NAFTA@10

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Editors

Foreword

The research assembled in this volume has been undertaken by academic and government researchers writing in a personal capacity. Foreign Affairs and International Trade Canada managed and assembled this volume with the objective of contributing to, and encouraging, debate on an issue of major importance to the Department, to the Government of Canada, and to Canadians. The views expressed in this volume, however, are those of authors and do not reflect the views of the departments represented in this volume or of the Government of Canada.

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NAFTA Rules of Origin

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Introduction[1]

Over the last several years, increased public attention has focused on the potential for deeper North American integration. Discussions prior to 2001 had already demonstrated growing support for further facilitating the cross-border movement of goods and people given that Canada – U.S. trade had reached the point where traditional approaches to border administration and border management had become increasingly problematic. Moreover, the post September 11th environment has elicited growing Canadian interest towards rethinking the Canada-U.S economic relationship and NAFTA in the larger context of an overall security perimeter that would protect and ensure our economic security, our border security and U.S. homeland security.

Much of the attention deals with the feasibility and desirability of a Canada-U.S. customs union, a perimeter approach and various NAFTA plus proposals. Proponents of a Canada-U.S customs union often stress the administrative and compliance cost savings and efficiency gains that would be associated with the elimination of rules of origin, regulatory differences and other barriers to trade and the difficulties arising from the application of trade remedies. NAFTA rules of origin (ROO), government procurement restrictions, anti-dumping procedures, intrusive countervailing duty investigations, burdensome regulatory requirements, and other restrictive trade measures, discourage cross-border investment decisions, reduce Canada-U.S. trade flows, and reduce the potential benefits accruing to Canada and the United States as members of a preferential trade agreement.

The purpose of this study is to examine and assess the key issues and evidence associated with the growing concern related to the restrictive nature of NAFTA ROO. In particular this paper attempts to shed empirical light on the degree to which NAFTA ROO impose significant compliance costs on traders, restricts the use of NAFTA, and reduces the potential benefits from NAFTA.[2]

Are NAFTA ROO Necessary?

Under NAFTA, as under other free trade agreements, each member country retains their respective external tariffs and other import restrictions against non-members while lowering or eliminating tariffs on goods "originating" from other member countries. All trade under NAFTA is supported by an extensive system of ROO.

ROO are the criteria used to define where a product "originates". There are two classes of ROO: non-preferential and preferential. Non-preferential ROO are used to distinguish foreign from domestic products in establishing anti-dumping and countervailing duties, safeguard measures, origin marking requirements and/or discriminatory quantitative restrictions or quotas.[3] Preferential ROO define the conditions under which the importing country will regard a product as originating in an exporting country that receives preferential treatment under a free trade agreement (FTA). They are used to prevent imports from non-member countries from taking advantage of the concessions that have been made by member countries of the free trade agreement.

In the absence of preferential ROO, imports to the free trade region would come through the country with the lowest external tariff and, in theory, serve the entire free trade region. This would force a convergence of external tariffs and possibly a competitive decline of external tariffs. In essence, ROO are thus a means to operate the FTA and operate independent external trade policy.

Preferential ROO provide the method for customs officials to determine which goods are entitled to preferential tariff treatment. Preferential ROO are a necessary and integral part of any free trade agreement.

What Are NAFTA ROO?

Under NAFTA, a good is considered to be an **originating good** and is entitled to preferential tariff treatment; if it meets one of the five requirements set out in the NAFTA ROO:[4]

1. the good is **wholly obtained or produced** in a NAFTA country (including those goods that are entirely grown, fished, or mined in a member country - it does **not** include goods purchased in a NAFTA country that were imported from a non-NAFTA country);
2. the good is made up entirely of **components and materials** that qualify in their own right as goods that originate in a NAFTA country;
3. the good meets the requirements of a **specific rule of origin** for that product, as listed in NAFTA Annex 401.[5] With respect to Canadian

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[3] The WTO agreement on ROO aims at harmonizing non-preferential rules of origin so that all WTO members apply the same criteria, ensuring that these rules do not themselves create unnecessary obstacles to trade. The agreement sets out a work programme for the harmonization of these rules to be undertaken by the WTO in conjunction with the World Customs Organization (WCO).

[4] Canada Customs and Revenue Agency (1995), Information for Importers, Exporters or Producers. CCRA document C-144.

[5] For this requirement each of the non-originating materials used in the production of the good undergoes an applicable change in tariff classification set out in Annex 401 as a result

imports, this normally applies when goods are produced from material imported from countries other than the United States or Mexico;

4. the good qualifies under NAFTA **Article 401(d)**,[6] which only applies to a few cases; or

5. the good is automatic data processing equipment or parts qualifying under the provisions of Annex 308.1.

Of these five requirements, the most commonly used is the ***specific rule of origin***, which applies to a good that includes any non-originating materials in its production. These specific ROO are based on the substantial transformation criteria. There are at least three methods that are used in the NAFTA agreement to determine whether there has been sufficient transformation to warrant preferential tariff treatment of the good:

- a change in tariff classification (CTC) requiring the product to change its tariff classification at the item, sub-heading, heading or chapter level under the Harmonized Commodity Description and Coding System[7] (Harmonized System or HS) in the originating country[8];

- a domestic or regional value content (RVC) rule requiring a minimum percentage of local value added in the originating country (or setting the maximum percentage of value originating in non-member countries); or

- a technical requirement prescribing that the product must undergo specific manufacturing processing operations in the originating country.

The first step to understanding the NAFTA Annex 401 specific rules of origin is to understand the Harmonized System. The HS uses a 6-digit number to identify basic commodities or sub-headings. The HS is organized around 96 chapters arranged in 21 sections. The first two digits indicates the chapter, the first four digits indicate the heading level while six digits identifies the sub-heading level. Within the HS structure, there are over 1200 headings and over 5000 subheadings.

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of production occurring entirely in the territory of one or more of the Parties, or the good otherwise satisfies the applicable requirements of that Annex where no change in tariff classification is required, and the good satisfies all other applicable requirements of this chapter.

[6]Article 401 (d) applies when the good is produced entirely in one or more of the NAFTA countries but one or more of the non-originating materials provided for as parts under the Harmonized System that are used in the production of the good does not undergo a change in tariff classification for either of two particular reasons, and provided the good meets the regional value content criteria as outlined in Article 402.

[7] The Harmonized Commodity Description and Coding System (HS) was developed and is maintained by the World Customs Organization, an independent intergovernmental organization with over 150 member countries based in Brussels, Belgium. Over 170 countries, representing about 98% of world trade, use the HS as a basis for trade negotiations, collecting international trade statistics, quota controls, rules of origin, and statistical and economic research and analysis.

[8] We will use the notation CC to denote a change at the chapter level, CH to indicate a change in heading; CS to represent a change in sub-heading and CI to designate a change in tariff classification at the item level.

Each country is allowed to add additional digits to make their tariff classifications more specific. In Canada, an additional two digits are used for exports and an additional four digits for imports while the United States uses a 10-digit system for imports and exports.

Most of the specific ROO require a certain HS classification change from the non-originating materials to the finished good. The CTC must result from processing in one or more of the NAFTA countries. For example, orange marmalade is classified under heading 20.07 while fresh oranges are 08.05. The specific NAFTA rule of origin for orange marmalade requires a chapter change. If fresh oranges from Brazil are transformed into orange marmalade in the United States, the orange marmalade is an originating good since a change from chapter 08 to chapter 20 has occurred.

Often the CTC has an additional requirement that must be met for a good to qualify for NAFTA status. Usually this additional requirement tests the good's regional value content or adds a technical requirement. RVC rules are used extensively for automotive goods and chemicals, but are quite limited in other product areas.[9] If a rule requires a CTC and a RVC test, the good must meet both of these requirements to qualify as an originating good.

Moreover, in some preferential trade agreements, a choice of origin test is offered for some tariff items. In NAFTA and other agreements based on NAFTA, one test is commonly based on a CTC rule alone, while a second test, for the same tariff items, may involve a CTC rule at a lower level together with a technical test and/or RVC requirement. About 34 per cent of all tariff line items at the 6-digit level in NAFTA specify a RVC requirement as part of the first or second test.

According to the WTO (2002) survey of ROO, the average threshold on domestic content or RVC varies from 40-60% using any method of calculation. The NAFTA RVC threshold is 60% if calculated by the transaction value method or 50% if calculated by the net cost method.[10]

NAFTA introduced a highly disaggregated system of ROO with specific rules at the product level (generally using a HS 6 level of disaggregation). Those specific rules were adopted to close loopholes that might allow third country-producers to benefit from NAFTA status by performing assembly, processing or minimal production operations in the territory of one of the parties (Carrére and de Melo (2004)).

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[9] RVC may be calculated using one of two methods: transaction value or net cost. Usually, the exporter or producer can choose between either method. However, there are a number of situations where the exporter or producer cannot use the transaction value method. The producer can also revert to the net cost method if using the transaction value method is unfavourable

[10] The net cost method calculates RVC as a percentage of the net cost to produce the good while the transaction value method calculates the value of the non-originating materials as a percentage of the GATT transaction value of the good. Because the transaction value method permits the producer to count all of its costs and profit as originating, the required percentage of RVC under this method is higher than under the net cost method.

NAFTA Certificate of Origin and Verification

The three NAFTA members adopted a uniform certificate of origin to certify that goods imported into NAFTA territories qualify for the preferential tariff treatment accorded by NAFTA. NAFTA relies on the process of self-certification where the certificate of origin must be completed and signed by the producer or exporter of the goods. When the exporter is not the producer, the exporter can complete the certificate on the basis of knowledge that the good originates, reasonable reliance on the producer's written representation that the good originates, or a completed and signed certificate of origin for the good voluntarily provided to the exporter by the producer.

Only importers who possess a valid certificate of origin can claim preferential tariff treatment. A certificate of origin can cover a single importation of goods or multiple importations of identical goods. Certificates that cover multiple shipments are called blanket certificates, and can apply to goods imported within any 12-month period specified on the certificate.

The certificate of origin is only one of the several documents required by importers of goods seeking preferential tariff treatment under NAFTA. Importers must maintain records pertaining to the importation for at least five years, or any longer period that may be specified by their country. Exporters or producers that provide a certificate of origin must maintain records pertaining to the exportation for five years.

