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and the
FREE TRADE AREAS
of the
AMERICAS**

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Brazil, Mercosur and the Free Trade Area of the Americas

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Coordenação Editorial

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Cep: 70076-900 – Brasília-DF

Fone: (61) 315 5374 – Fax: (61) 315 5314

E-mail: editbsb@ipea.gov.br

Home page: <http://www.ipea.gov.br>

Serviço Editorial

Rio de Janeiro

Av. Presidente Antônio Carlos, 51 – 14º andar

Cep: 20020-010 – Rio de Janeiro-RJ

Fone: (21) 804 8118 – Fax: (21) 220 5533

E-mail: editrj@ipea.gov.br

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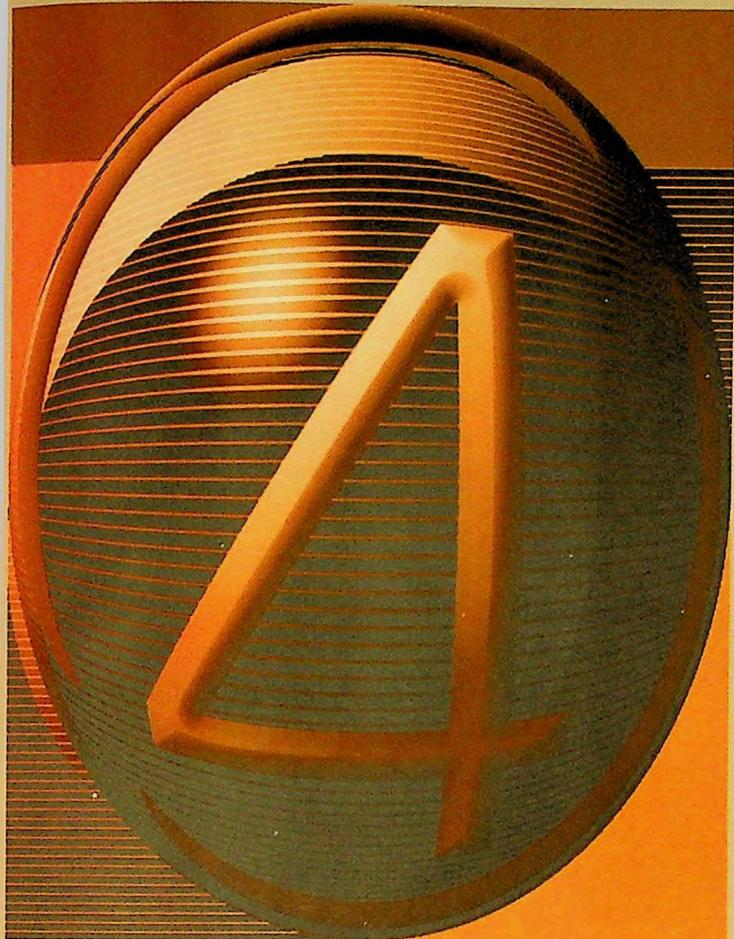
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TELECOMMUNICATIONS SYSTEMS, THE FTAA AND THE MERCOSUR: ISSUES AND QUESTIONS

Renato G. Flores Jr.

1. Introduction

THE PRESSURE FOR NEGOTIATING a Free Trade Area for the Americas – FTAA seems to overlook the huge diversity of the prospective members, the fundamental asymmetry of the US presence, and the varying degrees of common interests, depending on the sectors and issues at stake. Telecommunication services, a major and extremely peculiar representative of the services group, is particularly fit for illustrating the difficulty of achieving such an elusive integration.

This paper tries to demonstrate the huge gap between FTAA's and MERCOSUR's interests, and the main consequences that may ensue, if a hasty negotiation on telecommunications takes place. To build the argument, we begin by setting a framework for analysis, based on a historical and political economy view of the telecommunications services evolution. Though necessarily sketchy, section 2 raises a few points that will orient the main conclusions in the whole paper. Section 3, discusses the telecoms chapter of the NAFTA. The analysis is made by contrasting it with the outcome of the World Trade Organization – WTO negotiations at the Negotiating Group on Telecommunications. We think that the NAFTA chapter can be a good indicator of the objectives sponsored by the main driving force for the FTAA, the US. To complement this profile, a second part broadens the scope of the analysis by examining other evidences of the US trade policy on telecoms. A synthesis is then presented in section 4, considering the different directions on the official policy that the domestic sector might impose. The purpose is to extract a probable line of behaviour and the main goals of the US negotiators.

Section 5 changes the focus to South America, with particular emphasis on the MERCOSUR. The pace of the sector negotiations is examined and a broad view of the main problems within the integration is drawn. This view is complemented by a deeper analysis of the Brazilian situation, taking into account some possible scenarios that may evolve in its recently privatized environment.

The two branches are combined in section 7, where we try to identify common and conflicting interests. An economic analysis of possible gains under the FTAA outcome is performed, showing the costs of selected decisions. Under this light, the final section draws the main conclusion of the study and proposes a negotiating strategy for the MERCOSUR members. The conclusion assumes as a working hypothesis that it is important to pursue the Southern Cone integration, by the deepening and enlargement of the MERCOSUR process. This effort, within a

multilateral framework of trade liberalization, is considered a strategic and economic priority.

2. The Telecommunications Sector: a Few Introductory Points

2.1 Service providers x manufacturers

Besides being a major and rather specific sector within the constellation that makes up the services side of any modern economy, telecommunication activities bear a very complex, close and dynamic relationship with many manufacturing sectors. Without cables, optical fibres, modems, satellites, antennas, digital and analog commuting centres, amplifiers, mobile phones, different kinds of receivers, chips and specialized workstations there is no (tele)communication.

Any analysis of the subject must, first of all, bear in mind that one is always dealing with a two-sided question in which the dichotomy service providers x equipment manufacturers is quite often a false one, the former being a natural – even vertical, in the technical sense – extension of the latter. This dynamic relationship acquires more dramatic shades at present, given the rocketing technological competition in the sector. This makes for the simultaneous existence of distinct modes and/or equipments for providing the same service, and also, not rarely, of slight variations within the same (broad) service.¹ Voice and fax transmission are good examples of the variety of modes and equipment: a given customer can make calls either from a fixed or cellular phone, he can also call from a fast moving train or on board of an aircraft in a transatlantic flight; his faxes can be sent either from a standard machine (usually with voice facilities included) or from his portable, coupled to a proper transmission network. As for the variations, TV broadcasting services can be enjoyed either from the traditional, open channels portfolio, or from a cable services subscription or via satellite. Any of these signals can be watched in a large spectrum of receivers, ranging from a rather standard one to a wide-screen high-definition set, not forgetting the mini and micro sets and the home computer screen.

Moreover, an important change in the service providers' side has added more competition among manufacturers. Within the (state) monopoly situation prevailing in most countries until recently, most big manufacturers enjoyed a very comfortable position, secured by a sizeable number of stable contracts with the official services provider. Privatization and deregulation in the telecoms market have considerably shaken this *status quo* increasing the degree of competition between manufacturers. Though both waves have, at the same time, opened new markets for these same manufacturers, competition has undoubtedly increased.

¹ Roughly approximating a situation of monopolistic competition within the service in question.

The combined effect of the above forces is a double rearrangement in the sides of the equipment as well as service providers. On one hand, diversity has allowed for the appearance of new, rather specialized and small producers, able to deliver a (usually) sophisticated device, answering very specific and well defined needs. These technical *boutiques*, as fancy and innovative as their counterparts in the biotech sector,² have profited from the myriad of opportunities and problems created with the opening of the markets – specially the US one. However, on the other hand, the high costs of R&D among the big manufacturers, the fiercer competition and the need to keep up with a technologically leading, reasonably diversified portfolio of products, has stimulated a very intensive mergers and acquisitions activity and the creation of (mega)alliances within the sector. It will be no wonder if, in a not too distant future, the whole sector will evolve into a much more concentrated structure, of a distinct transnational character, as witnessed now in the car industry.

2.2 A political economy dimension

The second point is the historical, and very strong interrelationship of the sector with an international political economy dimension. This has its origins in the past century, when, in 1865, the ITU – International Telecommunication Union was founded by some twenty European countries.³ Given the key role of telecommunications in the globalization of the economy – a phenomenon already in motion at the end of the nineteenth century – the founding of the ITU reflects the (right) perception of the main players at the time of the importance of creating an adequate international forum for conducting the technical, commercial and diplomatic discussions raised by the telecoms operations. This is confirmed with the entrance, in 1908, of the United States. Though a latecomer, the US immediately assumed an important position in the Union, characterised by consistent and very strong efforts to make its views prevail. Indeed, from the end of the Second World War to the late sixties, most analysts identify a period of a *Pax Americana* in the international side of the sector, with the US dictating the rules while most developed nations were coping with the restructuring of their economies, severely damaged in the war. The Union was actually absorbed by the United Nations constellation, in 1947, though keeping a relative independence: the General Assembly can recommend but not command or impose specific tasks to it.

In the early seventies, some important changes took place (see, for instance, Lee, 1996). Two movements, the Movement of Non-Aligned Countries and the

² The famous backyard or “back of the university lab” genetic engineering firms.

³ Brazil became a member on July 4, 1877, about thirty years before the entrance of the United States in 1908.

New World Information and Communication Order – NWICO, set off a series of crises within the UN. The first openly opposed the functionalist view of international organisations, and in the large debate which ensued from this supported – though usually in a veiled way – the NWICO. A conflict started then at UNESCO, triggered by some NWICO positions, backed by the strong ally. As a result, the United Kingdom and the US quit UNESCO at the beginning of the eighties. Meanwhile, both Japan and the Western European economies had recovered from the post-war depression making with the US, at the end of the eighties, the famous Triad where the main international economic decisions are made. This all meant that, by the mid eighties, it was evident at least for the US that the ITU forum, though still a major negotiating arena for telecommunications (specially as regards the technical issues), was neither fully convenient nor sufficient any more. The reason was twofold: discussions often risked to become too political, contaminated by the overall UN crisis, and the economic issues had become too big. New rules and a new forum were urgently needed.

Under this light, from the historical Modification of Final Judgement (MFJ)⁴ by Judge Greene, in 1982, to the US pressure to include and sustain the discussion on services in the Uruguay Round, particularly telecommunications which has links with most of the others, and, finally, to the very active and adamant role it played in the subsequent meetings of the WTO's Negotiating Group on Basic Telecommunications – NGBT, till its final resolution on June 1997, lies the double objective of securing and increasing an undeniable competitive advantage – provided by the pioneering liberalization experience – and of moving to an economic forum like the WTO, discussions which were becoming either too technical or too political. This does not mean that the ITU has not a strategic role any more. In 1992, it granted to the multinationals of the sector the right to have members in its Council.

This political economy dimension manifested itself not only in the search for new international organisations to house the telecoms debate. The greater and much more competitive supply of services spurred by the US liberalization and the fast pace of technological innovation, started to put pressure on the national governments, to pry open their respective markets. One way to achieve this was by breaking the existing state monopoly. It must be stressed that this is not necessarily the single solution available. However, most – but not all – national operators, facing sometimes the vagaries of annual budgets and fiscal policies

⁴ As widely known, the MFJ ended the Justice Department's prosecution against the American and Telegraph Company – AT&T. It required at&t to divest itself from its local exchange operations, giving rise to the appearance of the seven independent Regional (or "Baby") Bell Operating Companies (RBOCs).

(specially in the less developed countries) – started to have difficulties in accompanying the fast and multiple developments in the sector.

Early in 1982, the United Kingdom – on the basis of the British Telecommunications Act of July 1981 - started a duopoly experiment, forcing the incumbent, British Telecom, to allow for one competitor, Mercury.⁵ On January 1, 1998, the telecom services market in the European Union was open to full competition, notably in the sub-sectors of voice and infrastructure. Individual members have either privatized their state operators or were forced to allow new entrants. In the same way, many countries in Asia and Latin America have already radically changed the monolithic structure which prevailed for so long. This means that in a little more than ten years after actual pressure for change had begun, the world scene had been drastically transformed. Notwithstanding, the main actors are still hungry: national restrictions to the participation of foreign capital in the new entrants still exist; tariff and non-tariff barriers, specially technical standards and protocols, still impede the free flow of telecoms equipment; and the new domestic regulations are many times not to their taste. Moreover, in the more technical arena, the issue of compatibility and interconnection among the various standards, systems, equipment and access protocols has become a central point to them.

2.3 The main actors

Who are then these main actors, continually pushing for institutional and regulatory changes at the country level, while running ahead of the established agreements in the international level? They must be found in two dimensions: a national one – where a few countries lead the technological developments and display an aggressive international stance –, and a transnational one, with major firms trying to control the world scene in the sector.

It is worth singling out some key players.

It is perhaps worth singling out some key players. In the nation's side, after the US, the not necessarily homogenous EU group is surely important, followed by Japan and Korea, two relevant services and equipment providers are US multinationals, though among manufacturers, the “seven sisters”, Lucent, Alcatel, NEC, Ericsson, Motorola, Nortel and Siemens, with different geographic origins, stand out.

⁵ This duopoly ended only in 1996, when other competitors were allowed in the market. Mercury was initially a consortium of Cable and Wireless, BP and Barclays Bank, and began by building an optical fibre network, alongside railway tracks.

3. The NAFTA Chapter On Telecommunications: a Prelude

The rather lengthy text of the NAFTA may serve, in the case of telecommunications, as an initial likely model of what might be aimed at in the FTAA negotiations. Indeed, being also a free trade agreement pushed by the US, in which there exists a technological imbalance between the partners, the solutions arrived at are a good signal of the intentions of the main advocate of the FTAA. Of course, given the very special Mexican-US relationship, some of them are specific to it, being unimaginable in a broader Latin-American context. However, we sustain that most of the main points raised below are useful guidelines for the future negotiations.

Services in general are the subject of chapter 12 of the agreement, while telecoms receive separate treatment in the next chapter 13.

3.1 NAFTA's chapter 12: Cross-Border trade in services

The services chapter in the NAFTA, with thirteen Articles⁶ and several Annexes, is conceptually poorer than the WTO's GATS – General Agreement on Trade in Services, though, it must be said, some concepts which apply to services as well as goods are treated in other chapters of the Free Trade Agreement. In spite of this, the principles of national treatment and most favoured nation are clearly stated in Articles 1202 and 1203. Moreover, the GATS solution of parties' schedules, listing, by sector, its commitments to “liberalize quantitative restrictions, licensing requirements, performance requirements or other non-discriminatory measures related to the cross-border provision of service” was adopted. However, some sectors are already specifically treated in the Annexes to the text; the most detailed one being professional services, dealt with in Annex 1210 three sections.⁷

The chapter is very careful in two issues. The first is called Reservations (Article 1206) and refers to the maintenance, prompt renewal and amendment of any existing measure, non-conforming to the text of the agreement, at the federal, state or province and local government level. There is also the device of the parties' schedules for listing – down to the level of state or province – these measures, and an endeavour, in Article 1207, to progressively liberalize those related to quantitative restrictions. The overall feeling – taking services as a whole – is of much care in terms of not forcing too strongly the wave of liberalization. As we shall see below, things become much more explicit, and less compromising in the case of telecommunications.

⁶ The last Article, as usual in the text of the NAFTA, is solely concerned with definitions.

⁷ Namely, sections A – Scope and Coverage, B – Foreign Legal Consultants, and C – Temporary Licensing of Engineers.

The second worth mentioning issue is in Article 1211: Denial of Benefits. Paragraphs 1 (a) and 2 open the possibility to deny the liberties in the chapter to enterprises owned or controlled by a non-Party in the cases when:

- the denying Party does not maintain diplomatic relations with the non-Party or has imposed restrictive measures against it that would be violated or circumvented by the activity in question (par. 1(a));
- the enterprise has no substantial business activities in the territory of any Party (par. 2).

Beyond the explicit finger of US foreign policy – it is difficult not to think of the Helms-Burton Act -, the second proviso contains a kind of rules of origin restriction to trade in services. Though very general, and in spite of the fact that the burden of proving the statement is on the denying partner (par. 3), it blocks the operation, in the NAFTA territories, of “disguised foreign providers”. Being a device in the spirit of an antidumping clause, it might then be used as a protectionist tool, causing difficulties to foreign firms.

Summing up, the services chapter is more specific than the GATS, though somewhat poorer conceptually and containing, in principle, more protectionist loopholes than the WTO text.

3.2 Chapter 13: Telecommunications

Now the level of detail deepens, and the reader has the feeling that someone who knows exactly where to go had a great influence on the final form of the ten articles in the chapter. In spite of all its specificity, the chapter does not mention anything regarding satellites and foreign ownership of providers in the FTA area. Though we ignore more clear evidences on the motives for these absences, it might be that, as for the former, there was no concrete challenge to the US position, together with no significant interests from the other two members. It might also have been the case that the US did not want to put on the table this sub-sector, where serious local interests compete between themselves (Iridium, a subsidiary of Motorola, Globalstar and Odyssey had, during the NGBT negotiations, at the WTO, opposing positions with respect to Hughes and Comsat). The latter seems to be a more clear evidence of the lack of motivation, from the US, in changing their existing rules on the subject.

For those who accept the points raised in the previous section, the emphasis the text puts on the equipment side causes no wonder. In the core Article 1302 (Access to and Use of Public Telecommunications Transport Networks and Services), paragraph 7 (b) allows that the conditions for access to and use of the public transport networks include “a requirement to use specified technical interfaces, including interface protocols, for interconnection with such networks or

services". Further down, Article 1304 is entirely devoted to standards-related measures, and though starting with a liberalizing tone in its paragraph 1, includes in the next paragraph the proviso:

"2. A Party may require approval for the attachment to the public telecommunications transport network of terminal or other equipment that is not authorized, provided that the criteria for such approval are consistent with paragraph 1";

and, three paragraphs after, states:

"6. No later than one year after the date of entry into force of this Agreement, each Party shall adopt, as part of its conformity assessment procedures, provisions necessary to accept the test results from laboratories or testing facilities in the territory of another Party for tests performed in accordance with the accepting Party's standards-related measures and procedures".

These three examples clearly show the concerns of the equipment manufacturers. The first two allow for some technical protectionism of existing technologies – which can be more or less reasonable depending on the situation –, while the last one helps in breaking a well-known non-tariff barrier.

As a companion to the last example, paragraph 3(b) of the same article, states that each party shall ensure that "private leased circuits are available on a flat-rate pricing basis". Flat-rate pricing charges on the basis of a fixed charge per period of time, regardless of the amount of usage, it is less economically efficient than other criteria like non-linear pricing, for instance, and benefits large scale operators/users. Coupling this with the provisions in (b) and (c) of paragraph 2, Article 1303 (Conditions for the Provision of Enhanced or Value-added Services), according to which a Party shall not require a person providing enhanced or value-added services to cost-justify its rates or file a tariff, a bias in favour of the more developed market is clear.

The principle of transparency is present in various articles – be it as regards licensing or conformity assessment procedures – and, stressing the importance of the chapter, Article 1307 disposes that in the event of any inconsistency between chapter 13 provisions and those in any other chapter, the former prevail.

4. The US Objectives

It is only natural that, as the most advanced nation in telecommunications, the US fights for a completely liberalized world telecoms market. This reveals itself quite clearly in various international performances, such as its key role in the NGRT/WTO and in the further proposal of an Information Technology

Agreement - ITA, during the 1996 WTO Ministerial Conference, in its continued power politics at the ITU, and in the careful writing of NAFTA's chapter thirteen.

This conspicuously active international role does not mean that the domestic sector is a homogenous and peaceful association of interests. Since the MFJ, tensions between the RBOCs and the regulators, both at the federal and state levels, were great. In July 1994, roughly ten years after the effective implementation of the MFJ, four RBOCs filed a motion before (again!) Judge Greene to vacate the MFJ in its entirety. The carriers submitted 47 affidavits from leading economic experts in support of their motion. Great changes in the legislation eventually took place in 1996 with an encompassing Telecommunications Act.

In a rather synthetic view, the central aim of the 1996 Act is to open the US\$ 10bn local telecoms market to competition. To encourage the RBOCs to allow competitors in their home areas, the Act grants them the right to compete in the long distance market. The catch, however, is that the Baby Bells must first "prove" to the Federal Communications Commission - FCC (the federal regulator), and the Justice Department, that their regional markets are open to competition. Despite repeated applications for this, up to now no, none of them has yet met the 14-point checklist contained in section 271 of the Act that the FCC is legally required to use to assess their eligibility.

Tension also exists between the Federal Communications Commission - FCC, the federal regulator, and the big operators and manufacturers. Due to the dynamic US environment, the latter are usually ahead of the prevailing rules, continually clashing with its restrictions and provisos. In the international scene, they - more than the US Department of Trade (and the FCC itself) - openly favour an aggressive bilateral approach, being usually unsatisfied with the rulings and timings akin to the multilateral opening of markets. These disputes pop up sometimes even in the Geneva forums.

From a more scientific perspective, the US is also a very important laboratory for most developments in the sector. Focussing on the economic side, the majority of the ideas and relevant practical experiences on the pricing of telecoms services can be found in the multiplicity of theoretical and practical work triggered by the decisions in the early eighties (see Baumol and Sidak, 1994, and Mitchell and Vogelsnag, 1996, for instance). This does not necessarily mean that the solutions in practice nowadays are the best ones. Many open questions remain on the ideal choice of pricing controls and schemes, and the complex issue of interconnection is still a fertile research area. Indeed, most that can be said about the existing solutions is that they are a "best" of some order, given the US market dynamics and competition conditions.

As any highly performing and competitive agent would do, the US objectives, in a macro view, are to reproduce these competition conditions in the foreign markets, in order to fully exploit its accumulated knowledge and experience in living with and even shaping its very dynamics.

5. Services and Telecommunications in the MERCOSUR and South America: a Brief Overview

In the South American context, two experiences are outstanding: Chile and Venezuela. Chile began by establishing a sophisticated and well structured regulatory framework and only afterwards, backed by this legal architecture, implemented a privatization cum liberalization programme. The *Compañía de Telecomunicaciones de Chile - CTC* was then acquired by *Telefónica de España* and, though still (and inevitably) presenting some problems, the whole transition can be considered a success. CTC has consistently been one of the most performing Chilean companies. Results referring to the first quarter of this year indicate an increase of 24.8 per cent in its operating figures (with respect to the same period in 1997), and one of 15.2 per cent in installed service lines. Net profits were on the order of US\$ 28.2 million.

Venezuela has practically chosen the opposite road. The state monopoly was privatized by the end of 1991, before the establishment of the regulatory framework. However, privatization rules were cleverly designed. Given the great regional inequalities, cross-subsidisation between international and local calls was maintained – in a decreasing proportion – for a period of nine years. Moreover, though the new private operator kept the monopoly of fixed telephony, free competition was open for all the remaining services and related equipment. The privatization auction procured US\$ 1.9 billion to the government, and control was acquired by GTE of the US (with 40 per cent), having the employees retained 11 per cent of the shares. By the end of 1993, the new operator had fully complied with all the targets related to service improvement and the contractual requirements on global investment, infra-structure and capital replacement. In November 1996, the employees acquired an additional 9 per cent, and the government got rid of the remaining 40 per cent it still had in control.

For the three Spanish speaking MERCOSUR members, the situation is less positive. In an ambitious privatization move, in 1989, Argentina divided the country into two regions which ended up in the hands of consortia led by *Telefónica de España* and *France Telecom*, respectively. The duopoly however presented problems, not the least due to difficulties in the relations between the two operators. Confirming the exceptional character of the Venezuelan experiment, the fact that privatization came before the establishment of the regulatory framework – which only last year started to have a more defined

structure – has been a major source of misunderstandings and inefficiencies. Notwithstanding, this has not deterred private Argentinean providers to adopt an aggressive policy in the Brazilian and Chilean markets. Firms like ImpSat Corporation (25 per cent owned by Telecom Italy)⁸ and Multicanal are already well positioned in the first country. The former establishes and explores private communication lines between big clients. It counts on its network of more than five thousand terminals already installed in business offices all over Latin America⁹ to attract the large companies operating in any of the two countries. It has also entered, in Brazil, in the Internet business. The latter established in Campinas VCTV Cabo (49 per cent Multicanal/Grupo Clarín, 20 per cent Organizações Globo) in order to explore in the rich interior of São Paulo state the blooming cable TV market.

The Argentinean market is also very active in the area of cellular phones, which grew in 150 per cent during the year 1997. In the great Buenos Aires region, four operators compete: Miniphone (owned in equal parts by the two members of the duopoly), Bell South, Motorola and Movicom (from the Macri group). The two operators have their own cellular companies operating in the remaining areas in the North (Telecom) and South (Telefónica) of the country. From 1999, both will start to face competition also in the area of fixed telephony.

In Uruguay, the state operator Antel, through a big contract signed with Siemens (of Germany), moved to a completely digital network recently. Legal amendments were – and some still are – negotiated in Congress to allow Antel to establish international alliances and become, at least in a South American dimension, an international player. This has been accompanied by an ambitious investment programme of around US\$ 700 million in five years; a figure which must be evaluated taking into account the size of the country. No further changes in the structure of the sector seem to be under consideration.

In Paraguay, the situation is less clear, a very low quality still prevailing in the long distance connections. In spite of this, US and European providers and manufacturers are fairly active in the country, either establishing a presence or settling in a more concrete basis to operate, from there, in the MERCOSUR area. At their side, Telecom Personal the cellular operator in the North of Argentina, owned by *France Telecom*, acquired an important share in Cable Insignia S.A, which is able to provide personal telecoms services and operate a band B cellular system.

* Formerly Stet (of Italy).

⁹ Beyond Argentina, Colombia, Venezuela, Ecuador and Mexico, as well as teleports in Miami; links are via satellites.

Table 1 gives an idea of the state of foreign ownership of the main operators present in selected South American countries. At the side of GTE and BellSouth from the US, there is a very significant presence of the main providers from three Mediterranean countries. Spain, in particular, has a remarkable presence in the main carriers of the MERCOSUR member (Argentina) and of one associate (Chile); Italy appearing in the other (Bolivia).

TABLE 1: Presence of Foreign Operators in the Main Privatized Carriers in Selected South American Countries (percentage of ownership between brackets)

Countries	Origin of Operator			
	Spain	France	Italy	US
Argentina	Telefónica de Argentina (25%)	Telecom Argentina	Telecom Argentina (19,5%)	Movicom (65%)*, Teléfonos del Interior (23%)***, CTI Movil**
Bolivia	-	-	Entel Bolivia (50%)	-
Chile	Telec. de Chile (43%)	-	Entel Chile (20%)	BellSouth Comunicaciones*
Peru	Telefónica de Peru (31,5%)	-	-	Tele 2000 (58,7%)
Venezuela	Teléfonos de Venezuela (6,5%)	-	-	Telecel Celular*, Teléfonos de Venezuela (51%)**

Notes: a) The foreign operators are Telefónica de España (Spain), France Telecom (France), Telecom Italia (Italy), *BellSouth and **GTE (both from the US). b) The absence of brackets in the US column means that the foreign operator has total control of the related company.

The foreign penetration displayed in Table 1s should be no wonder. South American countries are considered one of the most promising world markets in telecoms. In 1997, the Latin-American market was of around US\$ 20 billion, and according to forecasts by Lucent Technologies, it will double by 2001. Its yearly growth rate is now at 20 per cent, while that in Asia is at 16 per cent. Table 2 shows the teledensity for the main South American countries, comparing it with the US and European (average) ones. Prospects are double: if for the top four there is room for doubling the density, for the other countries, rates are below 110 per cent, showing the huge potential for increase.

TABLE 2: Telephone Lines - Fixed and Celular - per 100 Inhabitants in the Main South American Countries: 1996

Argentina	25
Bolivia	4,32
Brazil	13,4
Chile	15,59
Ecuador	7,33
Paraguay	3,56
Peru	5,99
Uruguay	28,01

*Data refer to the latest available figure in 1998.

Source: ITU - World Telecommunications Indicators, 1996.

5.2 The MERCOSUR Negotiations

On December 15, 1997, the *Protocolo de Montevideo sobre el Comercio de Servicios del Mercosur* was signed. With thirty articles, heavily based on the GATS – the device of the lists with the schedules of the specific sectoral commitments was also adopted here –, though pushing somewhat further the integration, in the lines of a common market, the Protocol is a very reasonable framework for deepening trade in services within the Southern Cone. Under these guidelines, telecommunications are the subject of the negotiating nº 1, SGT1.

The SGT1 is divided into four commissions, dealing with postal services, radio communications, radio diffusion and public telecommunication services. They conduct at present 44 negotiating lines or working parties; Table 3 shows a few more relevant ones. Within such a complex task, it is only natural that negotiations move on slowly and are sometimes stuck by rather specific problems. Orbital positions, for instance, are a *contentieux* between Argentina and Brazil, the former having recently ceded to the US – in an unexpected move – its 85° position, class KU. The whole trend is however positive and progress is evident in certain questions. Examples are the trunking line which will link Belo Horizonte (Brazil) to Santiago (Chile), and the first (recent) decisions on common standards for equipment certification.

As regards the telecoms annex to the Protocolo de Montevideo, while Argentina pushed for a WTO-plus agreement, Uruguay and Paraguay have not presented any offers. In June 1998, Brazil presented its WTO proposal.¹⁰ There are hopes that, by the second semester of 1999 – after having updated its WTO offer under the light of the new legal developments and recent changes in the sector structure – Brazil will produce a more encompassing offer, likely to reach a common denominator with the Argentinean proposal.

¹⁰ See the next section.

TABLE 3: MERCOSUR, SGT1: Selected Negotiating Lines and/or Working Parties

Comissions*

Postal Services(8)

Radio Communications(17)

#3- cellular telephony

#8- personal communication systems

#12- management of the radioelectrical spectrum in the MERCOSUR area

#14- satellite systems

Radio Diffusion(11)

#1-UHF-TV agreement

#2- agreement on the distribution of multipoint, multichannel TV signals

#11- agreement on the distribution of multipoint, multichannel local TV signals

Public Telecommunications Systems(9)

#1- compilation of existing legislation and tariff structures

#2- procedures for equipment certification

#3- procedures for accrediting telecommunications equipment laboratories in the MERCOSUR area

#8- harmonization of interconnection criteria

* Total number of corresponding lines or parties between brackets

Source: ANATEL

By this time also, Uruguay and Paraguay have expressed their intention to present something. If no sudden changes or major problems occur, by 2000, harmonization and liberalization of the Southern Cone telecommunications sector – at least at a level similar to the one in the WTO annexes – will start to become a reality.

6. The Brazilian Environment

Brazil, the biggest country in Latin America, seems highly qualified as a significant case study of a national situation. Moreover, the country's huge telecoms market was effectively privatized this year.

Before auctioning its considerable assets in the sector, the government created a regulatory body, ANATEL – *Agência Nacional de Telecomunicações*, which is going to be the key official agent, with powers to set prices, technical standards and service targets, design tariffs, and issue all provisions regarding the establishing and supervision of a fair competitive environment in the sector.

6.1 The Legal Framework

Many different and complex events have peopled the road to the July 1998 landmark auction in the history of Brazilian telecommunications. The legal structure of the sector consisted, since 1962, in the *Constituição Federal* (the Brazilian Chart), the *Código Brasileiro de Telecomunicações* (the Brazilian Telecommunications Code) and a series of ordinary laws related to services not mentioned in the Code, decrees and specific rulings issued by the Ministry of Communications. The Code is actually Law 4.117/62, whose approval took nine long years of debate.

The 1988 Chart, in its Article 21, paragraphs XI and XII re-emphasized the role of the Union in the exploration, *directly or through government controlled companies*, of most telecommunications services. More specifically, it stated that:

- i) telephone, telegraph, data transmission and *other public telecommunication services* would be exploited by the Union, either directly or through concessions to state companies (par. XI);
- ii) information services could be exploited by private entities through the public network (par. XI);
- iii) radio, TV and *other telecommunication services* could be either directly exploited by the Union or, through concession, authorization or permission by private entities (par. XII).

An ambiguity is apparent on what are these “other public telecommunication services” and to what extent do they differ from “other telecommunication services”. Moreover, it is not clear how the provision of information services through the public network would be ensured.

In August 1995, the Constitutional Amendment nº 8 redefined the sector, laying the ground for the coming changes. In the revised Article 21, “other telecommunication services” disappeared from paragraph XII, and a shorter paragraph XI gave to the Union the right to exploit telecommunications services *directly or through authorization, concession or permission*. This right characterizes what is usually called a mixed regime, in which both the Union and the private sector can exploit the services; being however clear the end of the state monopoly on these services.

Two things are also worth mentioning as regards the Amendment. First, it announced that future legislation would deal with the organization of these services and the creation of a regulatory body. Second, combining (the revised) Articles 21 and 22, it separates – in a somewhat arbitrary way - radio diffusion and communications from the bulk of telecoms services.

In 1996, Congress approved Law 9.525/96, setting general guidelines on mobile telephony, limited services, use of satellites as carriers and opening the public network for the provision of value added services. As regards the first, the spectrum was divided into two parts – Bands A and B –, the first being already at the time exploited by the (then) state operators, while the second would be offered to private operators in the near future. The Law also prepares the ground for the further privatization of Band A services, by creating separate companies to deliver these services. Limited services for the use of third parties are permitted, on a renewable ten years basis, to Brazilian companies fully established in the country. As regards the use of satellites, a distinction is made whether the equipment occupies orbital positions officially notified by Brazil (informally, a “Brazilian” satellite) or not. Concessions, in the first case, on a renewable fifteen years basis, are a prerogative of Brazilian firms, and were automatically assured to the incumbent, EMBRATEL.

In the end of 1996, the government submitted a substantial project containing the major new law on telecommunications. This project contemplated the creation of the official regulator, the Agência Nacional de Telecomunicações – anatel, and described in reasonable detail policies and concessions for several key services. The law was finally approved during the following year. A full analysis of its content and implications is outside the scope of this work; the important point to be stressed is that this rather complex new structure has been on for hardly a year, there being no sufficient time to allow for a balanced judgement of its pros and cons.

At the same time that the discussions on the General Law took place in Congress, Brazil was presenting in Geneva its Schedule of Specific Commitments, and the related List of Article II Exemptions to figure in the Fourth Protocol to the General Agreement on Trade in Services, namely that on telecommunications services. The “Brazilian offer”, taken with respect to the other ones, was fairly encompassing and quite generous. The negotiators tried to conform it to the main lines of the (then) draft of the General Law, and made some explicit gestures to signal an open position. Regarding the percentage of foreign capital allowed in the companies using segment facilities of “Brazilian” satellites, for instance, the 49 per cent restriction will be abolished as from July 20, 1999. The commitments and exceptions – now deposited at the WTO – were sent to Congress in December 1997, for ratifying, what has not occurred yet. The great changes which took place since then are already demanding an update, and greater conformity to the new regulations, which is in progress.

6.2 The Recent Changes

The privatization design imposed a rather debatable segmentation of the country's geographic space. Three "local operators" for fixed telephony – one of them, Tele Norte-Leste, encompassing an area ranging from most of the Amazon region to the states of Minas Gerais and Rio de Janeiro, the latter with a notoriously poor service, were formed. Mobile systems will compete under a duopoly (bands A and B) in ten regions – one of them including the whole Amazon area but the state of Acre (namely "área 8", encompassing the states of Amazonas, Pará, Roraima, Amapá e Maranhão). The long distance and international calls operator, EMBRATEL, was also privatized. Most of these companies were created a few months before the selling, as local fixed telephony, together with cellular communications, was – with a few exceptions – managed at the state level. Through a series of decrees and other legal measures,¹¹ the government rearranged the sector – previously under a federal holding, TELEBRÁS –, separating, as different enterprises, mobile from fixed communications, and establishing the duopoly on cellular operations. The whole lot was valued at a base price lower than US\$ 13.5 billion, much less than the first expectations, as a result of the shortage of investment money after the November 1997 Asian crisis. Moreover, a progressive strategy was not adopted: all companies should be sold at the same time. This turned the date finally set for the auction into a *point d'honneur*, with the government viewing its actual realization as a major signal to the international investment community.

A long series of pressures, denials and concessions – at the same time that legal cases against the privatization poured every week – occupied the months from April to July. Fearful of losing in the final hour, the government started to progressively make concessions in key points. The percentage of foreign ownership of voting capital – limited to 49 per cent according to the Constitution – was eventually liberalized. Foreign operators also complained about the targets and related timings for attaining universal service, finally managing to change those previously stipulated. Equipment manufacturers protested on the market shares to be preserved for the domestic manufacturers – a point on which there was already disagreement between ANATEL and BNDES, the national development bank –, and were successful in eliminating them. While trying to improve the international attractiveness of the auction conditions, the government fought a judicial battle to hold a general meeting of TELEBRÁS shareholders to approve the crucial splitting of the holding that would make the jumbo sell possible. Only on May 22, in the third attempt, the meeting took place and the splitting was sanctioned.

¹¹ Starting with the above mentioned Law 9.295/96.

The auction finally became a reality on July 29, as planned, and was considered a success by the government, which eventually fetched US\$ 22.057 billion, a sum 64 per cent above the set minimum. Table 4 shows the main acquirers, by type of operation and region/company.

TABLE 4: The July 29, 1998 Telecoms Sell: Foreign Acquirers, by Region/Company and Type of Service

	Spain	Portugal	Italy	BellCanada & Telesystem
Fixed Telephony				
Tele Norte-Leste				
Tele Centro-Sul			X	
Tele São Paulo	X	X		
CRT	X	X		
Mobile Telephony (Band A)				
Telesp		X		
TeleSudeste	X			
Telemig				X
TeleSul			X	
TeleCentro-Oeste				
TeleNorte				X
TeleLeste	X			
TeleNordeste			X	

To the information in Table 4 it should be added that BellSouth has a significant participation in the Band B mobile network, and that EMBRATEL, the important long-distance exchange carrier was acquired by MCI. The presence of the Mediterranean operators is – as in Table 1 – very significant, with Portugal replacing France.

If many points of the “jumbo auction” can be the subject of criticism, it is not fair to rank it – given the many constraints which were at stake – as a bad outcome. What matters now is to adequately face the great challenges opened by this dramatic change in the Brazilian telecommunications environment. Among them, we find the following particularly important:

- the regulatory agency, ANATEL, will now begin to be really tested. There is a consensus that the period ranging from 18 to 60 months after the auction, roughly the first five years of the new system, will be obliged to demonstrate its ability to perform its “carrot and stick” duties. In particular, the two problems below deserve separate mention;
- the interconnection question: though the normative set for it has been already delivered, it is widely known that here lies one of the most delicate

and difficult issues of a liberalized telecoms environment (see, for instance, Laffont *et alii*, 1998). Only after the full implementation of the system, with the newly privatized companies in normal operation, and facing the competition of the “mirror operators”, what will actually start by early 2000, will the real interconnection problems appear;

- the universal service obligations: in Brazil this continues to be a main issue; according to a survey by IBGE, in 1993, 80 per cent of the residential telephone terminals in service were in the hands of the upper (in family income) 17 per cent families. Moreover, only 3 per cent of these terminals were in the hands of class D and E families (the lower social classes). We do not think that the “cellular boom” has substantially changed this situation. Attainment of the (minimal) universal service goals put forward in the privatization rules¹² will depend on ANATEL’s clout on the various service providers. International evidence shows that this is not an easy task, [OECD 1995]; in particular, the US evidence on welfare improvement of less favoured customers is not very encouraging, clear advantages having surely been created only for the larger users [Higgins and Rubin, 1995 Mitchell and Vogelsan, 1996];
- beyond the domestic competition context, there are important international issues affecting the system. One good example is the satellites sector, where the US has a rather protectionist stance, which sometimes manifests itself in aggressive positions, as the ones it has been taking in the discussions regarding the privatization of the INMARSAT/INTELSAT system.¹³

Aside these considerations, problem is looming in the equipment sector.

Table 5 shows the Brazilian trade balance for telecoms equipment. The escalating trade deficit has reached approximately US\$ 2.5 billion in 1997, with Brazilian exports showing a reasonable increase only in the ERBs & cellular phones and commuting centrals subsectors, where most items are goods only half manufactured in the country. There is an evident increasing lack of competitiveness that is not only due to the overvalued Real of the past few years. In spite of some strategies proposed by BNDES to cope with this situation, Melo and Gutierrez (1998), like the (domestic) manufacturing prospects embodied in the WLL – wireless local loop technology, the government does not seem to have a clear idea on this issue. Well before the Telebrás privatization, it has been oscillating between the pressures from (*foreign*) producers already established in the country and those from the foreign exporters eager to reap the gains opened by the new operators’ demand.

¹² And which were progressively softened until the date of the auction, in July 1998.

¹³ See also section 4.

TABLE 5: Brazil: Trade Balance for Telecommunications Equipment
(US\$ millions, for selected years)

	1993	1995	1997
IMPORTS	576,6	1360,1	2740,2
Parts and components	170,9	418,3	616
ERB & cellular phones	147,3	375,8	891,2
Commuting centrals	146,9	354	803,6
Cables & other ducts	62	134,5	315,5
Others	40,5	77,5	113,9
EXPORTS	147,8	130,4	289,4
Parts and components	8,9	11,4	19,5
ERB & cellular phones	3,4	4,2	92,8
Commuting centrals	29,4	25,1	100,4
Cables & other ducts	94,1	84,5	60,7
Others	12	5,2	16
DEFICIT	-419,8	-1229,7	-2450,8

Source: Secex/Decex

7. Possible Outcomes: Costs and Benefits

As pledged in the previous sections of this paper, perhaps a most possible outcome – if negotiations go on as scheduled – is an agreement in the fashion of NAFTA's chapter 13. Combining it with liberalization in the goods trade, this means that special advantages will be created for US providers and manufacturers. The pressure they exert to model the markets according to the US environment will then, in the whole MERCOSUR area, be much greater than at present. This may begin even before the signing of the agreement, if the pace of negotiations will point with reasonable certainty to such an outcome.

The increased pressure from US telecoms companies will impact as well as divert efforts to harmonize the existing regulatory systems, in order to create a fully liberalized market in telecommunications – in the spirit of the Asunción Treaty, that is, within a *common market perspective and not that of a free trade area* – among MERCOSUR members and associates. Such harmonisation cum liberalization is already a tremendous task, eventually leading to the existence of a single, supranational telecoms regulator, that will become much more difficult – if not aborted – in a FTAA environment.

It might be thought however that this loss of a deeper telecoms services integration within the MERCOSUR and associates would be compensated by significant economic and efficiency gains from the FTAA. Three points indicate that very likely this is not the case.

The first is the ongoing sectoral negotiations at the WTO. Taking for granted the existence and continuation of MERCOSUR, from a multilateral viewpoint, it is much more advisable to pursue the progressive opening of the sector under the WTO framework, deepening and enlarging the schedules presented by the MERCOSUR members. Instead of wasting energy in talks with a manifold of American countries, whose net result – whatever it might be – will be biased towards the US companies in detriment of other, specially European, competitors, it is much more profitable and wiser to design a common MERCOSUR schedule to be negotiated, in a concerted move of all members and associates, in the multilateral Geneva forum. It might also not be forgotten the possibility of the Millennium Round, whose existence would reinforce this point.

The second argument relates specifically to the equipment sector. For countries with low competitiveness in this industrial sector, as is the case in the MERCOSUR block, the optimal policy is obviously to create an environment where all competitive world players have equal chances to acquire market shares. Special facilities to US manufacturers – to which will boil down the FTAA in this case – is a suboptimal choice. The multilateral option is again dominant here, particularly because the close links between manufacturers and providers described in section 2. Ironically, the ITA, launched by the US in December 1996 – with the support of the European Union, Canada and Japan – during the First WTO Ministerial Conference, in Singapore, stands as a much better alternative. At that time, given the great number of exceptions for information technology goods in the CET, MERCOSUR members remained outside the agreement. According to the prevailing exceptions, by 2006, tariff harmonization in this category will lead to an average tariff of 16 per cent. Considering the changes which already took place during the Brazilian privatization, as well as those in the Argentinean sector, a new look should be given to these items, taking also into account the progresses in the implementation of the Common External Tariff. A concerted adherence of the MERCOSUR block to the ITA – negotiating, as best as possible, concessions with the US, the EU and Japan – should then be designed. We are conscious that this is not an easy task; Brazilian manufacturers strongly oppose the ITA at present, and MERCOSUR members must (first convince themselves of, and then) intelligently use their bargaining power as a key to telecoms equipment market.¹⁴ This task could perhaps be made much easier – and make more sense, as sustained by the Brazilian Foreign Office – if negotiated under the umbrella of the Millennium Round.

The two points above turn the FTAA negotiations on the sector, an unfortunate diversion of scarce human and technical resources, that will lead to a sub-optimal solution with respect to the common (MERCOSUR) pursuit of a multilateral sector

¹⁴ See end of section 5.1.

liberalization. This means an additional and unnecessary stress – in the sense coined by Lafer (1998) – on the MERCOSUR group that, given their limited technical and diplomatic staff knowledge in telecoms, will certainly weaken their clout in the multilateral arena.

The third point bears a more technical character. The extent of the recent changes in the sector in South America, and notably in Brazil, is so huge that a horizon of five to ten years will be needed to fully master the new reality. Technical questions of all sorts regarding ANATEL activities will pop up almost every week, and a transition dynamics will also take place among the new players. Changes in the composition of the consortia owning the fixed and mobile operators are already expected in the near future. Moreover, the functioning of the *Comissão de Arbitragem e Interconexão* will require a series of adjustments and corrections before reaching a normal operating mode. Price dynamics are also an unknown. In a country with the social disparities of Brazil, and – to a lesser extent – also in Argentina and Paraguay, universal service and the pricing of basic services are crucial issues. There are no evidences yet that the improvements in these questions - initially announced when the privatization programme was launched – will actually happen in the near future. The US evidence on this is not very encouraging, clear advantages having surely been created only for the larger users. Of course, this outcome is conditioned by the price systems allowed. All this shows that telecoms will already be, *per se*, a very turbulent sector in the coming years, demanding careful management and supervision. Opening the FTAA door might result in an one-way importing of solutions, modes of behaviour, legal and competitive structures that are not fit to the South American reality. Last but not least in this same vein, there is the question of foreign direct investment. Tables 1 and 2 clearly show that US as well as EU capital are competing in the sector. It is important to continue to attract at least these two sources, keeping similar level playing fields for them.

Beyond these three points, there is a further area where the answer does not fall in the affirmative either. Indeed, it could be raised that the FTAA would facilitate market access in the US and Canada for the MERCOSUR (indigenous) telecoms companies. This is not the case. Actually, but for negligible (in value) exceptions, we risk to claim that there are no providers or manufacturers, of MERCOSUR origin, which are competitive in the US and Canada telecoms markets. As is well known, MERCOSUR commercial interests in (non-Spanish) North-America are closely related to its *contentieux* with those countries, and are concentrated in textiles and leather goods, the agricultural and food processing sectors, as well as in selected manufactures as shoes, steel & steel goods and a few kinds of machinery. Given that Central America is a market traditionally protected – explicitly or implicitly – by the US, if there are any “American” prospects of market

access for MERCOSUR's telecoms providers and manufacturers, these lie in South America, and for this, a ftaa is not needed.

8. Conclusion: Timing and Strategies

Under the hypothesis that it is important to pursue the MERCOSUR project, within a multilateral framework of trade liberalization, there are no gains, as regards telecommunications services, in engaging in the FTAA negotiations. Indeed, the net outcome may even be costly and damaging to the MERCOSUR interests.

It is important then to briefly outline a strategy in the case that, for reasons whose discussion are outside the purposes of this text, MERCOSUR is "forced" to engage in the negotiations. We envisage two general principles and an action guideline.

First of all, it must be left very clear that a position against a FTAA in telecoms does not imply a disregard to the US experience and knowledge in the sector – quite on the contrary! As stated in this report, it is in the US that a most valuable laboratory in the sector is found. This means that the channels for information exchange, *and learning*, are those which should be pried open– if necessary – with a crowbar. Whatever regards education, training, information and technology exchange can and should be encouraged under an American co-operation framework.

The second principle is delaying. Brazil and MERCOSUR have been reasonably successful in cooling off the (intermittent) US integration ardour. The understanding of 2005 as a "lower deadline" for ending negotiations, together with a future implementation calendar of at least 15-20 years for any decision – as the US will enforce for all orange-juice like products which are sensible to them –, should be pushed through consistently. Coherent governmental support will be crucial for this.

Finally, a guideline must be used thoroughly, depending on how things turn out. It is usually accepted that the US intentions in the FTAA are in terms of a WTO-plus kind of agreement. In telecoms, a strong position should be held, in not advancing one inch from the WTO schedules. For telecommunications, a FTAA, if inevitable, should reduce to the very words of the WTO language.

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Comments by Ana Novaes

The objectives of Professor Flôres's paper are: (i) to show that it exists a sharp discrepancy between the FTAA and those of MERCOSUR; (ii) to show that there are no gains for MERCOSUR countries in a negotiation to liberalize the telecommunications sector; (iii) to show that an agreement entailing liberalization in the sector would be to the advantage of providers of telecommunications services and manufacturers of equipment from the United States.

In this comment I will argue that the author did not succeed in demonstrating these points and that an alternative approach would probably reverse his conclusions.

The basic argument used in the article is that the US and the UK are ahead of other countries in liberalizing their telecommunications sectors. The author bases his argument on sectoral proposals in the context of NAFTA. According to the author, the NAFTA agreement, which is generic in relation to other services, is specific for telecommunications. He stresses three points of the NAFTA agreement: (i) requirement that equipment be compatible with the protocols covering interconnection of the present network; (ii) that NAFTA signatories have to accept laboratory tests undertaken in the territory of member countries; (iii) NAFTA signatories have to assure that private circuits are available at a fixed rate, independently of use, favouring big scale operators.

In my view, these arguments do not warrant the conclusion that a NAFTA type negotiation leading towards liberalization would be detrimental to the interests of MERCOSUR. In the first place, there is nothing more reasonable than the requirement that equipment suppliers that are willing to enter the market should do so offering equipment which is compatible with the basis network to which they are going to be connected. This is, indeed, a requirement of the Brazilian General Telecommunications Law. The second point reflects a reciprocity treatment and intends to avoid non-tariff barriers as recognized by the author. Finally, the requirement that private circuits should be made available to users is a *sine qua non* condition to assure satisfactory competition. Points (i) and (iii) are common practice in Brazil today.

Still according to the author, the services sector in MERCOSUR is included in the Montevideo Protocol but, since it does not present the Protocol proposals for the telecommunications sector, it is difficult to compare them with those of NAFTA.

I believe that an alternative approach can lead to different conclusions. The argument that an uneven level of liberalization of the sector in different countries can lead to undesirable consequences of the liberalization processs, needs to be

grounded on facts. A more gradual liberalization policy could be, for instance, justified by the need to finance the universal system but this issue was not broached in the paper. The author's argument that US equipment suppliers would greatly benefit from an opening up of the MERCOSUR and that this is somehow undesirable, does not seem reasonable. The big players in Brazil are not US firms: Ericsson, Pirelli, Alcatel, Nortel and Furukawa. The entry in the market of US firms is to be welcomed. Brazilian consumers would benefit from this.

Consumers, by the way, were left out of the analysis. I believe that the analysis of the impact on residential and commercial consumers should be a major element in an article which suggests that a liberalization *a la* NAFTA would be against the interests of MERCOSUR countries.

I believe that the Brazilian experience will be fundamentally important for a proper understanding of the ways to be followed by MERCOSUR in liberalizing the sector. The author's views on the privatization process in Brazil are not very positive. I disagree from this assessment and contrast in the table below our differing views on the matter.

The arguments presented by the author do not support his hypothesis that a NAFTA type agreement for MERCOSUR would be to the disadvantage to its members. The author should revise his analysis so as to include:

- (i) what is thought in MERCOSUR concerning services in the context of the Montevideo Protocol;
- (ii) what are the differences between the NAFTA agreement and the present realities in MERCOSUR. Based on his paper, it appears to be no difference between NAFTA type policies and present Brazilian practices;
- (iii) identification of the great players in MERCOSUR and who are their potential competitors. Assessment of what could they gain or lose with NAFTA type policies.

I would not be surprised if the author reached opposite conclusions after such an analysis.

Article's evaluation	My evaluation
Split of TELEBRÁS imposed a "debatable segmentation"	Split of TELEBRÁS was a way to assure competition and avoid transforming a state monopoly into a private monopoly
Government decided to sell all companies at the same time and it became a point of honour to respect the initial time schedule	The timing of the TELEBRÁS sale could hardly be improved
Government made a concession by allowing foreigners to buy more than 50% of voting capital	Government increased competition and avoided higher costs in the formation of consortia with parallel shareholders' agreements. A concession was not to make compulsory the presence of a strategic investor in each consortium
Minimum price of R\$ 13.5 billion was much below initial expectations	In the day of the announcement, the minimum price was 70% higher than telebrás market value. The final price obtained was much above estimates of all analysts

OPENNESS AND EFFICIENCY IN BRAZILIAN BANKING¹⁵

Afonso S. Bevilaqua and Eduardo Loyo

1. Introduction

SINCE FREE TRADE IN SERVICES made its way into the diplomatic agenda for the Uruguay Round, Brazil has engaged, or otherwise resisted insistent calling to engage, in service negotiations at the multilateral or regional levels. Lack of enthusiasm on the part of Brazil was not surprising, on account of the little promise of gains it saw from increased market access abroad, and its fear of an onslaught on domestic markets – still very closed – by providers from developed countries. These concerns were especially strong regarding financial services.

In the last few years, however, foreign firms were permitted to make substantial inroads into the Brazilian financial services market. That penetration was neither of the size nor of the shape one would have predicted from the Brazilian stance in recent and ongoing negotiations, or from the few specific commitments made by Brazil in the area. Whatever foreign entry, there was basically amounted to unilateral liberalization not included in formal exchanges of concessions.

Within other thematic trade negotiation agendas, interesting trade-offs may call for sophisticated strategic considerations. In agriculture, for instance, each country must factor in the effects of liberalization elsewhere on the equilibrium in worldwide markets for different commodities, of which it may be either a net importer or a net exporter. In the case of financial services, it is generally accepted that market shares everywhere will be redistributed in favor of providers from developed countries, and that developing countries, unless they manage to exchange liberalization in services for concessions in other areas, will have to be content with gains they would equally obtain by liberalizing unilaterally.

Also, countries with little interest in non-discriminatory liberalization may still see gains in (or be prepared to face the burden of) liberalization within a regional group. That may again lead to interesting choices between non-discriminatory liberalization and several possible regional combines. But regional preferences are enforceable only if all participants maintain a similar level of protection against the outside world or rules of origin are in place to prevent more open members from serving as a transshipment route into more closed ones. Regarding financial services, neither condition is fulfilled by the regional integration initiatives in

¹⁵ We wish to thank (without implicating) Marcelo de Paiva Abreu, Masamichi Kono, Patrícia Bezerra de Mello, and Loïc Sadoulet. We are also grateful to Marina Fontoura for able research assistance.

which Brazil participates, making regional liberalization tantamount to non-discriminatory liberalization.

Because financial services lend themselves relatively little to economic strategizing in self-contained negotiations, and because past concessions made by Brazil were a very poor predictor of upcoming liberalization moves, we shall pay less attention to formal trade diplomacy than to the actual effects of the observed unilateral liberalization. Section 2 briefly reviews the relevant facts in support of that option. In section 3, we examine the theoretical case for unilateral liberalization in financial services, and identify one benefit that is both most promising and relatively easier to quantify, namely gains in cost efficiency in financial intermediation. We then proceed to measure the progress made in that respect in the last few years.

We concentrate on the banking market rather than financial services in greater generality. Given the universal banking system adopted in Brazil, and the fact that the Brazilian economy relies very heavily on financial intermediation through banks, that is already quite comprehensive. Banking has also been the sector with the highest profile in terms of recent market opening. It must be recognized, however, that other financial services may show even more dynamism in the future – for instance, it is generally reckoned that Brazil is considerably underinsured.

2. Negotiations and Liberalization

By 1995, foreign participation in the Brazilian banking market was largely what it had been for the entire preceding decade. Foreign banks operated in Brazil either through capitalized branches or as locally incorporated subsidiaries (sometimes, under both formats). Foreign financial institutions also held minority stakes in banks controlled by nationals, so imparting their international credibility to the local association and enjoying more authority over its operation than warranted by their capital share. Together, all those banks with strong ties to foreign capital accounted for about 15% of total assets in the banking system, and about 30% of assets of private banks [Bevilaqua, 1996]. Foreign banks concentrated in some market niches, such as international finance and high-end retail banking, or were the consumer finance arms of auto makers. As a result, they had only 4% of the bank branches in the country. Total foreign investment in the Brazilian banking system was close to US\$ 2 billion, of which Japan held 24%, the US 23%, France 13%, the UK 11%, and Germany 8% [Bevilaqua, 1996].

In terms of foreign participation in total banking assets, Brazil did not compare all too unfavorably to Argentina, with 15% in 1994, to Chile, with 24% in 1996, or to post-NAFTA Mexico, with 20% in 1996 (figures are from Dobson and Jacquet, 1998). In terms of market contestability, however, the regime was extremely closed – much more so than in these other countries. Basically, new

foreign banks were not permitted to establish in Brazil unless specifically authorized by a presidential decree. The same was required for any expansion of foreign participation, directly or indirectly, in locally incorporated banks. There was no indication of willingness to grant such discretionary authorizations in any substantial scale. Central Bank authorization was also required for the establishment of new branches of any existing bank, and that was used to severely limit the expansion of foreign banks.

The latest Brazilian schedule of commitments in financial services under GATS contains few substantive concessions.¹⁶ Limitations on market access and national treatment were left unbound for most sectors and modes of supply. Some of the few exceptions merely confirmed a long established *status quo*, like the commitment to no limitations on cross-border supply of freight insurance on exports. Others related to auxiliary services like actuarial, consultancy and survey services in insurance, which shall not suffer any limitation. There is otherwise no commitment whatsoever relating to consumption abroad or cross-border supply of financial services. Commercial presence generally requires the discretionary, case-by-case executive authorization to conduct business; marginal exceptions are insurance brokerage, clearing services for securities and derivatives, and over-the-counter securities trading. The executive authorization may impose *ad hoc* conditions and limits, including restrictions on branching. Reinsurance and work accident insurance remain public monopolies, and Brazil only made a quite indefinite promise to “undertake commitments” in these areas once Congress passed legislation already proposed by the executive lifting these monopolies. As a more palpable promise, and perhaps the most substantive item in the whole schedule, “foreign persons may participate in the privatization of public sector financial institutions and in each case commercial presence *will* be granted” (our emphasis).

GATS schedules that merely freeze the *status quo* in financial services are the rule rather than the exception (Sorsa 1997, Dobson and Jacquet 1998). Even those have been sometimes welcomed as a progress for preventing policy from ever slipping backwards (WTO 1997). In the Brazilian schedule, however, the executive authorization for commercial presence is so arbitrary that no operative lower bound is created. The notable exception is the rather firm commitment to allow foreign acquisition of public sector banks being privatized. That is in line with the apparent priority accorded by the Brazilian government to maximizing privatization revenues over competing policy objectives.

Liberalization of Brazilian trade in financial services was also not advancing much in the regional sphere. Brazilian foot-dragging with regard to an FTAA is

¹⁶ GATS/SC/13/Suppl. 3, 2/26/98.

part of a much broader diplomatic program, but even there, resistance gets especially strong when it comes to including financial services in the agenda. Just as resistance to GATS concessions, that is hardly surprising given the perceived competitive threat posed by US financial institutions. Within MERCOSUR, where there is no major money center, one might have expected more progress, but virtually none has been made. The obstacle, at least as far as banking is concerned, has been the great asymmetry between the multilateral trade regime adopted by different members (Bevilaqua 1996, Abreu 1997). While Brazil maintained a closed banking market, the others have very open regimes. Argentina, Brazil's main partner in MERCOSUR, imposes no restriction either on commercial presence in banking or on consumption of banking services abroad. Any Brazilian concession made on a preferential basis to a regional trading partner, which has itself a very liberal regime toward the rest of the world, would for all practical purposes amount to a multilateral concession. Firms from any other part would be able to penetrate the Brazilian market through subsidiaries incorporated, say, in Argentina. That happened, for instance, when NAFTA was formed: European banks made important acquisitions in the Mexican market through their US subsidiaries.¹⁷ The EU also adopted a "single passport" policy, and again much of the further external penetration into markets of EU members occurred through pre-existing subsidiaries in some other member (WTO 1997).

Within MERCOSUR, market access abroad might be of benefit to Brazilian banks, who could, with relative ease, extend to these neighboring countries the economies of scale already obtained in their much larger domestic market. Brazilian firms with business in these countries or multinationals with regional headquarters in Brazil might find Brazilian banks especially attractive there, and represent a platform from which these banks could launch onto a broader clientele. Some Brazilian banks have been cautiously testing the water in Argentina with single branch operations. Banco Itaú stands out, having already made much bolder moves into retail. Since 1995, it opened 32 branches, mainly in metropolitan Buenos Aires. Last May, it announced the acquisition of Banco del Buen Ayre, which will add 60 more branches to its Argentinean network, making it the fifth largest in the Buenos Aires region.¹⁸

Given the liberal regime adopted by Argentina on a multilateral basis, Brazil would, in principle, need to make no concession to benefit from that market access. However, Argentinean authorities indicated that some preferential treatment has been given to Brazilian banks – supposedly granted right of establishment when they were in less than full compliance with the relevant

¹⁷ "Sin el TLC, la recuperación bancaria hubiera sido más difícil", *El Economista* (Mexico), 5/5/97.

¹⁸ Information from the bank's Argentinean website, www.ita.com.ar.

Argentinean legislation – and threatened to revert to a zero tolerance policy if Brazil did not take liberalization steps as well (Bevilaqua 1996). The only publicized response by Brazilian authorities was to grant a similarly marginal preference to MERCOSUR investors, allowed to acquire stakes in Brazilian banks without collecting the “toll” – acquisition of “negative assets” of financial institutions under Central Bank intervention – required from other foreigners who wish to establish in Brazil.¹⁹ So far, banks originating in MERCOSUR made no major acquisition in Brazil.

There is, in principle, a possibility of imposing “rules of origin of capital” on providers of financial services. GATS in general precludes that type of discrimination in regional commercial integration agreements, but using access to a member of the regional agreement merely as a stepping stone towards another is not covered.

A service supplier of any other member that is a juridical person constituted under the laws of a party to an agreement [of regional integration] shall be entitled to treatment granted under such agreement, *provided that it engages in substantive business operations in the territory of the parties to such agreement* (Article V, paragraph 6, our emphasis).

Furthermore, in the case of regional agreements “involving only developing countries, more favorable treatment may be granted to juridical persons owned or controlled by natural persons of the parties to such an agreement” (Article V, paragraph 3).

It is extremely unlikely that such provisions could help resolve the financial services stalemate within MERCOSUR (they clearly have no bearing on an eventual FTAA). First, enforceability of preferences based on the origin of control is debatable. Compared to rules of origin for goods, it may even be easier to recognize the ultimate origin of controllers of financial institutions who wish to take advantage of their international corporate identity, but it may be hard to characterize that in legal statutes. Second, from the point of view of Brazil’s partners in MERCOSUR, whose financial systems have much deeper penetration of foreign investment, such

¹⁹ “Banco de Galicia may participate in BCN Barclays this month”, *Gazeta Mercantil Online*, 6/19/97; “Authorization for Galicia’s participation published today”, *Gazeta Mercantil Invest News*, 10/14/97. Banco de Galicia acquired the 23% stake of Brazilian bank BCN in Banco BCN Barclays, a long-established association with Barclays Plc., for a reported amount of US\$ 27 million. “Brazil’s BCN sells stake in BCN Barclays”, *Reuters Financial Service*, 12/20/96. To have an idea of the magnitude of the preference accorded to Banco de Galicia, French Société Générale was at the time paying a “toll” of about US\$ 4.8 million in connection to a transaction valued at 80% more than Galicia’s acquisition. “Société Générale to take control of Banco Sogeral”, *Gazeta Mercantil Online*, 3/21/97. Incidentally, note that Banco de Galicia is locally-owned Argentinean bank and not a subsidiary of a foreign bank.

discrimination would partly defeat the purpose of obtaining liberalization from Brazil. Third, the overall legal status of MERCOSUR is not entirely established under the WTO, and it is uncertain whether it would qualify for the developing country provision of paragraph 3. Fourth, the stepping stone qualification of paragraph 6 is unlikely to bind, since most institutions with an eye on Brazil have similar plans at least for Argentina.

Without much improving its willingness to make formal liberalization commitments, the Brazilian government gradually softened its stance in the case-by-case authorization of establishment of foreign banks. That trend started in 1996, with the transfer to foreigners of control over small financial institutions under Central Bank intervention. That transfer was justified as a tidy solution to the problem of liquidation costs that would otherwise be borne by the federal government. The foreign-controlled banks so created were expected to restrict themselves to wholesale or highly specialized operations and were not granted much in terms of branching privileges. Banque Nationale de Paris, which had previously been associated with a Brazilian bank, set foot solo in Brazil announcing that it had no interest in retail anywhere outside the region of Paris.²⁰ Ford could open its own bank specialized in auto finance after dissolution of its regional alliance with Volkswagen, with the bank they jointly owned going to VW. That far, new entrants posed no threat to large domestic retail banks.

Then, authorization was given for transactions that involved somewhat larger and financially sound banks. But those were mainly transfers to foreigners of minority stakes in banks already controlled by foreign institutions. Société Générale acquired the 50% it did not yet own in Banco Sogeral, and Banco de Galicia of Argentina replaced Brazilian bank BCN with a 23% stake in Banco BCN Barclays (renamed Banco Barclays e Galicia). Again, that did little to upset the market in terms of added competition.

The first hint of what lay ahead came with the sale of Banco Bamerindus, in March 1997, to British financial group HSBC. That was once more a bailout engineered by the Central Bank, but it now involved what was then one of the top five private banks in the country, with total assets over US\$ 10 billion and a network of 1,200 branches. The acquisition reportedly cost HSBC US\$ 885 million – about US\$ 360 million in excess of book value.²¹ Other large bank bailouts had recently taken place, but in those cases, domestic solutions had been found: Banco Nacional had been absorbed by Unibanco and Banco Econômico by the much

²⁰ “BNP Brasil will operate by start of March, with Vayssie in command”, *Gazeta Mercantil Invest News*, 12/5/96.

²¹ “HSBC investment totaled R\$ 929 million”, *Gazeta Mercantil Online*, 4/2/97; “HSBC to pay premium in installments”, *Gazeta Mercantil Online*, 4/10/97.

smaller Banco Excel. According to the Brazilian finance minister, HSBC was allowed to step in “because there simply was no other institution capable of doing so”.²² Political circles kept debating the financial intricacies of the bailout – who would pay how much, to whom, for what, and when – but protectionist protests were muted as local bankers were themselves eager to get past lingering fears of systemic crisis. But it was widely acknowledged that competition would be turned on a full notch.²³

Other foreign acquisitions of Brazilian retail banks, ranging from quite sound to outright insolvent, soon followed. Banco Santander of Spain first acquired control of Banco Geral do Comércio, a smaller retail institution (assets of US\$ 1.2 billion and a network of 77 branches). A few months later, it took over the larger Banco Noroeste (US\$ 5.4 billion in total assets and 150 branches).²⁴ Through Banco Interatlântico, a preexisting local association with Crédit Agricole of France and Brazilian investors, it operated in wholesale markets, Banco Espírito Santo of Portugal acquired control of retailer Banco Boavista (total assets of nearly US\$ 4 billion). Boavista had negative net worth and was under threat of intervention by the Central Bank.²⁵ Banco Bandeirantes (total assets near US\$ 5 billion), also in difficulties, was sold to the Portuguese Caixa Geral de Depósitos, which had long operated a very small subsidiary in Brazil.²⁶ Banco Sudameris (total assets US\$ 6.4 billion), a Brazilian retail bank ultimately controlled by Banca Commerciale Italiana, was authorized to take over Banco América do Sul (total assets US\$ 3.4 billion, and Fuji Bank as a minority stakeholder) and to expand their combined networks to 500 branches.²⁷ Banco Bilbao Vizcaya of Spain acquired control of Banco Excel Econômico (total assets US\$ 10 billion), which was itself having difficulty in digesting its earlier takeover of Banco Econômico.²⁸ Lloyds Bank, which operated in Brazil both with a branch and with a locally incorporated subsidiary, and in addition to that held a 50% stake in Banco Multiplic, was

²² “HSBC was the only bank capable of taking over Bamerindus”, *Gazeta Mercantil Invest News*, 11/6/97.

²³ “HSBC wants to be the biggest bank in Brazil”, *Gazeta Mercantil Online*, 3/27/97; “HSBC redraws Brazil banking landscape”, *Reuters Financial Service*, 4/1/97.

²⁴ “Banco Santander gains foothold in Brazil”, *European Banker*, 3/24/97; “Santander acquires control of Noroeste”, *Gazeta Mercantil Online*, 10/31/97.

²⁵ “Espírito Santo to stay with 34% of Banco Boavista”, *Gazeta Mercantil Invest News*, 9/2/97; “Boavista Interatlântico to receive R\$ 120 million”, *Gazeta Mercantil Invest News*, 9/3/97; “Banco Boavista had negative net worth”, *Gazeta Mercantil Online*, 9/4/97.

²⁶ “CMN authorizes CIG to purchase Bandeirantes”, *Gazeta Mercantil Invest News*, 1/28/98.

²⁷ “Decree authorizes increase of foreign capital”, *Gazeta Mercantil Invest News*, 7/14/98.

²⁸ “Bilbao Vizcaya to inject \$ 1.5 billion into Excel, says Mauch”, *Gazeta Mercantil Invest News*, 7/30/98.

bought out of the latter association and walked away with its credit portfolio of nearly US\$ 1.3 billion.²⁹

Last June, CS First Boston took over Banco Garantia, the top investment bank in the country (assets US\$ 4.3 billion), paying an estimated US\$ 850 million, plus a US\$ 35 million toll to the Central Bank. Although Garantia was an icon in its market segment, that takeover caused no public alarm. Sale of Banco Real to ABN Amro, a month later, was not received quite as peacefully. Banco Real is the fourth largest private bank in the country, with nearly US\$ 20 billion in assets and a network close to 1,400 branches. Unlike many of the larger banks previously transferred to foreign control, Banco Real reportedly enjoyed perfect financial health, and the sale was motivated simply by succession problems within the controlling family. ABN Amro, which already had a sizeable local subsidiary (total assets US\$ 3.8 billion), would pay up to US\$ 3 billion for 40% of the voting stock and up to 100% of the preferred stock, plus a US\$ 70 million toll, and would be handed control of the bank in shareholders' agreement.³⁰

Leading Brazilian bankers made vehement protests against the "lack of transparency" in that negotiation, and complained that they too should have been given a chance to bid for Banco Real. It was also argued that Brazil was promoting a radical opening of the domestic banking market, a course with rare precedents in the entire world that might (for some reason left unspecified) even imperil the autonomy of conduct of macroeconomic policy. Brazil, it was claimed, should at least have negotiated reciprocal concessions in exchange for that market access. Central Bank officials reaffirmed that foreign investment was a welcome contribution in the process of restructuring the domestic financial system. No one defined precisely how far "restructuring" was meant to go, now that it was no longer confined to bailing out banks in trouble. But there was some indication that authorities might be content with the level of competition already attained – apart from the state banks scheduled for privatization, there might be a pause in large takeovers by foreigners.³¹

²⁹ "Multiplic and Lloyds to sever partnership", *Gazeta Mercantil Online*, 2/12/97; "Lloyds concludes operation with Multiplic", *Gazeta Mercantil Online*, 4/14/97.

³⁰ "Holandeses vencem jogo pelo Real", *O Globo*, 7/9/98; "ABN Amro to pay \$ 3bn for Banco Real", *Financial Times*, 7/9/98.

³¹ "Brazil: bank takeover stokes fear of invasion of foreign capital", *Inter Press Service*, 7/9/98; "Para Febraban, negócio não teve transparência", *O Globo*, 7/9/98; "Swift business surprises financial market", *Gazeta Mercantil Online*, 7/9/98; "Real: Brandão diz que bancos tinham que ser ouvidos", *O Globo*, 7/10/98; "Gustavo Franco rebuts Febraban criticism", *Gazeta Mercantil Online*, 7/10/98; "BC não vai limitar a entrada de bancos estrangeiros", *O Globo*, 7/12/98; "Discussions on bank denationalization", *Gazeta Mercantil Online*, 7/16/98; "Banco estrangeiro enfrentará competição dura", *O Estado de S. Paulo*, 7/19/98; "Foreign investments debate rages on", *Gazeta Mercantil Online*, 7/24/98.

As a result of all that activity, and a number of smaller transactions not mentioned here, foreign participation increased to 21% of total bank assets, and to 39% of total assets of private banks (up from 15% and 30%, respectively).³² In particular, foreign banks made great progress in their participation at the top of the bank ranking. Most importantly, there was a qualitative change of outlook in terms of market contestability – which will remain even if it is now decided to slow down foreign entry.

