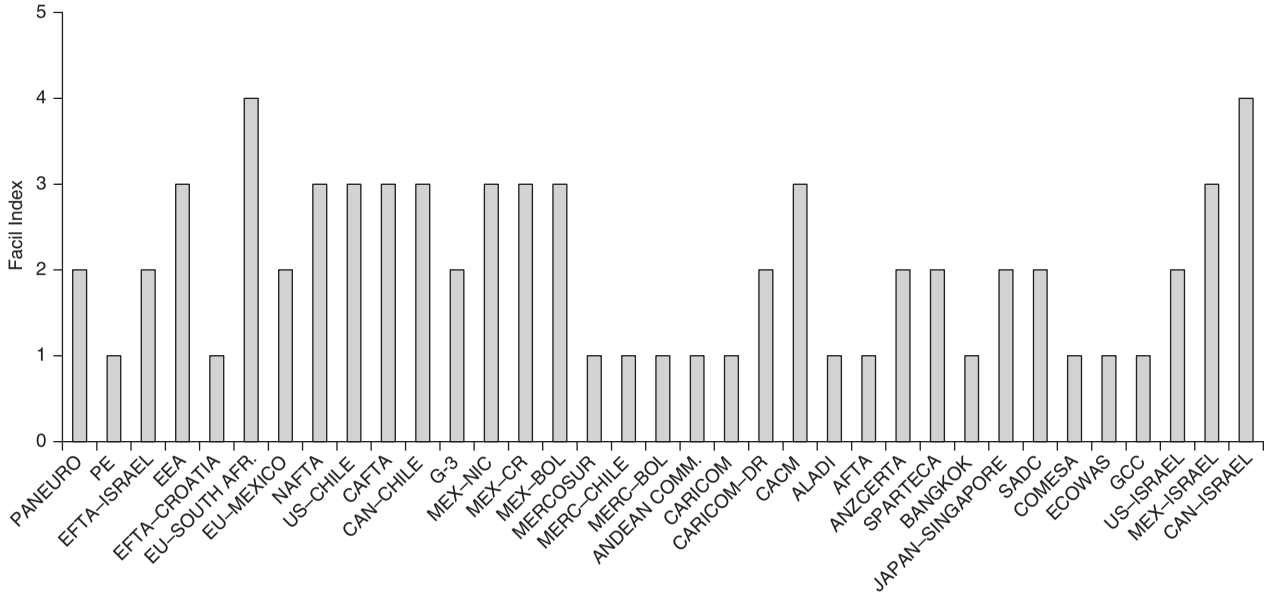

Fig. 3.3 Facilitation index for selected PTAs.

Source: Authors' calculations on the basis of coding scheme above.

de minimis nor feature many regime-wide provisions of flexibility; the most usually occurring regime-wide rule in these PTAs is drawback. Indeed, that regimes with the most stringent RoO and the highest degree of sectoral selectivity in RoO feature the highest facilitation values may evince counterlobbying by producers jeopardized by stringent product-specific RoO.

3.5 RoO 'innovations': *ad hoc* mechanisms for flexibility

This section provides a look at some further dimensions of RoO regimes that go beyond the more traditional and prevalent components included in the restrictiveness and facilitation indices in this study, but that alleviate the impact of stringent RoO: (1) a phase-in period for a stringent value content RoO; (2) permanent deviations for a country or a set of countries from the RoO regime that would otherwise apply; (3) flexibility in the ways of calculating value content; and (4) tariff preference levels (TPLs) employed when the partner lacks intermediate product industries. While most regimes employing these provisions make them applicable to all members, some regimes provide them asymmetrically, for instance to accommodate some country-specific idiosyncrasies in production structures or to provide greater leniency to a developing member country when the parties' development levels differ. These provisions can be of great importance particularly to countries with limited production base and/or in the absence of relatively cheap inputs and production processes in the PTA area.

A. RoO phase-ins

Some regimes have adopted what are in many cases highly detailed product-specific provisions that allow for phasing in of the RoO. Mercosur–Chile FTA provides a seven-year adjustment period for Paraguay to start applying the FTA's import content RoO of 40 per cent in selected headings across a host of sectors such as food products, chemicals, plastics, textiles, apparel, footwear, base metals, and machinery. During the period, Paraguay applies a 60 per cent import content rule. Mercosur–Bolivia FTA allows Bolivia to export to Mercosur some selected goods at 50 per cent import content for the first five years, and others at 60 per cent for three years as opposed to the 40 per cent that will subsequently take effect. For its part, Paraguay can export to Bolivia at 60 per cent import content for the first three years.

Also, the EU's extra-European agreements with Mexico and Chile allow for some product-specific deviations from the PANEURO standard for a certain period of time.[22] In the case of the EU–Mexico FTA, these pertain to one whole chapter (knitted apparel) and to 25 headings (or subheadings) in chemicals, textiles, footwear, machinery, and vehicles, and endure from two to six years prior to converging to the benchmark RoO. In footwear, the RoO is more restrictive for the EU than in its other FTAs: the same RoO applies as in the FTAs with Chile and South Africa up to a certain quota, while the rest of the EU exports to the Mexican market are regulated by much more stringent RoO. The RoO phase-ins are fewer in the case of the EU–Chile FTA, pertaining to textiles and bicycles for the first three years of the agreement.

B. Permanent reductions in the level of RVC

A second means to add leniency to the RoO protocol are permanent deviations for a country or a set of countries from the RoO regime that would otherwise apply. The RoO of the Andean Community allows the less-developed members, Bolivia and Ecuador, to use non-originating components up to 60 per cent of the value of the final good, as opposed to the 50 per cent applicable to the other members. LAIA allows the less-developed partners to use non-originating components of up to 60 per cent of the value of the final good, as opposed to 50 per cent applying to the rest of the members. In COMESA, products of importance to economic development to the partners (selected headings in mineral products, chemicals, machinery, and optical instruments) enjoy a 25 per cent RVC, as opposed to the across-the-board 35 per cent RVC that otherwise applies.

Also, the EU–Mexico and EU–Chile FTAs allow for permanent deviations from the single list, PANEURO model. The deviations are rather minor and apply only to selected industrial products.[23] Nonetheless, they indicate that Mexico and Chile did achieve some favorable sectoral outcomes in the RoO bargaining with the EU.

C. Options for calculating value content

Some regimes have created innovative optional means of calculating value content. In SADC, the more-developed members may allow the less-developed members to count as originating processes that are usually left outside the value-content calculation. Regimes modelled after NAFTA

[22] For a detailed treatment, see Estevadeordal and Suominen (2003).
[23] See Estevadeordal and Suominen (2003).

provide a number of optional ways of calculating RVC in vehicles when the producer uses pre-defined intermediate goods from chapters 40 and 84, as well as for calculating the RVC for these intermediate goods.[24]

However, it is Singapore's FTAs that incorporate perhaps the most innovative and comprehensive mechanisms to add flexibility to the calculation of the value content. These are designed to help the many Singaporean industries that have extensive outsourcing ties especially in South-East Asia to qualify for the preferential treatment provided by its FTA partners. The two key mechanisms are outward processing (OP) and integrated sourcing initiative (ISI). OP is recognized in all of Singapore's FTAs, while ISI is incorporated in the US–Singapore FTA. The concept of OP enables Singapore to outsource part of the manufacturing process, usually the lower value-added or labor-intensive activities, to the neighboring countries, yet to count the value of Singaporean production done prior to the outsourcing activity toward local, Singaporean content when meeting the RoO required by the export market. Table 3.6 illustrates the process.

Although the OP concept applies only to products with a value-added rule, it is credited to have encouraged outsourcing of labor-intensive and low-value processes and retaining higher-value activities in Singapore.

For its part, ISI operating in the US-Singapore FTA applies to non-sensitive, globalized sectors, such as information technologies. Under the scheme, certain IT components and medical devices are not subject to RoO when shipped from either of the parties to the FTA partner. ISI is designed to reflect the economic realities of globally distributed production linkages, and to further encourage US multinationals to take advantage of outsourcing opportunities in the ASEAN countries.

D. Tariff Preference Levels

The fourth *ad hoc* mechanism to add leniency to a RoO regime is Tariff Preference Levels (TPLs). TPLs allow goods that would not otherwise satisfy the RoO protocol to qualify for the preferential treatment up to

[24] The producer of a vehicle can calculate the RVC by averaging the calculation over the fiscal year by using any one of the following categories: (a) the same model line of vehicles in the same class of vehicles produced in the same plant in the territory of a party; (b) the same class of motor vehicles produced in the same plant in the territory of a party; and (c) the same model line of motor vehicles produced in the territory of a party. Meanwhile, the producer can calculate the RVC intermediate goods for vehicles by (a) averaging the calculation over the fiscal year of the motor vehicle producer to whom the good is sold, over any quarter or month, or over its fiscal year, if the good is sold as an aftermarket part; (b) calculating the average separately for any or all goods sold to one or more motor vehicle producers; or (c) calculating separately those goods that are exported to the territory of the other party.

Table 3.6 Operation of outward processing in Singapore's FTAs

Stage1		*Stage 2*		*Stage 3*	
Singapore	→ Foreign Country		→ Singapore		→ Exported
Conventional RoO	→ Stage 3 = Local Content				
Recognition of OP	→ Stage 1 + Stage 3 = Local Content				

some pre-specified annual quotas. Above these levels, non-originating goods become subject to the importer's MFN tariff. Most commonly applying to textiles and apparel, TPLs are employed particularly in the NAFTA-model RoO regimes. They are generally extended by all parties to all other parties, made available by any given party on a 'first-come, first-served' basis.

NAFTA provides TPLs for such non-originating products as cotton and manmade fiber apparel, wool apparel, manmade fiber fabrics, and fiber spun yarn. Depending on the product category, they reach up to 80 million square meters equivalent (SMEs) for Canadian and 45 million SMEs for Mexican exports to the US market, and 12 million for selected US exports to Mexico. The most recent RoO regime signed by the US, CAFTA, offers TPLs for only two of the Central American countries, Costa Rican and Nicaragua, and phases them out quickly. In the case of Costa Rica, TPLs are set at 500 000 SMEs, limited to wool, and due to expire in two years. Nicaragua's TPLs start at 100 million SMEs and are phased out in equal annual cuts over five years.

Still other regimes employ what could be viewed as a modified form of TPLs, allocating the quotas not fully free of RoO, but against some more lenient product-specific RoO. For instance, SADC provides quotas at more lenient RoO for the textile and apparel exports of Malawi, Mozambique, Tanzania, and Zambia (MMTZ countries) to the SACU region for a period of five years.

3.6 Policy recommendations: counteracting restrictive RoO and the splintering of the global RoO panorama

While RoO are not necessarily bad for sound economic decisions, restrictive RoO can be. Furthermore, the existing differences in the product-specific and regime-wide RoO *across* the different RoO regimes can even in a simplified bi- or tripolar RoO world make a difference in

economic decisions and limit exporters' opportunities for diversifying markets.

How can the potential frictions created by stringent RoO and cross-regime differences in RoO be reduced? How can entrepreneurs import inputs from the cheapest sources, firms exploit cross-border economies of scale at lowest costs, and multinational companies make sweeping investment decisions based on economic efficiency rather than distortionary policies? What are the best ways to counter the development of trade- and investment-diverting hubs in favor of a globally free flow of goods, services, and investment?

Abolishing RoO altogether would certainly be the best and simplest means to counteract the impact of RoO. Another way to relegate RoO to irrelevance is by bringing MFN tariffs to zero globally. However, since these options are hardly politically palatable in the near future, a third possibility is to harmonize preferential RoO at the global level. Establishing a small set of RoO combinations—a 'RoO band'— would be a good start. This would ensure that at least the required production methods in a given sector would remain relatively similar across export markets—and enhance the prospects of linking agreements with each other in the future. Measures to accompany the harmonization work could involve (1) the incorporation of the various mechanisms of flexibility to RoO regimes during the transition to a global RoO regime; and (2) the establishment of a multilateral mechanism to monitor the member states' implementation of preferential and non-preferential RoO.

To be sure, harmonization would not be a simple endeavor given the differences in the types of RoO around the world. Even slight differences can be difficult to overcome due to political resistance by sectors benefiting from status quo. Meanwhile, it is not clear that a strong global exporter lobby would materialize to voice demands for harmonization. Perhaps most importantly, both the EU and the US would likely in principle be reluctant to adopt each other's RoO. Both parties would likely also be concerned of the counterpart's striving for a RoO regime that would allow it to trans-ship via the parties' common PTA partners, such as Mexico, to the other party's market.

