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Eidgenössisches Departement für
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Direktion für Wirtschaftspolitik

**Ticon Development
Consulting,
The Origin Institute,
Trade Facilitation Services**

**Cross-Cumulation in Free
Trade Agreements**

Opportunities, Potential
and Challenges

**Grundlagen der Wirtschaftspolitik
Nr. 21**

**Study on behalf of the State
Secretariat for Economic Affairs
SECO**



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Berne, 2013

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Murray G. Smith

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EXECUTIVE SUMMARY AND KEY CONCLUSIONS

This study examines the challenges that arise at the level of the trade policies of Switzerland and its trading partners and for the broader multilateral trading system of rules of origin in Free Trade Agreements (FTAs). Like an increasing number of other countries, Switzerland has a large network of bilateral FTAs.

In the period since the creation of the World Trade Organization (WTO) in 1995, FTAs have proliferated as key instrument of trade liberalization in the multilateral trading system. More than 300 FTAs or Customs Unions (CUs) have been notified to the WTO under the General Agreement on Tariffs and Trade (GATT) (1947) and GATT (1994) under the WTO of which more than 223 are in force as of March 2013. Similarly 117 Economic Integration Agreements (EIAs) have been notified to the General Agreement on Trade in Services (GATS) under the WTO and are currently in force. Such EIAs are linked with FTAs or CUs. More than 90% of regional trade agreements currently in force under GATT Article XXIV are FTAs.

Framework for Analysis

As with Customs Unions, FTAs give rise to both trade creation gains and trade diversion costs. The analysis reviews the classic analysis of customs union theory in terms of trade creation and trade diversion and adapts this analysis to FTAs. The analysis concludes that FTAs as with CUs need to be assessed quantitatively on a case by case basis. The classic analysis of trade creation and trade diversion is extended to take account of different technologies, to incorporate economies of scale and product differentiation, and to consider dynamic growth effects and innovation as well as consumption effects.

Quantitative analysis of the potential trade creation and trade diversion effects of modern CUs and FTAs needs to be assessed in the context of Most Favoured Nation (MFN) trade regimes in the 21st century with 159 WTO members. In particular, most economies have few significant non-tariff measures such as quantitative restrictions and for most members MFN tariffs are low with limited tariff peaks. Some emerging markets who were longstanding members of the GATT still retain relatively restrictive trade and investment regimes but this creates incentive for FTAs or plurilateral approaches among the rest. The overall openness to trade and investment, and low MFN barriers in many countries, limits the scope for trade diversion from FTAs because preferences have modest impacts on trade flows. At same time removal of tariffs within FTAs enhances specialization in production of goods and services, stimulates productivity growth, and fosters innovation which in turn increases the potential for trade creation. Furthermore the expansion of trade in goods and services from integration, and increased ease of investment and mobility of specialized personnel, cooperation on regulation and better protection of

intellectual property are growth promoting and foster improvements in growth performance which benefit both parties and non-parties.

Analysis of Rules of Origin and Overlapping FTAs

The policy purpose of rules of origin in FTAs is to limit trade deflection where trade flows or production locations are shifted or deflected among countries to arbitrage differences in the external trade barriers of FTA partners. In practice rules of origin (RoO) in many FTAs tend to be more restrictive than necessary to limit trade or production deflection. This outcome is due to caution by negotiators and policymakers, due to protectionist pressures when the agreements are first negotiated, and due to the passage of time as MFN barriers are reduced and as more FTAs are negotiated. As a result of the tendency to restrictiveness of RoO in their design, restrictiveness in their administration, and the administrative challenges and costs for enterprises of complying with RoO, preference utilization is often lower than might be expected.

The most serious challenge of overlapping FTAs is that the RoO usually only apply to the respective bilateral FTAs and not to overlapping FTAs. This is often referred to as the “hub and spokes” or “spaghetti bowl” problem. The problem created by overlapping FTAs is that if three countries have three bilateral FTAs but no common FTA then trade can move at reduced tariffs or duty free only between each bilateral pair of countries for “originating products”. This significantly inhibits trade flows within the “zone” of the FTA partners who each have FTAs with each of the other partners. As an illustration, under one bilateral FTA, a product such as an automobile could qualify for duty free trade if sufficient components are manufactured and value added in assembly occurs between two partners but not if the supply chain of component manufacture and assembly involves all three partners of separate bilateral FTAs. It was to avoid this problem and to increase trade and investment within the zone that the North American Free Trade Agreement (NAFTA) was negotiated as a trilateral FTA to replace the Canada-US FTA. However expansion of a bilateral FTA to involve a third country as a full party is extremely rare. Instead the pattern of the last decade has been proliferation of overlapping FTAs.

Potential Role of Cross-Cumulation

One solution to the challenge of overlapping bilateral FTAs is **diagonal cumulation**. If rules of origin are identical in all the overlapping agreements then diagonal cumulation allows cumulation of originating content for any of the bilateral FTAs for any of the other FTAs in the network. As a result trade can move more freely inside the zone of overlapping FTAs and supply chains can be more flexible. The European Union (EU) has initiated this approach initially for the Pan European Rules of Origin which is now adapted to the Pan Euro-Med harmonized rules of origin. The introduction of diagonal cumulation led to a substantial expansion of trade in the

network of EU FTAs covered by the Pan European rules of origin and now the Pan Euro-Med rules of origin.

Cross-Cumulation is an innovative solution to the problem of overlapping FTAs where cumulation is permitted for overlapping FTAs with different rules of origin. Cross-Cumulation is analogous to diagonal cumulation in that originating content in each of the partners can be cumulated within the zone. Different forms of Cross-Cumulation are examined. The key advantage of Cross-Cumulation is that if there is some form of mutual recognition of different rules of origin in the respective bilateral FTAs in order that trade can move more freely in the common zone of overlapping FTAs without the challenges of negotiating common RoO or a common FTA.

Methodology

The methodology that was adopted was to use the INTraBID model framework and database developed by the Inter-American Development Bank to analyze the indirect trade flows between Switzerland through trading with FTA partners who in turn trade with other FTA or potential partners. This is the only available data base and modeling framework which allows the tracing of supply chains in this way. The approach undertaken was case studies in selected industries.

We undertook the analysis for three regional zones. It must be stressed that these are simply geographic regions at present, while Switzerland or the European Free Trade Association (EFTA) has bilateral FTAs with some of the partners and is in the process of negotiating with others, there are no applicable regional trading arrangements for which the Swiss exports would qualify. Thus we are examining the potential expansion of trade flows in these regions with the completion of the network of FTAs and potential introduction of Cross-Cumulation.

The three zones which we examined were:

- Western Hemisphere/Americas (WH) comprising Canada, Chile, Columbia, Mexico and Peru;
- East Asia (EA) comprising China, Korea and Japan; and
- Southeast Asia (SEA) comprising Singapore, Indonesia, Malaysia, Thailand and Vietnam.

Recognizing the challenges of analysis of Cross-Cumulation which focuses on the links between trade flows between partners in bilateral FTAs and the potential exports of another partner which has an overlapping FTA (in this case Switzerland), the study follows a case study approach analyzing Swiss trade and potential trade with these three regions in intermediate products for three sectors:

- Pharmaceutical products (HS 30);
- Measuring and precision instruments (HS 90); and
- Machinery and boilers (HS 84).

Analysis of Case Studies

Analysis of the effects of potential introduction of Cross-Cumulation on both imports to Switzerland and exports from Switzerland was conducted. However, since Switzerland has low MFN trade barriers in the industrial sector and since Switzerland has many FTA trading partners (including the EU) the implications of Cross-Cumulation for imports are likely to be low in terms of economic impact although there could be benefits in terms of greater certainty and flexibility for firms in sourcing decisions. Although the benefits of Cross-Cumulation on Swiss imports are likely to be modest they are likely to be positive since the scope for trade diversion is very limited.

The main economic impacts of Cross-Cumulation for Switzerland are likely to be increased opportunities for exports of specialized intermediate products which have the potential to be utilized as inputs into production in the potential free trade zones. The economic impacts of Cross-Cumulation are likely to be significant among the FTA partners of Switzerland.

In all three sectors in all three regions there is evidence of significant potential for expansion of Swiss exports of intermediate products to these FTAs partners if Cross-Cumulation could be introduced among the network of overlapping FTAs.

Some key findings are:

- *Pharmaceutical Products:* Global Swiss exports of input products for Harmonized System (HS) 300490 (medicines in doses), amounted to more than \$50 billion over three years or \$16 billion per year. Intraregional trade in this product group in the Western Hemisphere group amounted to \$5 billion per year and Swiss inputs amounted to about \$650 million per year. Similarly intraregional trade in these pharmaceutical products in South East Asia amounted to \$4billion per year and the exports of Swiss input products amounted to about \$200 million per year.
- *Measuring and Precision Instruments:* At a global level Switzerland exported almost \$20 billion of exports over three years of products which are inputs into the production of products in measuring and precision instruments (HS 90). Intraregional trade in the Western Hemisphere group amounted to more than \$8billion per annum but Swiss exports of intermediate products were about \$50 million per year. Intraregional trade in East Asia in HS 90 amounted to about \$60 billion per year and in the case of Southeast Asia were about \$4billion per year, yet Swiss exports of inputs to these products to these regions were modest.
- *Machinery Boilers and Computers:* Total global Swiss exports of intermediate products for production of products of chapter 84(machinery, boilers, electrical equipment, and computers) exceeded \$85 billion over three years or more

than \$26 billion per year. Intraregional trade in the Western Hemisphere group in HS 84 amounted to about \$29 billion per year yet Swiss exports on intermediate products amounted to about \$60 million per year. Intraregional trade in HS 84 in East Asia exceeded \$160 billion per year and Swiss exports of intermediate products amounted to about \$700 million. Intraregional trade in HS 84 exceeded \$37 billion per year in Southeast Asia and Swiss exports of intermediate products to these countries amounted to \$400 million per year.

In each of these regions and for each of the product groups analyzed there is potential for expansion of Swiss exports of intermediate products to the region with the completion of the network of FTAs and the introduction of Cross-Cumulation into the network of FTAs.

Research Questions

What do we know about the economic implications of the heterogeneity of RoO? Is the difference between diagonal and Cross-Cumulation a formal issue (if the RoO of concerned FTAs are sufficiently similar) or are there substantive effects on preferential trade flows?

In some cases the **technical** differences in RoO among bilateral FTAs may have little or no economic significance in the technical sense that harmonization of the RoO would make little difference to the economic requirements for compliance. Hypothetically the implications for **potential** trade flows for Cross-Cumulation would be similar as if diagonal cumulation were possible. In these cases Cross-Cumulation will have economic effects which are similar to diagonal cumulation. Yet the possibility for Cross-Cumulation to facilitate trade among overlapping FTAs without meeting the difficult requirements for complete harmonization of RoO is very significant. The many technical challenges which can block harmonization of RoO will block expanded trade flows which could occur with diagonal cumulation. Cross-Cumulation will address this problem.

Two approaches to Cross-Cumulation are considered. The Full Cross-Cumulation approach involves additional efforts to document origin under the relevant bilateral FTA which is applicable but originating content which is included in non-originating products will be included. The alternative Mutual Recognition approach to Cross-Cumulation is analogous to the mutual recognition approach to technical regulations and standards where mutual recognition can be achieved much more expeditiously than full harmonization. In the case of the Mutual Recognition approach Cross-Cumulation could lead to combinations of RoO in different bilateral FTAs that are on balance more liberal than would be the case with harmonized RoO. In such cases this likely will be more beneficial to expansion of trade within the combined free trade zone even if some originating content is not included in the administrative calculations.

What are the preconditions for FTA partners to successfully introduce Cross-Cumulation in their FTAs, with a view to use the concept as a building block towards the multilateralization of trade?

For countries that are partners to FTAs under GATT Article XXIV, then if the duties on inputs and outputs have been eliminated (or are very low) for specific product groupings then a flexible approach to implementation to Cross-Cumulation can be followed. There is a tendency to elimination of peaks in external trade barriers in countries which are members of FTAs. Even a modest degree of convergence in external MFN trade regimes and the elimination of internal trade barriers within the FTA zone reduces or can eliminate the incentives for deflection of trade and production within the zone of the overlapping FTAS.

This approach would involve setting some minimum standards for participation in terms of:

- A relatively open MFN regime with limits on tariff peaks;
- The constituent FTAs have been notified to the WTO under Article XXIV,
- There was effective and transparent customs administration;
- There are agreed procedures for acceptance of origin certifications; and
- The RoO meet some minimum technical requirements.

It may be appropriate to negotiate limited exclusions from Cross-Cumulation for sectors which retain high MFN trade barriers.

What are the trade creation and trade diversion effects of Cross-Cumulation?

In general the creation of FTAs or Customs Unions will have both trade creation and trade diversion effects. The framework for analysis considers different technology assumptions including classical Ricardian analysis, neoclassical Heckscher-Ohlin factor endowments with constant returns to scale, and economies of scale with differentiated products and product innovation. In the classical and neoclassical case, the effect of creating an FTA is likely to lead to the exit or diminution of the higher cost industry in the FTA partner subject to trade diversion leading over time to reduction of the external barriers mitigating the trade diversion. In the cases of economies of scale, product differentiation and product innovation, the dynamic benefits of trade liberalization are likely to lead to restructuring of the high cost industries and stimulating economic growth in the FTA zone with external benefits for third countries due to higher growth. Trade creation is likely to dominate among FTA partners who expand the volume of intra-industry trade after creation of the FTA.

Quantitative analysis by Baier and Bergstrand (2007) concludes that FTAs expand trade much more than previous studies based on gravity models would conclude. Magee (2007) finds that trade creation dominates trade diversion for both FTAs and CUs, but that CUs have greater impact on trade than FTAs.

The effect of implementing Cross-Cumulation within overlapping bilateral FTAs is to increase competition within the zone which encourages sourcing from the lowest cost sources within the zone avoiding the artificial segmentation of trade with bilateral RoO. Also increased competition within the zone will stimulate specialization in production and product innovation. Thus, Cross-Cumulation will enhance the trade creation effects of the initial overlapping bilateral FTAs and is unlikely at the margin to increase the degree of trade diversion associated with the creation of the bilateral FTAs. Overall Cross-Cumulation will reinforce the trade creating benefits of the bilateral FTAs which benefits Switzerland, FTA partners and third countries. The benefits will be enhanced as more bilateral FTAs are included in the Cross-Cumulation zone.

From an economic perspective, which combinations of actual and/or potential FTA partners would seem to be promising candidates for implementing Cross-Cumulation?

The choice of potential partners needs to balance the potential feasibility and willingness of the partners to deepen the network of FTAs and the economic potential. Clearly in one or more regions Cross-Cumulation could be initiated with a few partners with the hope that others would find the approach useful and seek to deepen the FTA network subsequently.

The Western Hemisphere grouping involving Canada, Colombia, Chile, Mexico, and Peru has good feasibility since there is a well-developed network of bilateral FTAs and some of the partners are exploring Cross-Cumulation. There is also significant economic potential to expand Swiss exports of specialized inputs in the pharmaceutical sector.

The potential East Asian group (China, Japan and Korea) and Southeast Asian zones (Indonesia, Malaysia, Thailand, Singapore and Vietnam) present significant opportunities both because the regions have been characterized by high growth (East Asia due to the growth of China) and the network of FTAs is expanding in both regions.

What are the effects of Cross-Cumulation in terms of costs and benefits at the firm-level?

The effects of implementing Cross-Cumulation in part, or all, of the Swiss/EFTA network of FTAs in terms of benefits and costs at the firm level include several different potential results.

First, the streamlining and restructuring of supply chains at the margin could enhance the competitiveness of Swiss production of final goods benefiting Swiss consumers or enhancing exports through some lowering of cumulative input costs. Set against this potential benefit of Cross-Cumulation is the cost for enterprises to administer and document Cross-Cumulation for input products.

Second, the benefits of Cross-Cumulation among groups of FTAs could enhance the market share of some export products in the markets of FTA partners as well as in third countries. Increased potential for export of specialized and innovative intermediate products is an important source of potential benefits for Swiss enterprises including SMEs. With a series of bilateral FTAs, at present the rules of origin constrain the export of intermediate products to be used in production of downstream products incorporating the inputs.

Third, introduction of Cross-Cumulation could enhance the prospects for Swiss exports of complementary goods and services such as capital goods, intellectual property or management services. Improving the business climate for divisional or head office headquarters services based in Switzerland is an important potential benefit.

Fourth, the benefits of Cross-Cumulation may be to enhance the interest of potential FTA partners to join a network of FTAs with Switzerland. This could have benefits for Switzerland, and Swiss-based MNEs either through enhanced opportunities for trade or more especially for enhanced investment opportunities, for expansion of trade in services including intra-enterprise movement of personnel and better protection of intellectual property.

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I INTRODUCTION

I.1 Overview and Context

It is more than two decades since China, the former Soviet bloc, India and other emerging markets began to integrate rapidly into the global economy and integration among developed economies intensified through several different interacting processes;

- Unilateral liberalization of highly restrictive trade and investment regimes in economies such as China, India and the former Soviet bloc;
- The negotiation and completion of the Uruguay Round and the dynamics of economic integration under the World Trade Organization (WTO);
- The rapid march of technology in transport and information, communications and telecommunications technologies which is reducing natural barriers to trade in goods and services and to investment;
- The increasingly global spread of foreign direct investment;
- The accession of more than thirty economies to the WTO including China and Russia¹; and
- The negotiation and deepening of regional integration agreements among developed countries (including European Union (EU) enlargement), among emerging economies such the Association of Southeast Asian Nations, and among groups of developed and emerging economies including the creation of the North American Free Trade Agreement (NAFTA).

All these factors interacted to lead to rapid expansion of global trade over the period 1991-2011.² Supply chains now reach around the world, as becomes evident when a tsunami in Japan or floods in Thailand disrupt production of automobiles, computers, or mobile devices on a global basis.

The implementation of the Uruguay Round under the WTO; the accession of 30 countries including China, Vietnam, and much of the Former Soviet Union (now including Russia); and fuller participation of developing countries in the WTO have resulted in significant liberalization of trade in goods and services. The implementation of WTO obligations and commitments and the accession of new members to WTO have had significant economic effects, but the difficulties in bringing the Doha negotiation to a conclusion has proved an obstacle to further multilateral liberalization.

¹ The number of completed accessions to the WTO increased from 30 to 32 with the accession of Laos and Tajikistan in October 2012 – see www.wto.org.

² The impact of the cyclical contraction in world trade during the global financial crisis and the subsequent rebound illustrates the significance of the boom in world trade over two decades.

Since the early 1990s there has been rapid expansion and proliferation of Regional Trade Agreements (RTAs) most of which are Free Trade Agreements (FTAs)³. There is much debate about whether regional liberalization is complementary to, or corrosive for, to the multilateral trading system. (See Bhagwati (2008), Baldwin (2011), Lipsey and Smith (2011) and WTO (2011)). Indeed the expansion and proliferation of FTAs is one of the most prominent features, if not the most prominent feature, of the last decade in the multilateral trading system.

We do not address all aspects of this wider debate in this study, but the economic effects of Rules of Origin in Free Trade Areas (FTAs) are a key set of issues in this wider debate. This study does examine the issues including the economic welfare effects that are related to Rules of Origin (RoO) in Free Trade Areas (FTAs) and considers the potential implications of new approaches involving Cross-Cumulation of Rules of Origin to link FTAs. Cross-Cumulation has been proposed as possible means to link overlapping FTAs and to overcome some of the constraints on supply chains of the proliferation of bilateral FTAs with separate rules of origin which have been referred to as a “spaghetti bowl” or “hub and spokes”.

The purpose of this Study is to obtain an analysis of the potential economic impacts of Cross-Cumulation, analytically and theoretically as well as empirically. The analysis aims at identifying preconditions and outlining an economic framework that would allow Switzerland's policy makers to make an informed decision whether or not to engage with specific FTA partners, or groups of partners, in order to introduce Cross-Cumulation. More generally the study considers the broader implications of multilateralizing Cross-Cumulation.

The successive waves of regional integration initiatives create both opportunities and challenges for Switzerland and other smaller high income or middle income countries. Switzerland has the opportunity to negotiate a wider range of FTAs with developed and emerging markets, while larger trading blocs such as the European Union and the United States are moving more deliberately in this process of regional integration. Cross-Cumulation could help Switzerland to deepen trade relations with existing FTA partner countries.

It is important to note that Cross-Cumulation focuses on the Rules of Origin for trade in goods in FTAs, but modern FTAs usually also involve commitments on trade in services including mobility for technical and managerial personnel, on aspects of investment policies and investor protection, on protection of intellectual property rights and on approaches to regulatory measures. The potential linkage of benefits from negotiating FTAs for trade in goods and from negotiating parallel agreements for trade in services, investment, intellectual property rights and regulatory measures that are WTO plus need to be considered in the assessment. Deeper integration on services, investment, intellectual property rights, and temporary mobility for business

³ About 93 percent of the RTAs related to trade in goods have been Free Trade Areas (FTAs) see section 2.1 below.

people as well as regulatory cooperation for Sanitary and Phytosanitary measures, standards and technical regulations, domestic regulation for services, and competition policy which are becoming part of FTAs, can provide economic benefits beyond trade in goods.

These potential welfare gains from expansion of trade in goods and services and from deeper economic integration are complementary. Introduction of Cross-Cumulation will serve to deepen and to energize the network of FTAs for trade in goods. Greater cooperation in this area could reinforce cooperation on complementary integration initiatives and processes.

1.2 Structure of the Report

The following is a brief summary of the structure of the report:

- The Background and Concepts section provides an overview of key concepts; reviews the recent developments in the trading system with RTAs, compares Customs Unions (CUs) and Free Trade Agreements(FTAs); reviews and adapts the economic welfare issues of “the theory of customs unions” to the analysis of FTAs, discusses policy issues related to Rules of Origin; and explores the potential role of Cross-Cumulation in linking Free Trade Agreements (FTAs).
- The Methodology chapter reviews the literature, identifies analytical and data challenges, and suggests analytical approaches to measuring the potential economic impacts of Cross-Cumulation.
- The chapter of sectoral case studies examines potential implications of introducing Cross-Cumulation to link groups of FTAs.
- The key research questions from the terms of reference are considered and analyzed.
- A range of issues related to potential implementation of Cross-Cumulation are considered.
- Analysis of potential partners and potential benefits and costs for Switzerland.

2 BACKGROUND AND KEY CONCEPTS

In this introductory section we present key concepts and provide some institutional and policy context. First, we review of the recent developments in the trading system with respect to RTAs in the trading system. Second, the similarities and differences between Free Trade Agreements (FTAs) and Customs Unions (CUs) and the economic welfare issues related to Regional Trade Agreements are reviewed. Third the policy issues related to Rules of Origin (RoO) in FTAs are considered. Finally the potential role of Cross-Cumulation in the RoO of different FTAs in linking FTAs is explained and discussed.

2.1 Regional Trade Agreements in the Trading System

Since the creation of the World Trade Organization (WTO) in 1995, Regional Trade Agreements (RTAs) and other Preferential Trade Agreements (PTAs) have proliferated. The surge in RTAs has continued unabated since the 1990s. As of 15 January 2012, some 511 notifications of RTAs (counting goods and services notifications separately) had been received by the GATT/WTO. Of these, 352 were in force.⁴ Of the 352 in force, 308 RTAs were notified under Article XXIV of the GATT 1994; 36 under the Enabling Clause; and 108 under Article V of the GATS. Not all agreements are necessarily notified or there can be delays in the notification process. Note that these data do not include unilateral preferential arrangements under the General System of Preferences (GSP) for Developing Countries and for Least Developed Countries (LDCs) under the commitment in the Ministerial Statement launching the Doha negotiations for duty free quota free access.