Under NAFTA, the importing country's customs administration can conduct verifications with the exporter or producer to confirm whether goods qualify as originating as certified by the certificate of origin. Verifications are principally conducted by written questionnaires and verification visits. Additional verification can be done by telephone, facsimile, and information from the supplier as well as on-site audits. Since imports claiming NAFTA status can be subject to post-entry audits while imports from NAFTA members using the most favoured nation (MFN) tariff are not subject to this process, there is a tendency for importers to take more care in meeting NAFTA requirements.[11] Therefore, we would expect to observe higher NAFTA compliance rates. However, discussions with importers/exporters revealed that some might use MFN status rather than NAFTA in order to avoid the possibility of post-entry verification, and in particular verification visits. Therefore, the higher costs associated with the use of NAFTA and the greater the possibility of post-entry audit, the lower NAFTA utilization rates.

Are NAFTA ROO Costly?

ROO impose administrative and compliance costs on parties involved in international transactions. Administrative costs refer to the costs incurred by governments in implementing, administering, and monitoring the system of ROO while compliance costs refer to the financial costs incurred by importers, exporters or producers to meet the ROO requirements to qualify for preferential treatment.

Compliance costs can be thought of as the cost of "paperwork" or "red tape" associated with filling out forms in order to satisfy Customs requirements

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[11] Officials from Canadian Border Services pointed this out to the authors.

and the cost to business associated with determining, meeting and proving origin (Australia Productivity Commission, 2004a). This could also include the office systems and computer programs for meeting and proving origin and the cost of maintaining records. These compliance costs are distinct from the economic costs associated with ROO such as the costs associated with changing production methods or input mixes and changing input sourcing to meet origin requirements. The economic effects of NAFTA ROO are examined in section 6.

Earlier estimates of the compliance and administrative costs associated with ROO were often based on pre-computer technology procedures and may overestimate current NAFTA transaction costs. Koskinen (1983) estimated the compliance costs for Finnish exporters under the European Community (EC) – EFTA FTA at 1.4 to 5.7 % of the value of export transactions. Herin (1986) estimated the compliance cost to meet the ROO within EFTA at 3 to 5 % of the price of the good. Those estimates are based on a paper intensive system. Holmes and Shepard (1983) found the average export transaction from EFTA to the EC required 35 documents and 360 copies.

In the NAFTA case, the empirical evidence on the administrative and compliance costs is very limited. Krueger (1997) reported, "Canadian producers have on occasion chosen to pay the relevant duties rather than incur the cost of proving origin". Recent discussions with Canadian exporters and importers revealed that for small shipments and exporters with limited knowledge of NAFTA and small-sized firms are likely to pay MFN duties rather than incur the additional expense of meeting the NAFTA requirements. In addition, firms who could not get sufficient numbers of certificates of origin from their suppliers chose MFN and paid duty rather than claiming NAFTA status.

Two recent studies, Cadot et. al. (2002) and Carrère and de Melo (2004), employ an indirect approach similar to Herin (1986) to estimate the compliance cost of NAFTA rule. Both of these studies utilize a revealed preference approach and both studies provide only an approximation of the compliance cost of NAFTA ROO for imports into the United States from Mexico.

The authors assume that the compliance cost to import the ith good, $c_{i,}$ is:

$$c_i = \delta_i + \sigma_i \qquad\qquad\qquad (1)$$

where δ_i is the NAFTA compliance component and σ_i is the non-ROO costs.[12]

If NAFTA utilization rates U_i are 100% for the ith good, then the NAFTA tariff preference is revealed larger than the compliance costs and the preference margin can be used as an upper bound for the compliance costs. For items with $U_i = 0\%$, the preference margin is revealed smaller that the cost of the compliance costs and provides a lower-bound estimate.

Where NAFTA utilization rates are $0 < U_i < 100\%$, Cadot et. al. (2002) and Carrère and de Melo (2004) assumed the firms were revealed indifferent

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[12] Cadot et. al. (2002) and Carrère and de Melo (2004) use the terminology administrative and distortionary cost as components of trade compliance cost. We follow the Australian Productivity Commission (2004a, b) use of terminology.

between shipping under NAFTA or MFN. This would imply that the expected cost of using NAFTA and the MFN are the same. Therefore, given revealed indifference between the MFN rate and cost of using NAFTA, the authors use the MFN rate or the difference between the MFN and NAFTA rate as a proxy for the costs associated with the use of NAFTA.[13] This provides an estimate of the average NAFTA compliance costs.

The authors assumed that NAFTA compliance component is negligible when U_i is close to 100% and NAFTA ROO is not restrictive, $r_i \leq 2$. The tariff preference when U_i is close to 100% and $r_i \leq 2$ would provide an estimate of the non-ROO administrative costs, σ_i.

Employing this revealed preference approach, Cadot et. al. (2002) calculated the cost of compliance and other NAFTA related administrative procedures for imports in 2000 from Mexico into the United States at 5.06% of the value of Mexican exports. When non-ROO administrative costs, estimated at 3.12%, are subtracted from the preceding estimates, the authors find that the compliance costs of NAFTA ROO to the private sector for exports from Mexico into the United States at 1.94% of value of Mexican exports.

Carrère and de Melo (2004), using 2001 data on Mexican exports to the United States, arrives at an average compliance cost estimate of 1.72% of the value of exports based on a total estimated cost of 6.16%.[14]

Following Cadot et. al. (2002) and Carrère and de Melo (2004) we employ this non-parametric indirect approach based on revealed preferences to approximate the upper bounds on the compliance cost of NAFTA ROO using HS 6 digit data on imports into the United States from Canada for 2003.

Where NAFTA utilization rates are $0 < U_i < 100\%$, we find the trade compliance costs to be 5.37% of the price for Canadian goods imported into the United States. Examining cases where $95\% \leq U_i <100\%\%$ and $r \leq 2$ we find the non-ROO costs associated with importation to be approximately 4.32%.[15] Subtracting the non-ROO costs from the trade compliance costs provides an estimate of 1.05% for the NAFTA ROO compliance costs. This is significantly lower than estimates from the Mexican data and might be due to the wider use of information and communication technologies, the greater maturity of Canadian and American firms, and the Canada – U.S. FTA experience by firms engaged in trade on the northern border compared to their Mexican counterparts.

It should be noted that these estimates need to be viewed with caution since they provide only an upper-bound proxy for the compliance cost of ROO. The question remains how much this upper bound might deviate from the true cost of NAFTA ROO or a statistically unbiased estimate.

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[13] This applies to individual importers where the NAFTA tariff rate is zero. For 2002 data, almost 100% of NAFTA rates were duty free.

[14] Carrère and de Melo (2004) follow Cadot et. al. (2002) using the term "administrative costs" to the firm to refer to compliance costs.

[15] There are 68 observations meeting the requirement that $95\% \leq u < 100$ and $r \leq 2$. We eliminate one observation since this outlier has an abnormally high effective tariff rate and is not representative of the trade cost within this group. With all 68 observations the compliance costs are estimated at .83% of the price of U.S. imports from Canada.

Table 1: Non-Parametric NAFTA Compliance Cost Estimates		
Study	Imports to U.S from	NAFTA ROO compliance cost
Cadot et. al.(2002)	Mexico	1.94
Carrère and de Melo (2004)	Mexico	1.72
This study	Canada	1.05

Are NAFTA ROO Too Restrictive?

As an integral component of a free trade agreement, ROO are intended to ensure that the benefits from an FTA accrue to its members. However, a particular ROO system can be liberal, promoting the flow of intra-bloc trade, or restrictive,[16] acting as a non-tariff barrier to trade within the preferential trade region.

Estevadeordal (2000) developed a categorical index on the restrictiveness of a given type of ROO ranging from 1 (least restrictive) to 7 (most restrictive). The index is based on two assumptions:

1. a required CTC at the level of chapter is more restrictive than a CTC at the level of heading, and a CTC at the level of heading is more restrictive than a CTC at the level of sub-heading, and so on; and
2. regional value content and technical requirement criteria attached to a given change in tariff classification add to the level of restrictiveness of the specific ROO.

Estevadeordal (2000) constructed the categorical variable, r, assigning to each HS 8-digit category an ordered numerical value according to the observation rules in Table 1.[17]

Table 2: ROO Restrictiveness Index Criteria	
r = 1	If a change at the item level is required
r= 2	If a change at the subheading level is required
r= 3	If a change at the subheading level plus an additional requirement is specified
r = 4	If a change at the heading level is required
r = 5	If a change at the heading level plus an additional requirement is specified
r = 6	If a change at the chapter level is required
r = 7	If a change at the chapter level plus an additional requirement is specified

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[16] ROO can be restrictive in terms of the difficulty to meet the ROO criteria or restrictive in their effects on trade or utilization of the preferential trade agreement.

[17] This table is a simplification of the table found in Estevadeordal and Suominen (2004b).

The index can be aggregated to the chapter, section or agreement level. Examining NAFTA exports from Canada to the United States, approximately 45% of all tariff lines (HS 8 digit) required a change in classification at the chapter level or more. Correspondingly, the majority of all tariff lines (51%) were represented by an index of 5 or higher while 11.4% of all tariff lines have an index of 3 or less (see Figure 1).[18] Almost 75% of all NAFTA tariff lines applied to Canadian exports to the United States required a change in tariff classification at the heading level (r=4) or at the chapter level (r=6).

**Figure 1: NAFTA ROO Restrictiveness Index
and Tariff Lines for Canadian Exports to the U.S. (2003)**
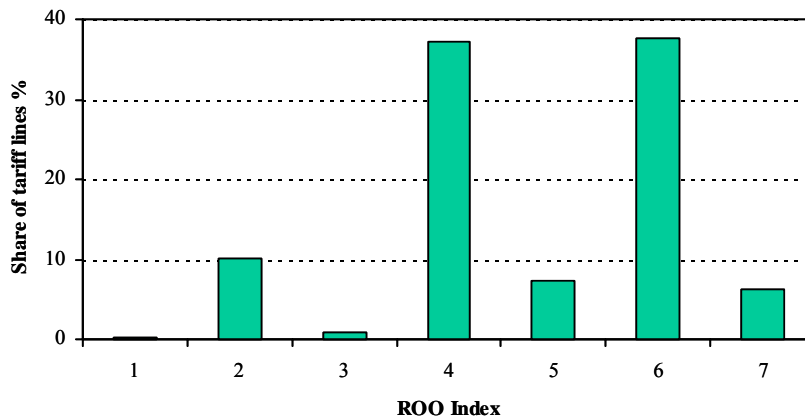
Source: USITC data for 2003 and Estevadeordal (2000) index.

Estevadeordal (2000) found that compared to other FTAs, NAFTA ROO are very restrictive with an average restrictiveness index of 5.1 compared to the pan-European ROO rated at 4.5, the EFTA-Mexico[19] ROO rated at 4.2 and the non-preferential ROO average at 3.9. NAFTA ROO are stringent due to the predominant use of the change in chapter criterion.