The absence of US banks among the foreigners recently entering or expanding in Brazil is noteworthy. BankBoston and Citibank are oldtimers in the high end of the Brazilian retail market, but did not take part in the recent wave of acquisitions. Instead, they have just obtained authorization to open 20 new branches each (Bank Boston already had 36 and Citibank 22).³³ The only substantial new entry was by NationsBank, which made a US\$ 50 million deal for a controlling stake in Banco Liberal – very far from the largest positions secured by European banks.³⁴ It has been argued that deregulation of the US banking market and the ensuing consolidation frenzy left little “appetite” for new ventures in emerging markets.³⁵ Apparently, European financial integration did not have similar effects, as some of the European banks making acquisitions in Brazil were also engaged in true shopping sprees all around Latin America.³⁶

Neither the extent nor the direction of such foreign entry would ever have been forecasted from Brazil’s position in formal negotiations about trade in financial services. Even after the first signs that Brazil might soften its stance through case-by-case authorizations, most eventual entry was expected to occur in the wholesale end of the market or in investment banking activities that could be performed out of mere representative offices (Bevilaqua 1996).³⁷ These were the least politically sensitive segments of the market, and the object of the avowed interest of potential

³² According to balance sheets of 12/97. *Gazeta Mercantil – Balanço Anual 1998*. In the meantime, Brazilian Banco Itaú took over the local subsidiary of Crédit Lyonnais, Banco Francês e Brasileiro (then with assets at US\$ 2.9 billion). “Itaú completes purchase of Banco Francês e Brasileiro”, *Gazeta Mercantil Online*, 4/2/96.

³³ “CMN makes decisions on Santander, Citibank and BankBoston”, *Gazeta Mercantil Invest News*, 5/28/98.

³⁴ “Foreigners flock to grab a share: foreign acquisition of Brazilian banks”, *The Banker*, 3/98.

³⁵ “Fusão é confusão” (interview with Henrique Meirelles, CEO of BankBoston), *IstoÉ*, 4/22/98.

³⁶ “New World ventures”, *The Banker*, 10/96; “BBV y Santander también compran activos financieros en Argentina, Brasil, Chile, Venezuela, Colombia, Panamá, Perú y Puerto Rico”, *El Economista*, 11/4/94; “HSBC keeps up Latin-American drive”, *Reuters Business Report*, 5/30/97; “Banks look to Latin America: huge growth potential is attracting foreign interest”, *Financial Times*, 8/18/97.

³⁷ Similar predictions were made for the Mexican market upon formation of NAFTA. “The gringos banks are drooling”, *Business Week*, 9/13/93.

entrants (Abreu and Flôres 1990). There, it was sometimes argued, resided the greatest competitive edge of sophisticated money center financial institutions (Garber and Weisbrod 1993 formally presented this argument for Mexico). Such was indeed the nature of the earliest wave of new entrants, which included firms like Merrill Lynch, Salomon Brothers, Bear Stearns, and Prudential Securities; even firms with strong retail activities abroad, like BNP, announced plans to concentrate on those market segments. The ground gained by foreigners in retail banking was remarkable.

In a particular twist of fate, foreign entry in retail banking sidestepped altogether the only channel declared open to it: privatization of public sector banks, in accordance with the Brazilian schedule of concessions under GATS. Only four banks have been privatized thus far: the official state banks of Rio de Janeiro (Bancrj) and Minas Gerais (Bemge), a federal bank (Banco Meridional), and a bank that had fallen in the hands of the government of Minas Gerais (Credireal). All four were bought by banks under domestic control: the two state banks by Banco Itaú, Meridional by Banco Bozano, Simonsen, and Credireal by BCN (later taken over by Bradesco).³⁸ Some foreign investors were reportedly coaxed into taking part, but few pre-qualified for the auctions, even fewer posted guarantees (a pre-requisite for bidding), and only one actually bid.³⁹ The next to be privatized is

³⁸ Foreigners do hold a stake in Banco Bozano, Simonsen, and it formally needs executive authorization to acquire other banks in Brazil. It may therefore have benefited from the special treatment of privatization. But some domestic banks with minority foreign partners had their requests for authorization of takeovers expedited on the grounds that they were notoriously "national companies". The reach of that sort of exception is not clear. "Decree necessary if Bradesco is to buy BCR", *Gazeta Mercantil Invest News*, 4/30/98.

³⁹ BCN, Bradesco, Itaú and investment bank Pactual, all domestic (the latter perhaps on behalf of third parties), pre-qualified and posted guarantees for the Bancrj auction (6/97), but the only bid was Itaú's. "Possibility of Bancrj being resold does not worry Franco", *Gazeta Mercantil Invest News*, 6/20/97; "Only Itaú presents proposal for Bancrj", *Gazeta Mercantil Invest News*, 6/26/97. In the Credireal auction (8/97), the pre-qualified domestic parties were BCN (represented by investment bank Pactual), Bicbanco, Noroeste (before the Santander takeover), and Bozano, Simonsen; BankBoston was the sole foreigner. Only BCN and Bicbanco posted guarantees, and only BCN bid. "Two brokerage firms present guarantees for Credireal", *Gazeta Mercantil Invest News*, 8/6/97; "Bicbanco confirms guarantees for Credireal auction", *Gazeta Mercantil Invest News*, 8/6/97; "Pactual buys Credireal for BCN at minimum price", *Gazeta Mercantil Online*, 8/8/97. Bradesco, Bozano, Simonsen and the Portuguese Caixa Geral de Depósitos (which would soon take over Banco Bandeirantes) reached the bidding stage in the Meridional auction (12/97), and CGI "fought until the bitter end with Bozano, Simonsen". Banco Pactual had pre-qualified but dropped out, and Banco Bilbao Vizcaya had been invited to participate but declined. "BC director clarifies Bilbao's interest in Meridional", *Gazeta Mercantil Invest News*, 10/17/97; "Three groups to bid for Meridional today"; *Gazeta Mercantil Online*, 12/4/97; "Success of Meridional auction will benefit other state banks", *Gazeta Mercantil Invest News*, 12/4/97. In the case of Bemge (finally auctioned in 9/98 after some postponement), foreigners ABN Amro, Bilbao Vizcaya and Santander pre-qualified together with Meridional (already in the hand of Bozano, Simonsen), Bradesco and Itaú, but only the domestic camp posted guarantees or bid. "Six groups dispute

the official bank of the state of Pernambuco (Bandepe), and ABN Amro pre-qualified side by side with Bradesco and Meridional.⁴⁰ That bank (as most other state banks) is not a very attractive business proposition as a first step into the Brazilian market (not the case of ABN Amro), because its branch network is heavily concentrated away from the major financial centers. The next true test of foreign interest in the privatization process will be the sale of Banespa (the state bank of São Paulo), scheduled for early next year.

3. Why Liberalize?

As mentioned in the introduction, it is generally believed that comparative advantage in the provision of financial services lies with developed countries, and that countries like Brazil have very little to gain from market access abroad. It has been suggested that Brazil should attempt to condition liberalization of financial services on concessions it sought in areas of its own interest. Possible links with agricultural trade with the European Union have been mentioned;⁴¹ in the past, foreign debt negotiations were also a candidate (Abreu and Flôres 1990). Brazil ended by relinquishing any such opportunity with its staunch resistance to formal concessions in financial services, followed by the unilateral, *de facto* about-face described above.

The change of heart among Brazilian authorities may have been sparked by the prospect of short-term benefits such as the capital inflows associated with bank takeovers or the foreign contribution in the bailout of problematic banks. The Central Bank collected nearly US\$ 250 million in tolls from foreign entrants – to which one should add what it saved on institutions that would have required a bailout had they not been so keenly taken over by foreign investors eager to set foot in the Brazilian market.⁴² The capital inflows associated with the takeovers may have been more valuable – at recent junctures, at least as a signal – than that fiscal contribution. Yet, any such immediate benefit is likely to be dominated by permanent effects that openness may have on the domestic financial market.

We are therefore led back to the gains from unilateral liberalization of trade in services. Studies advocating liberalization have stressed such arguments (Dobson

Bemge”, *Gazeta Mercantil Online*, 6/5/98; “CLC lists confirms three participants in Bemge auction Monday”, *Gazeta Mercantil Invest News*, 9/14/98; “Only Brazilian groups will dispute Bemge auction”, *Gazeta Mercantil Online*, 9/14/98; “BC authorizes transfer of Bemge stock control to Itaú”, *Gazeta Mercantil Online*, 9/18/98.

⁴⁰ “Foreign capital could play a part in Bandepe auction”, *Gazeta Mercantil Invest News*, 8/14/98; “List of pre-qualified for Bandepe auction being announced”, *Gazeta Mercantil Invest News*, 8/27/98.

⁴¹ “Blair praises Cardoso and makes promises for Mercosur”, *Gazeta Mercantil Online*, 5/20/98.

⁴² “BC não vai limitar a entrada de bancos estrangeiros”, *O Globo*, 7/12/98.

and Jacquet 1998, for instance), for lack of much else to say to most of the recalcitrant readership. Some of these arguments mix liberalization of trade in services with liberalization of the capital account. The latter indeed facilitates cross-border trade in financial services, but our main interest here is the effect of allowing foreign commercial presence without changing the capital account regime. That seems more applicable to the Brazilian case.

Focusing on commercial presence in banking, the following are the main arguments in support of liberalization, even unilateral:

1. *Classical gains from trade*: unilateral specialization along the lines of comparative advantage, as dictated by the external prices faced by a small country, tends to make that country better off. But there may be less room for that type of gain in financial services than in trade in goods. This is not to say that countries do not differ enough in endowments and technology for large comparative advantages to arise in financial services, which may in fact explain the observed pattern of cross-border trade in the sector (Moshirian 1994). The problem is that many financial services are not tradeable across borders, either for technological reasons or due to legal restrictions to capital mobility. In many lines of service, the bulk of the value must be added locally. Trade through commercial presence will tap on local resources and be relatively less conducive to reallocation along the lines of comparative advantage. On the other hand, many financial services that are tradeable across borders, and likely to remain so under the Brazilian regime for the capital account, already benefit from a relatively liberal environment (international interbank lending, for instance). Technological progress tends to enhance cross-border tradeability of value-added even in services that require commercial presence, but geographical segmentation of retail banking, for instance, remains strong even in liberalized markets like Europe (WTO 1997).

2. *Less market power*: the extra competition of foreign providers would reduce market power and bring the economy closer to the competitive equilibrium, with higher output and lower prices for financial services. Of course, some of what consumers gain, producers lose in the form of reduced profits. Estimates of the net welfare gain for the entire country associated with reduced market power in financial services usually yield small numbers (Rhoades 1982, Berger and Hannan 1998). Furthermore, when analyzing foreign entry, one must deduct from those (to arrive at a welfare computation at the country level) the monopoly rents that will accrue to foreign entrants – since market power is unlikely to disappear altogether.

3. *Lower prices*: this sort of argument stresses the gains to consumers in spite of the losses suffered by producers. The movement in prices and profit margins may be considerable even if the net welfare gains are small from a partial equilibrium perspective. Reduction of prices for financial services has been considerable in

Europe since the single market (WTO 1997). Claessens, Demirgüç-Kunt and Huizinga (1998) find evidence, in a large panel of banks in 80 countries, that profit margins are reduced by foreign penetration. At the partial equilibrium level, however, the argument demands some distributive justification, which may well be warranted but should be made explicit.

4. *General Equilibrium Spillovers*: prices of financial services are a cost of production everywhere in the economy, and also a transaction cost for buyers of goods and services. Reduction of these prices would be an across the board incentive to both supply and demand, and there might be welfare gains in the resulting increase in equilibrium output. This calls for an ambitious CGE exercise that falls outside the scope of this paper.

5. *Lower Costs*: foreign entrants might have lower costs, either because they seek cost minimization more actively or thanks to economies of scale and scope from their global activities. Their mere presence would reduce the average cost of financial intermediation. It might also trigger cost saving efforts by domestic firms. Many explanations exist for why firms in imperfectly competitive markets leave cost saving opportunities unexploited in the first place, including departures from profit maximization in favor of other managerial objectives. They would catch up on cost savings once that becomes a matter of survival. Aggregate costs would be driven further down by their efforts or otherwise by their demise, making way for the expansion of cost efficient firms. Several economists have suggested that cost inefficiencies harbored by monopoly power might be quite high (Scherer 1970) – an order of magnitude higher than the welfare loss due to market power itself. Estimates recently produced by Berger and Hannan (1998), based on comparison of local banking markets in the US with different degrees of concentration, point in the same direction. In connection with foreign entry, Claessens, Demirgüç-Kunt and Huizinga (1998) do find reduction of overhead costs, although the effect is small and not very significant (statistically).

6. *Better allocation of credit*: it is often claimed that credit assessment is the Achilles' heel of Brazilian banks, otherwise very advanced in trading and in customer service. That would be the legacy of many years of high inflation, when banks devoted less to credit concession and more to treasury operations, relying heavily on the inflationary float on their deposits. Their credit policy would focus excessively on guarantees (endorsements or collateral) and give scant attention to the prospects of the project being financed. These features obviously distort credit allocation, making it conform less with marginal capital efficiency patterns. Foreign banks could contribute by importing their superior credit assessment methods. Measurement of these effects, even after the fact, is very difficult – let alone prediction.

7. *More stability*: some authors believe that an emerging banking market open to foreign participation may be more stable and relieve domestic authorities of some of the regulatory, supervisory and lender of last resort burden. As long as foreign entrants are large international players based in developed countries, they would bring along compliance with their more stringent native regulations and market discipline, count on their own headquarters abroad as a lender of last resort, and on their activities elsewhere as a buffer against local shocks (Gavin and Hausmann 1997). There is the theoretical possibility that more competition could exacerbate the need for prudential regulation, as banks with lower profit margins constitute less valuable franchises, being therefore more prone to risk. A more down-to-earth argument to the same effect is that less profitable banks become less robust to occasional errors of strategy or management, and put more demands on a safety net. But adequate capital requirements can always ward off such dangers of increased competition. The argument of imported stability is stronger if market opening is managed so as to select entrants of good extraction. This may be a point in defense of a discretionary, case-by-case unilateral liberalization like Brazil's, instead of a multilateral, non-discriminatory set of rules.

8. *Modernization of the payments system*: there are patent inefficiencies in the Brazilian payments system, which requires too much processing of paper documents and too many trips to the bank. It could be made far less wasteful if cash or checks (which require a trip to the bank by the payee and further processing) gave way to electronic debit and credit cards as a means of payment. Similarly, the common practice of paying bills at the bank teller is very inefficient compared to payment by mail or by automatic bank debit. Some hope was expressed that foreign entrants, which run much more efficient payments systems at home, could do the same in Brazil.⁴³ But Brazilian banks have themselves all the automation capability to promote such changes, and would carry them out if only conditions were right. The most formidable barrier against such improvement seems to be the fact that a large contingent of the Brazilian population remains "unbanked", because their transaction balances do not cover the costs of maintaining a checking account. Assimilation of these contingents in the banking market before substantial improvements in their standard of living hinges on cost cutting advances in bank technology. Furthermore, dissemination of electronic

⁴³ "Entrada do ABN Amro deve acelerar mudanças no setor", *O Estado de S. Paulo*, 7/14/98. One excerpt reads (our translation): "A study by the American consultancy McKinsey shows that Holland (where ABN Amro is headquartered) uses the best banking practices in the world. McKinsey exemplifies noting that the bulk of bill payments in Brazil is still made at bank branches. After the customer gets to the bank and waits in line, processing at the teller still takes on average one minute. In the US, the system is semi-automated and a check received by mail takes 20 seconds to be confirmed. In Holland, most payments are made by an automated system taking 5 seconds."

payment awaits abundant and cheap telephone connections. In short, mere opening of the banking market promises no dramatic improvements in this area beyond its possible contribution to reduce bank costs.

In the next section, we try to measure the cost reduction effect described in item 5. We concentrate on that because it is easier to measure than the effects in items 3, 4, 6 or 7, perhaps more substantial than those in 1 or 2, and instrumental for progress in 8. Moreover, note that lower prices are expected to follow from lower costs even if market power is not reduced at all. Marshallian surplus expands both by the reduction of the social cost of production and by the increase in equilibrium output. If one believes the effects in 2, 3 or 4 to be important, one should be very interested in cost cutting. It may after all hold the best chance of lower prices in the case of Brazil: since new entrants merely took over existing banks, and some consolidation is also under way, the net effects on market power may be disappointing.

4. Measuring Cost Inefficiency

Here we attempt to measure how much progress has been made in reducing banking costs since the domestic market started to open up to foreign entry. We shall be concerned only with costs that represent absorption of real resources in the production of banking services – mainly personnel and administrative expenses. These – as opposed to interest payments, say, which are also an expenditure from the bank's point of view – represent the actual social cost of financial intermediation.

The thorny question in measuring cost inefficiency, usually defined as a ratio costs/output, is the choice of a meaningful measure of output. Some studies interpret the ratio costs/income as a measure of inefficiency in financial services (WTO 1997). Bankers engaged in cost saving programs seem to target this sort of ratio as well.⁴⁴ Income may not be a good proxy for output in this context: if unit costs are falling, prices are likely to be falling as well; but prices are equal to income/output, and so the ratio costs/income will underestimate the gains in cost efficiency.

Some other studies measure inefficiency by the ratio costs/total assets (Claessens, Demirgüç-Kunt and Huizinga 1998). Total assets are not a good measure of output either. First, not all assets represent a financial transaction – permanent assets, which are not a liability of anyone else's, clearly do not. Second, even assets that do represent financial transactions should not all have the same weight, dollar for dollar, in a measure of the social value of financial intermediation services. There is certainly more financial service content in a dollar

⁴⁴ "Queda do juro obriga bancos a buscar eficiência", *Gazeta Mercantil*, 8/12/98.

loaned to the public than in a dollar invested in the interbank market, so that some other bank may take the trouble of eventually lending it to the public. Third, as much as different classes of bank assets represent different financial services, so do different classes of bank liabilities – notably, deposits.

The problem is then to find an appropriate aggregate of the relevant multidimensional measure of output:

$$(y_1, y_2, \dots, y_n) \rightarrow f(y_1, y_2, \dots, y_n)$$

a scalar that can be used as the denominator in a measure cost inefficiency:

$$u = \frac{c}{f(y_1, y_2, \dots, y_n)}$$

The standard method for obtaining such a scalar is to rearrange the latter as a regression equation:

$$\log c = \log f(y_1, y_2, \dots, y_n) + v$$

which does not need to be linear or even parametric. The proportional inefficiency measure $u = e^v$ is obtained from the residual of that regression.

That measure gives only a partial answer to our question, because it captures technical but not allocative inefficiency. The marginal social value of each line of service may not be equated to its marginal social cost in determining what basket of services is produced. We do not measure such deviations from the social optimum. We simply estimate how much each bank spends to produce its own basket of services in excess of what a “representative” bank would have spent.

We have quarterly balance sheet data from 94.IV to 98.II (15 quarters) for a panel of 38 commercial and “multiple” banks operating in Brazil.⁴⁵ The panel is

⁴⁵ The sample includes the following banks: ABC Roma (recently renamed ABC Brasil), América do Sul, Bamerindus (now HSBC Bamerindus), Banco de Crédito de São Paulo (BCSP), Banco do Brasil (BB), Bandeirantes, Banespa, Banestado, Banestes, BankBoston, Banrisul, BBA Creditansalt, BCN, Bemge, Besc, BNL, Boavista, Bradesco, BRB, CCF, Cidade, Citibank, Dresdner, Excel (renamed Excel Econômico), Fénicia, Francês e Brasileiro (BFB), Itaú, Lloyds, Mercantil do Brasil (BMB), Mercantil Finasa, Multiplic, Noroeste, Real, Safra, Sudameris, Sumitomo, Unibanco, and Votorantim. Most of the data comes from *Revista Bancária Brasileira* (several issues) and from the database graciously provided by Ecomatematica.

however very unbalanced (it does not include all banks at all dates) and contains only 261 observations. We can afford to significantly estimate fewer parameters than the typical efficiency study of US banking, where the sample sizes are typically in the thousands.⁴⁶ Keeping in mind the need to economize on degrees of freedom, we run the following regression:

$$\begin{aligned} \log c = & \beta_L \log L + \beta_D \log(D + \lambda_D) + \beta_S \log(S + \lambda_S) + \beta_T \log T \\ & + \alpha_{mar} I(mar) + \alpha_{jun} I(jun) + \alpha_{set} I(set) + \alpha_{dec} I(dec) \\ & + \gamma n + \delta t + \varepsilon \end{aligned}$$

where:

c = salaries, benefits and administrative expenses

L = total loans

D = demand deposits

S = savings accounts ("cadernetas de poupança")

T = time deposits

$I(mar)$ = dummy variable for first quarter

$I(jun)$ = dummy variable for second quarter

$I(set)$ = dummy variable for third quarter

$I(dec)$ = dummy variable for fourth quarter

n = number of pre-stabilization quarters included in income statement

t = time, in quarters

Because we believe that some banks should be persistently more efficient than others, and that efficiency across the sample should improve with the passage of time, we might be inclined to estimate a panel data model with fixed time and bank effects. That is not practical given the size of our sample. The time trend included in the regression is a parsimonious though imperfect attempt to account for the time effects. That is important for removing correlation between the error

⁴⁶ A fine example is DeYoung and Hasan (1997), whose panel of 5,435 banks over four years contains 16,282 observations. Many others are surveyed by Berger and Humphrey (1997).

term and the regressors, which would otherwise be expected since output levels should rise as inefficiencies (and prices) fall. We experimented with the more flexible specification of higher order polynomials in t , but the time trend estimated in that way is very close to linear. Accounting for the time trend, inefficiencies are measured by:

$$u = \exp(\delta t + \varepsilon)$$

that is, the benchmark is the "representative" bank ($\varepsilon = 0$) in 94.IV ($t = 0$).

Inflation in Brazil dropped dramatically between June and July, 1994. Because the income statements from which the cost data are extracted show accumulated values in the four preceding quarters, those for 94.IV and 95.I still cover, respectively, 2 and 1 quarters of high inflation. Expenditures entering these income statements were not perfectly indexed, and so the costs incurred in these quarters are underestimated. Besides, the operational routine of banks during the high inflation period was of necessity very different, and that may also distort the comparison with post-stabilization costs. To avoid that noise in our measures of inefficiency, we include the variable n in the regression.

The seasonal dummies are included in a similar spirit. Loans and deposits are likely to be seasonal, while costs accumulated in four-quarter periods are not. The resulting seasonal variations in the relation between costs and output should not be regarded as inefficiency.

Regressors L , D , S and T were chosen because they represent the four broad categories into which transactions between banks *and the public* can be broken down according to balance sheet data. For two public sector banks, namely Banco do Brasil and Banespa, we substituted loans to the private sector for total loans (for the other state banks *in our sample*, that adjustment is not very important). That way, their performance is not influenced by the wild swings of public sector lending recently observed in their financial statements, which have no counterpart in the level of service they supplied to the public.

That set of regressors leaves out many services provided by Brazilian universal banks. First, it ignores activities such as brokerage, underwriting, mergers and acquisitions, and asset management. There is little hope of inferring what those are from financial statements alone. For that reason, we excluded from the sample banks that are notoriously devoted to such activities rather than to taking deposits and lending, which were bound to be judged very inefficient. We would also like to account for foreign exchange and money market transactions, but there, true services to the public are not easily told from mere treasury operations. Bank funding in the open market and foreign exchange balances are very volatile series, and their values at the statement closing date probably bear little relation to the level of regular transactions in those markets on behalf of customers.

Because our measure of inefficiency is (at least in part) the lack of fit of a cost function, gross misspecification will obviously taint the results. That is indeed a generic criticism to the very idea of estimating efficient cost frontiers, and the pragmatic response of the literature has been to choose flexible functional forms for the cost function. A popular choice is the translog, which involves linear, quadratic and cross-product logarithmic terms in the explanatory variables. That substantially increases the number of parameters to be estimated and, in our case, does not improve the fit of the regression a whole lot. The reason is that some of our explanatory variables (namely, demand and savings deposits) are either very close to zero (for non-retail banks) or otherwise very high (for retail banks). That much variability is not reflected in the regressand, and the result is a poor fit. The parameters λ_D and λ_S are an alternative flexibilization of the functional form that is parsimonious and helps address that specific feature of the data – they dampen the variability in the corresponding log terms by shifting their arguments to a region where the log function is less steep. That makes the regression nonlinear, but NLS is easy to implement because nonlinearity is limited to those two parameters.

Ideally, our cost measure should also include an imputed rent on facilities and equipment owned by the bank. We refrain from making such an imputation because we only know the *book* value of permanent assets in use by the banks, which is not likely to reflect the true economic value of the buildings they occupy and the equipment they operate.

There are two other corrections that are often suggested as desirable but, for lack of data, seldom performed. The first is a correction by some index of concentration of loans and deposits. Everything else equal, dealing with a larger number of customers costs more and should count as more service output. The other is a correction for quality of service, which could be based on customer satisfaction data if those were available. Everything else equal, higher quality service is likely to cost more and should also count as more service output. We are unable to correct for either effect, and can only offer both as caveats for the interpretation of our results. Note however that, in strict cross sectional comparisons, the quality and dispersion effects might run in opposite directions and even cancel each other, with high quality banks serving a very selective clientele and mass banks offering lower service quality.

A further question to confront is that of financial statement consolidation in banking conglomerates. Insofar as these are operationally integrated, their consolidated statements should give better measures of cost and service supply. In particular, consolidation would typically have the advantage of bringing into the picture leasing operations, which are usually concentrated in a specialized affiliate of the bank. However, consolidation, according to Brazilian law, involves many adjustments that are undesirable for our purposes, such as netting out deposits

held in the bank by non-financial affiliates, or adding in the personnel and administrative expenses of such affiliates, or consolidating participations in independently operating banks. To avoid all that, we generally restrict attention to non-consolidated statements. We make a couple of exceptions for financial groups still organized along the commercial bank-investment bank-savings and loans lines, case in which non-consolidated statements have very little economic meaning.⁴⁷ Foreign banks operating in Brazil both as a branch and as a locally incorporated subsidiary are considered jointly (by the simple sum of the relevant accounts in their financial statements).

Estimation by NLS yields:

$$\begin{aligned} \log c = & 0.198 \log L + 0.266 \log \left(D + 65878 \right) + 0.278 \log \left(S + 3794 \right) + 0.217 \log T \\ & \quad \quad \quad (0.042) \quad \quad \quad (0.058) \quad \quad \quad (33081) \quad \quad \quad (0.045) \quad \quad \quad (3509) \quad \quad \quad (0.026) \\ & + 0.263 I(mar) + 0.321 I(jun) + 0.321 I(set) + 0.291 I(dec) \\ & \quad \quad \quad (0.280) \quad \quad \quad (0.278) \quad \quad \quad (0.279) \quad \quad \quad (0.276) \\ & - 0.060n - 0.020t + \varepsilon \\ & \quad \quad \quad (0.040) \quad \quad \quad (0.006) \end{aligned}$$

where the numbers in parentheses are the standard deviations computed from the associated Gauss-Newton regression (Davidson and MacKinnon 1993). The parameter estimates are sensible but are not of much interest in their own right. We are ultimately interested in the associated measures of inefficiency. It is only worth noting that the time trend has a negative sign, indicating gains in efficiency as time passes.

In order to display the results in an organized fashion, we classify the banks in the sample in seven groups. The first three groups include private retail banks with extensive branch networks, classified according to total loans into “large”, “mid-sized”, and “small”. The fourth category, “public sector”, includes Banco do Brasil and the state banks. The fifth and sixth groups include non-retail banks, which operate mostly out of a main office (and perhaps a few regional offices), and typically do not accept demand or savings deposits from the public at large. Those are considered “foreign” if they are an integral subsidiary of a foreign bank; otherwise, they are grouped as “domestic” (even if they have foreign participation). In the seventh category we gather the high-end retail banks: full service banks targeting a selective clientele and having a much smaller branch

⁴⁷ These are Banco Real and Besc.

network than a regular retail bank of the same size. Figures 1 to 7 show the percentage inefficiencies – that is, $100 \times (\mu - 1)$ – of the seven categories, with each bank individually labeled.

Note first that the two largest retail banks, Bradesco and Itaú, made a lot of progress in terms of efficiency gains. Between 94.IV and 98.II, Bradesco's inefficiency declined from -1% to -40%, and Itaú's from 17% to -31%. During the entire period, Bradesco was more efficient than Itaú.⁴⁸ Unibanco started off relatively well at -10%, made some headway during the first year (all time low -39% in 95.IV), but then worsened considerably upon absorbing Banco Nacional in early 1996 (all time high 12%).⁴⁹ It has now (98.II) recovered most of the lost ground and reached -9% again, but in the meantime it fell far behind the leaders. The less complete data for Banco Real show it apparently stationed at quite good indices (between -20% and -31%) from 95.IV until 97.IV. Bamerindus was curiously the most efficient of the pack in 94.IV (-13%), became the most inefficient by 95.IV (10%), and regained leadership after restructuring by HSBC (-47% in 97.IV). The mean of the group in 94.IV (excluding Real) was -2%, and went down to -40% in 98.II (extrapolating for Real and Bamerindus with their 97.IV levels).

Among the mid-sized retail banks, Noroeste has been a persistent underperformer, and made very little net progress (started at 19% and ended at 16%). That performance is also worse than that of any of the large banks. Safra was the best of its group in 94.IV (-33%), but showed a serious worsening (all time high 30%), and has not yet managed to recover entirely (-15% in 94.IV). The remainder of the group did pretty well over the whole period: between 94.IV and 97.IV, Sudameris improved from -15% to -38%, BCN improved from -24% to -30%, and Excel worsened from -31% to -20% (the latter, due to its troubled acquisition of Banco Econômico, through a much bumpier road). Overall, the group made much less progress than the large banks: while they (excluding Noroeste) were ahead in 94.IV, that is no longer the case.

Among the small retail banks, América do Sul, BMB and Mercantil Finasa form a very homogeneous group, both in terms of the overall level of efficiency and in terms of progress made: they ranged from -20% to -26% in 94.IV, and from -33% to -37% in 98.II. Their performance is therefore very similar to that of BCN in the mid-sized group. Bandeirantes started off much worse at 8%, and ended with little progress at -4%. Boavista started together with the leading group

⁴⁸ Comparison of simple ratios of costs to income would have ranked Bradesco and Itaú the other way round, at least in 97.IV. "Queda do juro obriga bancos a buscar eficiência", *Gazeta Mercantil*, 8/12/98.

⁴⁹ That worsening was also captured by simple ratios of costs to total assets. "Productivity indices of Unibanco and Bandeirantes affected", *Gazeta Mercantil Online*, 7/28/97.

(-23%), but it is now more than half way closer to Bandeirantes (-14%). Like the mid-sized banks, this group also started ahead but made less progress than the large banks.

The public sector banks are a very interesting case. Compared to the former groups, they were typically a disgrace in 94.IV (with the exception of Banestes): Banco do Brasil was 32% inefficient, Banrisul 38%, and Banespa 57%. But they staged a remarkable comeback: by 97.IV, that same threesome was down to -25%, -29% and -1%, respectively, and improving. In the meantime, for instance, Banco do Brasil had even become considerably more efficient than Banco Itaú, which caught up again towards the end of the period. Banespa naturally performs worse among the public sector banks because its private loan portfolio (the measure of loans we used in its case) remained compressed by the huge borrowing requirements of the state of São Paulo.⁵⁰

The non-retail bank categories, both domestic and foreign, are bimodal and dispersed, each with a very efficient and a very inefficient group of banks. The most inefficient are much worse than the worst retail banks already examined, including those in the public sector. On the other hand, the most efficient non-retail banks are the most efficient in the whole sample. Bimodality is especially clear and dispersion is especially high among the foreign banks. The temporal evolution among non-retail banks is varied. The best in the foreign group have relatively flat trajectories, while the underperformers show substantial improvement until 96.IV, and then turn back up. The data for the domestic group is more fragmented and true temporal regularities are more difficult to identify. The two long series available show already inefficient BCSP getting worse, and already efficient BBA getting better.

Finally, the high end retail banks also display a lot of dispersion. In 94.IV, some of these were among the most extreme cases of inefficiency in the entire sample: Citibank had 102% and Banco Cidade 149%. Banco Cidade had improved considerably by 95.IV, but made comparatively little progress since then and remains very inefficient. Citibank's improvement was more persistent, and by 97.IV it nearly matched the good performance of Banco Francês e Brasileiro (-27% versus -28%); the latter had started at a much better position (1% in 94.IV). BankBoston has become more inefficient since 96.IV, when it was in great shape at -36% - its latest reading is -16% (98.II).

⁵⁰ Banespa loaned to the public sector 2.6 times what it loaned to the private sector in 94.IV, 3.8 times in 95.IV, and 5.2 times in 96.IV. In 98.IV, that proportion was back where it stood for the other state banks in the sample, around 6%, after restructuring supported by the federal government. It reached 41% for Banco do Brasil in 94.IV, but has declined considerably since then: 12% in 95.IV, 5% in 96.IV, and 7% in 97.IV.

5. Conclusions

The estimates above indicate that Brazil gained considerable terrain since 1994 in terms of bank efficiency. The most impressive progress has been made by the public sector banks, the largest retail banks, and some high-end retailers. Mid-sized and small retail banks and a number of domestic non-retail banks have also shown improvement, albeit less dramatic, with respect to their already superior initial performance. The “representative” bank captured by the time trend is about 20% more efficient now than it was in the end of 1994.

That overall tendency to improvement turned out to be very robust to a number of changes in the specification of the cost function or in the method of estimation, although such changes may alter somewhat the efficiency ranking of individual banks and their respective measures of progress. It confirms well publicized results obtained with simpler measures of efficiency, such as cost/assets or cost/income ratios, although those again tend to rank banks and their progress in a different way.⁵¹

Our findings do lend strong support to the ‘quiet life hypothesis’ of unexploited cost savings that come to the fore once market conditions turn adverse. But one must resist the temptation to attribute all the observed improvement to foreign entry. Another dramatic change in market conditions preceded the current wave of foreign entry, namely the sudden disinflation of mid-1994. Elimination of the inflationary float cut deep into bank profitability, and it would be a natural reaction of banks to seek cost savings even if the domestic market were to remain closed. In turn, the substantial foreign entry that started in 1996, but only gained momentum in 1997 and 1998, may be too recent to account for much of the efficiency gains already observed. Its effects could have radiated backwards had agents been able to see it coming. But the story told in section 2 makes that hypothesis quite unlikely.

In any case, there is abundant anecdotal evidence of cost cutting efforts induced by the new macroeconomic scenario but intensified by the added foreign competition. A recent news article, drawing on information obtained directly from banks, describes in the following terms the managerial mechanism of transmission: foreign entrants would impose the efficiency standards they have back home on the newly acquired Brazilian subsidiaries, and domestic banks would try to emulate these new competitors.⁵² Even if that is too recent a phenomenon to account for our results, it certainly indicates that banks feel that they still have plenty of slack on which to work to improve efficiency. For many banks, the dispersion found in our sample – even within each separate class of banks we

⁵¹ “Bancos buscam padrão internacional de eficiência”, *Gazeta Mercantil*, 8/12/98.

⁵² *Ibid.*

considered – certainly supports that view. But our method does not involve an absolute benchmark of efficiency, and so it makes no prediction of how far efficiency gains can go beyond the best practices found in the sample itself. Only a few more years of data will tell.

FIGURE 1: Large Retail Banks

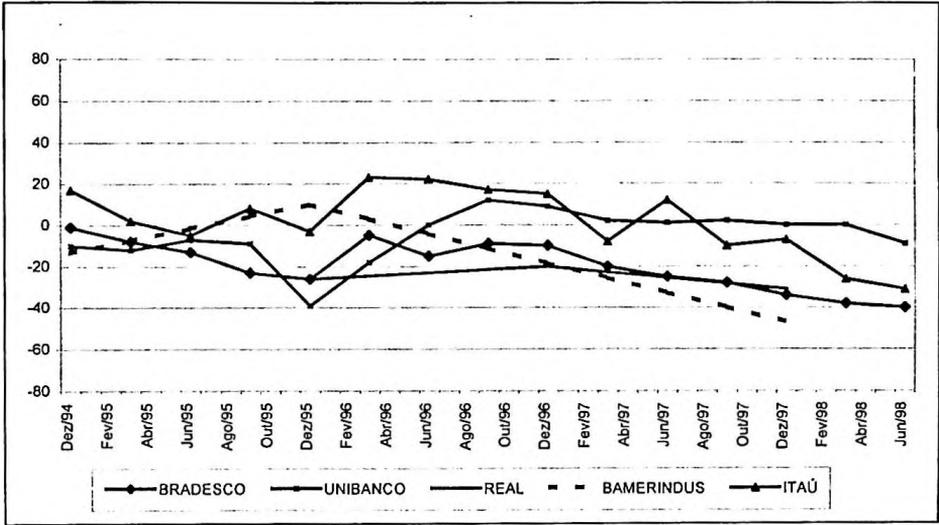


FIGURE 2: Mid-sized Retail Banks

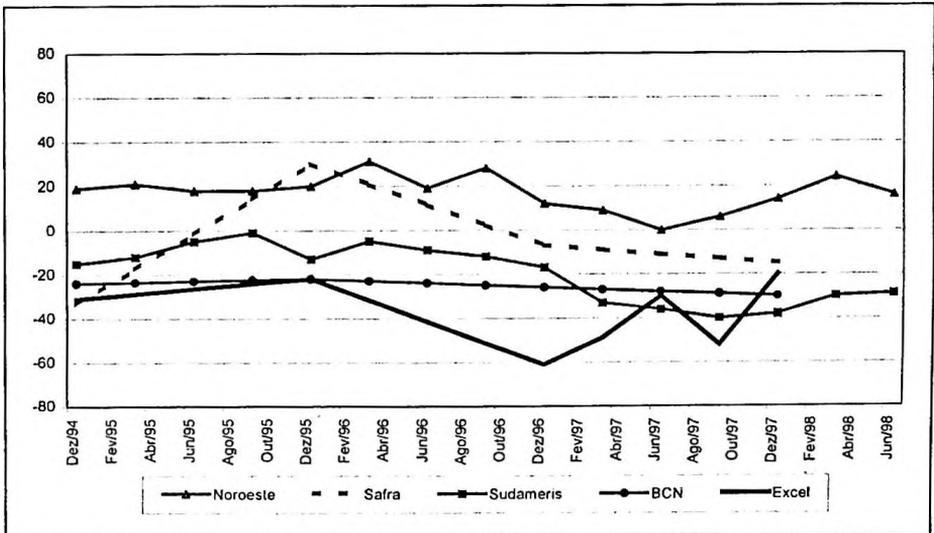


FIGURE 3: Small Retail Banks

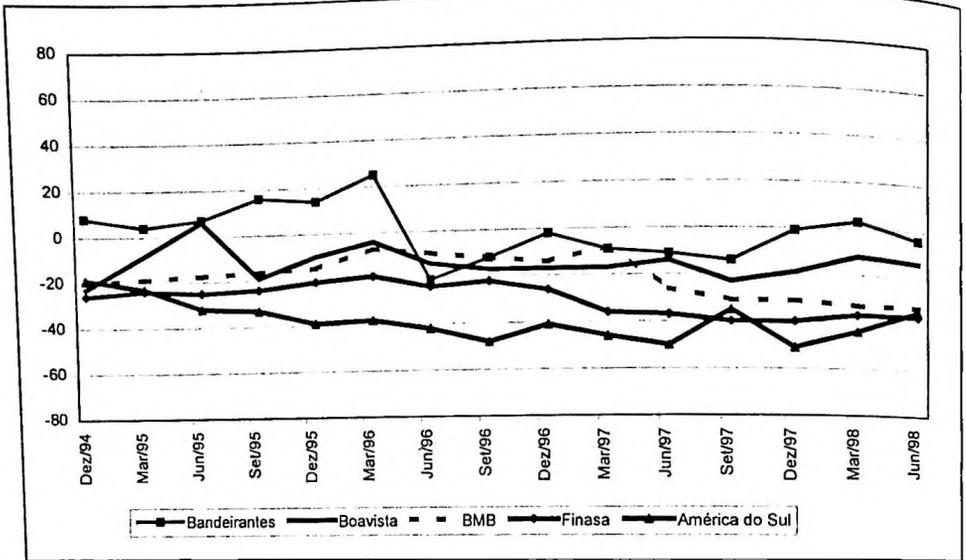


FIGURE 4: Public Sector Banks

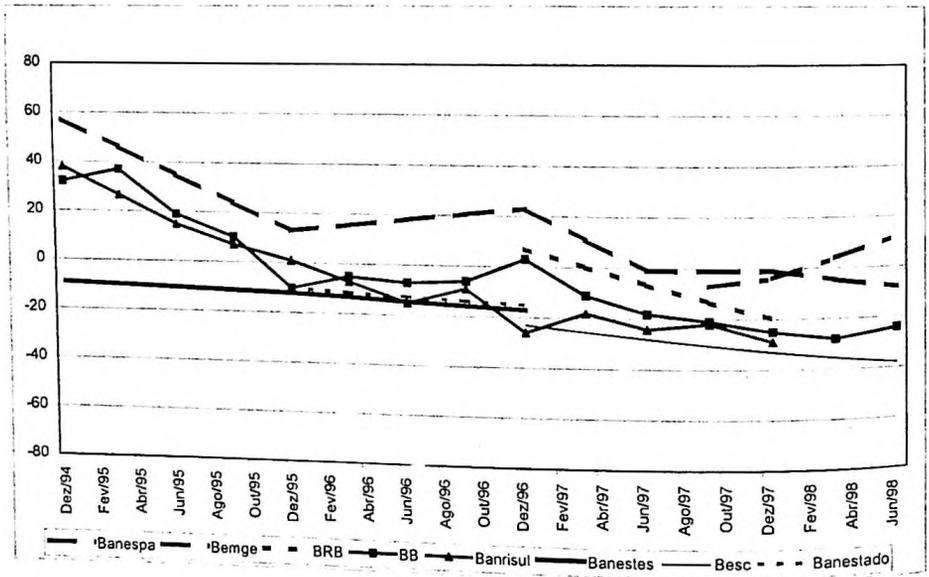


FIGURE 5: Domestic Non Retail Banks

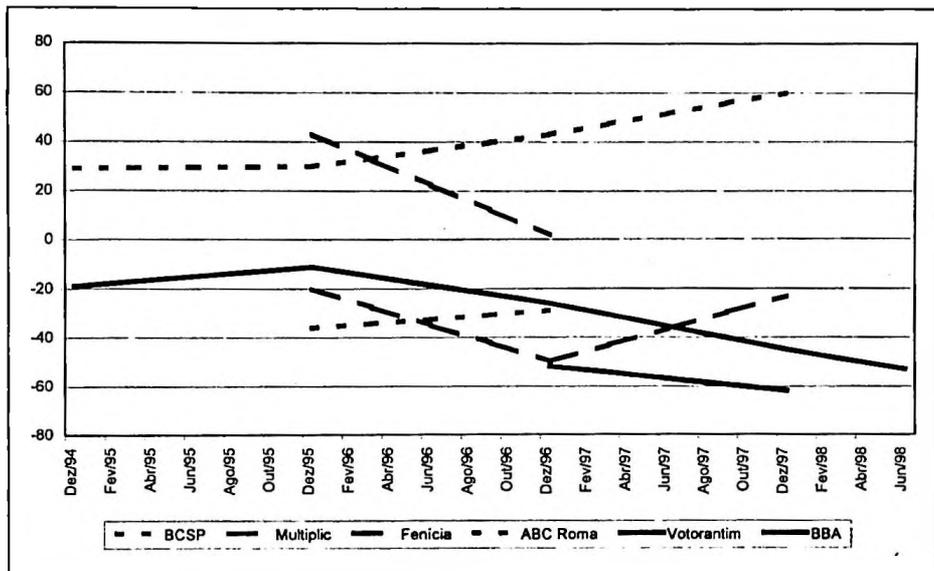


FIGURE 6: Foreign Non Retail Banks

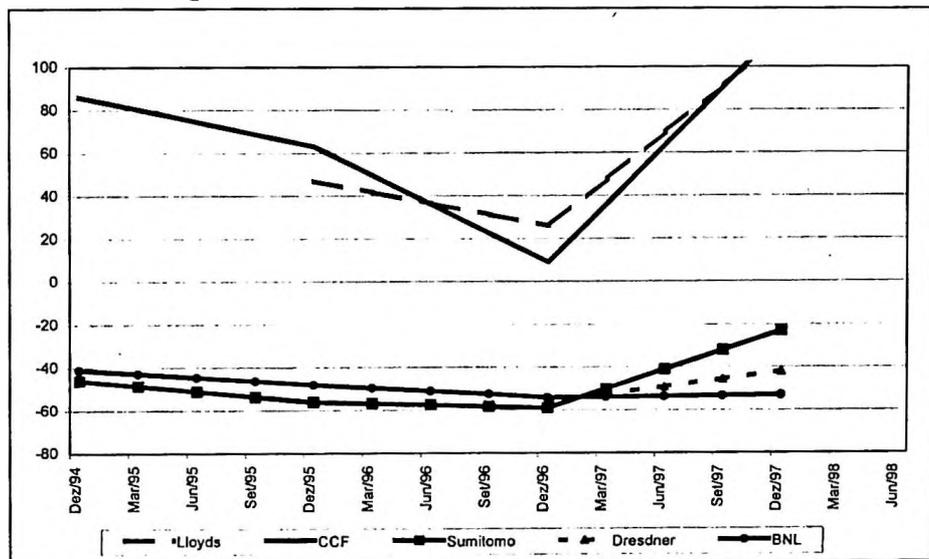
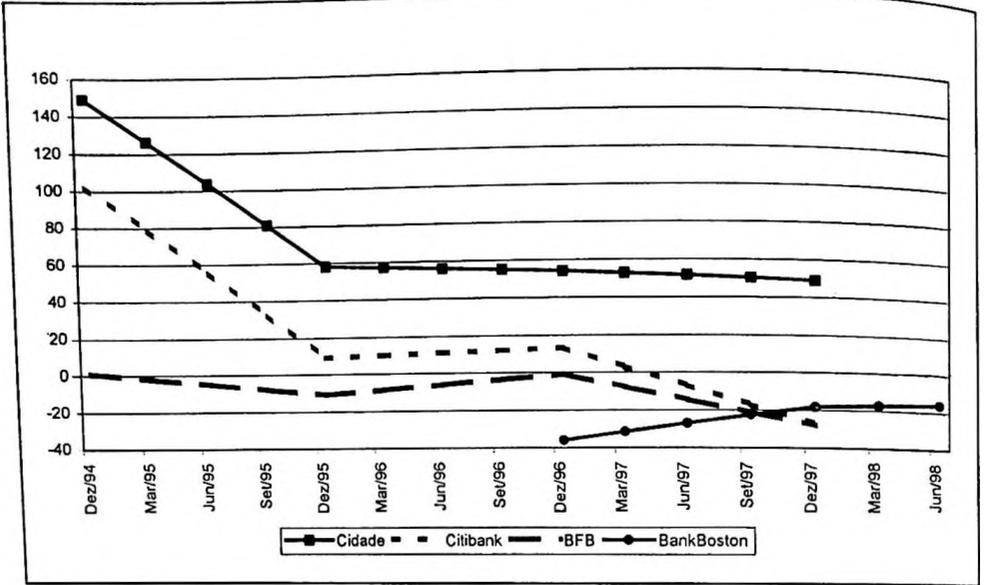


FIGURE 7: High End Retail Banks



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Comments by Robert Devlin

It should be stated at the outset that I am not an expert on the Brazilian banking sector. Nevertheless I find the paper's position in favor of financial liberalization attractive and particularly the idea that foreign entrants can contribute to lower costs of financial intermediation through the competition they generate. I personally witnessed this effect in Chile. The empirical results of the paper are suggestive of similar effects in Brazil. In sum, on its own grounds the paper is nicely done and highlights the important issue of competition and the costs of financial intermediation.

My main reservation about the paper is the absence of a discussion of the special systemic risks of financial liberalization, which are not found in the goods sector. This is an important problem that should condition any financial liberalization strategy.

The discussion of financial liberalization frequently makes a leap from the theory of the welfare gains of free trade in goods to analogous gains from free trade in financial services. This has serious shortcomings. The financial sector is different and quite specific in its dynamics.

Selling loans is not equivalent to selling cornflakes. When a good is sold, the exchange is a simultaneous one of money for a product. The value of the trade is discernable at the outset. In contrast, when a loan is marketed by a bank, payment is in the future and hence uncertainty affects the value of the trade.

The banking industry is noted for having significant economies of scale. Hence, market forces naturally drive banks to increasing market shares. If left to their own devices, market forces in banking will evolve into a structure of concentration, oligopoly and the quiet market life of high margins.

New entrants to the banking sector can destabilize an oligopolistic equilibrium. New entrants can set off a wave of competition for market shares. The competition will drive down costs, but also the price of the loans. Price can indeed be driven below costs when risk is taken into account. In an expanding and highly competitive market even prudent lenders have trouble resisting an excessive compression of prices because: (i) the lender is not sure what the risk adjusted price is (uncertainty), but (ii) is sure that if it does not lend to defend and increase market share it can be left behind market developments and absorbed by a more aggressive (and perhaps imprudent) lender. Thus, unfettered competition in financial services can lead to credit pyramiding, bubbles and systemic crisis.⁵³

⁵³ This is developed in more detail in R. Devlin, *Debt and Crisis in Latin America: The Supply Side of the Story*, Princeton University Press, 1989.

The systemic risk of financial liberalization is increased when there is an unstable macroeconomic environment, excess liquidity, underdeveloped financial regulatory structures, and a trade liberalization process which is only partially consolidated.

Foreign banks are just as prone to this competitive myopia as domestic banks. Indeed, they can provide special stimulus to a financial bubble. For any capital account regime they have easier access to foreign funds to fuel expansion. Foreign banks can make a bigger relative "bet" in the local domestic market because it often is a small share of its total world portfolio. These banks also introduce new products which sometimes can be in advance of real demands, or needs, of the economy, leading to supply-led indebtedness and more complicated regulatory challenges. Foreign banks also can lead the charge for premature, or excessively accelerated, liberalization of capital accounts.

Foreign banks also have special advantages for escaping systematic risk when trouble arises. They can fall back on their capital base at home and mobilize finance at rates lower than what is available to the domestic market in crisis. This allows them to sustain their market share in crisis and expand it through fire sale purchases of collapsed domestic banks. When push comes to shove, they have also often been successful in pressuring local governments to assume their bad loans.

None of these observations weaken the basic premise of the paper: promoting competition can improve the efficiency of financial intermediation. They do however, council more caution than is observed in the paper. In effect, financial liberalization should be cautious and sequenced properly with other macroeconomic, financial regulatory and trade reforms. I am not sure what has motivated Brazil's cautious approach to financial liberalization and foreign participation. However, as long as it is not motivated by protection for protection's sake, the cautious and deliberate approach described in the paper may have some merit from the standpoint of prudential concerns for systemic risk. The author's should make their assessment of developments in this broader context.

Finally, the paper estimates should adjust costs by product mix and for risk. Lower costs of intermediation also can partly be reflective of higher risk taking. This possibility could be irrelevant to the Brazilian case, but acknowledging the issue is useful.

Comments by Mário Marconini

The paper is very good, dealing with the recent (and still current) Brazilian banking liberalization and the inefficiency costs associated with banking in Brazil. The paper also reviews the main arguments in support of banking liberalization, focussing especially on the commercial presence “mode of supply”. The paper deals relatively little with the matter of trade negotiations and regional integration. In fact, considering the theme of the conference, that could be the weakest aspect of the work. The paper is perhaps good enough to allow the reader to infer the implications of its arguments and conclusions. If that was not the intention, then it should be revised to clarify what those implications are.

The description of the liberalization process is very complete and illustrative. In particular, it successfully draws the borders between the prudential and the market-opening phases of the process, identifying the sale of Banco Bamerindus in March 1997 to HSBC when “proteccionism protests were (still) muted, as local bankers were themselves eager to get past lingering fears of systemic crisis” – as the relevant turning point of said process.

The paper concludes that foreign entry may have been too recent to account for the overall 20% gains in efficiency experienced by the Brazilian banking sector since much of that efficiency clearly can be attributed to the stabilization of the economy in general and, in particular, to the elimination of the inflationary float. At worst, the reader is left therefore with the notion that it is too early to know whether liberalization is “good” or “bad”. At best, the reader would deduct that, for the reasons reviewed regarding unilateral liberalization in section 3, a continued liberalizing effort would prove positive in the future given, on one hand, the greater competition in the market and, on the other, more localized benefits such as lower prices for services and, feasibly, a better allocation of credit. What the reader does not necessarily learn from reading the paper is a clear sense of how Brazil should proceed strategically in future trade negotiations – global, hemispheric or sub-regional.

Reference is made to the need for rules of origin in trade agreements and to GATS Article V.6, which deals with juridical persons in member countries of an integration agreement.

There are five comments in that respect:

1. Paragraph 6 of Article V was included in the GATS Agreement as a result of a proposal from Canada who was especially concerned with “triangular” financial establishment in the NAFTA region – in particular, Japanese banks gaining access to Canada through the United States. The provision was included, therefore, to avoid “mailbox” or “paper” companies from

establishing themselves in Canada, having very little economic relevant activity in Canadian territory, and simply transacting with the United States;

2. Paragraph 3 of Article V, regarding developing countries, was the result of a Brazilian proposal, since the country was then concerned with benefiting Brazilian-owned and/or controlled banks in future MERCOSUR arrangements. That provision has lost its sense and appeal for MERCOSUR since the signing of the Montevideo Protocol on Trade in Services which stipulates no ownership and/or control thresholds or limits on juridical persons established in any of the member countries. It suffices for a bank to be established in one of the member countries and *engage in substantive business operations in the territory of the parties to MERCOSUR* for it to benefit from the rights deriving from the Protocol. In other words, unlike the GATS, the Montevideo Protocol does not reserve the benefits of the agreement to juridical persons who are majority-owned and/or controlled by persons of MERCOSUR origin;
3. The Montevideo Protocol avoids the “mailbox” problem by limiting benefits to juridical persons of another MERCOSUR State which are juridical persons of that MERCOSUR State, constituted or otherwise organized under the applicable law of that MERCOSUR State, and which are engaged in “substantive business operations” in that other MERCOSUR State as well. Therefore, branches or representative offices from non MERCOSUR States are *a priori* excluded from the scope of the agreement since they are not “juridical persons of that State”. Subsidiaries from entities originating in non-MERCOSUR States established in one of the MERCOSUR States, nevertheless, do stand to benefit from the rights of the Protocol since they are indeed juridical persons of another MERCOSUR State;
4. The issue of harmonizing definitions regarding what is considered to be a juridical person in each of the MERCOSUR States was deliberately left for the MERCOSUR Financial Affairs Sub-group (SGT-4) to resolve in their continuing talks; and
5. Paragraph 3 of Article V of GATS has therefore been ridden roughshod by Montevideo Protocol provisions on juridical persons. Admittedly, that reflects the intention of all sub-regional states to privilege foreign direct investment. In banking, there is, however, much room for harmonizing definitions and procedures which may still determine the scope of liberalization that can be had through sub-regional liberalization.

As mentioned before, section 2 seems to draw an important line between the foreign entry which took place during a “prudential” phase and that which began

after the HSBC take-over, when foreign acquisitions were no longer limited to ailing banks. In addition, the section sheds some light on the equally important distinctions between the commitments a country makes under the WTO and market realities. Thus, the Brazilian offer was minimal in relation to the entry and establishment of new banks or the acquisition by foreigners of national banks, merely referring to the case-by-case, discretionary executive authorization to conduct business for commercial presence as *per* the National Constitution. On the other hand, regarding public institutions, the Brazilian schedule committed the government to allow foreign persons to participate in the privatization of public sector financial institutions and to grant commercial presence in those cases. As the paper recognizes, most of the recent liberalization in Brazil was precisely through the acquisition of existing private institutions whereas participation in public institutions – admittedly, the “crown jewel” of the Brazilian offer – was “sidestepped altogether”. Therefore, even if the Brazilian offer did not create a “operative lower bound” since it left entry, establishment and foreign acquisition as discretionary as ever in the schedule, in practice that made no difference whatsoever and the Brazilian authorities pushed on with unilateral liberalization. Where an operative lower bound was indeed set in the schedule (for public banks), that had no effect on the market either. All this says something about the operative usefulness of agreements such as the GATS as gaugers of market openness around the world.

In the context of the Uruguay Round of multilateral trade negotiations, the assumption made that Brazil “relinquished an opportunity with its staunch resistance to formal concessions in financial services...” in the Uruguay Round is rather naive. There is absolutely no conceivable context within which this assumption could fit the realities of the Round. Brazil could not have influenced the overall bargaining across sectors by having a more positive attitude in financial services. It certainly would not change a comma or a semicolon in the negotiations on agriculture had it had a more forth-coming position in financial services. Why? Simply because the Brazilian financial market was not *that* important in the negotiations. In fact, nothing could have stopped the “song-and-dance” between Americans and Europeans on agriculture. Even within the services negotiations themselves it would be difficult to argue that the Brazilian position on financial services mattered that much since most of the focus was, up to the final deal last year, on east and Southeast Asian restrictions on banking. In fact, the last restriction to hold back the negotiations was the Malaysian divestment provision, according to which existing foreign insurance branches were required to incorporate locally by June 1998 and to respect a maximum ceiling of 51 per cent on foreign shareholding. The United States had, in the end, to swallow it.

Reference is made under “more stability” to the fact that “imported stability is stronger if market opening is managed so as to select entrants of good extraction” and that this related broadly with the attitude of Brazilian authorities regarding recent market opening in Brazil. An ancillary argument in this context is that countries differ in their capacities to assimilate foreign entrants, given different levels of market efficiency and regulatory discipline across countries. An extension of the same argument might eventually lead to the conclusion that non discriminatory liberalization across countries is anathema to orderly restructuring of the financial sector and that selective entry is in fact a fundamental requirement and not an option among many, in particular for countries whose financial sector is undergoing significant transitions as is the case with Brazil.

Brazil’s financial sector will continue to be the subject of trade negotiations in the short, medium and long-term. In that context, some dates are especially relevant: the year 2009 for the end of the intra-zone liberalization of services trade among MERCOSUR countries (assuming that Congress ratifies the Montevideo Protocol and it enters into force in 1999); the year 2005 for the end of the FTAA negotiations; and, the year 2000 for the possible start of the next round of WTO trade negotiations. Considering the dates, it is clear that there will be continuous need to re-evaluate financial priorities for Brazil *vis-à-vis* the rest of the world. One can also safely assume that plenty cross-breeding and fertilization will occur across global, hemispheric and sub-regional concerns. At a minimum, Brazil will have to decide what its unilateral stance means when translated into differing contexts. Some strategy will therefore be necessary.

Perhaps the most “urgent” demand is the one relating to the WTO. After all, the fact is that Brazil may need to begin at least reacting (since “pro-acting” in multilateral trade negotiations does not seem to inspire many Brazilian government officials) soon to what major trading partners want once again in services trade negotiations.

Up until now, negotiations on financial services have been essentially, of a legitimizing nature. In other words, only now that the financial authorities have indeed sealed the agreement which was earmarked for the end of the Uruguay Round in 1993, can one say that financial services are legitimately a part of the new multilateral trading system – WTO et al. During the round, the hesitation by major financial powers to include financial services as just another sector under the package of results was abundantly clear. So much so, that the negotiations had to continue beyond the multilateral agenda, only to reach anticlimaxes repeatedly and at great cost to the credibility of the WTO.

Ironic as it may be, now that financial services have been “legitimized” into the world trading system, the world itself has changed significantly, bringing to the surface nothing less than a full-fledged debate on the whims and flaws of financial

regulation. It is now clear that further rounds of liberalization, unlike the Uruguay Round, will have to address important issues relating to prudential regulation. During the round, the subject was avoided with passion, under the common perception that there was not enough time in the world for countries to agree on such measures. That perception may have to be revisited, were a new round to start poking at the currently battered financial system. Could one say that investment banking, for example, starting with its *bête noire* – the hedge fund (offshore, unregulated and wild), should be treated just like any other financial service from a systemic point of view? If not, how could one envisage the new round of negotiations without dealing at least ancillary with the matter?

To consider what the WTO might do in dealing with negotiations in financial services is important because the institution may once again serve as a guide to sub-regional and other integration efforts. For MERCOSUR that would be important although it would be wrong to say that the sub-regional block does not already have plenty to do (God and Brazil willing, of course). Both the Montevideo Protocol as well as the continuing deliberations of the SGT-4 (Sub-group 4 on Financial Affairs) could, if some closer thought were given to them, produce some important advances on the prudential area and even on the freeing of certain financial activities through harmonization and/or recognition of certain norms and practices of sub-regional relevance. For the FTAA, the influence of renewed talks at the WTO will be crucial.

Given that FTAA talks so far seem to evolve as if the real world did not exist at all (no authority to negotiate by the hemispheric “hegemon”, financial crisis, emerging trading wars and other assorted disasters), it would be very salutary to have some guidance from the forum which at least should deal with the whole world when it sets its eyes on something.



V Sectoral Impact of the FTAA: Goods

THEME V: SECTORAL IMPACTS OF THE FTAA: GOODS

Chairman: *Luis Fernando Tironi*

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FREE TRADE ARRANGEMENTS IN THE AMERICAS: QUID FOR AGRICULTURE?¹

Dominique van der Mensbrugge and Ramiro Guerrero

1. Introduction

THE URUGUAY ROUND AGREEMENT (UR), currently being implemented, was much more difficult to achieve than had initially been anticipated. Agriculture, which by and large had been ignored in previous trade rounds was made an integral part of the UR negotiations, and it turned out to be a major stumbling block in obtaining a consensus among countries, particularly between the two largest blocks – North America and Europe. These latter two regions had seen an increasing level of agricultural protection during most of the late 1980s and early 1990s as they both competed to maintain or increase their share of the global markets. While the final agreement was hailed as a significant achievement, most analysts would concede that it probably provided less reform than was anticipated, particularly in the area of agriculture. No doubt the UR provides a positive stepping stone for future achievements as it has led to a decline in non-tariff barriers, and an increase in the transparency of agricultural trade.²

The UR did not occur in a policy vacuum. During the period of negotiation and implementation, the world has witnessed a – perhaps unparalleled – unilateral decline in tariffs among developing countries. There is no single explanation for this phenomenon, though certainly conditionality, as well as contagion played important roles. Another parallel movement, and one that is not always perceived as benignly as unilateral liberalization, is the increase in regional trade agreements. In the Western Hemisphere, both MERCOSUR and NAFTA are products of the 1990s, the first creating a free trade zone among Argentina, Brazil, Paraguay and Uruguay, and the second creating the huge free trade zone between the three North American countries. Both of these two free trade agreements include a number of exempted sectors, many related to agriculture.

With few exceptions, the creation of MERCOSUR is considered a huge success for the four signing countries. Trade among the four has increased dramatically

¹ The views expressed in the paper are those of the authors and do not necessarily reflect those of the OECD nor of any of its Member Countries governments. The authors acknowledge the significant assistance of Christophe Complainville in the preparation of the scenarios and tables, and helpful comments and suggestions from Marcelo de Paiva Abreu, Antônio Salazar Brandão, Gervásio Casto de Rezende, and Raúl Hinojosa-Ojeda. Send correspondence to OECD Development Centre, 94 rue Chardon-Lagache, 75016 Paris, France, email: Dominique.Mensbrugge@occd.org, web home page: www.occd.org.

² One caveat to this increasing transparency is the potential for backtracking since in many cases, countries have set upper limits on tariffs which are considerably higher than currently applied tariffs.

and its success is also associated with the ability of the region to stabilize the macroeconomic environment, particularly the taming of inflation and a reduction in the volatility of the exchange rate. Two other countries are now associate members – Bolivia and Chile.

The success of NAFTA has been more one-sided. Canada and the United States had signed a free trade agreement earlier in the 1980s, and even before then were closely linked together economically. Mexico for most of the century had followed a very different pattern of development from Canada and the US so that its joining of its northern members in a free trade area was a much greater structural shock. The relative size of Mexico also made it unavoidable that the creation of NAFTA would have a much greater impact in Mexico. There is little doubt that this has proven to be true, even if it is sometimes difficult to judge the impact of NAFTA given some of the other shocks which have hit Mexico over the last four years.

The parallelism between, on the one hand, global multi-lateral negotiations and, on the other hand, progress towards regional integration, is likely to continue in the near future. The World Trade Organization (WTO) Ministerial Meeting – to be held in 1999 – is likely to set the agenda for a future trade round, though its precise outline is yet to be determined. One option has been the so-called Millennium Round with a potential target deadline of 2003. At the same time, regional agreements are being actively discussed and in some cases negotiated. The APEC ministers have been busy with sectoral negotiations, and hemispheric talks in the Americas are progressing. What agreements actually occur in the Americas are far from being determined. Options include expanding both MERCOSUR and NAFTA, while President Clinton has proposed a hemispheric-wide free trade area known as the Free Trade Area of the Americas (FTAA).

This paper provides a preliminary exploration of some of the potential consequences of two possible hemispheric free trade areas (FTAs). The first is an expansion of MERCOSUR to the rest of Central and South America. We have designated this as Free Trade in Latin America (FTLA). The second is a hemispheric wide FTA, along the lines of President Clinton's FTAA proposal, and designated with the same acronym.

The focus of the paper is on the agricultural impacts of both FTAs, even though it is likely that any eventual agreement will include exemptions, many of which are bound to be in the agricultural sectors. The next section of the paper discusses key trends in agricultural trade barriers and policies in the main markets of the Americas over the last decade. This discussion is based on surveys and reflects a wide variety of sources. The following section, Section III, provides an overview of the database used in the quantitative assessment of the FTAs. Section IV describes the nature of the policy shocks and provides a quantitative assessment of the two trade scenarios. This is followed by a concluding section.

2. Agricultural Policies in the Americas

Context of Reforms (early 90s)

Agricultural policies in the Americas have undergone major changes during the 1990s. Reforms towards greater liberalization and market-oriented policies have been adopted by most countries in the region. Agricultural policy reforms have been implemented in the context of a broader scope of economic policy reforms, often under the pressure of structural adjustment programs and increased budgetary austerity. These broader reforms have implied a re-definition of the role of the state, and a shift away from the import-substitution model towards the free market-free trade (FMFT) paradigm of the “Washington consensus” (de Janvry et al, 1997).

Agricultural policy reforms have also occurred in a context of increasing regional integration, which has taken form in numerous bilateral and regional trade agreements. These agreements differ in depth and scope, and include customs unions (MERCOSUR,³ Andean Group,⁴ CACM,⁵ CARICOM),⁶ free trade areas (NAFTA, Group of Three)⁷, preferential trade agreements, several bilateral free trade agreements, and one regional scope agreement (ALADI). Most of these agreements are recent, and are still in process of implementation, implying reductions in non-tariff barriers to trade and decreasing tariffs. They have been strengthened by unilateral liberalization, and the commitments and regulations agreed to in the Uruguay Round and the WTO, of which most countries in the hemisphere are members.

Increasing integration has also implied substantial increases in intra-regional trade. Intra-regional trade between the 11 largest economies in Latin America increased by 50% between 1990 and 1994. Between 1986 and 1992 trade within Latin-American countries increased by 135% while their total exported value increased by 81% (de Janvry et al., 1997). Trade within the agreements has shown important developments. For instance, total trade between Brazil and the rest of MERCOSUR increased more than threefold (by 326%) between 1990 and 1996 (OECD, 1998a).

The context in which the reforms have taken place during the early 1990s was characterized by declining world prices for agricultural goods, high interest rates,

³ “Mercado Común del Sur”, is formed by Argentina, Brazil, Paraguay and Uruguay. Currently classified as a customs union, it eventually aims to evolve into a common market.

⁴ Formed by Bolivia, Colombia, Ecuador, Peru and Venezuela.

⁵ Formed by Central American countries.

⁶ Formed by Caribbean countries.

⁷ Formed by Colombia, Mexico and Venezuela.

and falling real exchange rates for most countries (Valdés, 1996). A current account deficit of the order of 2.5% of GDP and capital inflows the order of 3.5% of GDP were registered in Latin America up to 1997. Recently, world wide financial disturbances have affected the region with devaluation pressures. The possibility of abrupt devaluation and adjustments to changing international conditions raise doubts as to the success achieved in the way of greater macroeconomic stability.

Many countries are still vulnerable to pressure groups favoring policy reversal and seeking to reestablish protectionism. However, the obligations acquired in the various trade agreements reduce this risk and render credible the claim that the policy changes are irreversible. As an example, during Mexico's devaluation of 1994, taxes on imports were not increased in order to help achieve external balance.

Trade

One of the main features of economic policy reform in the region has been the liberalization of trade. Moreover, agricultural trade has not been an exception to this trend, as it had traditionally been. Most countries have engaged in a process of replacing non-tariff barriers to trade with tariffs or tariff-quotas; many had done so unilaterally before the UR agreement required them to do so. Also in the direction of greater transparency in trade policies, tariff structures have been greatly simplified, reducing the number of applicable tariffs. Import and export licensing, as well as specific product trade prohibitions have been greatly reduced or eliminated. Trade within the free trade areas is bound to be duty free.

Either as a unilateral initiative, or as a result of trade agreements, the level of applied tariffs has decreased steadily. Most countries have committed to further reduce tariffs and eliminate quota schedules under the various trade agreements. Country average tariff rates have fallen from 35-60% to 10-15% within a decade. Common external tariffs for the Andean group have fallen by half in the same period (de Janvry et al, 1997).

Chile's early reforms set a uniform tariff rate of 11% for nearly all products, and the common external tariff rates for MERCOSUR were set at 8-10% for most agricultural products. These levels are low by international standards. Mexico's trade liberalization implied decreasing the overall trade weighted average tariff from 13% to 6% between 1986 and 1987. The value of imports covered by import permits fell from 35% to 9% between 1985 and 1993. Mexico's commitment under the Uruguay Round Agreement is to reduce tariffs by 24% by 2004, while under NAFTA all agricultural and food trade will be duty free by 2008.

Since trade liberalization also covers non-agricultural sectors, the reduced barriers to trade affect agriculture through the markets of tradable inputs. Inputs had often been subject to import tariffs, which acted as negative protection to agriculture. Trade in inputs has been largely liberalized, though Valdés (1996), after comparing the Nominal Rates of Protection (NRP) and the Effective Rates of Protection (ERP), concludes that there is still considerable scope for cost reduction in agriculture, if input trade is further liberalized.

Trade reforms have not only removed barriers to imports, but also to exports. In fact, most Latin-American countries had traditionally given a differential treatment to importable goods and exportable goods. In general, importable goods tended to be protected and exportable goods have been taxed.⁸ As a result, up to 1995, countries where the share of exportables in agricultural output is important (e.g. Argentina, Uruguay, Paraguay and Ecuador), show an overall negative NRP, due to the weight of export taxes in overall protection.

Great progress has been made in the way of eliminating export taxes. The average level of taxation of exportables has been reduced from -11.8% to -6.3% between the mid 1980s and the early 1990s (Valdés, 1996). Argentina made remarkable progress in this direction, while Ecuador continues to heavily tax exports. Nonetheless, significant differences in effective rates of protection subsist within individual countries for different products. Though these differences have been reduced, they continue to conceal significant income transfers between sectors and products.

Liberalization of exports has been driven not only by unilateral initiative, but also by the obligations acquired under the various trade agreements. Special attention is given to export subsidies under these agreements. Under NAFTA, a special commission was formed for eliminating all export subsidies, and under the UR Agreement, developing countries are required to reduce subsidies by 24% in value in a 10-year period. Within the context of the trade agreements, export subsidies – and support policies in general –, call for greater coordination and surveillance of sectoral policies.

Though trade liberalization has been generalized – and in some cases bold –, there remain some “vestiges” of interventionist policies. For instance Venezuela has stayed far behind its neighbors in terms of reform, and has shown a hesitating attitude towards liberalization, in a context of political turmoil. The Andean Group, for its part, has established a price band mechanism in order to protect itself from subsidized exports from third countries. This system – though fair in principle – may in practice open the door for resorting to protectionism.

⁸ During 1985-1995 for the countries and goods considered by Valdés, importables showed an average NRP of 18.7% and exportables had an NRP of -7.7%.

Moreover, this system has a dubious status before the WTO (Josling, 1997), and has been found to be inefficient, according to World Bank estimates (Janvry et al, 1997).

One salient feature of the tariff structure as it emerges from the reforms is that agricultural products face lower tariffs than processed products. This means that there still is discrimination against agriculture.

The main features of the development of trade policies in North America are the ratification of the Uruguay Round Agreement, and the creation of NAFTA. Canada has shown a decreasing utilization of border measures (tariffs and quotas) to protect local production. The share of market price support (which includes border measures) in support fell from 45% to 35% between 1985 and 1996. A notable exception to decreasing support in Canada is the dairy and poultry meat sectors. In the USA, border measures account for a decreasing part of producer support, which has itself decreased as a percentage of output value. Nonetheless, the USA continues to use tariffs and/or quotas for beef, sugar, milk and other dairy products. The USA and Canada continue to subsidize exports of some products, mainly in the dairy and sugar sectors.

Product and Input Markets

Trade duties, licenses and quotas are not the only instruments of economic policy to have been modified under the reforms. Other areas of agricultural policy like producer price support, consumer price ceilings and input subsidies have been largely reduced or eliminated. This process has often implied profound institutional reorganizations, with large state owned enterprises and public agencies being downsized, liquidated or privatized. The private sector is deemed to play an increasingly important role in supplying the services formerly provided by these organizations.

Up until the 1980's producer price support measures often coexisted with consumer and retail price controls and subsidies. These policies were often carried out by public agencies directly involved in distribution, commercialization and international trade.