However, adopting global regulations for preferential RoO regimes is not necessarily all that daunting. There are five sources of optimism.

First, the WTO members have already been able to sit down and compromise on harmonized non-preferential RoO, which not only evinces a reservoir of political will to tackle RoO, but also provides an immediately

available blueprint for harmonizing preferential RoO. And not only are non-preferential RoO negotiated and readily available as a model, but they make a good model: overall, they are less restrictive and complex than either the NAFTA- or PANEURO-type RoO.

Secondly, preferential RoO would likely prove easier to negotiate than non-preferential RoO. Non-preferential RoO involve tracking the production process all the way to the country in which the good originates, while preferential RoO simply require a determination that the final exporter country is also the country of origin: the good either originates in the PTA area or it does not, with the 'true' and very initial origin being immaterial. Preferential RoO talks would thus likely engage a smaller number of interested parties to contest a given rule. Moreover, unlike non-preferential RoO that are employed in the application of numerous other trade-policy instruments, preferential RoO have few purposes beyond refereeing the market access of goods to the PTA space. As such, their negotiation would probably not involve as much consideration of the other WTO agreements as the harmonization of non-preferential RoO does.

Thirdly, the growing attention at the WTO on PTAs in general and preferential RoO, in particular, should propel constructive proposals as to the types of RoO that are most conducive to the march toward unfettered global flow of commerce. For the first time in its history, the WTO Committee on Regional Trade Agreements (CRTA) has decided to consider RoO a 'systemic' issue, as opposed to both individual PTA issues such as prior considerations of the PANEURO system, and issues that—whether systemic or individual—are not being prioritized by the CRTA.

Fourthly, advances in Trade-Related Investment Measures (TRIMS) can help advance the harmonization of RoO, if RoO are viewed, as they rightfully can and should be, as policy instruments affecting investment decisions (Thorstensen 2002). Like TRIMS, RoO can be employed strategically as an incentive to attract investment and encourage exports—*and* exports with high local value. A sturdier multilateral regulatory framework on investment policies could help curb the strategic, trade- and investment-distorting uses of RoO.

Harmonization of preferential RoO—and harmonization toward a flexible-regime model—provides at present the most attainable means to counteract RoO's negative effects on global trade and investment. The negotiators of the Doha Trade Round should decisively tackle RoO as a distortionary trade and investment policy instrument, and do so in four concrete ways.

First, they should provide a forceful push for completing the task of harmonizing non-preferential RoO. Completing the harmonization process is all the more compelling in the face of the growth of global commerce and the increasing fragmentation of global production, both of which would thrive under a clear and uniform set of rules.

Secondly, the Doha negotiators should launch a process of *de jure* harmonization of preferential Rules of Origin. The relatively high levels of restrictiveness of the main RoO regimes and the differences between regimes pose unnecessary policy hurdles to rational economic decisions, limiting the opportunities for exporters to operate on multiple trade fronts simultaneously, and hampering consumers' access to the best goods at the lowest prices.

Thirdly, the Doha Round should forge in a multilateral mechanism to monitor and enforce the transparent application of both preferential and non-preferential RoO. And fourthly, RoO should be incorporated in the TRIMs negotiations.

Preferential RoO matter only as long as there are MFN tariffs. Thus, the ultimate key to counteracting preferential RoO's negative effects lies in the success of multilateral liberalization. Should multilateral trade rounds result in deep MFN tariff lowerings and the proliferation of PTAs engender a dynamic of competitive liberalization worldwide, the importance of preferential RoO as gatekeepers of commerce would automatically dissolve.

3.7 Conclusion

This chapter has sought to present a novel descriptive and analytical mapping of the global Rules of Origin panorama. We have (1) reviewed the types of RoO used around the world; (2) drawn comparisons between the structure of RoO across a host of PTAs; (3) presented methodologies for constructing generalizable measurements for (a) the degree of restrictiveness and selectivity of product-specific RoO, and (b) the level of flexibility provided by the various regime-wide RoO; and (4) explored the behavior of RoO over time. We have also sought to chart some of the main *ad hoc* measures in RoO regimes, and offer policy recommendations for reducing the actual restrictiveness of RoO and the proliferation of divergent types of RoO regimes around the world.

We have provided precursory evidence that RoO are to an important extent driven by political-economy dynamics. The analytical tools

developed here can be employed to evaluate the politics behind the definition of RoO as well as the economic effects of RoO. On a broader level, we have striven to help pave the way for further efforts to disaggregate PTAs by the various disciplines they prescribe. Such a task is central for developing a full understanding of the extent of contractual diversity in the rapidly proliferating PTA universe. It is also crucial for moving the debate on the effects of PTAs on the multilateral trading system toward PTA-PTA comparisons—and, ultimately, for making recommendations for designing PTAs in ways that are conducive to unfettered global commerce.

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Appendix I

The observation rule yields a RoO index as follows:

$$y = 1 \text{ if } y^* \leq \text{CI}$$
$$y = 2 \text{ if } \text{CI} < y^* \leq \text{CS}$$
$$y = 3 \text{ if } \text{CS} < y^* \leq \text{CS and VC}$$
$$y = 4 \text{ if CS and VC} < y^* \leq \text{CH}$$
$$y = 5 \text{ if } \text{CH} < y^* \leq \text{CH and VC}$$
$$y = 6 \text{ if CH and VC} < y^* \leq \text{CC}$$
$$y = 7 \text{ if } \text{CC} < y^* \leq \text{CC and TECH}$$

where y^* is the latent level of restrictiveness of RoO (rather than the observed level of restrictiveness); CI is change of tariff classification at the level of tariff item (8–10 digits), CS is change at the level of subheading (6-digit HS), CH is change at the level of heading (4 digits), and CC is change at the level of chapter (2 digits HS); VC is a value-content criterion; and TECH is a technical requirement.

We make three modifications to the observation rule in the case of RoO for which no CTC is specified in order to allow for coding of such RoO in the PANEURO, SADC and other regimes where not all RoO feature a CTC component. First, RoO based on the import content rule are equated to a change in heading (value 4) if the content requirement allows up to 50 per cent of non-originating inputs of the ex-works price of the product. Value 5 is assigned when the share of permitted non-originating inputs is below 50 per cent, as well as when the import content criterion is combined with a technical requirement. Secondly, RoO featuring an exception alone is assigned the value of 1 if exception concerns a heading or a number of headings, and 2 if the exception concerns a chapter or a number of chapters. Thirdly, RoO based on the wholly obtained criterion are assigned value 7.

To be sure, the observation rule is somewhat crude (1) for accounting for the restrictiveness of a standalone TECH RoO, which is likely more demanding than a coding of 1–2 allows; and (2) for capturing subtleties of the EU RoO as it does not account for the 'soft' CTC criterion used by the EU. However, it does allow for establishing useful cross-regime comparisons.

Appendix IIa PTAs around the world, by year of entry into force and full name

PTA	ENTRY YR	FULL NAME/TYPE
EU–ICELAND	1973	PANEURO
EU–NORWAY	1973	PANEURO
EU–SWITZERLAND	1973	PANEURO
BANGKOK AGREEMENT	1976	
LAIA	1981	Latin American Integration Association
SPARTECA	1981	South Pacific Regional Trade and Economic Cooperation Agreement
ANZCERTA	1983	Australia-New Zealand Closer Economic Relations Trade Agreement
GULF CC	1983	Gulf Cooperation Council
US–ISRAEL	1985	
ECOWAS Trade Liberalisation Scheme	1990	Economic Community of West African States
MERCOSUR	1991	Southern Common Market
NAMIBIA–ZIMBABWE	1992	
EFTA–CZECH REPUBLIC	1992	PANEURO
EU–CZECH REPUBLIC	1992	PANEURO
EU–HUNGARY	1992	PANEURO
EU–SLOVAK REPUBLIC	1992	PANEURO
EFTA–SLOVAK REPUBLIC	1992	PANEURO
EFTA–TURKEY	1992	PANEURO
EU–POLAND	1992	PANEURO
EU–BULGARIA	1993	PANEURO
AFTA	1993	ASEAN Free Trade Area
CEFTA	1993	Central European Free Trade Area/PANEURO
EFTA–BULGARIA	1993	PANEURO
EFTA–ISRAEL	1993	PANEURO
EFTA–HUNGARY	1993	PANEURO
EFTA–POLAND	1993	PANEURO
EFTA–ROMANIA	1993	PANEURO
EU–ROMANIA	1993	PANEURO
BAFTA	1994	Baltic Free Trade Agreement/PANEURO
COMESA	1994	Common Market for Eastern and Southern Africa
EEA	1994	European Economic Area/PANEURO
NAFTA	1994	North American Free Trade Agreement
G3	1995	Group of Three
EFTA–SLOVENIA	1995	PANEURO
EU–LATVIA	1995	PANEURO
EU–LITHUANIA	1995	PANEURO
EU–ESTONIA	1995	PANEURO
MEXICO–BOLIVIA	1995	
MEXICO–COSTA RICA	1995	
EFTA–ESTONIA	1996	PANEURO
EFTA–LATVIA	1996	PANEURO
EFTA–LITHUANIA	1996	PANEURO
SLOVENIA–LATVIA	1996	PANEURO
SLOVENIA–FYROM	1996	PE
MERCOSUR–CHILE	1996	
CZECH REPUBLIC–LITHUANIA	1997	PANEURO
POLAND–LITHUANIA	1997	PANEURO
SLOVAK REPUBLIC–ISRAEL	1997	PANEURO
SLOVENIA–ESTONIA	1997	PANEURO
CZECH–ISRAEL	1997	PANEURO
CZECH–LATVIA	1997	PANEURO
SLOVAK REPUBLIC–LATVIA	1997	PANEURO
SLOVAK REPUBLIC–LITHUANIA	1997	PANEURO
SLOVENIA–LITHUANIA	1997	PANEURO
EU–FAROE ISLANDS	1997	PE

Appendix IIa (*Continued.*)

PTA	ENTRY YR	FULL NAME/TYPE
TURKEY–ISRAEL	1997	PE
CAN–CHILE	1997	
CAN–ISRAEL	1997	
MERCOSUR–BOLIVIA	1997	
CZECH–ESTONIA	1998	PANEURO
HUNGARY–TURKEY	1998	PANEURO
ROMANIA–TURKEY	1998	PANEURO
SLOVAK REPUBLIC–ESTONIA	1998	PANEURO
SLOVAK REPUBLIC–TURKEY	1998	PANEURO
TURKEY–LITHUANIA	1998	PANEURO
CZECH REPUBLIC–TURKEY	1998	PANEURO
HUNGARY–ISRAEL	1998	PE
POLAND–ISRAEL	1998	PE
SLOVENIA–CROATIA	1998	PE
SLOVENIA–ISRAEL	1998	PE
EU–TUNISIA	1998	
EU–SLOVENIA	1999	PANEURO
POLAND–LATVIA	1999	PANEURO
CHILE–MEXICO	1999	
TURKEY–BULGARIA	1999	
EFTA–MOROCCO	1999	
HUNGARY–LITHUANIA	2000	PANEURO
POLAND–TURKEY	2000	PANEURO
TURKEY–LATVIA	2000	PANEURO
TURKEY–SLOVENIA	2000	PANEURO
HUNGARY–LATVIA	2000	PANEURO
BULGARIA–FYROM	2000	PE
TURKEY–FYROM	2000	PE
EU–ISRAEL	2000	PE
SADC	2000	Southern African Development Community
EU–MEXICO	2000	
EU–SOUTH AFRICA	2000	
MEXICO–ISRAEL	2000	
EU–MOROCCO	2000	
US–JORDAN	2001	
EFTA–MEXICO	2001	
EFTA–CROATIA	2002	PANEURO
EU–CROATIA	2002	PANEURO
CACM–CHILE	2002	
JSEPA	2002	Japan–Singapore Economic Partnership Agreement
SAFTA	2003	Singapore–Australia Free Trade Agreement
EU–CHILE	2003	
EFTA–SINGAPORE	2003	
CHILE–SOUTH KOREA	2003	
US–CHILE	2003	
US–SINGAPORE	2004	
CAFTA	Yet to be ratified	US–Central America Free Trade Agreement

Appendix IIb Selected PTAs by member states

PTA	MEMBERS
AFTA	Brunei, Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
ANZCERTA	Australia, New Zealand
BAFTA	Estonia, Latvia, Lithuania
BANGKOK AGREEMENT	Bangladesh, China, India, Republic of Korea, Laos, Sri Lanka
CACM	Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
CAFTA	Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, United States and Dominican Republic
CARICOM	Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago
CEFTA	Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Slovenia
COMESA	Angola, Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe
EEA	EU, Iceland, Liechtenstein, Norway
EFTA	Iceland, Liechtenstein, Norway, Switzerland
ECOWAS	Benin, Burkina Faso, Cabo Verde, Ivory Coast, Gambia, Ghana, Guinea, Guinea Bissau, Mali, Liberia, Niger, Nigeria, Senegal, Sierra Leone, Togo, Namibia, Zimbabwe
FSRs	Belarus, Kazakhstan, Kyrgyz Republic, Russia
G3	Mexico, Colombia, Venezuela
GULF CC	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
JSEPA	Japan, Singapore
LAIA	Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela
MERCOSUR	Argentina, Brazil, Paraguay, Uruguay
NAFTA	US, Canada, Mexico
SADC	Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe
SAFTA	Singapore, Australia
SPARTECA	Australia, New Zealand, Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, Western Samoa

Notes for tables

[i] Ex-works price means the price paid for the product ex works to the manufacturer in the Member States in whose undertaking the last working or processing is carried out, provided the price includes the value of all the materials (the customs value at the time of importation of the non-originating materials used, or the first ascertainable price paid for the materials in the member state concerned) used, minus any internal taxes that are, or may be, repaid when the product obtained is exported.