The Australian Productivity Commission (2004a, b) extended the ROO restrictiveness index to include 11 restrictiveness categories and normalized the index to a scale from 0 to 1 (see Figure 2). Since this methodology features a weighted sum over the 11 categories, it is particularly well suited for inter-preferential trade agreement (PTA) comparisons of ROO restrictiveness.

Compared to the ROO restrictiveness level associated with other preferential trade agreements (PTA), NAFTA ROO are the most restrictive in the sample of 18 PTAs. In addition, a comparison of the restrictiveness of NAFTA

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[18] We have updated the Estevadeordal index at the 6-digit level to incorporate the changes made to NAFTA ROO up until January 2003.
[19] European Free Trade Association (EFTA) is comprised of Iceland, Liechtenstein, Norway and Switzerland.

ROO to the four other U.S. FTAs (U.S.- Israel, U.S.-Singapore, U.S.-Jordan and U.S.–Chile) indicates that NAFTA ROO are the most restrictive.

Why are NAFTA ROO so restrictive? ROO can be used as a means of industrial policy; it is this factor that often leads to differences in restrictiveness between sectors and specific ROO for selected products. In this regard, ROO raises a larger question about the possible role of industrial policy, with the trade-off being between less strict ROO and hence more intra-NAFTA trade versus stricter ROO that potentially protects domestic sectors. Restrictive ROO can be viewed as a new form of hidden protectionism acting as a substitute for inter-FTA tariff barriers that were eliminated and as tool of industrial policy.[20] This appears to be the core of the problem with respect to restrictive ROO where some free trade agreements have in effect negotiated industrial policy into their free trade agreements by using more restrictive ROO in specific sectors and for specific products as substitutes for tariffs.

In many agreements, special treatment or more restrictive ROO are found in sensitive sectors such as textiles and clothing, the automotive sector, agriculture and some electronics industries. A sectoral examination of NAFTA ROO by Estevadeordal and Miller (2002) documents "missed preferences"—i.e., utilization rates below 100 percent—between the United States and Canada, which they attribute to the tightening of the ROO under NAFTA in 1994. Estevadeordal and Miller demonstrated that agriculture, textiles and apparel, transportation equipment and automobiles sectors implemented stricter ROO with NAFTA compared to the FTA.

Figure 2: Restrictiveness Index for Preferential ROO
0 (least restrictive) to 1 (most restrictive)
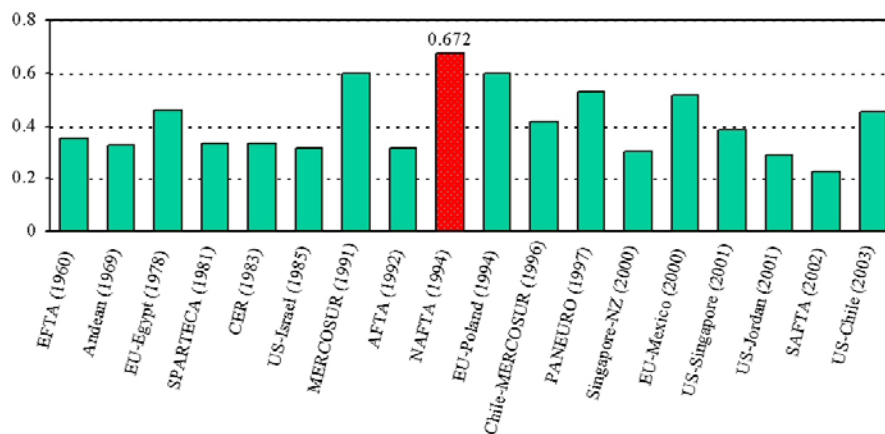
Source: Australian Productivity Commission (2004a, b)

For the automobile sector, NAFTA introduced stricter ROO compared to earlier trade agreements. While under the Auto Pact and the former Canada-U.S. FTA, duty-free trade between participants was contingent on a 50% Canadian or

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[20] See Estevadeordal, Antoni and Kati Suominen (2004a).

U.S. content; the threshold increased to 56% on January 1, 1998 and to 62.5% on January 1, 2002 for passenger cars, light trucks, small buses (transport of 15 or fewer persons), their engines and transmissions. The corresponding level for heavy-duty vehicles, large buses and all other parts is 60% since January 1, 2002. Companies operating in Canada are required to meet these increased regional value content levels plus in most cases in the automobile sector a change in tariff classification at the heading level in order to export to Mexico and the United States at the NAFTA rates.

For textiles and apparel, the origin criterion requires that most of the production occurs in North America. The production of most textile and apparel goods is a four-step process:

- Fibres, hair, wool and other raw materials are gathered or harvested.
- Fibres are spun to make a yarn.
- The yarn is woven into a fabric.
- The fabric is cut and sewn (or assembled) into a garment.

The basic origin rules for textile and apparel are "yarn forward" and "fiber forward". This means that the yarn or fiber, whichever applies, used to form the fabric must originate in a NAFTA country. Put differently, apparel products imported into the United States must satisfy a "triple transformation" rule requiring domestic content of each one of three transformations stages: fiber to yarn, yarn to fabric, and fabric to garment.[21]

According to the WTO (2002), the NAFTA ROO might have increased trade diversion in favour of NAFTA partners, notably in the clothing sector (the yarn forward rule) and the motor vehicle component sector. They may have also penalized Canadian clothing manufacturers using inputs from MFN sources and contributed to the lack of international competitiveness of the North American textiles and clothing industries.

An alternative way of examining the coverage of the ROO index is to examine the relationship between the index and the share of imports as shown in Figure 3. In 2003, 67.7% of U.S. imports from Canada under NAFTA were covered by a restrictiveness index of 5 or more. In addition, 25% of U.S. imports from Canada under NAFTA required a change at the chapter level (r= 6) or higher. This compares with only 57.9% of Canadian NAFTA imports from the United States being covered by an index of 5 or more, while about 19% of NAFTA imports into Canada from the U.S. required a change of tariff classification at the chapter level (r=6 or 7) or higher.

This suggests that even though Canada and the United States face the same set of NAFTA ROO, the composition of trade results in imports into the United States from Canada experiencing more stringent NAFTA ROO than imports into Canada from the United States.

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[21] Cadot et. al. (2002) "Assessing the Effects of NAFTA Rules of Origin"

Figure 3: NAFTA's ROO Restrictiveness Index and Share of NAFTA Exports
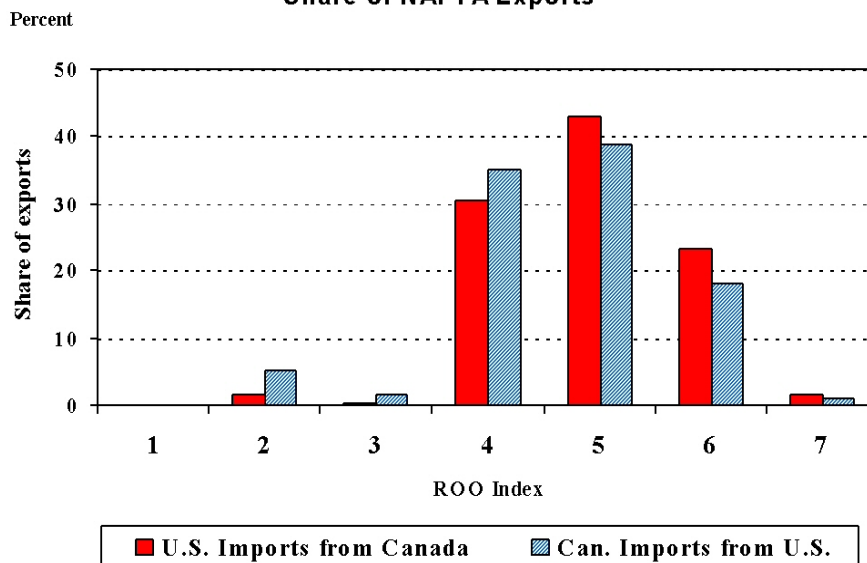
Source: Compilations based on Statistics Canada and USITC 2003 data

Restrictive and costly NAFTA ROO creates an incentive to use the MFN tariff rates rather than NAFTA in order to avoid the ROO compliance costs associated with the latter. As such, restrictive ROO result in reducing the NAFTA utilization rates and reducing the benefits resulting from the free trade agreement.

When importers of NAFTA goods into the United States have the choice of paying a higher MFN tariff or using the lower NAFTA rate (positive tariff preferences) but incur the costs of the NAFTA ROO, the importers will have a preference to choose the least-cost method of importation. Without any additional transaction costs, when NAFTA and MFN rates are the same (i.e. no positive tariff preference), importers will choose to use the MFN rate since it does not involve the NAFTA ROO related costs and avoids the possibility of origin verification.[22] Hence, all else remaining equal, as MFN rates fall due to multilateral trade liberalization, we should observe fewer importers using NAFTA and more using MFN on bilateral trade between Canada and the United States.

It is interesting to note that there appears to be a common misconception among the public that most intra-North American trade occurs using NAFTA. In 2002, 54% of total U.S. imports from Canada entered under the NAFTA regime and 45% entered at MFN rates.[23] Similarly, approximately 50% of imports to Canada from the United States entered under NAFTA while 62% of imports into

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[22] By choosing MFN, however, the importer must incur the Merchandise Processing Fee.
[23] WTO (2004) indicates the remaining 1% fell under a variety of programs such as civil aviation and pharmaceuticals

the United States from Mexico used the NAFTA regime and 37% at MFN rates for 2002. The intra-North America trade outside of the NAFTA regime may reflect exporters taking advantage of the prevailing zero or low MFN rates since the NAFTA margin of preference is not sufficiently attractive to offset the cost of complying with ROO requirements.

Are There Sectional Differences in NAFTA Utilization?

Examining NAFTA utilization rates by sector for Canadian exports into the United States reveals large inter-sectional differences (see Table 3). Canada has high utilization rates for fats and oils (98%), textiles and apparels (95%), plastics (94%) and transportation equipment (85%). However, Canadian exporters have extremely low NAFTA utilization rates for jewellery (14%), wood products (17%), pulp and paper (19%), arms and ammunitions (22%) and chemicals (26%).

These sectional differences may be a reflection of the restrictiveness associated with the specific ROO, the inter-sectional differences in the MFN tariff rates versus the NAFTA rate, the difference in the ability to qualify for NAFTA status and/or the degree of trade friction found within the sector. Carrère and de Melo (2004), using an econometric approach, find for Mexican exports into the United States that the NAFTA utilization rates are positively influenced by the tariff preference margins. Moreover, Carrère and de Melo find that additional technical requirements, regional value content and the change in tariff classification at the chapter level are an impediment to NAFTA utilization.