In Brazil, the minimum price program (MPP), run by the Commission for Production Financing⁹ (CFP), was the most important element of agricultural policy. Farmers had the option of selling their output to CFP at a minimum guaranteed price, or borrowing against the minimum price value of the stored commodity for future sale elsewhere. Hence, in addition to market support, the

⁹ Specialized agencies provided price support for certain commodities (e.g. sugar, coffee, wheat, cocoa).

CFP provided the service of risk management. In Mexico, CONASUPO¹⁰ guaranteed minimum prices to producers for twelve main agricultural products. It purchased directly from farmers, and its share in marketed production was significant (ranging from 20% to 60% for maize and beans between 1965 and 1988) (OECD, 1997a).

On the consumer side, there were “cheap food policies” which were often focused on a few products. In Brazil, milk, as well as other products, were kept low by means of price freezes, controls on marketing margins, and permitting the entry of subsidized imports (OECD, 1997c). In Mexico, a broad range of products was covered by consumer subsidies, which took the form of price ceilings and sales by CONASUPO at a price below purchase price. Marketing subsidies were also granted.

With the reforms, these programs were reduced or eliminated. In 1988, Brazil moved towards replacing the price support scheme by a band system operated by means of accumulating and releasing stocks. In 1993, scarce funds led to the elimination of the program and to the almost complete deregulation of agricultural markets, though wheat and other cereals continued to be supported. The marketing boards for the main products were eliminated.

In Mexico, CONASUPO stopped buying most products at guaranteed prices in 1989. As transitional measures, a special agency was created in order to help develop a private commercialization network, and a system of “concerted prices”¹¹ between sellers and buyers was established. Special support was given to maize and beans, given their importance in the Mexican diet. As a consequence of NAFTA, this support is being phased-out and replaced by a program of direct payments to producers (PROCAMPO). On the consumer side, price ceilings were eliminated, and in 1995, subsidized consumption remained for only three items: maize, tortilla and milk. Given their importance in the diet, they will continue, albeit targeted to the low-income sectors.

Reduced producer and consumer support has meant sharp reductions in government spending in agriculture. In Brazil, during Collor de Melo’s administration, government spending on agriculture (including programs managed by state owned companies) decreased by 50% in real terms (OECD, 1997c). In Mexico, expenditures for market price support dropped from US\$ 674 to US\$ 253 million between 1989 and 1995. Expenditures for consumer subsidies dropped from US\$ 1,173 to US\$ 678 million in the same period.

¹⁰ National Basic Foods Company created in 1965.

¹¹ Concerted prices had been phased out by 1995.

Reduction of support to agriculture has also taken place via the reduction or elimination of subsidies to inputs. The public agencies and firms in charge of distribution of agricultural inputs at subsidized prices have been liquidated or privatized, or have withered. Reducing subsidies stimulate an increase in input price, while reduced import tariffs act in the opposite direction.

Support policies in agriculture are especially important in the context of trade agreements. A producer price support within a free trade area, causes the supporting government to bear the costs of support to partner country's producers. On the other hand, subsidized production by one country constitutes unfair competition for the neighbors. Within MERCOSUR, efforts were made to arrive at concrete commitments on support measures, though no agreement was reached and member countries are only bound by WTO regulations on AMS.¹² In the case of Mexico, NAFTA has urged its members to move towards non-distortive support measures, like the direct payments of PROCAMPO in Mexico.

The USA has traditionally used non-recourse loans and deficiency payments to provide support to farmers, (essentially by means of a minimum guaranteed price). However, the reforms introduced by the FAIR¹³ Act (1996) reduce the distortions induced by producer support. Payments are no longer linked to prices, as the deficiency payments have been replaced by the "production flexibility contract payments". The loan rates were also modified, and they are assumed to be set lower than the market rates, so they will not act as a price support mechanism (OECD, 1997b).

Other programs such as the Export Enhancement Program (EEP), and the GSM (export credit guarantee) remain after the FAIR Act. A special program for subsidizing dairy product exports exists, and the subsidy levels are set to the maximum levels compatible with the UR Agreement. The US government also has subsidized food programs for low-income households and schools.

Canada's agricultural policies have included price and income support, transportation subsidies, credit and marketing. For wheat and barley, the Canadian Wheat Board (CWB) controls prices and exports in the main producing regions. The gross revenue insurance plan (GRIP) provided crop insurance, with a compensation for low prices – thus constituting a form of price support. Significant expenditures were allocated to the grain transportation subsidy (WGTA). With the reforms, the GRIP was abandoned, though a non-distortionary insurance program (NISA) remains. The transportation subsidy was eliminated in 1995, and direct payments to farmers were offered as compensation.¹⁴ There have

¹² Aggregate Measure of Support.

¹³ Federal Agricultural Improvement and Reform.

¹⁴ These compensation payments had ended by 1997.

also been changes in the operation of the CWB, allowing market forces to play a more important role and eliminating the use of differential pricing for the domestic and export markets.

Other Policies

Other aspects of agricultural policy reform have included drastic reduction of subsidized credit to agriculture by means of shrinking or privatization of rural development banks. Interest rate controls and concessions are no longer used.¹⁵ In the area of agricultural research and extension services, the budget has also been sharply reduced, though this may be counter-productive according to some analysts. Regarding irrigation services, the budget has also been reduced, and their management has been decentralized and/or privatized. Other reforms related to agriculture include the liberalization of the land market (i.e. elimination of restrictions on size of farms, renting of land-reform parcels, etc.). The private sector and NGOs are deemed to play a more active role in these areas.

Trends in Protection and Support Indicators

Agricultural support policies induce several distortions, which are sometimes difficult to assess. Therefore, it is most important to quantify them in order to disentangle the effect of each policy instrument on each producer group, since hidden income transfers and differential treatments often exist. The producer subsidy equivalent (PSE) is a synthetic indicator that summarizes all the information relative to agricultural support measures.¹⁶ It has the additional advantage of permitting the assemblage of commodity or country level indicators into broader aggregates.

The evolution of PSEs over the period of reforms permits us to gauge the evolution of agricultural policies and the distortions they induce. A comparison with the nominal rate of protection permits us to deduce the relative importance of price and non-price intervention in the support given to agriculture. Table 1 presents PSEs and NRPs for selected countries in Latin America before, during and after the reform period.

For Argentina, only exportables are considered. The trend in NRPs follows closely the declining trend in export taxes, which became a positive transfer by 1993. There is little difference between NRP and PSE measures, indicating that non-price support was negligible. However, as price related transfers decrease, non-price transfers – such as expenditures on research and extension – become

¹⁵ Brazil is among the exceptions.

¹⁶ For methodological details on PSE calculations refer to *Agricultural Policies in OECD Countries: Measurement of Support and Background Information*.

relatively more important. Brazil shows very high volatility in the indicators, and a protection pattern inconsistent¹⁷ with the general tendency (i.e. Brazil shows negative protection for importables). This is due in part to the fact that, for certain products, Brazil was an importer in some years and an exporter in others.¹⁸ There was international price volatility as well.

Chile had no taxes for exportables and had positive protection for importables. PSEs follow NRPs closely, which reflects the high relative importance of price-related transfers. There is a decreasing trend in protection. Similarly, Colombia shows a declining positive level of support, with non-price transfers becoming relatively less important. Ecuador shows an increasing level of taxation of exports, which is reflected by increasing negative protection indicators. Paraguay had decreasing negative protection – due to reduced taxation –, while Uruguay shows a slight trend to increasing taxation.

TABLE 1: Aggregate Measures of Agricultural Protection in Latin America¹⁹ (percent)

	1985-1989	1985-1990	1991-1991	1991-1992	1993	1993
	NRP ²⁰	PSE	NRP	PSE	NRP	PSE
Argentina	-21.2	-26.6	-5.8	-4	0.9	3.3
Brazil	1.7	-3.4	-9.5	-5.8	18.7	n.a.
Chile	13.5	13.7	15.3	10	13	n.a.
Colombia	26.3	13.7	18.1	12.1	13.3	n.a.
Ecuador*	3	-18.1	-6.9	-18.4	-12.4	-50.7
Paraguay	-25.7	-42.2	3.5	-26.5	-15.5	n.a.
Uruguay*	-5.3	-12.5	-12.1	-20.7	-8.4	-16

Source: Valdés, 1996.

¹⁷ “Although some externalities, such as volatile world prices, contributed to this inconsistency, it appears that the main causes were: i) that in those years Brazil was self-sufficient in certain products, it is unclear whether the import or export parity should have been used as reference points, and ii) the many government interventions that existed in each commodity market complicated the analysis considerably”. (Valdés, 1996, pp. 41-42)

¹⁸ Gervásio Castro de Rezende (personal communication) points out that this might have been the case for corn, for which the FOB price is used as reference, although Brazil is usually an importer.

¹⁹ Calculations are based on a small group of selected importable and/or exportable goods for each country. Commodities considered are different for each country.

²⁰ The NRP is calculated using tariff equivalents, which might differ from nominal tariffs, due to the effect of non-competitive markets, budget-financed price support or other distortions.

Table 2 presents support for selected products, from 1985 to 1994. In general, during two years (1990 and 1991) taxation – negative protection – tended to be greater than the trend observed in precedent and subsequent years. Brazil shows a notable volatility in the protection indicators, while Argentina shows (except for 1990 and 1991) an increasing level of protection (decreasing negative protection). The magnitude and sign of the PSE is largely determined by the NRP, which is itself volatile, due to macroeconomic and exchange rate instability.

TABLE 2: Selected Measures of Agricultural Protection in Latin America (percent)

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
<i>Wheat</i>											
Argentina	PSE	-27.5	-22.1	-2.3	6	-11.4	-39.2	-2.9	0.6	5.7	n.a.
	NRP	-24.2	20.9	-8	-1.8	-26	-30	-6.3	-1.9	3.2	3.2
Brazil	PSE	25.4	53.6	27.4	37	-21.5	-13.3	14.2	8.2	n.a.	n.a.
	NRP	21.6	70.9	24.8	29.3	-36.9	-30.4	-11.8	-11.6	-11.6	36.9
Average ²¹	PSE	-9.6	4.3	14.4	3.6	-4.6	-16	5.9	12.4	6.5	n.a.
	NRP	-2	26.5	14.7	12.3	-12.7	0.3	25.8	8	3.7	26.1
<i>Soybeans</i>											
Argentina	PSE	-52.3	-42.5	-16.1	-17.6	-56.5	-53	-11	-6.4	-1.2	n.a.
	NRP	-36.3	-32.6	-18.6	-17.6	-38.3	-36.1	-12.4	-8.6	-3.8	-4
Brazil	PSE	-2.7	32.7	7	32.6	42.1	21.4	28.1	9.1	n.a.	n.a.
	NRP	-11.9	2	-3	9.7	22.3	-1.6	10.2	-11.2	15.2	47.4
Average ²²	PSE	-23.3	15.3	2.9	3.9	-1.4	3.9	12.3	3.9	-8.7	n.a.
	NRP	-11	26.5	5.7	1.2	1.8	7.2	11.8	-2.9	7.5	11.8
<i>Maize</i>											
Argentina	PSE	-52.8	-42.9	-26.3	0.6	-39.6	-39.8	-4.7	-0.6	5	n.a.
	NRP	-35	-31	-23.1	-2.2	-30.3	-30.2	-6.5	-2.1	3.5	3.5
Brazil	PSE	-112.6	-18.7	-97.7	-95.3	-191.7	-56.9	-41.5	-85.1	n.a.	n.a.
	NRP	-54.6	-26.3	-51.1	-53.3	-67.5	-40.7	-33.9	-49.4	-5.8	15.5
Average ²³	PSE	67.7	-12.9	-11.9	-11.9	-37.5	-24.8	-7.2	-10.9	-19.8	n.a.
	NRP	-34.5	-11.3	3.9	0.6	-14.2	-15.5	9.9	21.5	24.2	9.2
<i>Beef</i>											
Argentina	PSE	-3.8	-7.7	-7.5	-5.7	-27.2	-21.7	-3.6	-0.1	4.9	n.a.
	NRP	-4.6	-7.5	-7.5	-6.3	-21.7	-18.7	-4.5	-1.5	3.5	3
Average	PSE	12.5	-0.4	2.9	10.2	-3.5	-6.5	0.6	9.9	-7.8	n.a.
	NRP	22.1	9.9	5.2	15.8	1.9	-3.9	2.4	13.5	2.6	-8.4

Source: Valdés, 1996.

²¹ Simple average for Argentina, Brazil, Chile, Colombia, Paraguay and Uruguay.

²² Simple average for Argentina, Brazil, Colombia, Ecuador and Paraguay.

²³ Simple average for Argentina, Brazil, Chile, Colombia, Dominican Republic and Ecuador.

The agricultural protection levels observed in Latin America contrast with the high levels observed in the OECD countries. Average PSEs for the OECD countries have ranged between 35% and 45% over the last decade, though with a declining trend. Two points should be stressed with respect to protection in Latin America. First, the existence of export *taxes* on major traded crops is, from the point of view of the producer, symmetric to an import subsidy. These distortions could be important and their effects should be analyzed further in future research. Second, the major role played by the real exchange rate in the determination of the sign and magnitude of protection should be highlighted. In the current context of global financial disturbances, this variable can play a major role – more important than tariffs – in explaining observed effective protection.

Table 3 shows PSE data for Mexico, as calculated by the OECD.²⁴ Total PSE shows great volatility, which largely reflects macroeconomic disturbances. Total pse, as well as pse expressed as percentage of output value shows an upward trend sharply interrupted with the December 1994 devaluation. With the devaluation, border prices expressed in local currency increased greatly, and reached levels higher than domestic prices. In this case price support (an important component of PSE) became negative. Excluding this shock, the upward trend in total PSE and in percentage terms is clear. We also observe the decreasing importance of input subsidies, which accounted for 78 percent of total support in 1988 and account for only 4.2 percent in 1997. Direct payments, which were negligible in 1988, become increasingly important, and account for 33.4 percent of total support in 1997. Market price support – accounts for nearly half of total support – tends to increase its share of total support.

Canada (Table 3) shows a decreasing trend in total and percentage PSE in the last decade. Support given by regional governments accounts for a significant share of expenditures. Reliance on market support (and hence border measures) declines in the last three years. The United States (Table 3) also shows a decreasing level of support for agriculture. Percentage PSE falls from 23 percent of output value in 1988 to 16 percent in 1997. The relative importance of market support is stable, with market price support accounting for 40 to 50 percent of total support.

²⁴ OECD's calculation method differs from Valdés', so the data are not comparable. Notably, the OECD performs calculations using a standard bundle of products, which is the same for all countries for which calculations are done.

TABLE 3: Aggregate PSEs in North America

	Unit	1990	1991	1992	1993	1994	1995	1996	1997
<i>Mexico</i>									
9 Net total PSE	MNSmn	10368.0	12039.7	15128.6	17505.0	17592.2	-71.1	9325.2	19277.2
11 Net percentage PSE	%	28.8	28.8	32.2	35.7	33.5	-0.1	8.5	16.2
12 Net total PSE in US\$	US\$mn	3649.8	3983.5	4888.1	5619.4	5191.6	-11.1	1226.9	2430.9
13 Market price supp. as % of tot PSE	%	53.0	81.1	78.6	76.9	50.8	-11740.4	10.3	53.2
14 Direct payments as % of total PSE	%	0.0	0.9	5.3	2.5	25.9	6812.5	60.1	33.4
15 Reduc. of input cost as % of tot PSE	%	43.1	13.6	11.0	15.4	18.6	3614.0	13.5	4.2
16 General services as % of total PSE	%	3.2	3.8	4.4	4.5	4.0	1040.8	10.3	5.8
17 Sub national as % of total PSE	%	0.7	0.5	0.6	0.6	0.7	173.1	1.3	0.6
18 Other subsidy as % of total PSE	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Canada</i>									
9 Net total PSE	C\$mn	8204.0	8486.0	7071.0	6167.0	5210.0	5400.0	5178.0	4335.0
11 Net percentage PSE	%	45.0	44.0	37.0	31.0	25.0	22.0	22.0	20.0
12 Net total PSE in US\$	US\$mn	7030.0	7404.0	5849.0	4780.0	3815.0	3934.0	3797.0	3135.0
13 Market price supp. as % of tot PSE	%	53.0	40.0	43.0	50.0	51.0	34.0	35.0	48.0
14 Direct payments as % of total PSE	%	14.0	30.0	23.0	14.0	13.0	25.0	23.0	14.0
15 Reduc. of input cost as % of tot PSE	%	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0
16 General services as % of total PSE	%	8.0	8.0	9.0	10.0	12.0	11.0	12.0	11.0
17 Sub national as % of total PSE	%	23.0	21.0	23.0	24.0	23.0	24.0	25.0	26.0
18 Other subsidy as % of total PSE	%	100.0	100.0	100.0	100.0	100.0	95.0	96.0	100.0
<i>United States</i>									
9 Net total PSE	US\$mn	28117.0	24841.0	26082.0	27657.0	25307.0	17344.0	22614.0	22791.0
11 Net percentage PSE	%	23.0	21.0	21.0	23.0	19.0	13.0	15.0	16.0
12 Net total PSE in US\$	US\$mn	28117.0	24841.0	26082.0	27657.0	25307.0	17344.0	22614.0	22791.0
13 Market price supp. as % of tot PSE	%	50.0	49.0	47.0	49.0	48.0	46.0	46.0	42.0
14 Direct payments as % of total PSE	%	25.0	22.0	26.0	23.0	24.0	9.0	20.0	24.0
15 Reduc. of input cost as % of tot PSE	%	7.0	6.0	5.0	7.0	4.0	10.0	7.0	7.0
16 General services as % of total PSE	%	11.0	13.0	13.0	13.0	15.0	22.0	17.0	17.0
17 Sub national as % of total PSE	%	7.0	7.0	7.0	7.0	7.0	11.0	9.0	9.0
18 Other subsidy as % of total PSE	%	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0

Source: OECD (1998a).

3. Trade in the Americas

This section discusses the basic features of the trading system in the Americas, including a description of measured trade flows and tariff barriers. The discussion relies on Version 4 of the GTAP database, which is the basis of the general equilibrium model used to undertake the policy simulations.²⁵

²⁵ The Global Trade Analysis Program (GTAP), is an international consortium of trade economists hosted in the Department of Agricultural Economics at Purdue University. Members of the consortium include representatives from academia, national and sub-national governments, and international organizations. The main product of the consortium is a globally consistent world Social Accounting Matrix (SAM). The current version of the database, Version 4, has a 1995 base year and includes 45 country/regional groupings and 50 economic activities. See Annex B for details on the regional and sectoral aggregation used for this paper. For more details on GTAP, see Hertel (1997), or visit the GTAP web site at <http://www.agecon.purdue.edu/gtap/>.

Regional Trade Patterns

Table 4 summarizes the main 1995 export flows for the two aggregate regions in the Americas – Central and South America (CSAM), and Canada, Mexico, and the United States (NAFTA).²⁶ Total exports from NAFTA are some US\$ 1,000bn in 1995, more than 5 times the value of exports from CSAM of some US\$ 186bn.²⁷ The following points highlight some of the features of the export markets for the two regions.

TABLE 4: Summary of Export Flows in 1995 (percent)

	Central and South America					NAFTA				
	Share	NAFTA	CSAM	OECD	OROW	Share	NAFTA	CSAM	OECD	OROW
Wheat	0.6	0.0	77.7	0.3	22.0	0.9	5.3	12.0	17.7	65.0
Other cereal grains	0.5	2.4	41.6	15.1	40.8	0.9	12.1	7.5	47.8	32.6
Oilseeds	1.1	4.5	12.8	72.6	10.1	0.7	13.6	2.1	66.8	17.5
Cane and beet sugar	1.7	17.6	6.6	15.0	60.8	0.0	0.0	14.5	2.9	82.6
Other crops	8.6	29.5	10.0	53.6	6.9	1.6	31.8	5.5	36.8	26.0
Cattle and sheep	0.1	2.8	93.7	1.6	1.9	0.2	85.9	0.6	12.0	1.4
Raw milk	0.0					0.0				
Other animal products	0.3	7.3	20.4	61.7	10.6	0.3	21.8	3.1	54.3	20.8
Beef products	1.2	15.3	18.3	58.7	7.7	0.5	21.5	4.5	64.4	9.7
Other meat products	0.6	3.0	16.6	43.1	37.3	0.4	26.9	4.4	32.5	36.2
Dairy products	0.2	6.6	88.0	1.6	3.8	0.1	25.6	14.6	21.9	37.9
Refined sugar	2.0	15.4	11.2	16.0	57.3	0.1	46.9	15.2	21.9	16.1
Vegetable oils	2.0	3.6	19.7	17.5	59.1	0.2	27.2	9.0	14.6	49.1
Other processed foods	8.9	16.6	18.6	51.4	13.4	2.4	32.2	7.0	42.5	18.4
Textile and apparel	7.8	61.5	17.7	14.5	6.3	2.5	45.6	18.8	23.3	12.3
Basic industrial goods	27.6	22.2	26.8	38.6	12.4	22.0	44.9	7.7	33.4	14.0
Other manufacturing	9.7	25.8	45.5	19.9	8.9	42.8	45.2	5.8	31.9	17.2
Energy	11.3	57.0	30.6	10.8	1.6	3.4	68.6	7.2	19.8	4.4
Construction	0.0	9.6	18.8	28.5	43.1	0.0	9.1	9.7	56.0	25.2
Services	15.7	14.7	11.0	54.0	20.3	20.8	16.7	3.8	62.3	17.2
Total	100.0	27.2	23.1	35.6	14.1	100.0	38.3	6.2	38.7	16.8

Notes: 1. The percentages under the columns labeled Share represent the commodity structure of exports for the two aggregate regions. Hence the largest export share of CSAM is basic industrial goods, with a 28 percent share, while NAFTA's largest share is other manufacturing, representing a share of total export of 42.8 percent.

2. The other columns represent the destination of the sectoral exports. For example, 16.6 percent of CSAM's other processed foods are imported by NAFTA, 51.4 percent by the rest of the OECD, 13.4 percent by OROW, with the remaining being intra-regional exports.

²⁶ All regional and sectoral abbreviations are described in the Annex.

²⁷ All values are expressed in 1995 US dollars unless stated otherwise.

NAFTA's exports are dominated by three sectors – basic industrial goods (22 percent), other manufacturing (43 percent), and services (21 percent). None of the other sectors even attains a 4 percent share. Total agricultural exports have only a 4.6 percent share, and if processed foods are included, the food export share reaches 8.4 percent. The addition of apparel and textile, somewhat dependent on agriculture, would push the overall agriculture and downstream exports to 10.8 percent.

- The two largest geographical markets for NAFTA's exports are itself (i.e. intra-regional trade), and the rest of the oecd, roughly balanced between 38 and 39 percent respectively. ROW represents an additional market of 17 percent. The balance, a relatively small 6.2 percent represents exports to CSAM, a market worth roughly US\$ 62bn.
- In relative terms for NAFTA, CSAM represents only a significant market (defined as 10 percent or more) in five sectors – wheat, sugar, dairy products, textile and apparel, and construction. In absolute terms, only wheat and textile and apparel matter, exports of the other goods being negligible.
- In absolute terms for NAFTA, the largest markets in CSAM (defined as US\$ 5bn or more) are textile and apparel, basic industrial goods, other manufacturing, and services.
- CSAM's exports are more balanced across sectors than in NAFTA, to some extent reflecting greater reliance on primary commodities and their closely linked downstream processes. Agricultural exports represent a 13 percent share, dominated by exports of other crops (fruits and vegetables, coffee, etc.). Food processing is another 15 percent, and textile and apparel has an 8 percent share. Energy, another basically primary commodity, has an 11 percent share. Other important sectors include basic industrial goods (28 percent), other manufacturing (10 percent), and services (16 percent).
- CSAM has a relatively well-balanced export share with respect to its various trading partners. Intra-regional trade represents some 23 percent of total exports, with NAFTA, OECD, and OROW representing respectively 27, 36, and 14 percent.
- In relative terms, NAFTA represents a significant market for CSAM (defined as greater than 30 percent) in other crops (30 percent), textile and apparel (62 percent), and energy (57 percent).
- The largest market for CSAM's agriculture is OECD. Almost 50 percent of CSAM's agriculture is exported to OECD, with NAFTA and intra-regional trade having an agricultural export market share of 23 percent and 15

percent. Adding food processing slightly modifies these percentages, since there is a relatively higher share of processed foods exported to ROW.

- In absolute terms for CSAM, the largest markets in NAFTA (defined as US\$ 5bn or more) are other crops, other food processing, textile and apparel, basic industries, other manufacturing, and energy. The total value of agricultural exports to NAFTA barely exceeds US\$ 5bn. Intra-regional agricultural exports are lower totaling only US\$ 3.6bn. The largest intra-regional markets in CSAM are processed foods, basic industrial goods, other manufacturing and energy.

Imports are simply the reverse side of exports. In aggregate NAFTA's imports are some US\$ 1,090 leading to a US\$ 90bn trade deficit in 1995. CSAM's imports total US\$ 206bn for a trade deficit of some US\$ 20bn. Table 5 summarizes the main structure of imports for both CSAM and NAFTA. The following points highlight some of the main features of the import structure.

The regional import shares roughly match the regional export shares indicating that there are no major regional trade deficits. There is one glaring exception for NAFTA. Its trade deficit with ROW is some US\$ 76bn representing some 45 percent of its exports to ROW. NAFTA has a positive trade balance with CSAM of about US\$ 12bn. CSAM, on the other hand, has a deficit with all regions, and the largest imbalance in relative terms (as a percentage of regional exports) is with NAFTA.

- NAFTA imports basic industrial goods (20 percent), other manufacturing (47 percent), and services (15 percent). Imports of energy and textile and apparel also exceed 6 percent each.
- The only sectors where CSAM has a significant market share in NAFTA are sugar, with a 60 percent share, refined sugar (44 percent), and other crops with a 31 percent share. Other sectors exceeding a 10 percent market share include processed foods, textile and apparel and energy.
- Intra-regional imports dominate many sectors in NAFTA including most of agriculture, and basic industrial goods.
- CSAM imports basic industrial goods (24 percent), other manufacturing (36 percent), and services (16 percent).
- NAFTA has a dominant market share in the CSAM region in wheat (50 percent), other cereals (61 percent), oil seeds (35 percent), other meats (34 percent), textile and apparel (37 percent), basic industrial goods (34 percent), and other manufacturing (33 percent).

In summary, intra-regional trade in NAFTA is roughly 7 times as great as its trade with CSAM. There is significant intra-sectoral trade in processed foods, textile and apparel, basic industrial goods, and services. Trade in agriculture tends to be in one direction, with NAFTA dominating in most sectors, and CSAM with predominance in sugar and other crops. Energy is another sector where CSAM plays an important role in trade between the two regions.

**TABLE 5: Summary of Import Flows in 1995
(percent)**

	Central and South America					NAFTA				
	Share	NAFTA	CSAM	OECD	OROW	Share	NAFTA	CSAM	OECD	OROW
Wheat	1.0	50.4	40.3	9.1	0.2	0.0	99.4	0.0	0.6	0.0
Other cereal grains	0.6	60.8	30.5	6.1	2.6	0.1	95.9	1.7	2.2	0.1
Oilseeds	0.2	34.8	61.3	3.7	0.2	0.1	84.8	8.0	4.0	3.1
Cane and beet sugar	0.1	1.3	94.2	4.4	0.0	0.1	0.0	60.3	21.0	18.7
Other crops	1.8	24.0	44.1	8.1	23.8	1.4	33.2	30.9	8.2	27.7
Cattle and sheep	0.1	5.0	90.3	4.7	0.0	0.2	95.4	0.4	4.2	0.0
Raw milk	0.0					0.0				
Other animal products	0.1	33.8	40.3	22.5	3.5	0.1	53.3	3.3	27.6	15.9
Beef products	0.3	32.5	61.3	6.1	0.0	0.2	43.1	14.2	42.6	0.1
Other meat products	0.2	37.4	37.6	22.9	2.0	0.1	73.1	2.2	21.8	2.9
Dairy products	0.8	9.7	26.0	63.9	0.4	0.1	21.6	2.5	74.6	1.3
Refined sugar	0.3	17.1	78.7	4.2	0.0	0.1	21.4	43.7	20.2	14.6
Vegetable oils	0.5	16.2	65.8	9.6	8.4	0.1	33.6	8.2	23.7	34.5
Other processed foods	3.4	23.9	43.5	27.9	4.7	2.0	35.3	12.4	33.3	19.0
Textile and apparel	6.1	37.0	20.3	17.7	24.9	7.1	14.6	11.5	17.4	56.5
Basic industrial goods	24.0	34.3	27.8	30.3	7.5	19.7	46.2	5.3	31.6	16.8
Other manufacturing	36.0	33.4	11.1	46.4	9.1	47.4	37.4	0.9	42.7	19.0
Energy	6.9	17.2	45.0	10.4	27.4	6.1	35.3	18.1	11.5	35.2
Construction	1.6	0.6	0.1	88.5	10.7	0.0	4.3	0.5	86.7	8.6
Services	15.9	24.0	9.8	39.3	26.8	14.9	21.4	2.6	55.6	20.3
Total	100.0	30.2	20.9	35.4	13.6	100.0	35.1	4.6	37.8	22.4

Notes: 1. The percentages under the columns labeled Share represent the commodity structure of imports for the two aggregate regions. Hence the largest import share of CSAM is other manufacturing, with a 36 percent share, while NAFTA's largest share is also other manufacturing, representing a share of total export of 47 percent.

2. The other columns represent the origin of the sectoral imports. For example, 23.9 percent of CSAM's other processed foods are imported from NAFTA, 27.9 percent from the rest of the OECD, 4.7 percent from ROW, with the remaining being intra-regional imports.

Regional Trade Barriers

The GTAP database incorporates a fully consistent set of bilateral trade flows for each of the commodities. Each flow between countries is associated with three price wedges, each of which is distinguished bilaterally. The first wedge is an export tax/subsidy, thus distinguishing producer prices from world export prices (i.e. FOB prices). The second wedge is a trade and transport margin, determining

the difference between FOB prices and CIF prices, i.e. imports evaluated at world prices. The final wedge is the bilateral tariff rate which converts the CIF import price into a tariff inclusive domestic import price.²⁸

Table 6 summarizes²⁹ the tariff rates for the two aggregate regions CSAM and NAFTA, with respect to their trading partners.³⁰ These are the tariffs applied in CSAM and NAFTA. The following points highlight some of the key points in these tables.

TABLE 6: Applied Tariffs: Central and South America (CSAM) and NAFTA (percent)

	Average Import Tariffs by Origin CSAM					Average Import Tariffs by Origin NAFTA				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	2.1	9.9	1.3	0.0	5.2	0.9	—	0.0	—	0.9
Other cereal grains	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	3.0
Oil seeds	11.5	8.8	7.7	0.0	9.7	0.0	0.0	0.0	0.0	0.0
Cane and beet sugar	0.0	5.4	0.0	—	5.1	—	57.0	8.2	60.0	47.3
Other crops	9.3	9.7	8.8	8.8	9.3	1.7	2.2	5.0	2.8	2.4
Cattle and sheep	0.0	8.0	0.0	—	7.2	0.0	0.0	0.0	0.0	0.0
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	5.4	8.6	3.7	5.1	6.3	0.7	1.3	4.2	0.3	1.6
Beef products	6.4	12.2	4.7	—	9.9	0.0	0.0	0.0	0.0	0.0
Other meat products	6.7	4.8	5.8	11.6	5.8	2.2	0.0	1.9	1.2	2.1
Dairy products	9.6	3.9	7.8	0.0	6.9	16.5	46.4	42.5	57.3	36.6
Refined sugar	15.6	19.1	7.5	—	18.0	34.8	57.1	23.8	58.6	46.0
Vegetable oils	9.2	14.2	8.9	6.4	12.2	0.0	0.0	0.0	0.0	0.0
Other processed foods	12.6	12.2	14.9	4.0	12.7	3.3	1.9	14.2	1.8	6.5
Textile and apparel	20.6	15.5	16.2	15.9	17.6	0.0	10.6	10.9	11.8	9.8
Basic industrial goods	8.5	10.1	9.7	8.9	9.3	0.0	1.5	4.0	3.5	1.9
Other manufacturing	13.1	15.2	14.4	14.0	14.0	0.0	1.5	3.1	2.2	1.7
Energy	8.0	11.4	7.6	18.4	12.3	0.0	1.1	3.0	1.2	1.0
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	10.1	10.9	10.1	9.4	10.2	0.1	4.2	3.1	3.8	2.3

Notes: Averages are weighted by trade shares. Import tariffs exclude import subsidies.

²⁸ All values in the GTAP database are based in US\$ 1995, therefore there is no conversion of trade into local prices using a nominal exchange rate.

²⁹ Since the base year of the GTAP data base is 1995, these data need not exactly coincide with Valdés' calculations showed in the previous section, which goes up to 1993 in most cases. Moreover, since in the policy simulation export taxes and import subsidies are not going to be altered, these are not shown in Table 6. Nonetheless, the information in GTAP is broadly consistent with the previous' section description of trade policies.

³⁰ The table also highlights the tariffs faced by intra-regional exporters in the Americas.

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- Since trade agreements do not address either export taxes or import subsidies, these will not be shocked in the policy simulation. In order to highlight only those policy instruments that will be shocked in the alternative policy scenarios, we only show positive import tariffs and negative export taxes (i.e. export subsidies).
 - The tariffs shown are trade weighted averages. For a given country, the absence of imports of certain good may cause it to have a zero tariff.³¹ Moreover, this country will have no weight as regional trade-weighted averages are calculated. In order to examine more closely the base year distortions to trade without the biases of regional aggregation, we have included this information for each country individually in Annex C.
 - Tariffs applied in the Americas are highly differentiated by both commodity as well as by region of origin. Part of the regional differentiation can certainly be attributed to the commodity composition of the import bundle. For example, the other manufacturing product from the United States could be electronic equipment, such as computers and peripherals, whereas imports from the rest of the OECD could perhaps be motor vehicles. For sectors with broad commodity coverage, one would anticipate a wider range of regionally differentiated import tariffs, assuming the import composition differs from one region of origin to another. Nonetheless, for the more narrowly defined commodities, particularly those in agriculture, there is a degree of regional variation reflecting presumably preferential trading arrangements and/or region-specific protection.
 - Central and South American countries tend to have higher tariffs for industrial goods, and for processed agricultural commodities (vegetable oils, refined sugar, other processed foods). For certain products, (cane and beet sugar, refined sugar, wheat, cattle and sheep, other animal products, beef products, vegetable oils) they have higher tariffs for imports coming from other Central and South American countries, than for imports coming from other regions. This could reflect either a compositional impact, or could reflect macroeconomic effects, such as the broad dollarization of trade in the Americas. However, on average across sectors, applied tariffs are broadly the same for all regions of origin.
 - There are no major export subsidies in Central and South America, with other meat products being the exception.

³¹ In the case of total absence of trade we have replaced the tariffs with a dash. However, a net exporter of a (narrowly defined) good can also have imports of the same good, in which case one can expect applied tariffs to be low or zero. For example, Argentina, which is a net exporter of wheat, imports small quantities (duty free) from Canada, and has thus a zero tariff, instead of a dash.

- Tariffs in the NAFTA region tend to be lower on average than in CSAM with a few exceptions. Of course, trade in the NAFTA region has largely been liberalized. Industrial tariffs among the OECD countries have come down significantly after successive trade negotiation rounds, though the averages may obscure high peak tariffs.
- In agriculture, NAFTA imposes essentially high tariffs on sugar and dairy products.³² Other relatively high tariffs (by NAFTA's own standards) are present in the textile and apparel, and the food processing sectors. All other industrial tariffs are low. On average, NAFTA exhibits much lower tariffs for imports coming from other NAFTA countries, which reflects the degree of implementation of the agreement reached by 1995. Across other regions, protection is fairly uniform on average, though at the commodity level there are important regional differences for cane and beet sugar and other processed foods.
- Export subsidies by NAFTA are concentrated on a few goods (cane and beet sugar, dairy products and refined sugar). However, their levels are high and, as pointed out in the previous section, are kept at the maximum levels compatible with the UR Agreement on Agriculture.

In summary, tariffs in the CSAM region are higher than in the NAFTA region. CSAM, for agricultural products, tends to have higher tariffs on hemispheric trade than on trade with the rest of the world, and tends to have higher tariffs for processed goods than for primary goods. The removal of tariffs within the CSAM region should lead to a degree of regional re-structuring of both agricultural and industrial production. It might also be trade diverting given the relatively higher levels of intra-regional tariffs compared to tariffs on imports from the rest of the world. Save for sugar, food processing, and textile and apparel, free trade in the Americas will probably only have minor impacts on the NAFTA economies, given that they already have low tariffs for most other goods.

³² Note that agricultural policies in NAFTA, particularly in the US and Mexico have been geared towards price and income support, and not extensively towards border measures. Also note that these are average tariffs. If import shares are small or zero, the average tariff will similarly be small. For example, Japan has prohibitive tariffs on rice imports which are therefore zero. Deducting tariffs from a Japanese SAM will generate a zero tariff level (as well as a zero propensity to import).

TABLE 7: Applied Export Subsidies: Central and South America (CSAM) and NAFTA (percent)

	Average Import Tariffs by Origin NAFTA					Average Export Subsidies by Destination CSAM				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	—	0.0	0.0	0.0	0.0	-0.7	-1.2	-1.2	-1.3	-1.2
Other cereal grains	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Oil seeds	0.0	-4.7	-0.9	-0.6	-1.3	0.0	0.0	0.0	0.0	0.0
Cane and beet sugar	0.0	0.0	0.0	0.0	0.0	—	-14.9	0.0	-27.4	-24.8
Other crops	-0.1	0.0	-0.3	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0
Cattle and sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	0.0	0.0	0.0	0.0	0.0	-3.4	-1.0	-2.0	-2.3	-2.3
Beef products	-2.0	-0.7	-3.6	-3.3	-2.8	0.0	0.0	0.0	0.0	0.0
Other meat products	-9.2	-8.9	-11.2	-11.3	-10.8	-3.5	-1.6	-2.4	-1.9	-2.5
Dairy products	0.0	0.0	0.0	0.0	0.0	-36.5	-36.0	-36.2	-35.7	-36.1
Refined sugar	-0.2	0.0	-1.3	0.0	-0.2	-21.4	-33.8	-20.9	-27.6	-24.2
Vegetable oils	0.0	-0.5	-0.2	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
Other processed foods	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Textile and apparel	-0.1	-1.5	-0.8	-2.7	-0.6	0.0	0.0	0.0	0.0	0.0
Basic industrial goods	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	-0.1	-0.2	-0.3	-0.3	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1

Notes: 1. Averages are weighted by trade shares. Export subsidies exclude export taxes.

4. Policy Simulations and Results

A standard tool in modern trade policy analysis is the so-called applied general equilibrium (AGE) model.³³ To investigate the impacts of trade policies in the Americas we have constructed a model referred to as the Framework for Integrated Economic Simulation of Trade in the Americas, also known as the FIESTA model. An overview of the main features of the model is provided in Annex B.³⁴

The model is recursive dynamic with a base year of 1995 and it is solved forward to the year 2010. We will not provide significant details about the

³³ There are several overviews of AGE models. See for example Shoven and Whalley (1984), Shoven and Whalley (1992), Dervis, de Melo, and Robinson (1985), and Hertel (1997). For AGE models specifically applied to agriculture, see Burniaux and van der Mensbrugghe (1994), and Parikh et al. (1988). For AGE models and trade, see François and Reinert (1997).

³⁴ For a complete and detailed description of the model equations and specification, see the document "Model Specification for FIESTA", available from the authors upon request.

reference simulation.³⁵ It suffices to say that the reference simulation relies on “guess-estimates” of population, labor, and productivity growth, with capital accumulation endogenously determined by gross national savings.³⁶ As in most AGE exercises key income and substitution elasticities are imposed, and these, combined with the base year SAM are used to calibrate the remaining parameters of the model. Most of these parameters are held fixed throughout the 15-year time horizon.³⁷ All base year price distortions, i.e. taxes and subsidies are constant throughout the reference simulation, implying that policies in the year 2010 reflect their levels in 1995.³⁸ Finally, foreign savings are also fixed at their base year levels. Due to the balance of payments closure rule, this fixes the aggregate trade balance for each region, though the structure of trade is allowed to vary.

Table 8 provides a broad overview of the reference scenario, including a snapshot of the macroeconomic aggregates for the base year, 1995, and the final simulation year, 2010, plus the imputed annual average growth rates. Under the assumptions of the reference scenario, there would be some slight catching up in *per capita* incomes between the OECD and non-OECD economies, though the gap would remain significant. The wealthiest Latin-American country (measured in terms of *per capita* income at 1995 market exchange rates) is Argentina. Its average income is about 28 percent of the average income in the US. In 2010, the parity index would increase to about 36. In the base year, the three NAFTA countries account for some 85 percent of hemispheric output, with just over 50 percent of the population. Over the fifteen year time horizon of the simulation, NAFTA's share in output would decline to 81 percent, and its population share drops to 49 percent. The global increase in trade somewhat outpaces the increase in GDP, 3.5 percent for trade compared to 3.1 percent for GDP.

³⁵ These are available from the authors.

³⁶ There is no autonomous shift parameter for land supply. It simply adjusts to contemporaneous price movements using a constant-elasticity function.

³⁷ There are several exceptions. Production parameters are re-calibrated to reflect the changing nature of capital due to the vintage capital specification. Similarly, consumption parameters are re-calibrated each year to reflect base year income elasticities. (In the absence of this latter re-calibration, the extended linear expenditure system would converge towards a Cobb-Douglas utility function).

³⁸ There is one exception due to the fiscal closure rule. The government fiscal balance is fixed (at its base year level). The direct household tax rate adjusts in order to achieve this target.

TABLE 8: Summary of Business-as-Usual Scenario (figures in billion of US\$ 1995 unless otherwise stated) Aggregate Statistics in Base Year (1995)

	GDP at	Population	Labor	Capital	Export	Import	GDP per	GDP	Population	Parity
	market price	(a)	force	stock	volume	volume	capita(b)	share(c)	share(c)	index(d)
USA	7,126	271	4,219	15,837	718	883	26,315	25.2	4.7	100.0
CAN	574	29	293	1,380	199	180	19,533	2.0	0.5	74.2
MEX	279	91	79	673	84	71	3,064	1.0	1.6	11.6
ARG	257	35	127	555	24	24	7,392	0.9	0.6	28.1
BRA	713	159	290	2,136	54	66	4,483	2.5	2.8	17.0
ANDEAN	231	100	80	581	45	49	2,312	0.8	1.8	8.8
CAM	85	63	34	217	38	47	1,361	0.3	1.1	5.2
RSM	88	23	27	211	25	29	3,743	0.3	0.4	14.2
EUR	8,956	482	5,580	27,800	2,515	2,561	18,572	31.6	8.5	70.6
ROECD	5,948	191	3,126	21,067	702	676	31,076	21.0	3.4	118.1
EASIA	1,703	1,669	642	4,098	771	776	1,020	6.0	29.3	3.9
ROW	2,352	2,592	997	7,320	488	528	908	8.3	45.4	3.4
TOTAL	28,314	5,706	15,494	81,875	5,662	5,890	4,962	100	100	18.9
Aggregate statistics in final year (2010)										
	GDP at	Population	Labor	Capital	Export	Import	GDP per	GDP	Population	Parity
	market price	(a)	force	stock	volume	volume	capita(b)	share(c)	share(c)	index(d)
USA	10,413	303	4,884	26,259	1,125	1,453	34,353	23.3	4.4	100.0
CAN	852	33	335	2,356	292	280	25,824	1.9	0.5	75.2
MEX	559	113	107	1,002	152	121	4,952	1.3	1.6	14.4
ARG	506	41	158	727	44	42	12,201	1.1	0.6	35.5
BRA	1,423	190	373	3,248	105	112	7,497	3.2	2.7	21.8
ANDEAN	413	129	112	1,023	81	81	3,212	0.9	1.9	9.3
CAM	166	81	48	332	74	78	2,035	0.4	1.2	5.9
RSM	190	29	35	418	54	53	6,561	0.4	0.4	19.1
EUR	12,888	486	5,662	39,820	3,641	3,916	26,534	28.9	7.0	77.2
ROECD	8,519	202	3,133	36,593	1,070	1,207	42,153	19.1	2.9	122.7
EASIA	4,157	1,911	783	12,526	1,871	1,579	2,176	9.3	27.6	6.3
ROW	4,521	3,393	1,399	11,529	927	894	1,332	10.1	49.1	3.9
TOTAL	44,607	6,911	17,030	135,832	9,436	9,816	6,455	100.0	100.0	18.8
Average percent annual growth rate (1995-2010, percent)										
	GDP at	Population	Labor	Capital	Export	Import	GDP per	GDP	Population	Parity
	market price	(a)	force	stock	volume	volume	capita(b)	share(c)	share(c)	index(d)
USA	2.6	0.8	1.0	3.4	3.0	3.4	1.8	-1.8	-0.4	0.0
CAN	2.7	0.8	0.9	3.6	2.6	3.0	1.9	-0.1	0.0	0.9
MEX	4.7	1.4	2.0	2.7	4.1	3.6	3.3	0.3	0.0	2.8
ARG	4.6	1.2	1.4	1.8	4.3	3.8	3.4	0.2	0.0	7.4
BRA	4.7	1.2	1.7	2.8	4.6	3.6	3.5	0.7	0.0	4.8
ANDEAN	3.9	1.7	2.2	3.8	3.9	3.4	2.2	0.1	0.1	0.6
CAM	4.5	1.8	2.2	2.9	4.5	3.4	2.7	0.1	0.1	0.8
RSM	5.3	1.4	1.7	4.7	5.3	4.1	3.8	0.1	0.0	4.9
EUR	2.5	0.0	0.1	2.4	2.5	2.9	2.4	-2.7	-1.4	6.7
ROECD	2.4	0.4	0.0	3.7	2.9	3.9	2.1	-1.9	-0.4	4.6
EASIA	6.1	0.9	1.3	7.7	6.1	4.8	5.2	3.3	-1.6	2.5
ROW	4.5	1.8	2.3	3.1	4.4	3.6	2.6	1.8	3.7	0.4
TOTAL	3.1	1.3	0.6	3.4	3.5	3.5	1.8	0.0	0.0	-0.1

Notes: (a) Population in millions.

(b) GDP per capita in US\$ 1995.

(c) GDP and population shares are percentages of world average.

(d) Parity index is the ratio of regional per capita income with respect to the US average, i.e. US=100.

(e) Statistics in the last three columns represent the differences between 2010 and 1995.

Policy shocks are evaluated in comparison to the reference simulation. Since the simulations are dynamic, the evaluation picks up some of the dynamic effects of changes in trade policies, for example the impacts of greater capital accumulation and changes in the composition of capital. The dynamic gains from trade tend to be significantly greater than the simple static gains to trade.³⁹ Since the final reduction in tariffs only occurs in the year 2010 (see below), the results do not reflect the final steady-state gains from trade liberalization.

This paper reports the results of two, perhaps rather simplistic, trade liberalization scenarios concerning the Americas. The first scenario is an attempt to assess the impacts of setting up a free trade area among the five central and southern American countries/regions (excluding Mexico). The second extends the free trade to the entire hemisphere, i.e. tariffs between all eight countries and regions in the Western Hemisphere. This latter simulation is intended to investigate the proposed Free Trade Area of the Americas (FTAA).

The term simplistic is used for several reasons. First, any free trade agreement is typically associated with transition periods, exemptions, and other measures, by-products of political tradeoffs intended to make the agreement widely acceptable. Second, trade barriers in the model are only represented as *ad valorem* tariffs, ignoring the multitude of other non-tariff barriers which are implemented in most of the countries concerned in this study, for example the milk and sugar quotas in North America. Third, in this version of the paper, we make no attempt to assess the secondary effects of free trade agreements. These effects could easily dominate the more traditional static welfare gains associated with the removal of trade barriers. These other effects include gains to be realized from scale economies, changes in foreign direct investment, and investment induced technological change. Results have shown that in the case of NAFTA, the largest economic benefits which accrued to Mexico have come from a rapid increase in foreign direct investment.

The removal of the trade restrictions is done in a uniform fashion, both temporally and across sectors. Starting in 2000, all (positive) tariffs and export subsidies are reduced linearly to a zero level by the year 2010.⁴⁰ The first simulation is designated as *Free Trade in Latin America* (FTLA).⁴¹ This involves the

³⁹ Since the model is not forward looking, it most likely misjudges the adjustment process towards a new equilibrium. Models with forward looking behavior are significantly more difficult to design and solve.

⁴⁰ The proposed FTAA assumes a target of 2005. We are implicitly assuming this target will be hard to achieve. The US Congress has not given the President fast-track authority and is unlikely to do so before 1999, reducing the time available between negotiations and implementation. Second, exemptions are certain to be included in any agreement, further postponing any final reduction.

⁴¹ Excluding Mexico.

eventual elimination of all bilateral tariffs and export subsidies by the year 2010 between the five Central and Southern America regions in the model – Argentina (ARG), Brazil (BRA), Central America (CAM), the Andean Pact (ANDEAN), and the rest of South America (RSM).⁴² The second simulation is designated as *Free Trade Area of the Americas* (FTAA) and extends the free trade agreement to the remaining three regions in the Americas – Canada, Mexico, and the United States.

Free Trade in Latin America

Aggregate Impacts

This section describes the main aggregate impacts from the FTAA simulation. Though most attention is given to these results, the structural impacts, discussed further in the next section are of greater consequence, particularly to those who are likely to feel these impacts. Negotiators are of course keen to understand the more detailed impacts, though the press and the public debate tend to focus on the aggregate impacts – for example job loss.

The impacts of the FTAA are rather mixed except for Argentina, which would tend to gain quite substantially from this trade reform scenario, see Table 9. The only unambiguous loser would be the RSM region (rest of South America) which is a relatively heterogeneous mix of countries. There is at least one indication that the simulation maybe underestimating the steady-state gains since in all regions there is a rather substantial increase in investment which would have positive effects in future periods. The negative impact in RSM is largely due to a deterioration in its terms of trade. The removal of tariffs allows its trading partners to increase the price of their exports, without a concomitant increase in the price of RSM's exports. There is virtually no aggregate impact in the regions outside of the FTAA.

The implementation of the FTAA leads to a rather significant rise in intra-regional trade. Export volume increases range from 2.0 to 4.3 percent, and import volume increases range from 1.9 percent to 5.7 percent.

The labor market closure assumes full employment, hence the impact on trade regime reform falls exclusively on wages. As Table 9 indicates, labor tends to benefit across the board from the agreement, with rises in the real wage varying from 0.3 to 1.5 percent. However, we are unable to provide much indication of the impacts on income distribution except to compare the rise in the real wage with changes in the return to capital.⁴³ The return to capital tends to decline in all regions of the FTAA except for Central America. Part of this decline can be attributed to the relative increase in the supply of capital coming from the higher rate of investment.

⁴² Note that these simulations do not include reductions in direct producer subsidies which play an important role in agricultural trade negotiations. Also note that negative tariffs (i.e. import subsidies) and export taxes, are also left untouched.

⁴³ This version of the model does not contain labor skill differentials.

TABLE 9: Aggregate Impacts
(percent)

	Free Trade in Central and South America (FTLA)													
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	ROW		
Consumption	0.0	0.0	0.0	0.2	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0		
Government	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0		
Investment	0.0	0.0	0.0	0.6	0.4	0.3	0.7	0.9	0.0	0.0	0.0	0.0		
Exports	0.0	0.0	0.0	4.3	2.7	3.3	2.0	3.4	0.0	0.0	0.0	0.0		
Imports	0.0	0.0	0.0	5.7	2.4	3.3	1.9	2.6	0.0	0.0	0.0	0.0		
Real GDP at Market Price	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0		
Real GDP at Factor Cost	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0		
Real Income	0.0	0.0	0.0	0.2	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0		
Terms of Trade	0.0	0.0	0.0	1.5	0.2	0.2	0.3	-0.4	0.0	0.0	0.0	0.0		
Consumer Price Index	0.0	0.0	0.0	1.9	0.0	0.0	0.1	-1.1	0.0	0.0	0.0	0.0		
Real Exchange Rate	0.0	0.0	0.0	2.2	0.2	0.5	1.0	-0.1	0.0	0.0	0.0	0.0		
Real Wage	0.0	0.0	0.0	0.7	0.3	0.6	1.0	1.5	0.0	0.0	0.0	0.0		
	Free Trade Area of the Americas (FTAA)													
Consumption	0.1	0.0	0.0	0.1	-0.1	-0.3	-0.8	-0.7	0.0	0.0	0.0	0.0		
Government	0.0	0.0	0.1	0.1	0.2	0.2	0.6	0.4	0.0	0.0	0.0	0.0		
Investment	0.1	0.0	0.3	0.7	0.8	0.7	2.2	1.8	0.0	0.0	0.0	0.0		
Exports	0.4	0.2	0.4	5.7	5.4	5.9	7.4	5.0	0.0	0.0	0.0	0.0		
Imports	0.7	0.2	0.6	6.2	3.6	4.7	5.3	3.3	0.0	0.0	0.0	0.0		
Real GDP at Market Price	0.0	0.0	0.1	0.1	0.2	0.2	0.6	0.4	0.0	0.0	0.0	0.0		
Real GDP at Factor Cost	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.0	0.0	0.0	0.0		
Real Income	0.1	0.0	0.0	0.1	-0.1	-0.3	-0.7	-0.6	0.0	0.0	0.0	0.0		
Terms of Trade	0.3	0.0	0.1	0.6	-1.1	-0.8	-1.0	-1.2	0.0	0.0	0.0	0.0		
Consumer Price Index	0.2	0.1	0.4	0.2	-1.9	-1.9	-0.5	-2.5	-0.1	-0.1	-0.1	-0.1		
Real Exchange Rate	0.3	0.2	0.5	0.6	-1.5	-0.7	2.1	-1.2	-0.1	-0.1	-0.1	-0.1		
Real Wage	0.1	0.1	0.2	0.8	0.6	1.1	3.5	2.3	0.0	0.0	0.0	0.0		

Sectoral Impacts

As suggested earlier, the structural results are likely to be stronger than the aggregate results. This is confirmed in Tables 10-12. Argentina would witness some of the strongest shifts in its trade composition. In particular, wheat exports would rise by 8 percent, and there would also be a rather significant rise in exports of other manufacturing and energy. In other agricultural products, Argentina would see an increase in the exports of beef and sheep meat and other crops, and a decline in the exports of other cereals and oil seeds, raw sugar, and non-ruminant meats. Imports would increase across the board in Argentina, with the largest increases occurring for sugar, and textile and apparel. Agricultural imports would rise significantly, even in sectors with an increase in exports. This is due to the Armington assumption and simply reflects product differentiation. The net impact on total agricultural production in Argentina is neutral. There are small declines in almost all agricultural sectors, which is almost offset by the rise in wheat production.

The structural changes in Brazil are less pronounced than in Argentina. Agricultural exports would increase on aggregate, with a rise in the exports of other cereals, sugar, other crops, and other animal products, and a decline in all other sectors. Brazilian exports would also increase in most other sectors, particularly textile and apparel and other manufacturing. Agricultural imports would rise substantially, except in the other cereals and sugar sectors. Wheat and cattle imports would increase the most, respectively by 11 and 16 percent. The net impact on agricultural output is relatively small, except for a 3.7 percent decline in the output of wheat. The next largest change is in cattle, a decline of 0.4 percent.

In the three aggregate regions, the situation is similarly varied as in Argentina and Brazil. The largest change in the structure of exports occurs in RSM, arguably the most heterogeneous region among the three aggregates. Wheat and beef exports would increase by more than 10 percent in this latter region, and agricultural exports increase across the board. Oil seeds and beef exports would also rise from the Andean Pact countries.

In terms of the main agricultural downstream sectors, exports of processed foods increases substantially for a number of commodities in most of the regions. There are small export declines in Argentina for other meat products and other processed foods, in Brazil for beef and other meat products, and for beef products in the ANDEAN region. There is a significant increase in exports in the textile and apparel sector where the MFA plays a significant role. Imports of processed foods increase substantially as well, particularly refined sugar, vegetable oils, and other processed foods.

The structural impacts on the regions outside of the FTLA are minor. Exports of a few commodities increase, particularly in agriculture, but the increases are small. There is a somewhat greater impact on imports. This most likely arises from the increase in trade prices for some of the relevant commodities as the removal of tariffs leads to greater demand and hence greater prices. These changes in trade structure have virtually no impact on external output. There is a small rise in NAFTA sugar output, and a 0.3 percent increase in the output of oil seeds in Europe.

Trade relations

The FTLA simulation shows unambiguously that there is trade creation and trade diversion. Intra-regional trade would increase some US\$ 13.3bn, though overall imports would increase by only US\$ 12.6bn, in other words, imports from the rest of the world would decline by about US\$ 740 million. The FTLA would have minor impacts on trade relations among the external regions.

Free Trade Area of the Americas

Aggregate Impacts

Free Trade in the Americas would modify substantially the aggregate impacts for the regions in Central and South America, with relatively minor impacts for the countries in NAFTA (see Table 9). The small welfare gains and losses in CSAM turn into relatively sizable welfare losses in most of the region, and the once substantial gain in Argentina is reduced to a small gain of 0.1 percent. Once again, the key explanatory variable is the deterioration in the terms of trade. For Brazil, ANDEAN, CAM, and RSM, the terms of trade loss are respectively 1.1, 0.8, 1.0, and 1.2 percent. The increase in the terms of trade for Argentina is only 0.6 percent compared to 1.5 percent in the FTLA scenario.⁴⁴ The broader removal of tariffs leads to an overall increase in world demand for a number of commodities. In large part, these commodities, on net, are being imported by the countries in CSAM and exported on net by the NAFTA countries. There is a rather marked increase in the volume of exports and imports compared to the FTLA simulation. The impacts on the non-hemispheric regions are negligible.

⁴⁴ Note that Table 8 indicates the importance of reporting several different measures of welfare since the measures are not consistent. In all regions, real GDP increases, even though in four of the CSAM regions, welfare, as measured by Hicksian Equivalent Variation declines.

Structural Impacts

The removal of trade barriers in NAFTA provides a rich market for agricultural exports from its southern neighbors. Whereas FTLA provided some structural changes in local trade relations, there is a more pronounced shift in agricultural exports from the CSAM region, presumably towards the north, i.e. trade barriers in NAFTA are currently impeding agricultural exports from the South. Exports of sugar increase the most, followed by other crops and other animal products.

Agricultural imports into NAFTA do increase – wheat (except in Canada), other cereals, sugar, other crops, and other animal products. The net changes on agricultural output in NAFTA are not very pronounced, sugar being the main exception.

The removal of trade barriers in processed foods and in apparel and textile provides a significant boost for the exports of these commodities from CSAM towards the North, though in the case of processed foods, there is an increase in two-way trade.

Trade Relations

The ftaa is even more trade diverting than the FTLA. Trade with the rest of the OECD and the other non-hemispheric countries could decline by up to US\$ 1.8bn, while intra-regional trade (both CSAM and NAFTA), could climb by some US\$ 33bn.

(Note that Annex A contains a few sensitivity simulations with respect to the trade elasticities for both the FTLA and FTAA simulations.)

TABLE 10: Impact on Sectoral Output
(percent)

	Free Trade in Central and South America (FTLA)											
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OKROW
Wheat	0.0	0.0	0.0	2.9	-3.7	-0.1	0.8	0.6	0.0	0.0	0.0	0.0
Other cereal grains	0.0	0.0	0.0	-1.5	0.1	0.0	0.2	0.8	0.0	0.0	0.1	0.0
Oil seeds	0.0	0.1	0.2	-0.3	0.0	-0.2	-0.3	0.1	0.3	0.0	0.0	0.0
Cane and beet sugar	0.4	0.3	0.0	-1.6	0.3	-0.1	-0.5	-2.0	0.1	0.1	0.1	0.0
Other crops	0.0	0.0	0.0	-0.1	0.0	-0.3	-0.4	1.3	0.0	0.0	0.0	0.0
Cattle and sheep	0.0	0.0	0.0	-0.4	-0.4	-0.2	-0.2	1.6	0.0	0.0	0.0	0.0
Raw milk	0.0	0.0	0.0	-0.1	-0.2	-0.3	0.5	0.1	0.0	0.0	0.0	0.0
Other animal products	0.0	0.0	0.0	-0.1	-0.2	-0.3	0.0	-0.3	0.0	0.0	0.0	0.0
Beef products	0.0	0.0	0.0	0.0	-0.2	-0.2	0.3	0.6	0.0	0.0	0.0	0.0
Other meat products	0.0	0.0	0.0	-0.1	-0.2	-0.1	1.4	-0.4	0.0	0.0	0.0	0.0
Dairy products	0.0	0.0	0.0	-0.2	-0.1	-0.3	0.8	0.2	0.0	0.0	0.0	0.0
Refined sugar	0.1	0.0	0.0	-0.8	0.3	-0.8	0.3	-1.1	0.0	0.0	0.0	0.0
Vegetable oils	0.0	0.0	0.1	0.3	-0.1	-1.0	0.6	0.9	0.0	0.0	0.0	0.1
Other processed foods	0.0	0.0	0.0	-0.3	0.1	-0.1	0.3	0.6	0.0	0.0	0.0	0.0
Textile and apparel	0.0	0.0	0.0	0.0	0.3	0.1	2.3	-0.3	0.0	0.0	0.0	0.0
Basic industrial goods	0.0	0.0	0.0	0.1	0.5	0.3	1.8	1.8	0.0	0.0	0.0	0.0
Other manufacturing	0.0	0.0	0.0	2.6	0.6	0.1	3.1	4.4	0.0	0.0	0.0	0.0
Energy	0.0	0.0	0.0	2.7	-0.8	1.0	0.7	-1.9	0.0	0.0	0.0	0.0
Construction	0.0	0.0	0.0	0.6	0.3	0.4	0.5	0.8	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	-0.5	0.0	-0.2	-0.5	-0.2	0.0	0.0	0.0	0.0
Total	0.0	0.0	0.0	0.2	0.1	0.1	0.5	0.3	0.0	0.0	0.0	0.0
Agriculture	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.3	0.7	0.0	0.0	0.0	0.0
Food Processing	0.0	0.0	0.0	-0.2	0.0	-0.2	0.3	0.4	0.0	0.0	0.0	0.0

(cont...)

(continued)

	Free Trade Area of the Americas (FTAA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW	
Wheat	-0.4	0.4	0.2	3.2	-4.1	0.9	4.5	0.8	0.0	0.2	0.1	0.0	
Other cereal grains	0.0	-0.4	-0.8	-0.7	0.4	0.2	-0.2	1.1	0.0	0.4	-0.1	0.0	
Oil seeds	0.1	-0.4	-0.4	0.5	0.6	-1.7	-1.2	0.9	-0.1	0.1	0.0	0.0	
Cane and beet sugar	-37.2	41.0	2.4	3.9	2.1	6.6	12.6	1.7	-0.3	0.7	-0.7	-0.2	
Other crops	-0.1	0.6	0.1	0.1	0.3	-0.1	-1.0	1.8	0.0	0.0	0.0	0.0	
Cattle and sheep	0.0	0.1	0.0	0.1	-0.5	-0.3	-0.9	1.3	0.0	0.0	0.0	0.0	
Raw milk	-0.2	-1.4	1.9	0.1	-0.1	-0.2	2.3	0.2	0.0	0.0	0.0	0.0	
Other animal products	0.1	-1.1	0.0	0.0	-0.1	-0.5	-0.5	-0.4	0.0	0.0	0.0	0.0	
Beef products	0.0	0.0	0.0	0.1	-0.4	-0.5	-0.4	0.5	0.0	0.0	0.0	0.0	
Other meat products	0.1	-0.7	0.1	0.0	-0.2	-0.5	0.5	-0.7	0.0	0.0	0.0	0.0	
Dairy products	-0.3	-1.5	3.0	0.1	-0.1	-0.1	3.4	0.3	0.0	0.0	0.0	0.0	
Refined sugar	-15.2	42.8	3.1	2.6	1.4	2.2	15.3	0.5	-0.2	-0.1	-0.4	-0.2	
Vegetable oils	0.1	-0.1	0.0	1.0	0.4	-1.4	1.2	1.0	0.0	0.0	-0.1	0.0	
Other processed foods	0.1	-0.3	0.0	-0.1	0.3	-0.2	-0.2	0.7	0.0	0.0	0.0	0.0	
Textile and apparel	0.1	-0.5	-0.1	0.1	0.8	0.3	21.6	-0.3	0.0	0.0	-0.2	0.0	
Basic industrial goods	0.1	0.0	0.1	0.1	0.8	0.1	2.1	2.7	0.0	0.0	0.0	0.0	
Other manufacturing	0.2	0.3	0.3	2.5	0.2	-1.7	-4.4	3.5	0.0	0.0	0.0	0.0	
Energy	-0.1	0.0	0.1	2.9	-0.7	2.5	-0.3	-1.9	0.0	0.0	0.0	0.0	
Construction	0.0	0.0	0.3	0.7	0.7	0.7	1.7	1.5	0.0	0.0	0.0	0.0	
Services	0.0	0.0	0.0	-0.6	-0.1	-0.4	-1.5	-0.3	0.0	0.0	0.0	0.0	
Total	0.0	0.0	0.1	0.3	0.2	0.2	1.6	0.5	0.0	0.0	0.0	0.0	
Agriculture	-0.4	-0.2	0.1	0.4	0.3	0.1	1.0	1.1	0.0	0.0	0.0	0.0	
Food Processing	-0.2	-0.2	0.2	0.1	0.2	-0.2	1.7	0.6	0.0	0.0	0.0	0.0	

TABLE 11: Impact on Sectoral Exports
(percent)

	Free Trade in Central and South America (FTLA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW	
Wheat	0.1	-0.1	0.1	8.1	0.0	0.0	0.1	14.3	0.0	0.0	0.0	0.0	
Other cereal grains	0.1	0.1	0.1	-3.8	0.2	0.0	0.2	1.0	0.0	0.2	0.1	0.1	
Oil seeds	0.1	0.1	0.3	-2.7	0.1	12.9	-0.3	0.3	0.3	0.0	0.1	0.1	
Cane and beet sugar	0.3	0.2	0.0	-1.7	0.5	1.1	-0.8	0.2	0.0	0.1	0.1	0.1	
Other crops	0.0	0.0	0.0	1.5	0.5	0.4	-0.6	4.2	0.0	0.0	0.0	0.0	
Cattle and sheep	0.0	0.0	0.0	2.5	0.0	7.5	-0.3	16.1	0.0	0.0	0.0	0.0	
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other animal products	0.0	0.0	0.0	-1.0	1.2	2.6	2.7	4.3	0.0	0.0	0.0	0.0	
Beef products	0.0	0.0	0.0	1.0	-0.5	-0.2	0.8	4.8	0.0	0.0	0.0	0.0	
Other meat products	0.0	0.0	0.0	-1.0	-1.2	5.5	5.2	0.7	0.0	0.0	0.0	0.0	
Dairy products	0.0	0.0	0.1	0.0	0.1	17.6	5.2	5.2	0.0	0.0	0.0	0.0	
Refined sugar	-0.4	0.0	-0.1	2.6	1.8	11.9	1.9	2.7	0.0	0.1	0.0	0.0	
Vegetable oils	0.0	0.0	0.0	1.1	0.2	8.6	8.2	4.7	0.0	0.0	0.0	0.0	
Other processed foods	0.0	0.0	0.0	-0.7	1.8	3.0	3.7	3.5	0.0	0.0	0.0	0.0	
Textile and apparel	0.0	0.0	0.0	2.3	4.3	7.8	3.1	2.2	0.0	0.0	0.0	0.0	
Basic industrial goods	0.0	0.0	-0.1	4.3	3.1	4.3	5.4	4.0	0.0	0.0	0.0	0.0	
Other manufacturing	0.0	0.0	0.0	16.3	5.9	7.1	5.0	14.7	0.0	0.0	0.0	0.0	
Energy	0.0	0.0	0.0	17.9	1.9	3.8	6.9	3.9	0.0	0.0	0.0	0.0	
Construction	0.0	0.0	0.0	-0.7	0.3	0.2	0.0	0.9	0.0	0.0	0.0	0.0	
Services	0.1	0.0	0.1	-2.3	0.1	-0.2	-0.8	0.4	0.0	0.1	0.0	0.0	
Total	0.0	0.0	0.0	4.3	2.7	3.3	2.0	3.4	0.0	0.0	0.0	0.0	
Agriculture	0.1	0.0	0.0	0.8	0.5	0.7	-0.6	3.8	0.0	0.0	0.0	0.0	
Food Processing	0.0	0.0	0.0	0.2	1.0	3.9	3.1	3.7	0.0	0.0	0.0	0.0	

(cont...)

(continued)

	Free Trade Area of the Americas (FTAA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAMI	RSM	EUR	ROECD	EASIA	OROW	
Wheat	-0.7	0.5	-0.7	8.5	0.0	0.0	0.4	13.6	0.1	0.1	0.1	0.0	
Other cereal grains	0.3	-0.4	-1.2	-2.0	2.0	0.4	0.2	1.9	0.0	0.1	0.1	0.1	
Oil seeds	0.1	-0.4	-0.3	-0.5	2.7	11.8	-1.8	1.2	-0.2	0.1	0.1	0.0	
Cane and beet sugar	-19.1	16.0	-1.0	-8.1	6.7	37.5	11.9	11.0	-0.4	3.1	-1.5	-1.7	
Other crops	0.4	1.9	1.2	2.9	3.9	1.6	-1.7	5.5	0.0	0.0	0.0	0.0	
Cattle and sheep	-0.2	0.1	-0.3	2.9	0.0	7.8	-1.1	15.1	0.0	0.0	0.0	0.0	
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other animal products	-0.1	-3.9	-0.2	0.7	3.1	3.6	2.1	5.5	0.0	0.0	0.0	0.0	
Beef products	0.1	0.0	-0.4	2.2	-0.2	0.9	0.7	5.4	0.0	0.1	0.0	0.0	
Other meat products	0.2	-2.6	-0.4	0.4	0.1	5.2	4.4	1.2	0.0	0.0	0.0	0.0	
Dairy products	-9.2	-17.7	36.8	-4.3	0.3	17.8	10.0	6.6	0.0	0.0	0.0	0.0	
Refined sugar	-23.6	65.8	18.7	34.6	8.1	37.0	22.0	10.6	-0.2	-0.2	-1.0	-1.0	
Vegetable oils	0.5	0.1	0.7	2.5	2.1	8.9	9.2	5.1	0.0	-0.1	0.0	0.0	
Other processed foods	1.9	1.0	1.4	0.6	3.6	4.2	4.8	4.8	0.0	0.0	0.0	0.0	
Textile and apparel	5.9	-0.6	-0.1	3.8	11.0	14.7	31.5	3.2	-0.1	-0.2	-0.3	-0.1	
Basic industrial goods	0.6	0.1	0.9	5.6	5.7	5.9	6.6	6.0	0.0	0.0	0.0	0.0	
Other manufacturing	0.6	0.3	0.5	16.2	7.2	7.0	6.8	14.7	0.0	0.0	0.1	0.0	
Energy	1.3	0.3	0.3	18.9	-4.5	7.6	6.9	4.9	0.0	-0.1	0.0	0.0	
Construction	-0.1	0.0	0.0	0.3	1.4	1.0	0.0	1.9	0.1	0.1	0.1	0.1	
Services	-0.3	-0.1	-0.3	-1.0	1.7	1.0	-1.8	1.4	0.1	0.1	0.1	0.1	
Total	0.4	0.2	0.4	5.7	5.4	5.8	7.1	4.9	0.0	0.0	0.0	0.0	
Agriculture	0.1	0.1	0.9	2.8	4.6	3.1	1.7	5.5	0.0	0.3	-0.1	-0.1	
Food Processing	0.3	0.8	2.3	2.2	3.6	7.1	11.1	5.1	0.0	0.0	0.0	-0.1	

**TABLE 12: Impact on Sectoral Imports
(percent)**

	Free Trade in Central and South America (FTLA)													OROW
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW		
Wheat	0.0	0.0	0.0	2.3	11.0	-0.3	0.9	-1.0	0.0	0.0	0.0	0.0	0.0	
Other cereal grains	0.0	0.0	0.0	3.7	-2.3	-0.8	0.7	-1.5	-0.1	0.0	-0.3	-0.3	-0.3	
Oil seeds	-0.4	-0.3	0.1	4.2	-0.8	8.4	2.7	11.5	-0.2	0.0	-0.1	-0.3	-0.3	
Cane and beet sugar	-0.6	-0.1	-0.9	31.6	-0.2	0.8	0.7	15.2	-0.2	-0.1	-0.3	-0.1	-0.1	
Other crops	-0.1	0.0	0.0	6.8	3.2	5.6	3.5	6.6	0.0	0.0	0.0	0.0	0.0	
Cattle and sheep	0.0	0.0	0.0	3.6	16.2	2.4	0.2	-2.1	0.0	0.0	0.0	0.0	0.0	
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other animal products	0.0	0.0	-0.1	2.9	2.8	6.4	2.6	7.7	0.0	0.0	0.0	0.0	0.0	
Beef products	-0.2	0.0	0.0	2.7	16.8	0.7	0.1	3.6	-0.2	0.0	0.0	0.0	0.0	
Other meat products	0.0	0.0	0.0	-3.6	2.6	-0.3	-0.5	-3.8	0.0	0.0	0.0	0.0	0.0	
Dairy products	-0.1	0.0	0.0	7.0	-0.6	2.2	0.6	4.0	0.0	0.0	0.0	0.0	0.0	
Refined sugar	-0.4	0.0	-0.1	26.9	3.8	23.8	21.9	20.9	-0.1	-0.1	-0.2	0.0	0.0	
Vegetable oils	0.0	0.0	-0.5	2.0	4.1	12.7	4.7	4.7	-0.1	-0.1	-0.1	-0.3	-0.3	
Other processed foods	0.0	0.0	0.0	8.8	0.6	7.3	5.9	7.1	0.0	0.0	0.0	0.0	0.0	
Textile and apparel	0.1	0.0	0.0	9.0	2.1	8.4	1.5	3.7	0.0	0.0	0.0	0.0	0.0	
Basic industrial goods	0.0	0.0	0.0	7.6	2.0	3.9	2.7	3.7	0.0	0.0	0.0	0.0	0.0	
Other manufacturing	0.0	0.0	0.0	4.8	1.9	1.2	0.8	0.6	0.0	0.0	0.0	0.0	0.0	
Energy	0.0	0.0	0.0	6.8	6.7	18.4	2.4	12.9	0.0	0.0	0.0	0.0	0.0	
Construction	0.0	0.0	0.0	1.3	0.1	0.2	0.3	-0.1	0.0	0.0	0.0	0.0	0.0	
Services	0.0	0.0	0.0	1.9	0.0	0.0	0.5	-0.7	0.0	0.0	0.0	0.0	0.0	
Total	0.0	0.0	0.0	5.6	2.4	3.2	1.8	2.5	0.0	0.0	0.0	0.0	0.0	
Agriculture	-0.1	0.0	0.0	7.8	5.5	3.0	2.2	4.6	-0.1	0.0	-0.1	-0.1	-0.1	
Food Processing	-0.1	0.0	-0.1	9.2	2.3	9.0	5.1	6.9	0.0	0.0	0.0	0.0	-0.1	

(cont...)