[ii] The transaction method is:

$$RVC = (TV - VNM/TV) \times 100,$$

where RVC is the regional value content, expressed as a percentage; TV is the transaction value of the good adjusted to a FOB basis; and VNM is the value of non-originating materials used by the producer in the production of the good.
The net cost method is

$$RVC = [(NC - VNM)/NC] \times 100,$$

where RVC is the regional value content, expressed as a percentage; NC is the net cost of the good; and VNM is the value of non-originating materials used by the producer in the production of the good.

[iii] The build-down method is

$$RVC = [(AV - VNM)/AV] \times 100;$$

the build-up method is:

$$RVC = (VOM/AV) \times 100,$$

where RVC is the regional value content, expressed as a percentage; AV is the adjusted value; VNM is the value of non-originating materials used by the producer in the production of the good; and VOM is the value of originating materials used by the producer in the production of the good.

[iv] The initial VC for chs. 28–40 is 40 per cent for the first three years, 45 per cent during the fourth and fifth years, and 50 per cent starting in year six. For chs. 72–85 and 90, VC is 50 per cent for the first five years, and 55 per cent starting year six.

[v] The Mercosur RoO is 60 per cent RVC, and, additionally, change in tariff heading (Garay and Cornejo 2002). When it cannot be determined that a change in heading has taken place, the CIF value of the non-originating components cannot exceed 40 per cent of the FOB value of the final good. Special RoO apply to selected sensitive sectors, including chemical, some information technology, and certain metal products.

[vi] The requirement is that the CIF value of the non-originating materials does not exceed 40 per cent of the FOB export value of the final good.

[vii] A 50 per cent MC rule applies to Colombia, Peru and Venezuela; products from Bolivia and Ecuador are governed by a 60 per cent MC rule.

[viii] The value-added test and is based on the formula: Qualifying Expenditure (Q/E)/Factory Cost (F/C), where Q/E = Qualifying expenditure on materials + qualifying labor and overheads (includes inner containers); and F/C = Total expenditure on materials + qualifying labor and overheads (includes inner containers). The factory or works cost are essentially the sum of costs of materials (excluding customs, excise or other duties), labor, factory overheads, and inner containers.

[ix] The agreement requires the value added ensuing from their production in member states be not less than 40 per cent of their final value 'at the termination of

the production phase'. In addition, the share owned by the citizens of the member states of the producing plant cannot be less than 51 per cent.

[x] The MC criterion is calculated from CIF and FOB as follows:

$$\text{NOM} = (\text{MCIF}/\text{FOB}) \times 100,$$

where NOM is the value content of non-originating materials, MCIF is the CIF value on non-originating materials, and FOB is the free on-board value payable by the buyer to the seller.

[xi] The origin protocol requires that either the CIF value of non-originating materials does not exceed 60 per cent of the total cost of the materials used in the production of the goods; or that the value added (the difference between the ex-factory cost of the finished product and the CIF value of the materials imported from outside the member states and used in the production) resulting from the process of production accounts for at least 35 per cent of the ex-factory cost (the value of the total inputs required to produce a given product) of the goods.

[xii] Besides the 40 per cent RVC rule, the share of member states' citizens of the plant that produced the product must be at least 51 per cent.

[xiii] The RVC is calculated as the sum of (i) the cost or value of the materials produced in the exporting Party, plus (ii) the direct costs of processing operations performed in the exporting party. It cannot be less than 35 per cent of the appraised value of the article at the time it is entered into the other party.

The cost or value of materials produced in a party includes: (i) the manufacturer's actual cost for the materials, (ii) when not included in the manufacturer's actual cost for the materials, the freight, insurance, packing, and all other costs incurred in transporting the materials to the manufacturer's plant, (iii) the actual cost of waste or spoilage (material list), less the value of recoverable scrap, and (iv) taxes and/or duties imposed on the materials by a party, provided they are not remitted upon exportation. When a material is provided to the manufacturer without charge, or at less than fair market value, its cost or value shall be determined by computing the sum of: (i) all expenses incurred in the growth, production, or manufacture of the material, including general expenses, (ii) an amount for profit, and (iii) freight, insurance, packing, and all other costs incurred in transporting the material to the manufacturer's plant.

Direct costs of processing operations mean those costs either directly incurred in, or that can be reasonably allocated to, the growth, production, manufacture, or assembly, of the specific article under consideration. Such costs include, for example, (i) all actual labor costs involved in the growth, production, manufacture, or assembly, of the specific article, including fringe benefits, on-the-job training, and the cost of engineering, supervisory, quality control, and similar personnel, (ii) dies, molds, tooling and depreciation on machinery and equipment that are allocable to the specific article, (iii) research, development, design, engineering, and blueprint costs insofar as they are allocable to the specific article; and (iv) costs of inspecting and testing the specific article.

[xiv] Drawback is not mentioned in Hungary–Israel, Poland–Israel, Slovenia–Croatia, Slovenia–FYROM FTAs. Drawback allowed for the first two years in EU–Palestinian Authority, two and one half years in EFTA–Palestinian Authority, three years in EFTA–FYROM, one year in Bulgaria–FYROM, three months in Turkey–FYROM, and two years in Israel–Slovenia.

[xv] Joint Declaration I of the FTA opens the possibility for full cumulation, stating that 'or that purpose, the Parties will examine the parameters to be considered in evaluating the economic conditions needed to eventually implement full cumulation. This process will begin no later than three years after entry into force of this Decision.'

[xvi] The Revised Treaty of Chaguaramas Establishing the Caribbean Community, including the CARCIOM Single Market and Economy stipulates that any member state needs to justify the need to apply an export drawback Council for Trade and Economic Development (COTED). COTED is mandated to review the use of drawback by members on an annual basis.

[xvii] When products from the South Pacific Islands that are exported to New Zealand are cumulated with Australian inputs, a minimum of 25 per cent of 'qualifying expenditure' from South Pacific Islands is required.

[xviii] Requires the expenditure on goods produced and labor performed *within the territory of the exporting* member state in the manufacture of the goods to not less than 50 per cent of the ex-factory or ex-works cost of the goods in their finished state.

The agreement stipulates that 'With respect to drawbacks within one year from the date of entry into force of this Agreement, the Standing Committee shall consider whether drawbacks on goods imported from third countries should be permitted in relation to products used in the manufacture of finished products for which concessions have been exchanged by the Participating States.'

[xx] Mentioned in the section on trade remedies. One of the criteria for imposing a countervailing duty is that the targeted subsidy is not less than the 2 per cent *de minimis*.

[xxi] The FTA stipulates that 'Where each Party has entered separately into a free trade agreement under Article XXIV of the GATT 1994 with the same non-Party before this Agreement enters into force, a good, which, if imported into the territory of one of the Parties under such free trade agreement with that non-Party, would qualify for tariff preferences under that agreement, shall be considered to be an originating good under this Chapter when imported into the territory of the other Party and used as a material in the production of another good in the territory of that other Party.'

5

Rules of Origin as export subsidies*

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5.1 Introduction

With the proliferation of preferential trading agreements over the last two decades, considerable attention has been devoted to assessing their effect on market access. Notwithstanding the fact that GATT Article XXIV, para. 8(b) requires the removal of trade barriers on 'substantially all trade' in Free-Trade Agreements (FTAs), in reality numerous barriers to intrabloc trade are often left intact or even erected as part of the agreements.[1] Rules of Origin (RoOs) feature prominently among those barriers.

In principle, RoOs are meant to prevent the trans-shipment of goods imported from the rest of the world, via member states with low external tariffs, into those with higher ones. In practice, these rules often have the effect of 'exporting protection' from high-tariff members to low-tariff ones, as pointed out by Krishna and Krueger (1995) and Krueger (1997).

In North-South FTAs, in particular, the combination of tariff preferences and RoOs can affect trade flows in ways that are not conducive to economic efficiency. Suppose that the production of final goods involves two stages: the capital-intensive production of components, and labor-intensive assembly. If goods are entirely produced in the North early on

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[1] See Serra *et al.* (1996) for a review of shortcomings in the application of Article XXIV.

in their product cycle, preferential tariff reductions may accelerate the process of assembly relocation in the South, leading to what Hanson (1996) called 'regional production networks'.[2] Suppose, however, that component manufacturing could profitably be relocated to another Northern country outside of the preferential trading bloc. Rules of Origin, by forcing Southern assemblers to source a minimum fraction of their components in the area, prevent the ultimate relocation of the whole value chain in the world's most efficient location. In other words, RoOs, when they bind, organize trade diversion by creating captive markets for relatively inefficient Northern intermediate-good producers.

While the potentially trade-diverting effect of RoOs has been widely recognized in the literature (see, for instance, Falvey and Reed, 2000), the recent political-economy literature has also highlighted the fact that RoOs can sometimes make preferential agreements politically feasible in circumstances where they wouldn't be otherwise (Duttagupta, 2000; Duttagupta and Panagaryia, 2002). As Grossman and Helpman (1995) showed that trade-diverting FTAs are, *ceteris paribus*, more likely than others to be politically acceptable, Duttagupta and Panagariya's result is quite consistent with RoOs acting as 'trade diverters'.

While the theoretical analysis of RoOs has made considerable strides since Krueger's pioneering work, their empirical analysis is still in its infancy, partly because their complex legal nature makes measurement difficult. Estevadeordal (2000) recently proposed a way of overcoming this difficulty by devising a qualitative index of RoO strictness. Using the fact that most RoOs are—at least in recent agreements—expressed as a required change in tariff heading at various levels of aggregation, Estevadeordal's index takes values that increase in the level of aggregation of the required change, the idea being that a change at a more aggregate level is 'wider' and hence a more stringent transformation requirement. On the basis of his index, he identified a strong negative effect of NAFTA's RoOs on Mexican market access. Using the same index, Anson *et al.* (2003) showed that the effect of NAFTA's tariff preferences is systematically reduced by RoOs.

Although Anson *et al.*'s results are qualitatively unambiguous, they suffer from the fact that the potential endogeneity of RoOs is not treated. If there is little doubt that, as pointed out by Estevadeordal (2000) and

[2] However, Hanson also shows that the emergence of vertical trade between Mexico and the United States largely pre-dates the formation of NAFTA, as assembly plants operating under the older 'maquiladora' regime already accounted for 53% of Mexico's manufactured exports in 1992.

Sanguinetti (2003), RoOs are the result of a political bargaining process that is itself likely to be affected by trade patterns, it is not entirely clear, short of a full political-economy model, what exactly they are endogenous to. If they are endogenous to Mexican final-good exports, clearly there is a simultaneity problem. If, however, RoOs are endogenous to trade flows that are related to Mexican exports only through an indirect, non-linear relationship, for estimation purposes the relevant system may be recursive rather than truly simultaneous.