In this study we are focusing on issues related Rules of Origin and Cross-Cumulation for trade in goods in FTAs negotiated and implemented under Article XXIV of the GATT 1994. The WTO data indicate that of the RTAs notified under Article XXIV of the GATT 1994 since 1995 about **93 %** have been FTAs and the balance have been Customs Unions.

Also we take note of other PTAs, primarily the Partial Scope Agreements (PSAs) among partners or groups of developing countries which are notified under the Enabling Clause. Most of these have been partial FTAs as well.

Thus it is apparent that the issue of overlapping and multiple groups of FTAs which we will discuss below is an important empirical aspect of the trading regime in the second decade of the 21st century.

It is also useful to note the significance of the linkages between FTAs as notified to the WTO under Article XXIV and separately notified as Economic Integration Agreements (EIAs) notified under Article V of the General Agreement on Trade in Services (GATS). Due to the legal structure of the WTO, there are separate notifications of agreements for trade in goods under GATT 1994 and for trade in

⁴ Website of the World Trade Organization: www.wto.org.

services under the GATS, but the agreements themselves can and often do address the full range of issues.

Please see the definitions below:

TYPES OF TRADE AGREEMENTS

Customs Union (CU): A regional agreement which removes internal tariffs on substantially all trade and establishes a common external tariff in accordance with GATT Article XXIV.

Economic Integration Agreement (EIA): An agreement under Article V of the General agreement on Trade in Services (GATS).

Free Trade Agreement (FTA): A regional agreement in which the members retain separate commercial policies for trade with third countries but remove tariffs and other restrictions from substantially all trade with their partners for products meeting the agreement's rules of origin in accordance with GATT Article XXIV.

Partial Scope Agreement (PSA): An agreement providing for reduction and/or elimination of duties on a limited number of products and thus not in accord with Article XXIV. Partial scope agreements are allowed under the GATT/WTO Enabling Clause but only for developing countries.

Preferential Trade Agreement (PTA): Other preferential trade agreements including PSAs, sectoral agreements and other preferential agreements.

Regional Trade Agreement (RTA): An agreement under Article XXIV including FTAs and CUs.

The proliferation of FTAs and other PTAs creates a complex trading regime simply because there are so many agreements with many overlapping memberships. In the early days of the GATT, regional arrangements were among small groups of contiguous countries such as the Benelux customs union. Yet the Benelux customs union foreshadowed the European Economic Community (EEC) and later the European Union. Since the formation of the WTO in 1995, not only has the number of such RTAs expanded, but many countries have initiated FTAs with countries in regions, or even continents, other than their own. For example, Singapore not only has FTAs with the other members of the Association of Southeast Asian Nations (ASEAN), -- Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, and Vietnam --, but also with Australia, Chile, China, India, Japan, Jordan, Korea, New Zealand, Peru, the United States, and The European Free Trade Association (EFTA). Although Singapore is exceptional, many countries have entered into bilateral FTAs outside their own geographic region or continent.

Switzerland is also active in developing a network of FTAs. In addition to the Free Trade Agreement with the European Union (EU) of 1972, Switzerland currently has a network of 26 free trade agreements (FTAs) with 36 partners outside the EU. Switzerland normally concludes its FTAs together with its partners Norway, Iceland

and Liechtenstein, in the framework of the European Free Trade Association (EFTA). Nevertheless, Switzerland has the possibility to enter into FTAs outside the EFTA framework as well, as it has been the case with Japan and the Faroe Islands.

2.2 Trade Creation and Trade Diversion

Although there has been some discussion in the economic literature of the economic welfare effects of trade creation and trade diversion of FTAs, there is some confusion in this discussion. Thus it is best to review the development of this theory which was originally focused on customs unions and to consider how to adapt this analysis to FTAs. This analysis is necessary to analyze the welfare effects of RoO and the potential effects of Cross-Cumulation in FTAs – See Lipsey (1960) for a review of customs union theory and Lipsey and Smith (2011) for analysis of FTAs.

To consider the economic effects of multilateral and regional trade agreements, we need first to compare mutual tariff reductions that take place in either RTAs or Multilateral Trade Agreements (MTAs) with unilateral tariff reductions (UTRs).⁵ Wonnacott & Wonnacott (2011) criticize the widespread view that unilateral tariff reductions can accomplish everything that can be accomplished by reciprocal tariff reductions. Against this view, they argue that the gains from being able to export more are in addition to the gains from increasing imports of products that can be obtained from abroad at a lower real cost than they can be produced at home. These enhanced export gains arise from at least two important sources.

The first is changes in the term of trade. Even a small country trading at fixed international prices in foreign markets suffers a reduction in its terms of trade when others levy a tariff on one of its products. This is because the foreign tariff forces the export price down by the amount of the tariff in order to sell in the foreign market at the given foreign price. This transfers some the gains from trade to the country levying the tariff. Thus, a reduction in the foreign tariff transfers some of these gains back to the producing country, even if its exports remain unchanged.

The second is the ability to exploit economies of scale in various lines of production of a differentiated product about which we have much more to say later. The implication is that even small economies can obtain terms of trade gains from removal of foreign tariffs. Some interpret this as providing a rationale for optimum or “strategic” trade policies but this interpretation misunderstands the economic interests of the economies. This issue is explored in more detail below.

We will extend this classic analysis in various ways including consideration of different technology and cost structures, consumption effects, general equilibrium effects, and innovation and growth.

⁵In their article, the Wonnacotts (2011) refer to these as Reciprocal Tariff Reductions (RTR), Multilateral Tariff Reductions (MTR), and Unilateral Tariff Reductions (UTR) respectively.

2.2.1 Classic Analysis of Customs Unions and Implications for Free Trade Areas

The classic customs union theory of Viner (1950) and Meade (1955) assumed Ricardian technology with fully constant costs leading to perfectly elastic supply curves of standardized commodities produced under conditions of perfect competition with labour as the variable input, hereinafter called 'the Ricardian case'. (See Lipsey (1960) for a review of this theory). The analysis then focussed on the welfare effects of the trade creation and trade diversion that accompany the shifts in production caused by the formation of a CU. In the classic Viner (1950) analysis *trade creation* was the result of shifts from higher cost production to lower production sources and *trade diversion* was the shift from lower cost production to higher cost production. The analysis also applies, with necessary adjustments, to free trade areas as will be examined below.

Before turning to the analysis of the welfare analysis of FTAs, there are additional sources of gains from trade and associated potential welfare gains from trade creation or potential losses from trade diversion.

In addition to the effects of these reallocations of production are effects both from possible changes in partners' terms of trade analysed by the Wonnacotts (2011) and discussed below and the reallocation of consumption analysed by Lipsey and Lancaster (1957: Section 5, "A problem in the theory of customs unions") who used these effects as an illustration of the general theory of second best. Earlier Lipsey (1957a, 1957b) had shown that the reallocation of consumption following a preferential removal of some tariffs can sometimes bring sufficient gain to outweigh the harmful effects of some significant amount of trade diversion. Lipsey (1970: 97-99) also showed that although these effects can be either favourable or unfavourable, they were more likely to be favourable the higher the proportion of total foreign trade that was done with the country's union partners prior to formation of the customs union (not surprising) and the higher the ratio of domestic trade to imports from non-partner countries, the volume of trade with partners being irrelevant *ceteris paribus* (perhaps a surprising result).⁶ Nonetheless, consumption effects are often ignored in the evaluation of trade policies. This may be because producers have more concentrated interests than consumers or just that production effects are more visible and easier to calculate than consumption effects.

The classical analysis considered by Lipsey (1960) examined production effects from the perspective of the "Ricardian" case of constant returns to scale with labour being the only input following the classical approach.⁷ However, there are other technology and market structures to consider.

⁶Lipsey isolated the consumption effect by studying the case in which a small country is specialized in the production of a single commodity whose production is unchanged when a union is formed. In this case, the union's only effect is to cause a reallocation of consumption when some tariffs are removed.

⁷ Ricardian technology has been widely used in analysis of trade policies going back to Ricardo. Ricardian technology involves constant returns to scale with labor as the variable input. Differences in

One such case is the case with homogeneous commodities, constant returns to scale and perfect competition where the aggregate supply curve is upward sloping due to a fixed factor or economy wide supply constraints.

Another alternative is the case of product differentiation and economies of scale in production, which give rise to either monopolistic competition or oligopolistic market structures. Many product groups are characterised by this structure. This case will be considered below in section 2.3.1, but we note that introduction of economies of scale and imperfect competition increases the likelihood of trade creation exceeding trade diversion in regional integration. Product differentiation and scale economies create the potential for pro-competitive and scale effects from regional or multilateral integration.

In addition, the differentiated products monopolistic competition framework suggests potential additional gains from trade through innovation and product evolution which enhances economic growth and yields dynamic benefits not considered in a static welfare analysis.

General equilibrium effects may arise if the partners are large economies and the initial trade barriers are high. For example the unilateral liberalization of China, the Soviet Union and India at the beginning of the 1990s involving more than half of the world's population, which previously had minimal participation in world trade, likely had general equilibrium effects influencing relative prices on a global basis. However this unique and historic set of events involved unilateral liberalization and did not involve the creation of a customs union or a Free Trade Area. The expansion or deepening of the network of FTAs by Switzerland, or even broader linkage of FTAs among WTO members, is unlikely to have general equilibrium effects.

2.2.2 Comparison of Customs Unions and FTAs

Most of the literature on economic impacts of regional trade agreements has traditionally focused on analyzing some of the economic effects of CUs. We have briefly reviewed this literature. How can this analysis be adapted to FTAs and in particular the analysis of the effects of Rules of Origin in FTAs? In general the classic result of Lipsey and Lancaster (1957) applies; we have the usual second best result. In spite of all attempts to arrive a general result that one form of organization is superior to another, the result depends on the context. CUs are superior in some initial specifications of costs, and pre and post RTA tariff rates, while FTAs are superior with other specifications.

Ultimately it is an empirical question and it is a quantitative empirical question. Yet the measurement of the potential gains and losses depends on a range of analytical questions.

technology among countries are then only source of gains from trade. One example would be assembly of manufactured goods where capital can be rented or purchased. This model is stylized but it is useful to develop basic results which can be elaborated or generalized to a wider array of technologies.

Let us turn now to Krueger's analysis (1997a, 1997b, 1999a, 1999b) of FTAs. She shows that in particular industries with a rule of origin with high content requirements in an FTA, a particular supplier industry in the low tariff partner can benefit from protection in the partner country that has the higher tariff on the intermediate and the final products.⁸ She considers the NAFTA cases of the textile and automobile industry, both of which sell differentiated products with many different variants. She argues that the higher Canadian and Mexican tariffs relative to those in the United States combined with the high content requirements for incorporating North American yarn and textiles into clothing in order to qualify for FTA tariff reductions allowed upstream suppliers and final assemblers in the United States to gain market share in the partner countries at the expense of third country imports which is a case of trade diversion.

This is just Viner's analysis of the trade diversion effects of a customs union transferred to an FTA. In Viner's analysis, the industry with the lowest costs in the customs union will gain market share throughout the trading zone and divert trade from lower cost third country suppliers who face the barrier of the common external tariff (provided that country's costs are lower than the foreign cost plus the tariff). In an FTA the lower cost industry within the FTA will also tend to gain market share in the combined markets at the expense of third country suppliers because if the industry fulfils the rules of origin it will benefit from tariff preferences especially in the higher tariff partner(s) in the FTA. However, this is a two edged sword. In so far as the imports from the lower cost partner displace imports from even lower cost suppliers in the rest of the world, this is trade diversion. But in so far as they displace local production in the high cost partner, this is trade creation in accordance with the classic analysis focusing on production effects.

2.2.3 Krueger's Comparison of FTA and CUs

Krueger does not share the Lipsey-Lancaster second best view that there can be no unqualified either/or preference for one arrangement over another; instead all real world judgments must be context specific and depend upon relative quantitative effects.⁹ Instead she argues:

"an FTA cannot lead to any more trade creation than can a customs union and, when ROOs export any protection, an FTA leads to more trade diversion than does a customs union. The proof is straightforward. All that needs to be assumed [!] is that [1] the customs union adopts a common tariff for each commodity at a level somewhere between that prevailing pre-union in the higher-tariff country and the lower-tariff country, [2] that the common external tariff be such that effective rates of protection are not increased under customs union, [3] there is no 'water' in either

⁸ The term restrictive rule of origin refers to a rule of origin with a high content requirement for the final product in the value chain to qualify for FTA tariff treatment.

⁹ This second best message is considered in the modern context in Lipsey (2007).

country's tariff schedule, and [4] that cost curves are either constant or upward sloping." Krueger (1997b: 180) (emphasis added)

To examine Krueger's claim we need to look carefully at her four assumptions. Assumption [1] seems a reasonable one given the historical evidence from the formation of customs unions and assumption [4] is not unduly restrictive at least in terms that it is widely used in the literature. However we do address this issue below.

Yet Krueger's assumption 2 is a strong assumption that the hypothesized customs union to which an FTA is being compared does not increase effective protection for industries at different stages of the supply chain. In the Viner case, the CU must increase the effective protection of the lower-tariff union partner, while the FTA does not. In the more complex case of supply chains and differentiated products, the creation of a CU can lead to subtle changes in rates of effective protection for different stages of production in the supply chain as compared with competition with third-country producers. With between 10,000 and 20,000 tariff lines, which is typical of most countries, the process of 'averaging' the external tariffs of partners forming a customs union can easily increase effective protection at various stages in production in any, or indeed all, of the partners as compared with third countries, depending on the details of the common tariff schedule created by the CU. For example, lowering input tariffs for an industrial activity will raise effective protection relative to third-country producers even if the tariff on the output remains constant. Krueger acknowledges these possibilities but argues that non-members of the CU in the WTO would not accept any increases in effective protection when a customs union is formed.

One wonders how easy it would be to discover any increase in effective protection in such cases and, if discovered, what could be done about it. Krueger assumes that non-members of a CU are very clever in understanding possible shifts in effective protection affecting their exporting industries from the creation of the CU and are able to press their claims in the WTO effectively while simultaneously assuming the opposite for non-members of an FTA. The latter are assumed often not to understand possible shifts in effective protection in an FTA potentially affecting their exporting industries and, when they do understand, to be unable to press their potential claims in the WTO. Krueger's assumed asymmetry in WTO review of CUs and FTAs is illogical.

In any case, the GATT/WTO has never had very effective disciplines on the formation of RTAs under Article XXIV whether CUs or FTAs. Non-members of a CU can request renegotiation of tariff and market access schedules in the GATT/WTO if they believe that their export interests are affected adversely by the formation of a CU but these negotiations can drag on for years or even decades. In the case of CUs, FTAs or PSAs formed under the Enabling Clause there are essentially no obligations on developing-country WTO members.

It seems clear that either a CU or an FTA can alter effective protection at different stages of the supply chain, giving rise to both trade creation and trade diversion. In a

CU the details of creation of the common external tariff can have effects on the pattern of effective protection against third-country producers and can influence the potential for trade creation and trade diversion. In an FTA, the original MFN tariffs are retained but the removal of the intra-FTA tariffs and the incentive effects of RoO can affect the pattern of effective protection against third-country producers causing trade creation and trade diversion.

Krueger's argument that CUs are less likely to cause trade diversion and more likely to be trade creating than FTAs is invalid. In general one cannot make conclusions about trade creation and trade diversion without analyzing the potential quantitative effects of the changes in the trade regime and the implications for trade flows. In particular the magnitude of the tariff preferences created by the FTA is an important consideration. Also the design and implementation of Rules of Origin may have economic effects which are examined below.

2.2.4 How Significant are Trade Preferences?

One important factor influencing the relative economic significance of trade creation or trade diversion in the case of either CUs or FTAs is the relative economic significance of trade preferences. When Viner, Meade and Lipsey developed customs union theory in the 1950s, average tariffs among the small number of GATT member countries were high, and many major economies retained quotas on imports for balance of payments reasons as a legacy of the interwar economic problems and the damage of the Second World War on trade and production. In such a world with tariffs averaging more than 50% with tariff peaks exceeding 100% and with quotas on many import products, the scope for trade diversion from regional trading arrangements, whether FTAs or CUs, was substantial.¹⁰

The multilateral trading regime of the world economy is vastly different than the situation which prevailed 60 or even 50 years earlier.

The potential economic significance of trade preferences are examined in a recent study by the WTO (2011). The study finds that in aggregate, 50 per cent of imports by the 20 countries examined in the WTO's 2011 World Trade Report (excluding intra-EU trade) originate in countries with which some sort of preferential agreement exists.¹¹ Only a third of that (16 per cent of all trade) is potentially preferential. There are two reasons for this difference: first, over one half of world trade is already subject to zero MFN rates, implying that no preferences can be granted. For example, 63 per cent of Singapore's imports originate in FTA or PTA partners, but practically all of its imports enter under MFN zero duties. Second, preference

¹⁰There were 23 founding members of the GATT in 1949 including China which soon withdrew due to domestic circumstances. Only 13 countries participated in the Ancey Round of 1950 and the range of tariff concessions exchanged was limited. The import quotas were gradually dismantled under IMF supervision, but the Bretton Woods System could only be considered to be operational after 1959.

¹¹ WTO (2011), *World Trade Report 2011--The WTO and preferential trade agreements: From co-existence to coherence* Geneva.

regimes often feature product exemptions, such that trade in these products still occurs at MFN rates.

According to the analysis by the WTO, for some countries, the share of preferential imports is relatively high. For example the analysis in the report shows that 64 per cent of intra-EU trade, 48 per cent of Mexico's imports and 54 per cent of Switzerland's imports are preferential or potentially preferential, specifically there is a potential positive preference margin, but these margins are mostly fairly small.¹² Only a small share of imports – less than 2 per cent across all 20 countries (excluding intra-EU trade; the share amounts to 4 per cent if trade within the EU is included) – is eligible for preferences where preference margins are 10 per cent or more. The main exception is Mexico (15.8 per cent of imports).

The fact that trade preferences are limited in most countries' MFN trade regimes and the fact that countries have preferential trade with a large number of partners both tend to limit the scope for trade diversion in the classic analysis with constant costs of production. As is discussed in the next section the removal of even low MFN tariffs in expanding networks of FTAs have the potential to generate trade creation when the potential role of economies of scale, product differentiation and innovation are considered.

2.3 Gains from Trade, Production Networks and Deeper Integration

The review of classical customs theory and the extension to FTAs has focused on the analysis of the Ricardian or Vinerian case with constant returns to scale. This analysis can be extended to different potential sources of gains from trade.

2.3.1 Potential Gains from Trade

Constant Costs

Much of the policy analysis of CUs and FTAs has been based on constant costs of production, comprising either the Ricardian case, where technology differences or the Heckscher Ohlin case, where factor endowments such as natural resources or abundant labor, are the primary sources of gains from trade while ignoring consumption and terms of trade effects.

The introduction of economies of scale and product differentiation to which we now turn has important further implications for the analysis of the welfare effects of both RTAs and multilateral liberalization. The potential role of economies of scale and product (and service) differentiation is more important for trade among high income countries or upper middle income countries which produce a range of specialized goods and services. For example Switzerland is not an oil producer but does have a

¹² Please note that we stress the potentially preferential aspect since as we discuss below, preference margins are often not utilized. We believe our analysis is compatible with the discussion in the WTO report.

specialized industry engaged in the trading, transport and storage of petroleum products on a global basis.

Differentiated Products and Economies of Scale

The theory of intra-industry trade was developed initially by Grubel and Lloyd (1975), who proposed it as an alternative to factor endowments (Heckscher-Ohlin) or Vinerian (Ricardian) types of theories emphasizing inter-industry trade with constant costs, identical technologies and fungible products. Based on their analysis of the empirical evidence of trade and industry adjustment from the creation of the European Community in the 1960s, Grubel and Lloyd observed rapid growth in intra-EC two-way trade in differentiated products leading to increased intra-industry specialization and simultaneously less inter-industry shifts in output than some observers had foreseen. Subsequently the empirical observations about the growth of intra-industry trade with the EC or among developed countries led to a consideration of monopolistic competition or oligopolistic industries characterized by product differentiation. Thus firms competed by specializing in market segments or niches in the whole EC market for the particular product range of brand they produce.

The experience with European integration has led to a deepening of the theories of economic integration. The introduction of imperfect competition and scale economies has been linked to new models of international trade under imperfect competition, drawing abundantly from industrial organization economics (Krugman 1980, Lancaster, 1980, Brander and Spencer 1984, Smith and Venables 1988).

Introduction of differentiated products and monopolistic competition in international trade led to an associated policy literature which is referred to as strategic trade and industrial policies. An article by Brander and Spencer (1981) analyzed the potential for import tariffs to extract monopoly rents from foreign producers of differentiated products. This led a debate about whether this “profit-shifting” analysis creates the potential for proactive “strategic” trade and industrial policies—see Krugman (1986). There are several criticisms of this strategic trade and industrial policies. First, governments are assumed to have significant knowledge of technology and market structures and be able to correctly forecast the reaction of foreign firms. In practice governments are unlikely to have the analytical capacity to determine the optimal form of trade intervention. Second the domestic political process may compromise the government’s ability to apply such policies. Third, the tariffs should collect revenues and rents from foreigners but the tariffs should not induce domestic production which would be inefficient and yet is often the focus of trade policies. Fourth even if governments could accurately predict and implement profit shifting tariffs these tariffs could be circumvented by inefficient branch plant assembly operations which will impose economic costs. Fifth proponents of strategic tariffs assume that foreign governments are passive. If governments react there are potential *prisoners’ dilemma* problems of mutual tariff wars and retaliation which could be economically damaging.

Indeed the debate about Strategic Trade and Industrial Policies provides a rationale for reciprocal trade negotiations either multilaterally in the WTO or in bilateral or regional negotiations of FTAs. The mutual and reciprocal reduction of tariffs is a negotiating and contractual response to the game theoretic problem of the *prisoners' dilemma*.

In particular the rationale for FTAs of eliminating tariffs ensures governments resist the temptation to tax imports and avoid escalating trade wars and enable greater competition within the trading zone which will increase product diversity and stimulate innovation. Romer (1987, 1990, 1994) develops the analysis that increasing economic integration can increase product specialization, stimulate innovation and permanently raise the economic growth rate. A complementary line of analysis is Neo-Schumpeterian perspectives emphasizing differences in technology and endogenous technologies (Romer 2004, Aghion and Howitt 1998, Lipsey, Carlaw and Becker, 2006 and Aghion and Durlauf 2011). This "creative destruction" approach focuses on the links between competition and the introduction of new products and technologies.

2.3.2 Linkages between Trade in Goods, Services, Intellectual Property Rights and Investment

The welfare effects of FTAs are not limited to analysis of the increase in trade flows or the increases in productivity of good production that may occur. Cross-Cumulation could bring benefits in terms of increased trade flows, but there also could be complementary services and investment flows and dynamic effects from technology transfer and innovation effects. Participating in an FTA network brings broader economic growth and wealth effects beyond the static gains for increased efficiency in production and consumption.

In either goods or services industries, if in the integration zone there are well developed monopolistic competition or oligopolistic industries with differentiated products or services (or bundles thereof), then when barriers to trade and investment are removed the result is less of a flow response of shipping millions of tons of fungible products through trade leading to large inter-industry shifts and instead the result is much more complex involving intra-industry adjustments. There are potential scale effects, product specialization effects, pro-competitive pricing effects, and induced direct investment and innovation effects occurring with less actual trade effects. The increase in contestability becomes more important than the increased actual trade flows.