In a later section of this paper, we report the findings of our econometric work, which takes advantage of section, chapter and sub-heading trade data. Our results based on U.S. imports from Canada data confirm the Carrère and de Melo (2004) findings, which focused on U.S. imports from Mexico.

Are There Differences in Canadian and U.S. NAFTA Utilization?

Do Canada and the United States differ in their pattern of use of NAFTA? Importers into the United States should have a greater tendency to use NAFTA compared to importers into Canada due to a fee that is charged on imports into the United States using MFN/NTR[24] that is not charged when using NAFTA. The merchandise processing fee (MPF) is a fee collected by the U.S. Bureau of Customs and Border Protection on most goods imported into the United States that do not qualify for any special programs such as NAFTA. This non-refundable fee charged by U.S. Customs for administrative expenses for processing an imported shipment requiring formal entry is accessed at 0.21% of the value subject to a $25.00 minimum and a $485.00 maximum. However, shipments valued at less than $2,000.00 are assessed a $2.00 fee. There is no comparable fee for imports into Canada.

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[24] The United States adopted the term Normal Trade Relations (NTR) status replacing Most Favoured-Nation (MFN) status in 1998. We use the term MFN/NTR.

Table 3: NAFTA Utilization Rates and Restrictiveness Index Imports from Canada into the U.S.		
	NAFTA Utilization Rate[1]	Estevadeordal Restrictiveness Index[2]
1. Live Animals, Animal Products	33	6.0
2. Vegetable Products	72	6.0
3. Fats and Oils	98	5.9
4. Prepared Food, Beverages, Tobacco	64	5.7
5. Mineral Products	45	5.6
6. Chemicals	26	3.1
7. Plastics	93	4.8
8. Leather Goods	57	5.6
9. Wood Products	19	4.1
10. Pulp and Paper	26	5.4
11. Textiles and Apparel	94	6.0
12. Footwear, Headgear, etc	72	4.8
13. Article of Stone, Plastic, Glass, etc	58	5.1
14. Jewellery	14	5.3
15. Base Metals	62	4.8
16. Machinery, Electrical Equipment	41	3.8
17. Vehicles,Transport Equipment, etc	85	4.2
18. Optical, Photographic, etc	40	4.3
19. Arms & Ammunition	22	5.4
20 Miscellaneous	15	5.8
Average	**52**	**5.1**
[1] Authors' calculations based on 2003 USITC data. [2] Estevadeordal (2000) and updates on the restrictiveness index.		

Discussions with large Canadian exporters of goods into the United States indicate that the MPF is one factor taken into consideration when deciding between using NAFTA preferences and MFN rates. It is viewed as a major irritant to Canadian shippers but makes using NAFTA status marginally more appealing.

A preliminary comparison between Canadian and U.S. NAFTA utilization rates for bilateral trade (see Table 4) reveals that, based on the sections average, imports from the United States into Canada use NAFTA preferences about 48% of the time compared to 52% for imports from Canada into the United States. More striking are the large inter-country differences for NAFTA utilization rates between Canada and the United States at the section level. Out of the twenty sections compared, six sections reflect an inter-country difference in NAFTA utilization rates of less than 10 percentage points, six sections with an inter-country difference between 10 and 20 points and eight sections with an inter-country difference in NAFTA utilization rates of greater than 20.

To date, these large inter-country differences within sections have not been explained. We speculate that inter-country differences in MFN rates, trade

288

patterns within sections, and trade policy differences may be partly responsible for these differences.

Using overall NAFTA utilization[25] rates reveals that 57% of all imports into the United States from Canada used NAFTA status while only 44% of all imports into Canada from the United States used NAFTA. Given the relative size of the Canadian market, Canadian producers and manufacturers tend to be more export orientated with a particular focus on the United States. More importantly, a small number of large firms account for a major share of Canada's exports to the United States. According to Sulzenko (2003), in 2001 the top five exporters accounted for almost half, and the largest 2,000 firms accounted for over 80 percent of Canada's exports to the United States. With the paramount importance of the United States as Canada's principal export market and the concentration of firms who export to the U.S. market, Canadian producers and exporters tend to be more focused on meeting NAFTA ROO requirements in production and manufacturing and, as a matter of course, provide the necessary certificates of origin to U.S. importers. This is reflected in the higher NAFTA utilization rates.

### Has the Pattern of NAFTA and MFN Imports Changed?

The growth in U.S. imports from Canada under both the NAFTA[26] and MFN programs during the period 1990-2003 is illustrated in Figure 4. This period was witness to considerable trade liberalization, including the implementation of the Canada-U.S. FTA, NAFTA, and the general downward drift of MFN tariffs as a result of multilateral initiatives. However, there are two distinct sub-periods over this 14-year span. The period from 1990 to 1999 witnessed spectacular growth in U.S. imports from Canada under NAFTA; rising over 300% from $29 billion to $127 billion (constant 2000 U.S. dollars). NAFTA imports from Canada to the United States levelled off and remained relatively stable at $180 billion (constant 2000 U.S. dollars) over the period 2000 to 2003. MFN imports also increased but at a somewhat slower pace until 1997 at which time they grew more quickly than NAFTA imports until 2000. By 2000, however, MFN imports into the United States from Canada levelled off. Since the mid-1990s most U.S. imports from Canada has taken place under NAFTA. But by 2003, the difference between NAFTA and MFN imports amounted to only some US$ 14 billion on total imports of some US$ 226 billion.

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[25] The NAFTA utilization rate base on the average of section rates, the most common rate reported, provides a biased estimate of the actual NAFTA utilization rate when compared to the overall NAFTA utilization rate based on HS 6 data. The former is calculated as the average of the 20 or 21 sections utilization rates while the overall NAFTA utilization, for example for imports into Canada from the United States, is calculated as the total value of imports using NAFTA status from the United States divided by total value of imports into Canada from the United States. The overall utilization rate can be viewed as a trade weighted measure of utilization.

[26] In this section, we will use 'NAFTA' when referring to either the NAFTA or its predecessor, the Canada-U.S. FTA.

Table 4: NAFTA Utilization Rates by Sectors for Canada – United States Trade, 2003			
	U.S. Imports from Canada[1]	Canadian Imports from U.S.[2]	Inter-Country Difference
1. Live Animals, Animal Products	33	50	-16
2. Vegetable Products	72	21	51
3. Fats and Oils	98	93	5
4. Prepared Food, Beverages, Tobacco	64	81	-16
5. Mineral Products	45	24	21
6. Chemicals	26	53	-27
7. Plastics	93	82	11
8. Leather Goods	57	37	21
9. Wood Products	19	30	-11
10. Pulp and Paper	26	28	-2
11. Textiles and Apparel	94	84	10
12. Footwear, Headgear, etc	72	71	0
13. Article of Stone, Plastic, Glass, etc	58	43	15
14. Jewellery	14	17	-3
15. Base Metals	62	49	14
16. Machinery, Electrical Equipment	41	23	18
17. Vehicles,Transport Equipment, etc	85	55	30
18. Optical, Photographic, etc	40	16	25
19. Arms & Ammunition	22	52	-29
20 Miscellaneous	15	55	-40
Average utilization rate based on sections	52	48	6
Overall utilization rate:[3] aggregate	57	44	13
[1] Authors' calculations based on 2003 USITC data [2] Authors' calculations based on 2003 Statistics Canada data [3] Overall utilization rate does not include section 21			

**Figure 4: U.S. Imports from Canada By NAFTA and MFN**

NAFTA

Non-NAFTA

MFN
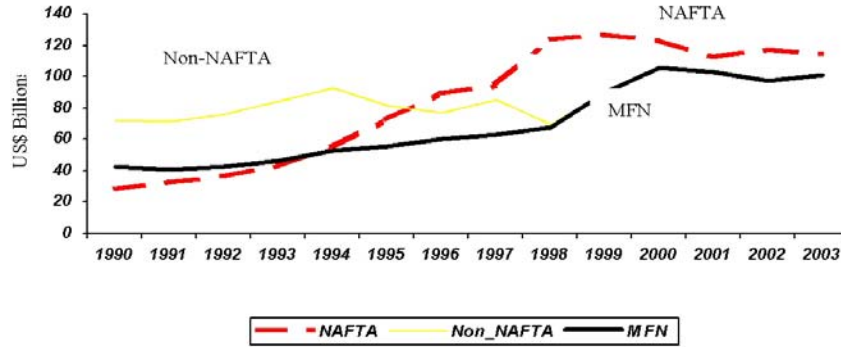
Source: Authors' calculations based on USITC data in 2000 US constant dollars.

Disaggregating NAFTA imports into dutiable and duty-free imports, we observe that the spectacular rise in NAFTA imports till 1997 was due to the growth in the duty-free component (see Figure 5). Although the NAFTA duty-free component was initially the smaller of the two components, the duty-free component has risen quickly so that by 1997 NAFTA imports were almost exclusively duty-free. This pattern of NAFTA duty-free imports is a reflection of the phase-in of FTA and NAFTA tariff reductions between Canada and the United States.

Figure 5: U.S. NAFTA Imports from Canada
(Dutiable and Duty Free)
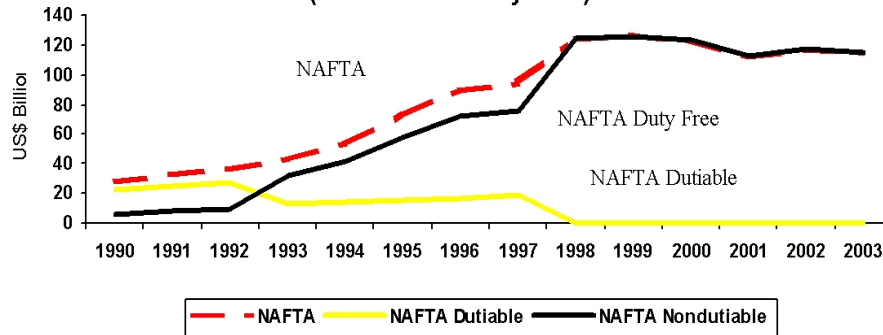
NAFTA

NAFTA Duty Free

NAFTA Dutiable

Source: Authors' calculations based on USITC data in 2000 US constant dollars

291

An alternative way to examine the growth in the use of NAFTA is to focus on utilization rates. The growth in the use of NAFTA by Canadian exporters to the United States during the first half of the 1990s was outstanding; utilization rates moved from less than 25% in 1989 to approximately 68% in 1998 (see Figure 6). For the period 1998 to 2003, approximately 54% of all imports into the United States from Canada used NAFTA status.