In this chapter, we take the endogeneity problem as a starting point for an exploration of the political-economy forces that are likely to shape RoOs. Although many assumptions must be made along the way, we show that in a model of endogenous RoO determination à la Grossman–Helpman (1994), the key determinant of RoOs in terms of trade flows is a product of US intermediate-good exports to Mexico and input-output coefficients. The model generates results both in terms of interpretation of what RoOs do and in terms of what the estimation strategy should be.

As for interpretative results, the key one is that whereas RoOs create captive markets for US intermediate goods, tariff preferences needed to make them acceptable to Mexican exporters along their participation constraint constitute a transfer—albeit a modest one—from US taxpayers.[3] The combination of RoOs and tariff preference is then equivalent to an export subsidy on US intermediate goods. The model thus proposes a tentative answer, in this particular context, to a question arising frequently in trade policy—namely, why inefficient indirect instruments are used to redistribute income or favor particular activities when more direct instruments would achieve the same results at lower welfare costs. Here, RoOs substitute for a prohibited instrument, as export subsidies would be in violation of the US's obligations under the GATT.

Our analysis of Rules of Origin requires a model with multiple stages of production. In contrast to Lloyd (1993), Rodriguez (2001) and Carrère and de Melo (2004) who use a multistage production model due to Dixit and Grossman (1982), our analysis requires only a two-stage Leontieff production technology whose analytics are very simple.

As for the estimation, the model suggests, as the key determinant of NAFTA's RoOs, a vector product of input-output coefficients multiplied by US intermediate-good exports upstream of the good to which RoOs apply. Our estimation strategy thus consists of regressing RoOs on steady-state

[3] By participation constraint, we mean that the rate of effective protection granted to Mexican final-good producers by the combination of tariff preferences and Rules of Origin is just zero.

tariff preferences (equal, at the end of the phase-out period, to the US MFN tariff adjusted for exceptions) and the upstream variable just described, the functional form being the political-economy model's first-order condition. This generates a vector of predicted RoOs that are then used in the market-access equation. As for tariff preferences, we do not model their endogeneity directly as intra-NAFTA tariffs smoothly converge to zero over a fixed phase-out period. A fuller model would recognize, as Estevadeordal (2000) did, that the length of the phase-out may itself be endogenous, but the model we use does not lend itself easily to taking this into account.

NAFTA, on which we test the model's main predictions, is a good testing ground for the effect of RoOs. It is the quintessential example of the North-South agreement due to the comprehensive tariff liberalization built in the agreement and the fact that member countries share borders, eliminating the need to account for distance as in traditional gravity exercises. From 1989 to 1994, Mexico's exports to the United Stated benefitted from the Generalized System of Preferences (GSP), after which this regime was overhauled by NAFTA. We construct a panel dataset with information dating back to 1994 on commodity exports from Mexico to the United States under different preferential programs. The data was compiled mostly from USITC sources at the 6-digit HS disaggregation level and contains information on tariff preferences (GSP and NAFTA rates) granted by the United States to Mexico. The data on Rules of Origin comes from Estevadeordal (2000).

The results are in striking conformity with the model's predictions. All variables are significant—most of them at the 1% level—and have the expected signs. Tariff preferences and RoOs exert positive and negative influences respectively on Mexican exports, and the key variable influencing endogenously determined RoOs—a product of input-output coefficients and US intermediate exports to Mexico—has the predicted sign and is significant at the 1% level.

The chapter is organized as follows. Section 5.2 sets out the political-economy model and characterizes its equilibrium. Section 5.3 presents the empirical methodology and results, and Section 5.4 concludes.

5.2 Politically determined RoOs

This section uses a simple, stripped-down political-economy model to illustrate the simultaneous determination of tariff preferences and RoOs. Although the model borrows from Grossman and Helpman (1994) the

appearance of a general-equilibrium model, it is best thought of as a partial-equilibrium one as interindustry linkages are non-existent except for the vertical linkages around which the discussion is centered.

5.2.1 *The economy*

Consider a PTA formed by two small economies, North (N) and South (S). The North produces, under increasing cost, an intermediate good denoted by the subscript I and exports it to the South that uses it to assemble a final good denoted by the subscript F. Southern supply of the final good is not enough to cover the North's consumption at its tariff-ridden price, so the North also imports from the rest of the world. The South imports all its own consumption of the final good from the rest of the world and exports all its production to the North.[4]

Households in both countries consume the final good and an aggregate of all other goods, which also serves as numeraire, under identical and quasilinear preferences. Let c_F and c_0 denote, respectively, the quantities of final and 'other' goods consumed by a representative consumer in either country. The utility function is

$$U = c_0 + u(c_F), \tag{5.1}$$

where $u' > 0$ and $u'' < 0$.

The final good sold in the free-trade area is produced by combining value added and the intermediate good. Value added is created with intersectorally mobile labor ℓ and specific capital κ under a technology $f(\ell, \kappa)$. The technology producing the final good, into which the value-added production function is nested, is of the Leontieff type with input-output coefficient a_{IF}. Letting y_F and x_I stand, respectively, for the final-good output and quantity of intermediate good consumed in the process,

$$y_F = \min\{f(\ell, \kappa); x_I/a_{IF}\}. \tag{5.2}$$

Let p_I^* and p_F^* be, respectively, the intermediate and final goods' world prices. Under free trade, given the technology postulated, the 'net price' out of which a Southern producer can remunerate value added (wages and profits) is

$$p^* = p_F^* - a_{IF}p_I^*. \tag{5.3}$$

With the stock of specific capital fixed, the technology f that generates value added displays diminishing returns on labor. The supply of value

[4] This is shown to arise endogenously as a result of tariff preferences, perfect competition, and the non-market saturation assumption in Cadot *et al.* (2001).

added is therefore upward sloping in its net price p^*, and economic rents accrue to owners of specific capital, who are assumed to be the industry's residual claimants.

A similar good is sold in the rest of the world, and the marketing mix between the free-trade area and the rest of the world is determined by a Constant Elasticity of Transformation (CET) technology (see the footnote in Section 5.3) that provides the functional form for the market-access equation estimated in the empirical part.

The rest of the economy uses only labor under constant returns to scale, which fixes the wage rate. Given this assumption, the model becomes a quasi-partial equilibrium one. In this setting, the Southern final-good producers' surplus under free trade, π_{F}^*, is a monotonic increasing function of p^*:

$$\pi_{\mathrm{F}}^* = p^* y_{\mathrm{F}} - w_{\mathrm{S}} \ell_{\mathrm{F}}.$$

Letting p be the *domestic* net price, $(p - p^*)/p$ is the effective rate of protection granted to Southern producers when selling on the Northern market.[5]

The intermediate good is produced in the North with 'value added only' (no intermediate consumption) under a technology similar to f (i.e. a CRS combination of labor and specific capital). Letting y_{I} be its output, the producer surplus is

$$\pi_{\mathrm{I}} = p_{\mathrm{I}} y_{\mathrm{I}} - w^{\mathrm{N}} \ell_{\mathrm{I}}. \tag{5.4}$$

Finally, we will treat the intermediate-good's supply elasticity in the North, $\varepsilon_{\mathrm{I}} \equiv p_{\mathrm{I}} y_{\mathrm{I}}' / y_{\mathrm{I}}$, as a constant.

5.2.2 *The preferential regime*

In order to keep things simple, we will treat MFN (external) tariffs on the final and intermediate goods as pre-determined to the PTA and hence parametric. Northern tariffs are, respectively, $t_{\mathrm{F}}^{\mathrm{N}}$ and $t_{\mathrm{I}}^{\mathrm{N}}$ and Southern ones $t_{\mathrm{F}}^{\mathrm{S}}$ and $t_{\mathrm{I}}^{\mathrm{S}}$. In order to focus on the effects of Northern tariffs and RoOs, we will set $t_{\mathrm{F}}^{\mathrm{S}} = t_{\mathrm{I}}^{\mathrm{S}} = 0$. Extensions to other cases are straightforward but add little to the analysis.[6]

[5] To see this, it suffices to observe that p is unit value added.

[6] First, note that endogenous determination of MFN tariffs would yield $t_{\mathrm{I}}^{\mathrm{S}} = t_{\mathrm{F}}^{\mathrm{N}} = 0$ given that the South does not produce the intermediate good and the North does not produce the final one. However, if specialization is a result of the PTA and MFN tariffs are pre-determined to it (say, because they are negotiated in multilateral rounds and thus constitute valuable bargaining chips), they will not be eliminated after the PTA's formation.

The model's endogenous political-economy variables are the preferential tariff applied, as part of the PTA, on Southern exports of the final good, τ, and the regional value content of the RoO, r. Let $x_{\mathrm{I}}^{\mathrm{N}}$ be the amount of intermediate good sourced in the North (as opposed to imported from the rest of the world), and let $\delta = t_{\mathrm{F}}^{\mathrm{N}} - \tau$ be the rate of preference (in specific form). The price at which Southern final-good producers—we will henceforth use the term 'assemblers' for brevity—can sell in the North is

$$p_{\mathrm{F}} = \begin{cases} p_{\mathrm{F}}^{*} + \delta & \text{if } x_{\mathrm{I}}^{\mathrm{N}} \geq r x_{\mathrm{I}} \\ p_{\mathrm{F}}^{*} & \text{otherwise.} \end{cases} \tag{5.5}$$

That is, Southern assemblers can sell under the PTA's preferential regime if they satisfy the RoO. If not, they sell under the MFN regime, i.e. at the world price.

Given the RoO, Southern assemblers selling under the preferential regime source a proportion r of their intermediate good in the North. The price of the 'composite' intermediate good is thus $rp_{\mathrm{I}} + (1-r)p_{\mathrm{I}}^{*}$, and the net price faced by Southern assemblers is

$$p = p_{\mathrm{F}}^{*} + \delta - a_{\mathrm{IF}}[rp_{\mathrm{I}} + (1-r)p_{\mathrm{I}}^{*}]. \tag{5.6}$$

5.2.3 *The politics*

We assume no bargaining between the Northern and Southern partners: the North makes a take-it-or-leave-it offer to the South that the South accepts as long as its participation constraint is not violated. This is admittedly a rather crude description of negotiations between Northern and Southern preferential partners but perhaps not an unrealistic one judging from ample anecdotal evidence about US-Mexico or EU-Eastern Europe negotiations.

Thus, the political action is in the North, where the RoO's RVC content r and the rate of preference δ are simultaneously determined. Our analysis is concerned with a transition phase during which preferences are partial. In the long run, after intrabloc tariffs have been phased out the rate of preference is automatically equal to the rate of MFN tariffs, so the participation constraint suffices to determine the RoO's RVC content. During

Secondly, even if $t_{\mathrm{F}}^{\mathrm{S}} > 0$, is level is inconsequential. To see this, observe that if $t_{\mathrm{F}}^{\mathrm{S}} < t_{\mathrm{F}}^{\mathrm{N}}$, the South's entire output is sold in the North and the analysis is as if $t_{\mathrm{F}}^{\mathrm{S}}$ was zero. If $t_{\mathrm{F}}^{\mathrm{S}} > t_{\mathrm{F}}^{\mathrm{N}}$, the South's output is sold in priority on the Southern market. But if some of it is also exported to the Northern market (which is, of course, necessary for RoOs to have any effect at all) then the South's output being larger than its consumption, the Southern price is 'competed down' to the level of the Northern tariff-ridden price, and the analysis proceeds as before.

the transition phase, however, both are determined simultaneously. As a further simplification, whereas intrabloc tariffs are phased out progressively in a continuous manner, we assume that the phase-out is done in two steps: from MFN tariff to 'the' preferential rate (on which our analysis focuses), and hence to zero.