(continued)

	Free Trade Area of the Americas (FTAA)													
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW		
Wheat	2.5	-0.8	-1.1	0.0	13.1	-2.5	0.9	-3.0	-0.1	-0.1	-0.3	-0.3		
Other cereal grains	-0.3	-0.3	7.4	1.3	-2.8	-2.0	1.3	-2.3	-0.1	-0.1	-0.4	-0.3		
Oil seeds	-0.4	-0.4	0.1	3.3	-0.3	13.8	16.5	12.2	0.0	0.0	-0.3	-0.1		
Cane and beet sugar	-0.2	26.2	5.1	34.8	-0.4	0.1	8.6	17.0	0.8	-0.1	0.5	2.3		
Other crops	1.3	-0.1	4.8	6.5	2.8	6.8	12.7	7.1	0.0	0.0	-0.1	0.0		
Cattle and sheep	0.0	-0.1	0.4	2.6	15.1	2.2	0.1	-1.5	0.0	-0.1	0.0	0.0		
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Other animal products	-1.9	-2.0	1.6	1.5	0.8	7.2	8.6	8.8	0.0	0.0	-0.1	0.0		
Beef products	-0.3	0.0	0.4	1.9	17.7	3.6	2.5	3.7	0.1	-0.1	0.0	0.0		
Other meat products	-2.6	3.6	-1.5	-4.0	8.8	1.0	0.5	-2.6	0.0	0.0	0.0	0.0		
Dairy products	1.9	6.6	-17.8	2.4	-3.5	-3.1	-3.7	1.1	0.0	0.0	0.0	0.0		
Refined sugar	51.9	-3.7	-16.4	27.1	-0.3	22.9	7.1	21.8	0.6	0.4	1.0	1.7		
Vegetable oils	0.3	0.0	0.3	1.0	3.5	14.4	6.4	5.0	0.1	0.0	0.2	0.0		
Other processed foods	0.8	2.9	8.8	10.1	0.0	8.9	10.5	8.5	0.1	0.1	0.1	0.0		
Textile and apparel	2.6	0.7	1.0	10.2	2.6	13.5	12.5	4.1	0.0	0.0	-0.1	-0.1		
Basic industrial goods	0.5	0.1	0.9	9.2	2.9	5.7	6.2	5.3	0.0	0.1	0.0	0.0		
Other manufacturing	0.2	0.1	0.4	5.5	5.6	3.8	2.3	1.6	0.0	0.0	0.0	0.0		
Energy	1.1	1.0	1.2	5.9	6.2	19.9	6.2	13.6	0.0	0.0	0.0	0.0		
Consumption	0.2	0.1	0.4	0.6	-0.5	-0.3	0.9	-0.5	0.0	0.0	0.0	0.0		
Services	0.3	0.0	0.3	0.4	-1.7	-1.4	0.5	-1.9	-0.1	-0.1	-0.1	-0.1		
Total	0.7	0.2	0.6	6.1	3.6	4.7	5.5	3.3	0.0	0.0	0.0	0.0		
Agriculture	3.4	1.6	3.5	7.6	5.8	3.3	7.9	4.8	0.0	-0.1	-0.1	0.0		
Food Processing	4.3	2.3	-0.6	9.7	1.6	9.6	7.3	7.8	0.1	0.1	0.1	0.2		

5. Conclusion

The simulations reported in this paper would lead to conclude that regional free trade arrangements in the Americas are unlikely to produce significant macroeconomic impacts, at least as captured by the simple removal of import tariffs and export subsidies. This is not an altogether surprising result as it has been demonstrated in many other studies of regional integration, notably those related to the NAFTA accord. In most neoclassical AGE models, the simple adding up of the Harberger triangles, related to the inefficiency losses from trade measures, do not lead to significant gains. Adding in some of the dynamic gains from trade reform, as partially captured by the FIESTA model, leads to some additional benefit.⁴⁵ But, as proven by other studies, the main dynamic gains from trade reform emanate from increased foreign investment and/or trade and investment related increases in productivity. It has also been shown that market structure matters. Incorporating scale economies and imperfect competition could significantly alter the macroeconomic results. Finally, one should note that the framework used to capture trade measures in this paper only partially reflects the true trade regime which includes many other distortionary policies.

The somewhat small numbers, however, also reflect another reality. Over the past decade we have witnessed significant trade reform of all three types: unilateral, regional trade agreements, and a global agreement. Protectionism has decreased dramatically in virtually all of the countries in the Western Hemisphere. This is one reason why trade negotiations have focused increasingly on non-traditional trade policies such as competition policy, labor and environmental regulations, tax harmonization, etc.

The structural implications of free trade areas in the Americas are more consequential than the aggregate implications. While protectionism has declined in many countries over the last decade, there are still some prohibitive tariffs in certain sectors, particularly in agriculture, but also in manufacturing in the Southern American countries. In terms of the FTLA scenario – free trade in Latin America –, the impacts on the composition of output are not remarkable. In only a handful of sectors is output likely to change by more than 2.5 percent in either direction, for example wheat in Argentina and Brazil, and other manufacturing. The impacts on trade are more significant with increases in two-way trade. This has also been largely observed in the forming of MERCOSUR and NAFTA. The compositional impacts under hemispheric free trade are more important, particularly in some key agricultural sectors such as wheat, sugar, and to a lesser

⁴⁵ Even in the context of the simple recursive-dynamics of the FIESTA model, we may be underestimating the long run dynamic gains since the tariff reductions are phased in, with their full elimination only occurring in the final simulation year, i.e. 2010. The steady-state dynamic gains are likely to be greater than those reported.

extent, dairy products. Central America would get a significant output boost in textile and apparel in joining the FTAA. Again, the trade impacts are much more significant. Agricultural exports for Argentina and Brazil, for example, would increase by 2.8 and 4.6 percent respectively in the FTAA simulation, as compared to only 0.8 and 0.5 percent respectively in the FTLA simulation.

Changes in the all-important trade elasticities (see Annex A for the sensitivity analysis results) would not greatly modify the aggregate results. The degree of market power – as measured by the Armington elasticity –, or output flexibility – as measured by the CET elasticity –, do influence the structural results. But in most cases, the results are reinforced rather than reversed.

This paper has focused on agriculture. However, in terms of economic weight, most of the action will occur on the manufacturing side. The impacts on manufacturing are likely to be severely underestimated due to aggregation. Aggregation veils the importance of peak tariffs in key sectors, and as has been shown in other studies, some of these sectors play a critical role in the economy, for example ferrous and non-ferrous metals, and motor vehicles and parts. A complementary analysis of manufacturing trade would provide a more complete picture of free trade areas in the Americas.

The aggregate impacts do elicit some concern about the welfare benefits which would accrue to individual countries and/or regions. There is nothing in the trade literature which indicates that all countries in a free trade area would benefit from joining, even in the absence of terms of trade effects. In particular, it is important that trade reform be linked to reform of other policies which could inhibit the accrual of the full benefits from trade reform. For example, the negative impacts of production taxes/subsidies and/or export subsidies could be exacerbated by trade reform. In an economy with multiple distortions, trade reform is not guaranteed to lead to economic improvement.

Regional integration agreements elicit worries concerning their impacts on external trading partners. The results in this paper indicate that the consequences for countries outside of the Americas will be minor, both in aggregate terms, as well as in structural terms. There is a negligible amount of aggregate trade diversion, with in certain cases, some trade creation, for example sugar. At a minimum, one would hope that regional integration agreements in the Americas would solidify the move towards freer international trade and in particular, firmly lock the Latin-American countries into abandoning import substituting strategies which have proven to be harmful.

One would perhaps like to conclude by pushing for more efforts towards further global trade reform. The benefits to accrue from these regional trade agreements appear to be slight, even if they are underestimated, whereas the

opportunity cost of negotiating these agreements is high. Most of the countries in the Americas would have more to gain from global trade reform, perhaps particularly in the field of agriculture, where OECD trade policies are particularly distortive. Even in the absence of global or regional agreements, it has been shown empirically, as well as in practice, that unilateral trade reform could still generate significant benefits. As Chile has shown, uniform tariffs, in and of themselves are capable of producing a rationalization of the trade regime which have had direct economic benefits, as well as the harder to measure benefits of reduced trade, transport, and administrative costs of a streamlined trade regime.

Abbreviations

ALADI	Asociación Latinoamericana de Integración.
APEC	Asia-Pacific Economic Co-operation.
Andean Group	Formed by Bolivia, Colombia, Ecuador, Peru, and Venezuela.
BaU	Business-as-usual. Acronym used to describe reference (or baseline) scenario, in the absence of changes in trade and agricultural policies.
Billion or bn	Equivalent to one-thousand million (or 10 ⁹).
CACM	Formed by countries of Central America.
CARICOM	Formed by countries of the Caribbean.
CSAM	Central and South America.
ERP	Effective rate of protection.
FTA	Free trade agreement.
FTAA	Free Trade Area of the Americas.
FTLA	Free Trade in Latin America.
Group of Three	Association of Colombia, Mexico and Venezuela.
GTAP	Global Trade Analysis Program.
MERCOSUR	Common market formed by Argentina, Brazil, Paraguay, and Uruguay. Bolivia and Chile are associate members.
NAFTA	North American Free Trade Area formed by Canada, Mexico and the United States.
NRP	Nominal rate of protection.
OECD	Organization for Economic Co-operation and Development. (Web home page: http://www.oecd.org).
PSE	Producer subsidy equivalent. A measure of trade protection.
ROW	Rest of the World.
SAM	Social Accounting Matrix.
UR	Uruguay Round. Multilateral trade agreement.
WTO	World Trade Organization.

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Annex A: Sensitivity Analysis

Among all of the elasticities included in GE models, trade reform scenarios tend to be most sensitive to the trade elasticities. The FIESTA model includes four sets of trade elasticities – two sets of Armington elasticities determining the substitutability of the demand for goods across regions of origin, and two sets of CET elasticities determining the flexibility of supply of goods across regions of destination. The lack of econometric validation of the trade elasticities forces the policy analyst to impose a set of values, to a large extent based on consensus ranges found in the literature. The increasing use of global models has made the selection more difficult, as the number of countries and sectors multiplies. For the FIESTA model, we have chosen a very simple set of *reference* elasticities. First, it is assumed that the elasticities are uniform across all regions. Second, it is assumed that the elasticities are uniform across types of elasticities. Hence, the top and second level Armington elasticities are the same, and they are the same with the top and second level CET elasticities. The following table provides the reference values, as well as the values for the sensitivity simulations.

Sector	Reference		Armington Shock		CET Shock	
	Import	Export	Import	Export	Import	Export
Wheat	3.0	3.0	4.5	3.0	3.0	∞
Other cereal grains	3.0	3.0	4.5	3.0	3.0	∞
Oil seeds	3.0	3.0	4.5	3.0	3.0	∞
Cane and beet sugar	3.0	3.0	4.5	3.0	3.0	∞
Other crops	2.0	2.0	3.0	2.0	2.0	∞
Cattle and sheep	2.5	2.5	3.8	2.5	2.5	∞
Raw milk	2.5	2.5	3.8	2.5	2.5	∞
Other animal products	2.0	2.0	3.0	2.0	2.0	∞
Beef products	2.0	2.0	3.0	2.0	2.0	∞
Other meat products	2.0	2.0	3.0	2.0	2.0	∞
Dairy products	2.0	2.0	3.0	2.0	2.0	∞
Refined sugar	3.0	3.0	4.5	3.0	3.0	∞
Vegetable oils	2.0	2.0	3.0	2.0	2.0	∞
Other processed foods	2.0	2.0	3.0	2.0	2.0	∞
Textile and apparel	3.0	3.0	3.0	3.0	3.0	3.0
Basic industrial goods	2.5	2.5	2.5	2.5	2.5	2.5
Other manufacturing	2.5	2.5	2.5	2.5	2.5	2.5
Energy	2.0	2.0	2.0	2.0	2.0	2.0
Construction	1.0	1.0	1.0	1.0	1.0	1.0
Services	2.0	2.0	2.0	2.0	2.0	2.0

The general rule is that commodities that are relatively well-defined, i.e. less aggregated, tend to have higher trade elasticities. Hence wheat will have a higher elasticity than other crops. Similarly, transport costs and other features of commodities may make them less traded, even if they are relatively homogenous. For example, across many regions, transportation of gas is prohibitively expensive, hence the trade elasticity of gas will typically be higher than for oil.

This annex reports the results from two sensitivity simulations. Under the first, the Armington import demand elasticities – both top and second level – are raised by 50 percent with respect to their reference levels for agricultural and food commodities *only*. This makes the import demand for these commodities more sensitive to relative price changes. The extreme assumption is that the import demand elasticity is infinite, i.e. that goods are Heckscher-Ohlin goods, implying the law of one price holds. The other consequence is that countries are either net exporters or net importers, but would not both import and export the same commodity. In the second sensitivity experiment, the CET elasticities – both top and second level – are set at infinity for the same set of agricultural and food commodities. This implies that the law of one price holds for domestic exporters and renders export supply more sensitive to small changes in relative prices.

Convergence towards Heckscher-Ohlin for Agricultural and Food Products

The aggregate impacts of raising the agricultural and food import demand elasticities are very slight (see Table A-1). This is true for both policy simulations, FTLA and FTAA. There is a small impact on the consumer price index and real wages, which do not move in a consistent direction across regions. The increase of the Armington elasticities reduces *exporters* market power, and the net impact from the trade reform will depend on the relative trade position of each country. For example, if a country is a net importer of a product with relatively inelastic demand, the removal of the import tariff provides an opportunity for the exporter to raise prices. If however the Armington elasticity is raised, the market power of the exporter is diminished, and the price rise will be less than with the lower Armington elasticity. The net impact on each region is difficult to gauge *a priori* since each region is an exporter and importer. Note that a lowering of the Armington elasticity would work in the opposite direction, it increases the market power of exporters.

The structural results on the other hand are accentuated (see Tables A-2 through A-4). Where regions had positive increases in sectoral exports, these exports are higher, and where regions had export declines, the declines are steeper. Similarly for imports.

The Armington sensitivity experiment therefore suggests that the level of the Armington elasticity will most likely only have a negligible effect on the aggregate impacts from trade reform, but could significantly alter the structural changes generated by reform. Since the model does not adequately reflect the costs of structural transition, implementation of any agreement would need to focus on these costs, particularly if the assumed trade elasticities are assumed to be too low.

Removal of the CET

The second type of sensitivity analysis was to remove the CET specification for the allocation of domestic production across regions of destination (including the home market). The removal of the CET makes suppliers more nimble, i.e. they can switch the supply of output without friction to the market with the highest return.

Similar to the raising of the Armington elasticity, the aggregate impacts of the CET removal are not dramatic (see Table A-5). Overall trade increases, but the net effects on other aggregate variables is slight. The structural results again provide much more contrast. It is worth pointing out that the impacts on the other sectors, i.e. other than agriculture and food, is slight.

TABLE A-2: Impact on Sectoral Output with higher Armington elasticities
(percent)

	Free Trade in Central and South America (FTLA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW	
Wheat	0.0	-0.1	0.0	3.7	-4.8	-0.1	0.9	0.7	0.0	0.0	0.0	0.0	
Other cereal grains	0.0	0.0	0.0	-1.9	0.1	0.1	0.1	1.0	0.1	0.0	0.1	0.0	
Oil seeds	0.1	0.1	0.3	-0.3	0.0	-0.3	-0.4	-0.2	0.4	0.0	0.1	0.0	
Cane and beer sugar	0.5	0.5	0.0	-2.2	0.4	-0.1	-0.5	-2.8	0.1	0.1	0.1	0.0	
Other crops	0.0	0.0	0.0	-0.2	0.0	-0.4	-0.5	1.6	0.0	0.0	0.0	0.0	
Cattle and sheep	0.0	0.0	0.0	0.0	-0.6	-0.2	-0.2	2.0	0.0	0.0	0.0	0.0	
Raw milk	0.0	0.0	0.0	-0.1	-0.1	-0.3	0.5	0.2	0.0	0.0	0.0	0.0	
Other animal products	0.0	0.0	0.0	-0.1	-0.2	-0.3	0.0	-0.2	0.0	0.0	0.0	0.0	
Beef products	0.0	0.0	0.0	0.0	-0.4	-0.2	0.4	0.8	0.0	0.0	0.0	0.0	
Other meat products	0.0	0.0	0.0	0.0	-0.3	-0.1	1.8	-0.3	0.0	0.0	0.0	0.0	
Dairy products	0.0	0.0	0.0	-0.2	-0.1	-0.4	0.9	0.3	0.0	0.0	0.0	0.0	
Refined sugar	0.1	-0.1	0.0	-1.3	0.4	-1.2	0.4	-1.4	0.0	0.0	0.0	0.0	
Vegetable oils	0.0	0.0	0.1	0.5	-0.1	-1.6	0.5	0.8	0.0	0.0	0.0	0.1	
Other processed foods	0.0	0.0	0.0	-0.4	0.2	-0.1	0.2	0.7	0.0	0.0	0.0	0.0	
Textile and apparel	0.0	0.0	0.0	0.0	0.3	0.1	2.4	-0.4	0.0	0.0	0.0	0.0	
Basic industrial goods	0.0	0.0	0.0	0.1	0.5	0.3	1.9	1.7	0.0	0.0	0.0	0.0	
Other manufacturing	0.0	0.0	0.0	2.6	0.6	0.1	3.2	4.3	0.0	0.0	0.0	0.0	
Energy	0.0	0.0	0.0	2.8	-0.8	1.1	0.7	-2.0	0.0	0.0	0.0	0.0	
Construction	0.0	0.0	0.0	0.6	0.3	0.4	0.5	0.8	0.0	0.0	0.0	0.0	
Services	0.0	0.0	0.0	-0.5	0.0	-0.2	-0.5	-0.2	0.0	0.0	0.0	0.0	
Total	0.0	0.0	0.0	0.2	0.1	0.1	0.5	0.3	0.0	0.0	0.0	0.0	

(cont...)

(continued)

	Free Trade Area of the Americas (FTAA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW	
Wheat	-0.5	0.5	0.1	-4.0	5.2	1.1	4.6	1.0	0.0	0.3	0.1	0.1	
Other cereal grains	0.0	-0.5	-1.0	-1.0	0.5	0.3	-0.5	1.4	0.0	0.5	0.1	0.0	
Oil seeds	0.2	-0.5	-0.7	0.6	0.7	-2.0	-1.3	0.9	-0.1	0.1	0.0	0.0	
Cane and beer sugar	-48.1	63.1	2.8	4.1	2.5	7.2	15.1	1.7	-0.5	0.7	-1.1	-0.3	
Other crops	-0.2	0.8	0.1	0.1	0.4	0.0	-1.4	2.3	0.0	0.0	0.0	0.0	
Cattle and sheep	0.1	0.1	-0.1	0.2	-0.6	-0.3	-1.0	1.8	0.0	0.0	0.0	0.0	
Raw milk	-0.3	-1.5	2.4	0.2	0.0	-0.2	2.6	0.3	0.0	0.0	0.0	0.0	
Other animal products	0.1	-1.3	0.0	0.1	-0.1	-0.5	-0.6	-0.4	0.0	0.0	0.0	0.0	
Beef products	0.1	0.0	0.0	0.1	-0.5	-0.5	-0.6	0.7	0.0	0.1	0.0	0.0	
Other meat products	0.1	-1.0	0.1	0.0	-0.2	-0.5	0.4	-0.7	0.0	0.0	0.0	0.0	
Dairy products	-0.3	-1.7	3.7	0.2	-0.1	-0.1	3.9	0.5	0.0	0.0	0.0	0.0	
Refined sugar	-20.7	56.4	3.6	3.0	1.7	2.6	20.7	0.6	-0.3	-0.3	-0.6	-0.3	
Vegetable oils	0.1	-0.1	0.0	1.2	0.4	-2.0	1.0	1.1	0.0	0.0	-0.1	0.0	
Other processed foods	0.2	-0.4	0.0	-0.1	0.3	-0.2	-0.5	1.0	0.0	0.0	0.0	0.0	
Textile and apparel	0.2	-0.5	-0.1	0.1	0.8	0.3	21.2	-0.4	0.0	0.0	-0.2	0.0	
Basic industrial goods	0.1	0.0	0.1	0.1	0.7	0.1	1.9	2.5	0.0	0.0	0.0	0.0	
Other manufacturing	0.2	0.3	0.3	2.5	0.2	-1.7	4.3	3.4	0.0	0.0	0.0	0.0	
Energy	-0.1	0.0	0.1	2.8	-0.7	2.5	-0.4	-1.9	0.0	0.0	0.0	0.0	
Construction	0.0	0.0	0.3	0.7	0.7	0.7	1.7	1.5	0.0	0.0	0.0	0.0	
Services	0.0	0.0	0.0	-0.6	-0.1	-0.4	-1.5	-0.3	0.0	0.0	0.0	0.0	
Total	0.0	0.0	0.1	0.3	0.2	0.2	1.6	0.6	0.0	0.0	0.0	0.0	

TABLE A-3: Impact on Sectoral Exports with higher Armington elasticities
(percent)

	Free Trade in Central and South America (FTLA)													
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	ORW		
Wheat	0.1	-0.1	0.1	10.5	0.0	0.0	0.1	17.4	0.0	0.0	0.0	0.0		
Other cereal grains	0.1	0.1	0.1	-4.7	0.3	0.0	0.1	1.1	0.1	0.2	0.1	0.1		
Oil seeds	0.1	0.2	0.3	-3.2	0.1	15.6	-0.3	0.0	0.4	0.0	0.1	0.1		
Cane and beet sugar	-0.4	0.3	0.0	-2.3	0.7	1.4	-0.8	-0.4	0.1	0.1	0.1	0.1		
Other crops	0.1	0.0	0.0	1.8	0.6	0.5	-0.7	5.1	0.0	0.0	0.0	0.0		
Cattle and sheep	0.0	0.0	0.0	3.2	0.0	9.0	-0.3	19.8	0.0	0.0	0.0	0.0		
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Other animal products	0.0	0.0	0.0	-1.2	1.4	3.1	3.2	4.9	0.0	0.0	0.0	0.0		
Beef products	0.0	0.0	0.0	1.1	-0.6	-0.2	1.0	5.8	0.0	0.0	0.0	0.0		
Other meat products	0.0	0.0	0.0	-1.1	-1.4	6.6	6.4	0.8	0.0	0.0	0.0	0.0		
Dairy products	0.0	0.0	0.0	0.0	0.2	21.5	6.2	6.4	0.0	0.0	0.0	0.0		
Refined sugar	-0.6	-0.1	-0.1	2.7	2.3	14.2	2.4	2.9	0.0	0.1	0.0	0.0		
Vegetable oils	-0.1	0.0	-0.1	1.5	0.3	10.1	9.6	5.5	0.0	0.1	0.0	0.1		
Other processed foods	0.0	0.0	0.0	-0.9	2.1	3.5	4.4	4.2	0.0	0.0	0.0	0.0		
Textile and apparel	0.0	0.0	0.0	2.4	4.4	7.9	3.2	2.1	0.0	0.0	0.0	0.0		
Basic industrial goods	0.0	0.0	-0.1	4.4	3.2	4.4	5.5	3.9	0.0	0.0	0.0	0.0		
Other manufacturing	0.0	0.0	0.0	16.4	6.0	7.1	5.0	14.6	0.0	0.0	0.0	0.0		
Energy	0.0	0.0	0.0	18.1	1.9	4.0	7.1	3.9	0.0	0.0	0.0	0.0		
Construction	0.0	0.0	0.0	-0.7	0.3	0.2	0.0	0.8	0.0	0.0	0.0	0.0		
Services	0.1	0.1	0.1	-2.2	0.1	-0.1	-0.8	0.4	0.0	0.1	0.0	0.0		
Total	0.0	0.0	0.0	4.3	2.8	3.4	2.0	3.4	0.0	0.0	0.0	0.0		

(cont...)

(continued)

	Free Trade Area of the Americas (FTAA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW	
Wheat	-0.9	0.7	-0.9	10.9	0.0	0.0	0.3	16.7	0.1	0.2	0.1	0.1	
Other cereal grains	0.3	-0.5	-1.6	-2.7	2.4	0.5	-0.5	2.2	0.0	0.2	0.1	0.1	
Oil seeds	0.2	-0.6	-0.4	-0.8	3.1	14.2	-2.6	1.3	-0.2	0.1	0.1	0.0	
Cane and beet sugar	-23.7	29.2	-1.1	49.7	7.6	-40.0	13.4	12.0	-0.6	3.7	-2.1	-2.3	
Other crops	0.5	2.5	1.4	3.3	4.6	1.9	-2.5	6.7	0.0	-0.1	0.0	0.0	
Cattle and sheep	-0.2	0.2	-0.4	3.7	0.0	9.4	-1.3	18.5	0.0	-0.1	0.0	0.0	
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other animal products	-0.1	-4.9	-0.4	0.6	3.6	4.2	2.3	6.4	0.0	-0.1	0.0	0.0	
Beef products	0.2	0.0	-0.5	2.4	-0.4	1.0	0.4	6.5	0.0	0.1	0.0	0.0	
Other meat products	0.3	-3.2	-0.6	0.4	0.0	6.4	5.0	1.3	0.0	0.0	0.0	0.0	
Dairy products	-10.3	-19.8	-47.8	5.9	0.5	21.8	12.4	8.5	0.0	-0.1	0.0	0.0	
Refined sugar	-26.9	86.0	22.5	41.4	10.0	45.4	29.4	12.0	-0.3	-0.8	-1.5	-1.3	
Vegetable oils	0.6	0.1	0.7	3.0	2.5	10.4	10.8	6.0	-0.1	-0.1	-0.1	0.0	
Other processed foods	2.3	1.1	1.6	0.6	4.2	5.0	5.4	5.7	-0.1	0.0	0.0	0.0	
Textile and apparel	6.0	-0.5	-0.1	3.8	10.9	14.7	31.2	3.1	-0.1	-0.2	-0.3	-0.1	
Basic industrial goods	0.6	0.1	0.9	5.6	5.6	5.9	6.4	5.8	0.0	0.0	0.0	0.0	
Other manufacturing	0.6	0.3	0.4	16.2	7.2	7.0	6.7	14.6	0.0	0.0	0.1	0.0	
Energy	1.3	0.3	0.3	18.9	4.4	7.6	6.8	4.8	0.0	-0.1	0.0	0.0	
Construction	0.0	0.0	0.0	0.3	1.4	1.0	0.0	1.9	0.1	0.1	0.1	0.1	
Services	-0.3	-0.1	-0.4	-1.1	1.6	1.0	-1.9	1.3	0.1	0.1	0.1	0.1	
Total	0.5	0.2	0.4	5.8	5.5	6.0	7.2	5.0	0.0	0.0	0.0	0.0	

TABLE A-4: Impact on Sectoral Imports with higher Armington elasticities
(percent)

	Free Trade in Central and South America (FTLA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW	
Wheat	0.0	0.0	0.0	2.2	14.3	-0.3	0.8	-0.9	0.0	0.0	0.0	0.0	
Other cereal grains	0.0	0.0	0.0	4.6	-2.9	-1.1	0.6	-1.9	-0.1	0.0	-0.3	-0.4	
Oil seeds	-0.4	-0.4	0.1	4.9	-1.2	10.4	3.2	14.2	-0.2	0.0	-0.2	-0.4	
Cane and beet sugar	-0.6	-0.1	-1.0	38.9	-0.3	0.9	0.8	19.1	-0.3	-0.1	-0.3	0.0	
Other crops	-0.1	0.0	0.0	8.4	4.0	7.0	4.4	8.1	-0.1	0.0	0.0	0.0	
Cattle and sheep	0.0	0.0	0.0	4.4	19.9	2.9	0.2	-2.4	0.0	0.0	0.0	0.0	
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other animal products	0.0	0.0	-0.1	3.4	3.6	8.0	3.3	9.8	0.0	0.0	0.0	0.0	
Beef products	-0.3	0.0	0.0	3.3	20.8	0.9	0.0	4.4	-0.2	0.0	0.0	0.0	
Other meat products	0.0	0.0	0.0	-4.4	3.3	-0.3	-0.8	-4.5	0.0	0.0	0.0	0.0	
Dairy products	-0.1	0.0	0.0	9.0	-0.7	3.0	0.6	5.2	0.0	0.0	0.0	0.0	
Refined sugar	-0.4	0.0	-0.1	53.1	4.5	29.2	28.9	26.1	-0.1	-0.1	-0.2	0.0	
Vegetable oils	0.0	0.0	-0.6	2.4	5.0	15.7	5.6	5.6	-0.1	-0.1	-0.1	-0.3	
Other processed foods	0.0	0.0	0.0	11.1	0.8	9.2	7.5	9.0	0.0	0.0	0.0	0.0	
Textile and apparel	0.1	0.0	0.0	8.9	2.1	8.3	1.4	3.7	0.0	0.0	0.0	0.0	
Basic industrial goods	0.0	0.0	0.0	7.5	1.9	3.8	2.7	3.8	0.0	0.0	0.0	0.0	
Other manufacturing	0.0	0.0	0.0	4.8	1.9	1.1	0.7	0.6	0.0	0.0	0.0	0.0	
Energy	0.0	0.0	0.0	6.7	6.6	18.3	2.3	13.0	0.0	0.0	0.0	0.0	
Construction	0.0	0.0	0.0	1.3	0.1	0.1	0.3	-0.1	0.0	0.0	0.0	0.0	
Services	0.0	0.0	0.0	1.8	0.0	-0.1	0.4	-0.7	0.0	0.0	0.0	0.0	
Total	0.0	0.0	0.0	5.6	2.4	3.3	1.9	2.7	0.0	0.0	0.0	0.0	

(cont...)

(continued)

	Free Trade Area of the Americas (FTAA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAMI	RSM	EUR	ROECD	EASIA	OROW	
Wheat	3.2	-1.1	-1.4	-0.1	16.7	-3.0	0.5	-3.2	-0.1	-0.2	-0.3	-0.4	
Other cereal grains	-0.4	-0.3	9.1	2.0	-3.5	-2.4	1.8	-2.7	-0.2	-0.1	-0.5	-0.4	
Oil seeds	-0.7	-0.4	0.1	4.2	-0.6	16.7	20.7	14.8	0.0	-0.1	-0.4	-0.2	
Cane and beet sugar	41.4	32.7	6.3	43.1	-0.1	0.3	12.9	21.5	1.1	-0.2	0.8	2.9	
Other crops	1.5	-0.2	5.8	8.1	3.6	8.5	16.0	8.8	0.0	0.0	-0.1	0.0	
Cattle and sheep	-0.1	-0.1	0.5	3.4	18.7	2.7	0.3	-1.8	0.0	-0.1	-0.1	0.0	
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other animal products	-2.3	-2.3	2.0	2.0	1.4	9.1	10.7	11.2	0.0	0.0	-0.1	-0.1	
Beef products	-0.4	0.0	0.5	2.5	21.8	4.5	3.2	4.6	0.1	-0.1	0.0	0.0	
Other meat products	-3.2	4.5	-1.8	-4.9	10.9	1.3	0.6	-2.9	0.0	0.0	0.0	0.0	
Dairy products	2.7	8.4	-20.7	3.9	-3.9	-3.1	-4.5	2.0	0.0	0.0	0.0	-0.1	
Refined sugar	65.2	-4.6	-52.5	33.2	1.1	29.4	12.6	28.3	0.9	0.6	1.6	2.2	
Vegetable oils	0.3	0.0	0.4	1.3	4.3	17.6	7.6	5.9	0.1	0.0	0.3	0.0	
Other processed foods	0.9	3.5	10.8	12.7	0.2	11.2	13.1	10.6	0.1	0.2	0.1	0.0	
Textile and apparel	2.6	0.7	1.0	10.3	2.6	13.4	12.4	4.2	0.0	0.0	-0.1	-0.1	
Basic industrial goods	0.5	0.1	0.9	9.3	3.0	5.7	6.2	5.4	0.0	0.1	0.0	0.0	
Other manufacturing	0.2	0.1	0.4	5.6	5.7	3.8	2.3	1.7	0.0	0.0	0.0	0.0	
Energy	1.1	1.0	1.2	6.0	6.3	19.9	6.3	13.7	0.0	0.0	0.0	0.0	
Construction	0.2	0.1	0.4	0.7	-0.5	-0.3	0.9	-0.4	0.0	0.0	0.0	0.0	
Services	0.3	0.0	0.3	0.5	-1.6	-1.4	0.7	-1.8	-0.1	-0.1	-0.1	-0.1	
Total	0.8	0.3	0.7	6.3	3.8	4.9	5.7	3.5	0.0	0.0	0.0	0.0	

TABLE A-5: Aggregate Impacts with removal of CET specification (percent)

	Free Trade in Central and South America (FTLA)											
	USA	CAN	MEX	ARG	BRA	AND/AN	CAM	RSM	EUR	ROECD	EASIA	ROW
Consumption	0.0	0.0	0.0	0.2	0.0	0.0	0.1	-0.3	0.0	0.0	0.0	0.0
Government	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0
Investment	0.0	0.0	0.0	0.6	0.4	0.4	0.7	0.9	0.0	0.0	0.0	0.0
Exports	0.0	0.0	0.0	4.6	3.0	3.8	2.4	4.1	0.0	0.0	0.0	0.0
Imports	0.0	0.0	0.0	6.1	2.8	3.9	2.4	3.2	0.0	0.0	0.0	0.0
Real GDP at Market Price	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0
Real GDP at Factor Cost	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0
Real Income	0.0	0.0	0.0	0.2	0.0	0.0	0.1	-0.3	0.0	0.0	0.0	0.0
Terms of Trade	0.0	0.0	0.0	1.6	0.2	0.4	0.4	-0.5	0.0	0.0	0.0	0.0
Consumer Price Index	0.0	0.0	0.0	1.8	-0.1	-0.4	0.0	-1.0	0.0	0.0	0.0	0.0
Real Exchange Rate	0.0	0.0	0.0	2.2	0.2	0.4	1.0	-0.1	0.0	0.0	0.0	0.0
Real Wage	0.0	0.0	0.0	0.7	0.3	0.6	1.1	1.5	0.0	0.0	0.0	0.0
	Free Trade Area of the Americas (FTAA)											
	USA	CAN	MEX	ARG	BRA	AND/AN	CAM	RSM	EUR	ROECD	EASIA	ROW
Consumption	0.1	0.0	0.0	0.1	-0.1	-0.3	-0.7	-0.7	0.0	0.0	0.0	0.0
Government	0.0	0.0	0.1	0.1	0.2	0.2	0.6	0.4	0.0	0.0	0.0	0.0
Investment	0.1	0.0	0.3	0.7	0.8	0.7	2.2	1.8	0.0	0.0	0.0	0.0
Exports	0.5	0.2	0.5	6.4	6.1	6.7	8.1	5.8	0.0	0.0	0.0	0.0
Imports	0.8	0.3	0.8	6.8	4.0	5.4	6.0	3.9	0.0	0.0	0.0	0.0
Real GDP at Market Price	0.0	0.0	0.1	0.1	0.2	0.2	0.6	0.4	0.0	0.0	0.0	0.0
Real GDP at Factor Cost	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.0	0.0	0.0	0.0
Real Income	0.1	0.0	0.0	0.1	-0.1	-0.3	-0.6	-0.7	0.0	0.0	0.0	0.0
Terms of Trade	0.4	0.0	0.1	0.5	-1.3	-0.8	-1.0	-1.4	0.0	0.0	0.0	0.0
Consumer Price Index	0.2	0.1	0.3	0.3	-1.8	-1.9	-0.8	-2.4	-0.1	-0.1	-0.1	-0.1
Real Exchange Rate	0.3	0.1	0.4	0.7	-1.4	-0.6	1.8	-1.1	-0.1	-0.1	-0.1	-0.1
Real Wage	0.1	0.1	0.2	0.8	0.6	1.2	3.5	2.3	0.0	0.0	0.0	0.0

TABLE A-6: Impact on Sectoral Output with removal of CET specification (percent)

	Free Trade in Central and South America (FTLA)													
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW		
Wheat	0.0	-0.1	0.0	4.0	-5.9	0.2	0.4	0.9	0.0	0.0	0.0	0.0		
Other cereal grains	0.0	0.0	0.0	-2.2	0.1	0.1	0.0	0.9	0.1	0.0	0.1	0.1		
Oil seeds	0.1	0.1	0.2	-0.4	0.0	-0.5	-0.6	-0.1	-0.4	0.0	0.1	0.0		
Cane and beet sugar	0.3	0.3	0.0	-2.8	0.5	-0.1	-0.5	-3.4	0.0	0.1	0.1	0.0		
Other crops	0.0	0.0	0.0	-0.1	0.0	-0.4	-0.6	1.6	0.0	0.0	0.0	0.0		
Cattle and sheep	0.0	0.0	0.0	0.2	-0.8	-0.3	-0.2	2.7	0.0	0.0	0.0	0.0		
Raw milk	0.0	0.0	0.0	-0.1	0.0	-0.3	0.5	0.2	0.0	0.0	0.0	0.0		
Other animal products	0.0	0.0	0.0	-0.1	-0.2	-0.4	0.1	-0.3	0.0	0.0	0.0	0.0		
Beef products	0.0	0.0	0.0	0.1	-0.4	-0.2	0.4	0.7	0.1	0.0	0.0	0.0		
Other meat products	0.0	0.0	0.0	0.1	-0.3	-0.1	2.0	-0.3	0.0	0.0	0.0	0.0		
Dairy products	0.0	0.0	0.0	-0.2	0.0	-0.4	0.9	0.2	0.0	0.0	0.0	0.0		
Refined sugar	0.0	0.0	0.0	-1.4	0.5	-1.8	0.3	-2.0	0.0	0.1	0.0	0.0		
Vegetable oils	0.0	0.0	0.2	0.6	-0.1	-2.1	0.3	0.5	0.0	0.0	0.0	0.1		
Other processed foods	0.0	0.0	0.0	-0.3	0.2	-0.1	0.1	0.6	0.0	0.0	0.0	0.0		
Textile and apparel	0.0	0.0	0.0	0.0	0.3	0.1	2.4	-0.4	0.0	0.0	0.0	0.0		
Basic industrial goods	0.0	0.0	0.0	0.1	0.5	0.3	1.9	1.7	0.0	0.0	0.0	0.0		
Other manufacturing	0.0	0.0	0.0	2.6	0.6	0.1	3.2	4.3	0.0	0.0	0.0	0.0		
Energy	0.0	0.0	0.0	2.7	-0.8	1.1	0.7	-2.0	0.0	0.0	0.0	0.0		
Construction	0.0	0.0	0.0	0.6	0.3	0.4	0.5	0.8	0.0	0.0	0.0	0.0		
Services	0.0	0.0	0.0	-0.5	0.0	-0.2	-0.5	-0.2	0.0	0.0	0.0	0.0		
Total	0.0	0.0	0.0	0.2	0.1	0.1	0.5	0.3	0.0	0.0	0.0	0.0		

(cont...)

(continued)

Free Trade Area of the Americas (FTAA)													
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW	
Wheat	-0.5	0.5	0.2	4.2	-6.6	1.8	4.3	1.2	0.0	0.2	0.1	0.1	
Other cereal grains	0.0	-0.6	-1.6	-1.1	0.5	0.5	-0.4	1.4	0.0	0.4	0.2	0.1	
Oil seeds	0.2	-0.5	-0.6	0.4	0.7	-3.1	-3.1	0.9	0.0	0.1	0.1	0.0	
Cane and beet sugar	-6.1	26.2	3.6	3.7	2.9	9.1	10.4	2.0	0.0	0.8	-0.3	-0.3	
Other crops	-0.2	0.7	0.0	0.1	0.4	0.0	-1.5	2.3	0.0	0.0	0.0	0.0	
Cattle and sheep	0.1	0.1	0.0	0.3	-0.8	-0.3	-0.9	2.5	0.0	0.0	0.0	0.0	
Raw milk	-0.4	-2.3	3.4	0.2	0.0	-0.1	3.0	0.4	0.0	0.0	0.0	0.0	
Other animal products	0.1	-1.6	0.1	0.1	-0.1	-0.5	-0.5	-0.4	0.0	0.0	0.0	0.0	
Beef products	0.1	0.0	0.0	0.2	-0.6	-0.6	-0.4	0.7	0.0	0.1	0.0	0.0	
Other meat products	0.1	-1.1	0.1	0.1	-0.2	-0.6	0.8	-0.7	0.0	0.0	0.0	0.0	
Dairy products	-0.5	-2.5	5.3	0.3	0.0	0.1	4.7	0.6	0.0	0.0	0.0	0.0	
Refined sugar	-2.1	50.4	4.7	2.3	1.9	3.5	17.0	0.3	-0.1	-0.4	-0.4	-0.3	
Vegetable oils	0.2	0.0	0.0	1.1	0.3	-2.6	0.7	0.8	0.0	0.0	-0.1	0.0	
Other processed foods	0.2	-0.5	-0.1	-0.2	0.3	-0.3	-0.6	0.7	0.0	0.0	0.0	0.0	
Textile and apparel	0.2	-0.5	-0.1	0.1	0.8	0.3	22.0	-0.4	0.0	0.0	-0.2	0.0	
Basic industrial goods	0.1	0.0	0.1	0.1	0.7	0.1	2.3	2.6	0.0	0.0	0.0	0.0	
Other manufacturing	0.2	0.3	0.4	2.5	0.2	-1.7	4.7	3.4	0.0	0.0	0.0	0.0	
Energy	-0.1	0.0	0.1	2.8	-0.7	2.5	-0.2	-1.9	0.0	0.0	0.0	0.0	
Construction	0.0	0.0	0.3	0.7	0.7	0.7	1.7	1.5	0.0	0.0	0.0	0.0	
Services	0.0	0.0	0.0	-0.6	-0.1	-0.4	-1.4	-0.3	0.0	0.0	0.0	0.0	
Total	0.0	0.0	0.1	0.3	0.2	0.2	1.6	0.5	0.0	0.0	0.0	0.0	

TABLE A-7: Impact on Sectoral Exports with removal of CET specification (percent)

	Free Trade in Central and South America (FTLA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW	
Wheat	0.1	-0.1	0.1	11.4	0.0	0.0	-0.3	26.9	0.0	0.1	0.0	0.0	
Other cereal grains	0.1	0.1	0.2	-5.6	0.4	0.1	0.0	1.0	0.1	0.2	0.1	0.1	
Oil seeds	0.2	0.2	0.2	-4.7	0.3	27.4	0.0	0.4	0.4	0.1	0.1	0.2	
Cane and beet sugar	0.2	0.1	0.0	-1.7	0.8	2.5	-0.8	2.5	0.1	0.2	0.1	0.1	
Other crops	0.0	0.0	0.1	3.4	1.2	1.3	-0.7	7.0	0.0	0.0	0.0	0.0	
Cattle and sheep	0.0	0.0	0.0	6.6	0.0	15.8	-0.3	31.8	0.0	0.0	0.0	0.0	
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other animal products	0.0	0.0	0.0	-1.4	2.7	5.6	5.7	8.9	0.0	0.0	0.0	0.0	
Beef products	0.0	0.0	0.1	2.5	-0.4	0.0	1.5	8.9	0.0	0.0	0.0	0.0	
Other meat products	0.1	0.0	0.1	-1.5	-2.0	11.5	9.8	1.7	0.0	0.0	0.0	0.0	
Dairy products	0.0	0.0	0.1	0.4	0.3	38.6	9.9	10.5	0.0	0.0	0.0	0.0	
Refined sugar	-1.4	0.0	-0.3	7.3	3.5	26.2	-4.2	7.9	0.0	0.1	0.0	0.0	
Vegetable oils	-0.1	0.0	-0.3	2.2	0.7	18.9	16.5	8.8	0.0	0.1	0.0	0.0	
Other processed foods	-0.1	0.0	0.0	-1.0	3.6	6.4	7.8	6.5	0.0	0.0	0.0	0.0	
Textile and apparel	0.0	0.0	0.0	2.4	4.3	7.8	3.2	2.1	0.0	0.0	0.0	0.0	
Basic industrial goods	0.0	0.0	-0.1	4.4	3.1	4.4	5.5	4.0	0.0	0.0	0.0	0.0	
Other manufacturing	0.0	0.0	0.0	16.3	5.9	7.1	5.0	14.6	0.0	0.0	0.0	0.0	
Energy	0.0	0.0	0.0	18.0	1.9	3.9	7.0	3.9	0.0	0.0	0.0	0.0	
Construction	0.0	0.0	0.0	-0.6	0.3	0.2	0.0	0.9	0.0	0.0	0.0	0.0	
Services	0.1	0.1	0.1	-2.2	0.1	-0.1	-0.8	0.4	0.0	0.1	0.0	0.0	
Total	0.0	0.0	0.0	4.5	3.0	3.8	2.3	4.0	0.0	0.0	0.0	0.0	

(cont...)

(continued)

		Free Trade Area of the Americas (FTAA)												
	USA	CAN	MEX	ARG	PRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW		
Wheat	-0.9	0.7	-1.5	11.6	0.0	0.0	-1.4	24.8	0.1	0.1	0.1	0.1		
Other cereal grains	0.5	-0.3	-1.3	-3.2	3.6	0.8	-0.4	2.4	0.0	-0.2	0.2	0.1		
Oil seeds	0.1	-0.3	-0.7	-1.7	4.4	25.1	-1.5	1.5	-0.2	0.1	0.1	0.1		
Cane and beet sugar	13.6	-1.8	-2.9	73.5	9.3	53.8	8.1	17.0	-0.3	3.8	-2.2	-3.4		
Other crops	1.1	3.3	2.2	5.9	7.4	3.2	-1.8	9.0	0.0	-0.1	-0.1	0.0		
Cattle and sheep	-0.4	0.2	-0.3	7.2	0.0	16.5	-1.1	29.9	0.0	-0.1	0.0	0.0		
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Other animal products	-0.3	-6.3	-0.3	1.3	6.2	7.6	5.7	11.5	0.0	-0.1	0.0	0.0		
Beef products	0.3	0.0	-0.7	4.3	0.0	2.1	2.4	10.0	0.0	0.1	0.0	0.0		
Other meat products	0.2	-3.9	-0.8	0.7	0.2	11.2	8.8	2.8	0.0	0.0	0.0	0.0		
Dairy products	-15.9	-28.9	84.8	9.6	1.0	39.3	18.8	13.9	0.0	0.0	0.0	0.0		
Refined sugar	-17.3	86.2	31.6	62.6	13.5	73.5	27.9	19.4	-0.3	-0.7	-2.2	-2.0		
Vegetable oils	0.8	0.4	1.3	3.9	3.5	19.5	18.2	9.5	-0.1	-0.1	-0.1	0.0		
Other processed foods	3.8	2.4	2.8	1.2	6.8	8.7	10.8	8.7	-0.1	-0.1	0.0	0.0		
Textile and apparel	6.0	-0.6	-0.1	3.8	10.9	14.7	32.0	3.1	-0.1	-0.2	-0.3	-0.1		
Basic industrial goods	0.6	0.1	0.9	5.6	5.5	5.8	6.9	5.8	0.0	0.0	0.0	0.0		
Other manufacturing	0.6	0.3	0.5	16.2	7.1	7.0	7.1	14.6	0.0	0.0	0.1	0.0		
Energy	1.3	0.3	0.3	18.8	4.3	7.5	7.2	4.8	0.0	-0.1	0.0	0.0		
Construction	-0.1	0.0	0.0	0.2	1.4	1.0	0.0	1.9	0.1	0.1	0.1	0.1		
Services	-0.3	0.0	-0.3	-1.1	1.6	1.0	-1.6	1.4	0.1	0.1	0.1	0.1		
Total	0.5	0.2	0.5	6.4	5.9	6.6	7.8	5.7	0.0	0.0	0.0	0.0		

TABLE A-8: Impact on Sectoral Imports with removal of CET specification (percent)

	Free Trade in Central and South America (FTLA)												
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW	
Wheat	0.0	0.0	0.0	7.8	17.4	-1.1	1.0	-2.4	0.0	0.0	-0.1	-0.1	
Other cereal grains	0.0	0.0	0.0	5.8	-3.4	-1.2	1.0	-2.0	-0.1	0.0	-0.3	-0.5	
Oil seeds	-0.6	-0.6	0.1	8.0	-1.7	17.6	4.9	24.2	-0.2	0.0	-0.2	-0.7	
Cane and beer sugar	-0.7	0.0	-1.3	69.4	0.1	2.5	1.2	31.0	0.0	-0.1	-0.3	-0.3	
Other crops	-0.2	0.0	-0.1	13.9	6.3	11.0	6.6	14.7	-0.1	0.0	-0.1	0.0	
Cattle and sheep	0.0	0.0	0.0	5.6	32.6	4.9	0.4	-2.5	0.0	0.0	0.0	0.0	
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other animal products	0.0	0.0	-0.1	5.7	5.8	13.4	5.2	16.5	0.0	0.0	0.0	0.0	
Beef products	-0.4	0.0	0.0	4.5	35.7	1.2	0.2	8.2	-0.3	0.0	0.0	-0.1	
Other meat products	0.0	0.0	0.0	-6.7	5.3	-0.3	-0.7	-6.9	0.0	0.0	-0.1	0.0	
Dairy products	-0.2	0.0	0.0	14.5	-1.1	4.3	1.0	8.7	0.0	0.0	0.0	0.0	
Refined sugar	-0.5	0.0	-0.3	58.3	9.5	52.1	49.4	44.4	-0.1	-0.1	-0.3	-0.2	
Vegetable oils	-0.1	0.0	-0.8	4.1	8.1	25.7	8.9	8.4	-0.1	-0.1	-0.2	-0.5	
Other processed foods	0.0	0.0	0.0	18.2	1.3	14.9	12.0	14.9	0.0	0.0	0.0	0.0	
Textile and apparel	0.1	0.0	0.0	8.9	2.1	8.4	1.5	3.7	0.0	0.0	0.0	0.0	
Basic industrial goods	0.0	0.0	0.0	7.5	2.0	3.8	2.7	3.8	0.0	0.0	0.0	0.0	
Other manufacturing	0.0	0.0	0.0	4.7	1.9	1.1	0.8	0.6	0.0	0.0	0.0	0.0	
Energy	0.0	0.0	0.0	6.7	6.6	18.4	2.4	13.0	0.0	0.0	0.0	0.0	
Construction	0.0	0.0	0.0	1.3	0.1	0.2	0.3	-0.1	0.0	0.0	0.0	0.0	
Services	0.0	0.0	0.0	1.8	0.0	-0.1	0.5	-0.7	0.0	0.0	0.0	0.0	
Total	0.0	0.0	0.0	6.0	2.7	3.8	2.3	3.1	0.0	0.0	0.0	0.0	

(cont...)

(continued)

	Free Trade Area of the Americas (FTAA)													OROW
	USA	CAN	MEX	ARG	BRA	ANDEAN	CAM	RSM	EUR	ROECD	EASIA	OROW		
Wheat	4.4	-0.8	-2.1	3.2	20.9	-4.4	1.0	-6.2	-0.1	-0.2	-0.5	-0.5		
Other cereal grains	-0.2	-0.9	14.2	2.2	-4.9	-3.3	1.6	-3.5	-0.2	-0.1	-0.6	-0.6		
Oil seeds	-0.1	-1.0	0.1	6.6	-1.0	28.1	31.1	25.2	-0.1	-0.1	-0.6	-0.4		
Cane and beet sugar	55.0	35.0	2.3	79.1	-3.7	-2.1	11.0	29.3	-0.3	-0.7	-1.3	1.8		
Other crops	2.5	0.1	10.0	13.2	5.8	14.0	25.1	16.1	0.0	0.0	-0.1	0.0		
Cattle and sheep	0.0	-0.1	0.5	4.1	30.6	4.6	0.2	-1.7	-0.1	-0.2	-0.1	0.0		
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Other animal products	-3.3	-4.8	3.1	3.4	2.3	15.3	17.2	18.9	0.0	-0.1	-0.1	-0.1		
Beef products	-0.5	0.0	0.6	3.2	37.6	7.5	4.4	8.4	0.1	-0.2	0.0	0.0		
Other meat products	-4.4	6.4	-3.1	-7.5	19.5	2.6	0.8	-4.5	0.0	0.1	0.0	0.0		
Dairy products	4.1	12.7	-29.0	5.8	-6.3	5.1	-6.0	3.4	0.0	0.0	0.0	0.0		
Refined sugar	85.1	-2.0	-62.1	59.5	0.1	47.0	35.4	41.7	0.2	0.9	-0.1	1.9		
Vegetable oils	0.6	-0.1	0.2	2.3	6.8	28.6	11.6	8.6	0.0	0.0	0.3	-0.1		
Other processed foods	1.6	5.5	18.2	21.3	0.3	18.6	21.0	18.1	0.1	0.2	0.1	0.0		
Textile and apparel	2.6	0.7	0.9	10.3	2.7	13.5	12.5	4.2	0.0	0.0	-0.1	-0.1		
Basic industrial goods	0.5	0.1	0.9	9.3	3.1	5.7	6.1	5.4	0.0	0.1	0.0	0.0		
Other manufacturing	0.2	0.1	0.3	5.6	5.7	3.8	2.2	1.6	0.0	0.0	0.0	0.0		
Energy	1.1	1.0	1.2	6.0	6.4	19.9	5.9	13.7	0.0	0.0	0.0	0.0		
Construction	0.2	0.1	0.4	0.7	-0.5	-0.3	0.8	-0.4	0.0	0.0	0.0	0.0		
Services	0.3	0.0	0.3	0.5	-1.6	-1.4	0.3	-1.8	-0.1	-0.1	-0.1	-0.1		
Total	0.8	0.3	0.8	6.7	4.0	5.4	6.2	3.9	0.0	0.0	0.0	0.0		

Annex B: The FIESTA Model

The AGE model named Framework for Integrated Economic Simulation of Trade in the Americas, otherwise known as the FIESTA Model, is a global, multi-region, multi-sector, dynamic applied general equilibrium model.⁴⁶ Global economic activity is disaggregated across 12 country/region groupings, and 20 economic sectors (see Tables B-1 and B-2 for details). The broad regional groupings include five OECD blocks – Canada (CAN), the United States (USA), Mexico (MEX), Europe (EUR), and the rest of the OECD (ROECD). The emphasis of this model is on Latin America which is similarly divided into five blocks (aside from Mexico) – Central America and the Caribbean (CAM), the Andean Pact (ANDEAN), Argentina (ARG), Brazil (BRA), and the rest of South America (RSM). The remainder of the world is split into two large aggregates – East Asia (EASIA), and the rest of the world (ROW).

The primary focus of this version of the model is on agriculture, and the sectoral aggregation reflects the major mutually traded agricultural commodities, largely ignoring tropical products such as fruits, coffee, and cocoa. Of the total of twenty sectors, eight are raw agricultural commodities – wheat (WHT), other cereal grains (GRO), oil seeds (OSD), raw sugar (both cane and beet, C_B), other crops (OCR), cattle and sheep (CTL), other animal products and wool (OAP), and raw milk (RMK). The current version of the model has the food processing sector disaggregated into six sectors – beef and sheep products (BovMeat), other meat products (OthMeat), dairy products (MilkProd), refined sugar (RefSug), vegetable oils (VOL), and all other (OthFoodPr). All other sectors are aggregated into six groupings – energy (NRG), textile and apparel (TextApp), basic industry (BasInd), other manufacturing (OthManu), Construction (Construc), and services (Service).

The final key dimension of the model is time. The base year of the data and the model is 1995. The model is solved in subsequent years in 1996, 1997, 1998, 2001, 2004, 2007, and 2010. The time periods are linked together through factor growth (labor/land) and accumulation (capital), and changes in productivity.

The remainder of this appendix outlines briefly the main characteristics of supply, demand, the dynamics and the policy instruments of the model.

⁴⁶ The FIESTA model is a direct descendant of the RUMS Model (see Burniaux and van der Mensbrugghe), and the OECD LINKAGE Model (see OECD, 1997d). A complete and detailed description of FIESTA's equations and specification is provided in "Model Specification for FIESTA", available from the authors upon request.

Supply, Demand and Foreign Trade

Production

There are twenty producing sectors in FIESTA. Eight sectors concern the production of agricultural goods: wheat, other cereal grains, oil seeds, sugar, other crops, livestock, other meats, and milk. Food processing is divided into six sectors. The remaining sectors are broad aggregates of the rest of the economy: energy, textile and apparel, basic industry, other manufacturing, construction, and services.

All sectors are assumed to operate under constant returns to scale and cost optimization. Production in each sector is modeled by a series of nested CES production functions which are intended to represent the different substitution and complementarity relations across the various inputs in each sector. There are material inputs which generate the input/output table, as well as factor inputs representing value added.

Three different production archetypes are defined in the model – crops, livestock, and all other goods and services. The CES nests of the three archetypes are graphically depicted in Figures B-1 through B-3. Within each production archetype, sectors will be differentiated by different input combinations (share parameters) and different substitution elasticities. The former are largely determined by base year data, and the latter are given values by the modeler.

The key feature of the crop production structure is the substitution between intensive cropping versus extensive cropping, i.e. between fertilizer and land (see Figure B-1).⁴⁷ Livestock production captures the important role played by feed versus land, i.e. between ranch- versus range-fed production (see Figure B-2).⁴⁸ Production in the other sectors more closely matches the more traditional role of capital/labor substitution, with energy introduced as an additional factor of production (see Figure B-3).

In each period, the supply of primary factors – capital and labor – is usually predetermined.⁴⁹ However, the supply of land is assumed to be sensitive to the contemporaneous price of land. Land is assumed to be partially mobile across agricultural sectors.

The model includes adjustment rigidities. An important feature is the distinction between *old* and *new* capital goods. In addition, capital is assumed to be

⁴⁷ In the original GTAP data set, the fertilizer sector is identified with the crop sector, i.e. chemicals, rubber, and plastics. In the aggregated version of the data fertilizer is identified with the basic industry sector (BasInd).

⁴⁸ Feed is represented by three agricultural commodities: wheat, other grains, and oil seeds.

⁴⁹ Capital supply in each period is somewhat influenced by the level of contemporaneous investment.

partially mobile, reflecting differences in the marketability of capital goods across sectors.⁵⁰

Once the optimal combination of inputs is determined, sectoral output prices are calculated assuming competitive supply (zero-profit) conditions in all markets.

Consumption and the closure rule

All income generated by economic activity is assumed to be distributed to consumers. A single representative consumer allocates optimally his/her disposable income among the consumer goods and saving. The consumption/saving decision is completely static: saving is treated as a "good" and its amount is determined simultaneously with the demands for the other goods, the price of saving being set arbitrarily equal to the average price of consumer goods.⁵¹

Government collects income taxes, indirect taxes on intermediate and final consumption, taxes on production, tariffs, and export taxes/subsidies. Aggregate government expenditures are linked to changes in real GDP. The real government deficit is exogenous. Closure therefore implies that some fiscal instrument is endogenous in order to achieve a given government deficit. The standard fiscal closure rule is that the marginal income tax rate adjusts to maintain a given government fiscal stance. For example, a reduction or elimination of tariff rates is compensated by an increase in household direct taxation, *ceteris paribus*.

Each region runs a current-account surplus (deficit) which is fixed in nominal terms. The counterpart of these imbalances is a net outflow (inflow) of capital, which is subtracted from (added to) the domestic flow of saving. In each period, the model equates gross investment to net saving (equal to the sum of saving by households, the net budget position of the government and foreign capital inflows). This particular closure rule implies that investment is driven by saving.

Foreign Trade

The world trade block is based on a set of regional bilateral flows. The basic assumption in FIESTA is that imports originating in different regions are imperfect substitutes (see Figure B-4). Therefore in each region, total import demand for each good is allocated across trading partners according to the relationship

⁵⁰ For simplicity, it is assumed that old capital goods supplied in second-hand markets and new capital goods are homogeneous. This formulation makes it possible to introduce downward rigidities in the adjustment of capital without increasing excessively the number of equilibrium price to be determined by the model (see Fullerton, 1983).

⁵¹ The demand system used in FIESTA is a version of the Extended Linear Expenditure System (ELES) which was first developed by Lluch (1973). The formulation of the ELES used in FIESTA is based on atemporal maximization - see Howe (1975). In this formulation, the marginal propensity to save out of supernumerary income is constant and independent of the rate of reproduction of capital.

between their export prices. This specification of imports – commonly referred to as the Armington⁵² specification – implies that each region faces a downward-sloping demand curve for its exports. The Armington specification is implemented using two CES nests. At the top nest, domestic agents choose the optimal combination of the domestic good and an aggregate import good consistent with the agent's preference function. At the second nest, agents optimally allocate demand for the aggregate import good across the range of trading partners.

The bilateral supply of exports is specified in parallel fashion using a nesting of constant-elasticity-of-transformation (CET) functions. At the top nest, domestic suppliers optimally allocate aggregate supply across the domestic market and the aggregate export market. At the second nest, aggregate export supply is optimally allocated across each trading region as a function of relative prices.

Trade measures are fully bilateral and include both export and import taxes/subsidies. Trade and transport margins are also included, therefore world prices reflect the difference between FOB and CIF pricing.

Prices

The FIESTA model is fully homogeneous in prices, i.e. only relative prices are solved for. The price of a single good, or of a basket of goods, is arbitrarily chosen as the anchor to the price system. The price (index) of OECD manufacturing exports has been chosen as the *numéraire*, and is set to 1 in the base year and all subsequent years. From the point of view of the model specification, this has an impact on the evaluation of international investment flows. They are evaluated with respect to the price of the *numéraire* good. Therefore, one way to interpret the foreign investment flows is as the quantity of foreign saving which will buy the average bundle of OECD manufacturing exports.

Dynamic Features and Calibration

The current version of FIESTA has a simple recursive dynamic structure as agents are assumed to be myopic and to base their decisions on static expectations about prices and quantities. Dynamics in FIESTA originate from three sources: (i) accumulation of productive capital; (ii) the putty/semi-putty specification of technology; and (iii) productivity changes.⁵³

Capital Accumulation

In the aggregate, the basic capital accumulation function equates the current capital stock to the depreciated stock inherited from the previous period plus gross investment. However, at the sectoral level, the specific accumulation functions may

⁵² See Armington, 1969.

⁵³ Unlike some previous versions of the model, this version of the model does not have a resource depletion module for fossil fuels.

differ because the demand for (old and new) capital can be less than the depreciated stock of old capital. In this case, the sector contracts over time by releasing old capital goods. Consequently, in each period, the new capital vintage available to expanding industries is equal to the sum of disinvested capital in contracting industries plus total saving generated by the economy, consistent with the closure rule of the model.

The Putty/Semi-putty Specification

The substitution possibilities among production factors are assumed to be higher with the *new* than with the *old* capital vintages – technology has a putty/semi-putty specification. Hence, when a shock to relative prices occurs (e.g. tariff removal), the demands for production factors adjust gradually to the long-run optimum because the substitution effects are delayed over time. The adjustment path depends on the values of the short-run elasticities of substitution and the replacement rate of capital. As the latter determines the pace at which new vintages are installed, the larger is the volume of new investment, the greater the possibility to achieve the long-run total amount of substitution among production factors.

Dynamic Calibration

The model is calibrated on exogenous growth rates of population, GDP *per capita*, and an autonomous energy efficiency improvement in energy use (known as the AEEI factor). In the reference scenario, the dynamics are calibrated in each region by imposing the assumption of a balance growth path. This implies that capital/labor ratio (in efficiency units) is held constant.⁵⁴

⁵⁴ In the reference scenario, two equations are used to “calibrate” the aggregate capital and labor productivity parameters. The first equation is the growth rate equation determining real GDP. In the reference simulation, the growth rate is fixed, therefore this equation can be thought of as determining one of the productivity parameters. The second equation defines the capital/labor ratio in efficiency units. In the reference simulation, this ratio is again imposed (at its base year value), and therefore this equation can be thought of as determining the other productivity parameter. In policy simulations, both the rate of growth of real GDP, as well as the capital/labor ratio are endogenous, and the capital and labor productivity parameters are exogenous.

TABLE B-1: Regional Concordance of the FIESTA Model

1 CAN	Canada (CAN)
2 USA	United States of America (USA)
3 MEX	Mexico (MEX)
4 CAM	Central America
<i>Anguilla, Antigua & Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Montserrat, Netherlands Antilles, Nicaragua, Panama, St. Kitts & Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad & Tobago, Turk and Caicos Islands (CAM)</i>	
5 ANDEAN	Andean Pact
<i>Venezuela (VEN), Colombia (COL), Bolivia, Ecuador, Peru (RAP)</i>	
6 ARG	Argentina (ARG)
7 BRA	Brazil (BRA)
8 RSM	Rest of South America
<i>Chile (CHL), Uruguay (URU), Guyana, Paraguay, Suriname (RSM)</i>	
9 EUR	Europe
<i>United Kingdom (GBR), Germany (DEU), Denmark (DNK), Sweden (SWE), Finland (FIN), Austria, Belgium, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain (REU), Iceland, Liechtenstein, Norway, Switzerland (EFT), Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia (CEA)</i>	
10 ROECD	Rest of the OECD
<i>Australia (AUS), Korea (KOR), New Zealand (NZL), Japan (JPN)</i>	
11 EASIA	East Asia
<i>The People's Republic of China (CHN), Hong Kong (HKG), Indonesia (IDN), Malaysia (MTS), Philippines (PHL), Singapore (SGP), Thailand (THA), Chinese Taipei (TWN)</i>	
12 ROW	Rest of the World
<i>Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan (FSU), Turkey (TUR), Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen Arab Republic (RMI), Morocco (MAR), Algeria, Egypt, Libya, Tunisia (RNF), Viet Nam (VNM), India (IND), Sri Lanka (LKA), Bangladesh, Bhutan, Maldives, Nepal, Pakistan, Sri Lanka (RAS), Botswana, Lesotho, Namibia, South Africa, Swaziland (SAF), Angola, Malawi, Mauritius, Mozambique, Tanzania, Zambia, Zimbabwe (RSA), Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Republic of the Congo, Democratic Republic of the Congo (formerly Zaïre), Côte d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Madagascar, Mali, Mauritania, Niger, Nigeria, Rwanda, Sao Tome & Principe, Senegal, Seychelles Islands, Sierra Leone, Somalia, Sudan, Togo, Uganda, (RSS), Afghanistan, Albania, Andorra, Bermuda, Bosnia and Herzegovina, Brunei, Cambodia, Croatia, Cyprus, Fiji, Kiribati, Laos, Macedonia [former Yugoslav Republic of], Malta, Mongolia, Myanmar, Nauru, North Korea, Papua New Guinea, San Marino, Solomon Islands, Tonga, Tuvalu, Vanuatu, Western Samoa, Yugoslavia [Serbia and Montenegro] (ROW)</i>	

Notes: 1.Regional sub-aggregates are:

CSAM Argentina, Brazil, Central America, Andean Pact, and rest of South America

NAFTA Canada, Mexico and the United States

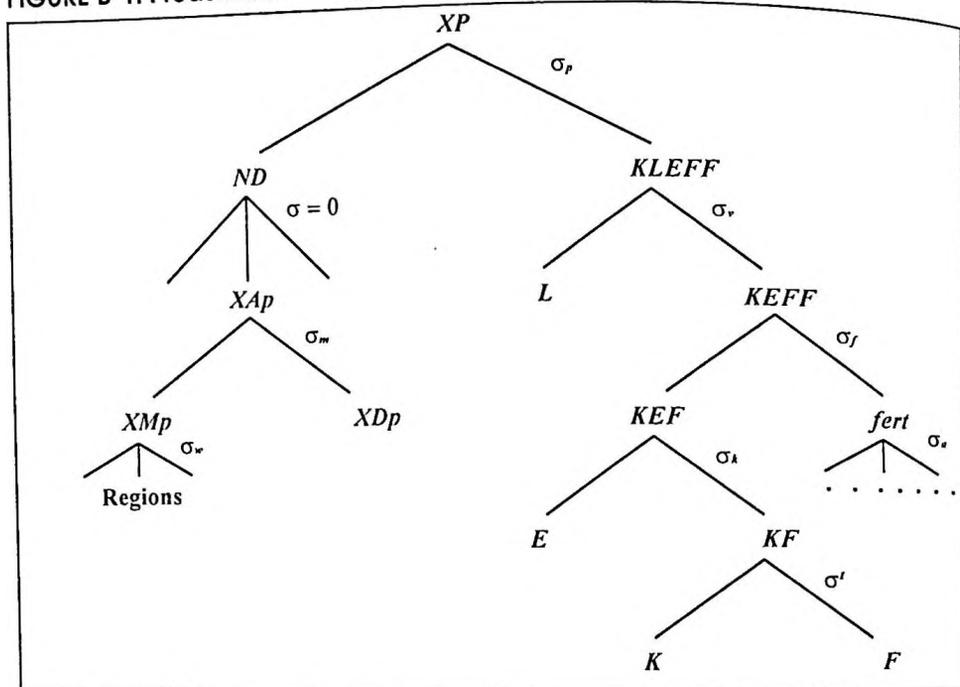
OECD Europe and the rest of the OECD

OROW East Asia and the rest of the World

TABLE B-2: Sectoral Concordance of the FIESTA Model

1 WHT	Wheat (<i>WHT</i>)
2 GRO	Other cereal grains (<i>GRO</i>)
3 OSD	Oil seeds (<i>OSD</i>)
4 C_B	Sugar cane and beet (<i>C_B</i>)
5 OCR	Other crops
<i>Paddy rice (PIDR), vegetables and fruits (V_F), plant-based fibers (PFB), other crops (OCR)</i>	
6 CTL	Bovine cattle, sheep and goats, horses (<i>CTL</i>)
7 RMK	Raw milk (<i>RMK</i>)
8 OAP	Other animal products and wool
<i>Other animal products (OAP), ywool (WOL)</i>	
9 BovMeat	Bovine meat products (<i>CMT</i>)
10 OthMeat	Other meat products (<i>OMT</i>)
11 MilkProd	Dairy products (<i>MIL</i>)
12 RefSug	Refined sugar (<i>SGR</i>)
13 VOL	Vegetable oils and fats (<i>VOL</i>)
14 OthFoodPr	Other processed foods
<i>Fisheries (FSH), processed rice (PCR), other food products (ofd), beverages and tobacco products (B_T)</i>	
15 NRG	Energy
<i>Coal (COL), crude petroleum (OIL), natural gas production (GAS), refined oil (P_C), electricity (ELT), gas manufacture and distribution (GDT)</i>	
16 TextApp	Textile, apparel, leather, and footwear
<i>Textile (TEX), Apparel (App), leather products (IEA)</i>	
17 BasInd	Basic industries
<i>Forestry (FOR), minerals (OMN), wood products (IUM), pulp and paper (PPP), non-metal mineral products (NMM), ferrous metals (I_S), other metals (NEM), metal products (FMP), chemical, rubber, plastic products (CRP)</i>	
18 OthMan	Other manufacturing
<i>Motor vehicles and parts (MVT), other transport equipment (OTN), electronic equipment (ELE), other machinery and equipment (OME), other manufactures (OMF)</i>	
19 Constr	Construction
<i>Construction (cns)</i>	
20 Service	Private and public services
<i>Trade and transport (T_T), other private services (OSP), water distribution (WTR), other public services (OSG), dwellings (DWE)</i>	

FIGURE B-1: Production Nesting in the Crop Sectors

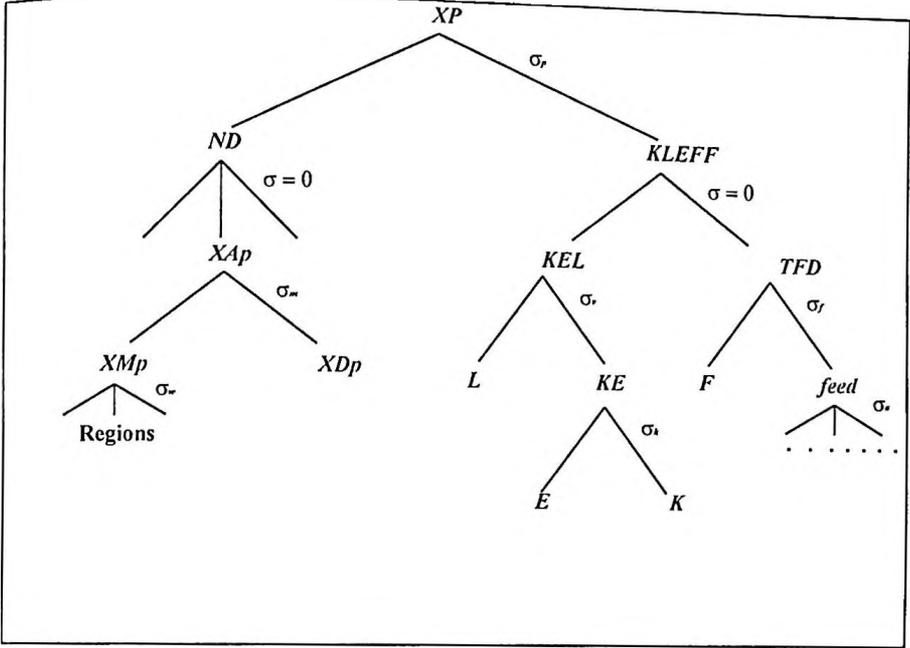


- XP*: Output (by vintage)
KLEFF: Capital, labor, energy, land and fertilizer composite good
KEFF: Capital, energy land and fertilizer composite good
KEF: Capital, energy and land composite good
Fert: Aggregate fertilizer bundle⁵⁵
E: Aggregate energy bundle
KF: Capital and land bundle
K, L, and F: Capital, labor and land
XAp: Armington demand for intermediate goods (other than fertilizer and energy)
XDp: The domestic component of intermediate demand
XMp: The imported component of intermediate demand

Note(s): 1) The following production elasticities are differentiated by capital vintage, the others are vintage independent: σ^v , σ^f , σ^k , and σ^t .