There are significant potential benefits from liberalization of trade in services including investment. Markusen (1989) has analyzed gains from trade in services due to potential economies of scale in the provision of specialized producer services. Deardorff (2001) has analyzed the potential for economies of scale and specialization in providing of producer services to lead to externalities from liberalization of trade in service in the form of expanded trade in goods. Thus

liberalization of trade in services also has additional benefits of expanding trade in goods, which are over and above the various sources of gains from expanded trade in goods discussed in the previous section.

2.4 The Role of Rules of Origin in FTAs

Countries form free-trade areas with the objective of enhancing trade in goods "originating" amongst themselves. This is compatible with Article XXIV of the GATT 1994 under the WTO which permits the creation of free trade areas when "the duties and other restrictive regulations of commerce (except, where necessary, those permitted under Articles XI, XII, XIII, XIV, XV and XX) are eliminated on substantially all the trade...in products originating in such territories".¹³ Members of a FTA retain control of their trade policies towards the rest of the world and have separate tariff schedules and independent commercial policies for the trade with third countries. In contrast in a customs union, the members have a common external tariff and a common commercial policy.¹⁴

Within any free-trade area, duty-free trade is limited to goods "originating" within it. Rules of origin therefore lie at the heart of every FTA. In their narrowest form they could exclude goods containing any third country content. In practice, however, FTAs often permit varying degrees of third country content levels. The policy and administrative questions involve how much third country content is allowed and under what conditions.

2.4.1 Purpose of Rules of Origin

The legal purpose of rules of origin is to determine which products are "originating" and thus qualify for preferential tariff treatment under a specific FTA. One of the economic and trade policy objectives that is served by rules of origin is to limit trade deflection. If there were no rules of origin, then traders would arbitrage differences in the external tariff structure in a Free Trade Agreement by redirecting trade in order to obtain better market access.¹⁵ This is the simplest form of trade deflection, but products can also be incorporated in other products and this can create deflections in production or trade diversion as there are incentives to relocate production such as final assembly due to discrepancies in the external trade regime due to differences in the MFN trade regime of the FTA partners. This can lead to trade diversion as production is shifted to higher cost production in the trading zone from third countries. At the same time the shifts in production that occur as a result of the removal of tariff barriers in an FTA can be reallocation of production that is trade creating as production is shifted to lower cost production within the zone.

¹³ The quote is from Article XXIV 8(b) referring to FTAs in the GATT 1994. Almost identical language is contained in Article XXIV 8(a) referring to customs unions.

¹⁴ The European Union represents a very advanced and integrated customs union with a common commercial policy, but the EU has FTAs with a number of partner countries or regional groupings.

¹⁵ Such activity is not costless since both transport costs and trading costs are likely to be involved.

The policy challenge of designing rules of origin is to minimize the potential for trade deflection or trade diversion while facilitating trade creation.

Any FTA gives preferential access to products originating in the partner country or countries. If the partner has a zero duty on an important component such as for example, woolen textile fabrics which are utilized in the manufacturing of clothing while the other member of the FTA has high tariffs on the import of woolen textiles, then in the absence of rules of origin, there will be incentive to trans-ship the fabric through the partner country in order to qualify for the preferential tariff access. This is referred to as trade deflection; a key trade policy objective of rules of origin is to limit trade deflection where goods are simply rerouted to take advantage of tariff preferences. Such deflection of trade clearly does not involve originating products. More complex is when the woolen fabric is imported into the partner country and then cut and assembled into clothing in the partner country. This is considered to be a deflection of production if the differences in the external tariff structures and commercial policies of the FTA partners create significant incentives for this relocation of the production activity. (Suppose in this example, both partners had high tariffs on woolen suits but one partner had very low or zero tariffs on the woolen imports while the other partner had high tariffs on the imported woolens.)

Some policy observations can be made. First low rules of origin requirements are usually sufficient to limit trade deflection. In the example above if one partner has a 20 percent tariff on imported woolen suits and the other partner has a 25 percent tariff, then a modest requirement such as the sewing (or gluing) of the suit (which would translate into a low value added requirement) would suffice to limit trade deflection.

More complex is the issue of deflection of production. In this case the crucial factor is the combined effects of the differences in MFN tariffs on imported woolen cloth and the tariffs on finished suits in terms of the differential effective protection for location of production. Thus, deflection of production is likely to be a significant policy issue only when nominal tariffs on the finished products are substantial and when there are significant differences in the MFN tariffs of the partners on intermediate products which are inputs into the product. Thus the policy objective of limiting deflections of production could warrant a more restrictive RoO (as measured in a value content requirement or equivalent) if there are significant differences in the external tariff structures of the partners. Note that there could be an economic welfare issue but a more likely political economy factor influencing the policy debate will be representations by industry lobbies in the country with higher input and final product tariffs for more restrictive RoO in order to reduce the deflection of production.

There is extensive literature suggesting that political economy considerations to limit industrial adjustment combined with rent seeking frequently leads to more restrictive ROO than is necessary to limit deflections of trade or production. Cadot et al (2011) review this literature.

One of the conclusions of the analysis by Cadot (2011) and others is that restrictive rules of origin lead to lower utilization rates of tariff preferences. Compliance with rules of origin involves costs of acquiring documentation about the location of production and the origin of components and inputs. The more 'restrictive' the rule in terms of a higher value added requirement or in terms of the number of steps in the production process than the compliance costs rise further. Indeed as more stages in production become involved even within one economy then various suppliers at different stages in the supply chain need to produce documentation which they may be unwilling or unable to do. The issue of experience with rules of origin is discussed below.

2.4.2 Policy Considerations in Designing or Negotiating Rules of Origin

Analyzing different approaches to rules of origin requires consideration of the policy objectives being served and the tradeoffs among serving these different objectives. One such objective is limiting trade deflection or limiting deflections of production which may require a relatively restrictive rule of origin with high content or multiple stages of processing requirements depending on the structure of the external trade regimes of the FTA partners as was discussed above.¹⁶ Rules of origin which are less restrictive (in terms of value content or transformation requirements) will maximize the expansion of trade and may increase the economic gains from a FTA. Yet if rules of origin are set low in terms of content or processing requirements then the incentive for trade deflection or deflections of production could increase if there are significant differences in the external trade regimes of the partner countries.

The original Rules of Origin in the European Free Trade Association were in practice relatively liberal in a number of respects. The Rules of Origin in EFTA included a 50 percent value content rule, which seems to be a fairly high content standard, but Curzon (1974) notes that the restrictive effect was reduced by two factors. First selected duty free input products were treated as originating. Second the content was measured on the FOB sales price which included distribution and other costs not included in an ex-factory price.

Some commentators have concluded that the EU's earlier Pan-Euro-Med rules of origin were among the most restrictive rules of origin.¹⁷ However, this conclusion overlooks the role of cumulation in reducing the potential trade restrictive effects of rules of origin in a large set of Free Trade Agreements such as in the Pan Euro Med.

¹⁶ We follow the terminology of Curzon-Price 1974.

¹⁷ Regarding the comparison of the restrictiveness of rules of origin, refer to Estevadeordal, Antoni and Kati Suominen (2004) "Rules of Origin in FTAs in Europe and in the Americas: Issues and Implications for the EU-Mercosur Inter-Regional Association Agreement". INTAL-ITD. (<http://www.iadb.org/intal>).

Nonetheless the Euro Med rules pose a challenge for a small trading partner which is negotiating an FTA with the European Union.¹⁸

As an example of a small economy, let us consider the example of Estonia which was one of several countries which negotiated the bilateral Europe Agreements in the 1990s. If the rule of origin for a specific manufactured product is set at 50 percent value-added requirement then very few manufactured products produced in Estonia would have qualified under the FTA since the economy was small and the number of vertically integrated industries was few. If cumulation on a bilateral basis is permitted then Estonian manufacturers would have been more likely to qualify for reduced duties only if components or inputs from the EU were used in the production process. The advantage of the Pan European rules was that Estonian could source components from partners in the Baltic States or from Central Europe as well as from EU sources and still qualify for the preferential tariff treatment.

The example of Estonia as a small economy shows that the effect of cumulation, in this case diagonal cumulation, in a large trading zone offsets to some extent the difficulties that restrictive rules of origin pose for small open economies.

There are several analytical and policy aspects, some of which have offsetting effects on or implications for the design of rules of origin.

First rules of origin in sectors such as textiles and clothing, where third country MFN tariffs are higher on the final product and where there are some divergences in tariff structures vis-à-vis third countries, have some need to be relatively more strict in order to limit the scope for deflections of trade or deflections of production due to divergences in the external tariff structure of the FTA members and the variation in effective rates of protection at different steps in the supply chain. Thus products such as textile yarn or fabrics or automotive parts might be imported duty free from third countries because MFN duties are not applied to these products from these partners. As a result of using the imported products as an input into production the final product the result could be deflections of trade and production. It is not uncommon to observe “restrictive” rules of origin for textiles and apparel in the form of high value added percentage requirements or requirements that product is processed from yarn to fabric to finished product in a processing requirement (known as a “yarn forward” rule of origin).

Second smaller economies are likely to propose rules of origin with lower content requirements. At least in some sectors, (depending on the structure of external tariffs and the incentives for deflection of trade or production), there is a rationale for lower content requirements for most FTAs, especially for smaller economies, than the Pan Euro Med rules.

Third, since deflections of trade or production are more likely when MFN trade barriers are higher for the final product and when there is more variation in the

¹⁸ See Estevadeordal and Suominen *ibid.* and Smith et al, Sustainability Impact Assessment of the EU Korea FTA, www.eu-korea-sia.org.

external trade regimes in terms of differences in the barriers to imported inputs it follows that some flexibility in rules of origin is more appropriate for sectors where there are lower MFN barriers and less dispersion in third country tariff structures. For example, for sectors characterized by uniformly low or zero MFN barriers such as Information and Communications Technology products, especially those covered by the International Technology Agreement in the WTO, the content requirements for products to be treated as originating products could be relaxed or removed entirely.

Fourth, Rules of Origin are also negotiated to reduce protectionist resistance to the FTA. In industries such as textiles and apparel, more restrictive ROO may benefit producers at a particular stage in the supply chain in one or more of the member countries. There are undoubtedly a number of examples of this in different sectors and different countries. Both Krueger 1997(a,b) and Smith (1993) agree that Rules of Origin in the North America Free Trade Agreement were made more restrictive to respond to protectionist pressures. The broader issues of whether FTAs or Customs Unions are more trade diverting or creating were discussed above, but there is considerable evidence to support the hypothesis that the ROO were made restrictive to reduce competitive pressures with the introduction of the NAFTA. Smith (2011) argues that over two decades considerable industry adjustment has occurred and there have been a number of administrative measures introduced to reduce the restrictiveness of the ROO, but that rigidities in the structure of the NAFTA provisions and the lack of willingness of the three parties to reopen the Agreement has meant that the ROO are now more restrictive than is considered appropriate by the previously protectionist industry lobbies. RoO have been liberalized but they are especially rigid for textile and apparel are rigid changes and take years of effort to achieve and considerable lobbying resources to achieve.

The key points are that the ROO are:

- Important policy issues in the design of an FTA;
- They are not simply technical measures to prevent trade deflection;
- ROO can be very liberal if the MFN regimes of the partners are characterized by few tariff peaks, average tariff rates are low, and if the tariff peaks are highly correlated; and
- The appropriate ROO changes over time most often to a more liberal rule as the industry restructures to meet international competition and as trade policies evolve to lower trade barriers either through multilateral reductions, phasing in of FTA tariff reductions, and as other FTA partners are added.

2.4.3 Types of Rules of Origin

Rules of origin fall into two main categories:

1. Wholly obtained products: Natural resources, agricultural and fish products, as well as other products are considered to be originating if they are produced

within the territory of the FTA partner with no intervention of third parties components.

2. Sufficiently transformed products: There are different methods applied to define a product as sufficiently transformed:
 - Percentage or value added content rules (VAC): A product is considered originating if the cost of materials and components imported from outside a free-trade area does not exceed a specified percentage of its ex-works price or the FOB price or the value added content exceeds a prescribed minimum.
 - Change of Tariff Heading (CTH): A product is considered to be "sufficiently transformed", and therefore originating, if its tariff heading (a four digit code) under the Harmonized System of the World Customs Organization is different from those of its imported inputs. These types of rules can be very specific indicating which changes of tariff heading are sufficient to qualify and which are not.
 - Specific Processing Requirements (SPR): A product is considered originating if specific processing operations have been carried out within the exporting country.
 - General requirements of substantial transformation: In the past, some RoO required substantial transformation without specifying a rule.

In addition to general rules, ROO can often be product or sector specific and often can involve combinations of these types of rules. For example, a RoO may specify either a VAC rule or a CTH rule and leave it to the traders and producers involved to choose which method is most suitable.

The rules of origin themselves sometimes result in unintended negative consequences for FTA area manufacturers and traders. These unintended consequences are often the result of unavoidable or unanticipated imperfections in the various methodologies used to define substantial transformation or lack of foresight and flexibility by the negotiators and industry lobbies.

Most recent FTAs attempt to address these deficiencies with a series of **tolerances** (the term used more often in Europe) which are relieving mechanisms or remedies including the approved use of accounting segregation of fungible materials as opposed to physical segregation and tolerance or *de minimis* provisions (North American term) that permit the use of minimal amounts of non-originating materials in the production of originating goods under specified conditions. In practice the two approaches are the same but there are differences of detail. For example, tolerance allows the use of non-originating materials with a maximum value of 10 % of the ex-works price of the final good. However, the tolerance percentages cannot be taken for an aggregation with a maximum value-added threshold, meaning that this tolerance cannot be used to exceed the maximum value of prohibited non-originating

input listed in the product specific rules. Under the North American Free Trade Agreement (NAFTA) “De Minimis” offers the possibility to use prohibited non-originating input to a certain percentage (7 % of the transaction value of the good adjusted to a FOB basis or in certain cases the total cost of the good) which under normal circumstances would mean that the origin status of the final good would not be fulfilled.¹⁹

The fundamental points are that FTAs need to have some flexibility in application of ROO and the willingness to adapt and to change their rules of origin as the economy and the overall trading regime evolves.

2.5 Experience with Rules of Origin and Utilization of Preferences

Rules of Origin have been a key element in Free Trade Agreements (FTAs). In many FTAs, the actual utilization by traders of FTA preferential tariff rates appears is more limited than might be anticipated by the magnitude of the tariff preferences. The reasons for this can be many including that supplier firms do not provided the information or documentation that permits certification of origin or that firms conclude that the costs of fulfilling the requirements of certification are too high relative to the duty reductions and choose not to seek duty reductions.

Even in the early days of EFTA significant amounts of trade, which seemed to qualify for preferential tariffs, actually paid duties. See Curzon-Price (1974).

In this section a few examples are presented with respect to the administration of RoO and the actual utilization of regional tariff preferences in order to assess the implications for Cross-Cumulation.

Southeast Asia

There is a lack of direct data on the utilization of AFTA tariff preferences, but there is considerable evidence of low utilization from firm surveys and other sources. It is widely recognized in ASEAN that AFTA preference utilization is low.²⁰ However, the direct data on utilization of ASEAN preferences from the ASEAN member customs authorities is not available from the ASEAN Secretariat or from the ASEAN member states.²¹ The study prepared for the World Bank cites a firm level survey that indicates that utilization of AFTA preferences is about 5 percent.²² A more recent study prepared for the Asian Development Bank, (ADB) found that about 23 percent of firms in East Asia used FTA preferences, but this data includes all FTAs not just AFTA and includes Japan and Korea, which have extra regional FTAs.²³ Another

¹⁹WCO, *Comparative Study of Preferential Rules of Origin*.

²⁰ Hadi Soesastro, 2005 “*Accelerating ASEAN Economic Integration: Moving Beyond AFTA*,” March, Economics Working Paper Series, WPE91, <http://www.csis.or.id/papers/wpe091>.

²¹ Miriam Manchin & Annette O. Pelkmans-Balaoing, “Rules of Origin and the Web of East Asian Free Trade Agreements”, World Bank, World Bank Policy Research Working Paper 4273, July 2007, p13.

²² Ibid.

²³ Masahiro Kawai and Ganeshan Wignaraja, “The Asian “Noodle Bowl”: Is It Serious for Business?” ADBI Working Paper Series No. 136, April 2009, Asian Development Bank Institute, p. 11.

survey was conducted for the Economic Research Institute of ASEAN and East Asia by the Australian National University, which found rules of origin certifications and other elements of customs administration to be significant barriers to trade in most ASEAN countries.²⁴

The low utilization of ASEAN tariff preferences could reflect several factors. This low utilization reflects, in part, the perceived high costs of administrative compliance and documentation, together with a list of sensitive products and exceptions that are not subject to the preferential rates, which may discourage broad-based use of AFTA preferences. In addition it is difficult for firms in industries such as textiles and apparel and electronics to document the supply chain and to obtain AFTA preferences. The ADB study found that automotive firms were more likely to seek to utilize FTA preferences than firms in sectors such as electronics and textiles and apparel.²⁵ The higher margins of preference in automotive products creates a strong incentive for compliance with Rules of Origin in order to obtain preferential tariff treatment and the tighter and vertically integrated supply chains in the automotive sector may facilitate the documentation of rules of origin.

Even when firms make considerable efforts to document ROO, customs authorities in some ASEAN members, notably Indonesia and Vietnam are known to have refused ROO certifications on seemingly spurious technical grounds such as the signature crossing the lines of the form or variations in the signature of the respective authority which are indeed authentic. Similarly there may be other administrative requirements such as that the origin certificate must accompany the actual shipments and that separate origin certificates are required for each shipment. Interviews of enterprises confirmed these difficulties with customs administration in Vietnam. Revenue targets imposed on customs authorities create pressures on the authorities to refuse preferential tariff treatment. Also refusal of certificates of origin involves an element of judgment and more administrative discretions than the tariff classification and can be a target for corrupt officials who seek to obtain additional remuneration. Neither customs brokers nor companies are prepared to complain or to appeal such rulings since they fear greater disruption of shipments with customs in the future.

With the complexity of the origin regimes for producers in ASEAN, with the ASEAN Trade in Goods Agreement (ATIGA) and a series of bilateral FTAs with Australia, China, Korea, Japan and New Zealand, there would be benefits to introduce Cross-Cumulation, but greater efforts would be needed to improve the transparency and effectiveness and transparency of the administration of rules of origin.

²⁴ Christopher Findlay, "Trade Facilitation" in Jenny Corbett & So Umezaki, (eds) *Deepening East Asian Economic Integration*, ERIA Research Project Report 2008, No. 1, Jakarta: ERIA.

²⁵ *Ibid.*

Latin America

In Latin America, the results of an IADB survey of 345 firms suggests that only 18 per cent are not using any PTA, and that on average firms are using more than one (Harris and Suominen, 2009). These figures vary as one breaks down the sample by country, firm size, or industry. The least likely firms to be making use of PTAs were large textile firms in Panama (no use of PTAs), whereas large food and agriculture firms in Chile were most likely to be taking advantage of PTA tariff preferences (using 3.5 PTAs on average). Furthermore, of the firms not using any agreement, the overwhelming majority of them were Panamanian (57 of 61 firms were not using tariff preferences), which is easily explained by the fact that Panama does not have FTAs in force with any of their primary trading partners. A total of 98 per cent of firms surveyed in Chile, Mexico and Colombia were using preferences (Harris and Suominen, 2009).

There is empirical evidence that lower content requirements will lead to higher utilization of FTA tariff preferences. See Cadot et al (2011). Experience with low utilization of FTA preferences in different regions suggests that it not just a question of whether a sufficiently high number of steps and processes in the supply chain are performed but also whether these steps can be documented. Especially if steps in the supply chain predominantly involve SMEs, there may be challenges to get adequate documentation of the production steps. For example, SMEs may not be able to provide adequate documentation of the value added if the RoO are based on a value added rule.

Both enterprises and responsible authorities are administering multiple RoO systems on a daily basis which affects many billions of trade on annual basis. The administrative challenges of RoO are significant and costly and enterprises are able to manage the processes. Nonetheless it is important to recognize the costs. Rules of Origin in many FTAs are too restrictive for the purposes of limiting trade deflection or deflections of production, either because of an excess of caution in the negotiating process, of a tendency to replicate previous RoO, or because of protectionist pressures or a combination of the these factors. Furthermore, over time the appropriate RoO in principle should change as unilateral or multilateral liberalization occurs, and as the FTA partners negotiate additional FTAs with third countries. Ideally RoO should be adjusted over time as circumstances change and most of the changes in trading regimes in the last 15 years have favored more liberal RoO. Yet RoO are often difficult to change in FTAs with cumbersome procedures for review and adjustment.

2.6 The Hub and Spoke or Spaghetti Bowl

2.6.1 Hubs and Spokes, Spaghetti Bowls & the Overlapping-FTA Problem

The global proliferation of preferential trade agreements has created a “spaghetti bowl” of origin complexities and difficulties for the public and private sectors alike.

Each different origin regime in each FTA that a country signs, significantly reduces administrative and implementation efficiencies for both traders and customs officials on a bilateral basis due to the complexity of separate administration and certification requirements. In addition to these trade administration, certification and compliance costs, the greater challenge lies in the fact that generally speaking producers can only apply the principles of cumulation within a preferential trade agreement or each FTA and not between or among FTAs or PTAs. In other words, the goods considered as originating under one FTA cannot be considered as originating under another FTA unless it is explicitly recognized.

The key argument which was advanced by Wonnacott (1990, 1991) Lipsey (1990) and others was that if the United States were to negotiate a bilateral free trade agreement with Mexico without including Canada, the U.S. would be the only country with preferential access to both the Canadian and Mexican markets. Such a “hub-and-spoke,” trading arrangement would disadvantage Canadian exports in the US market as well as in the Mexican market.

Investment would also be diverted under a hub-and-spoke trading arrangement. Multinationals would prefer to invest in the United States (the hub), since only that location would provide barrier-free access to all three countries. Investment in a smaller spoke country, such as Canada and Mexico, would provide free access to only two markets – the domestic market and the U.S. market.

In addition to frustrating the development of efficient and flexible global value chains, the inability of parties that share preferential trade agreements (i.e. A+B, B+C and C+A) to cumulate originating materials and origin content is illogical and even absurd in that it does not allow for the indirect movement of duty free products that can otherwise move duty free directly. For example, imagine that originating yarn from C can move duty free to B under the bilateral FTA. Imagine then that the same yarn is shipped from C to A and woven into fabric. In the absence of inter-FTA cumulation rules the fabric woven in A cannot be shipped to B duty free unless by unlikely chance the woven fabric meets the RoO of the bilateral FTA.

2.7 Rules of Origin and Cumulation

As outlined above and in the related literature, the tariff treatment of trade in goods under preferential trade agreements (FTAs and other PTAs), unlike customs unions, is essentially managed by the rules of origin (ROOs) that are negotiated by the parties of an FTA. Rules of origin are required to prevent the phenomena known as trade deflection that could occur when two parties of a PTA have different external rates of duties on imports from non-parties.

Typically, substantial transformation can be achieved if the imported non-party goods go through a specified tariff shift and/or satisfy some form of value added criteria and/or meet a technical processing requirement. The products that do satisfy these substantial transformation specifications are usually defined as originating goods. Incidentally, FTAs also provide precise definitions of goods that are wholly produced

or obtained within the preferential free trade area so that FTA partners can also trade these goods duty free or duty reduced.