Figure 6: NAFTA Utilization[1] 1989-2003 Canada - U.S.Trade
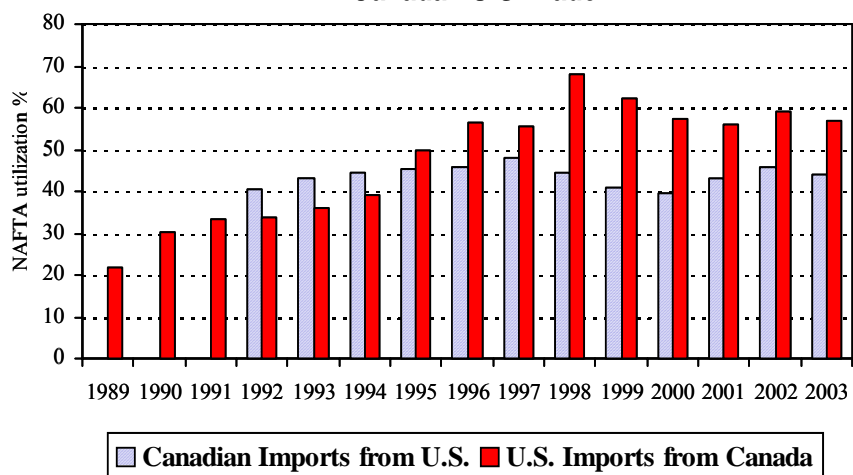
[1] NAFTA utilization based on subheading data excluding section 21.
Source: Authors' calculations based on Statistics Canada and USITC data

What comes as a surprise is the peak in the NAFTA utilization rate by U.S. importers in 1998 and the subsequent decline in the late 1990s. In 1997, NAFTA utilization by U.S. importers was 56%, jumping to 68% in 1998 but declining to 62% in 1999 - averaging around 57% in the post-1998 period.

Comparing Figures 4, 5 and 6 provides a revealing story. The year 1997 witnessed the start of the accelerated growth in imports under MFN duty-free while U.S. imports from Canada under NAFTA peaked in 1997 and declined slightly in dollar value. Taken together, this resulted in a decline in the NAFTA utilization rate. Given the choice between NAFTA duty free and MFN duty free, importers will choose the latter since it costs less to import despite the additional cost of the Merchandise Processing Fee.

The pattern of NAFTA utilization for Canadian imports from the United States reveals a slightly different pattern.[27] The growth in the use of NAFTA was considerably less pronounced for imports into Canada from the United States moving from a 40% utilization rate in 1992 and peaking at a 48% utilization rate

[27] We use 1992 to 2003 data only for Canadian imports from the United States provided by Statistics Canada.

in 1997. Post-1997 shows a declining utilization rate to the 44% range in 2001 to 2003. From 1992 to 2003, NAFTA utilization rates for imports into Canada from the United States remained in the 40 to 50% range.

Comparing NAFTA utilization on Canada–U.S. bilateral trade shows that U.S. imports from Canada had a significantly higher NAFTA utilization rate than Canadian imports from the United States. During the period 1997 to 2003, 56% of U.S. imports from Canada used NAFTA status while only 44% of Canadian imports from the United States used NAFTA. NAFTA utilization rates peaked in 1997 on Canada-U.S. bilateral trade and have subsequently declined since then. Overall, Canadian importers of U.S. goods use NAFTA about ten percentage points less than U.S. importers of Canada goods.
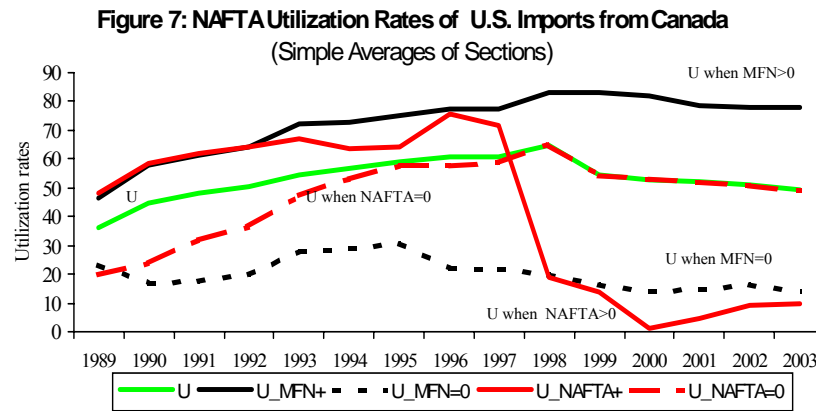
Do MFN Rates Influence NAFTA Utilization?

The level of NAFTA utilization has changed over the 1989-2003 time period as tariff rates under both NAFTA and the MFN have fallen. The average overall NAFTA utilization rate rose steadily between 1989 and 1997, declined thereafter until 2000, and has been relatively stable since then. This was illustrated earlier in Figure 6.

In order to gain additional insight into the behaviour of NAFTA imports, we segment the NAFTA import data into situations where tariffs are positive or zero. In particular, we calculate NAFTA utilization rates through time for five cases:

- Overall NAFTA utilization (U)
- MFN tariffs rates are positive (U when MFN>0)
- MFN tariffs rates are zero (U when MFN=0)
- NAFTA tariff rates are positive (U when NAFTA>0)
- NAFTA tariffs rates are zero (U when NAFTA=0)

These NAFTA utilization rates are shown in Figure 7. Several striking features become apparent. First, NAFTA utilization is very high at around 80% when the MFN tariff is positive. Firms attempting to minimize costs will weight

Figure 7: NAFTA Utilization Rates of U.S. Imports from Canada
(Simple Averages of Sections)
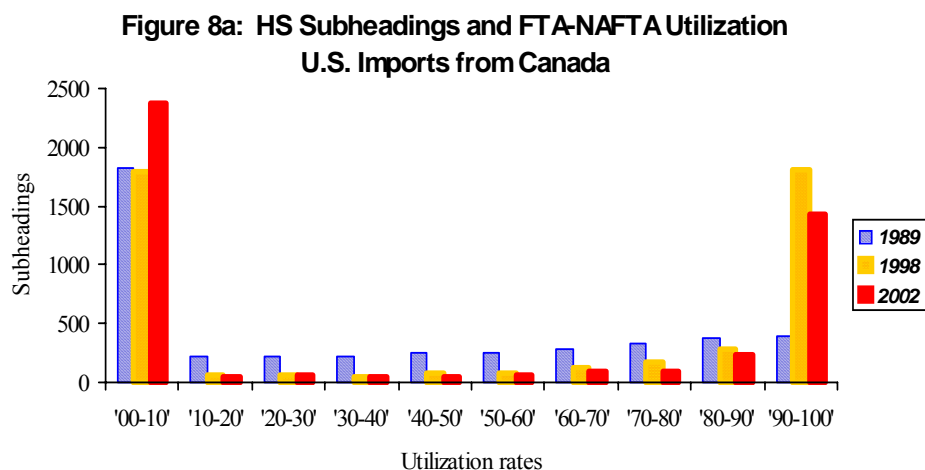
Source: Based on USITC data.

293

the cost of NAFTA ROO against the cost of the MFN tariff. The higher the MFN tariff, the more likely firms will use NAFTA. Second, NAFTA utilization rates have been relatively stable but low when the MFN tariff was zero. In this case, NAFTA utilization has been around 15% since the mid 1990s. When both the MFN tariff and NAFTA tariff rate are zero, it costs less to use MFN than NAFTA. Hence firms will import MFN duty free rather than NAFTA duty free since the former does not involve the additional costs associated with NAFTA ROO. Third, FTA utilization for those commodities that had not yet become NAFTA duty free plummeted around 1998. NAFTA utilization fell where NAFTA duty was positive since the number of dutiable NAFTA goods fell rapidly as a result of the final phase in NAFTA duty-free status for Canada–U.S. bilateral trade. Finally, the overall NAFTA utilization rate increased through 1990s peaking during the late 1990s. Since then, NAFTA utilization has fallen to the 50% range where about half of all goods imported into the United States from Canada use NAFTA.

A Disaggregate Look At NAFTA Utilization

We examine the frequency of subheadings and its relationship to NAFTA utilization rates over the 1989-2003 period for U.S. imports from Canada. Our results are illustrated in Figure 8a.

Comparing the two extremes through time, we observe that zero or low NAFTA utilization has increased since 1998 while high or 100% NAFTA utilization has fallen since 1998. Moreover, there has been a "hollowing" out of the middle of NAFTA's utilization range over time (commodities in each of the 10-20 to 80-90 utilization levels). This represents the distribution across subheadings of the declining in the use of NAFTA particularly from 1998 to 2002.

The data for Canadian imports from the United States reveal a different story as shown on Figure 8b. NAFTA utilization rates for Canadian imports is clustered at the upper end while the remainder is distributed relatively uniformly


Figure 8a: HS Subheadings and FTA-NAFTA Utilization U.S. Imports from Canada

Source: Based on USITC data.

294

across the spectrum of utilization. Historically we observe utilization rates declining for those sectors with utilization rates greater than 50% while utilization rates are growing for sectors with less than 50% NAFTA utilization.

We must note that the utilization rates vary among sections and through time. For U.S. imports from Canada, as illustrated in Table 5a, NAFTA utilization rates in some HS sections such as Fats and Oils remained high and stable throughout the time period while others sections such as Vegetables reflected continual growth. The most dramatic growth in NAFTA utilization has been in Transport Equipment, from 4.4% in 1989 to 91.7 in 1998 and 85.0% in 2003. NAFTA utilization for Footwear was high until 1998 but has fallen back to its pre-FTA level. NAFTA utilization in several other HS sections fell right after 1998 with the most dramatic decrease occurring in Arms and Ammunition from a 90% NAFTA utilization rate to 22 % between 1998 and 2003. The 33% NAFTA utilization rate recorded for Live Animals in 2003 marked the first time in ten years that its NAFTA utilization rate fell below 40% and might reflect the mad cow fall-out.