The politics is described by a Grossman–Helpman game in which the intermediate producers lobby faces the government with a contribution schedule $C(\delta, r)$ conditioned on the policy variables of interest to it, δ and r. The function C has the 'truthfulness' property that

$$\left.\frac{\partial C}{\partial r}\right|_{r^e,\delta^e} = \left.\frac{\partial \pi}{\partial r}\right|_{r^e,\delta^e} \quad \text{and} \quad \left.\frac{\partial C}{\partial \delta}\right|_{r^e,\delta^e} = \left.\frac{\partial \pi}{\partial \delta}\right|_{r^e,\delta^e},$$

where the superscript e designates equilibrium values. With only one lobby, the common agency degenerates into a simple principal-agent relationship.[7] Without hidden action, the principal (the lobby) is then able to appropriate the entire protection rents, and any equilibrium will have the property that the government is just indifferent between implementing the lobby's preferred policy and the default one (free trade).[8] Put differently, the lobby's contribution just compensates the government for the (subjective) monetary equivalent of the efficiency loss generated by trade protection. The government determines δ and r to maximize a linear combination of welfare (valued at a constant monetary equivalent a) and the lobby's contribution:

$$G^N \equiv C(\delta, r) + aW(\delta, r).$$

The pair (δ, r) is set to leave the FTA's Southern partner on its 'participation constraint'. Given that the South's consumption of the final good is

[7] The model ignores lobbying by Northern final-good producers, if any. There are several reasons for this. First, in terms of modelling issues, competitive final-good producers would be concerned about prices only, not market shares. As the Northern MFN tariff on the final good is unchanged, their profits would be unchanged as long as the area is not self-sufficient at the Northern tariff-ridden price. Secondly, even if the market is not competitive, as long as the South is on its participation constraint (more on this below) Southern exports to the North are unchanged.

Empirically, as far as NAFTA is concerned, a substantial proportion of the companies doing assembly work in Mexico for re-export into the US are either subsidiaries of US companies or non-competing subcontractors. Cases in which Mexican companies compete head on with US assemblers (either independent or vertically integrated) are, arguably, sufficiently marginal to assume that reducing such competition was *not* a key consideration for US negotiators.

[8] This assumption about rent sharing is in conformity with the empirical observation that small contributions seem to buy 'large' policies in terms of redistributive effects (Ansolobehere *et al.*, 2002). Any alternative assumption would imply larger contributions, which would go against the evidence.

always priced at p_F^*, consumer surplus is unaffected by changes in either τ or r. Thus, the only change in Southern welfare—or any political objective function combining welfare and producer surplus—is in assemblers' profits, and the South's participation constraint is completely characterized by $p = p^*$.

5.2.4 *Equilibrium*

RoOs have the effect of segmenting the intermediate good's market in the trading bloc. Southern assemblers selling on the Northern market must comply with the RoO if they are to benefit from the preferential regime. The market on which they buy the intermediate good is then a closed-economy market where Northern supply must match the RoO-induced Southern demand. We now determine p_I, the price prevailing on that market.

Price determination As already noted, with their home market unprotected, Southern assemblers sell all their output on the protected Northern market where they enjoy preferential access. Suppose that p_I is greater than p_I^*. In an interior solution, it has to be. The RoO's domestic content is then binding, which means that a proportion r of the South's intermediate-good demand will be sourced 'locally' (in the North). The market-clearing condition determining the intermediate good's domestic price is thus that the local demand induced by the RoO, $ra_{IF}y_F(p)$, be equal to its supply, i.e.

$$ra_{IF}y_F(p) = y_I(p_I), \tag{5.7}$$

where, as before, y_F is the South's final-good production and y_I is the North's intermediate-good production.

Let p_I satisfy eqn (5.7). If $p_I \leq p_I^* + t_I^N$, the RoO is not binding, which means that the North's supply of the intermediate good is sufficient to satisfy the South's needs and more. We will henceforth disregard this case and suppose that the intermediate good's price determined by eqn (5.7) is larger than its tariff-ridden price in the North.

Using eqns (5.3) and (5.6), the South's participation constraint can be written as

$$p_F - a_{IF}[rp_I + (1-r)p_I^*] = p_F^* - a_{IF},$$

or, using eqn (5.5) and simplifying,

$$\delta = ra_{IF}\Delta p_I, \tag{5.8}$$

where $\Delta p_I = p_I - p_I^*$. Expression (5.8) says that the degree of effective protection given to Southern assemblers by the combination of r and δ is zero.

In conformity with the agency literature, we will assume that when just indifferent, Southern assemblers choose to use the preferential regime. Moreover, we assume homogeneity of firms, so *all of them* use the preferential regime. With compliance-cost heterogeneity among Southern assemblers, the preferential regime's utilization rate would be less than one and a decreasing function of the rate of effective protection conferred by the mix of preferences and RoOs, as in Carrere and de Melo (Chapter 7). As this would add substantial complication to the analysis, we leave it for further research.

Under compliance-cost homogeneity, the Northern government's maximization problem under the South's participation constraint and the intermediate-good market-clearing condition is

$$\begin{aligned} &\max_{\delta,r} G^N \equiv C_I(\delta, r) + aW^N(\delta, r) \\ &\text{s.t.} \\ &\delta = ra_{IF}\Delta p_I \\ &ra_{IF}y_F(p) = y_I(p_I) \\ &0 \le r \le 1, 0 \le \delta \le t_F^N. \end{aligned} \tag{5.9}$$

As an intermediate step before solving problem (5.9), we now calculate two useful derivatives treating r as pre-determined: dp_I/dr and $d\delta/dr$. The first measures the marginal effect of the RoO, expressed as a regional value content (RVC) r, on the intermediate good's internal price. The second measures the substitutability between the RoO's RVC rate r and the tariff preference rate δ along the South's participation constraint. Both apply only to interior solutions, i.e. when the inequality constraints (5.9) are not binding.

Differentiating totally eqns (5.7) and (5.8) with respect to p_I, δ and r and rearranging gives

$$\begin{aligned} d\delta &= a_{IF}\Delta p_I dr + ra_{IF}dp_I \\ a_{IF}y_F dr &= y_I' dp_I. \end{aligned}$$

The second line gives directly

$$\frac{dp_I}{dr} = \frac{a_{IF}y_F}{y_I'} = \frac{p_I}{r\varepsilon_I} > 0, \tag{5.10}$$

where ε_I is the intermediate good's supply elasticity—treated as constant—and the second part of the equation comes from eqn (5.7). As can be read

directly from eqn (5.10), the elasticity of the intermediate good's internal price to the RoO's RVC rate is just the inverse of its supply elasticity. As the latter goes to infinity, as expected the price becomes totally insensitive to a tightening of the RoO.

Moreover, eqn (5.10) shows that, as long as tariff preferences can be adjusted, the ambiguity of the RoO's effect on the intermediate-good's price noted by Ju and Krishna (1998, 2000) does not apply except at corners. The reason is that, by construction, along the South's participation constraint value added in the final-good sector cannot go down, so (given the Leontieff technology) nor can output. In other words, here RoOs cannot become so stiff as to become self-defeating because any tightening of r is met by an offsetting increase in δ. In order to see what happens at corners, solve eqn (5.8) for r at $\delta = t_F^N$ and define $\bar{r} \equiv t_F^N / a_{IF}\Delta p_I$ as the RVC that just satisfies the participation constraint at full preferences. Ju and Krishna's argument applies in the semi-open interval $(\bar{r}, 1]$ if $\bar{r}<1$. With homogenous firms in the South (in terms of their compliance costs), beyond $\bar{r}$ the participation constraint is violated and the preferential regime's utilization rate jumps down to zero.

Upon rearrangement, the first line of eqn (5.10) gives

$$\begin{aligned} \frac{d\delta}{dr} &= a_{IF}\Delta p_I + r a_{IF}\frac{dp_I}{dr} \\ &= a_{IF}(\Delta p_I + \frac{p_I}{\varepsilon_I}) > 0. \end{aligned} \tag{5.11}$$

Thus, the compensation required by a tightening of the RoO's RVC rate, in terms of tariff preferences, has two components. The first is just the difference between the internal and world prices of the intermediate good multiplied by the input-output coefficient. The second reflects the fact that as the RoO's RVC rate is tightened, costs go up for Southern assemblers not just because they must source a higher proportion of intermediate goods in the area where they are more expensive, but in addition, doing so puts upward pressure on their internal price. This last effect is inversely proportional to its supply elasticity.

We are now in a position to solve problem (5.9). Combining the inequality constraint on δ with the participation constraint gives

$$r a_{IF}\Delta p_I \leq t_F^N.$$

Letting λ and μ be two Lagrange multipliers, we have

$$\pounds = G[\delta(r), r] + \lambda(1 - r) + \mu(t_F^N - r a_{IF}\Delta p_I),$$

and the Kuhn–Tucker conditions are

$$\frac{dG}{dr} \leq 0, r \geq 0, r\frac{dG}{dr} = 0;$$
$$1 - r \geq 0, \lambda \geq 0, \lambda(1 - r) = 0;$$
$$t_F^N - ra_{IF}\Delta p_I \geq 0, \mu \geq 0, \mu(t_F^N - ra_{IF}\Delta p_I) = 0.$$

We now construct the expression for dG/dr that will be set equal to zero under the first-order condition. It has two components: a contribution effect and a welfare effect.

Contribution effect Using Hotelling's lemma and the contribution function's truthfulness property, we have, in the neighborhood of the equilibrium,

$$\frac{dC}{dr} = \frac{d\pi_I}{dr} = y_I\frac{dp_I}{dr} = \begin{cases} p_I y_I/r\varepsilon_I & \text{if } r < \bar{r} \\ 0 & \text{if } r > \bar{r}, \end{cases} \tag{5.12}$$

and the derivative is undefined at $r = \bar{r}$ because p_I jumps down to one at that point (because the preferential regime's utilization rate falls to zero). Thus, left to itself—i.e. absent any welfare consideration—the Northern intermediate-good lobby would be willing to push RoOs to $\bar{r}$, the level of RoO strictness that makes Southern assemblers just indifferent between using the preferential regime or not given tariff-free access ($\delta = t_F^N$).[9]

Combining eqns (5.12) and (5.11), it is apparent that the Northern intermediate-good lobby is willing to contribute in favor of 'deep' tariff preference in the downstream sector because, along the South's participation constraint, tariff preference buys stiffer RoOs, which in turn are to its advantage.

Welfare effect Let m_F and m_F^* be the North's imports of final goods from the South and from the rest of the world, respectively. As the North does not produce the final good, $m_F + m_F^* = c_F$. Under quasi-linear preferences, Northern welfare is the sum of income—from profits, wages and tariff revenue—and consumer surplus, which by eqn (5.1) comes only from consumption of the final good. Formally,

$$W^N = \pi_I + w^N\ell_I + \tau m_F + t_F^N m_F^* + u(c_F) - p_F c_F.$$

As $m_F = y_F$ (the South exports its entire final-good output to the North), $m_F^* = c_F - m_F = c_F - y_F$, so

$$W^N = \pi_I + w^N\ell_I + t_F^N c_F - \delta y_F + u(c_F) - p_F c_F. \tag{5.13}$$

[9] We are grateful to Maurice Schiff for helping to clarify this discussion.

Along the South's participation constraint, p is constant and hence so is y_F. Thus, treating p_I and δ as endogenous variables along the problem's constraints,

$$\begin{aligned}\frac{dW^N}{dr} &= y_I\frac{dp_I}{dr} - y_F\frac{d\delta}{dr}\\ &= \frac{p_I y_I}{r\varepsilon_I} - a_{IF}y_F(\Delta p_I + \frac{p_I}{\varepsilon_I}).\end{aligned}$$

Using the fact that, by eqn (5.7), $a_{IF}y_F = y_I/r$, this becomes

$$\begin{aligned}\frac{dW^N}{dr} &= \frac{y_I}{r}\left\{\frac{p_I}{\varepsilon_I} - (\Delta p_I + \frac{p_I}{\varepsilon_I})\right\}\\ &= -\frac{y_I}{r}\Delta p_I < 0.\end{aligned} \tag{5.14}$$

Combining the contribution and welfare effects gives

$$\begin{aligned}\frac{dG^N}{dr} &= \frac{dC}{dr} + a\frac{dW^N}{dr}\\ &= \frac{p_I y_I}{r\varepsilon_I} - a\frac{y_I}{r}\Delta p_I\\ &= \frac{p_I y_I}{r}(\frac{1}{\varepsilon_I} - \frac{a\Delta p_I}{p_I}).\end{aligned}$$

Under the first-order condition, this expression is set equal to zero, so

$$\frac{p_I}{\Delta p_I} = a\varepsilon_I. \tag{5.15}$$

The second-order condition requires $a\varepsilon_I > 1$, which we assume to hold.[10]

It can be shown by algebraic manipulation that, along the first-order condition, r is a decreasing function of δ. However, the equilibrium value of r that is observed in the data is not determined just by the model's first-order condition but by its intersection with the participation constraint along which r is an increasing function of δ. Using eqn (5.8) to substitute for Δp_I in eqn (5.15) gives

$$r = \frac{\delta a\varepsilon_I}{a_{IF}p_I}. \tag{5.16}$$

[10] This assumption is not innocuous. The parameter a is, in our setting, the dollar amount that the intermediate-good lobby must contribute per equivalent-dollar of welfare reduction. As contributions are typically small relative to the distortionary costs of trade policies, a is likely to be less than one. Then ε_I, the elasticity of supply of intermediate goods, must be above one. When this assumption is violated, a corner solution occurs at either $r = 0$ (no RoO) or $r = \bar{r}$.