In light of the above, it is clear that the primary purpose and intent of rules of origin is to prevent FTA benefits accruing to the goods of non-FTA members. However it is also acknowledged that rules of origin have come to be used and promoted in a variety of ways for a variety of reasons beyond the simple logic of limiting trade deflection or deflections of production:

- To protect and promote existing production and sourcing patterns within a preferential trade area;
- To protect and promote the use of intermediate goods that are available from production within a preferential area; and/or
- To secure the support for regional trade agreements by domestic industries by off-setting their concerns about import competition with restrictive rules of origin.

2.7.1 Cumulation

Cumulation is when the value added or degree of processing of the product is cumulated among inputs at different stages of production. For example if a circuit board for a computer is sent from one FTA partner to another FTA partner and then assembled into a computer with other components then the rule of origin determination may take into account the value added or the change in tariff heading of the imported input.

The rules for cumulation of content can be significant in influencing the trade effects of a rule of origin. The Pan-European Cumulation System, as this innovative scheme was widely known, was introduced in 1997 to link the various external free trade agreements that the EU had developed with the European Free Trade Association (EFTA) and with Central and Eastern European countries through the Europe Agreements. The result was effective creation of a Pan-European free trade zone in industrial goods. Turkey, which had been in customs union with the EU since 1996, joined the Pan European Cumulation system in 1999. Of course the countries of Central and Eastern Europe, which were signatory to the Europe Agreements subsequently joined the European Union.

The current system of Pan-Euro-Med cumulation of origin is an extension of the previous system of Pan-European cumulation. It therefore operates between the EC and the Member States of the EFTA (Iceland, Liechtenstein, Norway and Switzerland) and Turkey and countries which signed the Barcelona Declaration, namely Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia and the Palestinian Authority of the West Bank and Gaza Strip. Faroe Islands have been added to the system as well.

Cumulation is often permitted in an FTA so that products produced in one partner which are exported to the other partner, and are processed or assembled in the

other partner can be re-exported to the another FTA partner regardless of whether the processing or assembly was sufficient to confer origin on the product.

2.7.2 Diagonal Cumulation and Harmonization of Rules of Origin

Diagonal Cumulation

One remedy to the difficulties outlined above can be found in diagonal cumulation. Diagonal cumulation refers to situations to where there are three or more countries that have concluded bilateral or regional FTAs with each other. The most prominent application of diagonal cumulation was in the Pan European rules for cumulation developed by the EC with the countries of Central and Eastern Europe in 1997 and which has evolved into the arrangement for Pan-Euro-Mediterranean cumulation which involves the EU with 27 member states and 15 other countries including Switzerland and EFTA countries and Mediterranean countries including Turkey.²⁶

By most commonly accepted definitions to date, diagonal cumulation involves participating countries to agree bilaterally that materials originating in one country shall be treated as originating materials in all the other countries. This approach and definition is predicated upon all parties having concluded FTAs with each other **and** in that, in most cases, each of these FTAs feature identical or nearly identical origin provisions (i.e. they define originating goods in identical fashions). In nearly all cases, diagonal cumulation refers to partial diagonal cumulation: this is to say that only **originating materials** can benefit from the benefits of diagonal cumulation.

Our focus in this analysis is on FTAs, or other PTAs such as Partial Scope Agreements (PSAs), however, some of the benefits of diagonal cumulation can also be found in various non-reciprocal preferential regimes such as under the EU General System of Preferences (GSP) and Everything But Arms (EBA) preferences for Least Developed Countries where it is often referred to as regional cumulation and that some regional cumulation schemes feature full cumulation privileges.

In light of the customary requirement of common origin provisions, diagonal cumulation in the reciprocal preferential sphere has been largely restricted to the EU “Pan-Euro” regime where the EU has traditionally had the ability to nearly identical origin definitions with their PTA partners – partners who in most cases were aware of and desirous to secure the benefits of partial diagonal cumulation.

The following box provides a summary overview of diagonal cumulation.

²⁶Syria is potentially a member but is not an active member at the present time.

DIAGONAL CUMULATION IN THE PAN-EURO MED CONVENTION

The system of diagonal cumulation (the use of inputs which are originating in the other partner countries / entities of the pan-European cumulation system (EU, EFTA and Turkey) as originating input of the manufacturing country) according to the free trade agreement concluded between these countries / entity is gradually being expanded to the countries participating in the Euro-Mediterranean partnership (the Faeroe Islands, the Mediterranean countries Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia and the Palestinian Authority of the West Bank and Gaza Strip).

Diagonal cumulation is possible under the following preconditions:

- There must be free trade agreements between all countries participating in the acquisition of originating status of the final product and of the country of destination;
- The Euro-Med Origin protocol must be applicable by all those countries;
- The application of diagonal cumulation between the countries / entity involved is published (publication in the Official Journal of the European Union (C series) and the partner countries according to their own procedures).

The use of input materials from a country which does not apply the Euro-Med Origin protocol is considered to be non-originating in the context of the Euro-Med cumulation system. Diagonal cumulation may only be applied between those countries / entities which have already concluded free trade agreements between each other and have implemented the Euro-Med origin protocol (identical rules of origin). This means that the Euro-Med cumulation network will gradually be extended with the application of diagonal cumulation among a limited number of countries even before all free trade agreements with identical Euro-Med origin protocols will be operational (variable geometry).

In order to trace back the different origin of the input materials used, a specific proof of origin was created, the Euro-Med origin. The pan-European origin used for diagonal cumulation purposes with the EUR.1 certificates continues to be applied for the trade between EC, EFTA and Turkey.

How does diagonal cumulation function?

For diagonal cumulation purposes, the manufacturing or processing operations (the terminology in the European context speaks about "working or processing") carried out in a partner country on originating input does not have to be "sufficient working or processing" within the meaning of Article 6 of the origin protocol in order to confer on the final good the origin of the partner country.

2.8 The Innovation of Cross-Cumulation

During the evolution on preferential trade agreements in the Americas and in Asia, there was no equivalent to the origin "juggernaut" strength of the EU to require the use of common origin provisions in all their FTAs. Therefore, FTAs in these other regions tend to feature similar overall rules of origin but usually there subtle differences in the definitions of originating goods that largely reflect the existing production and sourcing patterns between the FTA parties as opposed to any objective origin criteria.

With the proliferation of FTAs this cumulation lacunae became increasingly problematic and thus the consideration of options that do not require origin uniformity, which is required for diagonal cumulation, was a logical step. Cross-Cumulation involves different alternative approaches to addressing this set of issues.

The issue came to a head during the Free Trade Area of the Americas negotiations when the Canadian negotiator asked the origin team to devise an alternative to diagonal cumulation which could address the problem of overlapping FTAs in the Americas. The resulting proposal has become known as Cross-Cumulation which involves at least three participating countries that agree with the basic premise that materials originating in one country shall be treated as originating materials in all the other countries. In order to be more flexible than diagonal cumulation, Cross-Cumulation does not require common origin provisions. The matter was subsequently examined in greater detail by Cornejo and Harris (2007).

CANADA'S APPROACH TO CROSS-CUMULATION

Many of the details of exactly how Cross-Cumulation could or should work have yet to be finalized as witnessed by the following provisions found in FTA's with several of Canada's partners:

Canada - Israel FTA

Article 3.6: Third Country Materials for Originating Goods

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.

Canada - EFTA FTA

Article 21 of Annex C – Accumulation

1. If a material that has undergone production in the territory of a Party without obtaining originating status is used in the territory of another Party in the production of an originating product, the production carried out in the territory of the first Party on that material may be taken into consideration in the territory of the other Party with respect to the originating status of the product.

2. At the time of completion of an origin declaration for a product referred to in paragraph 1, the exporter shall possess all documents provided with respect to the production carried out in the territory of another Party on that material as part of the documents supporting the originating status of the product.

3. The documents with respect to the production carried out on a non-originating material, referred to in paragraph 2, shall be completed in a legible and permanent form, signed or otherwise endorsed by the producer and describe that material in sufficient detail to be identified.

4. The Parties shall, **no later than four years** after the date of entry into force of this Agreement, review paragraph 1, particularly taking into account new concepts, such as Cross-Cumulation or pan-free-trade-agreement-cumulation.

Canada - Peru FTA (these provisions are essentially replicated in the Canada - Colombia/Jordan/ Panama FTAs)

Article 306: Accumulation

1. For purposes of determining whether a good is an originating good, a good originating in the territory of one or both of the Parties shall be considered as originating in the territory of either of the Parties.

2. For purposes of determining whether a good is an originating good, the production of the good in the territory of one or both of the Parties by one or more producers shall, at the choice of the exporter or producer of the good for which

preferential tariff treatment is claimed, be considered to have been performed in the territory of either of the Parties by that exporter or producer, provided that:

(a) all non-originating materials used in the production of the good satisfy the requirements set out in Annex 301 entirely in the territory of one or both of the Parties; and

(b) the good satisfies all other applicable requirements of this Chapter.

3. Subject to paragraph 4, where each Party has a trade agreement that, as contemplated by the WTO Agreement, concerns the establishment of a free trade area, with the same non-Party, the territory of the non-Party shall be deemed to form part of the territory of the free trade area established by this Agreement, for purposes of determining whether a good is an originating good under this Agreement.

4. A Party shall give effect to paragraph 3 only once provisions with effect equivalent to paragraph 3 are in force between each Party and the non-Party. The Parties may agree to limit such provisions to specified goods or to apply under specified conditions.

The general point is that these provisions enable Cross-Cumulation, but require a subsequent negotiation with the non-party to clarify the potential application to the non-party of Cross-Cumulation. Possible modalities for the operation of Cross-Cumulation can be found in the following more explicit provisions of the Canada – Peru FTA:

For purposes of determining whether a good of Chapters 50 to 63 is an originating good, any nylon filament yarn classified under subheadings 5402.19, 5402.31, 5402.32, 5402.45, 5402.51 or 5402.61 used in the production of that good in the territory of a Party shall be considered as originating if:

(a) the nylon filament yarn is imported into the territory of the Party from the territory of the United States of America or Mexico; and

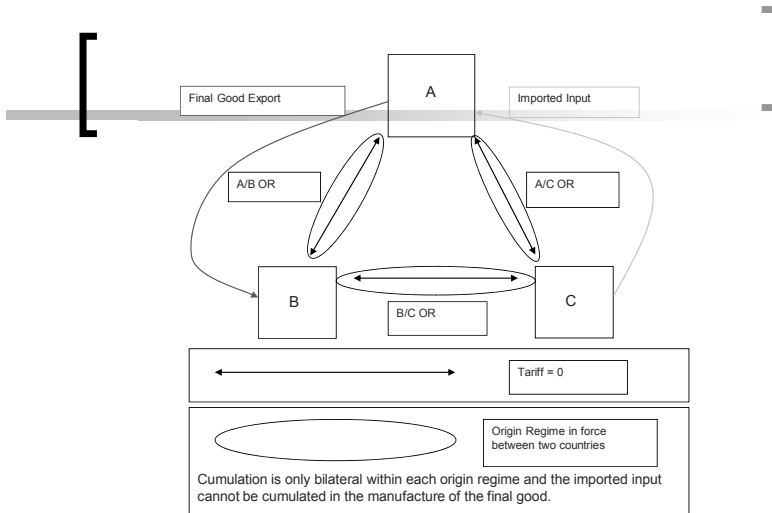
(b) the nylon filament yarn would be originating if the territory of the United States of America or Mexico were part of the free trade area established by this Agreement.

Thus the Canada-Peru FTA envisages the potential linkage of the bilateral agreement with the NAFTA.

2.8.1 Possible Approaches to Cross-Cumulation

Cornejo and Harris (2007) designed a methodology for convergence of the spaghetti bowl of RoO in the Western Hemisphere. They indicated that the countries should negotiate and implement a Generalized Origin Rule (GOR) for applying “extended” cumulation. The paper discusses the following methodological lines: extended cumulation, methods and modalities of negotiation, implementation of the GOR and coordination with bilateral RoO, and finally, flexibility for the treatment of sensitive products.

Figure 2.1: Diagram of Cross-Cumulation



Source: Cornejo, Rafael, and Jeremy Harris, (2007) "Convergence in the Rules of Origin Spaghetti Bowl: A Methodological Proposal," INTAL Working Paper 34, October 2007, Inter-American Development Bank

According to Cornejo and Harris (2007) three elements are necessary for extended cumulation to be applicable. There should be "agreement triangles" among the country of the input supplier, the exporting country of the final good and the country importing the product. All three countries should have zero tariffs on both the input and the final product. And finally, the countries involved should have negotiated under the GOR the RoO of the input to be cumulated and the final product. This is called variable geometry. According to Cornejo and Harris (2007, p15), "criteria will be developed for each product to identify from which convergence member countries there can be cumulation, which countries will be excluded and what will be the conditions for cumulation. These criteria set up connections that vary by final product, exporting country, importing country and input". Therefore, there could be many different combinations for extended cumulation among SA countries for different sets of products and inputs.

The Cornejo and Harris proposal is interesting, but it is quite demanding. The proposal is requiring that there be a reciprocal agreement, that the input and output tariffs should be zero under all relevant FTAs, and there is convergence of RoO.

Alternative approaches which are more flexible are possible especially for FTAs which are compatible with Article XXIV of the GATT 1994.

One approach would be simply mutual recognition of the rules of origin under different bilateral FTAs. For example three countries with three bilateral FTAs could agree that products which qualified under any of the bilateral FTAs could be cumulated and would be eligible for duty free treatment within the zone.

There are a variety of approaches to Cross-Cumulation and they are also related to the processes of certification of origin and verification and audit processes. These are discussed more below.

2.8.2 Hub and Spokes Revisited

The issue of “hub and spokes” or the “spaghetti bowls” with overlapping FTAs raises particularly important issues with differentiated products which are produced in multiple steps and processes. The segmentation of supply chains with overlapping FTAs is inimical to modern supply chains, since the ROO constrain the supply chains raising costs and reducing flexibility. The concept of the supply chain provides a useful metaphor for the complexity and variety of what Richard Baldwin has termed trade in tasks. Yet the concept of the supply chain may be too mechanistic implying a fixed and rigid pattern of supply analogous to Soviet style central planning. A better analogy might be a neural network which is more flexible and dynamic as well as more complex. As was discussed, the experience with the creation of FTAs suggests that the expansion of trade and the enhancement of technology with increased intra-industry trade leads to increased specialization and productivity gains. Enterprises wish to have flexible and resilient supply chains with multiple sources and channels available for utilization to reduce risk.

An alternative metaphor is that the lack of either diagonal cumulation or Cross-Cumulation among overlapping bilateral FTAs creates constrictions in the blood vessels or neural networks which are vital to the healthy development of international commerce.

2.8.3 Implications of Diagonal Cumulation

Wider Zone of Duty Free Access

The potential gains from cumulation come from removing the segmentation of trade that would result from the rules of origin in overlapping bilateral FTAs. Empirical evidence reveals that the harmonization of RoOs, via diagonal cumulation in the PECS, has impacted trade flows since 1997. For instance, analyzing the textile industry, Augier et al. (2004) find that trade between non-cumulating countries could be lower by up to 50 to 70 per cent. Similarly, using data on trade flows between 38 countries for three baskets – trade in all goods, trade in intermediate goods, and trade in manufactured goods – Augier et al. (2005) conclude trade among countries that became part of the pan-European system of diagonal cumulation was higher relative to trade with other countries by about 43 per cent between 1995 and 1999.

In addition, they show that the introduction of the PECS in 1997 increased trade between the spokes by 7 and 22 per cent. However, their methodology is based on using dummy variables in a gravity model to capture the role of cumulation. Hence, it is possible that these variables are capturing other factors.

At the same time, analyzing data on trade flows between and among 38 countries, Gasiorek et al. (2009) find that the trade between newly cumulating countries (following the introduction of the PECS in 1997) rises by more than trade between these countries and third countries for some selected industries

Augier, Gasiorek and Le Tong based their empirical analysis on a unique 'natural experiment' that was created by technical changes to Europe's web or lattice of rules of origin (ROOs) in 1997. This change, known as 'diagonal cumulation', relaxed the restrictiveness of rules of origin on trade among the EU's free trade agreement (FTA) partners without changing the degree of tariff preference. Their analysis allowed them to establish a lower-bound and upper-bound estimate of trade impact of ROOs reduced trade among the EU's trade partners. The lower bound Gasoriek et al find is something like 10% while the upper bound is around 70%. They use an aggregated gravity model with three products, primary, intermediate inputs and goods for final consumption, which has considerable dispersion in the estimates in the parameters but the results are clearly significant. They conclude that the most direct lessons are for FTA negotiations. They argue that Europe's implementation of 'diagonal cumulation' is a good way of reducing the welfare-reducing impact of overlapping rules of origin without gutting their fraud-fighting ability.

2.9 Summary of Different Types of Cumulation

The following box summarizes the different types of cumulation.

Types of Cumulation: A Recap

Introduction

In order to define Cross-Cumulation, it is important to first provide a brief explanation of what cumulation is and the different form cumulation takes within, between, and among, preferential trade agreements (FTAs).

Whether preferential trade takes place **within** the context of two countries who belong to a single FTA (intra-FTA trade) or **among** more than two countries connected by different FTAs (inter-FTA trade), policy makers must find ways to address the frequent situation where goods are made of materials produced in more than one country.

Cumulation¹ policies are those policies that define the origin treatment of imports from one country that are used as materials or inputs by a party to make goods in their country.

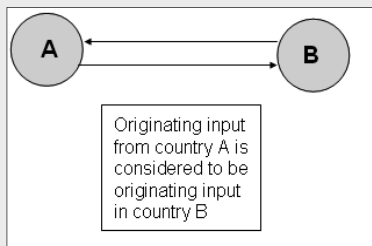
As will be outlined below, some of the multiple considerations that go into cumulation policies respond to the following questions:

1. Is the imported input/material originating as defined in the applicable FTA and if not then how should the originating content in the non-originating import be treated?;
2. Is the trading context intra-FTA or inter-FTA?; and
3. Does the trading context involve the same rules of origin or different rules of origin?

The following **five** scenarios attempt to describe the forms that cumulation take within different trade arrangements.

Scenario “A” Bilateral (partial) Cumulation (Intra-FTA: same rules of origin apply; originating good)

- Inputs/materials originating in one party shall be considered as originating in the other party: **intra-FTA context**.
- The most common form of cumulation in all FTAs. Obviously, the **same rules of origin apply** because all trade is within a single FTA.
- **Only** applies to originating goods (that is why it is sometimes called **partial** because it does not address the case of non-originating inputs or materials that include originating content –the originating content is not counted). In this case, fabrication, finishing or assembly can add value to the material input or component but not sufficiently for the product to originate. This originating content is not counted in the cumulation of content.

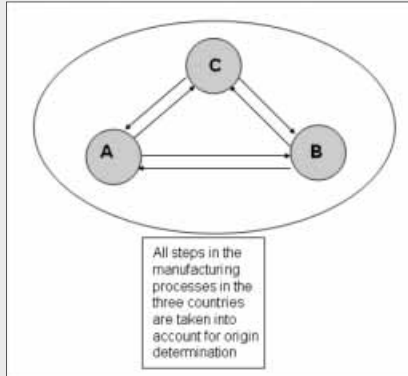


Examples: A pullover of HS heading 61.10 is manufactured in country A by sewing together originating knitted fabrics from country B. According to the FTA between these two countries, the specific rule of origin for pullover requires manufacturing from yarn in order that origin is conferred to the pullover. While the simple manufacturing process of sewing together non-originating knitted fabrics in country A would not confer origin and the pullover would have to be considered as non-originating, the pullover in this case will be considered to be originating since it was manufactured with originating fabrics from country B following bilateral cumulation provision in the FTA (WCO)¹. However, if the yarn is imported and the knitted material is not originating under the RoO then neither knitted material nor the pullover will be originating.

Scenario “B” Full Cumulation

(Intra-FTA: same rules of origin apply; non-originating goods)

- Non-originating imports with originating content from one party can be used by the other party (parties) to produce originating goods.
- Full cumulation simply requires that the origin requirements be fulfilled within the FTA zone as a whole.

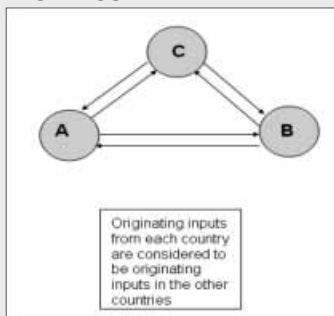


Example: A pullover of HS heading 61.10 is manufactured in countries A, B and C. All of these countries are parties to the same FTA that has full cumulation provisions. The product specific origin rule requires manufacturing from yarn in order that preferential origin is conferred to a pullover. Non-originating yarn was woven into knitted fabrics in country C. The knitted fabric was dyed in country B and the dyed fabric was sewn together in country A. Again, while the single operations in the individual countries do not confer origin, all operations taken together fulfill the origin requirement and the final product is considered to be originating in country A and can be re-exported into the other partner countries under preferential treatment. (Source WCO with amendments).

Scenario “C” Diagonal Cumulation

(Inter-FTA: same rules of origin apply; originating goods)

- Applies to trade between FTAs or **Inter-FTA trade**.
- Operates between more than two countries provided they have concluded preferential trading agreements between each other.
- All the participating FTAs must have the **same rules of origin** (therefore found almost exclusively in EU trade agreements)
- Normally only applies to **originating goods**



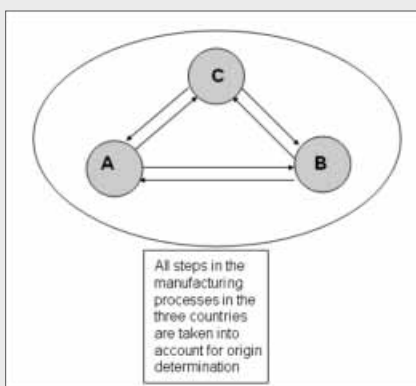
Example: A pullover of HS heading 61.10 is manufactured in country A by sewing together knitted fabrics originating in countries B and C. According to the free trade agreements between these three countries, the

specific rule of origin for the pullover requires the manufacturing from yarn in order that origin is conferred to the pullover. Once again the simple manufacturing process of sewing together knitted fabrics in country A would not confer origin and the pullover would have to be considered as non-originating according to the origin legislation of the three FTAs between country A and B, A and C, and B and C. However, with diagonal cumulation the pullover is considered to be originating in country A since it was manufactured with originating fabrics from countries B and C (WCO).

Scenario “D” Full Cross-Cumulation

(Inter-FTA: different rules of origin apply; all goods)

- Cross-Cumulation occurs on trade between FTAs (not within FTAs, or intra-FTA trade), similar to “diagonal cumulation” **with the difference that under Cross-Cumulation the different FTAs can have different rules of origin.**
- Cross-Cumulation is **the only** cumulation methodology that addresses and accommodates trade in inputs/materials **under different sets of rules of origin.** A variation is discussed below.
- Full Cross-Cumulation (like full cumulation) demands that the origin requirements are fulfilled within the preferential trade zone as a whole (**with the applicable rule of origin being the one between the last two parties of a transaction**).

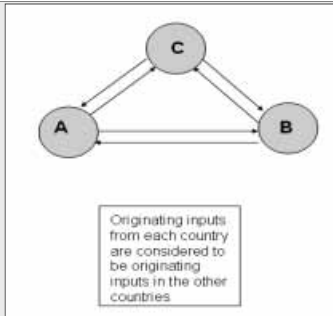


Example: A pullover of HS heading 61.10 is manufactured in countries A, B and C. Each bilateral pair of these countries has a free trade agreement with full cumulation provisions but each agreement feature different rules of origin. The product specific origin rule between A and B requires manufacturing from originating yarn in order that preferential origin is conferred to a pullover. Yarn was produced in country C with cotton imported from a third country (i.e. Country D). Country C ships the yarn to country B where it is knitted and sewn into a pullover. While the single operations in the individual countries C and B do not confer origin, however, under Cross-Cumulation all operations in all three countries taken together fulfill the origin requirement (of the free trade zone) and the final product is considered to be originating in country B and can be re-exported into country A as originating under the A + B FTA (Source WCO with amendments).