Figure 8b: HS Subheadings and FTA-NAFTA Utilization
Canadian Imports from the United States
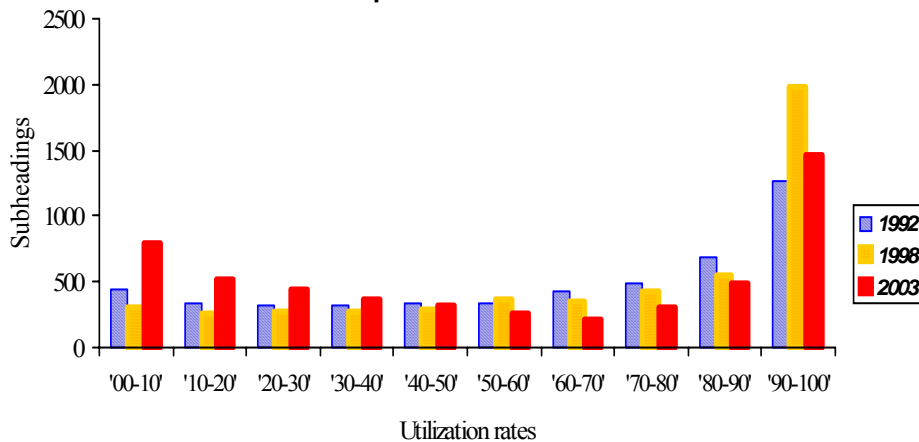
Source: Authors' calculations based on Statistics Canada data.

In fact, in 9 out of the 21 sections for U.S. imports from Canada, NAFTA utilization rates fell more than 10 percentage points between 1998 to 2003 pulling down the overall 2003 utilization average. NAFTA utilization rates peaked in 1998 for 13 of the 21 sections causing the average NAFTA utilization rate also to peak. The question remains; what caused this peak in NAFTA utilization rate and what caused the subsequent decline?

Table 5a: NAFTA Utilization By Section, 1989-2003 U.S. Imports from Canada	1989	1992	1995	1998	2003
1 Live Animals, Animal Products	35	54	49	49	33
2 Vegetable Products	49	65	68	71	72
3 Fats and Oils	86	97	96	97	98
4 Prepared Food, Beverages, Tobacco	58	74	70	71	64
5 Mineral Products	47	57	54	47	45
6 Chemicals	30	44	45	43	26
7 Plastics	70	84	87	93	93
8 Leather Goods	47	42	48	52	57
9 Wood Products	4	5	17	26	19
10 Pulp and Paper	6	12	17	23	26
11 Textiles and Apparel	66	89	90	96	94
12 Footwear, Headgear, etc	76	95	97	98	72
13 Article of Stone, Plastic, Glass, etc	44	57	69	81	58
14 Jewellery	1	21	40	37	14
15 Base Metals	42	59	57	69	62
16 Machinery, Electrical Equipment	23	42	53	63	41
17 Vehicles,Transport Equipment, etc	4	11	49	92	85
18 Optical, Photographic, etc	22	43	57	72	40
19 Arms & Ammunition	6	48	89	90	22
20 Miscellaneous	44	66	86	93	15
Average of Sections[1]	**38**	**53**	**62**	**68**	**52**
Overall Utilization	**28**	**34**	**50**	**68**	**57**

[1] Average of sections and overall utilization are calculated excluding section 21.
 Source: Authors' calculations with USITC data for various years

The historical usage of NAFTA across HS sections for imports from the United States into Canada shows a different pattern as illustrated in Figure 5b. In 18 out of 20 sections for imports into Canada from the United States, NAFTA utilization rates fell from 1998 to 2003 with 12 sections falling more than 10 percentage points. Transport equipment (section 17) posted the only increase in NAFTA utilization moving from 20% to 55% while Plastics (section 7) remained the same at 82%. The overall utilization rate for imports into Canada, calculated as the value of imports using NAFTA divided by the value of imports from the United States, has remained relatively constant over the last ten years while the utilization rate calculated as the average of sections shows a rising trend, peaking in 1998 and subsequently declining.

Table 5b: NAFTA Utilization By Section, 1992-2002		1992	1995	1998	2002	2003
Canadian Imports from United States						
1	Live Animals, Animal Products	67	66	65	49	50
2	Vegetable Products	68	70	64	26	21
3	Fats and Oils	85	92	95	93	93
4	Prepared Food, Beverages, Tobacco	80	84	86	83	81
5	Mineral Products	20	33	34	19	24
6	Chemicals	65	67	65	56	53
7	Plastics	70	81	82	82	82
8	Leather Goods	63	58	58	46	37
9	Wood Products	31	33	37	30	30
10	Pulp and Paper	54	60	61	43	28
11	Textiles and Apparel	81	87	89	87	84
12	Footwear, Headgear, etc	70	78	81	74	76
13	Article of Stone, Plastic, Glass, etc	60	61	56	43	43
14	Jewellery	20	20	41	19	17
15	Base Metals	64	69	67	56	49
16	Machinery, Electrical Equipment	39	44	37	25	23
17	Vehicles,Transport Equipment, etc	18	15	20	53	55
18	Optical, Photographic, etc	28	28	26	20	16
19	Arms & Ammunition	22	44	62	59	52
20	Miscellaneous	71	68	67	58	56
	Average of Sections[1]	**54**	**58**	**60**	**51**	**48**
	Overall Utilization	**41**	**45**	**44**	**46**	**44**

[1] Average of sections and overall utilization are calculated excluding section 21.
Source: Authors' calculations based on Statistics Canada data for various years

What Are the Economic Effects of NAFTA ROO?

There are several drawbacks to the use of restrictive ROO as outlined in the research literature. The three most often cited adverse effects created by restrictive ROO are that they restrict trade, misdirect investment, and distort sourcing and production decisions.[28]

First, with restrictive ROO and high transaction costs, there can be significant resource costs associated with the application of ROO. As noted earlier in this chapter, the private sector incurs compliance costs (broker fees, additional accounting costs, audit costs, etc.) to meet the origin requirements while the public sector incurs administrative costs (customs costs, audit costs, etc.). The costs associated with ROO would have the effect of raising consumer

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[28] See Australian Productivity Commission (2004b), Krishna (2004), Krueger (1993, 1997, 1999) and Estevadeordal and Suominen (2004a) for example.

prices, lowering producer returns and decreasing the volume of exports that otherwise would have occurred thereby directly reducing the net benefits accruing to NAFTA members. The more restrictive and costly the ROO, the greater the reduction in net benefits from a free trade agreement. In this case, restrictive ROO serve as a traditional barrier to trade, *i.e.*, to protect domestic producers of final goods when the rules of origin are so administratively or technically difficult to comply that they serve as a non-tariff barrier to trade (LaNasa (1995)).

Second, restrictive ROO may distort the location of production and investment decisions. Estevadeordal and Suominen (2004) identify two types of investment diversion that could occur as a result of restrictive ROO. First, there is the case where final goods producers from outside the FTA "jump" the ROO by locating plants within a FTA region in order to satisfy the ROO even if the FTA region was not the optimal location for investment. Second, ROO can result in investment diversion within the FTA area since outside producers could have an incentive to locate in the largest FTA market or the FTA member region with the lowest external tariffs such as the United States in the context of NAFTA.

NAFTA ROO can create a bias toward investment in the United States since multinational firms seeking larger markets have the incentive to minimize the uncertainty and resource costs associated with ROO. The costs associated with ROO, border costs, additional transportation charges for goods targeted for the U.S. market and investors' desires to secure access to the U.S. market add a bias towards investing in the United States compared to Canada or Mexico. This may be a contributing factor explaining why Canada witnessed a decline in the share of North American bound FDI.

Third, restrictive ROO can create incentives for producers to use member country inputs to satisfy ROO requirements rather than third country inputs even though third country inputs may be available at lower cost. The incentive is to increase the amount of intermediate and final good manufacturing, processing and assembly done within NAFTA, when regional value content requirements are binding, at the expense of facilities in other countries that would otherwise have a comparative advantage. This distortion of the sourcing and purchasing decision causes policy-induced allocation inefficiency where firms and industries are producing goods at a higher cost even though less costly inputs are available (trade diversion). Krishna (2004) indicates that that this provides hidden protection to suppliers within an FTA.

Estevadeordal and Suominen (2004), employing a 156-country gravity model, carried out the most extensive investigation to date regarding estimating the trade effects of ROO. The authors find that regimes with restrictive ROO and with high degrees of sectoral selectivity discourage aggregate trade flows. In addition, they find that at the sectoral level (in vehicles), restrictive ROO in final goods encourage trade in intermediate goods, and could thus engender trade diversion in inputs.

What do the quantitative studies reveal about the economic costs of NAFTA ROO? Appiah (1999) incorporated the NAFTA ROO into a multi-sector general equilibrium model, modeling NAFTA ROO as an RVC requirement he found, in his intermediate case, the welfare costs of the NAFTA ROO to be 1.5 to

2.3% of GDP.[29] The author finds that the more restrictive the ROO, the more the cost in terms of forgone GDP. With non-restrictive ROO, the cost of ROO to the Canadian economy is 0.3 to 0.61% of GDP while restrictive ROO could cost the Canadian economy 2.8% of GDP. In addition, Appiah (1999) found that welfare costs of the NAFTA ROO to the U.S. economy are approximately 0.47% to 1.22% of U.S. GDP in the intermediate case.

Cadot et. al. (2002) employed data on Mexican exports to the United States, exports to the rest of the world, NAFTA preferences, Estevadeordal's restrictiveness index, and dummy variables to estimate a model explaining the effects of NAFTA ROO on Mexican exports to the United States. The authors found that relaxing the NAFTA ROO would increase Mexican exports to the United States between 17.8% and 35%.[30] In addition, relaxing the change in tariff classification at the chapter level would increase Mexican exports by 35.3%. This suggests that NAFTA ROO significantly reduce exports from member countries.

Ghosh and Rao (2004), assessing the likely effects from a Canada–U.S. customs union in a dynamic multi-sector, multi-country general equilibrium model, find that eliminating the NAFTA ROO alone between Canada and the United States would increase Canada's GDP by 1.04%, U.S. GDP by 0.13% and would increase Canadian exports to the United States by 19% and American exports to Canada by 22.7%.[31] In addition, the simulations indicate that the elimination of NAFTA ROO between the two countries would increase investment into Canada by 1.3% and the United States by 0.23%.

Examining NAFTA ROO and Bilateral Trade

In this section, we explore the relationship between NAFTA utilization rates, Estevadeordal's ROO restrictiveness index, and tariff preferences. To simplify, we can conceptually view the producer/exporter facing a two-stage problem.

In the first stage, the producer/exporter must make a sourcing and/or production decision. We can think of this sourcing and production decision when ROO are binding within the framework of the producer's/exporter's profit maximization problem with the additional ROO binding constraint. The formulation of the constraint(s) is different depending on whether ROO are characterized by CTC, CTC plus RVC, or CTC plus technical requirements. It is the producer/exporter that provides the certificates of origin to the purchaser/importer of the good.