⁵⁵ In the current version of the bundle, there is a single fertilizer input, which is associated with the chemicals sector in GTAP.

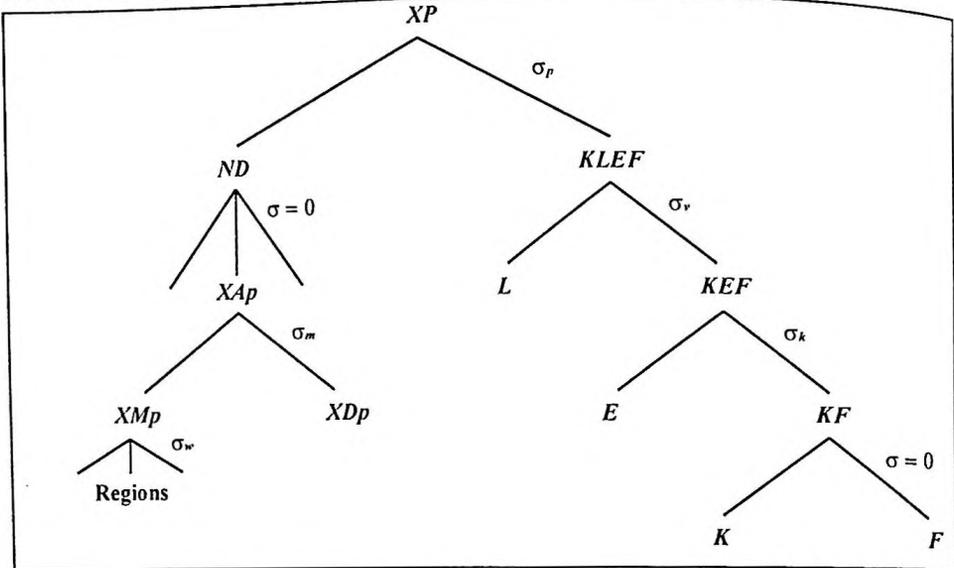
FIGURE B-2: Production Nesting in the Livestock Sectors



- XP: Output (by vintage)
- KLEFF: Capital, labor, energy, land and feed composite good
- TFD: Land, and feed composite good
- KEL: Capital, energy and labor composite good
- Feed: Aggregate feed bundle
- KE: Capital and energy bundle
- E: Aggregate energy bundle
- K, L, and F: Capital, labor and land
- XAp: Armington demand for intermediate goods (other than fertilizer and energy)
- XDP: The domestic component of intermediate demand
- XMP: The imported component of intermediate demand

Notes: 1) The following production elasticities are differentiated by capital vintage, the others are vintage independent: σ^* , σ^f , and σ^k .

FIGURE B-3: Production Nesting in the non-Agricultural Sectors



XP: Output (by vintage)

KLEF: Capital, labor, energy and sector-specific factor composite good

KEF: Capital, energy and sector-specific factor composite good

KF: Capital and sector-specific factor composite good

E: Aggregate energy bundle

K, *L*, and *F*: Capital, labor and sector-specific factor⁵⁶

XAp: Armington demand for intermediate goods (other than fertilizer and energy)

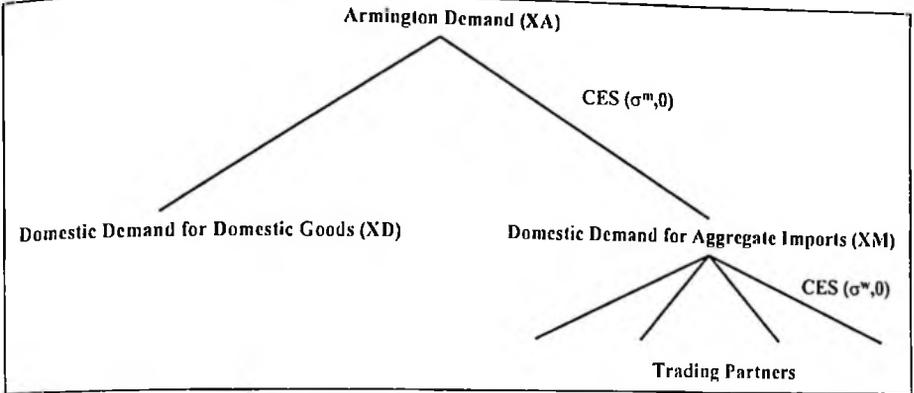
XDP: The domestic component of intermediate demand

XMP: The imported component of intermediate demand

Notes: 1) The following production elasticities are differentiated by capital vintage, the others are vintage independent: σ^p , σ^v and σ^k .

⁵⁶ The sector-specific factor includes for example natural resources.

FIGURE B-4: (Armington) Import Demand Structure



Notes: 1) FIESTA uses a two-tier Armington trade structure. Each agent in the economy determines a demand for an aggregate composite commodity, often referred to as the Armington commodity. The first stage of the Armington structure disaggregates the Armington demand into a domestic component (i.e. demand for domestic production), and an aggregate import component. The second stage further disaggregates the aggregate import demand into demand for imports from each individual region. This latter second stage determines the world trade flow matrices. The first level of the Armington structure can be either agent specific or based on the aggregate domestic Armington demand (depending on a runtime model flag). In the case of the former, both the share parameters and the substitution elasticities are specific to each agent of the economy – production, consumption, government expenditure, and investment expenditure. In the case of the latter, the agent specific Armington demands are aggregated, and the share and substitution parameters are implemented at the national level. The second level of the Armington structure uses an economy-wide demand function.

Annex C: Base Year Trade Barriers

Table C- 1: 1995 Import Tariffs and Export Subsidies – Argentina

Table C-2: 1995 Import Tariffs and Export Subsidies – Brazil

Table C-3: 1995 Import Tariffs and Export Subsidies – Canada

Table C-4: 1995 Import Tariffs and Export Subsidies – Mexico

Table C-5: 1995 Import Tariffs and Export Subsidies – USA

Table C-6: 1995 Import Tariffs and Export Subsidies – Andean Group

Table C-7: 1995 Import Tariffs and Export Subsidies – Rest of South America

Table C-8: 1995 Import Tariffs and Export Subsidies – Central America

TABLE C-1: 1995 Import Tariffs and Export Subsidies – Argentina

	Import tariffs (%)					Export subsidies (%)				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	0.0	—	—	—	0.0	—	0.0	0.0	0.0	0.0
Other cereal grains	0.0	0.0	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0
Oil seeds	0.0	0.0	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0
Cane and beer sugar	—	18.2	—	—	18.2	0.0	0.0	—	0.0	0.0
Other crops	2.5	7.1	4.7	5.7	6.2	0.0	0.0	0.0	0.0	0.0
Cattle and sheep	0.0	0.0	—	—	0.0	0.0	0.0	0.0	0.0	0.0
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beef products	0.0	0.0	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0
Other meat products	0.0	3.9	4.2	—	3.9	0.0	0.0	0.0	0.0	0.0
Dairy products	16.0	14.4	16.3	—	15.7	0.0	0.0	0.0	0.0	0.0
Refined sugar	—	15.8	0.0	—	15.5	0.0	0.0	0.0	—	0.0
Vegetable oils	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other processed foods	15.8	13.2	13.7	13.8	13.7	0.0	0.0	0.0	0.0	0.0
Textile and apparel	17.7	18.1	17.9	19.1	18.3	0.0	0.0	0.0	0.0	0.0
Basic industrial goods	10.5	10.1	10.1	11.5	10.3	0.0	0.0	0.0	0.0	0.0
Other manufacturing	8.5	13.4	10.3	12.5	10.6	0.0	-0.1	0.0	0.0	0.0
Energy	3.5	6.3	3.9	22.2	7.7	0.0	0.0	0.0	0.0	0.0
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	7.4	10.0	8.2	10.5	8.7	0.0	0.0	0.0	0.0	0.0

Notes: 1. Source: GTAP. Averages are weighted by trade shares. Calculations exclude import subsidies and export taxes.

TABLE C-2: 1995 Import Tariffs and Export Subsidies — Brazil

	Import tariffs (%)					Export subsidies (%)				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	12.2	12.2	12.2	—	12.2	—	—	—	—	—
Other cereal grains	0.0	0.0	0.0	0.0	0.0	—	0.0	0.0	0.0	0.0
Oil seeds	8.0	7.7	8.0	—	7.8	0.0	0.0	0.0	0.0	0.0
Cane and beer sugar	—	0.0	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0
Other crops	6.2	7.8	7.7	8.6	7.9	0.0	0.0	0.0	0.0	0.0
Cattle and sheep	0.0	13.7	0.0	—	12.4	—	—	—	—	—
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	0.0	13.3	2.6	6.6	3.5	0.0	0.0	0.0	0.0	0.0
Beef products	19.8	19.8	0.0	—	19.7	-12.1	-11.7	-12.8	-12.8	-12.7
Other meat products	20.0	15.8	16.3	21.6	18.5	-11.9	-12.8	-12.8	-12.8	-12.8
Dairy products	0.0	0.0	0.0	0.0	0.0	—	0.0	—	—	0.0
Refined sugar	0.0	3.5	0.0	—	2.7	0.0	0.0	0.0	0.0	0.0
Vegetable oils	0.0	9.6	2.5	4.7	7.2	0.0	0.0	0.0	0.0	0.0
Other processed foods	4.7	2.0	10.9	2.3	5.6	0.0	0.0	0.0	0.0	0.0
Textile and apparel	10.4	10.3	16.3	16.4	13.7	0.0	0.0	0.0	0.0	0.0
Basic industrial goods	7.5	7.6	9.1	7.2	8.1	0.0	0.0	0.0	0.0	0.0
Other manufacturing	20.3	25.1	21.2	19.8	21.1	0.0	0.0	0.0	0.0	0.0
Energy	9.1	19.5	7.7	18.4	16.0	0.0	0.0	0.0	0.0	0.0
Construction	—	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	11.5	11.8	13.5	11.5	12.3	-0.1	-0.2	-0.5	-0.5	-0.3

Notes: 1. Source: GTAP. Averages are weighted by trade shares. Calculations exclude import subsidies and export taxes.

TABLE C-3: 1995 Import Tariffs and Export Subsidies – Canada

	Import tariffs (%)					Export subsidies (%)				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	0.0	—	—	—	0.0	-0.2	0.0	-0.3	-0.3	-0.3
Other cereal grains	0.0	—	—	—	0.0	-0.2	0.0	0.0	0.0	-0.1
Oil seeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cane and beet sugar	—	6.8	7.3	7.3	7.2	—	—	0.0	—	0.0
Other crops	0.3	0.0	0.6	0.1	0.3	0.0	0.0	0.0	0.0	0.0
Cattle and sheep	0.0	—	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	0.0	—	0.0	0.0	0.0	-5.4	0.0	-5.5	-5.1	-5.3
Beef products	0.0	0.0	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0
Other meat products	5.8	—	5.6	0.0	5.7	-5.5	-3.8	-5.5	-5.5	-5.4
Dairy products	86.1	—	86.1	88.9	86.2	-46.3	-46.3	-46.3	-46.3	-46.3
Refined sugar	6.9	6.6	7.2	5.3	6.9	-6.8	0.0	-6.8	0.0	-6.6
Vegetable oils	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other processed foods	5.2	1.9	4.7	1.4	4.5	0.0	0.0	0.0	0.0	0.0
Textile and apparel	0.0	15.0	17.0	18.1	11.2	0.0	0.0	0.0	0.0	0.0
Basic industrial goods	0.0	1.4	5.3	4.8	1.3	0.0	0.0	0.0	0.0	0.0
Other manufacturing	0.0	1.9	4.4	2.5	0.9	0.0	0.0	0.0	0.0	0.0
Energy	0.0	5.1	8.3	8.5	5.9	0.0	0.0	0.0	0.0	0.0
Construction	—	—	0.0	—	0.0	—	—	—	—	—
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	0.2	3.1	4.7	6.2	1.6	-0.1	-0.3	-0.1	-0.3	-0.1

Notes: 1. Source: GTAP. Averages are weighted by trade shares. Calculations exclude import subsidies and export taxes.

TABLE C-4: 1995 Import Tariffs and Export Subsidies – Mexico

	Import tariffs (%)					Export subsidies (%)				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	0.0	—	—	—	0.0	—	0.0	0.0	0.0	0.0
Other cereal grains	5.0	—	0.0	—	4.9	0.0	0.0	—	-4.7	-4.0
Oil seeds	0.0	0.0	0.0	—	0.0	0.0	0.0	0.0	—	0.0
Cane and beet sugar	—	0.0	—	—	0.0	—	0.0	—	0.0	0.0
Other crops	5.7	7.0	9.9	5.7	6.0	0.0	0.0	0.0	0.0	0.0
Cattle and sheep	0.0	—	0.0	—	0.0	0.0	—	—	—	0.0
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	3.2	0.0	0.0	0.0	2.6	0.0	—	0.0	—	0.0
Beef products	0.0	0.0	0.0	—	0.0	0.0	—	0.0	—	0.0
Other meat products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy products	0.0	0.0	0.0	—	0.0	0.0	0.0	—	—	0.0
Refined sugar	0.0	0.0	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0
Vegetable oils	0.0	0.0	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0
Other processed foods	10.5	15.4	16.8	15.8	12.4	0.0	0.0	0.0	0.0	0.0
Textile and apparel	0.0	12.5	16.2	18.3	3.4	0.0	0.0	0.0	0.0	0.0
Basic industrial goods	0.0	7.4	10.2	11.9	2.5	0.0	0.0	0.0	0.0	0.0
Other manufacturing	0.0	10.1	11.0	13.3	3.4	0.0	0.0	0.0	0.0	0.0
Energy	0.0	1.6	2.2	10.0	0.6	0.0	0.0	0.0	0.0	0.0
Construction	0.0	0.0	0.0	0.0	0.0	—	—	—	—	—
Services	0.0	0.0	0.0	0.0	0.0	—	—	—	—	0.0
Average	0.3	6.3	9.3	11.7	2.8	0.0	0.0	0.0	0.0	0.0

Notes: 1. Source: GTAP. Averages are weighted by trade shares. Calculations exclude import subsidies and export taxes.

TABLE C-5: 1995 Import Tariffs and Export Subsidies – USA

	Import tariffs (%)					Export subsidies (%)				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	1.8	—	0.0	—	1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Other cereal grains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil seeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cane and beet sugar	—	63.8	67.9	63.8	63.9	—	-39.0	—	-39.0	-39.0
Other crops	1.9	2.3	5.7	3.0	2.7	0.0	0.0	0.0	0.0	0.0
Cattle and sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	0.3	1.5	4.8	0.3	1.9	-1.9	-1.1	-1.8	-1.8	-1.8
Beef products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other meat products	1.8	0.0	1.7	1.4	1.7	-1.7	-1.2	-1.7	-1.7	-1.7
Dairy products	52.2	52.4	51.8	51.8	51.8	-34.1	-34.1	-34.1	-34.1	-34.1
Refined sugar	63.8	63.8	63.8	63.8	63.8	-39.0	-39.0	-39.0	-39.0	-39.0
Vegetable oils	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other processed foods	1.2	1.6	15.6	1.8	6.7	0.0	0.0	0.0	0.0	0.0
Textile and apparel	0.0	10.5	10.1	11.2	9.9	0.0	0.0	0.0	0.0	0.0
Basic industrial goods	0.0	1.0	3.5	3.2	2.0	0.0	0.0	0.0	0.0	0.0
Other manufacturing	0.0	0.7	2.7	1.9	1.8	0.0	0.0	0.0	0.0	0.0
Energy	0.0	1.0	1.4	0.8	0.6	0.0	0.0	0.0	0.0	0.0
Construction	—	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	0.1	4.2	2.8	3.5	2.4	-0.1	-0.2	0.0	-0.2	-0.1

Notes: 1. Source: GTAP. Averages are weighted by trade shares. Calculations exclude import subsidies and export taxes.

TABLE C-6: 1995 Import Tariffs and Export Subsidies – Andean Group

	Import tariffs (%)					Export subsidies (%)				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	0.0	0.0	0.0	0.0	0.0	—	—	—	—	—
Other cereal grains	0.0	0.0	0.0	0.0	0.0	—	0.0	0.0	—	0.0
Oil seeds	14.1	11.5	—	—	12.5	0.0	0.0	0.0	0.0	0.0
Cane and beet sugar	0.0	1.4	—	—	1.4	0.0	0.0	0.0	0.0	0.0
Other crops	7.2	11.9	9.6	7.2	9.5	-0.3	0.0	-0.3	-0.5	0.3
Cattle and sheep	0.0	3.5	0.0	—	2.6	0.0	0.0	—	—	0.0
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	7.0	8.5	6.6	0.0	7.7	0.0	0.0	0.0	0.0	0.0
Beef products	5.9	4.1	0.0	—	5.4	0.0	0.0	0.0	—	0.0
Other meat products	5.7	3.0	0.0	0.0	3.8	—	0.0	—	—	0.0
Dairy products	18.1	17.2	18.0	0.0	17.9	—	0.0	—	—	0.0
Refined sugar	14.4	18.4	0.0	—	18.0	0.0	0.0	0.0	—	0.0
Vegetable oils	15.1	19.0	19.8	16.0	18.4	0.0	0.0	0.0	—	0.0
Other processed foods	13.4	13.7	18.4	1.4	14.5	0.0	0.0	-0.4	0.0	-0.2
Textile and apparel	18.4	16.9	17.0	19.0	17.6	-0.1	-0.3	-0.4	0.0	0.0
Basic industrial goods	8.3	11.0	10.9	10.8	9.9	0.0	0.0	0.0	0.0	0.0
Other manufacturing	12.8	13.2	14.1	14.0	13.4	0.0	0.0	0.0	0.0	0.0
Energy	8.1	17.1	8.0	6.3	14.2	0.0	0.0	—	0.0	0.0
Construction	0.0	—	0.0	0.0	0.0	—	—	—	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	9.4	12.0	9.5	5.5	9.6	0.0	0.0	-0.1	0.0	0.0

Notes: 1. Source: GTAP. Averages are weighted by trade shares. Calculations exclude import subsidies and export taxes.

TABLE C-7: 1995 Import Tariffs and Export Subsidies – Rest of South America

	Import tariffs (%)					Export subsidies (%)				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	0.0	0.0	—	—	0.0	—	0.0	—	0.0	0.0
Other cereal grains	0.0	0.0	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0
Oil seeds	—	11.3	—	—	11.3	0.0	-8.4	-8.6	-8.7	-8.3
Cane and beet sugar	—	12.4	—	—	12.4	0.0	0.0	0.0	—	0.0
Other crops	9.7	11.9	9.6	10.1	11.2	0.0	-0.1	-3.3	-0.5	-1.1
Cattle and sheep	—	0.9	—	—	0.9	0.0	—	—	0.0	0.0
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	9.4	10.4	8.0	0.0	9.7	0.0	0.0	0.0	0.0	0.0
Beef products	0.0	6.9	0.0	—	6.5	0.0	0.0	0.0	0.0	0.0
Other meat products	5.8	5.5	7.1	0.0	5.8	0.0	0.0	0.0	0.0	0.0
Dairy products	16.8	16.6	18.1	0.0	17.4	0.0	0.0	—	—	0.0
Refined sugar	0.0	17.9	0.0	—	16.4	-6.7	0.0	-6.7	—	-6.4
Vegetable oils	10.9	11.4	12.0	0.0	11.2	0.0	-5.8	-5.9	0.0	-5.3
Other processed foods	15.3	15.5	18.5	10.1	16.0	-0.5	-0.4	-0.2	-0.1	-0.3
Textile and apparel	10.3	17.0	12.8	12.9	13.6	-4.3	-10.3	-7.0	-12.0	-8.8
Basic industrial goods	10.2	10.8	10.9	11.0	10.7	-0.1	-0.3	-0.1	0.0	-0.1
Other manufacturing	10.7	12.4	11.7	11.2	11.4	0.0	0.0	0.0	0.0	0.0
Energy	11.8	17.1	13.5	23.0	17.7	0.0	0.0	0.0	—	0.0
Construction	—	—	0.0	0.0	0.0	—	—	—	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
Average	8.8	11.8	9.7	8.7	9.9	-0.4	-1.1	-0.5	-0.7	-0.7

Notes: 1. Source: GTAP. Averages are weighted by trade shares. Calculations exclude import subsidies and export taxes.

TABLE C-8: 1995 Import Tariffs and Export Subsidies – Central America

	Import tariffs (%)					Export subsidies (%)				
	NAFTA	CSAM	OECD	OROW	Average	NAFTA	CSAM	OECD	OROW	Average
Wheat	0.0	0.0	0.0	—	0.0	—	0.0	—	—	0.0
Other cereal grains	0.0	0.0	0.0	0.0	0.0	—	0.0	—	—	0.0
Oil seeds	10.8	5.6	—	0.0	9.7	0.0	0.0	0.0	0.0	0.0
Cane and beet sugar	0.0	0.0	—	—	0.0	0.0	0.0	0.0	0.0	0.0
Other crops	13.0	15.7	15.4	17.4	14.1	0.0	0.0	0.0	0.0	0.0
Cattle and sheep	0.0	0.0	0.0	—	0.0	—	0.0	0.0	0.0	0.0
Raw milk	—	—	—	—	—	—	—	—	—	—
Other animal products	9.8	6.0	0.0	—	8.2	0.0	0.0	0.0	0.0	0.0
Beef products	5.3	5.3	5.5	—	5.3	0.0	0.0	0.0	—	0.0
Other meat products	5.4	5.2	5.4	0.0	5.3	0.0	0.0	0.0	—	0.0
Dairy products	5.3	5.3	5.4	0.0	5.3	0.0	0.0	0.0	—	0.0
Refined sugar	16.6	35.1	15.2	—	23.1	0.0	0.0	0.0	0.0	0.0
Vegetable oils	6.4	12.2	20.4	8.1	10.2	0.0	0.0	0.0	0.0	0.0
Other processed foods	13.4	20.0	16.7	2.3	15.6	0.0	0.0	0.0	0.0	0.0
Textile and apparel	22.7	18.0	16.8	16.0	20.2	0.0	0.0	0.0	0.0	0.0
Basic industrial goods	8.4	10.1	8.0	7.8	8.7	0.0	0.0	0.0	0.0	0.0
Other manufacturing	6.8	7.2	7.3	7.6	7.2	0.0	0.0	0.0	0.0	0.0
Energy	6.9	1.5	8.6	0.0	3.4	0.0	0.0	0.0	0.0	0.0
Construction	0.0	0.0	0.0	0.0	0.0	—	—	—	—	—
Services	0.0	0.0	0.0	0.0	0.0	—	—	—	—	—
Average	10.7	8.1	6.6	8.3	8.6	0.0	0.0	0.0	0.0	0.0

Notes: 1. Source: GTAP. Averages are weighted by trade shares. Calculations exclude import subsidies and export taxes.

Comments by Antônio Salazar P. Brandão

It is a pleasure to discuss the interesting paper prepared by Dominique van der Mensbrugge and Ramiro Guerrero. The paper contains useful information for the analysis of the consequences of the creation of free trade areas in the Latin-American region and more broadly in the whole continent. I will focus my comments on specific issues and, whenever possible, will try to compare results with those of other models.

But let me start with one remark about the model. FIESTA is a recursive dynamic model. Compared to static models, this structure puts an additional burden on the analyst since calibration, among other things, is more difficult. But there are additional benefits too. One of them is the possibility of looking at the adjustment of the economy before it returns to its balanced growth path.

And this leads me to ask why adjustment paths were not shown in the paper? Adjustment issues in the labor market are likely to be one of the dominant factors in the policy discussion of FTAA. It would be quite interesting to see what the model is saying about the relocation of labor among sectors and activities and about the trajectory of the real wage rate over time.

But if labor market issues are a bit beyond the terms of reference for a paper focused on agriculture, it still would be useful to know how production, exports, imports and prices of agricultural commodities adjust over time. This type of information is crucial to allow both the government and private decision makers to make better judgements about who will bear the adjustment costs of the transition.

Let me now note three points related to data:

a. Instability in the Brazilian PSEs and NRPs are, to a great extent, a problem of policy instability and do not arise solely because of methodological issues. Brandão and Carvalho have encountered the same type of problem in their study of agricultural price policy from the late 1960s to the early 1980s. Nonetheless, it is important to acknowledge that high rates of inflation, such as those verified in Brazil in recent years, complicate the calculation of these coefficients since not all prices adjust at the same speed.

b. Another issue is the regional variation in tariffs. The GTAP data base still does not capture well country or region specific tariffs. Most of the differences found in the calculations are likely to be caused by aggregation. I suspect that, even for the narrowly defined commodities, this may be true. This is an obviously important issue because tariff changes drive the results. I suggest that the authors try to pin down exactly for which goods the data base is picking up preferential treatments and for which goods the difference is due to aggregation or other causes.

c. On Table 6 the regional aggregation is an unnatural one. Given the importance of MERCOSUR in the region, it would make more sense to have the MERCOSUR countries as one of the aggregates. This will facilitate the understanding of these tariffs. For example, I am puzzled by the fact that *cane and beet sugar* have an import subsidy of 10.4% from CSAM countries when the MERCOSUR common external tariff is 16%.

The experiment in the paper is the linear reduction to zero of positive tariffs during the period 2000 until 2010. Two free trade areas are considered:

- *Free Trade in Latin America (FTLA)*. In this case, all positive tariffs among Latin-American countries are eliminated (Mexico is included in the NAFTA region) by the year 2010.
- *Free Trade in the Americas (FTAA)*. Includes Canada, Mexico and the United States.

This experiment is not in the spirit of what is likely to take place during the negotiations. By removing only positive tariffs, the experiment allows import subsidies to remain in place after the creation of the free trade area. If these are not eliminated, the scope for gain by some countries will be much less. For example, NAFTA has an import subsidy of 11.8% for oilseeds imported from NAFTA countries (Table 6 of the paper). For imports of the Central and South American countries the subsidy is only 4.3%. Clearly not removing this subsidy will reduce the scope for oil seed exports, say from Argentina and Brazil, into NAFTA countries and reduce *a priori* the attractiveness of FTAA.

One of the important aspects of the existence of various studies such as this is that they allow us to identify common patterns in the results and to spot those areas where the results are not entirely consistent. The common patterns are useful in pointing out the nature of the effects being analyzed and comprise the part that should interest the most to policy makers and negotiators. The diverging results require further research and is the job of the academic community to understand why they are different.

I would have liked to compare the results in this paper and those of Brandão, Valls, Lopes, Souza e Ribeiro on the impacts of FTAA on Brazil. The analysis was based on the GTAP (see Hertel) model.

But this comparison cannot be easily made. In our paper we have used a previous version of the GTAP database, namely the 1994 version, while the database used by van der Mensbrugghe and Guerreiro is the most recent one. The protection data is therefore quite different since the base year there was 1989, prior to MERCOSUR and to the unilateral trade reform of Brazil. Because of this, the experiment in our paper was done in two steps: first we simulated the creation

of MERCOSUR⁵⁷ and, from there, FTAA was simulated by setting all tariffs within the continent to zero. It should be noted also that the aggregation in our paper is different than the one used here.

Nevertheless, the following points are useful to note:

- the impacts on production are, for most goods, not large in both exercises. This is not surprising since exports and imports are still a relatively small proportion of production in Brazil (even in agriculture). A similar result was also found by Brandão, Hertel and Campos; and
- the most dynamic exports of Brazil are those of manufactured goods as opposed to those of agricultural goods.

But there are different results too. One of the most important is the welfare analysis. In our paper there are unambiguous welfare gains (as measured by the equivalent variation) for Brazil with FTAA. Brazil gains are approximately US\$ 1.5 billion. The losers naturally are the countries excluded from the agreement, namely the European Union and the Pacific Countries. The North American region (Canada and the USA) is the biggest gainer.

The contrast with the results reported by van der Mensbrugghe and Guerrero, who show a welfare loss for Brazil, requires specific attention from all of us.

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⁵⁷ In other words, the common external tariff was imposed for imports from outside MERCOSUR and the intra MERCOSUR tariffs were set to zero.

Comments by Gervásio Castro de Rezende

I have two sets of comments to make. The first is related to the contents of section 2, especially on data on Brazil. The second is on the limitations of the model to assess regional integration.

On section 2 my comments are the following:

1. I do not believe that "liberalization of trade" is "one of the main features of agricultural policy reforms", since it is a policy in itself and affected agricultural policy but without being a part of agricultural policy. The authors indirectly recognize this when they note the inconsistency between "support policies" and "trade agreements";

2. It should be noted that the price band system was not in fact adopted. Moreover, it is not correct to say that in 1993 there was a "complete deregulation of agricultural markets". In 1995, for instance, the government financed the stockpiling (EGF) of more than 5 million tons of maize and 1.6 million tons of rice; even soya had its commercialization strongly supported by the government. On the other hand, the authors left aside the drastic changes in agricultural policy which occurred from 1996 onwards;

3. In relation to US policy, the authors referred only to the FAIR Act (1996), without emphasizing, among other important features, that the relevant price from the point of view of decision-making by the US farmer in relation to sowing, is the market price itself and not the guaranteed prices. In the new situation, adjustment of total world supply to price variation will be much faster as a consequence of the swifter US reaction and markets shall be generally more volatile.

4. It is asserted that "interest rate controls and concessions are no longer used", but this is not true in the case of Brazil.

5. The nominal rates of protection for Brazil in table 2 are rather strange. Duties on wheat are introduced in 1989, which is absurd. Soya appears as highly protected in 1994! But the worst case is that of maize: it is highly subsidized (at a rate which reaches a peak of 67.5%) in the whole 1985/95 period; this is certainly due to the fact that domestic price was compared to FOB export prices as Brazil were a maize exporter when in fact it is an importer.

The limitations of the use of the model for analysis of trade integration are a consequence of the FIESTA being a direct descendant of the RUNS (Rural Urban North South). The RUNS model was created in the OECD Development Centre to analyze the liberalization of agricultural trade then under discussion in the Uruguay Round of multilateral trade negotiations in the GATT. This explains why

the model was very disaggregated in the agricultural sector and too aggregated in the case of other sectors.

In the analysis of trade integration it is important to gauge the impact on all sectors as there would certainly be losers and winners. The authors note that "the South would tend to export more agricultural goods to the North, in exchange for more industrial goods." It would be necessary to disaggregate more the industrial sector (which has only two subsectors in the FIESTA model: "basic industrial goods" and "other manufacturing"), to adequately assess sectoral resistance to the FTAA. One should also not criticize the FTAA initiative based on the assessment of its impact on a specific industrial sector as done, for instance, for telecommunications in this seminar.

TECHNOLOGICAL CHANGE AND MODERNIZATION IN THE MERCOSUR AUTOMOTIVE INDUSTRY*

Paulo Bastos Tigre, Mariano Laplane, Gustavo Lugones and Fernando Porta

1. Introduction

THE DEVELOPMENT OF THE automotive industry in MERCOSUR countries is being strongly stimulated by the agreements on market unification between the bloc's members. MERCOSUR is a consumer market of more than 200 million people, with an estimated GDP of over US\$ 1 trillion and a high income-elasticity of demand. The establishment of MERCOSUR gave rise not only to intra-subregional trade growth but also to a marked increase in investment and output in the automotive sector, a sector in which the main world markets are saturated. In the 1990s, investment in this sector in MERCOSUR will reach almost US\$ 25.000 million, while the production of vehicles grew from 650,000 in 1990 to 2.2 million in 1997.

It should be noted that such a performance is not solely attributable to the MERCOSUR free trade agreements, but also to macroeconomic factors and to recovery in the markets. Macroeconomic stability, particularly of exchange and interest rates, has decisively affected vehicle trade, investment and consumption. The "boom" of 1994-1997 has now been interrupted by the balance of payments problems confronting mainly Brazil, and by the consequent devaluation of the Real in January 1999. The performance of the macroeconomic variables also affects the institutional framework, which hampers the economic integration process. Despite the progress made, the sub-region continues to display significant regulatory asymmetries and the establishment of a common automotive regime still requires substantial efforts at harmonization.

This article seeks to analyze the effects of the sub-regional agreements on MERCOSUR's member countries, with particular reference to the adding of value, trade creation and diversion, the benefits to consumers, and the regional regulatory difficulties. The main analyses and findings on MERCOSUR's automotive sector, as well as its key future challenges, are summarized in the context of the strategies adopted by multinational companies, technological change, and the reorganization of the international production chain. As to the challenges, stress is placed on the need to harmonize the regulatory distortions stemming from existing incentives and subsidies in the four countries, and the question of extra-MERCOSUR trade in the context of a growing trade deficit.

*This and following three sectoral papers were presented only in a summary form in the seminar.

2. MERCOSUR and the International Automotive Industry

At the international level, there is growing competition and internationalization in world vehicle production. Accumulated investments and improvements in productivity have led to an increase in installed capacity that exceeds expected demand by more than 30%. The traditional markets are relatively saturated, characterized by a high ratio of vehicles per person and facing problems of congestion and environmental pollution. The emerging markets, on the other hand, are more dynamic, with brighter prospects for growth in potential demand.

In these circumstances, the auto companies have adopted a strategy that combines: a) reorganization of the value chain so as to adapt it to the new conditions determining cost-effectiveness; b) intensifying the internationalization of production so as to strengthen their presence in the markets with greatest potential; and c) adaptation of their production structures to the emergence of large trading blocs in the world economy. Although the national bases of the automotive industry are being undermined by the globalization of competition, there is no world vehicle market. More evident is a process of sub-regionalization of the industry, and hence the necessity for firms to establish a production base in each of the main sub-regions.

Investments in developing countries respond to two distinct logics. First is the search for a way to reduce production costs so as to serve neighboring central markets (European periphery, Mexico). In this case, such investments are part of a vertical division of labor in each sub-region. Second is the desire to capture emerging markets (China, MERCOSUR). In the latter case, market size and the existence of special rules for the sector explain the location decision. In general terms, these investments respond to cutting edge product technology, techniques and production processes. In turn, the firms secure economies of scale at the global level, sharing components among plants in different locations.

The auto firms' strategy seeks to reactivate sales by reducing prices, increasing model variety and renewing products almost permanently. This entails higher expenditure on product development and reducing the acceptable period for return on investments. The compromise between variety and profitability tends to be solved by introducing innovations in plants and in the chain of suppliers. The technical changes have reduced the economically viable scale to around 100,000-150,000 units. The increased capacity for intra-model differentiation has allowed companies to exploit market segmentation, and lower volumes of each individual model are sold without affecting costs. Such a trend facilitates investments by new companies that are not yet present in MERCOSUR, with the aim of exploring local market "niches" that are relatively small by international standards, such as in light utility vehicles and luxury cars.

The new competitive and technological model involves very close cooperation between assembly companies and their direct suppliers. This entails a process of "simultaneous engineering" so as to cut the supply period and to share development costs with the suppliers of parts. Simultaneous engineering consists of dividing the tasks involved in producing new models between the central auto companies and the suppliers. The pattern of production tends to be based on long-term relationships, joint production planning, the auto firms' concentration on design tasks (with an attendant deverticalization of the plant), and the use of modular assembly techniques (demand for complete systems and sub-assemblies). Supply networks tend to be pyramidal, comprising successive strata composed of an increasing number of suppliers that are more distant from the central auto companies.

The most immediate suppliers take responsibility for setting up the systems and for coordinating the provision of sub-assemblies and parts provided by those in the lower layers of the structure. The circle of direct suppliers consists of a relatively small number of companies linked to the auto firms or to very large independent companies that have enough financial and technological capacity to engage in simultaneous engineering and to join in their clients' internationalization strategy. This trend also translates into a growing concentration and transnationalization (through acquisitions, mergers or new revenues) of the auto parts industry in the various producer markets. A significant repercussion of this process for the MERCOSUR countries is the concentration of auto parts production in a small number of transnational companies, to the detriment of traditional Brazilian and Argentine suppliers. The local companies generally lack the necessary financial and technological capacity to become global.

In the 1990s, developing countries were the main targets for investment by auto companies and producers of parts. The Japanese companies continued investing mainly in Asia, while the Americans and Europeans concentrated their investments in Latin America and the European periphery. Production capacity in the Asian and Latin-American countries will have doubled by 2000 if compared to mid-decade figures. MERCOSUR has become a significant arena for global oligopolistic competition in this industry. For European firms, the region is an essential base for their survival strategy. For American companies, it is the second foreign market after Europe. Suppliers of parts tend to follow this trend, and to follow their clients to the new locations.

3. The Regulatory and Macroeconomic Framework in MERCOSUR and Its Impact on the Sector

The performance of the MERCOSUR auto industry was facilitated by a favorable combination of exogenous factors. Changes in the macroeconomic environment

induced a sharp increase in domestic demand. In particular, price stability allowed the countries of the sub-region to develop credit and financing mechanisms conducive to the consumption of durables. At the same time, sectoral policies adopted in Argentina and Brazil, as well as progress in the integration program, were decisive in reactivating and reorganizing local production and in attracting new investments.

The rapid growth of the Argentine economy between 1990 and 1994 was largely driven by the expansion of private consumption. In this context, the performance of the auto industry in itself explained only half of the growth of manufacturing industry. The subsequent recession, following the "tequila effect", facilitated a marked expansion of sectoral exports to the Brazilian market, an expansion that was sustained in the reactivation phase that began in 1996. The growth effect of price stabilization was replicated in Brazil as of 1994, and was maintained until the end of 1997. As integration advanced, national and sub-regional demand interacted positively in this period.

The counterweight to this process was the negative pressure on both economies' external accounts arising from changes in the sector's methods of internationalization. Under these conditions, the auto companies' modernization strategy and search for efficiency gave rise to external deficits and to the fragility of local production linkages. Growing global trade deficits, fostered by the policies of commercial opening and overvalued currencies, raised doubts as to whether growth could be sustained – as shown by the devaluation of the Real in January 1999. The new policy of allowing the Brazilian currency to float freely, adopted since then, contrasts with the Argentine currency board system that ties the value of the Peso to the dollar at fixed parity. Such a difference in the exchange regimes of MERCOSUR's two leading countries causes macroeconomic uncertainties that affect trade and investment.

The policies and institutions characteristic of a closed economy were dismantled in the 1990s. The conception of industrial policy, in particular, was radically altered, with an attendant abandonment of the earlier preference for sectoral or vertical policies. Within this general framework in the MERCOSUR countries, policy towards the automotive sector was a significant exception. In this case, the regulations applied in Argentina and Brazil (and, in some sense, in Uruguay too) were sectorally defined and sought to promote investment and the local production of vehicles in a context of relatively high protection. The main distinctive features were the promotion of product modernization, specialization, securing productive scale, deverticalization and greater use of imported components.

In the Argentine case, the opening of the sector was managed through compensated trade demands so as to stimulate a flow of exports. In turn,

investment was promoted by applying differential tariffs to the imports brought in by the auto companies. In Brazil, the main instrument initially adopted was a special tax regime for production of a low-price vehicle (a standard car), which coincided with a program of relative trade liberalization in the other categories. As of 1995, this system was replaced by one similar to that used in Argentina, although with higher tariff levels. The sub-regional agreements recognized these national norms and complemented them with the liberalization of intra-zone trade.

The national regulatory regimes will expire at the end of 1999, and should be replaced by a common MERCOSUR regime that is still under discussion. Some elements of the future common regime have been fixed and are unlikely to be changed. Prominent among these are:

- complete liberalization of intra-subregional trade (elimination of trade compensation mechanisms);
- common external tariff of 35% for vehicles;
- elimination of the preferential tariffs on imports (currently granted in Brazil and Argentina in proportion to exports);
- minimum 60% content of sub-regional parts.

The common external tariff level for parts and inputs, and the minimum content of national parts, are still to be defined. This also applies to the imposition of tariffs or the use of other compensation instruments for intra-zone trade in products manufactured in plants that receive subsidies or state transfers.

There are also greater unknowns. One is the future of the parts sector, and particularly the precise nature of the division of labor among the countries of the sub-region. This issue is very sensitive to the decisions that will be made on effective protection levels for the automotive sector, and on the required levels of sub-regional and (eventually) national content in production. The other unknown is the sustainability of the industry in the sub-region (particularly as regards the level of foreign capital in the sector) when the current regulations no longer apply. In other words, there are doubts about the level of trade deficit that can be absorbed by each partner in the face of a high and growing level of imports, especially of parts. We will return to these matters in the next section.

4. Structure and Performance of the Industry in MERCOSUR

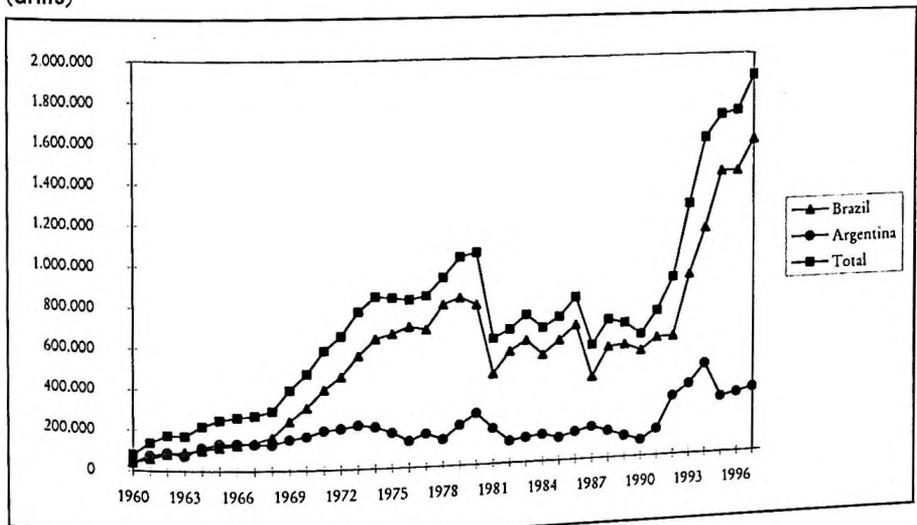
The integration of the markets of the four MERCOSUR countries has entailed the emergence of a large sub-regional market with a peculiar characteristic: MERCOSUR is simultaneously an important "emerging market" (comparable to France and the United Kingdom, greater than that of Italy, South Korea, Canada and Spain), and an important "emerging producer" (with an installed capacity comparable to that of South Korea, Spain and Canada). It differs from these latter

mainly in its lower export coefficient, which is similar to large national markets such as China and India.

The industry had similar origins in both Argentina and Brazil: it began in the 1950s with the first wave of internationalization of US and European auto companies. Most of these were established in one country or both to produce for the domestic market. They developed very differently in the 1970s: in Argentina, output fell because of the stagnation of the domestic market and the failure of attempts at export promotion; in Brazil, output increased five-fold and the companies modernized their facilities. In the 1980s, industrial activity declined in both countries, and the differences in size persisted. In Argentina, after a brief period of opening to imports, some companies (GM, Chrysler, Fiat, Peugeot, Citroen) closed their plants or transferred them to local licensees.

Toward the end of the 1980s, after more than 30 years of ups and downs in local production and of gradual decline from international standards, output levels were similar to those at the outset in Argentina and to those of 1970 in Brazil. Overall, some 600,000 vehicles were being produced, there was severe backwardness in product and process technology, and national content was almost 100%. The change in macroeconomic conditions in the 1990s spurred demand while the new sectoral regulations expanded and modified the supply profile. By 1997, Argentine output stood at almost 500,000 vehicles and Brazilian production was around 1.8 million. Sub-regional output is thus about 5% of the world total.

GRAPH I: Internal Automobile Market in Brazil and Argentina 1960-1997 (units)



Source: AAMA, ANFAVEA and ADEFA. Presentation, NEIT/IE/UNICAMP.

TABLE 1: MERCOSUR: Production, Sales and Foreign Trade of Vehicles, 1996
(units)

Country	Production	Internal market	Imports	Exports
Argentina	312,910	376,109	161,002	109,041
Brazil	1,804,328	1,730,791	224,008	296,273
Paraguay	0	24,959	24,959	0
Uruguay	2,703	28,804	28,804	3,553
Total MERCOSUR	2,119,941	2,160,663	438,773	408,867

Source: ANFAVEA. Presentation NEFT/IE/UNICAMP.

The number of vehicles sold in the sub-region in 1996 placed MERCOSUR in sixth place in the world ranking of markets, after the United States (15.4 million units), Japan (7.0 million), Germany (3.7 million), France (2.5 million) and the United Kingdom (2.2 million). In that year, MERCOSUR's car market surpassed that of Italy (1.8 million), South Korea (1.6 million), Canada (1.2 million) and Spain (1.1 million).

In the ranking of producers, MERCOSUR was in eighth place after the United States (11.8 million units), Japan (10.3 million), Germany (4.8 million), France (3.5 million), South Korea (2.8 million), Spain (2.4 million) and Canada (2.4 million). MERCOSUR ranked higher than Italy (1.5 million), China (1.4 million) and Mexico (1.2 million).

The potential size of the market, the performance of demand in recent years and the creation of an enlarged market, prompted a strategic change in automotive firms' decisions on MERCOSUR. It is estimated that by the end of this decade, about US\$ 20 to 25 billion (divided 4 to 1 between Brazil and Argentina) will have been invested in the sub-regional industry, and that there will be a total installed production capacity of between 3.5 and 4 million units a year. In line with world trends, the sub-regional industry will also have a significant level of excess supply unless there is a substantial increase in extra-MERCOSUR exports or greater internal demand. Neither circumstance seems very likely given the current income profile and production costs.

The firms already installed in the sub-region were joined by Asian newcomers. Moreover, companies that had previously withdrawn from Argentina returned and firms installed in only one country opened plants in the other. After a first stage (to 1994) of adapting to the growth of demand by exploiting and rationalizing installed capacity, as well as by partial improvements to prevent bottlenecks, investment projects were geared towards the installation of state of the art plants to produce new models for simultaneous or near-simultaneous launch in the main consumption centers. These projects feature intra-subregional specialization and complementarity that benefit from the instruments of the economic integration program.

Three different strategies are evident among the firms. The first is that of the four big sub-regional producers that account for 90% of the market. Fiat and GM devised their new projects in light of the sub-regional market; VW and Ford adapted their sub-regional base to the new conditions. These four concentrate on production of a relatively limited range of small and medium models, and they import upper range vehicles from outside MERCOSUR. The second strategy is that of companies without a prior presence in Brazil that began their sub-regionalization process late: Peugeot, Citroen and Renault. Their model of installation is the same as that of the four big producers, but their prospects for success depend on the financial effort they make to capture parts of the sub-regional market, which is seen as strategic for their international positioning. The third strategy is that of the Asian terminals, Toyota, Honda, Asia, and Hyundai. These develop low-scale projects concentrated on utility vehicles, and they import vehicles from outside MERCOSUR for the purposes of brand positioning.

Under the promotional regimes used to date, opening to imports was heavily managed and the auto companies were given effective control of the process through tariff differentials and trade compensation instruments. Hence, in both countries, over 80% of imports are brought in by the affiliates in place. At the same time, intra-firm trade within MERCOSUR is particularly intense, the result of the dominant strategy of a sub-regional division of labor. In this context, competition between brands (through prices and pre- and post-sale services), accentuated by the different positioning requirements and the prospects of over-production, serves as a significant market regulator.

The substantial expansion of the industry's output in the 1990s was accompanied by a stagnation in employment levels which, given the negative trends in most industrial sectors in the period, made the auto sector a relative recipient of manpower. Once the ongoing projects have matured, the employment prospects for the sector are poor. In this context, productivity leaped spectacularly, growing by 157% and 127% respectively in Argentina and Brazil between 1990 and 1997. The auto companies average 15 vehicles per worker (with an individual range that goes from 12 to 20), a level still remote from the average of 50 in plants in Japan. The main factor in this sub-regional productivity performance lies in the strategies of profits of scale per model produced, and in the use of new organizational techniques.

The new projects included international state of the art technology in production and management and, to a lesser degree, in the area of processes. It is in this latter area that the greatest heterogeneities and asymmetries are evident, not only between modernization and greenfield projects, but also as regards best international practice. In general, the smaller scale of the undertakings (in

Argentina they are not normally beyond the lower level of the optimal range) leads to a smaller relative degree of automation in some stages.

It is much easier to get a brand new vehicle. Gone are the long delays in delivery and the imposition of surcharges or particular models, while the financing plans offered to buyers compare favorably with those for other consumer durables. Although average prices have been disinclined to fall, and there are still significant differentials with regard to international averages, the upgrading of models means that accessories, which five or six years ago were reserved for luxury vehicles, can now be obtained for substantially less outlay.

Changes in the product and in the auto companies' logic of production also redefine the production standards in the parts sector. On the one hand, in some cases the products themselves are modified and tend to be developed as sub-assemblies. On the other, there is in general a sharp increase in demands on quality, scale, costs and delivery times. In this regard, parts firms that supply vehicle manufacturers on an international scale have decisive advantages over local suppliers, in as much as they might already have made and supplied to the corporation the parts needed for new models. This largely explains the entry of new foreign direct investment (FDI) into the parts sector, often through a deliberate process whereby the assembly companies "import" suppliers.

The global trend to reduce the number of suppliers and to broaden the mechanisms of technological cooperation parallels the preference for putting together sub-assemblies in new plants. The terminals opt, in strict order, for global suppliers, joint ventures with international firms or local parts makers that produce under some international license. This constrains the local suppliers' possibilities for technological development and imperils their very survival. It is important to note that the national regimes have not included specific instruments to develop suppliers, with the exception of the sub-regional content requirements.

5. International Trade and the Role of MERCOSUR in the Sector's Development

MERCOSUR's vehicle exports have tripled relative to the 1980s average. This is the result of a ten-fold and seven-fold increase in the volumes exported respectively by Argentina and Uruguay since 1991, and of the doubling of Brazilian sales. The sub-regional market was the leading destination of exports and the main factor underlying this performance. In 1997, intra-subregional trade stood at almost two thirds of total automotive trade between the member countries. Such a development reflects the integration and complementarity strategies adopted by companies in MERCOSUR, which have sub-regionally specialized their facilities. At present, the export coefficient is around 20% for Brazil, with anti-cyclical fluctuations, and exceeds 30% in Argentina.

TABLE 2: Vehicle Exports from MERCOSUR by Three-year Periods
(in US\$ thousands)

Country	Period I 1986-1988	Period II 1991-1993	Period III 1994-1996	Annual variation *
Argentina	347,360	1,223,879	3,585,402	31.0%
Brazil	7,630,620	8,513,885	9,610,714	7.9%
Paraguay	-	185	7,238	-
Uruguay	39,078	122,104	277,247	14.9%
MERCOSUR	8,017,058	9,860,053	13,480,971	11.2%
Growth in the period	-	22.9%	36.7%	-

Sources: DATAINTAL and ANFAVEA

* average annual geometric rate between 1986 and 1996

TABLE 3: Share of Vehicle Exports in Total MERCOSUR Exports,
by Three-year Periods
(in US\$ millions)

Item	Period I 1986-1988	Period II 1991-1993	Period III 1994-1996	Annual variation *
Vehicle exports (a)	8,017,058	9,860,053	13,480,971	11.2%
Total exports (b)	109,632,536	150,864,583	207,511,744	9.38%
Share (a/b)	7.31%	6.54%	6.50%	-

Sources: DATAINTAL and ANFAVEA

* average annual geometric rate between 1986 and 1996

In the Argentine case, export growth is almost exclusively linked to the opening of the Brazilian market and responds to the compensated trade requirements established by the national regime in place since 1991. By contrast, the Brazilian industry was already exporting heavily towards other Latin-American countries by the mid-1980s, helped by intensive promotional programs. The creation of the "MERCOSUR automobile" entailed a complete reorientation of Brazilian export flows, particularly towards Argentina. In the case of auto parts, the changes in trends between the two decades were less significant, since the intra-MERCOSUR (in fact, Argentina-Brazil) pattern of specialization and complementarity had begun developing earlier. In the auto parts sectors, the MERCOSUR effect accelerates and deepens previous strategies.

With regard to imports of vehicles and of their parts and spares, growth in the sub-region has averaged around 22% a year and the automotive sector's share of imports almost doubled in the period, increasing from 5.49% to 10.17%. Argentina and Paraguay experienced the greatest relative growth in this period, with annual averages of almost 27% and 25% (Table 4). Following this phenomenal expansion in the first half of the 1990s, however, the sub-regional trend is towards a gradual reduction in the rate of import growth. This is due to three factors: first, new vehicles and components factories have begun operations; second, the growth rate of the domestic vehicle market in Brazil and Argentina has declined since 1998, after constrained demand for imported vehicles had been met

and overall economic growth had slowed; third, a common automotive regime will enter into force in 2000, favoring internal production with a common external tariff of 35% and a 60% minimum content of locally-acquired components. Such a policy eliminates some current incentives to import in Brazil, which facilitates the reduction of tariffs for companies interested in producing locally.

TABLE 4: MERCOSUR Vehicles Imports by Three-year Periods
(in US\$ thousands)

Country	Period I 1986-1988	Period II 1991-1993	Period III 1994-1996	Annual variation *
Argentina	765,664	4,267,926	7,950,579	26.9%
Brazil	2,646,651	4,101,238	13,081,670	20.2%
Paraguay	92,785	314,639	563,840	24.6%
Uruguay	233,244	627,288	832,226	18.2%
MERCOSUR	3,796,174	9,311,091	22,428,315	22.1%
Growth in the period	-	145%	141%	-

Sources: DATAINTAL, ANFAVEA

* average annual geometric rate between 1986 and 1996

TABLE 5: Share of Vehicle Imports in Total MERCOSUR Imports,
by Three-year Periods
(in US\$ millions)

Item	Period I 1986-1988	Period II 1991-1993	Period III 1994-1996	Annual variation *
Vehicle imports (a)	3,796,174	9,311,091	22,428,315	22.1%
Total imports (b)	69,113,007	118,552,311	220,429,800	14.2%
Share (a/b)	5.49%	7.85%	10.17%	-

Source: DATAINTAL and ANFAVEA

* average annual geometric rate between 1986 and 1996

The fact that imports grew more than exports led to a progressive deterioration in the sub-region's automotive trade balance in the three periods analyzed (Table 6). MERCOSUR's trade balance of US\$ 4,200 million in the first period became a deficit of US\$ 8,900 million in the latter period. Argentina's deficit was bigger, although growth of exports (31%) and imports (27%) was more balanced. In Brazil, export growth was much greater than import growth (20% and 8%, respectively), prompting a reversal of the sector's traditional trade balance. In Uruguay, as in Argentina, export growth (15% a year) and import growth (18%) were more balanced but still enlarged the overall deficit.

**TABLE 6: MERCOSUR Automotive Trade Balance by Three-year Periods
(in US\$ thousands)**

Country	1986-1988	1991-1993	1994-1996	Annual variation *
Argentina	(418,304)	(3,044,047)	(4,365,177)	23.7%
Brazil	4,926,139	4,412,647	(3,470,956)	-
Paraguay	(92,785)	(216,768)	(556,232)	-24.5%
Uruguay	(194,166)	(505,184)	(554,979)	-19.0%
MERCOSUR	4,220,884	548,962	(8,947,344)	-

Source: DATAINTAL, ANFAVEA

* average annual geometric rate between 1986 and 1996

The deficit in the automotive sector accounted for almost 70% of the sub-region's total trade deficit (Table 7). This owes most to the situation in Argentina, where the automotive sector's trade deficit represented 90% of the total trade deficit in the latter three-year period. The search for greater equilibrium has been the keynote of ongoing discussions to define a new common policy. Argentina advocates maintaining a minimum local content of 60%, of which half should be from the country itself. Brazil argues for less local content, without discriminating against the MERCOSUR country in which the components originate.

**TABLE 7: Contribution of the Automotive Sector to the Trade Deficit
in the Period 1994-96 (in US\$ thousands)**

Item/Country	Argentina	Brazil	Paraguay	Uruguay	MERCOSUR
Total exports	60,606	137,804	2,679	6,416	207,505
Total imports	65,466	138,405	7,785	8,773	220,429
Balance /Deficit (1)	(4,860)	601	(5,106)	(2,357)	(12,924)
Balance /Deficit of the sector (2)	(4,365)	(3,471)	(556)	(555)	(8,947)
Share 2/1	89.8%	-	10.8%	23.5%	69.2%

Source: DATAINTAL, ANFAVEA

The sub-regional trade of MERCOSUR's automotive sector grew from less than 9% in 1986 to almost 58% in 1996. This growth reflects the sub-regional integration strategy of the companies operating in the bloc, which effectively specialized their industrial units in Brazil, Argentina and Uruguay. Outside the sub-region, exports are still not growing significantly. Exports to Europe grew almost 25% in absolute terms in the period 1986-1996, mainly reflecting Fiat's exports to Italy. Sales to the rest of Latin America remained stagnant, since the North American Free Trade Agreement (NAFTA) made trade less attractive among economic blocs.

TABLE 8: Destination of Automotive Exports from the MERCOSUR Countries (Argentina, Brazil, Paraguay and Uruguay) in US\$ thousands

Year	MERCOSUR	Europe	Latin America (excluding MERCOSUR)	Others	Total
1986	137,246	296,098	921,202	224,924	1,579,470
%	8.68	18.74	58.32	14.24	100
1989	202,801	755,028	1,430,190	311,683	2,699,702
%	7.51	27.96	52.97	11.54	100
1993	1,677,385	343,753	1,221,174	123,114	3,365,426
%	49.84	10.21	36.28	3.65	100
1996	2,847,485	368,860	981,194	682,104	4,879,643
%	58.35	7.55	20.10	13.97	100

Source: Argentina, Paraguay and Uruguay: DATAINTAL.

Brazil: Anuário Estatístico da Indústria Automotilística Brasileira-ANFAVEA

Note: The export data include products grouped in vehicles, engines and components, and exclude agricultural vehicles.

This emphasis on sub-regional specialization in vehicle exports has been viewed by some analysts as a demonstration of trade diversion and, therefore, of the dangers of constructing MERCOSUR as a sub-regional "fortress". The conventional indicators suggest that there is a trade diversion effect in the category of vehicles in Brazil, and of auto parts in Argentina. Inversely, there would be trade creation in automobiles in Argentina and in auto parts in Brazil. Analysis of these trends should consider the fact that, unlike the 1980s, the sector is now developing in a semi-open economy and with internationally acceptable standards of production and technology.

It can be said that before the establishment of MERCOSUR, the countries that are now members, developed under conditions of a closed economy (particularly Argentina and Brazil, and especially in the automotive sector) and, therefore, that the marked increase in the income-elasticity of imports stems from the process of economic opening. While the time comparison is not significant, comparison of the trends in imports from various sources offers some points for analysis (Table 9). For Argentina, in the case of passenger vehicles (the main trade category of vehicles), the income-elasticity of extra-MERCOSUR imports is more than 50% higher than that of intra-MERCOSUR imports in the period 1990-96, which suggests that there has been a net creation of trade in this category. In utility vehicles and auto parts in general, by contrast, the corresponding estimates indicate possible trade diversion. In the case of Brazil, the indicators suggest a trade diversion effect for automobiles and utility vehicles that tends to lessen as of 1994 and, on the other hand, a net trade creation effect in auto parts during this latter period.

Theoretically, significant levels of intra-industrial trade in a particular sub-region - in as much as it points to the probability of strategies of specialization and complementarity, and allows exploitation of economies of scale and scope -

suggest efficiency gains that can offset the results of trade diversion. In intra-MERCOSUR trade, especially trade between Argentina and Brazil, all the significant categories of the automotive sector show high indices of intra-industrial trade (Table 10). For automobiles, trucks, utilities and auto parts, the indicator grows throughout the 1990s and stands at around 80% for Argentina and 90% for Brazil. This is in line with the trends already mentioned as regards the effective integration of the sub-regional industry.

Obviously, measuring intra-industrial trade is very sensitive to the degree of aggregation that is used to define the product/sector. Table 12 presents estimates for Argentine trade between 1992 and 1997 at the level of homogeneous products of the automotive sector. There is a high and growing level of intra-industrial trade in the categories of medium gasoline automobiles, pick-ups and medium utility vehicles, as well as in the categories of gear boxes, axles and transmission systems, and brakes and servo-brakes. A comparison of the unit values of exports and imports suggests that, in the case of automobiles, since 1995 there has been a strategy of trade in similar products (horizontal differentiation), while in light trucks and utilities, the trend in the same period has been towards vertical differentiation (Table 11). For auto parts, both trends are evident according to the product type.

TABLE 9: MERCOSUR – Automotive Industry Trade Creation and Diversion Income-elasticity of Demand (E_i)¹

781

MERCOSUR

	90-96
Intra-zone	16.39
Total	10.78
Extra-zone	9.54

781

Brazil

	90-96
Intra-zone	45.30
Total	14.17
Extra-zone	11.33

781

Argentina

	1990-96
Intra-zone	4.79
Total	6.41
Extra-zone	7.56

782

MERCOSUR

	90-96
Intra-zone	13.51
Total	7.72
Extra-zone	6.27

782

Brazil

	90-96
Intra-zone	18.70
Total	7.75
Extra-zone	5.63

782

Argentina

	1990-96
Intra-zone	7.95
Total	6.34
Extra-zone	5.72

784

MERCOSUR

	90-96
Intra-zone	4.15
Total	2.99
Extra-zone	2.60

784

Brazil

	90-96
Intra-zone	4.48
Total	3.23
Extra-zone	2.99

784

Argentina

	1990-96
Intra-zone	3.44
Total	2.36
Extra-zone	1.99

$E_i = m_i/y_i$

m_i : growth rate of the imports of industry j

y_i : growth rate of the gross domestic product of country i

Source: authors' presentation based on DATAINTAL

TABLE 10: MERCOSUR - Automotive Industry Intra-industrial Trade (CCI) ¹

781

MERCOSUR

Destination	1986-88	1991-93	1994-96
EEC	6.60	39.51	7.89
MERCOSUR	6.68	94.11	95.87
Rest of LA	0.21	64.10	89.49
USA	1.31	79.33	0.73
World	-4.35	31.54	45.96

782

Brazil

Destination	1986-88	1991-93	1994-96
EEC	4.34	63.27	12.08
MERCOSUR	2.87	44.57	88.97
Rest of LA	0.20	0.11	99.93
Argentina	3.06	50.96	81.03
USA	1.17	83.02	0.91
World	1.70	78.14	41.63

781

MERCOSUR

Destination	1986-88	1991-93	1994-96
EEC	0.00	23.26	90.83
MERCOSUR	0.00	93.01	96.19
Rest of LA	24.62	19.42	43.48
USA	0.00	5.90	1.02
World	54.18	64.26	94.75

782

Brazil

Destination	1986-88	1991-93	1994-96
EEC	0	14.55	44.40
MERCOSUR	74.96	35.42	99.15
Rest of LA	4.71	0.50	1.21
Argentina	0.00	45.27	83.80
USA	0	7.27	1.34
World	40.99	37.90	92.98

784

MERCOSUR

Destination	1986-88	1991-93	1994-96
EEC	29.25	79.95	70.12
MERCOSUR	87.23	91.37	98.43
Rest of LA	73.14	32.08	21.55
USA	44.28	57.89	62.35
World	98.01	98.89	90.64

CCI=[1-IMij-Xij]/(Mij+Xij) *100; Mij: merchandise imports
 Xij: merchandise exports grouped under activity i by country j
 Source: authors' presentation based on DATAINTAL

781

Argentina

Destination	1986-88	1991-93	1994-96
EEC	78.32	6.15	0.27
MERCOSUR	75.80	50.45	78.25
Rest of LA	0.22	21.62	45.44
Brazil	77.58	56.23	71.19
USA	93.12	0.35	0.35
World	70.61	31.05	53.24

782

Argentina

Destination	1986-88	1991-93	1994-96
EEC	0	29.14	25.17
MERCOSUR	18.63	55.81	86.84
Rest of LA	33.82	60.64	28.52
Brazil	***	64.02	84.90
USA	0	0.01	0.16
World	32.50	43.37	77.71

784

Argentina

Destination	1986-88	1991-93	1994-96
EEC	7.89	27.64	7.75
MERCOSUR	77.57	64.90	86.46
Rest of LA	92.57	87.41	77.18
Brazil	77.81	62.29	86.37
USA	68.61	67.30	70.67
World	50.66	57.26	67.14

TABLE 11: ARGENTINA - Automotive Industry Intra-industrial Trade (CCI) ¹

	1992	1993	1994	1995	1996	1997
781						
870323	15.66	44.87	37.15	74.74	76.16	78.46
870332	4.36	50.33	2.96	6.93	0.80	7.94
782						
870421	1.95	62.62	67.72	76.47	67.85	79.73
870431	0.02	63.14	90.82	73.39	68.85	27.89
783						
870210	18.37	4.16	17.11	41.86	37.78	86.42
784						
87084090	95.72	67.96	76.37	61.67	74.05	81.15
87085090	44.28	73.35	63.09	55.42	45.60	42.95
87083900	42.75	62.77	50.42	72.03	74.12	50.86
87087090	21.58	42.02	37.16	39.70	20.13	14.93

CCI = $[1 - IM_i - X_{ij}] / (M_{ij} + X_{ij}) \cdot 100$; M_{ij} : merchandise imports grouped under activity i by country j ;

X_{ij} : merchandise exports grouped under activity i by country j

Source: authors' presentation based on data from INDEC, Argentina.

TABLE 12: ARGENTINA - Automotive Industry Intra-industrial Trade and Product Differentiation (IDj) ¹

	1992	1993	1994	1995	1996	1997
870323	0.012	0.643	0.612	0.822	0.807	0.875
870332	0.709	1.264	0.665	0.892	0.973	0.900
870421	0.754	0.992	1.101	1.207	1.541	1.530
870431	0.957	1.176	1.307	1.178	1.279	0.872
870210	0.001	1.357	1.234	4.242	3.295	0.985
87084090	0.950	1.161	1.046	1.118	1.132	1.308
87085090	0.726	0.979	0.999	0.838	0.876	1.004
87083900	0.257	0.325	0.282	0.245	0.439	0.339
87087090	0.956	1.029	1.093	1.188	0.781	0.757

IDj = UVX_j / UVM_j ; UVX_j : unit value of exports of product j ; UVM_j : unit value of imports of product j

Source: author's presentation based on data from INDEC, Argentina.

TABLE 13: MERCOSUR – Automotive Industry Revealed Comparative Advantages (C_j)¹

MERCOSUR				Brazil				Argentina			
Position	1986-88	1991-93	1994-96	Position	1986-88	1991-93	1994-96	Position	1986-88	1991-93	1994-96
781	0.7506	0.2880	0.3054	781	0.9298	0.3231	0.2498	781	0.0896	0.1876	0.4319
782	0.0150	1.0839	1.4396	782	0.0096	1.3599	1.3608	782	0.0350	0.2962	1.6189
783	0	3.2642	1.4596	783	0	3.2228	1.4010	783	0	0.1183	13.3068
784	0.7883	1.4461	1.8219	784	0.6832	1.1526	1.3761	784	0.3877	0.8376	1.0135
786	0.2706	0.3869	0.5646	786	0.1761	0.3480	0.5191	786	0.3485	0.1109	0.1033

$$^1 C_j = (X_{ji}/X_{jw}) / (X_{jt}/X_{wt})$$

X_{ij}: exports of product/branch /sector j by country i

X_{jw}: world exports of product j

X_{jt}: total exports of country j

X_w: total world exports

Source: authors' presentation based on DATAINTAL

TABLE 14: MERCOSUR - Automotive Industry Indicator of Contribution to the Balance (ICB) ¹

781

MERCOSUR

Destination	1986-88	1991-93	1994-96
EEC	2.768	-1.740	-8.397
MERCOSUR	0.890	1.170	0.725
Rest of LA	10.662	0.313	-2.113
USA	3.393	-0.443	-1.496
World	3.512	-1.188	-3.125

781

Brazil

Destination	1986-88	1991-93	1994-96
EEC	3.498	-1.279	-8.079
MERCOSUR	4.478	4.901	-0.990
Rest of LA	13.155	3.152	-1.278
Argentina	1.517	5.563	-1.115
USA	3.666	-0.025	-1.533
World	4.899	0.104	-3.112

781

Argentina

Destination	1986-88	1991-93	1994-96
EEC	-0.096	-2.502	-8.881
MERCOSUR	-0.290	-5.525	1.155
Rest of LA	2.733	-4.134	-2.717
Brazil	0.034	-3.542	2.638
USA	0.002	-1.371	-1.224
World	0.104	-3.782	-3.129

782

MERCOSUR

Destination	1986-88	1991-93	1994-96
EEC	-0.031	0.994	0.265
MERCOSUR	-0.008	0.451	-0.180
Rest of LA	0.091	1.970	0.951
USA	-0.072	-0.906	-1.139
World	-0.061	0.447	-0.074

782

Brazil

Destination	1986-88	1991-93	1994-96
EEC	-0.012	1.338	0.958
MERCOSUR	0.003	2.357	0.081
Rest of LA	0.053	3.313	3.940
Argentina	-0.004	2.330	-0.508
USA	-0.007	-1.246	-1.246
World	0.006	0.911	0.200

782

Argentina

Destination	1986-88	1991-93	1994-96
EEC	-0.077	-0.232	-1.205
MERCOSUR	0.215	-1.282	0.156
Rest of LA	0.000	-0.714	-1.979
Brazil	-0.366	-0.647	0.735
USA	-0.271	-0.406	-0.798
World	-0.271	-0.738	-0.668

784

MERCOSUR

Destination	1986-88	1991-93	1994-96
EEC	-4.633	-3.038	-2.224
MERCOSUR	-1.010	-1.124	0.038
Rest of LA	0.098	3.213	5.854
USA	1.155	1.556	2.216
World	-0.857	-0.612	-0.441

784

Brazil

Destination	1986-88	1991-93	1994-96
EEC	-3.786	-3.873	-5.028
MERCOSUR	0.017	1.927	2.589
Rest of LA	2.152	6.662	6.734
Argentina	-0.838	2.272	3.752
USA	1.467	1.612	2.531
World	-0.197	0.368	0.254

784

Argentina

Destination	1986-88	1991-93	1994-96
EEC	-6.520	-4.795	-4.348
MERCOSUR	-1.465	-4.383	-4.016
Rest of LA	0.071	-1.077	-1.748
Brazil	-0.888	-4.044	-3.728
USA	-1.215	0.141	0.222
World	-3.046	-2.652	-1.979

$$ICS = \{(Xi-Mi)/(X+M)/2 - (Xi-M)/(X+M)/2\} \cdot [(Xi+Mi)/(X+M)] \cdot 100$$

- Xi: exports of product i
- X: total exports
- Mi: imports of product i
- M: total imports

Source: authors' presentation based on DATAINTAL

It is evident that the development pattern of the MERCOSUR auto industry is linked to a new model of international insertion in which the sub-regional space is fundamental, which in turn is related to a change in its competitive capacities. The performance of the automotive sector in Argentina in recent years reflects its positive development in the scale of comparative advantages of national output, although it continues to be in deficit. According to the simplest indicator, which takes only exports into account, Argentina has relative advantages in the production of utility vehicles and auto parts ($IVC > 1$) and is reducing its disadvantages in the production of automobiles (Table 13). Brazil, for its part, also has strong relative advantages in the same categories, but the indicator suggests a decline in its relative competitive position in automobiles.