Scenario “E” Mutual Recognition Cross-Cumulation

(Inter-FTA: different rules of origin apply; all goods)

The mutual recognition approach to Cross-Cumulation is a variation on full Cross-Cumulation. Under mutual recognition Cross-Cumulation, imported materials or inputs which are **originating** under the bilateral FTA between countries B and C under a separate bilateral FTA retain origin and can be combined with originating products and processes in country B when exporting to country A under the bilateral FTA between A and B. In effect countries A and B agree to grant mutual recognition to the rules of origin under the bilateral FTA between B and C (and presumably between A and C) for the purposes of determining origin. Originating content which is incorporated in non-originating products under the bilateral FTA between A and B would not count for determination of origin. The Mutual Recognition Approach to Cross-Cumulation is analogous to diagonal cumulation, but the difference is that the Rules of Origin under the respective bilateral FTAs are accepted for certification of origin without full harmonization of the rules of origin.



Example: Consider the determination of origin for the pullover under HS 61.10 discussed above. The key difference between the Mutual Recognition Approach to Cross-Cumulation and the Full Cumulation Approach to Cross-Cumulation is that the applicable Rule of Origin would be under the separate bilateral agreements. Thus the origin for the yarn imported from country C to country B is determined under the bilateral FTA between Country B and C and the product would obtain the necessary origin certification under the bilateral agreement between B and C. Since A and B agree to grant equivalency to the Rules of Origin in the cumulation zone the product which is originating under the bilateral between B and C is treated as originating under the bilateral FTA between A and B as same as if the input material or product (in this case yarn) were imported from A or produced in B and the finished product then would be treated as originating for the bilateral FTA between A and B if there was sufficient processing of the knitted fabric under the relevant Rule of Origin for HS 61.10 in the bilateral FTA between A and B.

Canada-Peru Free Trade Agreement Accumulation Provisions

Article 306: Accumulation

1. For purposes of determining whether a good is an originating good, a good originating in the territory of one or both of the Parties shall be considered as originating in the territory of either of the Parties. (See scenario A)
2. For purposes of determining whether a good is an originating good, the production of the good in the territory of one or both of the Parties by one or more producers shall, at the choice of the exporter or producer of the good for which preferential tariff treatment is claimed, be considered to have been performed in the territory of either of the Parties by that exporter or producer, provided that: (See scenario B)
 - (a) all non-originating materials used in the production of the good satisfy the requirements set out in Annex 301 entirely in the territory of one or both of the Parties; and
 - (b) the good satisfies all other applicable requirements of this Chapter.
3. Subject to paragraph 4, where each Party has a trade agreement that, as contemplated by the WTO Agreement, concerns the establishment of a free trade area, with the same non-Party, the territory of the non-Party shall be deemed to form part of the territory of the free trade area established by this Agreement, for purposes of determining whether a good is an originating good under this Agreement. (See scenarios D or E)
4. A Party shall give effect to paragraph 3 only once provisions with effect equivalent to paragraph 3 are in force between each Party and the non-Party. The Parties may agree to limit such provisions to specified goods or to apply under specified conditions. (See scenarios D or E).
5. Note that Scenario C does not apply because the RoO are not the same under the respective bilateral agreements.

The different types of Cumulation described in the text box presented previously are noted in the provisions of the Canada-Peru Free Trade Agreement in the text box above.

3 METHODOLOGY

3.1 Analytical Tools and Methodologies

There is a significant economic literature which examines or simulates the economic implications and impacts of regional integration initiatives either in the form of FTAs or customs unions. Various types of methodologies are utilized including:

- Detailed computable partial equilibrium (CPE) model based studies;
- Computable general equilibrium modeling studies;
- Gravity models; and
- Analysis of trade flow impacts.

Due to data limitations, some studies do not attempt to measure the welfare effects of regional agreements, but instead take the first step down that path by estimating the impacts of the agreements on trade flows. Existing studies estimate changes in trade patterns due to regionalism in two distinct ways.

Ex ante studies use trade patterns and estimated elasticities in either detailed partial equilibrium models or more aggregated computable general equilibrium models developed prior to the agreement to calculate the predicted effect of eliminating trade barriers with a partner country.

Using Computable Partial Equilibrium (CPE) analysis has advantages and disadvantages compared to the computable general equilibrium (CGE) models for. The CPE approach focuses on the barriers to trade in particular industries and permits more disaggregation of the barriers to trade.

The CPE approach assumes the following:

- Domestic and imported goods are not perfect substitutes;
- International supply is perfectly elastic (the small country assumption);
- Domestic supply is upward sloping;
- All markets are perfectly competitive.

In implementing the computable partial equilibrium analysis one can use the software of the World Integrated Trade Solutions (WITS) developed by the World Bank and UNCTAD. Trade data can be obtained from the UNCTAD TRAINS and UN Comtrade data base and tariff data from the UNCTAD TRAINS or the WTO/IDB database.

The WITS model has tools for simulating the impact of tariff changes which can be used for assessing the impact of tariff changes such as the creation of an FTA. However, the WITS modeling framework does not permit analysis of the key issues related to RoO and Cross-Cumulation. In particular it is not possible to track the

indirect supply chain effects of Swiss exports of inputs to Tunisia that can be re-exported to Turkey due to diagonal cumulation or to measure the potential effects of Cross-Cumulation for Swiss trade with FTAs in Latin America or Asia.

Indeed while CPE studies of FTAs can be detailed in assessing changes in, or removal of, tariffs at the detailed tariff line level, it is difficult to incorporate analysis of Rules of Origin in CPE studies since it is not possible to trace the supply chain and it is difficult to measure or to forecast the proportion of bilateral trade between two FTA partners that could potentially qualify according to the Rules of Origin. The common assumption in analysis of FTAs is that all bilateral trade in a product category will meet the RoO requirement of the FTA. Clearly this is an optimistic assessment.

For a number of FTAs ex ante studies have been prepared using computable general equilibrium (CGE) models. This is an interesting line of research but most CGE studies are prepared at quite high levels of aggregation. A number of these CGE models have shown that for FTAs involving larger economies and for developed economies, that trade creation has dominated trade diversion.

Ex post studies examine trade flows after the FTA has been implemented and compare the actual levels of trade with a prediction of trade in the absence of the FTA. Ex post studies must establish a counterfactual of trade that would have occurred in the absence of the agreement, but some judgment is involved in setting model structure and there are criticisms of the specification and estimation of the elasticities. Alternatively gravity models are sometimes used to seek to measure the impacts of trade agreements on trade flows. This approach is discussed below,

Kehoe (2003) conducts an ex post evaluation of the performance of three of the more prominent multisectoral static applied general equilibrium models used to predict the impact of the North American Free Trade Agreement. The models he considers are: the Brown-Deardorff-Stern model of all three North American economies (see Brown 1994 and Brown, Deardorff, and Stern 1992, 1995), the Cox-Harris model of Canada (see Cox and Harris 1992), and the Sobarzo model of Mexico (see Sobarzo 1992a, 1992b, 1994, 1995). Kehoe concludes that these models drastically underestimated the impact of NAFTA increasing the volume of North American trade in manufacturing industries. Furthermore, the models failed to capture much of the relative impacts on different sectors. In Kehoe's view, the ex-post performance evaluations of applied GE models are essential if policymakers are to have confidence in the results produced by these models. Such evaluations also help make applied GE analysis to advance as a scientific discipline in which there are well-defined puzzles with clear successes and failures for competing theories. In his view analyzing sectoral trade data indicates the need for a new theoretical mechanism that generates large increases in trade in product categories with little or no previous trade. To capture changes in macroeconomic aggregates, the models need to be able to capture changes in productivity.

A separate empirical analysis of the impact of the Canada-US FTA on the Canadian economy, which was started in 1989 and phased in over ten years in parallel with the

NAFTA after 2004, which was conducted by Trefler (2004) indicates that the impact of trade agreements goes beyond scale effects and has significant implications for productivity growth. Based on detailed analysis of panel data on manufacturing firms, he finds that the initial impact of the tariff reductions on the high tariff import competing sectors is to accelerate firm turnover and exit and to reduce employment in the short term, but he finds there are significant productivity and output gains in the medium term. There are two possible complementary explanations. One is that the effect of regional integration is much more disaggregated unbundling of activities or tasks than has been incorporated into the applied general equilibrium models as yet – see Baldwin (2009), and more disaggregation of the production structure and supply chains needs to be attempted despite the data challenges. Another explanation is that more Schumpeterian views about endogenous technology need further consideration and analysis. The key point is that the CGE models used to analyse FTAs have provided a richer analytical framework than earlier quantitative work and were valid in the approach taken, but the reality has turned out to be richer than the models forecast with more subtle gains in intra-industry trade and productivity than foreseen.

One common way of predicting trade flows in the absence of the RTA is by using the gravity model to predict bilateral trade based on the distance between countries, the size of their economies, and other variables such as whether the two countries speak the same language. The effects of the agreement on trade are then measured by RTA dummy variables.

There are a number of criticisms of gravity models. First, the gravity models tend to be highly aggregated due to data constraints. Second and more important, the analysis depends on the apparent significance of the dummy variables which reflect “country” effects. Haveman and Hummels (1998) have criticized the specification of the standard gravity model analysis of trade creation and trade diversion and identify statistical anomalies. The problem of omitted variables means that the estimates of the dummy variables and their significance could be misspecified and invalid. Baier and Bergstrand (2008) examine this issue in more depth. The authors address econometrically the endogeneity of FTAs using instrumental variable (IV) techniques, control-function (CF) techniques, and panel-data techniques. They conclude that IV and CF approaches do not adjust for endogeneity well, but a panel-data approach does. Although Baier and Bergstrand (2008) do not address the welfare effects of FTAs they conclude that there are serious errors in many of the gravity models applied to the analysis of FTAs. In particular, they conclude that FTAs have much larger impacts on bilateral trade flows (up to five times larger) than was found in the standard gravity model methods.

These limitations do not apply in the same way to the study by Grasiorek et al (2009) because it is not a counterfactual study. It is based on a unique situation where diagonal cumulation was introduced in the Pan Euro trading zone.

The difficulties with CGE models for analysis of regional integration are significant. There are practical problems including that the CGE models are highly aggregative using average tariff and tariff equivalent measures for industrial sectors while in most countries there is a range up to 10,000 or more 8 digit or 10 digit HS classification tariff lines. Feenstra (1995) has made the point that high levels of aggregation can lead to serious underestimation of the effects of trade policies. Typically an analysis of an FTA in CGE study assumes that all trade barriers are removed after the implementation period and no account is taken of the effects of Rules of Origin in the analysis. Also there are technical issues since the decisions taken to structure the CGE models including Armington assumptions for constant elasticity demand functions can conflict with the model closure for open economies. The CGE models capture broad intersectoral shifts in resources in open economies over longer time frames, but they cannot capture the details of tariff structures and the direct and indirect effects of ROO and other formalities affecting trade. Although CGE models have been extended to incorporate scale effects and product differentiation their level of aggregation remains a challenge.

The challenge for analysis of the effects of Cross-Cumulation is that it is difficult to analyze the links in the supply chain. Permitting Cross-Cumulation expands the choice of suppliers and the range of potential inputs but it is difficult to identify let alone measure the effects on the pattern of trade flows in downstream products. In the next section a solution is proposed for this challenge.

3.2 Analysis of Trade Flows, Data Availability and Data Challenges

3.2.1 Data Sources and Challenges

The Integration and Trade Sector of the Inter-American Development Bank has developed specialized databases, models and tools to monitor and assess the impact that integration initiatives and associated trade flows have on the Americas. The portal INTradeBID (www.iadb.org/int/intradebid/) provides public access to these data and tools. These tools were extended and adapted to analysis of detail trade policy impacts on other regions or countries outside the Americas. In particular, INTradeBID includes an innovative database of product level rules of origin, codified at the maximum level of detail. This database, along with the associated tools, allows the identification and interpretation of the origin requirements of preferential trade arrangements.

The data base can be utilized at the level of six digit codes for the Harmonized System (HS) for trade flows. In particular the INTradeBID tools incorporate an input output matrix derived from the analysis of a data base of origin declarations middle income developing countries. This is a critical tool because it permits the linkage needed between trade flows of exports from production in an economy or a group of economies to exports from a third country. Indeed the richness of the data set and the potential to link it with databases on trade flows and trade barriers creates challenges for analysis.

Large data sets needed to be extracted for use with the INTradeBID model using the UN COMTRADE database for detailed trade flows and the TRAINS data base for tariffs maintained by UNCTAD as well as the input output model.

3.2.2 Methodology for Analysis of Trade Flows

The methodology that was adopted was to use the INTraBID model to analyze the indirect trade flows between Switzerland through trading with FTA partners who in turn trade with other FTA or potential partners. This is the only available data base and modeling framework which allows the tracing of supply chains in this way. The model functions as an enormous cross-border input-output model with the potential to link trade among many different countries and to trace supply chains in great detail, but it does not simulate the welfare effects of the changes in prices or relevant trade policy instruments. What the model does is indicate the detailed trade flows to or from Switzerland with different potential trade partners or trading blocks at different stages of the supply chain.

It is possible to utilize the input output linkages between trade in product categories at the six digit level with the trade in the input products or components that are used in the production of the traded products.

Analysis of the data and the trade flows potentially to be affected by Cross-Cumulation involved an iterative approach. Initially we examined both Swiss imports of parts and components from present or actual FTA partners and the exports of Swiss products. We started with Swiss trade with FTA partners in Latin America because the INTradeBID model had the requisite data incorporated in the model for this region.

When we examined the potential benefits to the Swiss economy from lower cost inputs due to the effects of introducing cumulation among FTA partners, we found that the benefits were likely to be modest since Switzerland already obtains imports on a low or zero-duty basis (excluding agricultural products) from the EU, EFTA and all its other FTA partners. In addition Switzerland's non-agricultural MFN tariffs are relatively low. Therefore the incremental effects of Cross-Cumulation on input costs and reduced consumer costs for Switzerland are modest.

After extensive analysis of trade flows among Switzerland's FTA partners, we undertook the analysis for three regional zones. It must be stressed that these are geographic regions since at present, while EFTA has bilateral FTAs with some of the partners and is in the process of negotiating with others, there are no applicable regional trading arrangements for which the Swiss exports would qualify. In one case, the EFTA and Western Hemisphere (Canada, Chile, Columbia, Mexico and Peru), there are a large number of overlapping bilateral FTAs but Chile does not have an FTA with Peru. Otherwise the network of overlapping bilateral FTAs in the region is complete. In the other regions there are more gaps in the network of overlapping bilateral FTAs, but there is potential to develop the already extensive

network of bilateral FTAs. Thus, we are examining the potential expansion of trade flows in these regions.

The three zones which we examined for trade with Switzerland were:

- Western Hemisphere/Americas (WH) comprising Canada, Chile, Columbia, Mexico and Peru;
- East Asia (EA) comprising China, Korea and Japan; and
- Southeast Asia (SEA) comprising Singapore, Indonesia, Malaysia, Thailand and Vietnam.

We first examined Swiss exports on a global basis for six digit SIC basis and linked this with products which were potential inputs to production and intraregional trade in the target trading zones. We also examined Swiss exports to bilateral partners in the region which were potential inputs into production in the potential FTA partner and examined the potential for increase in exports to different zones depending on the inputs utilized for production for export in the zone. The trade volumes observed were historic values for 2007 to 2009 with the current intraregional trade volumes reflecting the degree of integration in the potential zone. It is unlikely that Swiss exports could qualify for intraregional trade preferences under the existing bilateral FTAs.

When limiting the analysis to bilateral Swiss exports to the respective blocks, it was necessary to change the inclusion thresholds – that is, the original analysis considered only Swiss products with global exports in excess of US\$100M over 3 years, which was unreasonable when focused on any of the particular sets of partner countries. After analysis of the trade flows, the methodology that we settled on was to set the threshold at a round number that allowed inclusion of at least 100 Swiss products. This was \$15 million for both WH and SEA, and \$50 million for EA.

The methodology adopted was to examine the trade potential. Does Switzerland export competitively products that are inputs into the production of products which constitute significant regional trade flows in the regions? It is not possible to predict the potential quantitative expansion of trade volumes since there are no tariff equivalence estimates for rules of origin requirements.

4 ANALYSIS OF CASE STUDIES

Based on the analysis of the structure of Switzerland's exports, we have focused on three priority sectors:

- Pharmaceutical products Chapter 30 in the Harmonized System (HS 30);
- Optical, photographic, cinematographic, measuring, checking, precision, medical, or surgical instruments and apparatus (HS 90); and
- Boilers, machinery; nuclear reactors and parts thereof, (HS 84).

We examined the pattern of trade in a wide range of industrial sectors involving both sectors and various present and potential FTA partners in selecting the sectoral case studies and the potential geographic regions. Among the sectors we investigated were food and beverage products and textiles. However, the export volumes in these sectors were quite limited and the EU and Euro-Med zone predominated in export destinations for Swiss products. Also the trade regime for agri-food products remains complex despite the Uruguay Round reforms implemented under the WTO and due to the complexity of the trade regime and the tendency to exclude them from FTAs either through product exclusions or through restrictive rules of origin implies that they could create challenges for Cross-Cumulation.

In terms of Geographic possibilities, we have examined potential regional networks that could be deepened by Cross-Cumulation provisions. Of course global Cross-Cumulation among FTAs on different continents is not excluded but it is difficult to analyze since the criteria for inclusion of countries becomes arbitrary. Several possibilities were examined. One possibility was the recently concluded FTA between EFTA and the Ukraine. However, the main trading partners for Ukraine are the EU and Russia. This study is examining the potential for Cross-Cumulation with partners other than the EU with whom Switzerland already has diagonal cumulation under the Pan Euro-Mediterranean convention.²⁷ Russia is not included in the list of potential FTA partners for Switzerland and having recently joined the WTO seems focused on pursuing regional integration with former Soviet partners. Thus there is no obvious network of FTAs in which Ukraine could be included.

Due to the extensive data analysis that was conducted the results are presented as follows. For pharmaceutical products (HS 30) we have presented summary data in tables in the text for the regions. For the measuring and precision instruments (HS 90) and boilers and machinery (HS 84) we have presented statistical tables in annex 7 for the Western Hemisphere region.

Presenting all of the data for all products and regions would have greatly expanded the size of the report and would likely have diminishing if not negative returns in comprehensibility.

²⁷Nonetheless, Cross-Cumulation among the EU, Ukraine and Switzerland could be well worth consideration.

4.1 Pharmaceuticals (HS 30)

Global exports of pharmaceuticals from Switzerland amounted to more than \$53 billion in 2011. Our analysis focuses on the exports of Swiss products that would be inputs into production and then traded within the region. Most of the Swiss exports that were inputs into pharmaceuticals (HS 30) were either inorganic chemicals (HS 29) or pharmaceutical products (HS 30)

4.1.1 America/Western Hemisphere (Canada, Chile, Columbia, Mexico, Peru)

The following table presents the results of our analysis of the supply chains in pharmaceuticals where Switzerland is a significant exporter of inputs which could be utilized for production and trade in the WH economies and where there is a significant volume of trade among WH countries. As noted earlier this data was extracted using the INTraBID model which links inputs which could be utilized in regional trade flows. Note that CHE refers to Switzerland in accordance with the ISO country code.

Table 4.1: Swiss Global Exports of Products which are Potential Inputs for Production and Intra-regional Trade in Pharmaceuticals in the Americas Group

WH Product	Description	WH MFN	WH Exports \$000
300490	Medicaments for therapeutic or prophylactic uses, put up in measured doses - other	0,5,9	16,004,039
CHE Materials	Description	WH MFN	CHE Export \$000
292249	- Amino-acids, other than those containing more than one kind of oxygen function, and their esters; salts thereof:-- Other	0,2,6	1,243,652
292250	- Amino-alcohol-phenols, amino-acid-phenols and other amino-compounds with oxygen function	0,1,6	522,882
292429	- Cyclic amides (including cyclic carbamates) and their derivatives; salts thereof:-- Other	0,1,6	5,327,731
293219	- Compounds containing an unfused furan ring (whether or not hydrogenated) in the structure:-- Other	0,2,6	159,886
293229	- Lactones:-- Other lactones	0,1,6	1,224,723
293359	- Compounds containing a pyrimidine ring (whether or not hydrogenated) or piperazine ring in the structure:-- Other	0,1,6	1,968,929
293500	Sulphonamides	0,1,6	665,589
293621	-- Vitamins A and their derivatives	0,2,6	329,806
293628	-- Vitamin E and its derivatives	0,2,6	1,150,329
293629	-- Other vitamins and their derivatives	0,2,6	763,473
293722	- Steroidal hormones, their derivatives and structural analogues: -- Halogenated derivatives of corticosteroidal hormones	0,2,6	105,663
294190	Antibiotics.- Other	0,2,6	4,712,314
300210	- Antisera and other blood fractions and modified immunological products	0,4,9	37,801,014

Notes: Western Hemisphere (WH) includes Canada, Mexico, Colombia, Peru, and Chile.
Export data for 2007-2009, figures are 3-year totals in \$000.
MFN Tariffs (Minimum, Average, Maximum) based on 2010 figures. Specific tariffs omitted.
WH Exports only include products with >\$600M/year (2B over 3 years)
CHE Materials only include products with >\$30M/Year (100M over 3 years)

This table presents in the right column the Swiss global exports of products that are inputs into HS 300490 which is other pharmaceutical products. Total trade among the four countries in the Americas is \$16 billion over three years. As we can see most of the global exports that are potential inputs are from Chapter 29 inorganic chemicals produced in Switzerland. Globally Switzerland over three years exported more than \$50 billion of input products used in the manufacture of HS 300490 or about \$16 billion per year. The actual Swiss exports to the region are much smaller but still significant at more than \$2 billion over three years. Note that tariffs although low range up to 6 to 9 % among these FTA partners.

There is clearly considerable potential for Switzerland to expand exports of these pharmaceutical intermediate inputs to and within the region if Cross-Cumulation were introduced among some or all of the FTA partners in the region. Switzerland is a significant global exporter of inputs to these pharmaceutical products and there is substantial intraregional trade in pharmaceutical products. With Cross-Cumulation there would be increased opportunities to export these input products for incorporation into intra-regional trade in pharmaceuticals.

4.1.2 East Asia (Japan, Korea and China)

Switzerland is not currently exporting significant volumes of pharmaceutical intermediate products to this region but it is exporting finished pharmaceuticals. With Cross-Cumulation there could be greater potential to expand trade in pharmaceutical products with this region. Trade in pharmaceutical products within the region is very substantial but is below the threshold of \$ 10 billion over three years.

4.1.3 Southeast Asia

The following table presents the Swiss exports of products which are imported as inputs into pharmaceutical product 300490 other pharmaceuticals. The range of products utilized is smaller than in the Americas but the overall trade in the region of the output product is in excess of \$12 billion.