Reintroducing the inequality constraints, the solution is thus

$$r = \begin{cases} t_F^N / a_{IF} \Delta p_I & \text{if } \delta a \varepsilon_I \Delta p_I / p_I \geq t_F^N \\ 0 & \text{if } \delta a \varepsilon_I / a_{IF} p_I \leq 0 \\ \delta a \varepsilon_I / a_{IF} p_I & \text{otherwise.} \end{cases}$$

With several inputs indexed by i and one output indexed by j, it is easily verified that eqn (5.16) becomes

$$r_j = \frac{a\delta_j}{\sum_i a_{ij} p_i / \varepsilon_i}. \tag{5.17}$$

This expression will guide the empirical analysis in the section that follows.

5.3 Market access and RoO determination

5.3.1 *The data*

The estimation is carried out on a panel dataset covering the period from 1994 to 2001 and containing information on commodity trade and tariffs between Mexico to United States under MFN and preferential regimes. The data was compiled mostly from USITC sources at the 6-digit HS level of disaggregation. The data on Rules of Origin comes from Estevadeordal (2000). Descriptive statistics are shown in Table 5.1.

5.3.2 *Empirical estimation*

We estimate two equations: a market-access one and a political one. Let j stand for a tariff line (at the HS6 level) and t for time measured in years. The estimated system has a peculiar structure in the time dimension.

Table 5.1 Descriptive statistics

Variable	Obs	Mean	Std. Dev.
log RoO restrict. index	41 944	1.5753	0.3380
log pref. margin	41 834	0.0255	0.0500
log Mex. NAFTA exp.	21 041	13.093	3.090
log Mex.exports to ROW	33 706	11.819	2.959
agriculture	41 944	0.1024	0.3032
final	41 944	0.2530	0.4347
Chge of Chap.	41 944	0.5208	0.4996
Chge of Heading	41 944	0.3863	0.4869
Dhge of Sub-head	41 944	0.0411	0.1986
Exception	41 944	0.4439	0.4968
Technical req.	39 873	0.0651	0.2466
Regional value content	41 723	0.2713	0.445

Mexican exports to the US (y_{jt}) and to the world (x_{jt}) vary over time. So does the rate of preference (δ_{jt}), as NAFTA's tariff reductions were phased in progressively over a transition period (on this, see Estevadeordal, 2000). By contrast, Rules of Origin (r_j) were negotiated once and for all in the early 1990s. Thus, the market-access equation must be estimated on panel data, whereas the political determination of RoOs must be estimated on a cross-section of tariff lines with the variables suggested by the model as likely determinants of RoOs, as of the 1990s.

We measure RoOs in two alternative ways. First, we use a vector of binary variables, each marking the presence of a specific RoO instrument (change of tariff heading, technical requirement, etc.). Secondly, we use Estevadeordal's synthetic index. Using both proxies provides a check on the construction of Estevadeordal's index, as estimated coefficients should be larger in absolute value for instruments assigned a higher value in his index.

Thus, the market-access equations to be estimated is either

$$\ln y_{jt} = \alpha_{0t} + \alpha_1 \ln x_{jt} + \alpha_2 \ln \delta_{jt} + \alpha_3 r_j + u_{jt}, \tag{5.18}$$

where x_{jt} stands for Mexican exports of good j to the rest of the world, δ_{jt} is the rate of preference granted to good j in year t under NAFTA, r_j is Estevadeordal's (2000) index of RoO strictness, and u_{jt} is an error term. Alternatively,

$$\ln y_{jt} = \alpha_{0t} + \alpha_1 \ln x_{jt} + \alpha_2 \ln \delta_{jt} + \sum_{k=1}^{n} \widetilde{\alpha}_k r_{kj} + u_{jt}, \tag{5.19}$$

with a vector of n binary variables for the n legal forms of RoOs.

We control for serial correlation in the time dimension by time effects and for unobserved industry characteristics by fixed effects at the section level. As the estimation is carried out at the hs6 level of aggregation, we control for heteroskedasticity by using weighted least squares, the weight being Mexico's total exports. Expected signs and magnitudes in eqn (5.18) are $\alpha_1 > 1$, $\alpha_2 > 0$, $\alpha_3 < 0$, and, in eqn (5.19), $\widetilde{\alpha}_{k+1} < \widetilde{\alpha}_k < 0$ if RoO type $k+1$ is assigned a higher value than RoO type k in Estevadeordal's index.[11]

[11] This equation can be justified as follows. Consider a Mexican final-good exporter maximizing profits by choice of a mixture of export destinations. Let y stand for the value added of exports to the US, x for the value added of exports to the rest of the world, and let p be the relative net price in the US. Assume that the firm produces out of a fixed pool of resources R under a Constant Elasticity of Transformation technology (Powell and Gruen, 1962), i.e. $x^{\alpha} + y^{\alpha} = R$, where α is the inverse of the elasticity of transformation. The value of R is itself determined in the previous stage of a two-stage optimization problem. The second-stage problem is thus

$$\max_{x,y} x + py \text{ s.t. } x^{\alpha} + y^{\alpha} = R.$$

The political equation is based on eqn (5.17) in log form. As values of δ during the phase-out period were determined simultaneously with Rules of Origin, we instrument for δ using its steady-state value $\overline{\delta}_j$, the US MFN tariff (the value for 2001), and other variables s_j dummies signalling an agricultural good or a consumption good rather than intermediate good.[12] Thus,

$$\ln r_j = \beta_0 + \beta_1 \ln\left(\sum_i a_{ij} p_i/\varepsilon_i\right) + \beta_2 \ln \overline{\delta}_j + \beta_3 s_j \tag{5.20}$$

Alternatively, noting that, by eqn (5.10)

$$\frac{p_i}{\varepsilon_i} = \frac{r a_{ij} y_j}{y_i'} = \frac{y_i}{y_i'},$$

it follows that

$$\sum_i \frac{a_{ij} p_i}{\varepsilon_i} = \sum_i \frac{a_{ij} y_i}{y_i'},$$

so letting $z_j = \sum_i a_{ij} y_i / y_i'$, the equation to be estimated becomes

$$\ln r_j = \beta_0 + \beta_1 \ln z_j + \beta_2 \ln \overline{\delta}_j + \nu_j, \tag{5.21}$$

where $\beta_0 = \ln a < 0$ (if $a < 1$), $\beta_1 < 0$, $\beta_2 = 1, \nu_j$ is an error term, and $z_j = \sum_i a_{ij} y_i / y_i'$ is proxied (with measurement errors since y_i' is unobserved) by $\sum_i a_{ij} y_i$, the sum, over all goods i upstream of j, of the product of US exports of good i to Mexico, y_i, times the share a_{ij} of good i in good j's output.

Note that there is no endogeneity bias from the fact that z_j is a linear combination of intermediate-good exports from the US to Mexico that

The FOC yield $y/x = p^{1/(\alpha-1)}$ or

$$\ln y = \frac{1}{\alpha - 1} \ln p + \ln x,$$

a functional form close to eqn (5.18). If this equation is roughly invariant across tariff lines, the elasticity of transformation between the US and the ROW can be retrieved from the parameter estimate on the tariff-preference term, whereas the parameter estimate on exports to the ROW should be insignificantly different from one.

The interest of this formulation is that because of the curvature of the transformation surface, the export mixture is an interior solution even when the participation constraint is binding (i.e. when $p = 1$), an observation that is largely true at the tariff line (although not necessarily true at the firm level). This framework can be easily extended to a three-dimensional choice in which exports to the US can be made under either the preferential regime or the MFN one. If the choice between legal regimes for exports to the US involves no efficiency consideration, the transformation surface can be represented as

$$x^{\alpha} + (y_{NAFTA} + y_{MFN})^{\alpha} = R.$$

[12] We also tested an alternative formulation, namely $\widetilde{\delta}_j = \sum_{t=0}^{\infty} \beta^t \delta_{jt}$ with $\beta = 0.9$. The results were similar.

may be affected by final-good exports from Mexico to the US because z_j is calculated as an average for three years before NAFTA's entry into force, so the link between the two types of trade flows is tenuous at best. Thus, the system is recursive and estimated as such.

As Estevadeordal's RoO index is a categorical variable that takes on integer values between one and seven, the political equation is estimated as an ordered probit. As a result, direct quantitative interpretation of parameter estimates in terms of eqn (5.21) is not possible. As the model assumes that RoOs take the form of a continuous RVC, whereas actual ones are combinations of discrete instruments, there is no way around this difficulty.

5.3.3 *Results*

Estimation results are shown in Tables 5.2 and 5.3.

Column (1) of Table 5.2a shows results for eqn (5.21). The dependent variable is the log of Estevadeordal's index. The regressor called 'upstream' is z_j averaged out over 1989–93. Its coefficient is negative as predicted and significant at the one per cent level. The coefficient on the log of the US MFN tariff is positive as predicted, and also significant at the one per cent level. The coefficients are robust to other specifications where additional

Table 5.2a Regression results, RoO equation

dep. var (log) Procedure	(1) RoO index WLS	(2) RoO index WLS	(3) RoO index WLS
upstream	−0.198 [0.007]**	−0.194 [0.007]**	−0.339 [0.066]**
US MFN tariff 2001	4.039 [0.119]**	4.233 [0.124]**	−2.006 [0.743]**
Mex. MFN tariff 93		−2.147 [0.177]**	
Agriculture		0.156 [0.623]	
Final		0.066 [0.017]**	
Constant			7.823 [0.919]**
Observations	34 927	33 993	39 440
R-squared	0.34		

Notes:
All regressions with section, year dummy and weighted bytotal Mex.exports. standard-errors in parenthesis.
*significant at 5% level, **significant at 1% level.
(1) and (2): ordered probit. pseudo R2
(3): ordered probit; heterogeneity by HS section.

Table 5.2b Regression results, RoO equation

dep. var (log) Procedure	(4) pref.marg. WLS	(5) pref.marg. WLS	(6) RoO index SURE	(7) pref.marg. SURE
upstream			−0.069	0.001
			[0.002]**	[0.000]**
predicted RoO	−0.006	−0.004		
	[0.001]**	[0.0004]**		
US MFN tariff 2001	0.868	0.835	0.634	0.843
	[0.004]**	[0.003]**	[0.032]**	[0.002]**
Mex. MFN tariff 93	0.011	0.011	−1.785	0.011
	[0.003]**	[0.003]**	[0.045]**	[0.003]**
Constant	−0.015	0.014	2.753	−0.015
	[0.010]	[0.010]	[0.140]**	[0.010]
Observations	33 993	33 993	33 993	33 993
R-squared	0.85	0.85	0.48	0.85

Notes:
All regressions with section, year dummy and weighted by total Mex.exports. standard-errors in parenthesis.
*significant at 5% level, **significant at 1% level.
(4): RoO predicted in (1)
(5): RoO predicted in (3) −with heterogeneity-
(6) and (7): SURE equations. Correlation of residuals: −0.0001. Independence rejected (Breush–Pagan test)

variables are thrown in. In column (2), the coefficient of the log of initial Mexican MFN tariff is negative and significant, which supports the view that Rules of Origin are meant to avoid the trade-deflection effect. The easier it is to enter into the Mexican market, the higher the rule of origin. As expected, a final good is associated with a more restrictive rule of origin.[13] The relatively low explanatory power of the regression is not a surprise given that it is very parsimonious, that the data is only a cross-section, and that the dependent variable is itself a constructed one. Column (3) takes into account heterogeneity in the coefficient of the RoO index. Allowing for heteregeneity (at the section level in the HS classification), the sign of the US MFN tariff becomes negative, but the coefficient of the 'upstream' variable that stems from the political-economy model seems quite robust.