It is worth stressing that Balassa's indicator is not a pure measure of sectoral competitiveness but a positioning of the relative sectoral advantages within each country in light of its export performance. The trend mentioned does not in fact reflect a loss of competitiveness on the part of Brazilian automotive production relative to the previous decade. The industry was obsolete in the 1980s and exported at a huge fiscal cost. The industry of the 1990s, being in deficit, is undoubtedly more efficient. Between the two periods there was not only a change of regulations but also a reversal of trends in international markets and domestic consumption. It is obvious that the performance of sectoral exports in Brazil is not only linked to changes in competitiveness.

The indicator of contribution to the trade balance (ICB) is a more integral gauge of comparative advantages. It considers not only the performance of exports but also of imports, as well as of the balance between them (Table 14). Analysis of the ICB for the various automotive categories produced in Argentina reveals the positive development of the comparative advantages (strictly speaking, a decline in the level of disadvantages). In the context of this trend, the disadvantages remain significant for automobiles, relatively low in auto parts, and insignificant for utility vehicles. However, when the analysis is disaggregated by trade partner – which reveals a differentiated pattern of geographical insertion – one sees a positive comparative advantage for automobiles in relation with Brazil, and a strong disadvantage in auto parts. This trend suggests the emergence of a relatively balanced sub-regional pattern in automobiles trade, and of a sharp deficit for Argentina in the trade in parts.

Notwithstanding the comments made above, it should be pointed out that indicators of trade performance are somewhat doubtful means of estimating competitiveness in sectors such as the automotive sector, in which international trade is heavily managed by the auto companies or by national or sub-regional trade barriers. To the extent that the main destination of MERCOSUR production is its internal market, in the context of a managed opening to the rest of the world,

the commercial indicators should be supplemented with others related to changes in the quality of products and of industrial installations. Indeed, the substantial leap in product technology and in the upgrading and modernization of the installed industrial plant in the 1990s reveals marked increases in sectoral efficiency that are neither adequately nor completely reflected in trade performance indicators.

As was said earlier, MERCOSUR's intra-sectoral trade is intense. Significant levels of intra-industrial trade in a particular sub-region – in as much as it points to the probability of strategies of specialization and complementarity, and allows exploitation of economies of scale and scope – suggests efficiency gains that can offset the results of trade diversion. In intra-MERCOSUR trade, especially trade between Argentina and Brazil, all the significant categories of the automotive sector show high and increasing indices of intra-industrial trade. At the same time, the indicators of sectoral comparative advantages and international specialization reveal positive developments in Argentina and Brazil: the relative disadvantage in automobiles is declining, and an advantage in auto parts is being consolidated.

It can be said that the reactivation of sub-regional demand was a necessary if insufficient condition to foster the development of an activity that is highly dependent on economies of scale, as well as to attract investment. However, the application in the sub-region of the global strategies adopted by the vehicles manufacturers required that further progress be made on the formation of the customs union, to which end the agreements of Ouro Preto were finally signed in December 1994. The formal and real consolidation of MERCOSUR made it an area of gradual and sustained integration for which the auto companies increasingly compete in a recessive international sectoral environment.

Additionally, the promotional benefits granted to the auto companies by the regulatory systems and incentives policies of Brazil and Argentina lowered the cost and risk of investment. Seen with hindsight, and in light of the results within MERCOSUR, it is probable that such stimuli were redundant, especially those applied in the second half of the 1990s. However, it is evident that the trade compensation requirements and access to preferential tariffs favored the development of simultaneous activities in Argentina and Brazil, as well as the adoption of sub-regional strategies of specialization and complementarity.

6. Challenges and Prospects

By the end of the century, most of the investment in new facilities will have been made, and the MERCOSUR automotive industry will have completed an important phase of renovating, expanding and integrating its productive capacity in the sub-region. The industry has made great strides in overcoming the

technological backwardness accumulated in the 1980s, and today has modern products and facilities that are adapted to the local market.

The main question regarding the sector's future concerns the extent to which the recent dynamism can be maintained. Future growth will clearly depend on the inter-play of macroeconomic factors and their effects on economic and national sectoral policies. In light of the external vulnerability of the sub-region's economies, the automotive industry will be a prime "target" for government intervention. The need to generate a trade surplus tends to put strong pressure on the automotive industry to increase exports and/or reduce imports. Devaluation, higher interest rates and credit restrictions, which aim to reduce domestic consumption or attract foreign investment, tend to have very marked effects on the vehicle industry.

To a large extent, the development of macroeconomic variables is beyond the control of the companies in the sector. Such factors serve as external determinants for the assembly firms. Given the importance of the industry and its effects on output and employment in other sectors, as well as its direct and indirect influence on the trade balance and its capacity to attract foreign financing, it can be argued that the strategies of the assembly companies also condition the development of the macroeconomic variables. To the extent that the companies are already solidly integrated sub-regionally in terms of trade and production, their performance affects and is affected by macroeconomic conditions in the MERCOSUR members. Devising a common sectoral policy that can harmonize the interests of the MERCOSUR countries in the sector is therefore an inescapable challenge. To date, the establishment of a MERCOSUR Automotive Regime has been hindered mainly by differences among the governments as to the use of nationally-produced auto spares and the incentives offered for the installation of new factories.

In this context, it is important to note that MERCOSUR's status as an "emerging producer" depends to a large extent on its strengthening its role as an "emerging market." Most of the vehicles produced in MERCOSUR are sold in the sub-regional market. In other words, growth of the sub-regional domestic market will condition the maintenance of a modern and sub-regionally integrated base for the production of vehicles in MERCOSUR. In particular, growth of the Brazilian market is crucial for the profitability of the investments that the assembly companies have made in the region.

Sustaining growth in the domestic market will depend on consumer credit and on overcoming the external constraint imposed by the sector's trade deficit. In other words, the growth of the sector will only be viable if it does not impose a greater burden on the external accounts of the MERCOSUR countries. That condition indicates that the assembly companies must be able to increase their extra-subregional exports significantly, so as to offset future high levels of imports

of parts from outside the sub-region. In view of the sub-regional pattern of trade flows in the sector, the accession of new countries to MERCOSUR or the conclusion of trade agreements with the main consumer countries of South America (Chile, Venezuela and Ecuador) are the most effective short-term means of boosting exports of automobiles and components. The conclusion of such accords has hereto been hampered by the difficulties involved in devising the MERCOSUR Automotive Regime.

Increasing sub-regional output and/or exports of parts is essential if the sector is to expand without compromising the external accounts. Resolving the growing trade deficit in parts seems to condition the formulation of a MERCOSUR Automotive Regime.

Paradoxically, the competitive performance of the parts sector was quite positive in the 1980s, when some companies with Brazilian capital were able to place their products in developed country markets and successfully undertook the internationalization of production and the development of technology. In the 1990s, the growth of the assembly companies prompted an intense process of reorganization in the MERCOSUR parts sector, accompanied by strong concentration and denationalization. This process is recent, and its effects on the sector's future should be better assessed.

One unconfirmed hypothesis is that this process will in the future reduce the sector's trade deficit. Whatever the outcome of the entry of new parts producers, and of the denationalization of the sector, the differences among the MERCOSUR governments over intra-subregional trade in parts, center on the distribution of the bloc's deficit in such trade. The foreign trade indicators presented above show that Brazil's intra-subregional exports partly attenuate the extra-subregional deficit. In the Argentine case, the intra-subregional deficit adds to the extra-subregional deficit; on the other hand, part of the deficit is offset by exports of automobiles to the Brazilian market.

The way in which the supply of auto parts is finally structured will undoubtedly have a significant impact on the sustainability of the model of production and on the sectoral policy commitments made at the MERCOSUR level. In theory, there could be an assembly industry which puts together parts and components supplied by sub-regional partners (satisfying the "sub-regional content requirements") and by sources outside the bloc. In other words, and as an example, the Argentine industry could replicate on a bigger scale the recent Uruguayan experience. It is difficult to see such a development occurring, for two reasons: one technical, stemming from supply costs, and the other political, concerning the distribution of the surplus among the various sub-regional actors.

It should be underlined that trade flows in the automotive sector do not only reflect competitiveness conditions. The strategic decisions made by the companies

are also a very important factor, since intra-firm trade accounts for a significant portion part of the total. It is worth noting that the MERCOSUR countries have neither national assembly firms (unlike South Korea and Malaysia), nor partnerships between national companies and foreign assembly companies (as do China and India). Hence, the growth of sales and of the production of vehicles and components in MERCOSUR depends on the strategies that the international assembly companies establish for their affiliates in the sub-region. In that sense, MERCOSUR is a peculiarity: it is the only emerging sub-regional market in which European assembly companies are better positioned than their US and Japanese competitors. It is worth highlighting the fact that the presence of US companies in MERCOSUR is through their European affiliates.

Under current conditions, given the difficulties facing Japanese assembly companies in Asia and the significance of their interest in the US market, it seems unlikely that they will attempt to wrest the leadership from the European companies. The financial weakness of the Korean groups following the crisis of October 1998 also suggests that their initiatives in the sub-region will be limited. The performance of the industry in the coming years will therefore depend heavily on the strategy that the leading European assembly companies adopt in MERCOSUR, and on the role that they assign to their local affiliates in their worldwide corporate business. The adoption of strategies of specialization, and the integration of local affiliates into the international development and production of automobiles and components (as long as such strategies are compatible with the external account balance and favor market expansion), are fundamental if MERCOSUR is to be consolidated as an emerging producer of automobiles.

In the absence of such strategies and of the policies that prompt them, growth might be short-lived – as happened in Argentina in the 1960s and in Brazil in the 1970s. The interruption of growth will affect the profitability of the affiliates and will create problems similar to those of the 1980s, when the industry rapidly became obsolete despite the investment made at the end of the 1970s.

It should be recalled that the reactivation of the domestic market, the modernization of products and the construction of new factories that occurred in the 1990s brought a high fiscal cost. The MERCOSUR automotive industry enjoyed fiscal incentives from national, state and local governments. The return of those fiscal resources, in terms of the sector generating profits, jobs and foreign reserves, hinges on their performance in the coming years. That performance, in turn, depends on MERCOSUR's capacity to devise means of intervention that promote sustainable sectoral growth strategies which stimulate competition among companies and which do not involve the granting of redundant incentives.

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PRODUCTION AND TRADE IN DAIRY PRODUCTS IN MERCOSUR

Maria Beatriz Nofal and John Wilkinson

1. MERCOSUR in the World

Production

THE EUROPEAN UNION (EU) is the world's leading producer of dairy products. Several regions occupy second place, depending on the specific product concerned.

In 1996, the EU accounted for 40.2% of total powdered whole milk production. Oceania ranked second with 19.8% (New Zealand, with 14.8%, is the single largest producer in the world, together with China). MERCOSUR was in third place with 17.1%: Brazil was the fourth largest (with 9.8%, behind France) and Argentina the sixth (with 7.4%, behind Germany). NAFTA produced just 2.9% of the total (with the United States accounting for 2.7% and Canada 0.2%).

In 1996, the EU accounted for 39.3% of powdered skimmed milk production (Germany 13% and France 12.1%). NAFTA was the second most important producer with 19.1% (the share of the United States, the single largest producer, increased to 16%) and Oceania the third, with 14.3% (equally divided between New Zealand and Australia). MERCOSUR, with 3.5%, is one of the world's smallest producers (Brazil 2.1% and Argentina 1.4%), behind Asia (Japan 6.6%), the former Soviet Union (Russia 6%) and Eastern Europe (Poland 4%).

The EU is also the world's largest producer of cheese, with 47.4% of total world production. NAFTA is in second place with 33.1% (the United States accounts for 27.4% and is the world's leading producer). MERCOSUR is in third place with 6.4% (Brazil 3.3% and Argentina 3.1%). Oceania produces just 4.2% of the world total.

International trade

The main exporters of dairy products are Oceania (New Zealand and Australia) and the EU. In recent years, Oceania's export performance has been excellent, growing by far more than the rather sluggish world average, while the EU has lost ground. MERCOSUR's share of the world dairy sector is very modest at 3%, although it is increasing. Argentina is the most important exporter in the bloc. It is worth noting that Argentine exports of powdered whole milk registered the world's fastest growth between 1993 and 1997. Between 1995 and 1997, Brazil also became one of the world's leading importers of powdered whole milk.

2. International Trade Policy in the Dairy Sector

International trade policy and the WTO

The dairy sector is still protected by high tariff and non-tariff barriers, which restricts access to the markets of the leading producer countries (the EU, the United States and Canada). Most producer countries have also supported their dairy sectors with direct and indirect production and export subsidies (through fiscal and financial incentives), support prices and complementary support regulations (quotas). Protection and promotion policies have been applied throughout the value chain, from the initial stage in the countryside to the higher processing stage and concluding with marketing and export.

In reducing production and export subsidies, GATT's Uruguay Round marked the first major step to limit and channel the range of distortions affecting the sector in most countries.

Prospects for international trade policy

The leading producer countries are, on the whole, fulfilling the terms of the Uruguay Round, although discipline has slackened somewhat since the fall in the Asian markets. The debate is, instead, focusing on other areas that are obstructing trade, such as technical barriers and sanitary and phytosanitary matters.

The liberalization of trade in dairy products is on the agenda, and progress is being made, although much work still needs to be done. This is mainly because of the persistence of serious obstacles to trade in the EU and, to a lesser degree, in the United States, which have traditionally protected their agricultural sectors and associated manufactures. In the short term, the measures agreed by GATT give the MERCOSUR countries greater access to the EU and US domestic markets, principally in the cheese sector. In the medium term – perhaps during the next multilateral negotiations, the Millennium Round – real progress might be made in the liberalization of trade in dairy products, although complete liberalization might only be possible in the long term. Willingness to negotiate and to open up the sector will depend on the political economic conditions existing at the time in each country or bloc involved in the process.

MERCOSUR: External Trade Policy

MERCOSUR's position on international trade opening, market deregulation and the elimination of subsidies is clearly more advanced than that of the EU and the United States. There has also been a process of greater unilateral opening among the MERCOSUR members during the 1990s. The bargaining position of the MERCOSUR countries in international negotiations will be strengthened as the bloc

increasingly adopts a common posture and as the dairy sector is included in wider-ranging agricultural negotiations.

3. Changes in the Macroeconomic Situation and in the Sectoral Regulatory Framework in the 1990s

In the 1990s, three main factors – national, sub-regional and international – helped to expand and transform the dairy sector in the MERCOSUR countries. At a national level, the stabilization and structural reform processes introduced by the four countries led to a marked increase in domestic demand for dairy products and a significant restructuring and increase in production. Second, the sub-regionalization of the dairy market led to a previously inexistent correlation between economies of scale and competition. All the participating actors, old and new, now include the sub-regional market in their planning. Third, the agreements reached in the Uruguay Round led the MERCOSUR countries, at the time, to expect an improvement in the international environment for exports to markets outside the bloc. The prospects were highly favorable in this respect, especially since export subsidies were effectively reduced in the main producer countries as a result of GATT discipline, while international prices increased. Some of the investment in the MERCOSUR countries (Argentina and Uruguay) over recent years was therefore partly carried out on the assumption that a proportion of the increase in production (because of a rise in installed capacity) would go to the international market.

Although the expectations of EU and US compliance on subsidy reductions proved to be correct, their dairy sectors are so highly protected that the international export environment remains as restricted as ever. The difficult international financial situation after 1997 has only served to exacerbate this problem, since this has led to a return to protectionist tendencies and to a certain relaxation in international discipline on subsidies.

4. Changes in the MERCOSUR Dairy Industry in the 1990s

Of the four countries under study, Brazil and Paraguay are similar in that much of their milk supply originates from small, non-specialized agricultural producers. This is in contrast to Uruguay and Argentina, where specialized production predominates. Average production levels are therefore low in the two former countries, the genetic base is not specialized and the informal, unregulated milk sector plays a key role in the industrial organization of the sector as a whole.

The Brazilian and Paraguayan milk sectors are highly dependent on imports, while the Uruguayan and Argentine milk industries increasingly depend on the export market – above all the MERCOSUR sub-regional market and particularly

Brazil. The dairy chains of each of the four MERCOSUR countries are therefore heterogeneous, as can be seen from the following table:

TABLE 1: Profile of Milk Production in the MERCOSUR Countries in 1995

Description	Brazil	Argentina	Uruguay	Paraguay
Milk production (liters/day)	17,400 mill	7,800 mill	1,200 mill	430,000
Number of milk cows	19 mill	2.38 mill	348,000	517,000
Herd production (liters/cow/year)	900	3,500	2,580	1,850
Number of producers	1.2 mill	22,000	8,000	142,000
Consumer price of milk	0.65	0.75	0.55	n. a.
Producer price of milk (US\$/liter)	0.25	0.19	0.17	0.23
Consumption per capita (liter/year)	125	190	238	56
Imports (tons/year)	461,000	730	300	2,400
Exports (tons/year)	0	100,000	80,000	0
Availability (liter/per capita/year)	94	230	384	47

Source: *Revista Gloria Rural*, Dec. 97 and *Industria Laticínios*, Sep 1996. Presentation by the authors.

Brazil

After the opening of the sub-regional and global economies in the 1990s, the Brazilian dairy sector changed dramatically as domestic controls, in place since the late 1940s, were dismantled.

The 1990s were marked by three distinct periods. At the end of 1991, the sector was deregulated in the midst of recession. This created serious frictions between different actors in the chain. From 1994, the Real Plan led to an immediate redistribution of tax in favor of the popular sectors and to renewed growth. Dairy consumption expanded rapidly (12% in 1995 and 8% in 1996), allowing the significant growth in domestic production to be reconciled with high levels of imports. In 1995, MERCOSUR accounted for 43% of Brazilian butter imports by volume, 36% of powdered milk and 16% of cheese. In 1996, these percentages were 65% for butter, 37% for powdered milk and 56% for cheese. At the end of the 1990s, growth in this area is more modest. This has created new conflicts between the different actors in the chain – domestic production vs. imports, cooperatives vs. multinationals, specialized dairies vs. small diversified producers, formal vs. informal sector. Throughout the decade, the principal drive behind the transformations continued to be the substitution of the traditional fresh milk markets with those for long life.

Brazil

TABLE 2: Formal Milk and Associated Manufactures Market
(millions of liters of milk)

YEAR	1990	1991	1992	1993	1994	1995	1996	90-96 var
A) National production	9,609	9,439	9,583	9,145	9,441	10,577	11,366	18%
Pasteurized A+B	375	478	395	481	443	515	449	20%
Pasteurized C	2,881	2,905	3,625	2,293	2,275	2,872	2,303	-20%
Long life	174	178	317	407	720	913	1,700	877%
Powdered milk	1,589	1,651	1,788	1,550	1,607	n.a.	n.a.	n. a.
Cheese	2,220	2,220	1,891	2,310	2,900	3,480	3,800	71%
B) Imported dairy products	916	1,368	400	1,076	1,457	3,202	2,450	167%
Powdered milk	535	913	272	665	795	1,865	1,750	227%
Cheese	200	186	25	106	374	898	340	70%
Butter	181	269	103	304	288	438	257	42%
C) Total (A+B)	10,525	10,807	9,983	10,221	10,898	13,779	13,816	
% Participation (B/C)	8.70%	12.70%	4.00%	10.50%	13.40%	23.20%	17.70%	

Source: IBGE (Instituto Brasileiro de Geografia e Estatística); DECEX/MAARA (Departamento de Comércio Exterior/Ministério da Agricultura, Abastecimento e Reforma Agrária); ABPI.B (Associação Brasileira de Produtores de Leite Brasil); SUNAH

(Superintendência Nacional de Abastecimento), ABL.V (Associação Brasileira da Indústria de Leite Longa Vida) and, ABIQ (Associação Brasileira da Indústria de Queijos).

The opening up and growth of the sector helped diversify and segment the market for milk and its associated manufactures, particularly yogurt. New products, marketing and logistics increasingly became key indicators of competition. The growing importance of associated manufactures, as well as competition in the supply of raw materials, led to the adoption of new strategies which placed a premium on rewarding quality and quantity in milk production. Government policy and the strategies of leading companies concurred on the need to promote expansion tanks on agricultural properties and the bulking of milk production. The new relationship with the agricultural sector, together with the challenge of increasingly sophisticated markets dominated by large distribution chains, place most cooperatives in a difficult situation.

The increasing role of the multinationals, particularly Parmalat, Nestlé and Fleischman Royal, has exposed the weaknesses in traditional financing and administrative methods, and has revealed a lack of experience in marketing and a limited capacity to launch new products. In the late 1980s and early 1990s, those regional cooperatives in difficulties succumbed. More recently, the main dairies have also been affected. In the 1990s, the multinational companies grew rapidly through acquisitions. Parmalat acquired 18 dairies, the most this decade, thereby

becoming the second largest company in the sector. In response to the fall in its powdered milk market, Nestlé expanded into the long life market and, through acquisitions, increased its presence in the ice cream and chocolate sector. The consolidation of MERCOSUR's trade integration process, therefore, coincided with a strengthening of the dominant position of those multinational companies with a presence in the other countries of the region.

The Brazilian dairy industry is, therefore, undergoing a wide-ranging restructuring process following the rapid deregulation at the start of the 1990s, both internally and in its relations with the supply channels for raw material. This restructuring is taking place within a changing macroeconomic environment: from "stagnation" to rapid growth, followed more recently by a slowdown. The growth of the industry by segment is highly uneven – rapid in some areas, slow in others – and is taking place in an environment open to imports. In the 1994-1997 period, all prices in the sector remained below inflation. The industry has expanded because of economic growth in a context of high income-elasticity for dairy products and the redistribution of market spaces – between informal and formal sectors, sub-regional and national companies, cooperatives and multinational companies. MERCOSUR's impact can be seen at all levels: it has had an effect on market competition for finished products (long life milk, butter), on shaping investment decisions in the powdered milk and cheese sectors, and on prompting a greater level of organization of the actors in the chain, as exemplified by the "SOS Leite" movement.

Argentina

While the dairy sector in Uruguay in the 1980s was characterized by comprehensive international specialization, during that same period the Argentine milk sector underwent a transition (which was almost complete by the mid-1990s) from relative self-sufficiency to comprehensive international specialization.

A number of factors distinguish the structure of the Argentine dairy industry from that of Brazil. The informal sector is minimal, mainly exercising influence in parts of the cheese sector which, as in Brazil, is quite backward relative to other activities. Productivity, quality, concentration and proximity to raw material all increase the efficiency of the Argentine milk industry, as does the geographical concentration of demand. The structure and income levels of the population are also significant in respect to the strong penetration of industrialized products, particularly cheese.

In the early 1990s, the three leading companies, each with a stable presence over the last 20 years, were Sancor, a cooperative, Mastellone, a national company, and Nestlé, a multinational.

However, the transformations in the 1990s and the growing importance of export markets (above all MERCOSUR), as well as the changes in consumption patterns, are also changing the traditional profile of the sector, which has stimulated a wave of new investment.

In light of this recent rapid growth in the Argentine dairy sector, the regional cooperatives, unlike their counterparts in Brazil, have also invested considerably to increase capacity.

In Argentina, the contrast between the relative stability of domestic consumption, with the exception of yogurt, and the rapid growth of new investment, is largely due to the increase in exports generated by the creation of MERCOSUR. These factors also help explain the investment decisions adopted by the large multinational groups, with large investments in powdered milk and cheese production forming one element of a sub-regional strategy triggered by the consolidation of MERCOSUR. In addition to new investment geared to the sub-regional market, in which national companies, cooperatives and multinationals are equally involved, the leading companies are also committed to direct investment and the creation of alliances in order to secure a greater presence in the Brazilian market for end products.

TABLE 3: Argentina
Evolution of the Main Dairy Indicators and Coefficients of Opening
Powdered Milk (whole and skimmed)

	86-88	91-93	94-96
Production (tons)	100,800	96,799	170,201
Total consumption (tons)*	95,134	104,935	116,000
Per capita consumption(kg./per capita.)	3.06	3.15	3.34
Exports (tons)	8,844	13,657	59,639
Total US\$ exports (thousands)	9,621	28,629	140,595
Average price (US\$ / kg.)	1.15	2.11	2.33
Imports (tons)	1,849	22,307	9,322
Total US\$ imports (thousands)	1,827	38,042	16,884
Average price (US\$ / kg.)	1.19	1.71	1.86
Exports / Production	9%	14%	35%
Imports / Consumption	2%	21%	8%

Cheese (hard, semi-hard, soft and processed)

	86-88	91-93	94-96
Production (tons)	263,489	208,505	383,236
Total consumption (tons)*	258,748	323,781	372,887
Per capita consumption(kg./per capita.)	8.33	9.72	10.74
Exports (tons)	7,916	5,572	12,536
Total US\$ exports (thousands)	22,107	19,274	45,733
Average price (US\$ / kg.)	2.82	3.64	3.65
Imports (tons)	1,271	4,436	4,994
Total US\$ imports (thousands)	2,651	13,323	16,102
Average price (US\$ / kg.)	2.05	2.98	3.23
Exports / Production	3%	3%	3%
Imports / Consumption	0%	1%	1%

Yogurt (including cultured milk)

	86-88	91-93	94-96
Production (tons)	131,722	198,613	222,910
Total consumption (tons) *	134,370	197,298	223,655
Consumption per capita (kg./per capita)	4.32	5.92	6.44
Exports (tons)	0	14	181
Imports (tons)	0	107	1,157
Exports / Production	0%	0%	0%
Imports / Consumption	0%	0%	1%

Source: Secretaría de Agricultura, Ganadería Pesca y Alimentación-SAGPyA and FIEL (Argentina) and authors' calculations.

Uruguay

Given the level of concentration and profile of its industrial structure, Uruguay is more like Denmark than its MERCOSUR partners. As in Denmark, one cooperative, Conaprole, dominates production and accounts for 80% of milk processing in the country and 85% of exports.

Conaprole was largely responsible for a significant increase in milk production from the mid-1970s onwards, as a result of which the share of milk in total income from dairy products rose from an index of 100 in 1977 to 322 in 1997, while installed capacity increased from 100 to 229.

The absence of multinational companies has been a notable feature of the Uruguayan milk sector. Since this is no longer the case, Conaprole has launched a joint-venture with Bongrain, involving investment in a cheese processing plant with a capacity of 170,000 liters per day.

As a cooperative, Conaprole faces the same challenges as the Brazilian cooperatives (managerial professionalization, increasing resources, and adjusting to an economy where brands dominate), and has therefore sought to associate itself with the multinational company Bongrain, the world's largest cheese producer. Bongrain has a presence in three MERCOSUR countries and a clear sub-regional strategy that, promisingly, includes Chile.

As mentioned earlier, some 80% of Uruguayan exports go to the MERCOSUR market, and 70% to Brazil. MERCOSUR is not only the principal market for the traditional commodities of the dairy chain. The bloc is also becoming a key market for the development of brand products, as is the case with long life milk exports. The alliance with Bongrain places Conaprole at the heart of a sub-regional restructuring of the cheese sector, with a view to expanding to countries outside the regional bloc.

Paraguay

It was stated earlier that the Brazilian and Paraguayan dairy sectors have informal sectors of similar size. The industrialization of the milk sector in Paraguay, however, had its own particular dynamic because of the predominance of unprocessed milk consumption, even in the capital Asunción. The prevalence of this practice arose from the lack of refrigeration, both in the distribution chain and in most production sites. It therefore hindered the development of pasteurized milk and led to idle industrial capacity, estimated at around 60%. This bottleneck, caused by the specific nature of demand in Paraguay, was exacerbated by the technical backwardness of milk production.

Despite its small size, the Paraguayan market is integrated in the dynamic of the MERCOSUR sub-regional market. It depends on powdered milk imports from Argentina and also suffers trade pressures in the long life and yogurt sectors. As far as investment is concerned, Parmalat's presence complements the purchase of equipment from the Brazilian affiliate Tetrapak for setting up long life plants. Guaraní Dairy Industries, the fifth largest, has just concluded an agreement to represent and distribute products for the Argentine company Molfino Hnos S.A. The restructuring process, with the sub-regional integration process acting as a catalyst, is therefore now underway. According to a report by the *Instituto Comunicación y Arte* (ICA), in 1998 Parmalat became the second largest supplier in the capital and the third largest at national level, with 15.5% and 10.6%, respectively. The three leading companies, Trébol, Lactolandia and Parmalat, account for 85% of the domestic market.

5. The Development of the International Trade of the MERCOSUR Dairy Sector, 1986-1996

Intra- and extra-bloc exports and imports

The dairy trade of the MERCOSUR member countries has increased dramatically in the decade under study,⁵⁸ especially with respect to intra-bloc trade.

MERCOSUR dairy exports increased from US\$ 71 million in 1986-1988 to US\$ 140 million in 1991-1993 (+96%) and US\$ 350 million in 1994-1996. In value terms, exports in 1994-1996 grew by 151% compared with the previous three years, and by 390% compared with 1986-1988. This growth in sales was largely the result of intra-bloc dairy exports, which rose by 800% between 1986-1988 and 1994-1996, while extra-bloc sales increased by only 54% during the same period.

The main export product in 1994-1996 was powdered milk, which generated US\$ 179 million, or 51% of total dairy exports with the highest rate of growth. This product grew by 854%, between 1986-1988 and 1994-1996, moving from second place in 1986-1988 (after cheese) to first place in 1994-1996. Intra-MERCOSUR sales represented 86% of powdered milk exports in 1994-1996, with extra-MERCOSUR sales accounting for 14%. Cheese was the second most important export product in 1994-1996, generating US\$ 95 million and accounting for 27% of total dairy exports.

The most important export products from MERCOSUR countries to markets outside the bloc are cheese, generating US\$ 27 million (45% of extra-bloc dairy

⁵⁸ This study examined the average of three three-year periods: 1) 1986, 1987 and 1988; 2) 1991, 1992 and 1993; 3) 1994, 1995 and 1996.

exports) and powdered milk, with US\$ 25 million, (41% of extra-MERCOSUR dairy exports). There are virtually no exports of other dairy products to countries outside the bloc.

In 1994-1996, Argentina (61%) and Uruguay (36%) accounted for 97% of MERCOSUR dairy exports, with Brazil providing the other 3%. During the same period, Argentina accounted for 62% of intra-sub-regional dairy exports and Uruguay 37%, while Argentina was responsible for 57% of extra-bloc dairy exports, Uruguay 33% and Brazil 10%.

MERCOSUR dairy imports from outside the sub-region increased from US\$ 110 million in 1986-1988 to US\$ 165 million in 1991-1993 (+49%) and to US\$ 272 million in 1994-1996 (+65%). MERCOSUR's deficit in dairy trade with the rest of the world therefore increased from US\$ 71 million in 1986-1988, to US\$ 109 million in 1991-1993, and to US\$ 204 million in 1994-1996. This increase in the deficit and in the level of imports was partly due to Brazil's and Argentina's unilateral and non-discriminatory opening of the sector during the decade under study.

Brazil accounts for virtually all extra-sub-regional and intra-sub-regional imports, and the country is largely responsible for MERCOSUR's trade deficit with extra-bloc markets in the dairy sector. In 1994-1996, Brazil registered a US\$ 242 million deficit with the other MERCOSUR countries, and a US\$ 218 million deficit with non-MERCOSUR countries.

In sum, there is a clear trade profile for dairy products from the MERCOSUR countries. Argentina and Uruguay account for the largest share of intra- and extra-sub-regional exports. Brazil absorbs the bulk of intra- and extra-MERCOSUR imports, with Argentina a distant second. In the period under study, Argentina was (and remains) the MERCOSUR country most open to dairy imports. Powdered milk and cheese are the products most representative of the sector, both for exports and imports. In conclusion, the strong dynamism of the MERCOSUR dairy sector between 1991-1993 and 1994-1996 is due to the large increase in Argentine and Uruguayan exports (mainly powdered milk and cheese) to Brazil and, to a lesser although not insignificant degree, to Brazilian imports of these same products from countries outside the sub-region.

It is also worth noting that the trade pattern for products in the sector is increasingly influenced by the strategies adopted by the multinational dairy companies, which are rapidly positioning themselves in both Brazil and Argentina, and to a lesser degree in Uruguay.

6. MERCOSUR's Impact on the Dairy Sector

MERCOSUR's Impact on the Supply and Demand of Dairy Products

The dairy sector has been one of the most receptive to the productive transformations that have taken place in the sub-regional economy, and to trade integration in MERCOSUR. While high growth in production, consumption, investment and dairy exports in the 1990s cannot be divorced from the stabilization carried out by member countries, MERCOSUR has played a key role, being responsible for much of the strong growth registered in the above variables.

With respect to demand, the creation of MERCOSUR involved a widening of the internal market for member countries, with access to a market of 200 million consumers. The elimination of trade barriers meant that the increase in demand in the sub-region, mainly in Brazil, could increasingly be met by competitive exports from the member countries, which partly replaced exports previously subsidized by the EU. This led to a fall in domestic prices in Brazil.

In terms of supply, the attractions of an enlarged market in MERCOSUR, and the significant comparative advantages in the sector, have generated substantial foreign capital inflows. The creation of MERCOSUR led to greater competition in each country and at the sub-regional level. This competition led local and foreign companies to invest heavily. These firms penetrated the sector through mergers and associations with companies already established in the domestic markets of the member countries, evidence in many cases of clear sub-regionalization strategies. In other instances, the process entailed the first-time participation of new multinational companies, and of investment funds interested in acquiring firms in the sector because of its high potential for growth and for generating value-added. Greater competition stimulated an increase in investment and productivity, which in turn led to a significant transformation in the MERCOSUR dairy sector, especially in the industrial, technology, specialization, scale, management, marketing and distribution structures.

The impact of MERCOSUR on investment and productivity has varied from country to country, between the milk-producing and the industrial dairy sectors, and according to the particular product concerned. In Argentina, economic stability has been more important for the growth of investment and productivity in the milk-producing sector than the development of MERCOSUR. In Uruguay, economic stability has also played a key part in expanding the domestic market, although the country's insertion into the international economy prior to the establishment of MERCOSUR has also played an important role. In Brazil, and to a lesser degree in Paraguay, MERCOSUR has given milk producers a predominant role, thereby leading to a significant fall (by 34%) in the producer price of milk

between 1994 and 1997. In Argentina and Uruguay, MERCOSUR has had a greater impact on the growth in productivity in the industrial dairy sector (particularly in the production of powdered milk, cheese and, to a lesser degree, long life milk) rather than on the raw material-producing agricultural sector.

Investment in the sector is not geared exclusively towards the sub-regional market. Some is directed towards products for which demand is essentially domestic, as is the case with yogurt in all member countries. These products have demonstrated a great dynamism owing to economic stabilization and an increase in purchasing power. Similarly, in all MERCOSUR countries (but above all in Brazil), investment in production plants for long life milk is associated with changes in the liquid milk markets in these countries. In the cheese sector, some leading companies have a well-defined sub-regional investment strategy. MERCOSUR has therefore been more important in terms of investment – and productivity gains – in powdered milk and certain types of cheese, where production is geared towards the export sector, while stability has been more important than MERCOSUR for predominantly domestic consumer products.

Argentina and Uruguay have levels of productivity close to international standards, while Brazil and Paraguay are a little more behind.

The impact of MERCOSUR on alliances, joint-ventures, mergers and acquisitions has been very significant, and has affected the participation in the sub-regional market of societies vs. cooperatives and local companies vs. multinationals. In Brazil, multinationals have made substantial inroads, leading to a greater concentration of production and a smaller role for cooperatives. In Argentina, there were also important acquisitions and joint-ventures with multinationals but, unlike Brazil, the cooperatives also actively participated in the restructuring of the market and managed to maintain a stable footing. In Uruguay, the dominant cooperative structure adapted to the competitive presence of the multinationals via new alliance strategies.

The influence of MERCOSUR on dairy product prices was different in Brazil and Argentina. In Argentina, upward pressure from 1995 was induced by strong demand from Brazil, where there were high preferential tariffs *vis-à-vis* countries outside the sub-region, as well as by factors such as climate that were unrelated to MERCOSUR. In Brazil, MERCOSUR forced down prices for milk and dairy products owing to greater competition and lower prices in Uruguay and Argentina (although it should be noted that this downward trend predates MERCOSUR). In general terms, MERCOSUR has had a “direct” impact on forcing prices down, through greater competition at the sub-regional level, and an “indirect” effect, through the aforementioned productivity increases. Both these factors are closely related. It is worth noting that these are trends, since in the short term price

formation incorporates other factors, such as the seasonal and the climatic, which affect the production of milk as a raw material.

In general, the prospects for the dairy sector at the sub-regional and global level in the medium and long term are positive. The national companies, as well as the multinationals, have advanced greatly in terms of sub-regionalization, and the dairy industry is one of the sectors that has integrated most rapidly in terms of output and trade.

In the short term, however, the MERCOSUR countries will need to overcome the crisis brought about by the devaluation of the real in Brazil, which occurred amid an international environment weakened by successive financial crises. Commodity prices in international markets have fallen at the same time as a slowdown in many of the dairy-consuming markets led to a reduction in demand and to greater competition between exporting countries. Protectionist measures for the sector were increased in most countries, signaling a retreat from what was agreed in GATT. Recession in the MERCOSUR countries is coinciding with the devaluation in Brazil and the fall in domestic and sub-regional demand, as well as with a worsened financial environment marked by a lack of liquidity and an increase in interest rates.

Regionalism and Patterns of Trade

MERCOSUR has been very important in the development of dairy trade between member countries. This has not, however, been at the expense of extra-sub-regional imports and exports, nor has it aimed at diverting trade, increasing prices or creating other inefficiencies that might be generated by closed regionalism. Indeed, the reverse has occurred. MERCOSUR has not only reduced protection levels in the 1990s but, in terms of production and external trade, it is one of the least distorted sub-regions in the world – free from subsidies, quotas, price controls and other protectionist measures that affect the larger dairy producers in the developed countries. Since the establishment of MERCOSUR, there has also been a notable increase in productivity, which has resulted in a reduction in producer and consumer prices.

MERCOSUR's dairy sector enjoys comparative advantages – particularly in Uruguay and Argentina; Brazil is now acquiring such advantages. This is principally due to the sector's greater sub-regional orientation. In this respect, the trade pattern is well established. There is a world-wide tendency to export sub-regionally to nearby countries in view of the natural barriers affecting the transport of dairy products, which have a low unit value, and the perishable nature of some dairy products with higher added value (for example, cheese). MERCOSUR exports to markets outside the sub-region have also increased (by 38% between 1991-1993 and 1994-1996), as have imports from extra-sub-regional markets (by 65%

in the same period). Half of MERCOSUR imports originate from outside the sub-region, while a number of multinational companies have located in MERCOSUR in order to export to third countries. In particular, European firms are anticipating that the future elimination of subsidies will bring an end to the production of some dairy goods in Europe because of the high costs involved. They hope to export from MERCOSUR (Argentina and Uruguay).

If barriers and distortions affecting the international trade of dairy products are eliminated in the medium term – through multilateral agreements reached in the World Trade Organization – the international competitiveness of the sector would become more apparent, given the increasing quality and higher production levels of MERCOSUR products.

7. Challenges for the Dairy Sector

Challenges and Sustainability in the Development of the MERCOSUR Dairy Sector

While a number of the challenges confronting the dairy sector are common to all four of the MERCOSUR member countries, the capacity to overcome these difficulties successfully varies between the countries in light of the differences in the relative development of their productive sector, their consumption structures, and in areas related to their international competitiveness.

The principal medium- and long-term challenges are to continue to increase productivity and to achieve the maximum product and health standards, consistent with the highest international levels. In this respect, Brazil and Paraguay lag behind Uruguay and Argentina, since a significant proportion of the former's productive sectors are informal and are thus not subject to quality and health controls, either in milk production or in other dairy products (cheese).

In recent years, industrial production has tended towards concentration and specialization, with dairy production dominated by only a few actors equipped with new generation industrial plants of very high productivity. Dairy product diversity, already established in the developed countries, is expanding as companies increasingly focus on consumer demand.

Despite the aforementioned trends, there is still a significant gap in productivity and quality compared with the world's leading producers and exporters of dairy products (the EU and New Zealand/Australia). In terms of the cost of milk, the raw material, Argentina and Uruguay are, however, among the lowest-cost producers in the world. There is a gap in the quality of value-added dairy products (mainly some types of cheese), but not in the commodity-type

products, mainly powdered milk, where quality levels are already comparable with international standards.

In the short term, the MERCOSUR dairy sector is facing a number of important challenges related to the devaluation in Brazil and the international financial crisis, which has led to increased competition, lower international prices and a strengthening of protectionist measures on the part of most countries that have an impact on the sector. Tough international market conditions make it very difficult for either Argentina or Uruguay to redirect their exports towards third markets. These difficulties have been exacerbated by the slowdown in growth and the start of a recession in the domestic markets of these two countries. Domestic demand in Brazil, which is the principal market destination for Argentine and Uruguayan exports, is expected to fall significantly in 1999. This will invariably lead to a fall in demand for Argentine and Uruguayan imports owing to the devaluation of the real and, more importantly, to the recession.

Given the existing international market environment, Argentina and Uruguay will find it difficult to diversify their export markets, which are at present excessively concentrated in Brazil. On the one hand, the purchasing markets in Asia (and even in Russia) have contracted significantly, a situation that is likely to persist for some time (at least 12 or 18 months). On the other hand, the markets of the main developed countries, the EU and the United States (and even Canada), are practically closed to dairy imports, except for those covered by GATT Uruguay Round commitments. These countries are also partly watering down their commitments to reduce export subsidies, as agreed during the Uruguay Round, making it additionally difficult for MERCOSUR countries to export to third markets (for example, Mexico, the Caribbean countries or Africa).

Brazil aims to become self-sufficient in supplying its domestic market. If its production continues to increase at a steady pace, consumption will also increase. Given low *per capita* consumption, it is also expected that dairy consumption will steadily rise, as the power to purchase these products increases, whether through wage increases or a relative fall in prices. Brazil's aim of becoming self-sufficient will depend on whether the expansion in productivity outpaces increases in demand. It is worth noting that Brazil has the same seasonal cycle of milk production as Argentina and Uruguay. If Brazil succeeds in becoming self-sufficient it will force the other MERCOSUR countries to become net exporters to markets outside the sub-region.

A particular medium- to long-term challenge facing the Argentine dairy sector concerns the arbitrage of livestock and pasture for different rural products. This arises from the opening of new international markets for meat exports since Argentina recently received the status of country free of foot-and-mouth disease with vaccination. Hence, the profitability and productivity of Argentine meat will

easily compete with the dairy sector for resources in this area. This will invariably have an impact on the prices of these same resources. A second medium- to long-term challenge for Argentina is to absorb an increase in its exports without reducing its milk production. As the domestic market is more profitable than the international market, an increase in exports could lead to lower producer prices. In 1996, exports accounted for some 10% of milk production, and it is expected that this will increase to 20% by 2000. There has, however, been a fall in the domestic price of milk because of the crisis in Brazil.

Argentina and Brazil face the added problem – which is macroeconomic and therefore affects other sectors – of high interest rates and a lack of credit for small- and medium-sized companies. Together with the financial power of the large national and multinational companies, this has led to the uneven development of the sector according to company size, or to the take-over of small- and medium-sized firms by larger ones. A lack of credit is not a significant problem in Brazil since small and medium companies, as well as milk livestock farmers, have access to state credits at preferential rates from either the BNDES or the states' development funds.

A further macroeconomic factor, common to all MERCOSUR countries in varying degrees, is tax evasion within certain parts of the sector. This prompts unfair competition.

The most important challenge in the medium and long term, however, continues to be to increase the export supply, the value-added of exports, and product quality in order to gain access to the markets of the developed countries. In order to achieve this sub-regional competitiveness, representatives of the MERCOSUR dairy industry must overcome the effects of sectoral heterogeneity. Such effects, particularly in the short term, create pressures to introduce defensive measures that can threaten the consolidation of the sub-regional market. It is necessary, therefore, to stimulate and/or reinforce the sub-regional representation of the sector in both MERCOSUR negotiations and in international forum.

As will be examined below, access to these markets does not only depend on competitive conditions and the relative saturation of the MERCOSUR dairy export supply, but mainly on achieving, through international negotiations, greater access to these highly protected markets.

Problems and Challenges in Extra-MERCOSUR Trade

Because access to the markets of the main producing and exporting countries in the EU and the United States is still restricted, Argentine and Uruguayan dairy exports are somewhat dependent on the Brazilian market.

One of the most important challenges facing the MERCOSUR dairy sector is to export to countries outside the sub-region. The increase in productivity and efficiency over recent years, with quality standards increasingly reaching the levels of the most demanding countries, demonstrates that there is scope for competing internationally.

The future of the international dairy market is promising in the medium to long term, since demand and production will increase in a number of regions. In terms of trade, the regions that will benefit most from an increase in world demand for dairy products will be those that can produce at the lowest cost and are able to export without the use of subsidies. In this respect, MERCOSUR exporters, mainly Argentina and Uruguay, are well positioned internationally.

In the future, the dairy market will be much more diverse in terms of products and packaging. It will not be a market for products sold anonymously in bulk, but will rather consist of a range of specialized products, designed to satisfy the needs of increasingly demanding consumers world-wide. In line with international trends, the MERCOSUR dairy industry is increasing the sophistication and variety of the products that it offers.

The multilateral liberalization of the dairy trade is on the agenda and is making progress, but much work still needs to be done. This will take some time to achieve, mainly because of trade barriers in the countries of the EU and, to a lesser degree, in the United States and Canada. These countries have traditionally offered high levels of protection to their agricultural and associated manufactures sectors. In the short term, the measures agreed at the GATT Uruguay Round will afford the MERCOSUR countries greater access to the EU and US internal markets, particularly for cheese. Substantial progress in liberalizing the international dairy trade in the WTO may be possible in the medium term, perhaps during the next multilateral negotiations of the Millennium Round. However, transparent global competition will probably only be possible in the long term.

The bloc should focus its efforts on negotiating the elimination of restrictive barriers to international trade, as well as of subsidies for exports and dairy production. Trade promotion campaigns should also be organized; for example, the member countries, either individually or as a bloc, should establish a MERCOSUR stamp for use in markets with potentially large demand, such as Asia. The state could play an important supportive and complementary role in developing these trade promotion campaigns, although the private sector would play a key role and coordination at the MERCOSUR level would also be desirable.

In order to eliminate the aforementioned obstacles to free access, as well as distortions in international markets, the role of external negotiations involving the MERCOSUR public sector as a bloc is essential. MERCOSUR's main interest in

international trade negotiations should be to strengthen the non-discriminatory multilateral system for the reduction of trade barriers, and to propose new multilateral negotiations within the WTO. The new round of WTO negotiations will probably be the most effective⁵⁹ mechanism to advance in the global reduction of barriers and distortions that indiscriminately affect world trade; to make progress in the international liberalization of the dairy and agricultural/agroindustrial sector; and to strengthen global discipline so as to guarantee market access, particularly to the large, developed economies.

Problems and Challenges in Intra-MERCOSUR Trade

Since late 1997 and early 1998, Brazil has imposed non-tariff restrictions on the grounds that financial arbitrage on the part of importers and a triangulation of milk and other dairy products from outside MERCOSUR were undermining the common external tariff.

Triangulation may result from a lack of discipline which is "officially" tolerated within MERCOSUR with respect to sales within the zone. An allowance is therefore made for the use of "temporary admission" (as it is called in Argentina) or "drawback" (as it is called in Brazil).

Since January 1995, although each country continues to apply its own policy, a distinction should be made between export promotion mechanisms for intra-sub-regional and for extra-bloc sales.

The Common Market Council's (*Consejo del Mercado Común*, CMC) Decision CMC 10/94, introduced in 1994, limits and restricts the member countries' export incentives. The Decision places limits on financial, fiscal and customs incentives in intra-bloc sales or exports to MERCOSUR members. This measure, has largely been ignored, owing mainly to the extensive use of temporary admission and drawback in intra-sub-regional sales, as well as of financing instruments for intra-sub-regional exports.

The only means by which to eliminate the non-tariff barriers recently introduced by Brazil for intra-sub-regional trade lies in strictly applying and abiding by Decision CMC 10/94. On the one hand, if the use of temporary admission and drawback in intra-sub-regional sales were to be eliminated, as stipulated in Decision CMC 10/94, it would greatly limit the present risk of triangulation in MERCOSUR and would avoid discriminating against domestic

⁵⁹ Given that within NAFTA the trade in dairy products between the United States and Canada is still not liberalized, it is not yet clear when progress can eventually be made in this sector with respect to the FTAA. It is worth noting that Canada protects the sector more so than the United States, and that for Argentina and Uruguay, the United States has, and will continue to be, an important international ally in efforts to liberalize the dairy sector within the WTO.

producers. On the other hand, the elimination of export financing in intra-sub-regional sales, as is also stipulated in the Decision, would put an end – in intra-MERCOSUR operations – to the business of financial arbitrage between domestic and foreign interest rates for imports (and also for exports).

Enforcing Decision CMC 10/94 would also be a step in the right direction, since it would eliminate distortions in intra-regional trade, which can affect the efficient allocation of resources. It would also create incentives to base these advantages on the relative productivity and competitiveness of the domestic macro and microeconomic environment.

8. Conclusions and Recommendations

In the 1990s, three factors have had a fundamental impact on the dairy sectors in Argentina, Brazil, Paraguay and Uruguay. Two of these factors are associated with the sub-region, while the third is external. The sub-regional factors are, first, the stabilization and structural economic reform carried out in these countries and, second, the sub-regional integration process. The latter, together with the simultaneous process of unilateral opening, led to the creation of open regionalism in MERCOSUR. It is worth noting that the impact of sub-regional trade liberalization and the non-discriminatory reduction of tariff and non-tariff trade barriers was felt in both the Argentine and Brazilian dairy sectors as early as 1986-1987. The third factor was the agreement reached in the Uruguay Round. This led to a reduction in EU and US production and export subsidies – which, in turn, resulted in a significant fall in European powdered milk and butter surpluses – and to the dismantling of the central planning bodies in the former Soviet Union, which had a significant impact on international purchases and on the butter surplus.

These three factors had a significant and positive effect on the supply and demand structure of MERCOSUR's dairy sector. The international dairy sector is entering a new phase of greater discipline in terms of subsidies, which will eventually lead to a reduction in international trade barriers. In this new phase, competitiveness is the key factor for success. The MERCOSUR dairy industry, especially in Argentina and Uruguay, is therefore well positioned in the global market.

In terms of demand, the stabilization processes carried out in MERCOSUR led, on the one hand, to an increase in purchasing power and consumption in the member countries; this prompted an increase in the demand for dairy products. On the other hand, the creation of MERCOSUR implied a widening of the internal market for member countries, with access to a market of 200 million consumers. The elimination of trade barriers therefore meant that growing demand in the

region, particularly in Brazil, was increasingly being met by competitive exports from the member countries, partially substituting subsidized EU exports.

In terms of supply, the stabilization, external opening, and internal deregulation processes, on the one hand, and the development of MERCOSUR on the other, helped boost competition in each of the member countries and at the sub-regional level. At the same time, the above factors created the conditions that enabled this competition to be effected through heavy investment from local and foreign companies. These firms positioned themselves in the sector through mergers and associations with companies already established in the member countries' domestic markets. In many cases, there was evidence that a clear sub-regional strategy had been adopted. In other cases, this process led to the entry of new multinational companies and investment funds interested in making acquisitions in the sector because of its potential for growth and for generating value-added. Greater competition stimulated an increase in investment and productivity which, in turn, led to a significant transformation in the MERCOSUR dairy sector, especially in the industrial, technology, specialization, scale, management, marketing and distribution structures.

In general, the prospects for the dairy sector at the sub-regional and global level in the medium- and long-term are positive. National and multinational companies have advanced greatly in terms of sub-regionalization, and the dairy industry is one of the sectors that has integrated most rapidly in terms of output and trade.

In the short term, however, the dairy sectors in the MERCOSUR member countries face numerous threats following the international financial crisis, specifically the fall in international commodity prices and in world demand. This has increased both the level of competition between exporting countries and the risk of greater protectionism in the sector. It may also force countries to backtrack on GATT-agreed subsidy reductions. In the domestic and sub-regional context, the MERCOSUR countries have been affected by the strong devaluation and recession in Brazil, and the consequent fall in demand, as well as by a deterioration in financial conditions, which has led to a greater shortage of credit and money, as well as to an increase in interest rates.

These factors have affected the four MERCOSUR member countries to varying degrees, as was also the case during the 1980s.

In Brazil, the liberalization of the dairy market from the early 1990s onwards marked the end of 40 years of state regulation which, in contrast to the European and North American models, impeded the modernization of farming. The dairy sector thus consists of more than one million rural producers, in contrast to just over 20,000 in Argentina, where production is half that of Brazil, and 8,000 in Uruguay, accounting for 5% of total Brazilian production. Paraguay is most

similar to Brazil, where 140,000 producers account for less than half the production in Uruguay.

The new competitive environment transformed the industrial profile of the Brazilian dairy sector, as well as the relative position of the leading companies. The cooperatives were badly affected, leading initially to the sale of regional cooperatives and, more recently, the large dairies. The main beneficiaries – the multinational companies – simultaneously strengthened their control over the domestic market and repositioned themselves in neighboring countries, taking advantage of the geographical benefits of the enlarged market.

From 1994 onwards, the stabilization and subsequent growth of the economy substantially increased domestic demand. This led to a recomposition of the actors in the chain and helped soften the impact of imports, which were increasingly originating in the MERCOSUR countries. New lines of investment (for long life milk production) and the modernization of installations combined with strong productivity growth in specific parts of the chain (bulking, cold storage tanks, larger herds and increased yield per cow). Consequently, consumer prices did not move in line with inflation, and prices for raw materials fell by 40% between 1994-1997.

Today there is evidence of self-sufficiency in the sector, which is beginning to prepare itself for competition in the international markets where milk quality is the main priority. The cooperatives that survived the turbulence of the 1990s are now restructuring, notably through management professionalization, organizational flexibility and the creation of new partner relationships. There is a high degree of heterogeneity in the different parts of the sector, the result of changes in consumer patterns and the sub-regional restructuring of MERCOSUR's productive base. The principal actors in the sector are also demonstrating a higher degree of coordination, which is evidence of "patternization" and predictability in the supply of raw materials.

In Argentina, dairy production increased by 50% in the 1990s, while exports accounted for 12% of total production. Powdered milk and cheese were the main dairy export products. The way in which the ranking of leading firms has developed is evidence that there is greater stability in the Argentine dairy sector than in the Brazilian case, because of the relative stability of domestic consumption. The development of domestic consumption has been marked by a return to the levels existing prior to the crisis of the early 1990s, and by a strong increase in yogurt consumption. These factors, however, do not reflect the important changes which took place as a result of the dynamism of the sub-regional market. The leading companies have invested heavily in plants, while the regional cooperatives are modernizing and extending their existing installations. The cooperative sector is, therefore, not exhibiting the same signs of crisis and/or

pressures that exist in Brazil and, to a lesser degree, in Uruguay. On the contrary, in Argentina, Sancor is the leading company in the dairy sector (accounting for 25% of the market). The company has incorporated the latest technologies and has increased its exports of value-added products to countries outside the sub-region (United States), which in some cases arrive directly at the supermarket under the Sancor brand.

This new expansionary phase on the part of national companies and cooperatives is characterized by the creation of associations, reflecting perhaps the need to strengthen marketing, technology and finance. Mastellone, the second largest national company, entered into a joint venture with Danone to produce yogurt, and opened its capital to foreign investment. Milkaut is seeking to incorporate the latest technology through an alliance with the Dutch company Nutricia, while the cooperative Sancor, the largest company in the sector, prefers to consolidate its position through alliances with national (COTAR of Rosario), sub-regional (Batavo of Brazil, later acquired by Parmalat), and international (M.D. Foods of Denmark) cooperatives. The multinationals, meanwhile, are strengthening their position in Argentine dairy sector through direct investment.

Most of this new investment, which includes cutting edge technology – particularly in powdered milk and cheese – points to an increase in the ability of the sector to penetrate the sub-regional and, increasingly, the international markets. The accumulative effect of these investments is highly significant, and could be excessive, since it depends on the development of the Brazilian market, where there are signs that the domestic production of powdered milk is recovering strongly. The leading companies have also experimented with trade agreements or with investing directly in the Brazilian market. The challenge for the sector today is how to exploit this new international competitiveness (the result of sub-regional integration and opening) in order to increase its export presence in the extra-sub-regional markets, particularly for value-added products.

The Uruguayan dairy industry has been geared towards the export sector since the 1980s, principally because of bilateral agreements with Brazil and Argentina. The industry is also globally competitive, especially in cheese. The modernization of the sector was led by the Conaprole cooperative, responsible for 80% of milk collection in the country. The consolidation of MERCOSUR, which was marked by the renewed strength of the Brazilian market, helped to expand production in the 1990s and also allowed Conaprole to experiment with the export of brand products, primarily long life milk. At the same time, MERCOSUR facilitated the entry of multinationals into the Uruguayan dairy industry. These multinationals adapted the scale of their activities to the newly enlarged sub-regional market. The participation of Parmalat, which sought to exploit the advantages of the Uruguayan milk-producing areas, transformed the existing competitive

environment. Conaprole entered into a joint venture with Bongrain, the leading cheese producer, since Uruguayan milk is a key part of its sub-regional reorganization strategy. As a result of these multiple pressures and new opportunities, Conaprole is now itself restructuring.

The Paraguayan dairy sector failed to industrialize, given the predominance of unprocessed milk consumption, even in the capital. With the growth of the long life sector, boosted by the entrance of the multinational Parmalat, the industry is now restructuring through new investment by leading companies such as Trébol, Lactolandia and Parmalat. The latter is now the third largest dairy company. The sector is strongly integrated in MERCOSUR through the import of powdered milk from Argentina. The modernization of the consumer market and the growing importance of value-added products is reflected in the agreement between Guaraní dairy industries, the fifth largest company, and Argentina's Molfino Hnos. S.A. to market the latter's products in Paraguay.

Argentina and Uruguay account for most intra- and extra-bloc exports, while Brazil absorbs most intra- and extra-MERCOSUR imports. Despite being the fifth largest world dairy producer, Brazil has become the driving force behind MERCOSUR's international trade in dairy products. Brazil imported an average of US\$ 471 million worth of dairy products in 1994-1996, about half of which originated from outside the bloc. The strong dynamism of the MERCOSUR dairy sector between 1991-1993 and 1994-1996 was the result of increases in Argentine and Uruguayan exports to Brazil, in conjunction with a rise in extra-sub-regional imports to MERCOSUR, principally to Brazil, and subsequently to Argentina. Given that at the international level there is restricted access to the markets of the main producing and exporting countries (the United States and the EU), and because of the fall in demand from Asian countries (and Russia) following the financial crisis, Argentine and Uruguayan dairy exports – particularly powdered milk and long life milk – are to some extent dependent on the Brazilian market.

An issue of crucial importance for the development of the MERCOSUR dairy sector is the elimination of non-tariff barriers for intra-bloc trade and the establishment and consolidation of the customs union. This requires compliance with what is agreed, the improvement of the common external tariff, and the elimination of the lack of discipline in this respect. The member countries must first comply with Decision CMC 10/94 on limiting the use of temporary admission and drawback, as well as export financing for intra-bloc sales.

MERCOSUR must integrate further between 1999 and 2000, thereby enabling the sub-region to develop from trade integration to greater economic integration. Of key importance in this process are macroeconomic coordination, which should be preceded by a stage of strong cooperation, and the harmonization of investment incentives. These issues in particular, however, have provoked tensions

within MERCOSUR, especially since the devaluation in Brazil, and must be resolved as quickly as possible to ensure the formulation of concrete agreements and operative programs.

In future, the pattern of intra-MERCOSUR trade could change significantly in view of Brazil's aspiration to become self-sufficient and, in the longer term, to increase its exporting role. As long as the trend towards increased production continues, the MERCOSUR countries should find new markets for their products and transform themselves from sub-regional into global exporters.

MERCOSUR's ability to export to countries outside the region is one of the most significant challenges facing the bloc's dairy sector. The increases in productivity and efficiency achieved over recent years, as well as the rapid progress made in improving quality to international standards, is evidence that the sector is in a strong position to compete internationally. The MERCOSUR dairy industry will also benefit if the sub-regional trend towards concentration and specialization is accentuated. This is creating a sub-regional market with few highly competitive and quality-conscious competitors. The MERCOSUR countries also have comparative advantages in milk production, in terms of the prices that the dairy industry pays to the producer, which are among the lowest in the world. Producer prices in Uruguay and Argentina are, in effect, only 2 or 3 cents higher than those in Australia and New Zealand, the most competitive countries in the world, while prices in Brazil are slightly higher. The advantages in terms of the prices paid for raw materials are, in any case, greater than in the EU or the United States.

There are, however, a number of other considerations, some of them very important, that should be taken into account for the even development of the sector. These include the shortage of credit, and high interest rates, for small- and medium-sized businesses (especially in Argentina). A further aspect is tax evasion in some parts of the primary production and processing chain, which results in unfair competition for those who pay the corresponding taxes.

As mentioned above, the dairy sector faces a number of important short term difficulties arising from the devaluation of the real and the recession in Brazil, together with the international financial crisis. This has led to a fall in world demand for dairy products, greater competition between exporting countries, and lower international prices.

With respect to international trade, MERCOSUR is far more open than the EU or the United States. It has also deregulated its markets and eliminated subsidies to a greater degree. The bloc should thus focus its efforts on negotiating the elimination of restrictive international trade barriers and subsidies for exports and dairy production in the main producer countries (the United States and EU). Trade promotion campaigns should also be organized; for example, the member

countries, either individually or as a bloc, should establish a MERCOSUR stamp for markets with potentially large demand, such as Asia. The state could play an important supportive and complementary role in developing these trade promotion campaigns although the private sector would play a key role and coordination at the MERCOSUR level would also be desirable.

The role of external negotiations involving the MERCOSUR public sector as a bloc is essential for eliminating barriers to access and distortions in international markets. With respect to international trade negotiations, MERCOSUR'S main interest should be to strengthen the non-discriminatory multilateral system for the reduction of trade barriers, and to propose a new multilateral negotiation in the WTO. The new "Millennium Round" of negotiations will probably begin around 2000. A number of critical issues for MERCOSUR, such as global trade liberalization in the dairy and agricultural/agroindustrial sector, as well as the elimination of subsidies in the sector, will be difficult to resolve through trade preference agreements with either the United States or the EU. The new WTO round will, therefore, be the most effective discriminatory mechanism for continuing to reduce world-wide barriers and distortions that affect global trade, to advance in the international liberalization of the dairy and agricultural/agroindustrial sector, and to strengthen global disciplines to guarantee market access, particularly to the large, developed economies.

TABLE 4: World Trade in Dairy Products – World Exports 1997
000 Metric Tonnes

	CHEESES	WHOLE PM	SKIMMED PM	BUTTER	TOTAL
OCEANIA	349	455	421	423	1,648
EUROPEAN UNION	471	541	282	225	1,519
NORTH AMERICA	55	15	145	37	252
FORMER SOVIET UNION	4	5	40	75	124
EASTERN EUROPE	16		90	13	119
SOUTH AMERICA	20	57	16	4	97
WESTERN EUROPE	61		3		64
INDIA			8		8
ASIA		4			4
SOUTH ASIA				2	2
TOTAL	976	1,077	1,005	779	3,837

World Imports 1997

	WHOLE PM	SKIMMED PM	BUTTER	TOTAL
FORMER SOVIET UNION	60	60	278	398
NORTH AFRICA	115	125	50	290
SOUTH AMERICA	177	97	9	283
NORTH AMERICA	23	133	25	181
EUROPEAN UNION	4	62	91	157
ASIA	32	83	1	116
EASTERN EUROPE		3	8	11
OCEANIA	2	2	4	8
SOUTH ASIA			5	5
EASTERN EUROPE			4	4
INDIA				0
TOTAL	413	565	475	1,453

SOURCE: FAS, USDA (Foreign Agricultural Service, US Department of Agriculture).

**TABLE 5: Dairy Exports of the MERCOSUR Countries,
Intra-Zone and Extra-Zone
000 US\$
Argentine Exports**

DESTINATION	86-88	91-93	94-96
BRAZIL	6.859	20.759	151.697
PARAGUAY	28	18.699	26.742
URUGUAY	33	131	932
MERCOSUR TOTAL	6.920	39.589	179.371
EXTRA-MERCOSUR TOTAL	21.959	17.443	34.169
WORLD TOTAL	25.205	53.817	210.623

Brazilian Exports

DESTINATION	86-88	91-93	94-96
ARGENTINA	-	6.305	1.766
PARAGUAY	8	771	2.157
URUGUAY	16	53	176
MERCOSUR TOTAL	24	7.129	4.099
EXTRA-MERCOSUR TOTAL	1.753	4.303	6.237
WORLD TOTAL	1.777	11.433	10.336

Paraguayan Exports

DESTINATION	86-88	91-93	94-96
ARGENTINA	-	-	-
BRAZIL	-	78	22
URUGUAY	-	-	-
MERCOSUR TOTAL	-	78	22
EXTRA-MERCOSUR TOTAL	-	-	-
WORLD TOTAL	-	78	22

Uruguayan Exports

DESTINATION	86-88	91-93	94-96
ARGENTINA	8.000	25.549	23.424
BRAZIL	17.248	23.438	82.825
PARAGUAY	11	128	208
MERCOSUR TOTAL	25.259	49.115	106.457
EXTRA-MERCOSUR TOTAL	15.516	22.075	19.980
WORLD TOTAL	40.775	71.190	126.437

MERCOSUR Countries Total

DESTINATION	86-88	91-93	94-96
MERCOSUR TOTAL	32.203	95.912	289.948
EXTRA-MERCOSUR TOTAL	39.228	43.821	60.386
WORLD TOTAL	67.757	136.518	347.417

**TABLE 6: Dairy Imports of the MERCOSUR Countries,
Intra-Zone and Extra-Zone
000 US\$**

Argentine Imports

ORIGIN	86-88	91-93	94-96
BRAZIL	-	2.999	2.084
PARAGUAY	-	0	-
URUGUAY	7.648	27.352	18.052
MERCOSUR TOTAL	7.648	30.352	20.136
EXTRA-MERCOSUR TOTAL	2.941	55.982	43.140
WORLD TOTAL	10.589	86.333	63.276

Brazilian Imports

ORIGIN	86-88	91-93	94-96
ARGENTINA	7.458	24.254	164.746
PARAGUAY	-	78	28
URUGUAY	16.953	24.267	82.014
MERCOSUR TOTAL	24.412	48.599	246.788
EXTRA-MERCOSUR TOTAL	106.851	106.924	224.619
WORLD TOTAL	131.263	155.523	471.407

Paraguayan Imports

ORIGIN	86-88	91-93	94-96
ARGENTINA	20	3.630	13.132
BRAZIL	1	756	790
URUGUAY	-	124	85
MERCOSUR TOTAL	21	4.511	14.007
EXTRA-MERCOSUR TOTAL	519	1.389	766
WORLD TOTAL	540	5.900	14.774

Uruguayan Imports

ORIGIN	86-88	91-93	94-96
ARGENTINA	22	155	965
BRAZIL	1	186	177
PARAGUAY	-	-	-
MERCOSUR TOTAL	22	341	1.142
EXTRA-MERCOSUR TOTAL	415	820	3.887
WORLD TOTAL	438	1.161	5.030

MERCOSUR Countries Total

ORIGIN	86-88	91-93	94-96
MERCOSUR TOTAL	32.103	83.802	282.074
EXTRA-MERCOSUR TOTAL	110.727	165.114	272.412
WORLD TOTAL	142.830	248.917	554.486

1. Introduction

THE CORE OF THIS ARTICLE CONCERNS the role played by integration in the performance of the machine tools sector. Assessing the effects of integration, however, demands consideration of the technical and economic characteristics of the industry, the regulatory framework of the integration process, and the evolution of the industry in the sub-region. The first four sections very briefly address these issues, the fifth analyzes the effects of the integration process in detail, and the final section briefly outlines the challenges and prospects of the machine tools industry (MTI) in MERCOSUR.

2. Technical and Economic Characteristics of the Machine Tools Industry

From the technological point of view, the MTI is a strategic sector in as much as it is the heart of the capital goods industry and produces "machines that make machines". This means that the MTI is a locus for accumulating and diffusing technical progress throughout the whole economy.

One of the main structural features of the MTI is its heterogeneity, evident not only at the level of products – there are more than 3,000 types of machine tools (MT) covering a broad range in terms of performance, durability and price – but also as regards the manufacturers, since small family firms coexist with large business groups.

MT are usually mass produced, and the process requires a large number of qualified personnel (engineers and specialized operators). Economies of training are therefore of particular importance. In most countries, MT are manufactured using parts and spares that are bought from specialized suppliers. In the 1970s the technical basis of the industry, originally electro-mechanical, underwent a radical change as a result of the introduction of electronic controls (numeric control – NC), which arose from a technological amalgam known as "mechatronics". This transformation prompted, on the one hand, a significant change in the knowledge required to produce MT and, on the other, a relative increase in economies of scale. Although this new technical basis has now matured, the use of numeric control is more widespread in MT for chip removal than in shaping machines.

The production of MT was concentrated in the countries that led international industrialization (especially the United States and Germany and, after them, Switzerland and Italy). In the post-war period, Japan entered the heavy industry market and became the main producer and world exporter, followed later by South Korea, Taiwan and, more recently, China. In the West, and in particular in

the United States, MT production suffered a sharp decline but managed to recover from the end of the 1980s (see Table 1 for data on MT production and exports by country).

In MERCOSUR, only Argentina and Brazil have an MTI, since Paraguay and Uruguay import all the MT they consume. Nevertheless, as can be seen in Table 2, there are enormous structural differences connected to the size of the Brazilian MT industry (BMTI) and the Argentine (AMTI), their degree of opening and their regional orientation. These issues are analyzed in detail below.

World-wide, there are high indices of intra-industrial trade in MT, while the producer countries display a tendency to specialize in products with specific characteristics (for example, Germany is known for its high-performance and relatively costly machines). The leading producers therefore usually record high indices in the export and import of products, except for Japan which imports relatively few. International investment is much less than trade, although it has increased in large part because of Japanese expansion into the markets of the United States and Western Europe. In MERCOSUR, Argentina's import and export indices exceed those of the leading countries, while in Brazil the indices have increased substantially in this decade (mainly imports). The Brazilian case is also notable for the marked presence in its MTI of the subsidiaries of foreign companies.

The dynamism of the MTI clearly depends on the development of industrial investment, particularly in the metal-mechanic sector (within which the automotive sector stands out), and on the availability and conditions of credit to acquire capital goods, as well as on wage costs and exchange rates. The governments of the countries where the main MT manufacturers operate, apart from the influence that they have on dynamism through their macroeconomic policies, intervene directly in the development of the industry by applying export promotion mechanisms, protection against imports, credit and fiscal incentives for production and technological development, and coordination mechanisms between manufacturers, as well as between manufacturers and suppliers. Particular note should be taken of government activity in the cases of the Asian countries that entered the industry after the Second World War and in the recovery in the United States. In MERCOSUR, the relatively high level of protection that prevailed during the import substitution period gave way to a relative lack of protection in the Argentine case and to ambiguity in the Brazilian case.

3. The Regulatory Framework in Argentina and Brazil

As is well known, the import-substituting industrialization strategy gave rise to ambiguity as regards the establishment of capital goods industries at national level: while production was promoted and local production was protected against

imports, tariff and exchange rate mechanisms were also adopted to stimulate imports.

In Argentina, this profile was maintained throughout the post-war period until the end of the 1970s, when the AMTI was decimated by a combination of low tariffs and an overvalued exchange rate, coupled to an undynamic domestic market. Despite the fact that protection mechanisms were reestablished in the 1980s, their scope was reduced by low growth in the domestic market and the lack of competitive mechanisms for domestic financing. In that context, the liberalization of trade with Brazil from 1987 (the outcome of the bilateral agreements of the previous year), was fundamental to the survival of the industry.

In the Brazilian case, the import-substitution regime remained in place until 1990: once the bilateral agreement was signed, Argentine machines began to enter the market, even though the regime of relative protection against imports from third countries was retained. Until the end of the 1970s, the BMTI even enjoyed a domestic internal market that was expanding and, after 1964, credit mechanisms that benefited the sale of MT products.⁶⁰

In the 1990s, the two countries' development strategies began to converge, especially when the stability plans were implemented in Argentina in 1991 and in Brazil in 1993. Beyond monetary reform, both countries resorted to an exchange rate "anchor" that provoked severe deficits in the current account, which entailed a need for substantial funds in the capital account in order to maintain an even balance of payments. In this context, imports of capital goods were seen as strategic since, despite imposing a burden on the trade balance, in the long term they must prompt an increase in the productivity of the economy, expanding exports and fostering growth. The macroeconomic policies adopted in the two countries, particularly the combination of an overvalued exchange rate with high interest rates, provided a strong stimulus to MT imports. The tax burden on local production and imports seemed to have an identical effect.

In both economies, the incentives arising from macroeconomic policies were coupled to a profound liberalization of capital goods imports and the elimination of non-tariff barriers. As regards the tariff regime, the Argentine system is more radical than the Brazilian and tariff protection reached zero in the period 1993-1995, until negotiation of the MERCOSUR common external tariff (CET) gradually raised it: to 10% in March 1995 and 14% in August 1996. In Brazil, tariffs fell drastically in the period 1990-1995,⁶¹ a decline accelerated by negotiation of the

⁶⁰ Mainly through the FINAME, a subsidiary of the National Bank for Economic and Social Development, BNDES.

⁶¹ For example, the tariff on numeric control MT fell from 65% in 1990 to 17% in 1996.

CET. Although the latter contemplated convergence at 14% by 2001, in 1997 Brazil raised the tariff on MT by three percentage points to constrain imports.