Table 4.2: Swiss Global Exports of Products which are Potential Inputs for Production and Intra-regional Trade in Pharmaceuticals in the South East Asia (SEA) Group

SEA Product	Description	SEA MFN	SEA Exports \$000
300490	Medicaments for therapeutic or prophylactic uses, put up in measured doses - other	0,3,10	12,656,121
CHE Materials	Description	SEA MFN	CHE Exports
292429	Other	0,2,12	52,527
293621	Vitamins A and their derivatives	0,0,1	34,018
293628	Vitamin E and its derivatives	0,0,1	77,271
293629	Other vitamins and their derivatives	0,0,1	60,751
300210	Antisera and other blood fractions and modified immunological products, whether or not obtained by means of biotechnological processes	0,0,1	387,827

At present Swiss exports of these organic chemicals and other products which are inputs to HS 300490 to the South East Asia group are about \$600 million over three years compared to more than \$50 billion globally. Note that tariffs for the output product range up to 10%. Thus if the input products imported from Switzerland lead the finished products to fail to meet the rule of origin for the relevant bilateral FTAs then there are substantial obstacles to intra-regional trade incorporating these inputs.

4.2 Optical, Medical and Precision Equipment (HS 90)

The products in the HS chapter 90, Optical, Medical and Precision Equipment contributed \$16 billion in Swiss exports in 2011.

4.2.1 Americas

In the Western Hemisphere Group of Canada, Colombia, Mexico and Peru the total intra-regional trade in the products of chapter 90 amounted to over \$25 billion. Switzerland exported more than 20 different product groupings which are inputs and components of this sector. Please see Table 7.4.1 in Annex 7 for the range of products which Switzerland exports at the global level. At a global level many of the Swiss inputs which were exported were in different product categories, but about \$2.9 billion over three years was exported were products of chapter 90. At a global level Switzerland exported almost \$20 billion of exports over three years of products which are inputs into the production of products in HS 90. Yet actual trade between Switzerland and the countries in the Western Hemisphere Grouping is very modest in these input product categories amounting to less \$150 million over three years. There is considerable potential to expand trade in these products between Switzerland and the Western Hemisphere group with Cross-Cumulation.

4.2.2 East Asia

The trade in the East Asia Zone in products of chapter 90 is very substantial. In one product grouping at the six digit level the intraregional trade is more than \$185 billion over three years or more than \$60 billion. Yet Swiss exports of intermediate inputs to this region are modest. Other factors such as market structure may influence the sale of these products in the region. It will be interesting to see whether the bilateral FTAs with Korea and Japan lead to increased exports in this set of products to the region.

4.2.3 Southeast Asia

Trade in this HS grouping in Southeast Asia amounts to over \$11 billion. On a global level Switzerland exports significant amounts of many different inputs for the manufacture of products in this group. Yet Switzerland exports only modest amounts to the region. At present the only FTA is with Singapore, but one would expect some improvement after other FTAs are negotiated and cross cumulation could reinforce these gains.

4.3 Machinery, Boilers , Electrical Equipment and Computers etc (HS 84)

Total exports from Switzerland of the products in chapter 84 were \$29 billion in 2011 while Swiss exports of intermediate products used to produce products in chapter 84 were more than \$26 billion in per year in 2007-2009.

4.3.1 Americas

The table listing the products trade chapter 84 in the Western Hemisphere Group is reproduced in Annex 7.4 below. Total trade among the FTA partners exceeds \$89 billion over three years. On a global basis Switzerland exports many products which are inputs to production in this sector with significant export values as the Table in the Annex presents. Total global Swiss exports of intermediate products for production of products of chapter 84 exceeded \$85 billion over three years or more than \$26 billion per year. Switzerland's trade with the region in inputs into chapter 84 was about \$200 million over three years. This amount is significant but Cross-Cumulation could help to expand this export volume substantially.

4.3.2 East Asia

Trade within this chapter 84 in East Asia is enormous about \$500 billion. Switzerland exports products which are inputs into production in this sector from more than 200 HS product codes. Total global Swiss exports of intermediate products for production of products of chapter 84 exceeded \$85 billion over three years or more than \$26 billion per year. Total Swiss exports to the region exceeded \$2.2 billion over three years. There is clearly scope for significant expansion of intermediate products with the negotiation of an FTA with China. Cross-Cumulation could expand the trade with the region significantly.

4.3.3 Southeast Asia

Trade in products of Chapter 84 among South East Asian countries exceeded \$112 billion over three years or amounted to \$37 billion per annum. As noted above global Swiss exports of inputs to production of products of Chapter 84 exceeded \$26 billion per year. Exports by Switzerland to Southeast Asia of inputs for chapter 84 were \$1.1 billion over three years. Clearly there is potential to expand exports to the region with FTA negotiations under way with Indonesia, Thailand and Vietnam. Cross-Cumulation would also be a boost to exports to the region in light of the rich diversity of products exported from Switzerland on a global basis of products which are inputs into products of chapter 84 building on the existing FTA with Singapore.

5 ANALYSIS OF THE RESEARCH QUESTIONS

5.1 What are the Implications of the Heterogeneity of RoO?

What do we know about the economic implications of the heterogeneity of RoO? Is the difference between diagonal and Cross-Cumulation a formal issue (if the RoO of concerned FTAs are sufficiently similar) or are there substantive effects on preferential trade flows?

Let us consider the case of diagonal cumulation first before considering the comparison of diagonal and Cross-Cumulation. As the WTO (2002) Secretariat note stated:

“Among WTO Members, views are divided on how diagonal cumulation schemes under preferential rules of origin regimes affect the multilateral trading system. While for some Members such schemes reduce barriers and facilitate trade among participating economies by a simplification and harmonization of customs procedures, for others diagonal cumulation extends the preferential nature of any individual RTA to parties to other RTAs, without any legal basis, and introduce another layer of discrimination, since some third parties to the original RTA – those participating in the diagonal cumulation scheme – benefit from preferential treatment, while other third parties – those not participating in the scheme – are not eligible. (WTO (2002) p. 11)

The issue of diagonal cumulation may be less controversial among WTO members now than as quoted above a decade ago. One simple reason is that many more WTO members have negotiated FTAs and other RTAs or PTAs since the time of this quote.

Another more fundamental reason is that either diagonal or Cross-Cumulation is a logical extension of Article XXIV of the GATT-WTO. Thus if the three initial bilateral FTAs met the criteria of Article XXIV with respect to removal of customs duties and other restrictive regulations are eliminated on substantially all the trade between the constituent territories in products originating in such territories, then the extension of diagonal cumulation among the three partners is likely to meet the formal requirements of Article XXIV. Indeed one could argue that further progress in reducing the barriers to trade within and among overlapping FTAs is required under Article XXIV, but the argument is not normally framed in this way in the GATT/WTO.

Certainly the extension of diagonal cumulation is consistent with the recognition in GATT Article XXIV that it is desirable to increase ‘freedom of trade by the development, through voluntary agreements, of closer integration between the economies of the countries parties to such agreements.’ The GATT 1994 also notes that the ‘purpose of a customs union or of a free-trade area should be to facilitate trade between the constituent territories and not to raise barriers to the trade of other contracting parties with such territories’²⁸.

²⁸Article XXIV, 4, GATT 1994.

At a conceptual level, Cross-Cumulation is analogous to diagonal cumulation. Indeed, diagonal cumulation would be the limiting case if FTA partners gradually converged to common ROO in their bilateral FTAs which are linked by Cross-Cumulation. However, diagonal cumulation is not the same as full cumulation since to qualify for diagonal cumulation the product must be originating at each stage as it crosses the borders. Full cumulation including full Cross-Cumulation implies that originating content or value addition includes all originating content even if the product at the first stage includes non-originating materials and would not be counted as originating. (For example milling or processing of iron ore into powder as “fines” might not confer origin on the product, but the value addition from the processing could count towards the determination of origin of the steel or steel products that were eventually produced.

There are two issues to consider. First, how different in their trade effects are the effects of heterogeneity of ROO? Second would the combined ROO necessarily tend to converge toward the level of content requirement (or equivalent thereof) as would be the case with a large trading zone such as the Pan Euro Med or the NAFTA?

The economic effects of the heterogeneity of ROO and the interaction with Cross-Cumulation depend on several factors.

The obvious point is whether Cross-Cumulation is permitted between and among FTAs. In the absence of formal acceptance of Cross-Cumulation and if diagonal cumulation is only permitted when Rules of Origin are exactly the same as with the EU Pan Euro Med regime, and since there is considerable heterogeneity in the Rules of Origin in different FTAs, then all of the concerns about hubs and spokes or spaghetti bowls will apply to the different FTAs with segmentation of trade flows because diagonal cumulation cannot be applied. In the extreme case the difference in RoO may be simply technical and have equivalent economic effects but these technical differences are sufficient to block the possibility of RoO. In this situation, permitting Cross-Cumulation will have similar economic effects to diagonal cumulation.

Yet the reality of trade is likely to more complex. When comparing RoO between two bilateral FTAs for specific products, the RoO may contain provisions which for some products or industries are technically different but economically similar in effect, while other products may have RoO which both technically and economically different. It is possible that permitting Cross-Cumulation could have results for trade which are very similar to diagonal cumulation among FTAs because the RoO are very similar in their economic effects, but this is difficult to ascertain.

Alternatively if a group of countries who are members of overlapping bilateral FTAs with significant differences in their RoOs declare “mutual recognition” in the form of Cross-Cumulation of the respective RoOs in the bilateral FTAs, will the economic effects be the same as diagonal cumulation?

If the economic effects of the respective RoO are very similar at every stage of the production process in different overlapping FTAs, then the economic effects of Cross-Cumulation among the FTAs will be broadly similar to diagonal cumulation. For example, under diagonal cumulation for three bilateral FTAs and with identical harmonized rules of origin then the three bilateral FTAs become a common FTA with origin being cumulated in different countries in the zone. If there is Cross-Cumulation among three bilateral FTAs with similar economic effects but technically different rules of origin then the economic effects of Cross-Cumulation are analogous to diagonal cumulation. The three bilateral FTAs become in practice a common FTA. In this hypothetical situation the heterogeneity of RoO are simply technical with, for example, one rule having a change of tariff heading while the analogous rule for the same product or stage in the production process in another FTA is a value content rule but the two rules are considered to be economically equivalent.

Even under this restrictive assumption that two different rules of origin have economically equivalent effects, then introducing Cross-Cumulation would result in significant expansion of trade flows among the members. The reason is that the members would receive the benefit of diagonal cumulation without having to engage in the negotiating administrative and legal changes that would be required to harmonize rules of origin. Recall that Gasiorek et al found very large expansion of trade flows with the Pan Euro Med rules among the network of FTAs with the EU as a result of diagonal cumulation.

Yet in many situations the variation in the RoO may be more than technical and these cases need to be considered as well. The Rules of Origin in different FTAs may have similar but different economic effects. Sometimes it is difficult for experts to judge whether a value content rule or a change of tariff heading rule for a particular product is more or less restrictive. In other cases different bilateral FTAs may have RoO may differ not only technically in how they are specified but also may have differences in how much processing or content is required to qualify as originating. In particular FTAs with smaller bilateral trade volumes tend to have more liberal rules of origin. In discussion of the Pan Euro Med rules we suggested that the rules are quite restrictive in their content requirements but the restrictive effect is reduced by the diagonal cumulation and the large trading zone. If FTAs link small economies with high ratios of trade to GDP and some larger economies then some of the bilateral FTAs in the network are likely to have less restrictive Rules of Origin than other bilateral FTAs. Providing for mutual recognition of RoO will lead to some variation in the RoO. On balance the RoO are likely to be more liberal in the sense that less content and/or less processing is required than would be the case with diagonal cumulation.

Depending on how Cross-Cumulation is introduced, the reciprocal recognition of the RoO is likely to lead overall to more liberal rules of origin than would be the case with harmonized rules. Harmonized rules of origin tend to adapt the most restrictive rules as part of a bureaucratic and intergovernmental consensus. Cross-Cumulation can be implemented in a manner which is more flexible. Especially if there is a

willingness to recognize bilateral RoO which are more liberal, then there is a likelihood that the combined effects of RoO with Cross-Cumulation are likely to be more liberal than diagonal cumulation.

The most important gain is that Cross-Cumulation introduces the concept of mutual recognition into Rules of Origin. In the evolution of the European Union, the *Cassis di Dijon* decision by the European Court of Justice in 1979 emphasized mutual recognition. Subsequently the New Approach to Standards and Technical Regulation made it possible to develop or to recognize equivalent standards while it would have taken many years to develop detailed harmonized standards. In the case of Rules of Origin, they are embedded in FTA texts which are extremely difficult to change. The expansion of the trading zone with Cross-Cumulation would make it easier for enterprises to qualify for FTA treatment and achieve the benefits of diagonal cumulation through mutual recognition instead of full harmonization. This would solve the hub and spoke or spaghetti bowl problem.

5.2 What are the Preconditions for FTA Partners to Successfully Introduce Cross-Cumulation?

What are the preconditions for FTA partners to successfully introduce Cross-Cumulation in their FTAs, with a view to use the concept as a building block towards the multilateralization of trade?

One proposal for “extended cumulation” was made by Cornejo and Harris (2007). In order to promote better linkage of the various FTAs in the Americas, they proposed a negotiation focused on one issue -- rules of origin, to create a General Origin Regime (GOR). Their proposal is flexible. FTA countries could sign up particular sectors for the GOR cumulation regime.

As was noted earlier, the Cornejo and Harris proposal is interesting, but it is quite demanding. The proposal is requiring that there be a reciprocal agreement, that the input and output tariffs should be zero under all relevant FTAs, and there is convergence of RoO.

The requirement for reciprocal agreement is evident but if input and output tariffs are zero under all covered FTAs there is no obvious need for convergence of RoO. In most cases considerable variation in the real effects of RoO could be accepted because there are no incentives to deflect production within the combined zone.

The Cornejo Harris proposal is interesting and potentially useful but it is quite strict in the criteria. It is important to note that it was developed in the context of Western Hemisphere integration initiatives that involved FTAs and Partial Scope Agreements notified under the enabling clause to the WTO.

Especially in the case of FTAs notified under Article XXIV of the GATT 1994 the criteria for Cross-Cumulation could be, and should be, more flexible. If duties have been eliminated for input and output tariffs (or reduced to less than 2%) for FTAs that

have notified under Article XXIV of the WTO, then Cross-Cumulation could be introduced on a flexible basis with mutual recognition of the RoO and certifications of origin under the different bilateral FTAs. The reason is that with zero duties (or very low duties) on imports of inputs and outputs, there are negligible incentives for deflection of trade or production among the FTA partners.

Cornejo and Harris emphasized the convergence of RoO, but another issue which is relevant is the degree of convergence in the external trade regime of the FTA partners. Convergence of external trade regimes can occur through multilateral trade negotiations or unilateral initiatives to lower tariffs and other trade barriers in the FTA partners which have the external MFN tariff peaks. Lipsey and Smith (2011) explore these issues of the incentives for FTA partners to reduce peaks in MFN trade barriers as FTAs are implemented. Lipsey and Smith (2011) also point out that as FTA partners negotiate more FTAs this also serves to increased competition in the domestic market place which in turn tends to promote reduction of peaks in external trade barriers.

The exceptions are for sectors such as some agricultural products which tend to be effectively excluded from many FTAs. As a result, it may be necessary to have sectoral exclusions from Cross-Cumulation or negotiate special harmonized rules in a few specific sectors where high MFN trade barriers are retained.

There are key issues in making Cross-Cumulation work among a group of bilateral FTAs. These involve primarily practical matters such as administrative capacity of the private and public sectors, the adequacy of documentation, and adequate certification as well as economic drivers in terms of firms or industries prepared to take advantage of these opportunities.

If it is to work, customs authorities among the partners need to enable or to facilitate Cross-Cumulation. Unfortunately in some countries, refusal of origin on arbitrary grounds occurs either to achieve revenue targets or to provide a source of “facilitation fees” for officials. It is important to establish rules for acceptance of origin certifications to avoid arbitrary refusal of origin either at the time of entry of the products or at the time of post-entry audit.

The most fundamental issue about the potential for Cross-Cumulation among a group of FTAs is whether all potential partners are interested in the proposal for Cross-Cumulation. However, there could be elements of competitive liberalization. If three of four partners in overlapping bilateral FTAs are willing to go ahead with Cross-Cumulation, then they could proceed and the fourth potential partner could consider whether to join at a subsequent point.

Multilateralization of Cross-Cumulation is certainly possible. The Cornejo and Harris proposal for a GOR for the Americas could be proposed on a global level for members of FTAs. This might raise broader foreign policy issues and also commercial policy issues because of differences in sensitive sectors among countries and among FTAs.

Also as noted previously the Cornejo Harris proposal is quite restrictive. In particular there is not necessarily a requirement for harmonization of RoO. A more flexible approach could be appropriate at the multilateral level. This approach would involve setting some minimum standards for participation in terms of:

- A relatively open MFN regime with limits on tariff peaks;
- The constituent FTAs have been notified to the WTO under Article XXIV,
- There was effective and transparent customs administration;
- Agreed procedures for mutual recognition and acceptance of origin certifications; and
- The RoO met some minimum requirements.

With such standards, a flexible plurilateral protocol for Cross-Cumulation could be created and which would provide for the linking of both regional and supra-regional FTAs. Since there is no limit on the number of members in an FTA under Article XXIV and all the constituent FTAs should have already been notified under Article XXIV there would be no difficulty in principle with the WTO in extending Cross-Cumulation among a large number of FTAs. The key is the members of the various FTAs are open to the linking of the various overlapping FTAs.

Since the difficulties with RoO tend to be concentrated in a few industries with significant divergence in MFN trade regimes such as for some agricultural products, the solution could be the exclusion of such industries from the coverage of the Cross-Cumulation provisions. This would only be necessary when one or more of the underlying bilateral FTAs had exclusions or highly restrictive origin requirements. In a step by step approach such industries could be excluded with the provision to review in the future pending some convergence in external MFN barriers or widening of the FTA networks of the partners.

5.3 What are the Trade Creation and Trade Diversion Effects of Cross-Cumulation?

In general the scope for trade creation and trade diversion with Cross-Cumulation will be similar to the scope for the balance of trade creation and trade diversion with the creation of a Free Trade Area. There is an additional factor that Cross-Cumulation serves to link FTAs that have already been created. Thus, the introduction of Cross-Cumulation will tend to expand trade and to increase competition within the cumulation zone.

The WTO (2011) concludes that Rules of Origin can cause trade diversion through inducing enterprises to switch the linkages in their supply chains. The WTO report suggests that diagonal cumulation will tend to mitigate the trade diverting effects of bilateral RoOs. This suggestion is interesting but more analysis is needed.

Krueger's articles (1997a,b) raised the issue that rules of origin can lead to increased trade diversion. Lipsey and Smith (2011) find that Krueger's analysis is not generally valid and that rules of origin can limit as well as increase trade diversion depending on various empirical quantitative parameters. Baldwin (2011) makes a similar critique of Krueger.

Lipsey and Smith (2011) consider the issue of trade creation and trade diversion in three different cases: 1) Ricardian technologies; 2) factor endowments (Heckscher-Ohlin) or fixed factors such as land of variable fertility; and 3) product differentiation and scale economies in the production of each variant of that product. It is also important to consider both initial formation of the FTA and the subsequent behavior of the partners after the creation of the FTA. The analysis involves a sequence of steps, first the creation of the initial FTA and the subsequent linking of the FTAs through implementation of Cross-Cumulation.

Analysis of Different Technologies

To illustrate, consider a country, A, suffering trade diversion as a result of entering an FTA. It was importing a major product such as automobiles from the rest of the world in spite of its tariffs, while its new partner, B, was producing automobiles at home under its tariff protection. When the FTA is formed, B's auto industry can undersell the tariff-burdened auto imports coming from abroad (assuming they qualify under the RoO). The analysis examines the effects of creation of an FTA on the industry in terms of economic adjustment and restructuring and the political economy effects of the implementation of the FTA.

First, consider the Ricardian case²⁹. Because there was no industry producing autos in A, there are no local protectionist pressures coming from an auto industry located there. After the union, A's tariff revenue from auto imports is eliminated and the external tariff serves only to distort trade flows. These changes set up several political economy pressures for A to reduce its external tariff on autos: (i) since there is no longer a domestic industry to protest tariff reductions on autos, reduction of A's tariff on that product is a good bargaining chip in multilateral or other bilateral or regional liberalizing negotiations; (ii) if after the RTA is formed A reduces its tariff on autos sufficiently, it will restore trade in autos with the outside world and gain in living standards as the lower real-cost producers in the outside world replace the higher-cost producers located in its union partner; and (iii) the shift to sources outside of the RTA will restore some of the tariff revenue that disappeared when its partner displaced the outside world as supplier of X to A (not completely because the tariff must be below its pre-FTA level to make the imported product competitive against B's tariff-free export to A).

²⁹The Ricardian case may seem implausible for automobiles due to product differentiation and scale economies in production facilities such as stamping plants but some countries have highly protected assembly operations which assemble kits with minimal capital investment which correspond to the Ricardian production technology.

Second, consider a homogeneous product produced by price-taking firms with constant returns to scale but with an upward-sloping industry supply curve due to either Heckscher–Ohlin factor market effects or sector-specific factors with diminishing returns. For example, farmland can be shifted between livestock grazing and crops depending on relative prices but some farm land will be infra-marginal and other farm land will be marginal in one of the crops. In this case, there could be some high-cost production in A behind its high MFN tariff. As the tariff is reduced to zero for the FTA partner, imports from the low-cost third-country supplier will shrink and imports will rise from the FTA partner. In this case, there will be trade diversion when imports fall from the low-cost third-country producer to be replaced by imports from the partner B and trade creation from replacing high-cost domestic production in A with lower cost imports from B.

Tariff revenue on the imports from third countries will also be reduced. In terms of the political economy effects, the ‘benefits’ of the MFN tariff in terms of market share and terms of trade effects will accrue primarily to B’s exporters after the FTA is implemented. The political economy effects for A will be similar to those of the classical case discussed above.

Third, consider the important common case of product differentiation and scale economies in the production of each variant of that product. Now what was an either–or case under Ricardian assumptions becomes a matter of degree. All three areas A, B and (the many different parts of) the outside world are likely to have industries producing at least some of the variants of say apparel products (or automobiles but we will focus on apparel here). But because country A is less efficient in apparel than country B, it will likely have a smaller industry than the more efficient industry in B. When the FTA is formed, A’s industry will need to restructure to meet increased price competition from its FTA partner. What happens next depends on how the industry in A responds.

Consider Two Polar Cases

At one extreme, A’s apparel industry was producing at very high cost and is unable to cut its price or restructure sufficiently to respond successfully to increased competition in the FTA. It will lose market share to imports from B. In the extreme case, A’s domestic industry may exit the production of all variants of apparel. Here the political economy effects are similar as those outlined above in the classical case.

At the other extreme, A’s apparel industry is able to respond successfully to both the increased price competition from B and the opening of B’s market. The response will likely take two forms. First, pricing will come closer to costs (whereas before the FTA, A’s industries priced their products just below what the tariff burdened price of imports would have been and restricted output). Oligopolistic industries will face more elastic demand curves as tariffs are reduced and thus will restructure by expanding output by matching marginal revenue to marginal cost. (Eastman and Stykholt (1960) present a classic analysis of how an oligopolistic domestic industry

or foreign multinational enterprises investing in assembly operations to circumvent tariffs, are likely to high margin high cost producers which offer potential for restructuring as trade liberalization occurs. Second, there will be restructuring to produce those variants in which its costs relative to B are the lowest or premium priced specialized products, thus taking advantage of scale economies of longer production runs and product specialization. Intra-industry trade in X will expand among the FTA partners and the unit costs in both A's and B's apparel industry will decline as the industries in both countries gain economies of longer production runs of a smaller set of variants of apparel and/or increased product differentiation. Typically, third-country imports of apparel will shrink. Also, the increased competition between B and A will create incentives for innovation.