Columns (4) and (5) of Table 5.2b show an *ad hoc* regression of tariff preferences on the log of the 2001 value of the US MFN tariff (equal to the steady-state value of NAFTA tariff preferences), the log of the Mexican MFN tariff, and the predicted value of the RoO index from eqn (5.21):

$$\ln(1+\delta_{jt}) = \gamma_0 + \gamma_1 \ln(1+\overline{\delta}_j) + \gamma_2 \ln(1+t_{j0}^{Mex}) + \gamma_3 \widehat{r}_j + v_{jt}. \qquad (5.22)$$

[13] We used the BEC's classification rather than the WTO's because the latter classifies all goods in automobile and machinery and equipment as final ones, whereas vertical trade in those sectors is particularly important for Mexico.

Table 5.3a Regression results, market-access equation

Dep. Var.: log Mex. pref. exports	(1)	(2)	(3)
Exports to ROW	0.611	0.577	0.5761
	[0.006]**	[0.006]**	[0.006]**
RoO restrict.	−0.395		
	[0.031]**		
Pref. margin	2.828	1.887	
	[0.199]**	[0.193]**	
Chge of Chap.		−1.095	
		[0.131]**	
Chge of Head.		−0.751	
		[0.115]**	
Chge of Sub-head.		−0.773	
		[0.112]**	
Exception		0.506	
		[0.036]**	
Reg. Value Content		−0.432	
		[0.032]**	
Tech. req.		1.000	
		[0.055]**	
Upstream			0.226
			[0.012]**
US MFN tariff 2001			3.128
			[0.189]**
Mex MFN tariff 93			2.696
			[0.305]**
Pref.margin=0			−0.147
			[0.268]
US MFN=0			0.722
			[0.280]*
Constant	7.094	7.925	3.748
	[0.573]**	[0.555]**	[0.377]**
Observations	19 951	19 032	19 343
R-squared	0.70	0.72	0.71

Notes:
Dependent variable : log of Mexican exports under Nafta regime
All regressions are weighted. Standard-errors in parentheses. *significant at 5% level;
**significant at 1% level.

Tariff preferences are influenced by the US MFN tariff and, to a lesser extent, by the initial Mexican tariff. Although δ and r are negatively related along the model's FOC condition, the negative coefficient of the RoO index's predicted value has no direct interpretation as observed pairs (r, δ) are determined jointly by the FOC and the participation constraint. The last two columns—(6) and (7)—of Table 5.2b show the results of seemingly unrelated regressions, where the RoO restrictiveness index and the preferential margin are assumed to depend on the same variables. Independence between the two equations is rejected though the residuals correlation is low.

Table 5.3b Regression results, market-access equation

Procedure	(4) I.V.	(5) I.V.	(6) I.V.	(7) OLS	(8) OLS	(9) OLS
Exp. to ROW	0.597	0.586	0.625	0.604	0.604	0.607
	[0.006]**	[0.006]**	[0.005]**	[0.006]**	[0.005]**	[0.006]**
RoO restrict.	–1.527	−2.219		−1.14	−0.689	−1.57
	[0.110]**	[0.091]**		[0.061]**	[0.037]**	[0.116]**
Pref. margin	3.318	3.517	3.06	7.986	0.849	3.525
	[0.233]**	[0.244]**	[0.224]**	[0.359]**	[0.242]**	[0.229]**
RoO restrict*1994			−0.078			
			[0.010]**			
RoO restrict*1995			−0.043			
			[0.009]**			
RoO restrict*1996			−0.065			
			[0.009]**			
RoO restrict*1997			−0.054			
			[0.009]**			
RoO restrict*1998			−0.03			
			[0.009]**			
RoO restrict*1999			0.007			
			[0.009]			
RoO restrict*2000			−0.005			
			[0.009]			
Constant	9.351	10.852	6.755	6.15	8.855	9.399
	[1.265]**	[0.708]**	[0.635]**	[0.628]**	[0.643]**	[0.670]**
Observations	19 343	19 343	19 343	19 343	19 343	19 343
R-squared	0.68	0.65	0.7	0.7	0.7	0.7

Notes:
(4) and (6): pref.margin and RoO index instrumented. Instruments are upstream, US mfn tariff 2001, Mex mfn tariff 1993, section, year
(5) pref.margin and RoO index instrumented (same variables as (4) + agriculture, final)
(7) RoO index predicted with an ordered probit (Table 5.2, eqns (5.2) and (5.4))
(8) RoO index predicted with an ordered probit with heterogeneous effects by section (Table 5.2, eqns (5.3) and (5.5)).
(9) RoO and pref.margin predicted in SURE equations (Table 5.2, eqns (5.6) and (5.7))

Table 5.3 shows estimation results for the market-access equations (5.18 and 5.19).

Columns (1)–(3) of Table 5.3a report estimation results of Mexican exports ignoring the endogeneity issue. Column (1) shows the results of eqn (5.18). The coefficient on the log of Mexican exports to the ROW is 0.61 (and is quite stable across equations). The coefficient of the preference margin is positive, as expected, and significant at the one per cent level. The sign of the coefficient of RoO restrictiveness is negative, as expected. The explanatory power of the regression is quite high (with an unadjusted R-square of 0.7). In column (2), Estevadeordal's synthetic index is replaced by a vector of binary variables that code if the RoO

requires a change at different levels of tariff classification or a technical specification, a regional value content and if it allows any exception to the rule. The coefficients on RoO instruments are all significant at the one per cent level. Concerning the changes in tariff classification, their ranking is consistent with Estevadeordal's index: the more demanding the change in classification, the more negative is the impact of preferential imports. The coefficient of regional value content is also negative. However, the coefficient of dummies associated with the requirement of a technical specification or the existence of an exception are positive. Perhaps, this might be explained by the fact that a technical requirement is always associated with a change in classification. Column (3) runs the same regression, where both the RoO index and the preferential margin are replaced by explicative variables used in Table 5.2. All coefficients are positive, including the upstream variable. The only exception is a dummy that records if the preferential margin for that good is equal to 0. In that case, as can be expected, exporting under Nafta is of no interest.

Columns (4) and (5) of Table 5.3b take into account the endogeneity problem by using instrumental variables for both the RoO index and the preferential margin. As a result, the order of magnitude of the coefficient of the RoO index increases to a level comparable to the coefficient of preferential margin. Column (6) tests for the evidence of a learning curve, by interacting the coefficient on RoO with year effects. The order of magnitude of the coefficients of the interaction terms is indeed decreasing over time and is not significant after 1999. A test of equality of coefficients shows that the coefficients are significatively different only in 1997 compared to 1996 (and again in 2000 compared to 1999). The learning curve is thus not as marked as for Central and Eastern European countries (Tumurchudur, 2004).

Columns (7) and (8) of Table 5.3b show estimation results where the preferential margins and the RoO index are replaced by their predicted values from the sequential eqns (5.21) and (5.22) reported in Table 5.2. Finally, column (9) reports the estimation results of Mexican exports on preferential margin and RoO index predicted in the seemingly unrelated regressions. Signs and levels of significance are unaffected, suggesting that qualitative conclusions hold irrespective of the handling of endogeneity issues. However, the magnitudes of point estimates are seriously affected, especially if one takes into account a possible heterogeneity of the impact of RoO across sectors, suggesting that quantitative conclusions must be drawn carefully.

5.4 Concluding remarks

Two messages come out of our results. One is empirical, the other conceptual. First, at the empirical level, NAFTA's Rules of Origin seem to dilute the benefits generated by preferential trade liberalization, in terms of market access, for Mexico. This result, which is in conformity with the findings of the recent literature, suggests that RoOs should indeed be viewed as an economically sensitive item rather than a technical one in the agenda of bilateral trade negotiations. Moreover, the effect seems to be stronger for final goods than for intermediate ones, in conformity with what one would expect in a multistage production model where each stage is located according to the production stage's factor intensity and the host-country factor abundance. This result begs the question, why do Northern partners create policy instruments that put hurdles in a process that is economically efficient? One reason might be that RoOs are the price to pay for the acquiescence of Northern final-good producers threatened by Southern competition. However, many of the final-good assemblage activities undertaken by Southern 'maquiladoras' are non-competing, making this explanation less than satisfactory.

The second point of our chapter is about this issue. We use a standard model of endogenous trade policy—Grossman and Helpman's common-agency model—to explore an alternative logic, namely that RoOs reflect political pressure by Northern intermediate-good producers interested in creating captive markets for their goods in the South. The logic is as follows. On the assumption that the Mexican side is on its 'participation constraint', i.e. that the rate of effective protection conferred to Mexican final-good producers by the simultaneous use of tariff preferences and RoOs is just about zero, tariff preferences are the price to be paid for Mexican assemblers' acquiescence to a system that forces them to buy US intermediate goods. Seen in this way, as the model shows, preferences-cum-RoOs amount to a pure transfer from US taxpayers to intermediate-good producers, i.e. to a hidden export subsidy. Because export subsidies are in violation of any country's obligations under the GATT, recourse to an indirect and inefficient substitute instrument—RoOs—makes sense.

Empirically, the model suggests the inclusion, among the right-hand side variables of the second equation (RoO determination), of the product of input-output coefficients by US intermediate sales to Mexico. This somewhat unintuitive prediction provides a test of the approach's validity, since it is difficult to think of an alternative theoretical approach that would lead to the inclusion of that particular algebraic term. Empirical results are in

striking conformity with the model's predictions. In sum, they suggest that the use of NAFTA to create a captive market for US intermediates was indeed one of the forces shaping the agreement's Rules of Origin.

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APEC WORKSHOP ON BEST PRACTICES IN TRADE POLICY FOR RTAs/FTAs:
PRACTICAL LESSONS AND EXPERIENCES FOR DEVLOPING ECONOMIES

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Rules of Origin in RTAs/FTAs

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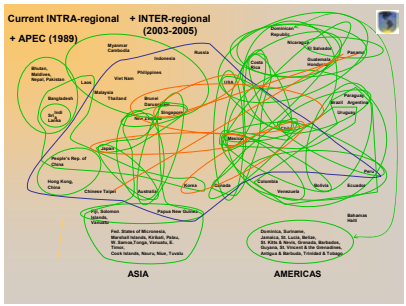
Presentation

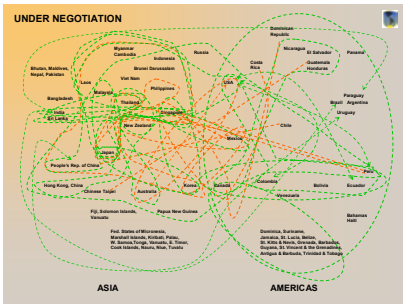
I. Introduction to RoO
II. Preferential RoO in the APEC region
III. The Economics of Preferential RoO
IV. RoO as "Building Blocks" or "Stumbling Blocks" to Regionalism?

An Introduction to Rules of Origin

Why RoO are so important?

- Preferential trading arrangements (PTAs) have proliferated spectacularly around the world to govern nearly half of world trade
- Rules of origin are included in virtually all PTAs and are a key piece in the functioning of FTAs





What types of RoO?

Two types of RoO:

- NON-PREFERENTIAL RoO
  - Antidumping
  - Quotas
  - Marks of Origin
  - Etc.
- PREFERENTIAL RoO
  - NON-RECIPROCAL (For example: GSP)
  - RECIPROCAL (For Example: FTAs)

Why preferential RoO ?