It should be underlined that, in both countries, various factors considerably reduced tariff protection and, consequently, the impact of the instruments of integration. Functional tariff exemptions were granted in both countries. In Argentina, they were applied to imports for "turnkey" projects, while in Brazil they were applied to products that have no national equivalent (that is, the ex-tariff, which is extremely difficult to verify). It is estimated that, in both countries, more than half of MT imports were conducted under these regimes. To these imports one must add tariff reduction that almost reached zero (2%) for investment in particular sectors, notably in the main market for MT (the automotive sector) and, in Brazil, for investment in certain regions.⁶² In both Argentina and Brazil, the implementation of protection mechanisms against unfair practices affecting international trade was delayed and, even today, such mechanisms operate uncertainly. Finally, in both countries tariffs levied on certain important components, such as numeric controls, are equal to or higher than those applied to MT, which reduces the level of effective protection.

Despite the similarities between the two regulatory frameworks, they display significant differences that inevitably affect the performance of the two MTI. Unlike Argentina, Brazil retained credit mechanisms for MT sales in the domestic market,⁶³ adopted an active policy of stimulating exports (even to Argentina) through fiscal and credit incentives, and established a link between imports of capital goods undertaken in the framework of the automotive regime and local purchases.⁶⁴ Brazil has shown greater willingness than Argentina to limit MT imports, as reflected by the recent tariff increase and the reduction of the ex-tariff products.

These substantial differences may be attributed, on the one hand, to the greater political and economic significance that the industrialization process assumed in Brazil and, on the other, to structural differences between the MTI of the two countries in terms of size and political weight, which has given rise to accumulative processes that are "virtuous" in one case and "defective" in the other.

⁶² Imports through the Manaus free zone enjoy an 88% cut on the tariff and the Tax on Industrialized Products.

⁶³ In 1988 Argentina reestablished some credit mechanisms that, as regards interest, resembled those used in Brazil. In both cases, the interest is substantially higher than those in the international market, which favors imports.

⁶⁴ In line with the norms of the Brazilian automotive sector, local purchases had to be equivalent to imports in 1997 and to 150% of them for 1998-1999. It is worth noting that it was unnecessary for local purchases to be the same products as were imported. There are no such provisions in Argentina.

4. Development of the Two Industries

The Pre-Integration Stage

The machine tools industries of Argentina and Brazil have the same origin, since both developed spontaneously in response to the stimulus that local production received as a result of restrictions on imports. In both countries production was begun by immigrants, mainly of Italian origin; was based on the knowledge that they had acquired in their countries of origin; and was supplemented with activities to repair, imitate and adapt the imported machines. In both cases, the machines made were relatively simple.

The two industries grew in a similar manner until the second half of the 1950s, when the affiliates of foreign (mostly German) companies entered the BMTI (but not the AMTI) to supply the automotive sector that was being established in Brazil during that period, stimulated by incentives to substitute imports. These affiliates of foreign firms produced their simplest models in Brazil, based on technology provided by their parent companies. The large national firms, particularly the leading manufacturer of lathes, faced the changes in demand and competition by expanding their productive capacity and availed themselves of the agreements on technology imports to modernize their product lines.

Despite differences in terms of the actors participating in the sector during the 1950s, both industries developed similarly until the end of the 1970s, when Argentina introduced a profound program of trade liberalization in a context of recession. By contrast, the BMTI enjoyed protection against imports in a rapidly-growing economy. Thereafter, the two industries followed very different paths.

With the opening to imports, the AMTI's output fell in 1979 and declined sharply as of 1980. In 1982, 2,500 units were produced, nine times less than the record set in 1973. Output by unit remained at very low levels until 1986. Until the opening to imports of 1977-1981, the AMTI's output went mainly to the domestic market. Although there was some displacement of local production by imports, the greatest impact on the sector sprang from the fall in the demand that began in 1978, since many MT users decided to discontinue production before the opening to imports.

As well as supplying between 80% and 90% of apparent consumption by unit (and around 60% by value), the Argentine industry began to generate significant export flows in 1974 and reached its maximum export value in 1980. Most of the exports went to the Latin-American market, consisting of relatively simple machines that competed adequately in type and quality with machines from other sources. Such machines were not manufactured elsewhere in the region, except in Brazil. These exports, especially given the high level of demand in Mexico, partly

offset the decline in the domestic market. However, as a consequence of the external crisis of which Mexico was the epicenter, export success turned out to be a temporary palliative.

In sum, output contracted as of 1978 and exports replaced the domestic market as the main source of growth in the period 1976-1981, when there was a process of de-substitution of imports and a fall in apparent consumption. The contraction of output led many establishments to close their doors while others turned to the repairs market or other fields. The companies that continued to produce MT opted to cut their workforce. In the 1980s, particularly from 1986 on, the slight reactivation of economic activity as a result of the Austral Plan, and the relative increase in productive investment, facilitated the recovery of MT output.

The BMTI, for its part, protected from imports and assisted by special credit lines in an expanding market, developed until the start of the 1980s and became the world's tenth leading manufacturer of machine tools. Production went mainly to the domestic market; exports accounted for less than 10% of sales and went primarily to other Latin-American countries, especially Mexico. Despite the protection regime, during the 1970s imports behaved pro-cyclically and supplied about 40% of apparent consumption in peak years.

Among producers in Brazil there was a tendency to specialize. The subsidiaries provided the most sophisticated products, such as machining centers and special machines; the national leaders supplied intermediate products, such as large lathes; and many small and medium local companies were devoted to the production of simpler products, following the metal-mechanic model. From 1982, as a consequence of the macroeconomic crisis, the BMTI entered a deep crisis. Between 1979-1981 and 1982-1984, domestic sales fell by almost 60%. Foreign markets offered no way of offsetting the losses, since they too were in recession.⁶⁵ In Mexico, for example, the value of exports in the period 1982-1984 was at least 30% less than in the previous three-year period. However, production of numeric control MT behaved differently, since the average number of units sold annually during the three-year crisis period (1982-1984) surpassed the average of the previous two years. Domestic production of numeric control MT, which exceeded import levels from 1981 on, was concentrated in a few subsidiaries of foreign firms and in the national leader in the production of chip removal machines.

The heterogeneity of the BMTI thus increased as a result of the crisis. Although most companies adopted defensive tactics, cutting their workforce and reducing their level of indebtedness, the leading firms adopted the new technological paradigm, even raising the share of investment in liquid operational revenues. It should be underlined that the learning process occurred under conditions of

⁶⁵ World output of machine tools fell by almost 40% between 1980 and 1983.

relative protection against imports, although such protection was justified as a means of securing high trade surpluses to pay the foreign debt service, rather than as an import-substituting industrialization strategy.

The Period of the Capital Goods Protocol (1987-1990)

In 1987, the Capital Goods Protocol to the Argentine-Brazilian integration agreement came into effect; several types of MT were included. Although exports to other destinations also increased, the Brazilian market absorbed almost three quarters of the value of Argentine exports in the period 1987-1989. The fall in sales to the domestic market as a result of the decline in economic activity in 1988, which worsened in 1989 and 1990, meant that exports acquired increasing weight in Argentine MT production (see Table A-1). In turn, the incidence of imports in apparent consumption was very significant throughout the 1980s. For the largest imports, from 1987 on, the industrial promotion systems that allowed MT imports to enter free of the corresponding tariffs, and the concessional credit made available by the Italian and Spanish governments, clearly played an important role. From 1988, imports of computerized numeric control MT acquired particular significance, since they accounted for 80% of the consumption of such machines.

While output stagnated in the first half of the 1980s because of the contraction of the domestic market and the decline in exports, in the period 1986-1990 exports became a key factor in the performance of the sector. Imports also grew, though not at the same rate as exports. The increase in production from 1986 was not only the result of greater demand, first in the domestic market and then in the Brazilian market, but was also a reflection of a change in the type of MT being manufactured. The most significant change was the greater portion of MT with computerized numeric control in the value of output. Total value produced in 1985 (6.4%) grew to 30.4% in 1989, and then fell to a quarter in 1990.

Of the MT with computerized numeric control, the only ones that attained a significant volume (and value) of production were lathes, whose export coefficient reached 86% in 1988 and later fell. There was a notable increase in the labor productivity, the first in the sector for many years, owing to better use of installed capacity and hence the attainment of certain economies of scale and the change in the composition of production mentioned earlier.

In the period 1984-1988, Brazil experienced limited economic growth, initially driven by exports and then by the apparent success of the Cruzado Plan. Consequently, domestic demand for machine tools recovered markedly. This was reflected in the average annual value of Brazilian output between 1986 and 1988, which was 3.4 times higher than the average in the three-year crisis period. This recovery was due exclusively to sales in the domestic market, since exports accounted for barely 5% of total sales in the three-year period. As usually happens,

imports reacted somewhat later and began to grow in 1987. In the last two years of the period, imports accounted for 24% of apparent consumption, in comparison with 9.5% in 1986 (see Table B-1).⁶⁶

This huge expansion of the Brazilian market favored the growth of all the segments of the BMTI and led the medium-sized national companies, which adopted a "subordination" strategy (Erber and Vermulm, 1993), to produce MT with numeric control although without threatening the leading companies that produced more complex and more expensive goods. In 1989, Brazil's production of numeric control MT was equivalent to almost ten times the Argentine output, reaching nearly 44% of the industry's sales. At the same time, the development of the Brazilian market opened the way to the entry of Argentine products, especially lathes with computerized numeric control.

This expansion cycle of the BMTI changed course in 1989 because of macroeconomic difficulties and, from the following year, because of structural reforms (prominent among which was the opening the BMTI to imports). Hence in 1989 the production of machines fell 20% over the previous year, and in 1990 the fall was over 11%. Total exports, although growing, continued to account for only a small share of output (7.6% in 1989-1990). Despite the crisis, imports continued to grow and represented 31% of apparent consumption in 1989-90 (see Table B-1).

The Performance of the AMTI in the 1990s

The sector was very weak in its technological and managerial capacities as a result of the opening to imports in the late-1970s and the crisis of the 1980s. Although access to the Brazilian market at the end of the last decade opened new possibilities, it was insufficient for the sector to reverse its serious structural weaknesses, which were mainly evident in the failure to upgrade equipment and processing and product technologies, as well as in the lack of financial and managerial resources for modernization. In these circumstances, the bias of economic policy in the 1990s and the government's attitude towards the demands of the sector formed a very unfavorable backdrop for the sector's development and, as a logical consequence, existing structural weaknesses deepened.

As regards local MT production, Table A-1 reveals a declining trend in the 1990s; indeed, in 1996 it reached a low of US\$ 24 million. While part of the decline in the value of output was due to lower prices, physical volume also

⁶⁶ The periodicity established by the Protocol acted as a dividing line in the Argentine case. In the Brazilian case, by contrast, such a situation did not arise, reflecting the different degree of importance that each country assigns to the MT industry and trade.

contracted as a result of the closing of businesses.⁶⁷ In 1997 there was a slight rebound in output, but it is too soon to be optimistic about a possible reversal of the trend. The production of parts and components for all MT has oscillated throughout the decade, with an average value of around US\$ 6.5 million in constant dollars. The different trends in the production of finished MT and parts seem to suggest that the manufacturers of parts and components produce for the used national MT replacement market and/or that some manufacturers of finished MT are also producing parts.

The fall in output prompted a severe contraction in employment. In 1988, 1,870 people were employed in the sector. Some 1,256 remained in 1991 and by 1997 this figure had fallen to just 763. For the most part, operators were let go, but a relatively large number of technical and professional jobs were also lost (20% of the total in 1991 and 1997). As employment declined more than output, labor productivity in the sector increased by 19% (in constant dollars) between 1991 and 1997, well below the index for all manufacturing industry, where growth was of the order of 58%.⁶⁸ The increase in labor productivity indicates that labor costs do not have a major impact on Argentine manufacturers when it comes to producing quality MT, despite business claims to that effect.

The output of MT with computerized numeric control performed better than that of conventional MT, since it came to account for almost half of total production. Lathes with computerized numeric control were the main product, although there was also increased production of machining centers. Although the index of import penetration of MT with computerized numeric control has been almost as high as that for all MT, local production has been better able to resist import pressure because of the strategy pursued by the Promecor firm, which made the company the local leader in that category.⁶⁹ As to the composition of the output of conventional MT, there was a relative fall in the output of boring machines, conventional lathes and milling cutters. While conventional lathes were manufactured by several companies in low volumes as a survival strategy, Frescar, a firm that has reached an agreement with a leading Brazilian company, has been prominent in the production of milling machines.

Press and guillotine production has retained its relative weight in total MT output. Although Diamant and Daisa, two traditional firms in the sector, closed, and the Del Piano and Rio Negro companies are very pessimistic about the future

⁶⁷ Regrettably, the AAFMTA has stopped compiling statistics in units as it did in the past.

⁶⁸ On the basis of INDEC's Industrial Survey, which defines productivity as the physical output per employee in manufacturing industry. Given the methodological differences between the two series, the comparison must simply be taken as an order of magnitude.

⁶⁹ Since the liquidation of the Turri company as a result of the closing of the Italian firm Mandelli, which had acquired it in 1991 from a local group (see Chudnovsky et al [1992]).

of the business,⁷⁰ the remaining manufacturer (Iturraspe) has performed relatively well. Detailed study reveals that while several manufacturers decided to close and others opted to work exclusively on repairing, maintaining and marketing imported MT, a few other firms managed to continue with the MT production, restructuring their activities and seeking "niches" that enable them to compete.

Productivity improvements have brought down the prices of the MT manufactured by these firms (by between 15% and 20% in recent years), and efforts to improve quality have given rise to a better after-sales service. Despite the general indifference of users to local production, the difficulties that some buyers have experienced with imported MT have to some degree enhanced the advantages of resorting to Argentine MT manufacturers. A study of three manufacturers (Fresar, Iturraspe and Promecor) showed that they compete reasonably well with imported MT in terms of quality, since they have adopted the same criteria as their counterparts that kept their plants open: they drastically cut the number of employees, rationalized output to the maximum (which included sub-contracting some activities), and sought greater vertical and national disintegration. The restructuring process has been substantial, and the difference from many of their counterparts is that they have not discontinued higher added value production lines, nor have they devoted themselves to MT repairs or the production of parts.

In sum, firms that had a chance to accumulate technological capacities over time have pursued technological self-reliance by imitating models exhibited at international fairs. As far as possible they have maintained their design departments and use computer assisted design. They have received technical aid from suppliers of MT units with computerized numeric control but, unlike the leading Brazilian firms, they have not deemed it necessary to resort to foreign partners in technological matters. Except for Fresar, they have not sought commercial agreements that give them access to foreign markets or enable them to sell imported MT in the Argentine market. The disinclination to reach commercial or technological cooperation accords illustrates a more general feature of small and medium Argentine firms: their mistrust of the contribution that their potential partners could make, and the fear of being absorbed by them.

Under these conditions it is not surprising that the share of MT exports in Argentina's total exports fell, and that the indicator of revealed comparative advantages declined between the periods 1991-1993 and 1994-96. Neither is it surprising that MT have a negative index of contribution to the trade balance (see Table 3). Table A-2 shows that, after Brazil, the second most important export

⁷⁰ Representatives of the company were interviewed at the beginning of the 1990s; the conclusions are analyzed in Chudnovsky et al. In the most recent interview, the company's vision of its own present and future was so pessimistic that there seemed little hope for the firm.

destination was the rest of Latin America. Of the industrialized countries, only the United States had any importance as an export market.

The weight of imports in apparent consumption of MT, which was always relatively high in the Argentine case, grew in the 1990s, and in 1993-1997 stood at about 90%. As shown in Table A-1, total MT imports in constant dollars grew by more than 20% in 1994-1996 relative to 1991-1993, reaching a record US\$ 146 million in 1996. Unlike the general category of capital goods, whose imports increased 37% in current dollars in 1997, MT imports declined in the latter year.⁷¹ Imports have not only been favored by tariff policies and the exchange rate. Credits from the supplying countries have also been a key factor in inducing local clients to acquire imported MT of higher unit value. Spain and Italy offer very favorable financing for the purchase of their MT. Additionally, the reduced country risk means that practically all supplying countries are able to finance their MT exports to the Argentine market.

As regards the composition of imports, MT with computerized numeric control have grown from a third of all imports in 1991-1993 to 48% of the total in 1997. Prominent among these were lathes and machining centers, while milling machines have lost relative weight in recent years. Unlike in Brazil, presses have a smaller relative weight in Argentine imports. By contrast, warping and shearing machines are increasingly important in import indices. Argentine imports come largely from Germany, Spain, Italy and the United States, with Brazil having had an outstanding role. Japan has also been a significant, albeit relatively smaller supplier, if one considers that a part of the imports from United States are produced by affiliates of Japanese companies in the country. Taiwan's share of Argentine imports has been growing, and in 1997 surpassed imports from Spain and the Japan. Imports from China have also increased their share in recent years.

After strong growth in 1991 and 1992, followed by a decline in recent years, imports of parts and components for MT have seen sustained growth – in contrast to the situation in finished MT. This trend seems to suggest that the imported parts are basically replacements for imported MT. However, there are some differences in the origins of finished MT imports and parts. The United States, Germany and Italy are the main suppliers of parts, and Brazil's role in this area is more prominent than in finished machines.

⁷¹ The fact that imports of capital goods grew substantially in 1996 and 1997 when the corresponding tariff was reestablished highlights the low price elasticity of demand and raises questions about the effectiveness of the regime prevailing in 1993-1994.

The Performance of the BMTI in the 1990s

In the 1990s, the output figures⁷² for the BMTI do not reflect the fact that the industry managed to overcome the decline that began in 1989 and that continued until 1992. Growth revived in 1993 and reached an exceptional point in 1995, as a result of the economic growth of the country in the previous year. At the start of the second semester of 1995, a contraction of economic activity translated into a sharp decline in the value of the MT output (in 1996-1997 the value of output fell 23.5% over 1995). It should be noted that in 1995, the high point of the decade, the value of output was still below that of the period 1986-1988 (See Table B-1). It is likely that part of the decline in the value of MT production is attributable to a fall in prices caused by three factors: the low growth of internal demand as a result of macroeconomic developments, the pressure exerted by imports, and efforts to reorganize production.

As to MT imports in this period, the qualitative information gleaned from interviews undertaken for this article and for earlier studies (Erber and Vermulm, 1993 and 1997) suggests that the companies producing MT modified their processes to cut costs. Such modification included implementing quality and productivity programs, rationalizing procedures, improving controls and making organizational changes that consisted of reducing the administrative levels and centralizing project activities. Some firms opted to establish just-in-time processes and production cells, leading to a slight increase in the purchase of parts and components. Such qualitative data are confirmed by the indices made available by the Associação Brasileira da Indústria de Máquinas e Equipamentos (ABIMAQ), which show that between 1989 and 1993 the number of employees fell drastically, even exceeding the decline in production, and did not recover even when output recovered; the number of working hours therefore grew. The salary index also declined in this period, and hence the growth of productivity led to a reduction of costs.⁷³

Furthermore, the fall in prices during the 1990s coincided with an increase in the complexity and unit value of the goods manufactured by the BMTI. According to ABIMAQ estimates, in the period 1990-1994 the share of numeric control machines increased in both the total number of machines and in the value of

⁷² From 1992 on, there is no information available on the number of units produced in Brazil, nor on the number of units marketed internationally. Neither is there information on the type of machines produced, except for some estimates that distinguish in an aggregate manner shaping machines from those for chip removal processes.

⁷³ In 1996, in a sample of 25 companies studied by the ABIMAQ, labor costs represented approximately 15% of their sales.

output.⁷⁴ Data from the companies show that the complexity of numeric control lathes sold in Brazil, as well of those exported, grew substantially throughout the decade, especially in recent years. These transformations were given greater emphasis in the sector's leading firms, many of which had been certified under norm ISO 9000. In the leading firms, subsidiaries are electronically connected to the parent company, even for activities concerning machine projects. The leading national firm, devoted to manufacturing mass-produced machines, concentrated its production on a smaller number of lines, allowing it to achieve economies of scope and to manufacture its machines at international scale.⁷⁵

In sum, the available information suggests that, despite the fact that the BMTI experienced a difficult period in the 1990s, it was able to react by cutting costs, increasing productivity and offering more complex products. This positive reaction came from the sector's leading companies, the first to adopt the electronic paradigm in Brazil, taking advantage of the crisis of the early 1980s and benefiting from economies of training and from relative protection against imports. Companies that adopted this paradigm later, following a "subordination" strategy (Erber and Vermulm [1993]), faced enormous difficulties in this decade, as shown by the fact that several had to close and others now offer their services to other companies. Their failure is probably due to a combination of factors, notably excessive diversification of their product lines, small scales for making mass-produced goods and training constraints. Despite the innovations in processes and organizations that sought to cut costs, such changes were not enough to offset the high price/performance ratio of the machines that they manufactured, since they had to face not only local competition but also imports.

The third group of companies in the Brazilian industry, consisting of small and medium firms that manufacture conventional equipment, were apparently less affected. Of particular note are those firms that manufacture shaping machines, since technological transformation in that area was less. This allowed them to exploit the accumulated experience and benefit from economies of training. Moreover, their products went to undemanding market niches where competition from imports is still slight. Some of these companies found additional markets in the MERCOSUR and in other countries of Latin America.

The information on the movement of exports confirms these trends of concentration and greater technological complexity. After remaining almost

⁷⁴ The share of numeric control machines increased from 10% to 24% of the total produced, and from 45% to 57% of the value of output between 1990 and 1994. However, these percentages should be treated with extreme caution and seen simply as indicators of a trend.

⁷⁵ According to data from Ahrantes (1998), in the period 1995-1997 the Romi firm would have invoiced for approximately 1,300 computerized numeric control lathes per year, which is more than double the minimum international scale.

unchanged between 1986-1988 and 1993, the value per kilo exported increased 44% between 1993 and 1996. In 1991, there was a turning point in Brazilian exports, since the value of foreign sales increased by almost 80% over the previous two-year period and the export coefficient more than doubled (see Table B-1). In the period 1991-1994, the export coefficient was 17.5%, compared to 6.7% in the previous four-year period. Exports then increased substantially again, and the export coefficient of the period 1995-1997 rose to 19.5%. The index that reflects comparative advantages, and which is presented in Table 3, developed similarly and increased between the periods 1991-1993 and 1994-1996. The structure of Brazilian exports also changed substantially in the period 1989-1990, since two thirds of exports were lathes, most of them conventional. However, in 1991 exports of shaping machines increased tenfold relative to the previous year, while in the period 1995-1997 this category of products accounted for 53% of exports: 27% were lathes and 8% were machining centers and multiple station machines. The bulk of exports of shaping machines were special presses, made to order, particularly for the automotive industry. Such machines require more than 100,000 project man-hours, take a year to produce and cost more than US\$ 10 million. Exports of MT with numeric control, which accounted for 13.7% of total exports of shavings removal machines in 1989, climbed to 31% in 1993 and to 75% in 1996.⁷⁶

Table B-2 shows that most Brazilian MT exports went to the United States and the European Community (particularly Germany, home country of the companies with affiliates in Brazil). In the former case, during the period 1994-1996 there was a predominance of presses (particularly special presses) for the automotive industry. In the latter case such machines teams shared first place with lathes (with or without numeric control) and with machining centers. At the start of the 1990s, there was an increase in trade with MERCOSUR, and the sub-region became the third most important destination for MT exports. Brazilian MT exports were concentrated in a small number of companies, since in the period 1995-1997 the four main exporters provided over 70% of foreign sales, a share that grew in the period 1991-1997. Of the eight biggest MT exporters between 1991 and 1997, six were companies dedicated to MT production and two to automobile production.⁷⁷ Exports from the MT manufacturers went mainly to the developed countries, particularly the United States and Germany.

⁷⁶ The data for 1989 were taken from Erber and Vermulm (1993), and those for 1993 and 1996 from Erber and Vermulm (1997).

⁷⁷ For two years in this period, automobile factories feature as large exporters of machine tools to developing countries. These operations probably represent the transfer assets used or bought in Brazil; such operations are intra-group and discontinuous. This phenomenon has been repeated recently at the MERCOSUR level.

Applying the typology presented above, only one of the six MT manufacturers that lead Brazilian exports does not feature among the industry leaders that opted for the electronic paradigm at the beginning of the 1980s. This company, one of those that adopted a "subordination" strategy, illustrates the problems faced by its counterparts, as mentioned earlier. Despite their long tradition in the sector, in which there was a dispute for leadership in the production of conventional lathes, it took a long time to adopt the electronic paradigm and to seek technological licensing. Hence, in the years between 1991 and 1994, its exports (which went mainly to the United States) concentrated on conventional lathes. Although there was an increase in the number of numeric control lathes exported by the company in 1995 and 1996 (to the point that they accounted for 50% of the total exported), it was not enough to enable the company to resolve the problems it faced in the domestic market, and the firm had to close in 1997.

Of the leading export companies, Romi, a manufacturer of lathes and machining centers⁷⁸ is the only national firm. The other four are either partly or wholly foreign-owned. Three of them make complex products, generally to order, such as transfer presses, machining centers and multiple station machines, while the fourth produces numeric control or conventional lathes. For the foreign firms that export products made to order, exporting is part of the international division of labor within the group to which they belong. The most common strategy consists of dividing tasks in terms of product lines. By virtue of this division, the firm headquartered in Brazil is responsible for some lines, frequently the simplest of the range offered by the group. This implies an "extroversion" of the division of labor, evidence of the training carried out by the Brazilian affiliate that enables it to export to industrialized countries. Another form of division of labor consists of joint production by the Brazilian affiliate or another company of the group. In this case, each company produces a part of the machine, with the Brazilian affiliate usually being responsible for the simplest components, and then all the parts of the machine are assembled in the client's factory. This kind of division of labor is achieved by integrating project and manufacturing activities, which in turn is viable because of the telecommunication networks. Irrespective of the technical and productive capacity of the Brazilian companies, the division of labor is influenced by the level of use of the parent company's production capacity. In this kind of market, relationships with the buyers are particularly important, and both the presence and the technical reputation of the parent company are important determinants of the international success of the company headquartered in Brazil.

For the leading firms manufacturing mass products, the strategy is to occupy specific market niches. The foreign firm basically exports automatic lathes without

⁷⁸ The Romi company also manufactures special machines for plastics injection; they are not included in this study.

numeric control to Germany, where the parent company is located. In the absence of support from a producer firm abroad, the Brazilian company opened subsidiaries dedicated to sales and technical assistance in United States and Argentina, the company's two main markets at the outset. Throughout the 1990s, this Brazilian firm boosted its exports of numeric control machines, increased the share of its exports going to the United States, and diversified the markets in which it was active.⁷⁹

Romi has recently entered into a partnership with a large international machines manufacturer and has established a trading and technology company through which both firms supplement their product lines and benefit from economies of scale. This strategy has been successful, since the company has substantially increased its sales to the United Kingdom, where its foreign partner has its headquarters. This approach has also been adopted in MERCOSUR, where the company opened a commercial affiliate in Argentina and established a company with an Argentine firm (Fresar), similar to the one established with the European company. Romi exports cast products to MERCOSUR and a high-precision system for punching centers that it sells to other mt manufacturers. Most of the exports are undertaken with the support of BNDES credits.

It should be pointed out that Romi is an exceptional case among Brazilian MT manufacturers, and even in Brazilian industry as a whole. The firm invests about 5% of its turnover in training and research, and for several decades has pursued a consistent strategy of linking technological licensing with developments in the company itself, from which have come several patents registered in the United States. In the 1980s, it set up modern productive facilities and a plant for producing numeric controls. These controls are used in the manufacture of products sold in the Brazilian market, while exported products are sold with international brand names and account for some 30% of MT turnover.

In line with the measures mentioned above, the opening of the market to imports in the 1990s represented another "parting of the waters" for the BMTI. In previous decades, imports tended to be pro-cyclical. This means that, with a gap of about a year, its share in apparent consumption increased in the growth phases and then declined in line with the fall in internal demand. The import coefficient during the 1980s therefore fell from 45.7% in 1980 to 9.6% in 1986. After the commercial opening of that decade, imports grew in value and in terms of their share of apparent consumption. Although they fell in the intense period of the

⁷⁹ In 1991, numeric control lathes represented 19% of exports of this type of machine, increasing to 90% in 1997. Initially, exports to the Argentine market (48%) were practically equivalent to those going to United States. In 1997, the US market absorbed almost 75% of exports with numeric control, and the firm was also exporting to the United Kingdom and several countries of Latin America.

1991-1993 crisis (apparently retaining the same one-year gap relative to domestic sales), they recovered immediately and, in the latter three-year period, have grown uninterruptedly despite fluctuations in internal demand. In 1997, a year of low economic growth, their share of consumption was around 52% (see Table B-1). Consequently, the import coefficient "floor" rose from less than 10% of consumption to about 30% in 1993. If there were to be a new phase of rapid economic growth, it is hard to calculate the upper limit that it could reach. It should be stressed that, despite the enormous growth of exports, the contribution of MT to Brazil's trade balance is increasingly negative (see Table 3).

Although the structure of Brazilian imports does not display a concentration similar to that of exports, which reflects the level of development of national supply, there have been some significant changes in the structure that are analogous to the modifications in the export profile. Comparing the three-year periods 1989-1991 and 1995-1997,⁸⁰ it is clear that the share of presses, multiple station machines and machining centers in total exports grew strongly. During this period, the value for weight of imported machines rose, in keeping with the changes in the structure, since presses (especially, those for the automotive industry) and other classes are relatively more expensive machines. The same trend toward importing more complex machinery is evidenced by the share of numeric control machines in cuttings removal machines, which rose from 75.5% in 1993 to 83.5% in 1996. In the latter year, numeric control machines accounted for 90% of the value of imported lathes, and 73% of imports were of the category that includes, for example, grinding machines (Eerber and Vermulm, 1997).

Table B-3 shows the origin of Brazilian MT imports in the period 1986-1997 and reveals the dominance of the most advanced countries, especially Germany, the United States and Italy. This is a reflection of the composition of the Brazilian automotive sector, which is dominated by firms from these three countries. The relatively limited share of Japanese imports can be under-estimated because of globalization, since one of the main suppliers of lathes from the United States is an affiliate of a Japanese firm established in the US market. Similarly, it is likely that the significant growth of imports from Spain stems from favorable financing conditions, as happened in Argentina. Argentina's share of Brazilian imports fell substantially in the 1990s; in 1997 this share and the composition of imports from Argentina alternated as a result of the agreement between the Romi and Fresar companies.

In conclusion, the supply of parts and spares should be briefly analyzed. One of the traditional features of the BMTI has been its high degree of vertical integration, a rational response to protection against imports of finished products, parts and

⁸⁰ As indicated earlier, 1992-1994 was a crisis period.

components, and to the low level of development of the network of local suppliers. Although the MT companies have "tertiarized" a significant part of their administrative services – for food and cleaning, for example – do not seem to have given the same degree of "tertiarization" to parts and components. This phenomenon, noticed in interviews and on factory visits, is explained by the combination of two factors: on the one hand, a reliable network of local suppliers was not established and, on the other, the MT manufacturers lack alternative uses for the facilities that they already have. Nevertheless, the opening to imports seems to have affected the use of more complex parts and spares, which is why the supply of these products is concentrated abroad, through purchases made directly by the MT companies or through packages arranged by suppliers in Brazil that import a portion of those components. For some subsidiaries, purchases abroad are made through the parent companies and therefore benefit from economies of scale. Consequently, the national component of MT has fallen, especially in the case of the more complex items. In line with what was mentioned earlier, the main exporter of lathes kept its installations for making numeric controls to use them for local sales and to export products using international units. The international trade in parts and accessories⁸¹ seems to complement the trade in finished machines, corresponding to regional transactions for a somewhat insignificant part of the total.

5. The Role of Integration in the Performance of the Sector

By the mid-1980s, the economic and political development of Argentina and Brazil revealed similar characteristics born of their price stability plans (the Austral and Cruzado plans, respectively), and the return to democracy in both countries. A reflection of that economic and political convergence, the governments of the two countries initiated the process of sub-regional integration through the Integration and Economic Cooperation Program. In 1991, the aims and geographical limits of this process were expanded in the Treaty of Asunción, which was signed by the two countries and by Paraguay and Uruguay. The expansion of intra-regional trade in capital goods was one of the prime objectives of the negotiations between the Argentine and Brazilian representatives, and the first protocol signed by the two countries in the framework of the Integration and Economic Cooperation Program concentrated on such goods.

⁸¹ Products of the class "parts and accessories exclusively or mainly for machines in positions 84.56 to 84.65." However, it should be noted that this class includes parts for machines that work with materials such as wood or cement (that is, they are not MT in the sense adopted in this study), and excludes components for general use, such as, motors, bearings and electronic parts.

The Capital Goods Protocol (1986-1990)

The Capital Goods Protocol aimed to establish a partial free trade area limited to such goods, excluding electronic products and capital goods made to order.⁸² The negotiation process finally centered on mechanical machines manufactured in small quantities, among which machine tools were prominent. National treatment had to be applied to those goods on the common list, which entailed exemption from tariff and non-tariff barriers. Most of the MT were included in the first common list of capital goods to be marketed with a zero tariff and free of any non-tariff barriers. As regards parts and components for MT, these only featured on the common list if they were for repair and maintenance purposes (until the last extension of July 1990 included them all).

With the signing of the Protocol, the paths of the two machine tools industries were commercially linked. The total annual MT trade between the two countries increased fifteen-fold in two years, giving rise to a large surplus for Argentina (Erber, 1990). Although the inclusion of most MT on the common list prompted serious fears among Argentine manufacturers, who were concerned at the larger size and supposedly greater competitiveness of Brazilian producers, several of the leading firms believed that their products could compete satisfactorily in the Brazilian market if the tariff and non-tariff restrictions were eliminated. Subsequent developments confirmed that Argentine manufacturers could indeed enjoy significant commercial success in the Brazilian market, as reflected in the balance of MT trade between the two countries. Trade was practically balanced in 1986⁸³ and by 1988 was substantially in favor of Argentina, which recorded a surplus of US\$ 21.6 million and brought the Argentine share of Brazil's MT imports to nearly 15% in 1989. However, Argentine imports represented just 4% of Brazil's apparent consumption in that year. As regards the composition of Argentine MT exports to Brazil, lathes with computerized numeric control were clearly prominent (reaching 40% of the value exported in 1988), as were conventional lathes, milling cutters, presses and shearing machines.

A series of conjunctural and structural factors favored Argentina's performance in the Brazilian market. Among the conjunctural factors, it should be stressed that in the period 1984-1988 the internal demand for machines tool recovered markedly, since the average value of annual Brazilian output in the period 1986-1988 was 3.4 times greater than the average of the period 1981-1983. This significant expansion of the Brazilian market, largely attributable to numeric

⁸² The exclusions were due to difficulties in harmonizing specific policies, such as that on information technology and acquisitions by state companies.

⁸³ In 1986 there was a slight Argentine surplus equivalent to US\$ 78,000, which is the price of a few machines (Erber, 1990).

control machines, opened the way for the entry of Argentine products, especially lathes with computerized numeric control. It is worth noting that tariff and non-tariff barriers to imports from third countries were retained under the Protocol, which meant that until 1990 Argentine MT that had Brazilian equivalents enjoyed a strong competitive advantage over machines produced in other countries. As a conjunctural element, the price factor of the Argentine machines seems to have been particularly favorable at the beginning of the agreement's implementation, but its influence then declined. Beyond the abrupt fluctuations in the exchange rate (the cruzado-austral rate was unfavorable for Argentine exporters in 1988, and very favorable in 1989), structural differences affected price-setting. In 1987, Argentine MT were sold at prices 20%-50% lower than those of machines made in Brazil. This difference sprang from the high prices with which Brazilian MT were marketed, and from the structurally lower costs of Argentine production at the time.

On the other hand, the average value of lathes with computerized numeric control exported to Brazil was considerably higher than those of machines exported to other destinations, such as Chile. The difference is partly explained by the high unit value of computerized numeric control items imported from Brazil for re-export. It should be pointed out that Brazil's information technology policy imposed the use of controls produced in Brazil, which raised costs for both Brazilian and Argentine manufacturers, forcing the latter to import computerized numeric control items from Brazil.⁸⁴ This implied that the margins of Brazilian producers in some kinds of MT were quite high, given the scant competition between them and, particularly, the scarcity of imports that competed with national production in the Brazilian market. Although the bigger profit margins (which often enabled significant investments to be made in expanding productive capacity) explain part of the problem, other factors also entered into play. Even though Brazil had significant economies of scale in the production of several kinds of MT, such economies were partially eroded by many manufacturers' excessive product diversification, the high level of national content in production and the high degree of vertical integration of production.

As regards parts and components, not only were electronic components such as computerized numeric controls produced in Brazil at prices much higher than international prices, but so too were several electrical, hydraulic, and mechanical components, in some cases with problems of quality or faulty finishing. The supply problems faced by Brazilian MT manufacturers during the "bonanza" of 1986-1988 served to reinforce the perception that it was necessary to maintain high levels of vertical integration – the classic accumulative process. Electronic and

⁸⁴ An inter-related trade between the AMTI and the Brazilian electronics industry was thus created (Erber, 1990).

some lesser components were also imported by Argentina, and the country's manufacturers therefore benefited from paying international prices – although they paid the corresponding tariffs – but within the levels of local content of MT allowed by the Protocol (that is, a maximum of 20% of the value of the MT could be imported from third countries). In Argentina, mechanical components for which casting had significant weight, were produced at prices lower than those of Brazil, while those that were intensive in iron and steel products were more expensive. With regard to qualified manpower, Argentina had a significant advantage over Brazil in terms of cost and availability. Since manpower has an important influence on the cost of MT, this was not a negligible consideration.

Although Argentine manufacturers exploited the conjunctural price differences to start winning a new market, over time the price differential began to diminish. While the financing conditions that they could offer when selling their machines in Brazil at the start of the agreement were same or better than those that the Brazilian producers offered to their buyers (through the FINAME financing lines), this advantage continued to decline and was reversed in 1990. The Argentine Central Bank's financing of capital goods exports grew in cost and was later interrupted.

The Argentine manufacturers adduced that their MT competed favorably in price, as well as in quality and performance with the equivalent Brazilian products, particularly for lathes with computerized numeric control and milling machines. If there were differences in quality, these could not have been too significant, although the selling of more personalized machines perhaps conferred some competitive advantage. In that regard, a factor that apparently favored sales of MT made in Argentina was that they could perform certain tasks or had accessories adapted to the client's needs, which enabled a distinctive stamp to be given to machines made to order, for goods that are basically mass-produced. This commercial approach, which in some cases was supplemented with pre-sales services to learn the precise nature of the client's needs, offset the disadvantages of Brazil's lack of producing plants and/or a developed technical assistance service in the marketing firms, which could come to hinder some after-sales services. In other words, the disadvantages in after-sales service were apparently offset by the advantages offered in pre-sales services.

Only one Argentine company installed a production affiliate in Brazil that imported a substantial amount of its parts from the Argentine parent company. It is significant that this affiliate produced (relatively simple) special machines primarily for the automotive industry – that is, it operated in a market niche in which proximity to the client was very important. During an interview for a previous study (Erber and Vermulm, 1993) it became clear that this company,

whose production was much less verticalized than that of its local competitors, was affected by local problems concerning the supply of parts and components.

In sum, there is no doubt that Argentine manufacturers took advantage of the commercial opportunity offered by the Capital Goods Protocol to sell a significant quantity of MT in the Brazilian market, almost without having to give up parts of their depressed domestic market. The presence of Argentine MT served to introduce some elements of competition in pricing and performance that were not common in the closed and dynamic Brazilian market. From this perspective, the Protocol also brought benefits for the Brazilian economy, in the sense in that it cut the cost of MT and gave users access to some benefits. Finally, it is worth noting that in this period Brazilian producers frequently harbored the suspicion that triangular imports were taking place. They argued that their Argentine competitors had imported machines from other countries and had immediately exported them to Brazil. Such concerns prompted an improvement in the rules of origin, which emerged from the successful negotiations between the two employer associations (AAMTA and ABIMAQ) and, at that time, it served as a learning process for MERCOSUR's subsequent stage.

The Treaty of Asunción (1991-1997)

The signing of the Treaty of Asunción brought a new framework to the economic and political life of the four signatory countries. From the specific perspective of the machine tools industry, however, the influence of the Treaty was somewhat tenuous, not only because trade between the two main countries already enjoyed preferences established in the Capital Goods Protocol, but because macroeconomic and sectoral policy measures adopted by Argentina and Brazil tended to erode the sub-regional preferences. Although the accession of Paraguay and Uruguay partially compensated for the decline in intra-regional advantages analyzed above, the smaller size of these two markets, (especially for machine tools) to a large extent limited the scope of the compensation. Finally, it should be stressed that the historical weakness of the Argentine MT industry was an insurmountable obstacle, despite the opportunities offered by MERCOSUR. Such weakness sprang from the inter-play of several structural factors in the sector (such as the size of the companies), and of macroeconomic and sectoral stimuli implemented since the 1970s that were negative for the sector's development.

In this context, it is worth analyzing in greater detail the development of intra-regional relations in the machines tools sector.

The Sub-Regional Trade of Brazil and Argentina

Table B-2 shows that Brazilian MT exports went mainly to the United States and the EC (especially Germany, the home country of companies with affiliates in

Brazil), which illustrates the export strategies of the leading companies considered in this study.

Mention has already been made of the limited effect that the Capital Goods Protocol had on Brazilian exports to Argentina. From the start of the 1990s there was an increase in trade with the sub-region (as evident in Table B-2 and as shown by the indices of regional orientation and intra-industrial trade in Table 3), making MERCOSUR the third most important destination of MT exports.

Disaggregating Brazilian exports to MERCOSUR by class of product and comparing them with exports to the rest of the world in constant values during the period 1991-1997, we can identify some significant features of Brazil's sub-regional exports.

First, the value and composition of exports was sharply affected by the presence of special machines in the export profile, such as multiple station machines and special presses, products typically used by the automotive industry. The relatively high values in 1991 and, particularly, 1996 may be attributed to such products, which respectively accounted for 43% and 89% of Brazilian MT exports during those two years. In the first case, exports to the sub-region reached 42% of total Brazilian exports for that class and, in the second case, 50%. With regard to the other years, the sub-region absorbed nearly 10% of Brazilian MT exports; it should be noted that in 1997 these values returned to the previous level following the "leap" of 1996.

Second, reference should be made to the marked share of lathes in the composition of sub-regional exports. Those with numeric control represented a significant portion of those exports, which points to intra-industrial trade *strictu sensu*, bearing in mind the weight these products have in Brazilian imports from Argentina. However, the data suggest that the role of the sub-region in this product type declined sharply.

Third, it is worth noting the growing role of plastics shaping products in Brazilian exports. Except for 1996, when exports of that class centered on special presses, during the other years there were sales of relatively simple products, those without numeric control, for example, such as guillotines, shearing machines, metals folders and hydraulic presses. These products have also played a prominent role in Brazilian imports from Argentina, which again points to intra-industrial trade *strictu sensu*, as was the case with lathes.

Finally, it should be stressed that exports to the sub-region are much more significant than world MT exports for finishing, such as grinding, sharpening and honing machines or metal polishers. This group was dominated by machines with numeric control during only two years of the period (1991 and 1996), which suggests that they were for the automotive industry, as were the special machines

exported in those two years. Table B-2 shows that in Brazilian exports to MERCOSUR there is a clear preponderance toward the Argentine market, which absorbed the most complex machinery such as special machines and numeric control lathes. Paraguay and Uruguay buy relatively simple machines for shaping and finishing, the same as the other countries of Latin America. Reflecting at least partially the changes in the structure of Brazilian exports already analyzed, sales to Paraguay grew in value terms but at a rate lower than total exports (a little over 1% during the period 1994-1996), while exports to Uruguay fell in value and share (0.3% of the total in the latter three-year period). Table B-2 shows that the share of these two countries in the total exported during the periods 1991-1993 and 1994-1996 was less than their share in the period 1986-1988, which suggests that their involvement in the sub-regional integration process had little effect on the BMTI.

MERCOSUR's importance as a market for Brazil's leading MT exporters varies according to whether they manufacture goods to order or in bulk. As to the former, due to the high value of the products and the nature of the orders, a sale tends to have a significant effect on the sub-region's share in their total exports. Hence, in 1991, sales to the Argentine market accounted for almost 50% of the Grobb company's exports, and more than 50% of Schuler's exports in 1996. However, these were those two companies' only exports to MERCOSUR in the whole period 1991-1997. With regard to mass-produced goods, the sub-regional market is only significant for the Romi firm, since it absorbs all of the company's exports of machining centers, which in the period 1995-1997 accounted for about 10% of its exports of lathes – that is, almost 12% of its total exports of machine tools. In the last period analyzed (1995-1997), more than 90% of Romi's lathe exports to MERCOSUR were numeric control models. However, the continuous presence of Romi in the sub-region cannot be attributed exclusively to the nature of its products, since the company has a very defined commercial strategy in which the Argentine market is seen as an extension of the domestic market, as reflected in its direct exporting activities and recent changes with a view to forming a strategic partnership. Companies such as Traub and Nardini, both of which make mass-produced goods, participated irregularly in the sub-regional market in the period 1991-1997. Only in the period 1992-1994 did they send a significant portion of their exports to MERCOSUR (Traub almost 12% and Nardini 16%, largely comprising lathes without numeric control), which probably explains the crisis suffered by the Brazilian and international market. In other words, in these two cases the sub-regional market seems to have been the destination for output surpluses.

Table B-4 reveals the year-on-year movement of the four companies that exported most to MERCOSUR in the period 1991-1997. First, it can be seen that

the concentration of the four biggest exporters to MERCOSUR is much less than for world exports, except when for transactions involving special machines, which affect the normal pattern (see 1991 and 1996, when CR4 exceeded 80% and 90%). Second, seventeen companies were in the four best positions during the period, as against eight companies in the total. If the companies that do not manufacture MT are excluded (they are examined below), the leading export firms to MERCOSUR fall into two groups of companies. The first includes Schuler, Grobb, Romi, Nardini and Traub, five leading companies in world exports. To these can be added Thyssen and Heller, two manufacturers of multiple station machines and heavy machining centers, subsidiaries of German firms whose main market is the automotive sector. These companies usually export to the developed countries, and only occasionally sell to MERCOSUR. That is, they act the same as the manufacturers of special machinery described earlier. The second group consists of eight⁸⁵ companies that are similar to each other but which differ from the leading companies mentioned above. First, it should be noted that these companies are systematic exporters. For example, the firm that operates least in the international market exported in four consecutive years, while the others exported almost every year.⁸⁶ On average they exported for 6.1 years. However, in MERCOSUR they are less consistently present since only two companies exported to the sub-region for the same number of years as they exported to the world. Hence the average number of years of export falls to 4.6.

The proportion of these companies' exports absorbed by MERCOSUR varies greatly over time, both between one company and another as well as within each company. If we take as a differentiating factor that the participation of MERCOSUR in total exports is equal to or above 50% during the seven years, for the eight companies there are only 16 instances when exports exceeded that limit out of a potential total of 56 cases. For only two companies, accounting for half of the cases mentioned, is MERCOSUR the main systematic market (that is, in almost every year in which they export). However, one of them ended export operations in 1994.⁸⁷ Within MERCOSUR, the relevance of the Paraguayan market for this group differs from its significance for the leading companies. For these firms, the main alternative markets to MERCOSUR are other Latin-American countries, which distinguishes them from the leaders that export mainly to the United States and Germany. It seems that these smaller companies sell in MERCOSUR through commercial representatives, which might partly explain the irregular nature of their sales.

⁸⁵ One company in the sample that has not been identified.

⁸⁶ Four exported in the seven years, two in six years and the last in five years.

⁸⁷ This is the company that exported for the fewest years, as mentioned earlier.

If we examine the destination of the products exported by these firms, there is no significant differentiation between the products going to MERCOSUR and those going to other destinations, which is consistent with their orientation towards Latin America. To conclude this assessment, it should be pointed out that the products exported are the same as those sold in the domestic market. They are generally technologically simple products such as drilling and grinding machines without numeric control, metals honing machines, small hydraulic presses, bending machines, shearing machines, metal punches and rolling machines. These companies, moreover, are traditional and important suppliers of the Brazilian market in those market "niches" in which they operate, consisting mainly of other medium and small companies in the metal-mechanic sector.

MT exports to MERCOSUR thus come from two types of companies: on the one hand, leading firms of Brazilian industry that opted for the electronic paradigm early on by acquiring licenses or with the support of their parent companies and, on the other hand, companies selling relatively simple products with some electronic elements, but which in those market "niches" are also important suppliers in Brazil. Both groups of companies went through the prior process of accumulating the necessary technological base and minimum production scales for the domestic market, and enjoyed a fair level of protection. It is worth recalling that the only company analyzed that adopted a subordination strategy ceased activities.

Viewed from another perspective, Brazilian exports to MERCOSUR can be classified as temporary or systematic, depending on the type of product. For goods manufactured to order, the MERCOSUR market (unlike the US market) is not large or dynamic enough to prompt routine exports. An example of this is the case of exports made by the leading manufacturers of special presses or multiple station machines. MERCOSUR does, however, offer a market for medium-sized companies since, by virtue of its characteristics, it is a sufficiently dynamic extension of the Brazilian market to absorb systematic exports of simple kinds of numeric control lathes, as well as machines for shaping and finishing relatively simple parts. Such are the products exported by leading companies like Romi and Traub (lathes), as well as some medium firms that partially adopted the electronic paradigm.

Table B-4 shows that, from 1995, companies in the automotive sector producing vehicles and auto parts⁸⁸ assumed a prominent role among the main exporters of MT to MERCOSUR. Data provided by Decex indicate that there are some ten companies in the sector (makers of automobiles and of auto parts) that exports MT to the sub-region; they generally export for small values corresponding to few machines. The main operations of international firms shown in Table B-4

⁸⁸ Gerda, a traditional steel company, only exported metal rolling machines in 1991.

included several types of machines and, in one case, lasted several years. This stemmed from the transfer of a production line from the Brazilian affiliate to Argentina as a result of the sub-regional division of labor induced by integration. The Brazilian automotive regime (which, as has been seen, gives priority to capital goods exports) surely acted as an additional stimulus when the Brazilian affiliate was chosen as the origin of the equipment. The available data suggest that this kind of export tends to be discontinuous over time; this case is thus similar to that for machines made to order, as analyzed above.

For the BMTI, in short, MERCOSUR seems to be a continuation of the Brazilian market. This promotes economies of scale and training in the companies that operate in that market. The data indicate that regional integration has not caused trade diversion from other regions toward MERCOSUR. Seen from the Argentine perspective, imports from Brazil have been increasing their share of the Argentine market: from 3.4% in 1986-1988 to 7.5% in 1991-1993 and 13.6% in 1994-1996. However, this latter average is strongly influenced by the unusually high value of imports in 1996 (US\$ 35 million). This was the result of imports of special machines, as was discussed earlier. In 1997, Brazil's share was again 7.5%. Since Brazil has not won a greater share during a period of import growth in Argentina (except 1996), the possibility that the creation of MERCOSUR gave rise to trade diversion in this sector can be ruled out.

In light of the foregoing, the opening to imports was a turning point for the BMTI. Argentina's share of Brazilian imports deserves a special mention. Table B-3 shows that in the period 1986-1988, when imports from other countries were restricted and Argentine products benefited from the liberalization arising from the Capital Goods Protocol, this share was significant – equivalent to 11% of the total. In view of the fact that Argentine exports were concentrated in a limited range of products (particularly lathes), this share should be underlined. However, after the opening in the 1990s and the quantitative loss of sub-regional benefits, the Argentine share fell drastically to 3.5% in the period 1991-1993 and then to 1.5% in 1994-1996.

With regard to the share of Argentine products in total Brazilian imports, disaggregation by classes shows that between 1991-1992 and 1995-1996 there was a progressive concentration of the import profile in numeric control lathes and simple machines, probably similar to the machines exported from Brazil to Argentina; in other words, it was intra-industrial trade. On the other hand, imports from Argentina lost relative share not only in the total but also in the most important classes. Perhaps part of this fall was caused by the change in the composition of Brazilian imports, since lathes lost relative share in the Brazilian profile, while imports of presses were markedly affected by the entry of complex products manufactured elsewhere than in Argentina. The fall in the most

significant categories thus suggests that Argentine manufacturers were experiencing difficulties when faced with competition in the Brazilian market. Such difficulties can be partly attributed to the lack of financing mechanisms, but they might perhaps also be due to a technological gap. Brazilian imports were ever more technologically sophisticated while the Argentine companies had low accumulation, in large part because of the public policies adopted in Argentina throughout the previous ten years. Irrespective of what the decisive factor was, the data analyzed preclude the possibility that MERCOSUR has caused trade diversion toward Argentina.

The situation described above changed in 1997. The Argentine share rose to 1.9% of the total and there was a change in the profile, since items in the category of milling and boring machines were in first place, accounting for almost half of imports from Argentina. Imports in this category grew from a total of US\$ 1,603,000 in 1995-1996 (of which less than 2% were numeric control machines) to US\$ 4,368,000 in 1997, of which 88% were numeric control machines.⁸⁹ There was an increase in the category's share of total imports, from 2.6% in 1995-1996 to 9.3% in 1997. Since this category includes milling machines, it cannot be ruled out that these changes are the result of the trading company established between the Fresar and Romi companies described in detail below.

Interviews with Brazilian lathes producers and with executives of the ABIMAQ were conducted throughout the decade (Erber [1990]; Erber and Vermulm [1993] and [1997]). These corroborate the statistics presented above, since these actors' perception of Argentine competition varied substantially. At the beginning of the 1990s, when the marked Argentine penetration arising from the Capital Goods Protocol had made itself felt (although general import liberalization had not yet happened), Argentine competition was a cause for concern in the Brazilian market and prompted strong claims of triangular operations, that the Argentines imported machines from other countries and re-exported them to Brazil.

Overall in the decade, in a context of more widespread opening, once the agreement between the AAMTA and the ABIMAQ on rules of origin had been reached, and flows of imports from Argentina were more moderate, imports of Argentine machines were no longer considered problematic. At present, the competitive effects of imports from Argentina on the Brazilian industry are probably felt more by the companies that adopted a subordination strategy in numeric control MT than by the sector's leading companies. In light of the above, the recent growth of imports of milling machines conforms to the strategy

⁸⁹ The values in US\$ presented correspond at 1997.

adopted by the leading company of mass produced machines. The relevance of those operations for Argentine industry is assessed below.

In sum, for the Brazilian market, imports of Argentine MT are a secondary, although not negligible, source of supply. There is nothing to indicate that these imports, centered on highly specific products for which Argentine industry accumulated capacity over the course of the time, represent trade diversion from other sources. On the contrary, such imports seem to reflect a healthy intra-industrial trade that, in principle, has comparative advantages.

Unlike the BMTI, most of Argentina's MT exports go to MERCOSUR (see Table A-2), which absorbed 27% of the total value produced by the Argentine industry in the period 1994-1996. Although significant for the survival of the weakened AMTI, this share is smaller than in the period 1986-1988, when it was nearly 30% (see Tables A-1 and A-2). In 1986-1988 the indicator of regional orientation reached exceptionally high values and then fell abruptly, but in 1994-1996 and 1997 this index grew again (see Table 3). In 1991-1993 and 1997 the intra-industrial trade coefficients were high. They were low in the period 1986-1988, when Argentine exports to Brazil were not offset by imports from Brazil, and in 1994-1996, when Brazilian exports to Argentina – highly influenced by what happened in 1996 – scarcely balanced the imports coming from Argentina.

Although Brazil is the main destination for Argentine MT exports, during the 1990s its share has been substantially smaller than it was under the Protocol (see Table A-2). This decline was partially offset by the increase in the Paraguayan and Uruguayan shares. During the period 1986-1988, the Brazilian market absorbed about 28% of Argentine MT output. This share fell to 23% in the latter period. The composition of Argentine exports varies significantly according to the various destinations.

As was indicated earlier, until recently there was a clear predominance of numeric control lathes and shaping machines in the products exported to Brazil. In the period 1994-1996, the respective shares of these products averaged 35% and 33%. This composition changed in 1997, when products in the class that includes milling machines occupied first place. Exports to Uruguay consisted almost entirely of presses and other shaping machines, while Paraguay is the main recipient of grinding and honing machines and other conventional machines for shavings removal, products similar to those that Brazil exports to those two markets.

Finally, the supply of parts and spares should be briefly analyzed. Brazilian imports of such products that are manufactured in MERCOSUR are not very significant, amounting to less than 1% of the total imported in the latter three-year period under discussion. However, Brazil is the main market for Argentine exports

of these products, accounting for 48% of such sales in the period 1995-1997. Brazilian exports of parts and spares evolved in the same way as finished machines. MERCOSUR was the second market after the United States, and the sub-region's share grew significantly in 1996. However, as with exports of finished goods, this growth should be attributed to parts for presses; the Schuler company accounted for 60% of the exports to MERCOSUR in that year. In Argentina's imports of parts and spares, Brazil's share, although growing, was still smaller than for imports of finished MT in the period 1994-1996 (11.2% for parts and 13.4%, for machines).

Beyond the exceptional situation of 1996 outlined above, the growing weight of Brazilian parts in Argentine imports suggests that some of these parts are increasingly used by the stagnated local production, which can take advantage of the zero tariff on components imported from Brazil. At the same time, this trend also suggests that some of Argentina's advantages in the production of parts and components, attributable to the effects of the Protocol, have declined during this decade.

In sum, international trade in parts and accessories has apparently complemented that in finished machines, and occupies a fairly unimportant share of total sub-regional transactions. Although in theory this is a field in which there could be growth in Brazilian imports from MERCOSUR (given the training in the Argentine companies), the "natural" path of the two industries is not moving in that direction. That is, if it were left to the market, with no additional efforts to coordinate production or orient international trade, the potential of intra-regional trade would remain unexploited. Here too, therefore, the situation is similar to that in the field of finished MT.

Paraguayan and Uruguayan Imports

As has been mentioned, neither Paraguay nor Uruguay have a machine tools industry, nor an industry in tools or accessories. However, in both countries there is a range of metal-mechanical establishments of other branches, some of which cast and machine spare parts. In both cases, the fact that such capacities exist makes possible various agreements or associations with machine tool companies in Brazil and Argentina that want to acquire or sub-contract parts.

When the Treaty of Asunción was signed, Paraguay and Uruguay had a zero tariff on capital goods. As a result of the negotiations to establish a common external tariff, the two countries agreed to raise the tariff progressively to 14% by 2006.

Table U-1 shows that Uruguay's MT imports grew significantly in the 1990s, and in 1996 stood at twice the value imported in 1990. However, their share of the country's total imports did not increase to the same degree: the share has

fluctuated between 0.11% and 0.21% in this decade, far below the percentages recorded in Argentina, but above those for Paraguay.

As regards the source, Table U-1 shows that Uruguayan imports from MERCOSUR fell from 42% in 1986-1988 to 18% in 1994-1996. While Brazil's sales declined in absolute values during the 1990s, Argentine exports were sustained but at levels lower than in the 1980s. Uruguay's main supplier of MT is Italy, whose share grew in 1986-1996 and reached approximately 34% in the period 1994-1996. As in Argentina, there has been a marked growth in imports from China, whose share in the total imported was around 14% in the same period, perhaps reflecting the demand for relatively simple and low-price machines.

Paraguay's MT imports, as shown in Table P-1, are notably lower than in the 1990s relative to the period 1987-1989, and their share of total imports has fallen markedly. In contrast to the Uruguayan case, Brazil and Argentina are Paraguay's main suppliers, although their share fluctuates substantially. Despite Brazil's predominance in intra-zone imports in the period 1986-1988, the situation was balanced during the 1990s thanks to the growth of the Argentine share. Combined, the two countries increased their share in Paraguay's intra-zone imports from 46% in 1986-1988 to 63% in 1994-1996. Another significant source of Paraguayan MT imports is the United States. So too is Taiwan, whose participation has grown consistently during the last ten years.

Sales to Paraguay and Uruguay have been relatively marginal to Brazilian and Argentine MT exports, although they have been more important to the AMTI than to the BMTI. In other words, the Treaty of Asunción added little to the situation that prevailed under the Capital Goods Protocol. The levels of Paraguayan and Uruguayan MT imports from the other two MERCOSUR countries should probably be attributed to proximity, and to the adaptation of Uruguayan and Paraguayan demand to Argentine and Brazilian supply. Although in the Paraguayan case the growth in the share of its two neighbors after the Treaty of Asunción suggests that there could have been some trade diversion, in the case of Uruguay the data presented above seem to rule out this possibility.

Investments and Strategic Partnerships

As was pointed out earlier, the machine tools industry does not attract a high level of international investment, although the restrictions on international trade and the need to be near to clients for the purposes of pre- and after-sales services can induce such investments – as shown by the establishment of foreign subsidiaries in the BMTI. In MERCOSUR only one case was identified of direct investment in production units, consisting of a joint venture between an Argentine firm and a Brazilian partner to produce special machines for the automotive

industry. Having faced great difficulties at the start of the 1990s, this undertaking has recently come to pass. Mindful of its marketing needs, by mid-decade Brazil's leading exporter of lathes and machining centers, Romi, installed a subsidiary in Argentina for sales and technical assistance, and another in Uruguay for financial services. In the same period, Romi and the Argentine company Fresar introduced the same model of commercial and technological cooperation with Bridgeport Machines Limited, aimed at the British market. Given its characteristics, this agreement deserves to be examined in detail.

Despite the enormous differences in size, the owners of both companies have had a very good personal relationship for many years and, at the end of 1995, they signed a formal agreement on productive complementarity. The Argentine firm has begun to produce (five monthly units since February 1998) a conventional lathe (TORMAX 20) for which there is still significant demand in Brazil. The Brazilian firm will discontinue its production when Argentine output reaches 25 monthly units. This decision is part of the Brazilian firm's strategy of deepening its specialization in computerized numeric control lathes and machining centers, replacing conventional lathes.

The lathes in question are manufactured in Argentina, importing from Brazil two thirds of their value (the cast bedplates, the shafts and gearing for the speed box), but the aim was gradually to reduce the import component to 45% by the end of 1998. It is also planned that the Argentine firm will produce another conventional lathe, the output of which the Brazilian maker currently exports in its entirety to United States. In return, the Argentine company has exclusive rights to sell TORMAX 20 lathes in Argentina.

This formal agreement had an immediate aim for the Argentine manufacturer, since the firm could claim the draw-back corresponding to its exports, which it cannot currently do. The main consideration is that the Argentine entrepreneur saw the agreement as a first step toward selling his milling machines in Brazil through the Brazilian firm's marketing chain. This happened in 1996 and gave rise to the second, informal component of the agreement. When the Brazilian firm ends production of a universal milling machine very similar to one that the Argentine company has always manufactured, the latter hopes to devote much of its output of milling machines to exports to Brazil, using the marketing channels of the large Brazilian firm. The milling machines to be exported to Brazil are made with the levels of national content prevailing in the Argentine market. In this case the volume of output precludes excessive resort to imported components, which would be only profitable if they were imported from China.

Although the core of the agreement is commercial, there is also a technological component, basically geared towards learning in the case of the Argentine technicians and towards quality inspections in the case of the Brazilian

manufacturer. The agreement between Romi and Fresar thus allows both companies to benefit from economies of specialization, scale and training in production and sales, generating potential benefits for their clients that translate into lower prices and better service provision.

Although the two employers associations established consultation mechanisms in 1994 to identify possible company alliances between the countries, this single case was apparently the result of direct contacts between the two firms. The Argentine firms retain some locational advantages that allow them to develop at a lesser scale in an expanded and open market like MERCOSUR, and some of them have accumulated particular technological capacities that make possible specialization in quality MT. Like their non-leading Brazilian counterparts, the firms in question supply certain market "niches" where their technological assets have some weight. A division of labor between Argentine and Brazilian producers that facilitates the development of economies of specialization and greater Argentine production in the MERCOSUR context faces severe limitations. A market as open to imports as Argentina discourages direct foreign investment (including Brazilian) geared towards exploiting or developing production capacity, and towards generating some process of productive specialization within MERCOSUR.

However, the refusal of the Argentine and Brazilian firms to reach complementarity agreements, the lack of interest of Brazilian or other firms in investing in Argentina, and the fact that production costs in Argentina are relatively high for specialization in low value added MT, make unlikely a process of productive and commercial specialization within MERCOSUR unless there is a change in sectoral policies.

6. Challenges and Prospects

The analysis above shows that the paths followed by the two MT industries diverged substantially from the end of the 1970s, when the AMTI bore the brunt of import liberalization without safeguards. In the second half of the 1980s, the sub-regional integration process prompted linkages between the two industries, which thereto had been independent, but this development had different meanings for each of them.

For the Argentine industry, especially in the period of binational integration under the Capital Goods Protocol, sales to the Brazilian market provided an escape valve in the face of unsatisfactory macroeconomic conditions in Argentina, and Brazil became the industry's main export market. In the 1990s, following the signing of the Treaty of Asunción, the addition of the Paraguayan and Uruguayan markets gave rise to a slight increase in exports, but Brazil continued to be the main market – although its relative significance declined in comparison to the previous period. Besides the direct effects arising from the increase in trade (which

allowed the survival of companies that were operating under highly unfavorable conditions, either because of the radical opening or for the lack of traditional support mechanisms such as financing for MT sales), the integration process afforded the AMTI indirect benefits through the negotiation of the CET. As a result of these agreements, the Argentine government was forced to abandon its zero tariff policy so as to harmonize it with the Brazilian tariff, which brought a minimum level of protection for Argentine MT. The entry of Brazilian machinery played a secondary role in a context of massive imports, which accounted for 90% of the apparent consumption of MT in Argentina. However, the fragility introduced into the AMTI as a result of the opening of the 1970s limited the scope of the Protocol and, later, of the Treaty of Asunción, especially when the industry had to face the new opening to imports in the 1990s.

Some Argentine companies have survived in a very unfavorable environment, as a result of a great effort at restructuring, and have demonstrated their capacity to face competition from imports. However, there is no indication that the AMTI will expand significantly in view of the national economic policy mechanisms that have prevailed in the 1990s. The reason is that instead of seeking mechanisms (such as those applied in Brazil) to promote the technological modernization of users and simultaneously to strengthen the technological capacities developed in this area, priority was given to the import of tangible assets. MERCOSUR, while contributing to the survival of the industry (as either a market or a catalyst for tariff changes), is not a sufficiently solid platform to induce growth.

In the Brazilian case, the Protocol was operational under conditions of high protection against imports from third countries, which allowed some local companies to adopt the electronic paradigm. This was particularly the case for those that led the sector in Brazil and that were absent in Argentina. In this context, the entry of Argentine machines represented a healthy injection of competition, albeit in a limited range of products. As has already been seen, the later signing of the Treaty of Asunción coincided with the opening of the BMTI to imports and to exports. In this situation of greater opening, Argentine competition (initially limited to lathes and then to shaping machines) lessened, and did not represent a threat to the survival of the Brazilian industry. Neither did Brazilian MT exports concentrate on the sub-regional market, although that market constitutes an encouraging change to the national market. This is especially true for the leading manufacturers of mass produced goods and for medium companies making relatively simple products and that, unlike the leaders, lack access to the markets of the most advanced countries. In this sense, MERCOSUR is a useful instrument for industrial deconcentration, as well as for fostering economies of scale and, consequently, cost and price reductions.

To date, MERCOSUR integration is limited to the trade area and reveals features of intra-industrial trade. There is no evidence of trade diversion from elsewhere, with the probable exception of the case of Paraguay. This trading relationship was fundamentally competitive except for the partnership between Fresar and Romi, which aimed to make their product lines complementary and to introduce economies of scale in both companies. The success of Romi's North-South and South-South cooperation suggests that this mechanism could be extended for mutual benefit.

The characteristics of both industries indicate that there is an intention to advance in this field of commercial partnership, and even to establish industrial agreements with a view to supplementing the supply of parts and components. This would allow economies of scale and cost, as well as price reductions. Although market failings as a coordinating instrument justify government intervention in such situations, the policies implemented by the Argentine and Brazilian governments do not include such intervention. Analysis of the policies pursued by the two countries shows that the strength of the common external tariff – the main economic instrument of integration established by the governments of the sub-region – was directly undermined by other policies granting tariff exemptions to imports from third countries. Less directly but no less influentially, such macroeconomic policies as exchange and interest rates can notably erode the significance of the tariff preference.

By virtue of their local nature, the policies that directly affect the CET can be most easily modified, since such change can possibly be offset by other measures. Consequently, it is suggested that the Brazilian government should definitively eliminate the ex-tariff concession and should not facilitate imports of used machinery. The Argentine government should not grant exemptions to those turnkey projects that have not yet been approved. In the same way, but recognizing the significance of the interests at stake, it would be advisable that the tariff levied on imports admitted under the regime governing the automotive sector in all the countries should rise to the level of the CET. Throughout the sub-region, moreover, clauses on sub-regional purchases of capital goods should be applied, similar to those now in force under the Brazilian regime on national purchases. If these regimes continue, there is a possibility of introducing a wide range of industrial development instruments that governments use to foster negotiations between suppliers and buyers in the production chain. This mechanism could be used at the sub-regional level by combining several instruments, such as tariffs and investment credits.

It would be unreasonable to propose changes to macroeconomic policies in light of the sub-regional integration of the machine tools sector. However, it is worth recalling that the national governments have mechanisms to mitigate the

adverse effects of such policies on the MTI and its integration: horizontal instruments that, in the face of current conditions, can notably improve and benefit other sectors. This is evidenced by fiscal policy on capital goods, credits for purchases of such products, as well as fiscal and credit mechanisms to stimulate technological training.

Finally, analysis of the Argentine and Brazilian machine tools industry underlines the importance of inter-governmental policy coordination. The fact that this issue recurs in the literature makes it no less relevant. Study of the two sectors indicates that coordination should not be limited to the macroeconomic dimension and financing, which are normally stressed, but should include sectoral policies that, because of their linkage effects, have a major impact on other activities.

Although the Argentine and Brazilian governments share a macroeconomic vision that gives primacy to capital goods imports, both have coordinated policies of relative protection for local industries; such policies have their minimum common denominator in the common external tariff. From another perspective, this indicates that the governments recognize that it is necessary somehow to balance the immediate interests of machine tools consumers and the economic and technological benefits that arise from having a local MTI.

The above analysis illustrates the need to extend policy coordination beyond the tariff environment, and to avoid the weakening of that instrument. The above sections, for example, show the importance for the development of the BMTI of such mechanisms as the financing granted by the BNDES system and the automotive regime's clauses on national purchases, such mechanisms being absent from the Argentine market.

The Brazilian case demonstrates that, in an unfavorable macroeconomic situation and in the face of a unilateral opening with little protection, those companies that had accumulated technological and productive competence under the protected conditions of the 1980s, with the support of sectoral policy measures, could also expand their exports, confront imports and cut prices to the benefit of consumers. Thus was obviated the classic dilemma that development should choose between local production and imports of capital goods. It is likely that, if the process of accumulation had not happened under a regime of protection, and if policies similar to those of Argentina had been adopted, the path pursued by the BMTI would have been similar to that of the AMTI.

On the assumption that there will be no technological revolutions (similar to the introduction of electronics in the 1970s), and that there will be no global crisis that leaves international MT companies with greater idle capacity, the leading companies of the BMTI will probably retain their capacity to compete with imports. For the medium-sized companies producing relatively simple goods (of

the kind exported to MERCOSUR), the main problem of competing with imports is perhaps the availability and cost of financing. Finally, as was already mentioned, the companies that adopted a subordination strategy were the most vulnerable as a consequence of import penetration and internal competition. Hence their prospects of surviving as MT manufacturers look bleak in the face of continued opening.

With progress on the coordination of tariff and macroeconomic policies, it is to be hoped that the governments will deepen their efforts to coordinate, which would be possible if Argentina were to introduce promotion mechanisms similar to those of Brazil. While it should be acknowledged, as mentioned earlier, that the existence of such mechanisms in one country and their absence in the other are perhaps due to very different methods and paths for industrial development, it is precisely the integration process that offers the chance to change such methods and paths.