The political economy of this case is interesting. The apparel industry's original belief that its continued existence depended on a high tariff will be eroded as it finds that it can stand up to competition from B. Also, it will receive diminishing direct benefits from the high tariff on apparel from third countries because, as the industry becomes more competitive within the FTA with increased specialization, it must also become more competitive with third countries. Although the domestic industry may continue to obtain somewhat higher prices and better profit margins in the domestic market due to the higher MFN tariff, increased competition within the FTA will tend to limit this effect. As A's apparel industry restructures within the FTA and expands exports to its FTA partner, it will become more difficult to make the political case for retaining the high MFN tariff because production and employment will be less directly linked to limiting competition from third- country sources. In some cases where the restructuring of A's apparel industry is particularly successful, the industry will see new opportunities to expand exports through reciprocal negotiations with third countries, either in subsequent FTAs or through multilateral negotiations.

Of course many industries will display different combinations of these two types of responses. The first case where costs are too high for the industry to survive are the Ricardian case, while the restructuring through production specialization and innovation corresponds to the second case. The balance of trade creation and trade diversion will depend on quantitative analysis of outcomes, which will vary over time as industries restructure.

The strong trend to increased intra-industry trade and the expansion of trade volumes with the creation of FTAs provides evidence that except for FTAs involving countries specialized in the production and export of a narrow range of primary products, most FTAs seem to be dominated by trade in specialized and differentiated products. Earlier in the methodology section, the ex post analysis of Kehoe (2003) concludes that the GE models, although theoretically advanced at the time, drastically underestimated the impact of NAFTA in terms of actual increases in the volume of North American trade in manufacturing industries. Much earlier Grubel and Lloyd (1975) had made a similar observation on the surprising expansion of intra-industry trade with the creation of the European Economic Community.

Quantitative Analysis

Quantitative analysis of the impact of FTAs and Customs Unions has been undertaken by Magee (2007). He uses a panel data set to estimate the effects of regional agreements on trade flows controlling for country pair, importer-year, and exporter-year fixed effects.³⁰ These fixed effects are intended to capture all of the determinants of trade flows normally included in gravity model specifications as well as controlling for yearly shocks that affects countries' trade levels. Magee's estimates reveal that the average regional agreement has significant anticipatory effects on trade flows and continues to affect trade flows for up to 11 years after the trade deal begins. The effect of customs unions is more prolonged than for free trade areas.

Magee concludes that while both customs unions and free trade areas have similar impacts on trade after seven years in existence, by year 18 the customs union effect on trade is nearly double that of a FTA. Partial Scope Agreements, on the other hand, lead to much smaller (and statistically insignificant) increases in trade flows, and trade does not begin to rise until after the preferential arrangement has been in place for five years. The dynamic models estimated in Magee's paper suggest that the long-run impacts of regional agreements are more positive than the short-run impacts in general.

Magee's estimates for individual countries reveal that a trade deal can have very different impacts on the countries involved. Countries signing regional agreements with partners who are both nearby and large tend to experience sizable increases in trade while agreements between less natural trading partners have much smaller effects.

The effect of customs unions is more prolonged than for free trade areas. His specific results for NAFTA after year 5 of agreement implementation, are that trade creation is much larger than the modest degree of trade diversion in US imports from Mexico by a ratio of about 40 to 1. Magee does not investigate the question of the cause of the lesser but significant trade effects of FTAs as compared with CUs, but the rules and administration of Rules of Origin would be a likely explanatory factor.

In Section 3.1 Analytical Tools and Methodologies, various criticisms of the use of gravity models to analyze the impacts of FTAs were reviewed. Although Baier and Bergstrand (2008) do not address the welfare effects of FTAs they conclude that there are serious errors in many of the gravity models applied to the analysis of FTAs and apply a number of econometric remedies including the use of panel data. In particular, they conclude that FTAs have much larger impacts on bilateral trade flows (up to five times larger) than was found in the standard gravity model methods.

If cumulation is strictly bilateral in three overlapping FTAs with no diagonal or Cross-Cumulation then the potential liberalization of the trade will be limited. As was

³⁰Magee is using a panel data set and seeks to avoid the specification issues identified by Haveman and Hummels (1998).

discussed earlier the economic welfare effects will depend on the balance of trade creation and trade diversion. If each of the bilateral FTAs in the cumulation group is expected to be trade creating on balance then it is likely that the expansion of liberalization within the FTA zone with full Cross-Cumulation will also be trade creating.

Trefler (2004) finds strong impulses to productivity growth from the creation of the Canada-US FTA. This tends to support the Schumpeterian views of Aghion and Howitt (1998), Lipsey, Carlaw and Becker (2005) and Romer (2004) that the quantitative benefits from economic integration are greater in innovation and technological change are endogenous.

There is a further factor that must be considered. The effect of implementing Cross-Cumulation within overlapping bilateral FTAs is to increase competition within the zone which encourages sourcing from the lowest cost sources within the zone avoiding the artificial segmentation of trade with bilateral RoO. Also increased competition within the zone will stimulate specialization in production and product innovation. Thus, Cross-Cumulation will tend to enhance the trade creation effects of the initial overlapping bilateral FTAs and is unlikely at the margin to increase the degree of trade diversion with the creation of the bilateral FTAs.

5.4 Potential Partners or Groupings for Cross-Cumulation

From an Economic Perspective, which Combinations of Actual and/or Potential FTA Partners would seem to be Promising Candidates for Implementing Cross-Cumulation?

From an economic perspective, Switzerland would benefit from additional FTAs and from extending Cross-Cumulation among existing FTA partners.

In a paper prepared for SECO, Abt The Federal Council's foreign economic policy strategy adopted in 2004 established four criteria for the selection of prospective free trade partners: 1) the current and potential economic importance of the partner country, 2) the extent of existing or potential discrimination that Switzerland would suffer vis-à-vis its main competitors in the market concerned, 3) the willingness of the partner country to enter into negotiations, and 4) political considerations, especially the coherence with Swiss foreign policy objectives.

Although adding more FTA partners to the SWISS-EFTA network of bilateral FTAs is of potential interest, the focus here is on groups of countries which could offer economic benefits and would be promising for implementing Cross-Cumulation.

There are several criteria which need to be considered:

- Economic potential thus large and/or high growth economies are a priority;
- Relatively open trade regime with limited and capped tariff peaks and correlation in the tariff peaks;

-
- Effective and transparent customs administrations; and
 - Commercial and policy interest in participating in Cross-Cumulation.

Of course all potential partners would need to have a network of bilateral FTAs, but among the target countries could be countries where negotiations of an FTA are underway or are prospective.

Clearly there are tradeoffs among these criteria. We consider these for different possible regional groupings and also for global networks. If one focuses on Cross-Cumulation with other partners than the EU our assessment is that the best prospects are three groups of countries that we have targeted. We comment on each briefly.

Americas/Western Hemisphere

The group of Canada, Colombia, Peru, Mexico and Switzerland is an obvious target because there are overlapping networks of FTAs among the group. Canada is already exploring Cross-Cumulation with Colombia and Peru. This group generally meets all of the criteria, but not all members may be willing to go forward at this time. However, a plurilateral approach involving a smaller group could get the process started.

East Asia

The group of China, Japan, Korea and Switzerland clearly has economic potential. Switzerland has the specialized economic potential to be a complementary partner for these economies. EFTA has an FTA with Korea. Switzerland has a bilateral FTA with Japan and is presently negotiating with China. The major challenge will be whether the Asian partners will be willing to explore Cross-Cumulation.

Southeast Asia

The group of Indonesia, Malaysia, Thailand, Singapore and Vietnam are an interesting group. The region is a relative dynamic set of emerging economies but there are differences among them.

Singapore has many FTAs and with its free trade regime could probably agree quickly to any proposed Cross-Cumulation arrangement. Singapore understands the benefits of triangular trade among economies at different levels of development and would encourage other partners in SE Asia to participate or indeed on other continents.

Malaysia is the only country on this list that is not currently negotiating with the EFTA, but it is negotiating along with Singapore and Vietnam with the EU.

European Union

One obvious area for priority for Switzerland is to extend the scope of cumulation is with the European Union. The trade relationship between the EU and Switzerland is well developed with the EU accounting for about three fifths of Swiss exports and more than three quarters of imports by Switzerland. In addition to the bilateral FTA

with the EU, Switzerland participates in the Pan Euro Med network with diagonal cumulation and also participates in cumulation under the EU General System of Preferences (GSP) and the EU Everything But Arms (EBA) preferences for least developed countries.

Although Switzerland has extensive cumulation arrangements with the EU, Switzerland does not participate in cumulation in important EU FTAs such as with Mexico and Korea, nor does it presently seem likely to participate in cumulation with several EU FTA partners with which FTAs have been negotiated but which are not yet in force including with Colombia, Peru, Singapore, the Central American group (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama) and Ukraine. The EU is launching negotiations with Japan and is currently negotiating with Canada, Gulf Cooperation Council, India, Malaysia and Vietnam as well as consolidating the Economic Partnership Arrangements

In light of the significance of the EU in the external trade of Switzerland, it is evident that extending Cross-Cumulation to other EU FTAs such as with Korea that overlap with Switzerland's network of FTAs is a high priority. The reasons are that Swiss exporters are disadvantaged on exports of input products to the EU when the final product is exported to Korea and EU inputs imported to Switzerland may not qualify for the Korea Swiss FTA disadvantaging Swiss producers in the supply chain.

Global Networks

Cross-Cumulation need not be limited to regional groupings. For FTAs that are notified to the WTO under Article XXIV of the GATT 1994, there will be additional gains from linking different partners and deepening the network of Swiss FTA partners on a trans-continental basis.

Cross-Cumulation will take time to negotiate and the involvement of different partners in the process will have a demonstration effect.

The key to implementing Cross-Cumulation will be the willingness of partners to negotiate and to implement Cross-Cumulation.

5.5 What are the Costs and Benefits of Cross-Cumulation at the Firm-level?

The potential effects of Cross-Cumulation for large multinational enterprises, or for SMEs which are well integrated into the world economy, and which are based in Switzerland could involve several aspects.

First, the streamlining and restructuring of supply chains at the margin could enhance the competitiveness of Swiss production of final goods benefiting Swiss consumers or enhancing exports through some lowering of cumulative input costs. This would reflect deepening of the supply relationships on a more flexible basis throughout the network of Swiss/EFTA FTAs. A significant potential benefit of Cross-Cumulation is the increased flexibility with respect to sourcing of supplies among FTA

partners. Set against this potential benefit of Cross-Cumulation is the cost for enterprises to administer and document Cross-Cumulation for input products.

At the same time there could be increased import competition in specific products in the Swiss market but this effect is likely to be very limited because Switzerland already has free trade agreements with the EU, with EFTA and more than 20

Second, the benefits of Cross-Cumulation among groups of FTAs could enhance the market share of some export products in the markets of FTA partners as well as in third countries. Increased potential for export of specialized and innovative intermediate products is an important source of potential benefits for Swiss enterprises including SMEs. With a series of bilateral FTAs, there are opportunities to sell final goods into the partner markets, but the segmentation of markets with overlapping FTAs with separate Rules of Origin, the “hub and spoke” problem, is an obstacle to selling intermediate products into the FTA since the rules of origin are likely to constrain the export in the overlapping FTAs of downstream products incorporating the inputs.

Third introduction of Cross-Cumulation, could enhance the prospects for Swiss exports of complementary goods and services such as capital goods, intellectual property or management services. Improving the business climate for divisional or head office headquarters services based in Switzerland is an important potential benefit.

Fourth, the benefits of Cross-Cumulation may be to enhance the interest of potential FTA partners to join a network of FTAs with Switzerland. This could have benefits for Switzerland, and Swiss-based MNEs either through enhanced opportunities for trade or more especially for enhanced investment opportunities, for expansion of trade in services including intra-enterprise movement of personnel and better protection of intellectual property, which are complementary with, and to some extent distinct from, bilateral merchandise trade flows.

There will be administrative costs for enterprises to administer Cross-Cumulation for Rules of Origin. There also could be benefits in terms of greater security to meet the rules of origin. Thus the additional administrative costs need to be weighed against the benefits of increased flexibility in sourcing both in Switzerland and in operations in the FTA partners, and increased export opportunities for specialized intermediate products.

6 HOW TO MAKE CROSS-CUMULATION OPERATIONAL

6.1 Negotiating Cross-Cumulation

There are several issues that must be taken into consideration while preparing to negotiate Cross-Cumulation. The first matter is that although Cross-Cumulation must normally be negotiated bilaterally, by definition, it involves at least three parties and, in today's international trade context of FTA proliferation, usually many more. That is to say that the three or more parties that have three separate bilateral FTAs with each other must all agree upon basic Cross-Cumulation definitions and administrative procedures.

For these reasons, it is important that the Cross-Cumulation provisions of FTAs be general and generic enough to accommodate the unique legal and regulatory characteristics of additional Cross-Cumulation participants. It is therefore also important that any Cross-Cumulation amendments can be achieved simply and without the necessity of FTA re-negotiations. It is recommended that both parties map the common FTA parties they have in common to see if any of these unique accommodations can be anticipated. This mapping process should also be extremely helpful in identifying what imported inputs could be used as originating materials under Cross-Cumulation and what exported outputs could be used as originating materials in a Cross-Cumulation context. This information and data, some of it only available from the private sector, will provide focus and strategic intent for Cross-Cumulation negotiators. We have utilized the IADB data base for this purpose and it could be a useful tool for this purpose.

Furthermore, given that Cross-Cumulation by definition does not require or impose the use of identical rules of origin, it is important that there be flexibility to agree that identified "sensitive" goods, – where there are significant variations in MFN tariff regimes and/or non-tariff measures and variation in rules of origin --, be excluded from the general Cross-Cumulation provisions and be subject to specific provisions. Otherwise, the entire Cross-Cumulation exercise could be delayed or held hostage over the fears of special interest lobbies whose explicit intent in pre-existing FTAs was to protect or promote their intermediate products. However "practical" or "expedient" such exclusions might be in order to implement the benefits of Cross-Cumulation expeditiously; it is also the case that complicated patterns of exclusions and exemptions or special provisions can be costly and confusing to both traders and administrators alike. Therefore, it is desirable for negotiators to agree upon conditions under which such exceptions can be phased-out. For example the criteria that once a product and all its inputs have become duty free in a number of overlapping FTAs could be considered as possible time frame given that they already reflect the previously negotiated concerns of domestic industry and that the industry has adjusted to competitive challenges.

It is also important to note that once the principles of Cross-Cumulation have been accepted that most of the remaining issues are technical customs matters so these

authorities and those responsible for origin verification be involved in the Cross-Cumulation negotiation process from the beginning. It is also desirable to develop agreed procedures for verification and audit of Cross-Cumulation provisions if the goal of achieving predictability of the trade regime in order to stimulate expansion of trade and investment flows is achieved.

6.2 Implementing Cross-Cumulation

The following points need to be considered in implementing Cross-Cumulation.

- Public notification, awareness initiatives and training.
- Training should focus on previously identified sectors and third-party service providers to domestic industry who import and export (logistics firms, freight forwarders, customs brokers, trade associations).
- Public awareness should include detailed Interpretive Bulletins.
- A grace period (in the absence of fraud and/or gross negligence) for origin verifications that involve Cross-Cumulation.
- Determining, proving and certifying origin in a bi-lateral cumulation context normally involves the importer requesting origin documentation from the exporter of a product – origin data being retrieved from the upstream supply chain. These activities will become somewhat more complicated in a Cross-Cumulation scenario wherein a domestic producer might not be aware of how or when his goods may be used in the manufacture of a product for export to a third country. In light of these issues, consideration could be given to helping domestic producers design systems to “broadcast” the origin information relating to their exports through communicating with potential suppliers or providing information in procurement notices through such means as including origin requirements in tender documents or providing information on their website. This would allow any and all downstream users to better exploit the Cross-Cumulation potential of imported inputs and thereby promote domestic exports at the same time.

The private sector through trade associations or industry bodies could facilitate the development of minimum origin data set requirements such as: tariff classification of inputs to make exported products; tariff classification of exported products; simple description of the process the imported inputs went through in the process of producing the exported goods and possibly some basic and confidential value added statements/calculations. Minimum origin data sets could be established as a matter of domestic policy and/or negotiated with Cross-Cumulation partners. While governments may be unable or unwilling to develop such data sets, it is important to note that private companies and industry associations are developing more sophisticated methods for tracing supply chains and provenance.

Often complaints are made that SMEs at different stages of the supply chain are not aware of origin requirements or how to document the originating content.

6.3 Certification of Cross-Cumulation

Cross-Cumulation should seek to avoid requiring any new forms of origin certification as all parties would continue to use the certification techniques and procedures established bilaterally.

However, unlike diagonal cumulation, full Cross-Cumulation explicitly promotes the cumulation not only of originating inputs and imports but also the originating **content** found in non-originating inputs which are exported to partners in overlapping FTAs. One of the implications of this full cumulation situation is that a non-originating export (that contains some origin content) may be shipped from country A to country B without any origin certification and then this “uncertified” origin content may be used in country B to produce an originating product for export to country C. How can the customs authorities (or the importer/purchaser for that matter) in county C become satisfied that the imported goods actually originate under the Cross-Cumulation regulations? How can the authorities in country C perform origin verifications in country A if the only origin declaration was between B and C?

In one sense, these complications are already partially addressed within FTAs that feature full cumulation such as the NAFTA. Under NAFTA Mexico might import a product that is further processed in Mexico but not sufficiently to substantially transform or originate the good at time of export to the United States. However, under full cumulation conditions the US manufacture may use the originating content of the Mexican import to produce an originating product for export to Canada and can produce a certificate of origin to this effect. Under this NAFTA scenario, the Canadian customs authorities can question and investigate the certificate of origin. This investigation can and does include a review of the documentation used to support the origin content from Mexico just as the Canadian authorities would review the information from all suppliers. When it is determined by the Canadian authorities that the Mexican content information and documentation is unsatisfactory then origin will be denied by Canada customs.

This approach differs from the current EU treatment of cumulation in that there is no prescribed “Supplier’s Declaration” form and although Canadian verification teams are allowed to visit the United States to audit the US exporter’s certificate of origin in the above-mentioned NAFTA example, they do not have the authority to perform an audit in Mexico to verify the origin content of the Mexican inputs. This is unfortunate because in those instances where there is doubt about an origin content (or originating product) claim by a third party and the customs authorities cannot perform on site audits to satisfy their doubts then in most cases origin is simply denied.

Allowing customs verifications by the third party authorities in the country of the first party in a Cross-Cumulation string (i.e. C performs verifications in A) might prove difficult to negotiate and expensive to implement. A practical alternative would be to

have Cross-Cumulation partners agree that supplier's declarations (preferably with standardized invoice wording as opposed to specified form) would be subject to origin verification in the same fashion as would be a certification of origin. In that way, if country C had doubts about the origin content of country A in country B's certificate of origin, then C could ask B to investigate A's origin content under the procedures established under B's and A's existing FTA.

This problem would not arise under the Mutual Recognition approach to Cross-Cumulation. In that case the certificate of origin for the export

Verification and audit need to be flexible to avoid imposing undue burdens on either customs authorities or enterprises engaged in supply chains. One solution is to rely upon the partner verification and audit process. Audit processes need to be reasonable and avoid the presumption of guilt.

On occasion customs authorities take a "deconstructionist" approach to origin and seek technical errors and discrepancies to disallow origin for products. To some officials this is perceived as doing their job and is intended to collect government revenues or to respond to pressure from domestic interests. In other cases this approach is a technique to extract bribes.

The key policy and practical point, is that Cross-Cumulation is likely to work if there is a serious willingness to build flexibly on existing agreements and existing processes and there are agreed and effective procedures for verification and audit.

7 APPENDICES

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7.2 Technical Notes and Texts of Agreements and Regulations

CANADA – EFTA FREE TRADE AGREEMENT

Article 5

Tolerance

1. Notwithstanding paragraph 1 of Article 4 and except for a product of Chapter 50 through 63, a product shall be considered as originating, where the value of all non-originating materials used in the production of the product that do not undergo the applicable change in tariff classification or fulfil any other condition set out in Appendix I, does not exceed 10 % of the transaction value or ex-works price of the product, provided that:

(a) if the rule of Appendix I applicable to the product contains a percentage for the maximum value of non-originating materials, the value of such non-originating materials shall be included in calculating the value of non-originating materials; and

(b) the product satisfies all other applicable requirements of this Annex.

Article 9

Accounting segregation of fungible materials

1. For the purposes of determining whether a product originates, when originating and non-originating fungible materials are used in production, the determination of whether the materials used are originating need not be made through physical separation and identification of any specific fungible material, but may be determined on the basis of an inventory management system.

Cumulation: The Intra-PTA Basics

The basic premise behind all origin negotiations and legislation is that goods that are wholly produced entirely in a country or that are substantially transformed according to the applicable rules of origin are goods that are to be considered as originating. Cumulation allows parties to a PTA to share production and thereby jointly satisfy the required rule of origin. In this sense cumulation expands and facilitates this basic premise by explicitly allowing aggregate production in either PTA country.

Naturally, cumulation (often referred to as accumulation in the North American sphere) comes in different forms and formats depending on the exact nature and wording found within any particular PTA. The following outlines some of the general types of accumulation complete with corresponding definitions:

Full Cumulation

Under most commonly accepted definitions, full cumulation (occasionally referred to as total cumulation) allows all stages of the processing and transformation of a product to be considered as qualifying regardless of where they occur within a PTA area. Simply stated, full cumulation only demands that applicable origin requirements be satisfied within the preferential trade zone as a whole as opposed to being satisfied within the territory of any particular preferential trade agreement party. In this sense, full cumulation considers the parties of a PTA to be a single territory and thereby allows the cumulation of production processes within a free trade zone and not just the cumulation of originating goods between PTA members:

Article 21 of the Canada – EFTA Free Trade Agreement

Accumulation

1. If a material that has undergone production in the territory of a Party **without obtaining originating status** is used in the territory of another Party in the production of an originating product, the production carried out in the territory of the first Party on that material may be taken into consideration in the territory of the other Party with respect to the originating status of the product (emphasis added).

2. At the time of completion of an origin declaration for a product referred to in paragraph 1, the exporter shall possess all documents provided with respect to the production carried out in the territory of another Party on that material as part of the documents supporting the originating status of the product.

3. The documents with respect to the production carried out on a non-originating material, referred to in paragraph 2, shall be completed in a legible and permanent form, signed or otherwise endorsed by the producer and describe that material in sufficient detail to be identified.

Article 404: Accumulation (North American Free Trade Agreement – NAFTA)

- a. For purposes of determining whether a good is an originating good, the production of the good in the territory of one or more of the Parties by one or more producers shall, at the choice of the exporter or producer of the good for which preferential tariff treatment is claimed, be considered to have been performed in the territory of any of the Parties by that exporter or producer, provided that:
 - i. all non-originating materials used in the production of the good undergo an applicable tariff classification change set out in Annex 401, and the good satisfies any applicable regional value-content requirement, entirely in the territory of one or more of the Parties; and
 - ii. the good satisfies all other applicable requirements of this Chapter.

Example of Full Cumulation as found in the NAFTA Rules of Origin Regulations

Producer A, located in NAFTA country A imports non-originating cotton, carded or combed, of heading 52.03 for use in the production of cotton yarn of heading 52.05. Because the change from cotton, carded or combed, to cotton yarn is a change within the same chapter, the cotton does not satisfy the applicable change in tariff classification for heading 52.05, which is a change from any

other chapter, with certain exceptions. Therefore, the cotton yarn that Producer A produces from non-originating cotton is a non-originating good.