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[29] Appiah (1999) models the NAFTA ROO as changes in the tariff classification and as regional value content requirements. The change in tariff classification is approximated by the percentage increase in value added per unit of foreign inputs to achieve the tariff classification change. His intermediate case simulates a change in tariff classification (tariff shift) equal to 30% in value added per unit cost of foreign input. Two other simulations are a tariff shift of 20% and 40% in value added per unit cost of foreign input.

[30] Cadot et. al. (2002) found that relaxing ROO to r = 3 would increase Mexican exports to the United States by 17.8% but setting it to r= 2 would increase exports by 35%.

[31] Ghosh and Rao (2004) provide upper-bound estimates and denote the maximum values that may occur. These are preliminary results and are subject to subsequent modification.

In the second stage, the choice of using NAFTA with its compliance costs versus MFN can be thought of in the context of a cost minimization problem of the importer. If the good for importation satisfies the ROO binding constraint within stage one, the importer can choose between NAFTA and MFN status. However, not satisfying the binding ROO constraint in stage one implies that the importer is only entitled to MFN status. It is the importer that must provide the necessary documentation to customs for clearance of the imported shipment.

We separate the choice of input mix in the production decision and the sourcing problem by producers/exporters from the importers' decision to use NAFTA or MFN. For our analysis, we focus on the use of NAFTA or MFN as a means to import into a member country and abstract from the sourcing and production decision.

The importer will seek the mode of importation, NAFTA versus MFN, which minimizes the cost of importation. It is assumed the logistical costs (transportation charges, insurance, brokers' fees, etc.) are the same under NAFTA and MFN. As mentioned before, the key cost factors that influence the choice of using NAFTA versus MFN are tariff preferences and the requirements associated with ROO.

It is expected that NAFTA utilization is positively related to tariff preferences since the greater the difference between MFN and NAFTA tariffs, the greater the cost savings from not paying MFN duty net of NAFTA ROO costs if one uses NAFTA. It is also expected that NAFTA utilization is negatively related to the degree of restrictiveness of ROO so that the more restrictive ROO, the less the use of NAFTA. The predominant use of the CTC at the chapter level makes it more difficult to satisfy compliance with ROO requirements compared to CTC at lower levels within the HS code and hence should result in lower utilization rates.

To capture the effects of ROO restrictiveness on utilization rates, we first employ the Estevadeordal restrictiveness index. The Estevadeordal index performs well in regressions with cross-country aggregate data (Estevadeordal and Suominen 2003). With single country trade data, the index performs well with disaggregated data (Anson et. al. 2003).

In addition, given the large percent of ROO requiring a chapter change, we also employ a chapter change dummy as an alternative to the restrictiveness index. Our regression strategy is to use the restrictiveness index and to compare these results to our regressions where dummies capture the CTC at the chapter level as specified in Annex 401 of NAFTA. Following Cadot *et. al.* (2002) and Carrère and de Melo (2004), we also include a sector specific dummy variable to capture the heterogeneity within certain sectors.

Our regression equation is:

$$\ln U = \beta_0 + \beta_1 \ln \tau + \beta_2 \ln r + \delta D \qquad (2)$$

where:

τ is the tariff preference rate calculated as $(t^{MFN} - t^{NAFTA})/(1 + t^{NAFTA})$ where t is the tariff rate

r is the Estevadeordal restrictiveness index of the ith good

D is a sector dummy

It is expected that $\beta_1 > 0$ and $\beta_2 < 0$.

Our first set of regressions, reported in Table 6, use section level data. The results show that tariff preferences are positively related to NAFTA utilization – the greater the tariff preferences (the higher the MFN rate) the greater the use of NAFTA. In all cases, tariff preferences are statistically significant. With every 1 percentage reduction in tariff preferences, there would be approximately ½ percentage reduction in the NAFTA utilization rate as importers find it relatively less costly to use the MFN and relatively less attractive to use NAFTA.

	Table 6: NAFTA Utilization Regressions					
	1	2	3	4	5	6
Independent variables	Dependent Variable NAFTA Utilization Rates					
Constant	3.177* (2.336)	2.951** (15.76)	3.192* (2.126)	3.203** (17.26)	2.959** (3.245)	3.175** (19.59)
Tariff preference	0.538** (3.837)	0.578** (4.074)	0.354* (2.126)	0.391 (2.081)	0.411** (3.544)	0.405** (3.492)
Restrictiveness index	-0.159 (-0.185)		0.016 (0.026)		0.156 (0.274)	
Section dummy	0.702* (2.336)	0.861* (2.495)	0.572* (2.177)	0.604* (2.212)	0.553* (2.327)	0.570* (2.484)
CC dummy		-0.363 (-1.024)		-0.105 (-0.382)		.099 (.533)
Country dummy					-0.078 (-0.420)	-0.076 (-0.409)
adj R^2	.57	.60	.48	.48	.44	.45
Data	U.S. HS sections	U.S. HS sections	Canada HS sections	Canada HS Sections	Pooled	Pooled
t-ratio in parenthesis * and ** denotes significance at the 5% and 1% level, respectively						

The Estevadeordal restrictiveness index is not statistically significant. This finding is not surprising given the data sets that we are using for these regressions. As a result, we replace the restrictiveness index with a restrictiveness dummy following Carrère and de Melo (2004). For our second regression equation, we replace the Estevadeordal index with a restrictiveness dummy (CC dummy) which takes on the value of 1 when $r \geq 6$ and 0 otherwise. The results indicate that the restrictiveness dummy has the correct sign, suggesting that CTC

at the chapter level reduces NAFTA utilization. However, the coefficient is not statistically significant. The section dummy captures the effects of selected sections on NAFTA utilization and is positive and statistically significant.

Running the regressions with pooled Canada–U.S. bilateral trade data reveals no change in the value of the estimated parameters compared to the single country analysis (see column 5 and 6). Again the restrictiveness index and the change in chapter dummy are not statistically significant. It is interesting to note that the country dummy is not statistically significant, suggesting similar behaviour in both countries. This would suggest that composition differences may explain the sectoral differences in utilization between the two countries.

We take an initial look at 2002 data for U.S. imports from Canada at the chapter level. Although there are 99 chapters designated, chapter 77 is reserved for future use while 98 and 99 are reserved for special use. Consequently, the chapter data allows for 96 observations. Inspecting the chapter data, we observe the dependent variable, NAFTA utilization rates U_i, with values $0 \leq U_i < 1$.[32] With a dependent variable that is zero for a significant fraction of the observations, conventional regressions fail to account for the qualitative difference between limit (zero) observations and nonlimit (continuous) observations.[33] If we only use the observations where $U_i > 0$ to estimate the regression equation by ordinary least squares, then the mean stochastic error would not equal zero violating the first assumption of the classical linear model.[34] Therefore, we estimate the coefficients using the Tobit regression model applied to HS chapter import data set.

This disaggregated data allows us to expand the range of dummy variables in an attempt to capture the effects of NAFTA ROO on utilization rates. Our strategy will be to run our first regression with the Estevadeordal restrictiveness index and then a second regression with the change in chapter dummy variable, reflecting the value of 1 when $r \geq 6$ and CC dummy = 0 otherwise. Our third regression includes three restrictiveness dummies: CC dummy for chapter changes, CHplus dummy for heading changes including a regional value content requirement, and a technical requirement and CH dummy for changes in headings. The results are reported in Table 7.

Tariff preferences and the sector dummy are statistically significant and hence NAFTA utilization rates are positively related to tariff preference in all three regressions. We find that the restrictiveness index has the right sign but again is not statistically significant. Similarly, none of change in tariff classification dummies are significant in regressions 8 and 9.

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[32] There is no HS chapter with a NAFTA utilization rate of 1.
[33] Greene (1990) provides an in-depth explanation of several limited dependent variable models.

Table 7: NAFTA Utilization Regressions			
	7	8	9
Independent variables	Dependent Variable NAFTA Utilization Rates		
Constant	2.10** (2.785)	2.727** (7.302)	2.237** (4.240)
tariff preference	0.308** (3.837)	0.307** (3.751)	0.308** (3.743)
restrictiveness index	-0.123 (-0.1855)		
sector dummy	1.419** (4.678)	1.443** (4.775)	1.390** (4.538)
CC dummy		0.085 (0.389)	0.584 (1.322)
CHplus dummy			0.505 (1.181)
CH dummy			.571 (1.344)
Data: USITC chapter import data for 2002, Estevadeordal index aggregated to the HS2 chapter level, 96 observations Coefficients estimated with the Tobit model. t-ratio in parenthesis ** denotes significance at the 1% level.			

The empirical results regarding the restrictiveness index and the CTC dummies are to be expected given the level of aggregation in the data. The influence of the restrictiveness index on utilization rates should show up with the single country trade data at the import transaction level, the item level and the subheading level. Anson et. al. (2003) and Cadot et. al. (2002) statistically find the inverse relationship between NAFTA utilization rates and the restrictiveness index employing sub-heading data on U.S. imports from Mexico.

Similarly the effects the CTC dummies on utilization are more likely to be captured in the econometric results the greater the degree of disaggregation. Carrère and de Melo (2004), using HS 6 data for U.S imports from Mexico, found the CTC dummies to be highly significant. This micro data also allowed the authors to explore how the stages of production (intermediate and final goods) influence utilization rates and the cost of compliance.

Does ROO Reduce U.S. NAFTA Imports From Canada

In this section, we will rely on the 2003 HS 6 data for imports into the United States from Canada in our regressions.[35] This data poses some challenges given the large number of subheadings where NAFTA utilization rates are zero or

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[35] We will not use the data for Canadian imports from the United States since the Canadian data contains noise in the tariff revenue component that may bias the econometric results.

100%. There are 1492 subheading observations where the NAFTA utilization rate is zero and 743 subheading observations where the NAFTA utilization rate is 100%.

The restrictiveness index was updated to incorporate the various changes in the NAFTA ROO that have occurred since 1998.

We chose to estimate our model using a two-limit Tobit model. This approach allows one to use the entire sample including observations where the dependent variable, the NAFTA utilization rate, might take on values of zero, one or any value in between.