- The main justification for preferential RoO is to avoid TRADE DEFLECTION, that is, to ensure that non-members do not obtain access to PTA preferences, but exporting to the PTA area through the lower- MFN tariff country in the PTA
- RoO defining the share of inputs that have to be procured or production processes that have to be performed within the PTA area in order for the good to be considered originating

Preferential RoO as a trade policy instrument …

- **However, RoO can be used as a powerful trade policy instrument:**
  - RoO can fully insulate an industry from the consequences of an FTA
  - RoO can protect intermediate good producers by favoring intra-PTA supply links
  - RoO can be used to attract investment in strategic sectors
  - RoO's effects in the S/R different than in the L/R
  - Very limited theoretical and empirical work

Preferential RoO: Product-Specific Rules

- **Wholly obtained or produced**
  Where only one country enters into consideration in attributing origin
- **Substantial transformation**
  Where two or more countries have taken part in the production process
  - **Change in Tariff Classification**
  - **Regional Value Content**
  - **Technical Requirement**

Preferential RoO: Regime-Wide RoO

- **Provisions adding leniency to RoO:**
  - *De minimis*
  - Cumulation
  - Self-certification
  - Roll-up or absorption principle
- **Provisions that may make RoO more restrictive:**
  - Lists of operations insufficient to confer origin
  - Complex certification methods
  - Inefficient customs verification and administration

A growing multilateral attention to RoO …

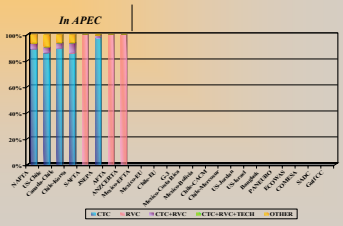
- **Non-Preferential RoO are being harmonized under the WTO Uruguay Round Agreement**
- **Preferential RoO may become a key element under the Doha Trade Round mandate to negotiate RTAs provisions**
- **Preferential RoO in bilateral FTAs are becoming a key element in building larger region-wide FTAs**

Preferential Rules of Origin in the APEC Region

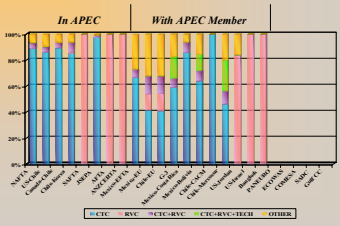
Preferential RoO in the APEC Region: Product-Specific Rules

- **RTAs/ FTAs Combinations of:**
  - **Change in Tariff Classification (CTC)**
  - **Regional Value Content (RVC)**
  - **Technical Requirement (TR)**
- **Levels of RVC**
- **Measuring *Restrictiveness* of Product Specific Rules**

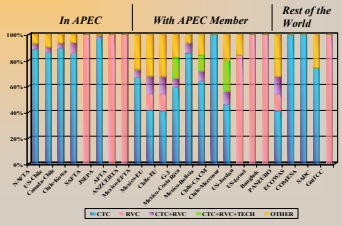
Product Specific RoO: CTH / RVC / TECH Combinations



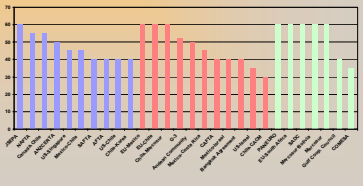
Product Specific RoO: CTH / RVC / TECH Combinations



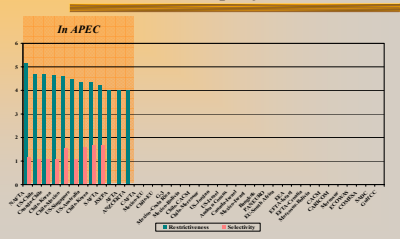
Product Specific RoO: CTH / RVC / TECH Combinations



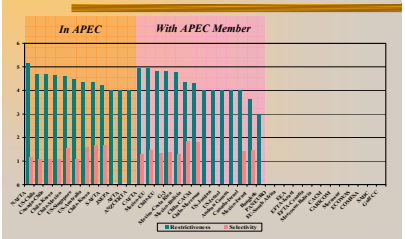
Product Specific RoO: RVC Levels



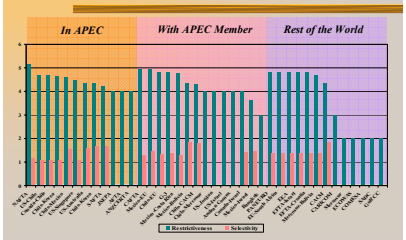
Restrictiveness & Selectivity of Product Specific RoO



Restrictiveness & Selectivity of Product Specific RoO



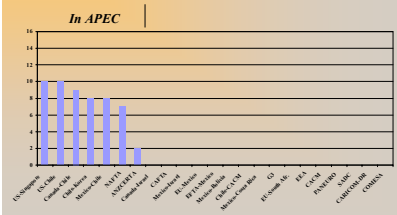
Restrictiveness & Selectivity of Product Specific RoO



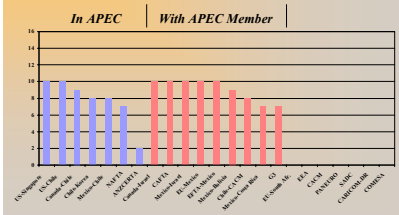
Preferential RoO in the APEC Region: Regime-Wide RoO

- **General Provisions affecting the overall leniency or restrictiveness of RoO:**
  - *De minimis*
  - Cumulation
  - Self-certification
- **Measuring the level of *facilitation* of Regime-Wide RoO**

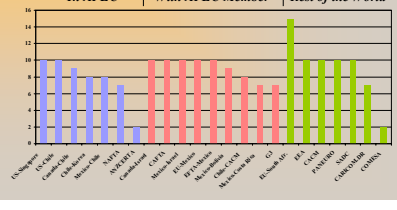
Regime-wide RoO: De Minimis Levels



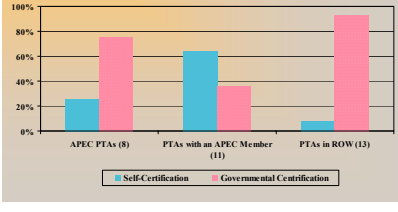
Regime-wide RoO: De Minimis Levels



Regime-wide RoO: De Minimis Levels

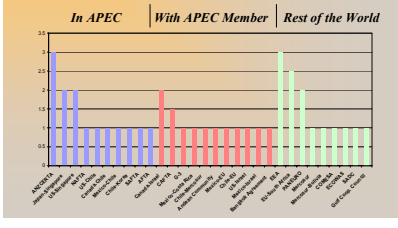


Regime-wide RoO: Certification Methods



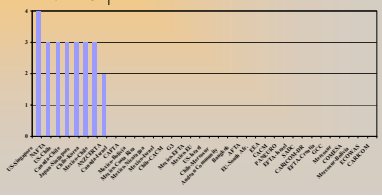
Regime-wide RoO: Cumulation Systems

1= bilateral, 2=diagonal, 3=full



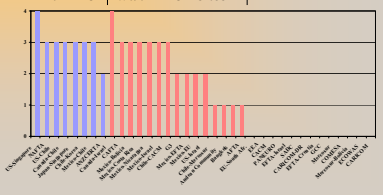
Facilitation Index in Regime-wide RoO Regimes

In APEC



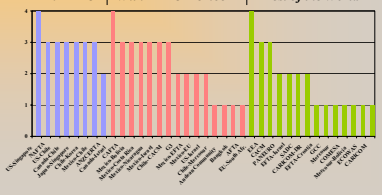
Facilitation Index in Regime-wide RoO Regimes

In APEC | With APEC Member



Facilitation Index in Regime-wide RoO Regimes

In APEC | With APEC Member | Rest of the World



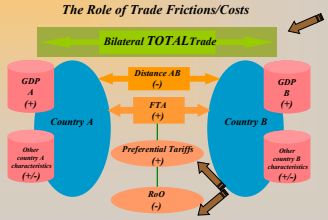
The Economics of Rules of Origin

Economic impacts of RoO…

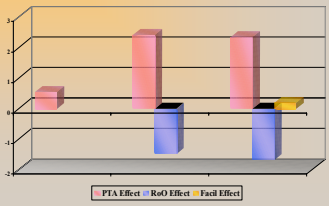
- Theoretical literature shows that restrictive RoO may distort trade, investment, and production patterns
- Empirical evidence:
  - Good news: Evidence that RoO are used to avoid trade deflection
  - Bad news: RoO have potential negative impacts on:
    - Administrative costs for firms
    - Low utilization of preferences
    - Effects on final and intermediate goods trade patterns

Explaining Bilateral Trade Patterns: A Gravity Model Approach

The Role of Trade Frictions/Costs

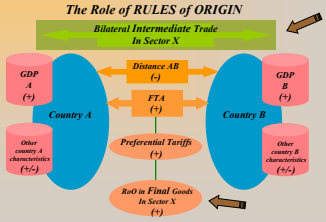


Trade Effects of PTAs with Rules of Origin



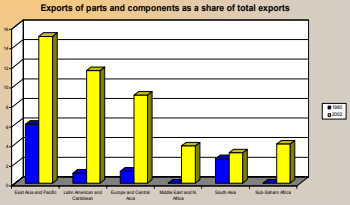
Explaining Bilateral Trade Patterns In INTERMEDIATE goods

The Role of RULES of ORIGIN

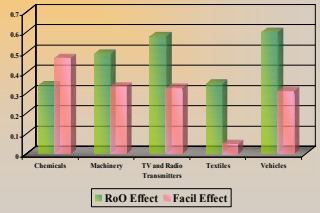


Trade in intermediates is very important in the APEC region

Exports of parts and components as a share of total exports



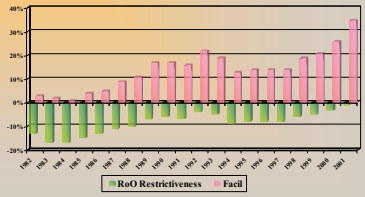
Do RoO Divert Trade in Intermediate Goods?



What Are the Effects of RoO over Time?

- The restrictiveness of RoO has increased over time, therefore we should expected that they have increasingly obstruct trade flows over time
- But consider that traders learn to comply with RoO, take advantage of the facilitation provisions, and/or alter production strategies to meet the RoO.
- "RoO learning" could reduce "RoO frictions" over time

The Effects of RoO over time: "learning by doing"

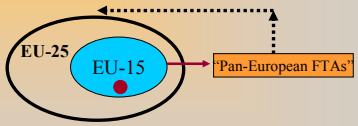


Results in Sum

- Both the restrictiveness and complexity of rules of origin ***reduce*** aggregate trade flows
- Regime-wide RoO provisions designed to add leniency to the application of product-specific RoO compensate negative impact on aggregate trade
- "RoO learning" compensates for "RoO frictions" over time
- Both the restrictiveness and complexity of rules of origin in FINAL goods significantly diverts trade in INTERMEDIATES

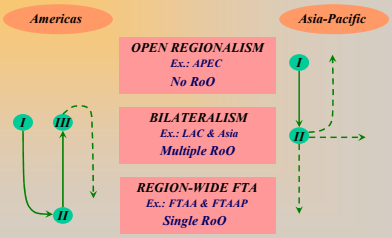
"Building blocks" or "Stumbling Blocks" to Regionalism ?

European Integration: The Pan-European RoO

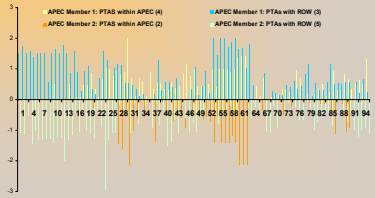


EU-15 "center of gravity" of a "Pan-European System of FTAs"

Paths to Regional Integration



Diversity of RoO across Two APEC Members' PTAs (by HS Chapter)



Why Harmonize Preferential RoO Regimes?

- Countries' operating in two or more RoO theaters:
  - Complicate firms' supply relations
  - Force specialization of production to a certain market(s) when RoO are strict
  - Increase transaction costs when certification methods diverge
- Particularly important for developing countries that are often spokes to different RoO hubs (PANEURO model, NAFTA model, etc.)
- Importance of the Doha's mandate to deal with RTAs issues, in particular on RoO

Future Clash or Harmonization of RoO Regimes?

- EU and NAFTA-based RoO regimes will likely predominate in the future, particularly across Europe and the Americas
- Maybe an emerging Asian/Asia-Pacific regime type?
- WTO/WCO harmonization process of non-preferential RoO **plus** *de facto* harmonization process of preferential RoO worldwide (PANEURO and NAFTA models) increases the prospects for *de jure* harmonization of preferential RoO…**but difficult**…

What role for APEC in the Asia-Pacific region?

- Encourage a *de facto* convergence of key RoO regimes in the region and work together on non-preferential RoO and future Doha negotiations
- Take advantage of importance of intra-industry linkages to encourage non-distortionary RoO
- Exploit the "bridge" between the "Americas" and "Asian" regimes to promote convergence and harmonization
- Extend APEC principles (non-discrimination, etc) to the application and design of RoO in Asia-Pacific FTAs (i.e. generous cumulation regimes)
- Promote best practices, in particular "micro" or "sectoral" designs, such as sectoral CU; innovations a la Singapore FTAs (OP / ISI); provisions for RoO revision; etc…

APEC WORKSHOP ON BEST PRACTICES IN TRADE POLICY FOR RTAs/FTAs:
PRACTICAL LESSONS AND EXPERIENCES FOR DEVLOPING ECONOMIES
February 2006, Ha Noi, Viet Nam

Rules of Origin in RTAs/FTAs

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