Producer A then sells the non-originating cotton yarn to Producer B, also located in NAFTA country A, who uses the cotton yarn in the production of woven fabric of cotton of heading 52.08. The change from non-originating cotton yarn to woven fabric of cotton is insufficient to satisfy the applicable change in tariff classification for heading 52.08, which is a change from any heading outside headings 52.08 through 52.12, except from certain headings, under which various yarns, including cotton yarn of heading 52.05, are classified. Therefore, the woven fabric of cotton that Producer B produces from non-originating cotton yarn produced by Producer A is a non-originating good.

However, under subsection 14(1), if Producer B chooses to accumulate the production of Producer A, the production of Producer A would be considered to have been performed by Producer B. The rule for heading 52.08, under which the cotton fabric is classified, does not exclude a change from heading 52.03, under which carded or combed cotton is classified. Therefore, under subsection 14(1), the change from carded or combed cotton of heading 52.03 to the woven fabric of cotton of heading 52.08 would satisfy the applicable change of tariff classification for heading 52.08. The woven fabric of cotton would be considered as an originating good.

<http://laws-lois.justice.gc.ca/PDF/SOR-94-14.pdf>

Partial Cumulation

Partial cumulation allows parties to a PTA to aggregate production but, unlike full cumulation described above, this can **only be achieved with originating products or materials** that have already obtained originating status in accordance with the applicable rules of origin within a PTA. In this sense, partial cumulation implies that goods originating in the territory of one member of a PTA can be considered as originating in any other PTA member(s) territory. Partial cumulation is likely the most common form of cumulation.

Example: A pullover of HS heading 61.10 is manufactured in country A by sewing together knitted fabrics originating in country B. According to the free trade agreement between these two countries, the specific rule of origin for pullover requires manufacturing from yarn in order that origin is conferred to the pullover. The simple manufacturing process of sewing together knitted fabrics in country A would not confer origin and the pullover would have to be considered as non-originating. Nonetheless, the pullover is considered to be originating since it was manufactured with originating fabrics from country B following bilateral cumulation provision in the free trade agreement.

http://www.wcoomd.org/origin/01_study/31_study_annex/31_cum_bil.pdf

Partial cumulation is often referred to as bilateral cumulation that occurs between two countries. This can be slightly confusing in that “bilateral” cumulation between more than two parties. Furthermore, it is also clearly a fact and a possibility that you can have full cumulation in a bilateral PTA. The expression “bilateral cumulation” seems to confuse the description of the type of PTA with the type cumulation that a PTA allows. For these reasons it might be clearer if both criteria were used in describing different cumulation

scenarios. For example: **partial bilateral cumulation** (originating materials can be cumulated between the two parties of a PTA) or **full bilateral cumulation** (applicable origin requirements must be satisfied within the preferential trade zone as a whole).

7.3 List of FTAs Concluded by EFTA and Switzerland

List of Free Trade Agreements of Switzerland

State Secretariat for Economic Affairs

Free Trade Agreements / EFTA unit, 1 October 2012

Free Trade Agreements of Switzerland¹

Europe	Status / comments
EFTA-Convention	Entry into force: 3 May 1960
European Community (EC)	Entry into force: 1 January 1973; bilateral CH-EC
Faeroe Islands	Entry into force: 1 March 1995; bilateral CH-Faeroe
Macedonia	Entry into force: 1 May 2002
Croatia	Entry into force: 1 September 2002
Albania	Entry into force on 1 November 2010
Serbia	Entry into force on 1 October 2010
Ukraine	Entry into force on 1 June 2012
Montenegro	Entry into force on 1 September 2012
Customs union Russia -Belarus-In negotiations Kazakhstan	
Bosnia-Herzegovina	In negotiations
Mediterranean basin	
Turkey	Entry into force: 1 April 1992
Israel	Entry into force: 1 July 1993
Palestinian Authority	Entry into force: 1 July 1999
Morocco	Entry into force: 1 December 1999
Jordan	Entry into force: 1 September 2002
Tunisia	Application since 1 June 2005 ; Entry into force: 1 June 2006
Lebanon	Entry into force: 1 January 2007
Egypt	Application since 1 August 2007. Entry into force: 1 September 2008
Algeria	In negotiations
Worldwide	
Mexico	Entry into force: 1 July 2001
Singapore	Entry into force: 1 January 2003
Chile	Entry into force: 1 December 2004
Republic of Korea	Entry into force: 1 September 2006
SACU ²	Entry into force: 1 May 2008
Canada	Entry into force: 1 July 2009
Japan	Entry into force: 1 September 2009. Bilateral CH- Japan
Colombia	Entry into force: 1 July 2011
Peru	Entry into force: 1 July 2011
Hong Kong	Entry into force: 1 October 2012
Cooperation Council for the	Signed: 22 June 2009, in ratification process on

Arab States of the Gulf (GCC)³	the GCC side
Thailand	In negotiations
Indonesia	In negotiations
India	In negotiations
China	In negotiations, bilateral CH-China
Central American States⁴	In negotiations
Vietnam	In negotiations

The EFTA States have signed Declarations on cooperation with the following partners: the MERCOSUR States (Argentina, Brazil, Paraguay, Uruguay), Mongolia, Mauritius, Malaysia, Panama and Georgia.

1. Without indication, the agreements have been concluded within the framework of EFTA.
2. South African Custom Union: South Africa, Botswana, Lesotho, Namibia and Swaziland.
3. Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.
4. Costa Rica, Guatemala, Honduras and Panama.

7.4 Statistical Tables

Table 7.1: Western Hemisphere (WH) Group Trade in Chapter 90 Optical Photographic, Cinematographic, Measuring, Checking, Precision, Medical or Surgical Instruments and Apparatus; Parts and Accessories thereof

Note that Swiss exports for the input products or materials are at the global level.

WH Product	WH MFN	WH Exports	CHE Materials	WH MFN	CHE Export
901839	0,3,7	4,994,327	390529	0,7,15	341,569
Catheters, cannulae and the like			390760	0,4,8	142,434
			390799	0,4,15	428,288
901890	0,3,6	5,529,727	381230	0,5,12	707,751
Instruments and appliances used in medical, surgical, dental or veterinary sciences, including scintigraphic apparatus, other electro-medical apparatus and sight-testing instruments.- Other instruments and appliances			390690	0,6,10	159,939
			392310	3,10,20	288,756
			392329	0,7,20	159,379
			401693	0,6,15	145,928
			401699	1,6,14	243,925
			491110	0,8,20	539,502
			722300	0,3,10	250,089
			731829	0,6,15	698,510
			740721	0,5,10	104,281
			850511	0,3,10	137,657
			901890	0,3,6	2,892,864
903289	0,4,11	4,443,134	390799	0,4,15	428,288
Automatic regulating or controlling instruments and apparatus.-- Other			731815	0,5,15	829,552
			732690	0,3,10	1,184,886
			760120	0,2,6	111,688
			850490	0,3,10	399,322
			850511	0,3,10	137,657
			850590	0,2,6	239,599
			852990	0,2,6	348,230
			853090	0,3,10	120,050
			853190	0,3,10	180,587
			853400	0,3,10	740,425
			853641	0,3,10	275,829

WH Product	WH MFN	WH Exports	CHE Materials	WH MFN	CHE Export
			853650	0,2,8	1,088,580
			853690	0,3,11	1,251,626
			853890	0,3,10	2,356,981
			854110	0,2,6	131,127
			854130	0,2,6	234,734
			854449	1,5,15	955,009
			901600	0,2,6	291,052
			903090	0,2,6	112,243
			903290	0,3,8	152,331

Notes: WH includes Canada, Mexico, Colombia, Peru, and Chile

Export data for 2007-2009, figures are 3-year totals in \$000.

MFN Tariffs (Minimum, Average, Maximum) based on 2010 figures. Specific tariffs omitted.

WH Exports only include products with >\$600M/year (2B over 3 years)

CHE Materials only include products with >\$30M/Year (100M over 3 years)

Table 7.2: Chapter 84 Trade in the Western Hemisphere Block of Nuclear Reactors, Boilers, Machinery and Mechanical Appliances; Parts thereof Trade in the Western Hemisphere Group and Swiss Global Exports of Inputs

WH Product	WH MFN	WH Exports	CHE Materials (HS Code)	WH MFN	CHE Export \$ 000
840734	0,3,10	11,084,355	721113	0,4,10	199,947
Spark-ignition reciprocating or rotary internal combustion piston engines.-- Of a cylinder capacity exceeding 1,000 cc			721310	0,5,15	162,792
			721320	0,4,10	268,441
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359
			730640	0,3,10	168,406
840991	0,3,10	6,781,158	391990	0,7,20	294,332
Parts suitable for use solely or principally with the engines of heading 84.07 or 84.08.-- Suitable for use solely or principally with spark-ignition internal combustion piston engines			680422	0,4,15	208,867
			721113	0,4,10	199,947
			721310	0,5,15	162,792
			721320	0,4,10	268,441
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359
			730640	0,3,10	168,406
			731815	0,5,15	829,552
			732510	0,5,15	121,162
			740721	0,5,10	104,281
			820770	0,2,6	321,998
820900	0,4,15	213,921			
846693	0,2,6	1,482,046			

WH Product	WH MFN	WH Exports	CHE Materials (HS Code)	WH MFN	CHE Export \$ 000
840999	0,2,6	3,538,380	721113	0,4,10	199,947
Parts suitable for use solely or principally with the engines of heading 84.07 or 84.08-- Other			721310	0,5,15	162,792
			721320	0,4,10	268,441
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359
			730640	0,3,10	168,406
841480	0,4,13	2,038,301	721113	0,4,10	199,947
Air or vacuum pumps, air or other gas compressors and fans; ventilating or recycling hoods incorporating a fan, whether or not fitted with filters.- Other			721310	0,5,15	162,792
			721320	0,4,10	268,441
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359
			730640	0,3,10	168,406
841590	0,3,10	2,373,739	392329	0,7,20	159,379
Air conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, including those machines in which the humidity cannot be separately regulated.- Parts			760711	0,4,10	103,748
841810	4,12,20	4,211,465	320890	0,6,15	319,495
- Combined refrigerator-freezers, fitted with separate external doors			390950	0,7,15	689,288
			721113	0,4,10	199,947
			721310	0,5,15	162,792
			721320	0,4,10	268,441

WH Product	WH MFN	WH Exports	CHE Materials (HS Code)	WH MFN	CHE Export \$ 000
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359
			730640	0,3,10	168,406
			850110	0,2,7	1,972,152
			850131	0,3,6	219,932
			850152	0,3,10	199,695
			850422	0,5,15	267,449
			850434	0,5,15	260,665
			850450	0,3,12	130,405
			850490	0,3,10	399,322
			850610	0,5,10	276,653
			850650	0,4,9	141,532
			850780	0,6,15	176,259
			853521	0,4,15	135,750
			853530	0,4,15	1,768,075
			853590	0,3,10	435,476
			853620	0,4,15	123,105
			853641	0,3,10	275,829
			853649	0,3,11	246,968
			853650	0,2,8	1,088,580
			853669	0,4,15	1,436,685
			853690	0,3,11	1,251,626
			853710	0,5,15	1,584,406
			853810	0,4,15	104,518
			853890	0,3,10	2,356,981
			854449	1,5,15	955,009
			903210	0,2,6	179,720

WH Product	WH MFN	WH Exports	CHE Materials (HS Code)	WH MFN	CHE Export \$ 000
842139	0,4,11	3,904,066	320990	0,7,15	113,575
- Filtering or purifying machinery and apparatus for gases :-- Other			731815	0,5,15	829,552
			760120	0,2,6	111,688
			760200	0,2,6	545,058
			842139	0,4,11	182,045
			842199	0,3,12	541,006
			848110	0,6,15	101,170
			848180	0,4,13	1,458,547
			902620	0,5,15	638,362
			903290	0,3,8	152,331
			843143	0,3,10	3,366,471
-- Parts for boring or sinking machinery of subheading 8430.41 or 8430.49			721310	0,5,15	162,792
			721320	0,4,10	268,441
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359
			730640	0,3,10	168,406
843149	0,2,6	2,430,461	320890	0,6,15	319,495
Parts suitable for use solely or principally with Of machinery of heading 84.26, 84.29 or 84.30:-- Other			721113	0,4,10	199,947
			721310	0,5,15	162,792
			721320	0,4,10	268,441
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359

WH Product	WH MFN	WH Exports	CHE Materials (HS Code)	WH MFN	CHE Export \$ 000
			730640	0,3,10	168,406
847130	0,2,6	2,222,453	847160	0,2,6	115,108
- Portable automatic data processing machines, weighing not more than 10 kg, consisting of a least a central processing unit, a keyboard and a display			847170	0,2,6	142,232
			847180	0,2,6	155,815
			850490	0,3,10	399,322
			850511	0,3,10	137,657
			850590	0,2,6	239,599
			852990	0,2,6	348,230
			853090	0,3,10	120,050
			853190	0,3,10	180,587
			853650	0,2,8	1,088,580
			901600	0,2,6	291,052
			903090	0,2,6	112,243
			903290	0,3,8	152,331
			847141	0,2,6	3,101,966
- Other automatic data processing machines:-- Comprising in the same housing at least a central processing unit and an input and output unit, whether or not combined			847170	0,2,6	142,232
			847180	0,2,6	155,815
			850490	0,3,10	399,322
			850511	0,3,10	137,657
			850590	0,2,6	239,599
			852990	0,2,6	348,230
			853090	0,3,10	120,050
			853190	0,3,10	180,587
			853650	0,2,8	1,088,580
			901600	0,2,6	291,052
			903090	0,2,6	112,243
			903290	0,3,8	152,331
			847149	0,2,6	5,295,378
- Other automatic data processing machines:-- Other, presented in the form of systems			847170	0,2,6	142,232
			847180	0,2,6	155,815
			850490	0,3,10	399,322
			850511	0,3,10	137,657

WH Product	WH MFN	WH Exports	CHE Materials (HS Code)	WH MFN	CHE Export \$ 000
			850590	0,2,6	239,599
			852990	0,2,6	348,230
			853090	0,3,10	120,050
			853190	0,3,10	180,587
			853650	0,2,8	1,088,580
			901600	0,2,6	291,052
			903090	0,2,6	112,243
			903290	0,3,8	152,331
847150	0,2,6	8,740,466	847160	0,2,6	115,108
- Processing units other than those of sub-heading 8471.41 or 8471.49, whether or not containing in the same housing one or two of the following types of unit: storage units, input units, output units			847170	0,2,6	142,232
			847180	0,2,6	155,815
			850490	0,3,10	399,322
			850511	0,3,10	137,657
			850590	0,2,6	239,599
			852990	0,2,6	348,230
			853090	0,3,10	120,050
			853190	0,3,10	180,587
			853650	0,2,8	1,088,580
			901600	0,2,6	291,052
			903090	0,2,6	112,243
			903290	0,3,8	152,331
			847160	0,2,6	2,654,530
- Input or output units, whether or not containing storage units in the same housing			847170	0,2,6	142,232
			847180	0,2,6	155,815
			850490	0,3,10	399,322
			850511	0,3,10	137,657
			850590	0,2,6	239,599
			852990	0,2,6	348,230
			853090	0,3,10	120,050
			853190	0,3,10	180,587
			853650	0,2,8	1,088,580
			901600	0,2,6	291,052

WH Product	WH MFN	WH Exports	CHE Materials (HS Code)	WH MFN	CHE Export \$ 000
			903090	0,2,6	112,243
			903290	0,3,8	152,331
847989	0,4,8	3,041,401	721113	0,4,10	199,947
- Other machines and mechanical appliances:-- Other			721310	0,5,15	162,792
			721320	0,4,10	268,441
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359
			730640	0,3,10	168,406
			848071	0,2,6	2,080,626
- Moulds for rubber or plastics:-- Injection or compression types			721113	0,4,10	199,947
			721310	0,5,15	162,792
			721320	0,4,10	268,441
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359
			730640	0,3,10	168,406
			731815	0,5,15	829,552
			740710	0,5,10	197,656
			740729	0,5,10	107,693
847790	0,3,10	644,796			
848180	0,4,13	5,051,805	320411	0,3,10	131,988
- Other appliances			320417	0,5,10	995,733
			320810	6,9,15	117,902

WH Product	WH MFN	WH Exports	CHE Materials (HS Code)	WH MFN	CHE Export \$ 000
			320890	0,6,15	319,495
			321000	0,6,15	134,451
			340399	0,7,15	151,290
			390529	0,7,15	341,569
			390690	0,6,10	159,939
			390730	0,6,15	834,044
			390760	0,4,8	142,434
			390799	0,4,15	428,288
			390950	0,7,15	689,288
			391739	0,5,20	267,205
			391910	0,7,20	175,650
			391990	0,7,20	294,332
			392329	0,7,20	159,379
			401693	0,6,15	145,928
			401699	1,6,14	243,925
			721113	0,4,10	199,947
			721310	0,5,15	162,792
			721320	0,4,10	268,441
			721399	0,3,7	118,725
			721499	0,3,7	256,694
			721510	0,3,7	249,282
			722220	0,1,6	274,163
			722300	0,3,10	250,089
			722790	0,3,6	125,052
			722830	0,3,10	139,027
			730630	0,4,10	907,359
			730640	0,3,10	168,406
			730729	0,4,15	156,127
			731814	0,6,15	356,877
			731815	0,5,15	829,552
			731819	0,6,15	457,037
			732020	0,6,15	159,615

WH Product	WH MFN	WH Exports		CHE Materials (HS Code)	WH MFN	CHE Export \$ 000
				732510	0,5,15	121,162
				732619	0,4,15	145,370
				732690	0,3,10	1,184,886
				740721	0,5,10	104,281
				740729	0,5,10	107,693
				741999	1,4,8	245,609
				760120	0,2,6	111,688
				760200	0,2,6	545,058
				848190	0,2,7	725,870
				848210	0,2,6	239,168

Export data for 2007-2009, figures are 3-year totals in \$000.

MFN Tariffs (Minimum, Average, Maximum) based on 2010 figures. Specific tariffs omitted.

WH Exports only include products with >\$600M/year (2B over 3 years)

CHE Materials only include products with >\$30M/Year (100M over 3 years)

7.5 Abbreviations and Acronyms

ACP:	Africa Caribbean and Pacific countries
ASEAN:	Association of South East Asian Nations
CAP:	Common Agricultural Policy (of the European Union)
CF:	Control Function
CHE:	ISO Country Code for Switzerland
CGE:	Computable General Equilibrium
CS:	Civil society
CSD:	Commission on Sustainable Development
CU:	Customs Union
DCs:	Developing Countries
DDA:	Doha Development Agenda
DGs:	Directorate Generals of the European Commission
DOTS:	Direction of Trade Statistics
EBA:	Everything But Arms
EC:	European Commission
EFTA:	European Free Trade Association
EIAs:	Economic Integration Agreements
EPAs:	Economic Partnership Agreements
EU:	European Union
EU-15:	European Union Member States prior to 2004
EU-25:	European Union Member States prior to 2007
EU-27:	European Union Member States since 2007
FDI:	Foreign Direct Investment
FTA:	Free Trade Area
GATS:	General Agreement on Trade in Services
GATT:	General Agreement on Tariffs and Trade
GATT 1947:	General Agreement on Tariffs and Trade (from 1947 until 1994)
GATT 1994:	General Agreement on Tariffs and Trade (from 1994)
GDP:	Gross Domestic Product
GSP:	Generalized System of Preferences
HS:	Harmonized System
IMF:	International Monetary Fund
IPR:	Intellectual Property Rights
IV:	Instrumental Variables
ISO:	Greek letter denoting the International Standards Organization
LDCs:	Least Developed Countries
MFN:	Most Favoured Nation
MNCs:	Multinational Corporations
NGOs:	Non-Governmental Organizations
NAFTA:	North America Free Trade Agreement
NTB:	Non-Tariff Barriers
NTM:	Non-Tariff Measures

OECD:	Organization for Economic Co-operation and Development
OPZs:	Outward processing zones
PECS:	Pan European Cumulation System
PTA:	Preferential Trade Agreement
R&D:	Research and Development
ROO:	Rules of Origin
RTA:	Regional Trade Agreement
RTR:	Reciprocal Tariff Reductions
SECO:	State Secretariat for Economic Affairs
SIC:	Standard Industrial Classification
SITC:	Standard International Trade Classification
SMEs:	Small and Medium Enterprises
SPS:	Sanitary and Phytosanitary Measures
TOR:	Terms of Reference
TRIPS:	Trade-Related aspects of Intellectual Property rights
WB:	World Bank
WH:	Western Hemisphere
WTO:	World Trade Organization

7.6 Glossary of Key Terms

DIAGONAL CUMULATION

The system of diagonal cumulation (the use of inputs which are originating in the other partner countries / entities of the pan-European cumulation system (EU, EFTA and Turkey) as originating input of the manufacturing country) according to the free trade agreement concluded between these countries / entity is gradually being expanded to the countries participating in the Euro-Mediterranean partnership (the Faeroe Islands¹, the Mediterranean countries Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia and the Palestinian Authority of the West Bank and Gaza Strip).

Diagonal cumulation is possible under the following preconditions:

- There must be free trade agreements between all countries participating in the acquisition of originating status of the final product and of the country of destination;
- The Euro-Med Origin protocol must be applicable by all those countries;
- The application of diagonal cumulation between the countries / entity involved are published (publication in the Official Journal of the European Union (C series) and the partner countries according to their own procedures).

The use of input materials from a country which does not apply the Euro-Med Origin protocol is considered to be non-originating in the context of the Euro-Med cumulation system. Diagonal cumulation may only be applied between those countries / entities which have already concluded free trade agreements between each other and have implemented the Euro-Med origin protocol (identical rules of origin). This means that the Euro-Med cumulation network will gradually be extended with the application of diagonal cumulation between a limited number of countries even before all free trade agreements with identical Euro-Med origin protocols will be operational (variable geometry).

In order to trace back the different origin of the input materials used, a specific proof of origin was created, the Euro-Med origin. The pan-European origin used for diagonal cumulation purposes with the EUR.1 certificates continues to be applied for the trade between EC, EFTA and Turkey.

FULL CUMULATION

“Full cumulation” gives the possibility to aggregate different origin conferring manufacturing stages or production processes done in different parties of a free trade zone. The European Economic Area (EEA Agreement) provides ground for full cumulation between its Contracting Parties allowing the three EFTA countries Iceland, Norway and Liechtenstein (except Switzerland) to participate in the single

European market. Full cumulation was also established between some Mediterranean countries and the EC or EFTA States. Despite the accession of the Mediterranean countries to the diagonal cumulation system within the Euro-Med framework, some Mediterranean countries keep the concept of full cumulation in their bilateral trade relations with the EC and EFTA.

Under full accumulation / cumulation all stages of processing or transformation of a product within a free trade zone can be counted as qualifying operation in the manufacturing of an originating good, regardless of whether the processing is sufficient to confer originating status to the materials themselves. This means that all operations carried out in the participating countries of a free trade zone are taken into account for origin determination purposes. While bilateral and diagonal accumulation / cumulation require that only originating goods can be considered as input for accumulation / cumulation purposes in another partner country, this is not the case with full accumulation / cumulation. **Full cumulation simply demands that the origin requirements are fulfilled within the preferential trade zone as a whole** (i.e. the area of all participating countries is considered as one area for origin determination). Full accumulation / cumulation makes it possible that a product originating in a third country and having undergoing successive working and processing which is insufficient in several countries of the same preferential zone to acquire the status of an "originating product" provided all this working together constitutes a sufficient transformation.

Full accumulation / cumulation allows for greater fragmentation of the production process than the more commonly used bilateral and diagonal accumulation / cumulation and hence is less restrictive since all content is counted, but it can be more costly to document and to verify.

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