Our regression equation is:

$$U = \beta_0 + \beta_1\tau + \beta_2 r + \beta_3 F + \delta_1 D_1 + \delta_2 D_2 + \delta_3 D_3 + \ldots + \delta_n D_n$$

where:

τ is the tariff preference rate calculated as
$(t^{MFN} - t^{NAFTA})/(1 + t^{NAFTA})$ where t is the tariff rate
r is the Estevadeordal restrictiveness index,
D_i are section dummy variables representing 19 sections.[36]

Again it is expected that the greater the tariff preference, the greater the use of NAFTA ($\beta_1 > 0$) and the more restrictive ROO the less the use of NAFTA ($\beta_2 < 0$). The section dummies should pick up the extent to which NAFTA is used more or less than average after correcting for the influence of the restrictiveness index, tariff preferences and freight and insurance charges.

The results are shown in Table 8. The coefficients associated with tariff preferences and the restrictiveness index are statistically significant and have the expected signs. Nine dummies are significant at the 1% level of confidence while an additional two section dummies are significant at the 5% level.

Section 2 (Vegetable Products), section 3 (Fats and Oils), section 4 (Food, Beverage and Tobacco), section 7 (Plastics), section 11 (Textile and Textile Articles) and section 15 (Base Metals) all reflect greater NAFTA utilization after correcting for the influence of the restrictiveness index, tariff preferences, and freight and insurance charges.[37] On the other hand, section 5 (Mineral Products), section 9 (Wood and Articles of Wood) and section 16 (Machinery and Mechanical Appliances) have a statistically smaller utilization rates after correcting for the restrictiveness index, tariff preferences and freight and insurance charges compared to the average section.

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[36] See appendix 1 for a listing of chapters and sections. Section 21 has been eliminated from the data set since there are no index numbers assigned to this section.
[37] Each of these sections have a dummy coefficient that is statistically significant at the 1% level.

Table 8: Determinants of NAFTA Utilization				
Independent Variables		Independent Variables (continued)	
Intercept	0.6720** (6.78)	D9	-0.3973** (-3.35)
Restrictiveness index	-0.0784** (-6.48)	D10	0.0651 (0.68)
Tariff preference	0.0194** (7.69)	D11	0.6537** (8.40)
D1	-0.0555 (-0.60)	D12	0.1162 (0.90)
D2	0.4759** (5.27)	D13	0.2008* (2.05)
D3	0.6723** (4.64)	D14	-0.0695 (-0.50)
D4	0.4467** (4.84)	D15	0.4263** (5.41)
D5	-0.7943** (-6.68)	D16	-0.2718** (-3.41)
D6	0.0861 (1.02)	D17	-0.0911 (-0.89)
D7	0.3331** (3.77)	D18	-0.0526 (-0.58)
D8	0.2531* (2.16)	D19	-0.2860 (-1.39)
		Observations Log likelihood	4489 -4385
USITC trade data for 2003 Coefficients estimated with Two-Limit Tobit T-ratios in brackets ** and * denotes 1% and 5% level of significance				

To assist in our understanding of these parameter estimates, we undertake the following conceptual experiments of hypothetically decreasing:

i.   the average restrictiveness index from 5 to 4, and
ii. the average tariff preference by 1 percentage point

separately and examine the impact on NAFTA utilization.[38] Reducing the average NAFTA ROO restrictiveness index from 5 to 4 would result in a 13% increase in the use of NAFTA. This would be equivalent to relaxing NAFTA ROO to the

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[38] We calculate the relevant elasticity evaluated at the mean of the data and simulate the effects of each scenario based in these elasticities.

point where the average NAFTA ROO would be a change in tariff classification at the heading level and would be equivalent to the ROO restrictiveness level of the Canada-Israel FTA. Similarly, redrafting NAFTA ROO so that average restrictiveness index fell to 3 would result in a 26% increase in NAFTA exports from Canada to the United States.

Reducing tariff preferences by 1 percentage point would decrease NAFTA utilization by 3.4%. As MFN rates fall, this makes the use of MFN more attractive. Our results indicate that reducing the restrictiveness of NAFTA ROO would bring about considerably larger increases in NAFTA imports compared to reducing MFN tariffs.

These results are consistent with the general conclusions of Ghosh and Rao (2004) who found that the gain from the reduction in NAFTA ROO was significantly larger than the gain from tariff harmonization. The econometric results confirm our earlier expectations that the restrictiveness of NAFTA ROO have dampened the use of NAFTA while the remaining MFN rates have encouraged the use of NAFTA.

Concluding Remarks

For Canada and the United States, improved access to each other's market has been beneficial. The security concerns in the wake of September 11th have made Canadians acutely aware of the strategic importance of the border and introduced new issues that must be resolved to facilitate the movement of goods and individuals between Canada and the United States.

The available empirical evidence suggests that NAFTA ROO, although intended to distinguish between NAFTA originating goods and non-originating goods, can result in significant, unexpected economic costs that alter the expected net benefits from trade. Importers are using NAFTA less than expected given that NAFTA utilization is around 50% of Canada-U.S. bilateral trade. NAFTA utilization for U.S. imports from Canada peaked in 1998 and has declined since then. About half of the Canada-U.S. trade is imported under NAFTA while almost all tariff lines under NAFTA are duty free. When MFN rates are zero, importers use NAFTA only to a very limited extent, likely as a result of costs of using NAFTA; when MFN rates are positive, importers rely more heavily on NAFTA.

Other studies based on data related to U.S. imports from Mexico indicated that NAFTA ROO are costly. Our analysis suggests that NAFTA compliance costs for U.S. imports from Canada are about 1% of the exports. In addition, Anson et. al. (2003), Cadot et. al. (2002) and Carrère and de Melo (2004) demonstrate that NAFTA ROO have significant negative effects on NAFTA utilization rates for U.S. imports from Mexico. For U.S. imports from Canada, we also find that NAFTA ROO significantly reduce NAFTA utilization rates.

The maturity of the bilateral trade relationship between Canada and the United States as reflected in the success of the Auto Pact, the FTA and the NAFTA, coupled with liberalized tariff environments witnessed by the historical reductions of Canadian MFN and U.S. NTR tariff rates over the last 15 years, may be eroding the usefulness of NAFTA as demonstrated by the declining NAFTA utilization rates on both sides of the northern border. If we want to capture

additional gains from trade, reduce inefficient and costly sourcing and production, and reduce compliance and administration costs associated with NAFTA rules of origin, then action is required to change the current NAFTA ROO environment.

There are several approaches that could be employed to address the adverse effects of ROO. The elimination of ROO for all intra-bloc trade between Canada and the United States could occur by moving toward a Canada-United States customs union. Alternatively, ROO could be eliminated for intra-bloc trade on a sectoral basis where the difference in level of MFN between the two countries is small or zero. Some have suggested that this as a potential option where the inter-country differences in tariffs are less than 1 percentage point. Our earlier work on a potential customs union suggested that the relative small differences in the external tariff between Canada and the United States for non-agriculture would make a sectoral approach towards the removal of NAFTA ROO attractive. Sensitive sectors such as automotives, agriculture and textiles might require special consideration. Reducing MFN rates could also eliminate some of the adverse effects of the NAFTA ROO. As we have seen as MFN rates decline, importers move from using NAFTA towards using MFN tariff rates.

At a minimum, NAFTA rules of origin should be liberalized in order to make it easier, less costly, and less burdensome for firms to establish origin, to comply with ROO and to use NAFTA. Although there are numerous options and variations to be considered in liberalizing NAFTA ROO, we explore three possible options below.

The first option to liberalize NAFTA ROO is to reduce the current regional value content threshold, currently at 60% if calculated by the transaction value method or 50% if calculated by the net cost method. Lowering the RVC threshold would allow greater choice in sourcing inputs, reduce ROO-induced inefficiency in production, and reduce some of the barriers to trade caused by NAFTA ROO. Moreover, reducing the RVC threshold would be relatively simple to implement and would involve minimal transaction costs. Currently, 35% of the tariff items have a RVC component.

Currently under the Canada–Chile FTA, the RVC is 25% (net cost method) and 35% (transaction value method) and for the Mexico – Israel FTA the RVC is 35% (net cost method) and 45% (transaction value method). The United States bilateral agreements with Israel and Jordan diverge markedly from the NAFTA model, operating with only RVC rules. The RVC threshold is 35% in both agreements. The application of a single test across all activities and the relatively low RVC requirement would be reflected in a lower restrictiveness index.

A second option to reduce the restrictiveness of NAFTA ROO would be to diminish the discriminatory nature of NAFTA CTC rules by downward harmonization. Estevadeordal (2000), Estevadeordal and Suominen (2004a, b) and the Australia Productivity Commission (2004a,b) identified the CTC ROO at the chapter level as a major cause of the restrictiveness of NAFTA ROO. The incidence of CTC ROO at the chapter level in the first test is significantly lower in the United States–Singapore FTA at 33% and the United States–Chile FTA at

37% compared to NAFTA at 54%.[39] Downward harmonization of the NAFTA CTC rules would require the modification of those CTC rules currently at the chapter (and perhaps heading) level downwards to CTC at the headings (or sub-heading) level. Again this option would reduce the policy-induced inefficiencies created by the current NAFTA ROO.

A third option would be to re-examine the exceptions to the CTC rules with the objective to eliminate these exceptions. About 50% of NAFTA ROO in the first test are CTC alone while 38% contain exceptions. Exceptions in CTC rules serve to restrict the application of the particular ROO.

A fourth option would be to simplify the second rule or test for the same tariff item. As outlined earlier, there is a wide range of tariff items where there is a choice of rules given. In NAFTA, the first test is commonly based on a CTC rule alone, while a second test, for the same tariff item, may involve a CTC rule at a lower level, together with a technical test and/or RVC requirement. For any tariff item where a choice of rules is given, simplification could involve CTC for rule one and a RVC only for rule two.

These options could be implemented independently or combined as a NAFTA ROO reform package.

It should be noted that although RVC threshold reduction, downward harmonization of CTC and the simplification of the second rule would all generate efficiency gains to the economy and benefits to producers and traders. However, these options would not address, to any large extent, the compliance and administration costs associated with NAFTA ROO. A review of NAFTA ROO transaction requirements for customs purposes and business and customs operational procedures to meet NAFTA ROO is required to identify any potential sources of administrative and compliance gains.

In conclusion, our present analysis suggests that NAFTA rules of origin are restrictive, create policy-induced inefficiencies in sourcing and production, impose compliance costs on firms engaged in intra-NAFTA trade, and inhibit NAFTA trade. The elimination or reduction of these costs associated with the NAFTA rules of origin would provide positive economic benefits to Canada by lowering costs to producers and prices to consumers, by increasing intra-NAFTA trade, and by reducing NAFTA ROO-induced inefficiencies.

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[39] See Estevadeordal and Suiminon (2004b) or the Australia Productivity Commission (2004b)

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