TABLE 1: World Output and Exports of Machine Tools, 1986-1997
(millions of US\$ 1997 and percentages)

Country ¹	Production			Exports			X/P		
	1986	1990	1997	1986	1990	1997	1986	1990	1997
1 Japan	9964	13353	9746	4441	4856	6690	44.6	36.4	68.6
2 Germany	8970	11980	6567	5761	7066	4269	64.2	59.0	65.0
3 United States	3985	4236	4598	856	1296	1206	21.5	30.6	26.2
4 Italy	2353	4521	3570	1408	2123	2126	59.8	47.0	59.6
5 Switzerland	2065	3575	1838	1826	3119	1655	88.4	87.3	90.0
6 Taiwan	532	1151	1758	378	781	1311	71.1	67.8	74.6
7 China	528	1002	1700	12	305	330	2.2	30.5	19.4
8 UK	1328	2049	1382	573	1066	794	43.1	52.0	57.5
9 France	953	1600	957	447	635	456	46.9	39.7	47.7
10 South Korea	483	958	881	39	106	305	8.1	11.1	34.6
11 Spain	574	1238	816	258	551	507	44.9	44.5	62.1
12 Brazil	537	526	545	57	46	147	10.5	8.8	27.0
13 Canada	303	443	471	209	234	595	68.9	52.7	126.2
14 Czechoslovakia	554	234	262	450	229	207	81.2	97.8	79.0
15 India	392	296	246	48	35	7	12.2	11.9	2.9
16 Austria	226	346	226	233	477	190	103.2	137.9	83.9
17 Poland	223	152	189	100	33	56	44.8	21.7	29.9
18 Sweden	310	330	181	238	353	200	76.6	106.8	110.5
19 Belgium	218	347	168	381	663	235	175.3	191.0	140.2
20 Russia ²	5324	4880	167	418	366	78	7.8	7.5	46.7
21 Finland	74	62	160	26	46	140	35.3	74.8	87.7
22 Netherlands	94	166	108	175	239	196	186.2	144.4	181.7
23 Turkey	-	-	108	-	-	15	-	-	13.6
24 Denmark	104	104	72	75	116	69	72.2	111.9	95.8
25 Yugoslavia	566	769	68	318	567	53	56.2	73.7	78.5
26 Ukraine	-	-	64	-	-	3	-	-	4.7
27 Rumania	444	588	57	75	156	41	17.0	26.5	71.1
28 Croatia	-	-	44	-	-	32	-	-	74.0
29 Portugal	19	40	33	10	24	22	53.8	60.1	65.1
30 Slovak Rep.	-	-	27	-	-	35	-	-	129.5
31 Mexico	25	26	25	4	13	14	17.6	50.2	57.2
32 Argentina	48	55	20	7	39	5	14.3	70.8	24.5
33 Hungary	261	33	7	200	11	5	76.7	32.6	74.3
34 South Africa	-	16	5	-	0	3	-	3.0	52.8
Others	474	168	0	398	353	0	83.9	210.6	-
Total	41930	55244	37064	19420	25904	21995	46.3	46.9	59.3

Sources: *American Machinist* (1986 and 1990) and *Metalworking* (1997).

¹ Ordered by main producers in 1997.

² In 1986 and 1990, Russia included the countries of the former USSR.

TABLE 2: Comparison of the Argentine and Brazilian MT Industries: Average 1995/97
(millions of US\$ 1997 and percentages)

	Argentina	Brazil	A/B (%)
Output	27	594	4,5
Exports	13	116	11,2
Imports	116	455	25,5
Apparent consumption	130	933	13,9
Export coefficient	46.9	19.5	240.5
Import coefficient	88.8	48.8	182.0

Source: Squares TO-1 and B-1

TABLE 3: Trade Indicators for the MT Sector, 1986-1997

	Argentina			
	86/88	91/93	94/96	1997
Index of regional orientation	16.69	3.24	3.93	4.45
Index of revealed comparative advantages	0.41	0.21	0.13	n.a
Index of contribution to the trade balance	-0.92	-1.41	-1.19	-0.82
Coefficient of intra-industrial trade	16.89	80.95	56.44	87.60
Value of intra-industrial trade	2256	8900	12398	15051
	Brazil			
	86/88	91/93	94/96	1997
Index of regional orientation	1.26	1.09	1.32	0.58
Index of revealed comparative advantages	0.18	0.45	0.51	n.a.
Index of contribution to the trade balance	-1.35	-1.48	-1.44	-1.47
Coefficient of intra-industrial trade	16.89	80.95	56.44	87.60
Value of intra-industrial trade	2256	8900	12398	15051

Sources: INTAL: Argentine trade 1986-96 and Brazilian 1986-1995;

DECEX: data for Brazil 1996 and 1997;

AAEMHA: data for Argentina 1997;

UNCTAD: world trade 1991-96; and

American Machinist: world trade 1986-1988.

**TABLE A-1: Output, Trade and Apparent Consumption
of MT in Argentina, 1986-1997
(millions current US\$ and percentages)**

	OUTPUT	IMPORTS	EXPORTS	CONSUMPTION	I/C	X/P
1986	33.17	16.41	4.72	44.86	36.58	14.23
1987	39.91	38.34	16.0	62.23	61.61	40.14
1988	48.62	44.6	32.64	60.58	73.62	67.13
1989	41.64	29.91	31.31	40.24	74.33	75.19
1990	44.84	32.14	31.70	45.27	70.98	70.70
1991	30.42	98.82	16.10	113.13	87.34	52.93
1992	31.84	71.15	7.88	95.11	74.81	24.75
1993	25.18	90.39	7.17	108.40	83.38	28.46
1994	24.99	119.32	6.23	138.08	86.41	24.91
1995	31.03	84.37	16.32	99.08	85.16	52.61
1996	23.55	142.92	11.14	155.33	92.01	47.30
1997	25.81	112.68	10.25	128.24	87.87	39.71
Three-year averages						
86/88	40.57	33.12	17.79	55.89	59.25	43.86
91/93	29.14	86.79	10.38	105.55	82.22	35.62
94/96	26.53	115.53	11.23	130.83	88.31	42.34

Source: Authors' presentation based on data from AAFMHA and INTAL.

TABLE A-2: Destination of Argentine MT Exports
(US\$ thousands and percentages)
In absolute values

Destination	1990	1991	1992	1993	1994	1995	1996	1997
Brazil	29.315	1.340	2.248	1.919	2.459	10.697	6.307	6.592
Uruguay	904	991	456	450	147	813	540	378
Paraguay	293	233	531	130	333	724	747	335
TOTAL MERCOSUR	30.513	12.564	3.235	2.498	2.940	12.235	7.594	7.305
United States	334	405	337	4.371	200	970	799	970
Rest of Latin America	6.278	5.539	4.370	3.154	2.857	2.800	2.072	1.942
Rest of the world	1.634	1.117	364	696	474	1.174	941	31
Total	38.758	19.626	8.305	10.719	6.471	17.178	11.405	10.248

In percentages

Destination	1990	1991	1992	1993	1994	1995	1996	1997
Brazil	75.64	57.78	27.06	17.90	38.00	62.27	55.30	64.32
Uruguay	2.33	5.05	5.50	4.19	2.27	4.73	4.74	3.69
Paraguay	0.76	1.19	6.39	1.21	5.15	4.22	6.55	3.27
TOTAL MERCOSUR	78.73	64.02	38.95	23.31	45.43	71.22	66.58	71.28
United States	0.86	2.07	4.05	40.77	3.09	5.65	7.01	9.47
Rest of Latin America	16.20	28.22	52.62	29.43	44.15	16.30	18.16	18.95
Rest of the world	4.22	5.69	4.38	6.49	7.33	6.83	8.25	0.30
Total	100.00							

Three-year averages

Destination	In thousands of 1997 US\$			In percentages		
	86/88	91/93	94/96	86/88	91/93	94/96
Brazil	16.710	5.169	6.488	65.06	40.12	55.52
Uruguay	517	632	500	2.01	4.91	4.28
Paraguay	201	298	602	0.78	2.31	5.15
TOTAL MERCOSUR	17.428	6.099	7.589	67.86	47.34	64.95
United States	774	1.704	656	3.01	13.23	5.62
Rest of Latin America	6.948	4.354	2.576	27.05	33.80	22.05
Rest of the world	533	726	863	2.08	5.63	7.39
Total	25.684	12.883	11.685	100.00	100.00	100.00

Source: Authors' presentation based on data from AAFMHA and INTAL.

**TABLE B-1: Output, Export, Import and Apparent Consumption
of MT in Brazil, 1986-1997**
(millions current US\$)

Year	Output	Exports	X/P (%)	Imports	I/C (%)	Consumption
1986	552	26	4.76	56	9.58	582
1987	523	24	4.68	114	18.57	612
1988	547	40	7.32	146	22.35	653
1989	461	31	6.64	168	28.05	598
1990	431	37	8.67	208	34.55	602
1991	350	68	19.55	227	44.64	509
1992	286	65	22.79	168	43.24	390
1993	437	75	17.15	161	30.76	523
1994	467	62	13.32	228	36.02	633
1995	668	117	17.47	424	43.44	975
1996	522	119	22.81	426	51.36	829
1997	543	104	19.14	484	52.42	923

Source: Authors' presentation based on information provided by ABIMAO, CACEX and DECEX.

TABLE B-2: Destination of Brazilian MT Exports, 1990-1997
(thousands 1997 US\$ and percentages) in absolute values

Destination	1990	1991	1992	1994	1995	1996	1997
Argentina	582	9.713	6.297	9.136	6.119	34.597	9.502
Paraguay	164	940	767	893	1.242	1.123	1.403
Uruguay	414	895	388	529	296	225	254
Total MERCOSUR	1.160	11.548	7.452	10.558	7.658	35.945	11.159
Rest of Latin America	5232	7.281	8.809	9.784	14.245	7.685	6.913
Germany	15542	21.058	10.333	8.736	9.748	17.950	15.609
United States	15782	31.913	44.991	31.217	79.548	50.839	39.366
China	0	0	0	163	320	2.105	1.163
Rest of the world	7.942	8.607	2.824	6.878	11.377	7.390	29.808
Total	45.658	80.408	74.409	67.337	122.895	121.914	104.018

In percentages

Destination	1990	1991	1992	1994	1995	1996	1997
Argentina	1.27	12.08	8.46	13.57	4.98	28.38	9.13
Paraguay	0.36	1.17	1.03	1.33	1.01	0.92	1.35
Uruguay	0.91	1.11	0.52	0.79	0.24	0.18	0.24
Total MERCOSUR	2.54	14.36	10.01	15.68	6.23	29.48	10.73
Rest of Latin America	11.46	9.05	11.84	14.53	11.59	6.30	6.65
Germany	34.04	26.19	13.89	12.97	7.93	14.72	15.01
United States	34.57	39.69	60.46	46.36	64.73	41.70	37.85
China	0.00	0.00	0.00	0.24	0.26	1.73	1.12
Rest of the world	17.40	10.70	3.80	10.21	9.26	6.06	28.66
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Three-year averages

Destination	In absolute values			In percentages		
	86/88	91/93	94/96	86/88	91/93	94/96
Argentina	1.418	7.943	16.617	3.29	10.00	15.97
Paraguay	992	957	1.086	2.30	1.21	1.04
Uruguay	272	637	350	0.63	0.80	0.34
Total MERCOSUR	2.682	9.527	18.054	6.23	12.01	17.35
Rest of Latin America	8.471	9.288	10.571	19.67	11.71	10.16
Germany	3.791	11.735	12.145	8.80	14.79	11.67
United States	23.327	41.511	53.868	54.16	52.33	51.77
China	409	2.152	863	0.95	2.71	0.83
Rest of the world	4.392	5.109	8.548	10.20	6.44	8.22
Total	43.074	79.322	104.049	100.00	100.00	100.00

TABLE B-3: Origin of Brazilian Imports by Country (thousands constant 1997 US\$ and percentages) in absolute values

Origin	1990	1991	1992	1993	1994	1995	1996	1997
Germany	57.670	87.335	55.141	64.510	58.193	105.576	178.646	105.947
Argentina	27.618	18.727	2.678	1.764	1.780	10.863	4.900	9.110
China	578	201	144	114	900	3.640	2.350	3.283
Spain	47.501	34.932	4.896	3.344	4.491	16.013	28.563	23.993
United States	41.684	32.966	31.694	31.875	36.712	74.594	63.695	81.408
Italy	27.133	30.175	28.368	33.440	50.707	62.128	54.716	100.801
Japan	12.036	16.368	35.886	20.753	35.184	62.960	34.126	78.950
Switzerland	16.907	12.084	13.421	5.885	20.765	36.869	16.479	15.602
Taiwan	1.341	1.376	5.956	5.376	12.269	14.333	8.972	24.878
Rest of the world	21.568	32.616	12.099	20.351	44.324	57.238	43.173	40.035
Total	254.035	266.780	190.283	187.413	265.325	444.213	435.621	484.005

In percentages

Origin	1990	1991	1992	1993	1994	1995	1996	1997
Germany	22.70	32.74	28.98	34.42	21.93	23.77	42.24	21.89
Argentina	10.87	7.02	1.41	0.94	0.67	2.45	1.16	1.88
China	0.23	0.08	0.08	0.06	0.34	0.82	0.56	0.68
Spain	18.70	13.09	2.57	1.78	1.69	3.60	6.75	4.96
United States	16.41	12.36	16.66	17.01	13.84	16.79	15.06	16.82
Italy	10.68	11.31	14.91	17.84	19.11	13.99	12.94	20.83
Japan	4.74	6.14	18.86	11.07	13.26	14.17	8.07	16.31
Switzerland	6.66	4.53	7.05	3.14	7.83	8.30	3.90	3.22
Taiwan	0.53	0.52	3.13	2.87	4.62	3.23	2.12	5.14
Rest of the world	8.49	12.23	6.36	10.86	16.71	12.89	9.91	8.27
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Three-year averages

Origin	In absolute values			In percentages		
	86/88	91/93	94/96	86/88	91/93	94/96
Germany	38.059	60.258	114.138	34.20	32.13	30.24
Argentina	12.108	6.624	5.848	10.88	3.53	1.55
China	0	133	2.297	0.00	0.07	0.61
Spain	1.651	12.344	16.355	1.48	6.58	4.33
United States	15.011	28.184	58.334	13.49	15.03	15.45
Italy	11.562	26.891	55.850	10.39	14.34	14.80
Japan	11.907	21.360	44.090	10.70	11.39	11.68
Switzerland	8.535	9.116	24.705	7.67	4.86	6.54
Taiwan	36	3.745	11.858	0.03	2.00	3.14
Rest of the world	12.419	18.899	48.245	11.16	10.08	12.64
Total	111.288	187.555	381.720	100.00	100.00	100.00

Source: Authors' presentation based on information provided by INTAL (1990/95) and DECEX (1996/97).

TABLE B-4: Main Brazilian MT Exporters to MERCOSUR, 1991 and 1997 (US\$ thousands in average value and share in total annual exports)

YEAR	EXPORTER	CLASS NBM	VAJUE	%	CR 4
1991	R. Grobb	57	4671	47.5	81.0
	Nagel	60	1725	17.5	
	Romi	58	1064	10.9	
	Cerdau	63	500	5.1	
1992	Romi	57	184	2.9	44.5
	Romi	58	1629	25.3	
	Traub	58	356	5.5	
	Statomatic	62	350	5.5	
	Fisame	62	338	5.3	
1993	Romi	57	292	3.4	40.1
	Romi	58	1600	18.5	
	Nardini	58	566	6.6	
	Sorg	62	538	6.2	
	Newton	62	463	5.4	
1994	Romi	57	254	2.6	51.4
	Romi	58	1711	17.5	
	Unidentified	n.a.	1937	19.8	
	Nichoff	62	113	1.1	
	Nichoff	63	600	6.1	
	Newton	62	422	4.3	
1995	Thyssen	57	1105	15.2	46.6
	Scania	60	81	1.1	
	Scania	61	802	11.0	
	Romi	57	98	1.3	
	Romi	58	738	10.1	
	Jochpe	59	105	1.4	
	Jochpe	60	471	6.5	
1996	Schuler	62	29812	84.8	92.4
	Romi	57	232	0.7	
	Romi	58	2155	6.1	
	Newton	62	531	1.5	
	Dana	Several	275	0.8	
1997	Romi	57	694	6.2	66.3
	Romi	58	3419	30.6	
	Nagel	60	1548	13.8	
	Scania	Several	972	8.7	
	Newton	62	786	7.0	

Source: Authors' presentation based on information provided by DECEX.

TABLE P-1: Origin of Paraguayan MT Imports, 1986-1996
(thousands of 1997 US\$ and percentages)

Origin	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	86/88	91/93	94/96
Argentina	13	94	136	71	279	518	754	332	338	649	433	81	535	473
Brazil	2210	3013	119	449	136	609	720	326	649	560	813	1781	552	674
Total MERCOSUR	2223	3111	255	520	435	1127	1474	670	987	1209	1249	1863	1090	1148
Germany	12	67	453	57	31	143	599	74	90	48	118	177	272	85
Belgium	0	1	3540	3884	0	22	0	0	0	0	1	1181	7	0
Spain	1	45	53	4	5	13	0	10	0	7	170	33	8	59
USA	7	14	71	37	204	39	559	160	56	55	364	31	253	158
Italy	17	941	1099	1	34	579	553	52	22	184	38	686	395	81
Taiwan	0	11	31	36	46	109	237	152	50	375	30	14	166	151
Rest of the world	155	69	43	40	277	86	221	595	44	238	135	89	301	139
Total	2417	4259	5545	4579	1033	2119	3644	1714	1249	2116	2104	4074	2492	1823
% MT/Total	0.29	0.51	0.72	0.54	0.07	0.14	0.26	0.10	0.05	0.07	0.07	0.50	0.16	0.07

In percentages

Origin	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	86/88	91/93	94/96
Argentina	0.54	2.21	2.46	1.55	26.98	24.46	20.70	19.37	27.04	30.65	20.56	1.99	21.46	25.94
Brazil	91.46	70.74	2.14	9.81	13.14	28.73	19.76	19.04	51.99	26.47	38.65	43.71	22.14	36.98
Total MERCOSUR	92.00	73.04	4.60	11.35	42.13	53.19	40.45	39.12	79.03	57.11	59.36	45.73	43.76	62.98
Germany	0.48	1.58	8.17	1.24	2.96	6.77	16.44	4.34	7.19	2.29	5.59	4.35	10.92	4.68
Belgium	0.00	0.03	63.85	84.82	0.00	1.05	0.00	0.00	0.00	0.00	0.05	28.98	0.30	0.02
Spain	0.06	1.05	0.95	0.08	0.47	0.61	0.00	0.58	0.00	0.35	8.07	0.81	0.31	3.24
USA	0.30	0.33	1.29	0.82	19.76	1.83	15.34	9.33	4.51	2.59	17.31	0.76	10.13	8.69
Italy	0.72	22.09	19.82	0.03	3.31	27.34	15.18	3.04	1.73	8.71	1.80	16.83	15.85	4.46
Taiwan	0.00	0.26	0.56	0.79	4.50	5.16	6.51	8.87	3.99	17.71	1.41	0.35	6.67	8.31
Rest of the world	6.43	1.61	0.78	0.87	26.86	4.05	6.07	34.72	3.55	11.24	6.42	2.19	12.06	7.63

Source: Authors' presentation based on INTAL data.

TABLE U-1: Origin of Uruguayan MT Imports (1986-1996)
(thousands of 1997 US\$ and percentages) in 1997 US\$

Origin	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	86/88	91/93	94/96
Argentina	267	519	669	1250	703	436	481	414	315	443	519	485	444	426
Brazil	241	181	274	291	325	249	1015	714	347	295	188	232	659	277
Total MERCOSUR	509	700	942	1540	1028	685	1497	1128	662	738	707	717	1103	702
Germany	89	48	213	347	60	20	165	104	43	179	116	116	97	113
China	0	41	111	189	418	638	889	711	699	455	502	50	746	552
USA	4	143	75	118	12	188	266	141	180	151	559	74	198	296
Italy	100	52	345	192	26	1136	216	966	568	1057	2200	166	773	1275
Taiwan	12	114	61	229	121	163	802	426	245	225	128	62	464	199
Rest of the world	92	986	431	866	340	509	711	317	897	492	731	503	512	707
Total	805	2082	2179	3482	2004	3339	4546	3794	3295	3297	4943	1689	3893	3845
%MT/Total	0.06	0.13	0.14	0.22	0.12	0.18	0.21	0.15	0.12	0.11	0.15	0.12	0.18	0.13

In percentages

Origin	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	86/88	91/93	94/96
Argentina	33.21	24.92	30.69	35.88	35.06	13.05	10.59	10.91	9.56	13.45	10.49	28.72	11.40	11.07
Brazil	29.96	8.69	12.56	8.35	16.22	7.46	22.34	18.81	10.55	8.94	3.81	13.73	16.94	7.20
Total MERCOSUR	63.18	33.60	43.25	44.24	51.28	20.51	32.93	29.72	20.11	22.39	14.30	42.45	28.34	18.27
Germany	11.01	2.29	9.78	9.98	2.99	0.60	3.64	2.75	1.31	5.43	2.34	6.90	2.48	2.93
China	0.00	1.95	5.07	5.43	20.85	19.11	19.55	18.75	21.22	13.80	10.16	2.98	19.17	14.36
USA	0.54	6.87	3.47	3.40	0.61	5.63	5.85	3.72	5.45	4.57	11.30	4.40	5.09	7.71
Italy	12.45	2.49	15.84	5.51	1.28	34.03	4.74	25.45	17.25	32.07	44.52	9.82	19.84	33.17
Taiwan	1.44	5.45	2.78	6.58	6.04	4.89	17.65	11.23	7.42	6.83	2.59	3.67	11.92	5.18
Rest of the world	11.37	47.34	19.80	24.87	16.95	15.24	15.64	8.37	27.23	14.92	14.80	29.78	13.16	18.38
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Authors' presentation based on DITAL data.

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THE IMPACT OF MERCOSUR ON GROWTH IN THE PETROCHEMICAL SECTOR

Lia Hasenclever, Andrés López, and José Clemente de Oliveira

1. Introduction

THROUGHOUT THE 1990s, MOST Latin-American countries adopted structural reform programs – trade opening, privatization and market deregulation – and have enjoyed higher macroeconomic growth and lower inflation than in the 1980s. The old regulatory framework developed under import substituting industrialization (ISI) has been dismantled and a new regime is emerging, as yet not fully crystallized, in which the role of the state is being reduced and redefined, and in which market forces are gaining ground.

The Southern Cone of Latin America has been no exception to these trends, although the countries of the region have had different experiences. In addition to the general changes mentioned above, Argentina, Brazil, Paraguay and Uruguay have also formed a customs union, MERCOSUR. Based on the Integration and Economic Cooperation Program signed by Argentina and Brazil in 1986, the integration process was widened to include Paraguay and Uruguay in 1991 with the signing of the Treaty of Asunción. The treaty set out criteria for the creation of a customs union, which was completed in 1995, although there are significant exceptions that reflect specific circumstances in the various productive sectors and countries involved.

While it has affected sectors, firms and countries in different ways, MERCOSUR has had a significant impact in addition to the changes wrought by structural reform and macroeconomic change. The main aim of this article is to analyze – in the case of the petrochemical industry (PCI) – the extent to which MERCOSUR has enabled the restructuring processes to have lower social costs and how integration has generated significant gains in terms of productivity, quality, economies of scale, specialization and know-how, compared to what would have been the case had unilateral opening occurred without MERCOSUR. The main questions are:

- i) How has sectoral trade within MERCOSUR and with the rest of the world changed in the 1990s compared with the 1980s?
- ii) How has MERCOSUR influenced the redefinition of company strategies, types of competition, and patterns of PCI specialization in the sub-region?
- iii) How has MERCOSUR fostered the restructuring of the PCI with regard to investment, productivity and competitiveness?

The methodology used in the study combines a sectoral studies approach with that used in the analysis of trade and integration. It analyzes patterns of intra-

industrial specialization, and the technological and organizational characteristics of petrochemical production in the MERCOSUR sub-region.⁹⁰ It is obviously complicated to "separate" analytically MERCOSUR's impact from those produced by other changes – trade opening, privatization, deregulation, macroeconomic change etc. However, by examining certain indicators, particularly those related to trade flows, and by means of consultations and interviews with the sector's main firms in Argentina and Brazil, it is possible to draw some preliminary conclusions about the effects of MERCOSUR on the PCI in both countries and to identify some of the challenges facing the sector.

The following section contains a brief synthesis of the international context in which the PCI is developing, existing forms of competition, the determinants of competitiveness, and the main techno-productive characteristics of the industry.⁹¹ The third section summarizes the main features of PCI development in Argentina and Brazil over the past decade. The fourth section discusses events in the 1990s, highlighting the profound changes in the sector's regulatory regime, its effects on the workings of the PCI, and its influence on the strategies and positioning of firms in the sector. The fifth section analyzes the three questions posed above with respect to the PCI's recent development. Finally, the article discusses the prospects for the sector in the context of MERCOSUR, and makes some sub-regional policy recommendations.

2. The International Context

The PCI is highly capital intensive, and investments in the sector exhibit significant economies of scale, both in productive units as well as at the firm/group level. There is also a high cost penalty for plants that operate below the minimum level of efficiency of installed capacity.

Vertical integration is typical of the PCI. Among its main determinants are: technological factors; economies of agglomeration; economies of transaction (these are important given the highly specific nature of the invested capital); monopolistic elements (transfer prices, upstream market distortions, barriers to entry, etc.); and first-stage costs (extraction and refining/separating hydrocarbons), which can be absorbed by firms that can integrate this phase with petrochemical production. Horizontal integration is also important, because of the existence of

⁹⁰ With regard to petrochemical production, the study focuses on the cases of Argentina and Brazil, given that Paraguay lacks domestic production and in Uruguay the local petrochemical supply is extremely limited, although there is a reasonably significant chemical industry which has, as a general characteristic, a high dependence on imported inputs (ERECO, 1994).

⁹¹ Definitions of the technical aspects of petrochemical production can be found in the methodological annex.

economies of scope in R&D, marketing, administration and financing (Chudnovsky and López, 1997).

Production capacity increases and decreases in a modular fashion because of the strong indivisibilities of investment in the sector. During expansion phases, the steps involved in proving the existence of reserves, sustaining favorable investment conditions and in actually making the investment take a substantial amount of time. In periods of falling demand, firms give priority to continuing a high use of capacity, but at the expense of operating at prices close to variable costs. This happens in a context where competition is largely oligopolistic at the national and sub-regional levels and, increasingly, at the global level.

Transnational companies (TNCs) play a key role in this oligopolistic competitiveness, particularly since they control most of the technologies used. In many cases, these firms opt to exploit their active technologies via licenses – an obligation for firms that work exclusively on engineering and technological development – or by direct investment abroad. A number of issues affect these decisions. They include the degree of maturity of the processes and products, ease of transport, the physical, geographic and economic characteristics of national markets where the strategy will be applied, as well as those markets' openness to trade, capital and foreign technology.

International trade does not loom large in the PCI. At the start of the decade, only 8.0% of Western Europe's plastics production was exported outside the region; in the United States and Japan the percentages were 11.0% and 11.5% respectively, most of which was sold to neighboring zones. This trade is also "managed", with oligopolistic practices, state regulations, and considerable use of anti-dumping measures. Price setting depends largely on unabsorbed (excess) production on the part of the main producer markets, wherein the floor price is the variable costs of production.

However, the PCI is subject to international price cycles, which are determined by two factors: the price of raw materials and, most important, the balance between installed capacity and demand – which basically depends on the level of economic activity in developed countries (DCs), but which is increasingly related also to growth in Asian countries. The existence of price cycles reinforces the importance of maintaining integration strategies, both vertical and horizontal (since they give firms greater flexibility in their productive mix and smooth the impact of different price changes through the various stages of the chain), and of establishing long-term contracts. When prices are low, the need to keep using capacity leads firms to practice aggressive export policies and dumping becomes habitual.

Between 1994 and mid-1997, prices boomed thanks largely to two factors: US economic growth and China's strong imports. In the period 1998-2000, by

contrast, prices for most high-volume thermoplastic products will be low because of the slowdown in world economic growth and lower demand in Asia. However, the financial difficulties affecting many Asian firms could delay expansion projects, thereby improving the supply-demand balance and limiting the fall in prices. Hence it is estimated that although the crisis is having negative effects on prices in the short term, the lower pace of supply in Asia could improve the supply/demand balances towards the end of the century, and thereby help to sustain prices.

In recent decades there has been a notable increase in the participation of less developed countries (LDCs) in production and export of petrochemicals worldwide. This began in the large installations of the oil-producing countries in the Middle East and North Africa, and in the fast-growing economies of South East Asia. For a country to become a major exporter of petrochemicals, it has to have a sizeable domestic market to sustain efficient plants both in scale and technology.

Most petrochemical technology has come from a small group of firms based in DCs, which dedicated large proportions of their sales to R&D. To enter the PCI, therefore, LDC firms depend on imported technology. Although petrochemical firms own a high proportion of the technology supplied, a large number of engineering firms are also technology suppliers. There are usually various alternative suppliers of each product in the commodities sector, but this does not apply to fine chemicals and specialties.

Finally, it should be emphasized that the exogenous determinants of the sector's competitiveness are the availability and price of raw materials and the cost of fixed investment. Raw materials (petroleum, natural gas, liquid propane gas) represent a significant proportion (some 60-65%) of the production costs of basic petrochemicals, a proportion that falls to 10-30% of the production costs of final petrochemical products. The large sums involved and long maturity periods of investments in the PCI also make the cost of capital significant; this generally puts LDCs at a disadvantage.

3. The Evolution of the Petrochemical Industry in MERCOSUR⁹²

As in most other producer countries, the PCI in Argentina and Brazil developed from broad and, in the Brazilian case, well-articulated state action, which included the definition of regulatory frameworks and the implementation of a combination of fiscal and credit stimuli and incentives. These sectoral policies developed under ISI and existed until the 1980s.

⁹² For a more extensive analysis, see Chudnovsky and López (1997) and López (1994), for the case of Argentina, and Hasenclever (1988) and Oliveira (1990 and 1994) for the case of Brazil.

In Argentina, although the first petrochemical plants were installed in the 1940s, it was only at the end of the 1950s that the PCI really began to develop. The first stage lasted until the end of the 1960s, when the sector was run by a group of TNCs operating small plants for the domestic market. The development of the PCI then took a leap with the creation of two petrochemical centers whose "mother" plants – Petroquímica General Mosconi (PGM) and Petroquímica Bahía Blanca (PBB) – were majority-owned by the state. The plan was that the satellite plants to which the mother plants provided basic products would operate under the control of private capital (preferably national), with minority state participation. The new regime aimed to replace intra-firm vertical integration, a characteristic of the sector at the international level, with a public-private intra-branch linkage (petrochemical pole). However, in practice these centers became a kind of "anti-pole", since the construction of the satellite plants was either not implemented or seriously delayed. This led to unplanned excesses and scarcities which had to be resolved through exports and/or imports, depending on the problem.

The combination of unsatisfied local demand with a favorable regulatory regime enabled the PCI to be one of the few growth manufacturing sectors in Argentina during the economic difficulties of the 1980s. In light of the sharp fall of the investment coefficient in manufacturing industry in the 1980s, more than US\$ 1.2bn was invested in the PCI – at 1980s prices – and 12 plants were opened. In contrast to the absolute fall in GDP, the physical output of the PCI grew at an annual rate of almost 10%, from just over 1 million tonnes to over 2.5 million tonnes between 1980 and 1990. Exports grew – in physical volume – by 8.5% per year, reaching almost US\$ 400m at the end of the decade.

Promotion policies played a key role in this expansion. The state provided a substantial portion of the investment costs (through industrial promotion regimes), ensured favorable prices and the preferential provision of raw materials, protected the domestic market through tariff and non-tariff barriers, and regulated entry to the sector as a means of avoiding "excessive" competition in the domestic market. However, the regulatory regimes began to impose minimum scale requirements on plants. As a result, the plants that opened in the 1980s were generally internationally efficient in scale, albeit at the lower end of the range.

During this phase, the participation of national firms in the PCI grew strongly. The "nationalist" bias in sectoral policies (eliminated at least formally after 1976), national firms' easier access to official channels, and their superior knowledge of the local "environment" were decisive in fostering their rise to sectoral leadership. The advance of national capital was concentrated in a few conglomerates that had existed since the second half of the 1970s and were expanding their presence in the Argentine economy. They were prime beneficiaries of the various sectoral and

regional industrial promotion regimes, which lasted until the 1980s. Significantly, and in contrast to what happened in Brazil, the TNCs that leased the technology used in the plants during the 1980s did not form partnerships with the local firms managing the projects.

In Brazil, the first attempts to break into petrochemicals production date from the 1950s. Towards the mid-1960s, there were already some second generation plants operating in São Paulo (largely owned by TNCs), as well as some units owned by the parastatal oil company Petrobras. In international terms, the latter were generally small-scale. It was not until the construction of the petrochemical center in São Paulo (1964-1969) that the Brazilian PCI began to emerge as a sector with an international scale and modern technology. It was also here that the so-called "tripartite" model began to develop (see below), with the participation of national private capital, the state (through Petroquisa, the PCI subsidiary of Petrobras) and foreign capital.

The rapid growth of the Brazilian economy from the mid-1960s generated huge demand for petrochemical products. This led the government to introduce generous promotion regimes, resulting in the creation of the petrochemical centers of Camacari (Bahia) and Triunfo (Rio Grande do Sul) in the 1970s and 1980s respectively. Although they were set up to substitute imports, both centers began operations with a capacity that exceeded domestic demand. This turned Brazil into an exporter of petrochemical products.

The consolidation of the tripartite model facilitated the economic policy goals of the state bureaucracy: the creation of nationally-controlled firms, thanks to the presence of private domestic partners and the state sector, which were largely financed with private capital through the participation of local and foreign private partners (who essentially brought the technological packages for the firms to install).

Meanwhile, national capital sought to establish regional alliances: between the Mariani, Econômico and Odebrecht groups in Bahia, and the Ipiranga, Olvebra and Hansen groups in Rio Grande do Sul. These were all interested in diversifying their activities and saw key opportunities in the PCI. Their business alliances brought about the domination of the petrochemical industry by national private capital (which took place at a time of intense diversification by national groups in other sectors), and enabled the groups to consolidate their holdings and reduce the risks of petrochemical investment.

On balance, there have been significant differences in the way the PCI was established and developed in Argentina and Brazil. First, although the PCI began a decade earlier in Argentina, the industry grew much more quickly in Brazil, particularly from the 1970s onwards. Second, TNCs were not involved in the

construction of petrochemical centers in Argentina, while in Brazil the "tripartite" model was developed to exploit the bargaining power stemming from the size of the domestic market. Third, installed capacity in Brazil reached international levels in terms of both scale and technology much earlier than in Argentina.

As a result of these different development paths, in the three years 1994-96 Brazilian petrochemical production was nine times greater, consumption was six times higher, and exports were five times greater than in Argentina. This is because the Brazilian PCI supply structure is more complete both horizontally and vertically.

However, in both countries the main criticisms of the old sectoral regulatory regime concern the state's inability to discipline private firms, the difficulties of aligning existing domestic prices for petrochemicals with international prices, and the inefficient treatment of externalities arising from the operation of the sector, both negative (environmental pollution) and positive (insufficient stimulus to develop human capital and domestic technological capacities). In the Argentine case, there was also a redundancy of incentives, an absence of coordination between the various state entities governing the sector, and inconsistencies between the conception and implementation of policy (Chudnovsky and López, 1997).

4. The Restructuring of the Petrochemical Sector in the 1990s

In both countries, the old sectoral regulatory regime began to be dismantled at the end of the 1980s. Reforms included the elimination or reduction of transfers through raw materials prices, as well as fiscal and credit promotion mechanisms, trade opening, and the privatization of state-owned firms. The method and schedule for this dismantling were heavily influenced in both cases by the characteristics of the old regime and the prior configuration of the sector, as well as by the structural adjustment processes and reforms that began at the same time in both economies. It was in Argentina that the processes were more drastic in terms of speed and size.

The MERCOSUR customs union was founded in this context. In the case of the PCI, the common external tariff (CET) did not differ much from the tariffs previously applied in Argentina and Brazil, although it was higher than those in Paraguay and Uruguay. Consequently, the two latter countries have made intensive use of the exceptions to the CET as a means of maintaining more favorable supply conditions from countries outside the zone. Almost all petrochemical products are traded at a zero tariff within the sub-region, and very few fall within the so-called adaptation regime.

Despite record increases in domestic consumption, production and installed capacity in the Argentine PCI have both grown more slowly as the decade has

progressed. Consequently, imports have increased sharply at the expense of the market share of domestic production (Table 1). Within the sub-regional market, the sector's exports, in decline during the decade, are still competitive.

In Brazil, there has been a moderate increase in consumption while output and installed capacity have been growing more slowly, resulting in a marked increase in imports. Exports to MERCOSUR have grown considerably, but at a lesser rate than imports (Table 1). The increase in imports did not have a markedly negative effect on the market share of local firms in Brazil, and has worked more as an element to regulate competition and foster change (increasing productive efficiency and bringing about a convergence between domestic and international prices).

In the 1990s, the key issue has been the closer alignment of domestic prices with the international prices of goods required by the sector. This applies both to petrochemical products (as a result of trade opening) and to raw materials used by the sector (as a result, in Argentina, of the elimination of special regimes and the privatization and deregulation of the hydrocarbon market; and in Brazil of reforms governing price fixing for raw materials produced by PETROBRÁS). This has produced a new situation wherein the real endogenous competitiveness of the sector stands revealed. Its capacity to expand with less state participation (apart from CET protection, which is much higher than in the United States or Europe) has disappeared in Argentina, and substantially diminished in Brazil.

The experience seems to show that the PCI's installed capacity under ISI was competitive enough to survive, with lower or zero transfers and greater exposure to international competition than in the past. In Brazil, it survived during a transitional phase, in which a new regulatory regime has yet to replace that established under the ISI model. This highlights the fact that the entrepreneurial and organizational capacity accumulated under ISI has been much greater than that assumed by the critics of ISI in the orthodox literature. At the same time, greater competition and fewer transfers to the PCI have forced firms to rationalize their structures, and to increase the efficiency of processes and the quality of their products. Consequently, it is clear that productive efficiency has improved and that human and physical resources are better used.

In the Argentine case, the marked expansion of domestic consumption was a key element in the continuity of the sector. In addition to the increase in petrochemical consumption fostered by higher economic growth rates, other factors helped increase domestic demand for petrochemicals. These included large investments by private firms; the reactivation of construction, agricultural output and the automotive sector; the techno-productive modernization of a substantial group of plastics processing firms; and the introduction of modern marketing and packaging practices, etc.

Meanwhile, Brazilian PCI growth has been limited by factors such as the low level of *per capita* consumption – largely because of income inequalities – and the rather outdated technology of the plastics processing industry. Neither has there been any stimulus from GDP growth or an increase in exports that could have offset such obstacles.

Although structural reforms led to a profit squeeze for Argentine firms in the early years (through the ceiling on domestic prices and the increase in the price of raw materials), there were also beneficial, albeit gradual, spill-over effects such as a reduction in labor and energy costs, an improvement in infrastructure and communications, and renewed access to the international capital market. These effects reduced both the costs of production and investment. Thus Argentine firms, through rationalization and downsizing, together with some investment and smaller technological changes, achieved a sharp increase in labor productivity (Table 1). Improvements in quality control and environmental management were also notable, although some problems persist in the latter area.

In Brazil, the generalized crisis obliged firms to cut costs drastically to compensate for the increase in the price of raw materials and the new price ceiling established by the threat of foreign competition. Firms enjoyed neither macroeconomic advantages such as a fall in the cost of labor or a more favorable exchange rate, nor an improvement in infrastructure and communications, nor access to foreign credit (in a context of very high domestic interest rates). The adjustment reduced production costs, achieved by small investments in “debottlenecking” and the modernization of equipment, while prompting a sharp reduction in the labor force; such cuts were largely concentrated at the management rather than the operational level. Productivity gains also came from the reorganization of management as a result of mergers and acquisitions. The latter also led to a reduction in the commercial structures and an increase in the range of activity of the support structures, such as plants, technical assistance equipment and R&D. Moreover, as in Argentina, there were improvements in quality control and environmental management.

The severe constraints on the PCI in Brazil over the past decade, a result of the oil crisis and the fall in domestic consumption, led the sector to increase productivity earlier through more efficient energy use, the preparation of quality programs and personnel training. Argentina only began to take these steps in the 1990s.

In addition to the changes in resource allocation and use, two other sets of issues help explain the process of restructuring the PCI in MERCOSUR. The first concern the significance and degree of state withdrawal from sectoral regulation, and its replacement by the market; the second are related to the dynamic effects of the reforms.

In Argentina, although the PCI has been liberalized and deregulated, the industry's particular characteristics have meant that the old state regulation has been replaced by private regulation, which includes trends towards vertical integration, inter-firm association, ordering of markets, etc., within a framework of greater concentration of local supply. Since the hydrocarbon market was deregulated, greater integration of the PCI in the production and processing of gas and petroleum appears to be an irreversible trend in Argentina. Almost 100% of the supply of aromatics and olefins – the sector's main basic products – is controlled by firms that extract and process hydrocarbons; these firms are operating towards the bottom of the petrochemical chain and control most of the more modern installations at the domestic level, generally in association with TNCs. There has thus been a switch from vertical inter-branch integration to vertical intra-firm integration. Hence the dominant actors, except in the case of stock transfers, will be those that make relevant investments in the future.

This brings us to the dynamic effects of the restructuring process. The definition of the role of various actors in the sector, new leading firms (Dow Chemical, YPF, Pérez Companc) that have access to international credit, domestic markets that exceed installed capacity in various key products, and the possibility of exporting tariff-free to the large Brazilian market, will bring about a phase of heavy investment (Table 1). This will allow a substantial increase in output and an improvement in the PCI's trade balance. In this sense, the decision of some large TNCs to make significant investments in Argentina has been clearly positive.

Expansion will largely occur in commodity lines, since it is unlikely that there will be an ambitious project in terms of the development of endogenous technological capacity, nor a shift into specialisms such as plastics engineering, etc. Most domestic firms contend that expenditure on developing their own technology is not very profitable, and have traditionally preferred to maximize the foreign content of technology. TNCs, meanwhile, tend not to develop R&D activities in their affiliates in LDCs.

The Argentine PCI will adapt to the size of the sub-regional market; extra-zone export activities will become purely residual. The TNCs, which provide technology and management, and the national conglomerates, which have access to raw materials and have experienced a long process of apprenticeship in the sector, will come to dominate the main markets in clearly defined areas of specialization.

By contrast, there are doubts about the outcome of PCI restructuring in Brazil. In particular, the state's new regulatory role has yet to be defined in an oligopolistic sector that is more concentrated than in the past. Petroquisa, the holding company that plays a key role in the coordination of this oligopoly by guaranteeing raw materials, has sold almost all its shares in the sector, and the new regulatory instruments are still being developed. Another weakness of the Brazilian

PCI is its low level of vertical integration. PETROBRÁS, which is still the main supplier of raw materials, has still not defined its new role in the industry. In addition, investment in petroleum and gas remains under discussion. This translates into a low level of expected investment relative to the size of the Brazilian market (Table 1).

Hence the process of restructuring the Brazilian PCI does not yet guarantee that it will achieve an adequate level of international competitiveness. Three other factors have blocked this objective: the lack of definition as to who will benefit from the advantages of backward integration, the inadequate size of the leading local groups, small economies of scope, and transaction costs that are inherent in the geographic and company fragmentation of the sector.

Consequently, the dynamic effects of the Brazilian restructuring process do not yet appear very promising, because the main players in the sector have not been clearly identified and expectations are low for a growth in exports and domestic consumption. Investments in R&D, however, appear more positive than in Argentina. Some TNCs have concentrated their development centers for Latin America in Brazil because of the size of the market. Similarly, when national firms broadened their networks of links with users, they also perceived more clearly the importance of these investments to protect themselves against competition from commodities imports. The strengthening of this dynamic effect will depend on the reduction of inequalities in income distribution and on overcoming the structural heterogeneity of the processing industry.

5. The Impact of MERCOSUR on the Structure and Development of the Petrochemical Sector

Intra and Extra-MERCOSUR Trade Flows

Analysis of the destination of Argentine petrochemical exports reveals a clear reorientation towards the MERCOSUR market and away from other destinations during the 1990s. In effect, during the period 1986-1988, an average of 14% of total petrochemical exports went to Brazil, and 20.9% to MERCOSUR as a whole. By contrast, in 1994-1996, when petrochemical export values were similar to those of 1986-1988, MERCOSUR virtually doubled its share of Argentine petrochemical exports (41.3%) in relation to 1986-1988. Brazil absorbed 32% of those exports, 130% more than in 1986-1988 (Table 2).

MERCOSUR has also become increasingly important for Argentine imports (almost all purchases made in the sub-region came from Brazil) in recent years, although the reorientation of trade has been slower in the case of exports (Table 3). As a source of Argentina's petrochemicals imports, MERCOSUR's share rose from 33.6% in 1986-1988 to 39.2% in 1994-1996.

An examination of how the geographical distribution of Brazil's petrochemical trade has developed shows similar trends for exports but not for imports. In effect, Brazilian petrochemical exports increasingly went to MERCOSUR during the period studied. From 19.6% of Brazilian sales in 1986-1988, MERCOSUR's share rose to 33.5% in 1994-1996. Argentina accounted for most of these sales and its share grew somewhat more than those of the other countries in the bloc (Table 4).

Interestingly, both Argentina and Brazil sold about 20% of their exports in 1986-1988 to MERCOSUR and about 14% to each other. Although the shares grew sharply in both cases, growth was greater in the Argentine case; this implies that there was a greater reorientation of exports to the countries of the bloc. Argentina exports relatively more to the European Union and the rest of Latin America, while Brazil exports more to NAFTA (North American Free Trade Agreement) and Asia.

Brazil's imports from MERCOSUR (almost 90% of which were supplied by Argentina) were proportionally much lower than Argentina's (7.6% compared to about 40%), and this share declined rather than increased in 1994-1996 compared with 1986-1988 (Table 5).

Uruguayan exports are almost entirely absorbed by MERCOSUR, and particularly by Brazil (over 90% in the years 1993 and 1996). Although MERCOSUR is also the main source of Uruguayan imports, its share fell from 73.3% in 1993 to 58.6% in 1996. Brazil has suffered most from this decline in MERCOSUR imports; its share fell from 51% to 40% between 1993 and 1996 (Tables 6 and 7).

Paraguay does not export petrochemicals (since it does not produce them) but its imports come mainly from MERCOSUR, with Brazil providing the largest share. Table 8 shows that MERCOSUR supplied over 80% of Paraguayan purchases in 1989 and 1996, with no real marked change in its relative share.

Both Uruguay and Paraguay have made extensive use of the regime of exceptions to the CET, which means that Argentine and Brazilian producers enjoy smaller margins of preference in those markets than they would if the CET were fully applied, although both countries have been converging according to their respective timetables. It thus remains to be seen what happens to petrochemical trade in the two countries once the CET is fully in force.

However, some trends raise questions about the possibility of trade diversion in the petrochemical sector since MERCOSUR was created. Trade diversion occurs when imports from third countries are substituted by imports from less efficient producers in the member states of the customs union, causing a loss of welfare and efficiency. Similarly, trade creation occurs when the consumption of domestic

products is replaced by similar products at lower cost from other members of the customs union.

It should be noted that various authors have questioned the interpretation in the orthodox literature that all trade diversion is harmful. Although in a static analysis trade diversion can in principle impede efficient resource allocation at a global level, it will not necessarily lead to a lower standard of living in countries that are members of the integration process where the diversion is occurring. In particular, if the post-customs union tariffs and non-tariff barriers are equal to or lower than those that existed before integration, consumers in the sub-region will pay the same or less than before, although the goods they consume come from less efficient producers in terms of production costs. Leaving aside static analysis, in certain conditions trade diversion can have positive consequences owing to economies of scale, specialization and know-how that can originate in an intensification of trade between partners, particularly when the diversion is accompanied by an increase in intra-industry trade (Lucángeli, 1992). It is therefore necessary to interpret the indicators of trade creation and diversion in the broader context of the development of the sector as a whole.

First, we use an indicator that used by Yeats (1997) in his article criticizing the effects of MERCOSUR's creation, and which is known as the regional orientation indicator (ROI). The ROI compares the relation between the relative weight of the sector within the total exports destined for a specific sub-region with its relative weight in exports to the rest of the world.⁹³ It can take values from zero to infinity; a unitary value suggests the absence of regional orientation for the good in question, and a value higher than one implies that the sector's trade is biased towards the sub-region being analyzed.

The ROI takes values higher than 1 for petrochemical exports from both Argentina and Brazil. This is repeated in almost all the families of products and periods analyzed. This indicates that the weight of petrochemical trade in intra-subregional trade is greater than in extra-subregional trade, and is more pronounced in the Brazilian case. However, the intensity of the regional orientation of the petrochemical trade fell in 1986-1988 and 1994-1996, both in Argentina and in Brazil, although in the latter's case there was an increase in 1991-1993 and 1994-1996 (Table 9). In both countries, a fall in ROI conforms to the condition that, if petrochemical exports lose significance both in sales to MERCOSUR and in extra-regional sales, that loss of significance is much greater in

⁹³ $ROI_j = (X_{jm}/X_{tm})/(X_{pj}/X_{m}) * 100$ where

X_{jm} = value of exports of product j destined for country m.

X_{tm} = value of total exports to country m.

X_{pj} = value of exports of product j which go to third countries.

X_m = value of total exports to third countries.

the former case, given the strong growth of intra-MERCOSUR trade throughout the decade.

This suggests that PCI exports from both countries are more biased towards the sub-regional market than average productive sectors in each economy, although this occurred before the integration process. From this, therefore, we cannot necessarily deduce that trade diversion is present.

To analyze trade diversion, we have used a methodology originally suggested by Balassa (1967), and used by Lucángeli (1992). The method consists of comparing the income elasticity of demand for imports in intra- and extra-zone trade during the periods before and after integration.⁹⁴ On the assumption that the income elasticity of demand for imports without integration is constant, an increase in that elasticity in intra-zone demand would indicate gross trade creation, while an increase in the income elasticity of demand for global imports would suggest the existence of real trade creation. Equally, a fall in extra-zone income elasticity would indicate trade diversion.⁹⁵

Two periods were chosen based on the available data: 1986-1988 and 1993-1996. In the first period, although the PCI was not involved in the early stages of integration, the bulk of bilateral trade in the sector was governed by preferential tariffs granted mutually by both countries within the ALADI framework. Following Lucángeli's suggestion (1992), the import elasticities of Argentina and Brazil were calculated together. This is preferable to calculating the elasticities separately.⁹⁶

This exercise gives rather surprising results (Table 10). In the first period, 1986-1988, it can be seen that the income elasticity of demand for intra-zone imports was very high, while it was negative for total demand and extra-zone imports. A decisive factor in this is the performance of a series of plants in

⁹⁴ Income-elasticity of demand of intra-zone imports: $E_i = m_{jm} / y_i$ where
 m_{jm} = growth rate of imports of the industry j coming from MERCOSUR.
 y_i = GDP growth rate of country i .

Income-elasticity of total import demand: $E_t = m_j / y_i$ where
 m_j = growth rate of total imports of product j .
 y_i = GDP growth rate of country i .

Income-elasticity of demand of extra-zonal imports: $E_e = m_{js} / y_i$ where
 m_{js} = rate of growth of imports of product j originating outside MERCOSUR.
 y_i = GDP growth rate of country i .

⁹⁵ Although, as Lucángeli (1992) points out, this is not a method that produces precise results; since it only indicates the presence of trade creation and diversion, it has the advantage of simplicity in calculation. Moreover, the other methods available make questionable assumptions and, from an empirical point of view, do not produce more satisfactory results.

⁹⁶ Petrochemical imports have been deflated taking as a base the evolution of prices of imports of the main imported products by both countries. Thus GDP growth has been calculated in both cases in constant 1990 dollars.

Argentina's Bahia Blanca pole, which in a context of low demand in Argentina began to export to Brazil. This led to a sharp reduction in the share of Argentina's domestic consumption met by imports (which explains a large part of the fall in the income elasticity of demand for petrochemical imports in the Argentina-Brazil grouping). At the same time, it was assumed that Brazil would replace extra-zone imports with purchases from its neighbor (explaining the sharp increase in the income elasticity of demand for intra-zone imports).

Although data from earlier periods have not been used, it can be inferred from the above that trade diversion was occurring during this period, facilitated by preferential tariffs which were negotiated according to the needs of petrochemicals firms in both countries. This can also be explained by the fact that since high transport costs are characteristic of the petrochemical sector, it is natural that imported supply should come from neighboring countries, whose producers benefit from having lower cargo costs to include in the sale price of the product. In addition, it is obvious that in view of the nature of ALADI negotiations at the time (essentially, preferences aimed at facilitating the entry of products with conjuncturely or structurally unmet local demand), trade "diversion" did not lead to an increase in the price of the sector's imported products consumed in Brazil.

Looking at what occurred in 1993-1996, with fully functioning integration and the total inclusion of the PCI in the process, it is clear that compared with 1986-1988, the income elasticity of demand for intra-zone imports, far from increasing, markedly declined. Meanwhile, the income elasticity of demand for global imports, as well as extra-zone imports, turned positive and took on values higher than the income elasticity of demand for intra-zone imports. In other words, between 1993 and 1996 – comparing extremes – extra-zone imports grew proportionally more than intra-zone imports.

To evaluate this phenomenon better, it is worth introducing two additional considerations. Taking Argentine and Brazilian imports together (which amount to almost 95% of MERCOSUR imports), extra-zone suppliers have increased their relative share from 74% in 1986-88 to 80% in 1994-1996.

Since both Argentina and Brazil have aligned their domestic prices with those in the main reference markets at international level, there is nothing to suggest the replacement of efficient extra-zone producers by less efficient intra-zone producers, but rather a natural reorientation owing to the closeness of the countries in the bloc. In addition, at the international level there is a strong tendency for foreign trade to be conducted largely between areas that are geographically close (the degree of regionalization of sectoral trade is still small by international standards).

Consequently, while these observations (and the specific phenomena affecting the development of the sector and the two economies in the period under study)

suggest that the data should be treated with caution, the indications are that there has been no trade diversion in the PCI. Probably the most reasonable explanation is that integration took place in a context of sharp reductions in barriers to extra-zone imports in both countries. In other words, it could be a consequence of what is known as 'open integration'.

Nevertheless, it is to be expected that the development of trade integration will affect the patterns of specialization and competitiveness of the member countries. Several methodologies, based on the evaluation of trade performance at country and sectoral level, have been developed to analyze these effects, the scope of which is discussed at length in the extensive literature.

One such methodology is based on the contribution to the trade balance indicator (CBI). This indicator expresses the relative comparative advantages of different sectors in terms of their contribution to the international trade balance of the country analyzed. It is constructed by taking the difference between the actual external balance as verified in the aggregate of the products studied (expressed in relative terms to the country's total trade) and the theoretical balance which would result if the total trade balance were distributed in proportion to the share of each aggregate of products in the country's total trade. If the observed balance is higher (lower) than the theoretical balance, the product or category of products would have revealed comparative advantages (disadvantages). Consequently, a CBI of > 0 indicates comparative advantages and a CBI of < 0 indicates disadvantages.⁹⁷

In Argentina, the CBI for petrochemicals has negative values throughout the period studied, and the final product category shows the greatest comparative disadvantages. In Brazil (1986-1988), this indicator shows comparative advantages for the PCI, particularly for final products, but in 1994-1996 the advantages only continued in intermediate products. Final products acquired the greatest competitive disadvantages (Table 11).

This exercise prompts two central observations. First, with regard to general exporting specialization, the Brazilian petrochemical sector has greater advantages, or fewer disadvantages, than that of Argentina. Second, these advantages have been eroded if general exporting specialization are considered, since petrochemical imports have grown significantly in both countries during the 1990s.

⁹⁷ $CBI = [(X_i - M_i)/(X + M)]/2 - [(X - M)/(X + M)]/2 * (X_i + M_i)/(X + M)$, where

X_i = exports of product i. X: total exports.

M_i = imports of product i. M: total imports.

Bilateral Argentine-Brazilian Trade

Argentine-Brazilian petrochemical trade grew considerably in the last decade, although at a lower rate than total bilateral trade. It grew by 175% from an average US\$ 157 million between 1986 and 1988 (10.8% of annual bilateral trade in the period) to US\$ 432 million between 1994 and 1996 (4.3% of annual bilateral trade in the period).

An analysis carried out at the beginning of the decade (López and Porta, 1992) found that the start of the integration process had significantly changed the nature of bilateral petrochemical trade, which until 1990 was basically dominated by products that were either in surplus or deficit in each country, or in products that had a structural deficit in local supply. The latter largely applied to Brazilian sales to Argentina.

By contrast, current bilateral trade is strongly weighted towards products that are in supply in both countries (particularly thermoplastics). Trade is growing and is relatively stable, beyond domestic demand fluctuations. In 1996, for example, a year of strong growth in petrochemical consumption in Argentina, local producers kept up their supply commitments to their Brazilian clients. This phenomenon is linked to the fact that operational margins for producers in the sub-region have tended to level out. Intra-zone exports are consequently considered in the same way as local sales, and clients in the neighboring country receive the same treatment as local clients. The creation of the customs union assumed that producers in both countries could benefit from income created by the margin of preference over extra-zone supply, and thereby stimulate the redirection of external sales to MERCOSUR. Brazilian producers have a 17% advantage on the transaction cost of exports to Argentina, and vice-versa for Argentine firms in Brazil. As mentioned earlier, intra-zone producers can capture the regional preference by setting their prices at extra-zone import parity. If there is eventually excess sub-regional supply, the producers can set their prices at sub-regional import parity, sacrificing the income from the margin of preference, but limiting the entry of competitive products from the northern hemisphere or Asia (FIEL, 1997).

The bilateral trade balance is structurally in deficit for Argentina, which recorded a negative balance of US\$ 90 million on average between 1986 and 1988. After a slight increase between 1991 and 1993, to just over US\$ 100 million on average, the Argentine deficit grew to US\$ 215 million between 1994 and 1996.

In this context it is useful to analyze intra-industry trade (IIT) in Argentine-Brazilian commerce. One of the desired effects of trade integration is that this type of trade increases, particularly when the countries involved have relatively similar structural characteristics. In addition, increasing IIT can generate welfare and

efficiency gains that are greater than those generated by increasing inter-industry trade. For this analysis, we use the traditional methodology (developed originally by Grubel and Lloyd), which defines an IIT indicator⁹⁸ that can take values of between 0 and 100; values close to 100 indicate a greater weight of IIT in the activity analyzed.

On this basis, it can be seen that the IIT has increased at a sustained rate since the last decade. Both the speed of the increase and the value of the index are higher in the case of final products (logically, given Argentina's low level of production of these goods), while the intra-industry trade indicator falls for intermediate products in the period (Table 12). This confirms what was said above about the greater weight of final goods (particularly thermoplastics) produced in both countries in bilateral Argentine-Brazilian trade.

The Influence of MERCOSUR on the Restructuring Processes of the PCI

The first point to highlight is that Argentine and Brazilian firms increasingly consider the member countries of MERCOSUR as part of the domestic market. This means that they do not use MERCOSUR as a regulator of domestic crises, but as a market to be served permanently. Thus a situation is being reached where calculations about the market share of each firm are made at the sub-regional MERCOSUR level; in other words, the PCI's oligopolistic competition is increasingly played out in MERCOSUR as a whole.

Geographical zones of influence are now being formed, such that firms in southern Brazil compete more strongly in the Argentine market because of their geographical proximity, and Argentine firms are actively penetrating neighboring areas of Brazil (the south and southeast).

MERCOSUR thus clearly influences firms' strategies. TNCs with productive installations in both countries can gain by restructuring their production, marketing and support, and technological development operations, and by establishing specialized operations organized by type of client, product variety, region, etc. They can therefore exploit opportunities for raw material supply in different locations, and strengthen the synergies between company assets and resources in the sub-region. Solvay and Dow Chemical are good examples of this phenomenon.

As for national firms, the Brazilian petrochemical companies positioning to locate themselves in the Argentine market include Ciquine, which bought

⁹⁸ $CC_{intra_i} = [1 - |M_{ij} - X_{ij}| / (M_{ij} + X_{ij})] * 100$ where

M_{ij} = imports of goods grouped under the activity i by country j .

X_{ij} = exports of goods grouped under the activity i by country j .

Argentina's Maleic to control the sub-regional supply for a specific product. PETROBRÁS, in association with Dow and YPF, is also doing this with the MEGA project. Odebrecht tried but failed to buy PBB. Meanwhile, Argentine firms that have made efforts in Brazil include Pérez Companc, which was associated with Odebrecht in the failed attempt to acquire PBB. It also has a project to build a polystyrene plant at the Triunfo pole, essentially motivated by the availability of raw materials there.

In addition, the increase in Brazilian exports to Argentina has brought competition to the local market. However, Argentine firms are more concerned about supply from markets in Asia than from their neighbor. This concern was particularly strong at the end of last year because of the Asian crisis. Asian goods entering the market increased to a level which, according to some producers, could be considered dumping. Similarly, imports from Argentina do not constitute much competition for Brazilian firms, which are also more concerned about Asian and Venezuelan supply. Obviously, Argentina and Brazil are affected differently by each other's imports because of the difference in the size of their industries and domestic markets.

At the same time, redirecting to MERCOSUR those Brazilian and Argentine exports that were previously sold outside the zone meant that firms in the sub-region maintained high levels of use of productive capacity. Proximity to the neighboring market broadened the scope for differentiating final products through interaction with clients. This improved export conditions because, instead of selling commodities to countries further afield, differentiation in the sub-regional market has enabled firms to make higher value added sales and to enjoy greater stability in their relations with clients.

Even before MERCOSUR was formed, both Argentine and Brazilian firms exported to third markets, although they did not always have a direct and permanent market presence. The chance offered by MERCOSUR to learn the export business is largely linked to the opportunity to develop relations with clients in the sub-region thanks to geographic and cultural proximity. This enables firms to introduce new product grades, and consequently achieve economies of scope and higher profits. However, according to Argentine and Brazilian producers, the demands of clients in MERCOSUR do not differ significantly from those in other markets. Current investment is largely thought of in terms of the sub-regional market, which means that firms do not expect to generate heavy extra-zone export flows (any extra-zone exports would largely be surplus trade). This follows international trends, which indicate that most international trade in petrochemicals takes place in zones that are geographically close.

Consequently, for firms located in both Argentina and Brazil, MERCOSUR is an opportunity. Such companies are competitive in terms of cost, technology and

scale, particularly once current investment becomes operational. With tariffs and geographical proximity, their products enjoy preferential access to a broad market compared with products from third countries. In the case of Argentina, MERCOSUR also allows firms to invest in internationally competitive plants, which would not have occurred if the firms had been limited to the domestic market. Without access to a large open market, it would have been very difficult for Argentina to have expanded its PCI.

Comparing Argentine and Brazilian scales, both the maximum and average sizes of plants are larger in Brazil for almost all petrochemical products. Brazilian scales are also more or less the same as European scales, and in some cases are larger, although they are somewhat smaller than US scales; on average, Brazilian plants are among the largest in the world. Obviously, Argentine scales are generally far from international scales.

The changes in organization, quality and processes, etc, cannot be attributed to MERCOSUR *per se*, but rather to trade opening and deregulation implemented since the beginning of the decade. However, MERCOSUR did generate changes in firms' strategies, such as the opening of commercial offices in the partner country, the definition of complementary strategies in TNC affiliates, direct investment in the partner country through the purchase of firms and the establishment of new plants, partnerships between firms in Argentina and Brazil, etc. MERCOSUR was also determinant in the decision of TNCs such as Solvay and Dow Chemical to invest heavily in Argentina, first by acquiring existing firms, and now through expansion projects, which would have been more difficult to justify if they were only serving the domestic Argentine market.

6. Prospects and Policy Suggestions

The main advantage of a customs union for firms in the sector is the larger scale of the market for their products (an advantage that is more relevant for Argentina than for Brazil, given the difference in the size of their markets) and the possibility of replacing exports to countries further afield (which can usually be done only by selling in bulk) with sales to clients in the sub-region. This facilitates product differentiation and better sales conditions. Increasing market size can also generate positive effects on both plant scale and eventually on the size of the groups that emerge as market leaders in the sub-region. This latter point is important for the PCI because economies of scale at the firm level are as significant as those at the plant level. Economies of scale at the firm level improve access to finance, increase the possibility of broadening innovation, etc.

The choice of investment location will be influenced by different factors depending on the type of product. Availability of raw materials is a key element; hence Dow Chemical and Solvay came to Argentina to secure access to raw

materials and base petrochemicals that were not available in Brazil, while the Odebrecht group positioned itself in Brazil to take advantage of the alternative sources of raw materials by the Paulínea petrochemical center project; the Pérez Companc group invests in Brazil largely for the same reason. Other factors such as the proximity of the market and favorable investment conditions can also influence these decisions.

The firms interviewed also consider the position of competitors in the neighboring country when devising their investment strategies. This probably leads to a "natural" coordination of investment, in light of the small number of players that will remain in the sector. This coordination is in turn determined not only by access to raw materials and financing, but also by the speed of project implementation. The particular competition conditions in the sector mean that the first player to invest in a product for which there is excess demand will discourage other competitors from trying to occupy the same market.

The evolution and performance of the PCI have a series of significant repercussions for the rest of the economy, essentially because it is a supplier of inputs that are widely dispersed in a vast number of productive activities. Local production of these goods in countries with high domestic demand not only replaces imports, which weigh heavily on the trade balance, but also ensures that domestic users (and especially the larger ones) have a continuity of supply that would be more difficult to obtain if they had to rely solely on imports for supply.

At the same time, if these users are at a disadvantage to their counterparts in other countries owing to deficiencies in the price and quality of local production, their competitiveness and costs can be adversely affected. This can then trickle down the domestic production chain, or reduce users' ability to compete in third markets or in the domestic market with imports from third countries.

Thus, sectoral policies should foster competitiveness gains for the PCI while ensuring the conditions for these gains to trickle down to the vast number of petrochemical users, most of which are heavily labor intensive small- and medium-sized enterprises (SMEs).

Another major condition for fostering the development of the PCI is a growing domestic market. This depends in part on economic growth in the MERCOSUR countries (since there is a close link between *per capita* income and petrochemical consumption), as well as on income distribution. It is also important that the petrochemical processing sector develops quantitatively and qualitatively to increase market volume and to enable petrochemical firms to differentiate their supply and provide new product lines, the current demand for which does not justify local production.

This opens the field of action for public policy, since the processing sector largely consists of SMEs that are constrained by lack of access to credit, technical information, qualified human resources, etc. Policies aimed at resolving the market and coordination failures affecting these firms, and at improving their competitiveness, will therefore have a positive impact on the PCI. They will also help to expand a sector that generates high levels of employment.

Although the PCI is by nature a sector of oligopolistic competition, this does mean that market-sharing agreements or other types of accords are acceptable. Hence, in addition to a policy to protect competition, it is necessary to maintain the threat of competition from extra-zone imports as a means of "disciplining" local producers. At the same time, to ensure that extra-zone import penetration does not lead to predatory pricing, non-tariff protection mechanisms have to become more agile so that they can be used at times of international crisis if it is found that there is significant damage to local production (while avoiding the erection of permanent barriers).

Another area for public policy could be to foster improvements in the PCI's environmental management. There is still room for progress in this area, both to reduce polluting emissions and to solve existing problems.

With regard to technology, although there are various constraints (particularly in Argentina), it would be desirable if policies were introduced to encourage firms to increase the resources devoted to innovation. This would have two positive effects: i) it would increase the sector's positive externalities; and ii) it would foster greater product differentiation and eventually new production lines that are currently absent in the sub-region.

Macroeconomic conditions also have a decisive impact on the evolution of the sector. Maintaining price stability is clearly a positive factor, but it should be accompanied by growth and better income distribution to increase the domestic market, and by similar conditions for access to credit as those prevailing internationally; this is a particularly serious problem for Brazil.

At the MERCOSUR level, some minimum level of policy coordination is necessary to prevent marked differences in the incentives offered by the countries (such coordination has not yet been achieved). It is an issue of leveling firms' exogenous costs (tax, labor, raw material, energy costs, etc., as far as differences do not correspond to structural factors in the countries but to policy decisions), coordinating the use of investment incentives, and eliminating obstacles to intra-subregional trade.

Although intra-MERCOSUR policy coordination is still deficient, it is important to note that, unlike in the past, at least among producers in Argentina and Brazil and the chambers that represent them, there is no serious concern about possible

asymmetries between the two countries. However, they have major concerns about the possibility of expanding the integration process to other countries and regions, with which there are various differences in the policies governing the sector. Negotiations between MERCOSUR and extra-zone countries or groupings should consider the active participation of the business sector, and address the specific problems affecting different productive activities.

It is also necessary to support the firms in the sub-region so that they improve their competitive opportunities *vis-à-vis* extra-zone producers and facilitate intra-subregional trade. In addition to the policies mentioned above, it is vital that the countries of MERCOSUR make progress in improving their transport and communications infrastructure, and in harmonizing norms and procedures.

TABLE 1: Evolution of the Petrochemical Industry in Argentina and Brazil 1990-1996

	Argentina		Brazil	
	%	US\$ millions	%	US\$ millions
Production (cum. growth 1990-96)	24.5		17.9	
Imports (cum. growth 1990-96)	507.7		158.6	
Exports (cum. growth 1990-96)	-16.3		13.1	
Apparent consumption (cum. growth 1990-96)	117.1		31.2	
Imports/apparent consumption (1990)	17.1		9.1	
Imports/apparent consumption (1996)	47.8		18.0	
Exports/Production (1990)	22.8		9.3	
Exports/Production (1996)	15.4		8.9	
Investment 1990-96		543		n.a.
Investment 1997-2001		2.191		3,235
Productivity (cum. growth 1990-96)	46.8		51.2	

Source: Authors' calculation based on data from ABIQUIM (*Associação Brasileira da Indústria Química*, Brazilian Chemical Industry Association), IPA (*Instituto Petroquímico Argentino*, Argentine Petrochemical Institute) and press information.

TABLE 2: Argentina: Destination of Exports of Petrochemical Products 1986-1996

Destination	Ave. 86/88	Ave. 94/96	Ave. 86/88	Ave. 94/96
	US\$ thousands	US\$ thousands	%	%
MERCOSUR	50,370	139,772	20.9	41.3
-Brazil	33,682	108,514	14.0	32.1
NAFTA	43,399	21,413	18.0	6.3
Asian NICS ¹ + Japan	10,414	7,130	4.3	2.1
EEC	58,432	68,251	24.2	20.2
Rest of Latin America	49,438	72,231	20.5	21.3
Rest of world	29,142	29,637	12.1	8.8
Total	241,196	338,435	100.0	100.0
Extra-MERCOSUR	190,826	198,664	79.1	58.7

Source: Author's calculations based on DATAINTAL.

**TABLE 3: Argentina: Origin of Petrochemical Product Imports
1986-1996**

Origin	Ave. 86/88 US\$ thousands	Ave. 94/96 US\$ thousands	Ave. 86/88 %	Ave. 94/96 %
MERCOSUR	125,879	325,653	33.6	39.2
-Brazil	123,737	323,533	33.1	38.9
NAFTA	155,745	250,808	41.6	30.2
Asian NICs ¹ + Japan	2,309	25,943	0.6	3.1
EEC	66,070	128,803	17.7	15.5
Rest of Latin America	7,555	27,144	2.0	3.3
Rest of world	16,666	72,298	4.5	8.7
Total	374,223	830,649	100.0	100.0
Extra-MERCOSUR	248,344	504,997	66.4	60.8

Source: Authors' calculations based on DATAINTAL.

**TABLE 4: Brazil: Destination of Exports of Petrochemical Products
1986-1996**

Destination	Ave86//88 US\$ thousands	Ave. 94/96 US\$ thousands	Ave. 86/88 %	Ave. 94/96 %
MERCOSUR	127,297	367,723	19.6	33.5
-Brazil	92,009	294,314	14.2	26.8
NAFTA	46,679	152,744	7.2	13.9
Asian NICs ¹ + Japan	70,848	131,843	10.9	12.0
EEC	98,125	148,864	15.1	13.6
Rest of Latin America	105,604	135,632	16.3	12.4
Rest of world	201,276	159,645	31.0	14.6
Total	649,830	1,096,450	100.0	100.0
Extra-MERCOSUR	522,532	728,728	80.4	66.5

Source: Authors' calculations based on DATAINTAL.

**TABLE 5: Brazil: Origin of Exports of Petrochemical Products
1986-1996**

Origin	Ave. 86/88 US\$ thousands	Ave. 94/96 US\$ thousands	Ave. 86/88 %	Ave. 94/96 %
MERCOSUR	30,769	131,079	12.82	8.75
-Brazil	26,645	113,349	11.10	7.56
NAFTA	140,624	585,044	58.57	39.04
Asian NICs ¹ + Japan	3,195	93,421	1.33	6.23
EEC	47,028	334,446	19.59	22.31
Rest of Latin America	5,015	147,531	2.09	9.84
Rest of world	13,445	207,234	5.60	13.83
Total	240,075	1,498,755	100.00	100.00
Extra-MERCOSUR	209,306	1,367,676	87.18	91.25

Source: Authors' calculations based on DATAINTAL.

**TABLE 6: Uruguay: Destination of Exports
1993-1996**

Destination	1993		1994		1995		1996	
	US\$ thousands	%						
MERCOSUR	1,475	99.9	15,131	98.0	17,837	98.9	19,177	98.4
-Argentina	622	4.4	947	6.1	868	4.8	1,164	6.0
-Brazil	13,575	95.0	14,078	91.1	16,735	92.8	17,767	91.1
Rest of world	21	0.1	315	2.0	198	1.1	318	1.6
Total	14,296	100.0	15,446	100.0	18,035	100.0	19,495	100.0

Source: Authors' calculations based on DATAINTAL.

**TABLE 7: Uruguay: Origin of Imports
1993-1996**

Origin	1993		1994		1995		1996	
	US\$ thousands	%						
MERCOSUR	58,239	73.3	66,858	65.8	74,805	62.7	71,760	58.6
-Argentina	18,254	23.0	21,415	21.1	25,515	21.4	23,405	19.1
-Brazil	40,532	51.0	46,311	45.6	50,029	41.9	48,995	40.0
NATFA	9,180	1.6	9,539	9.4	16,570	13.9	15,100	12.3
Asian NICs + Japan	1,337	1.7	3,456	3.4	4,997	4.2	7,450	6.1
CEE	8,054	10.1	12,258	12.1	10,585	8.9	9,343	7.6
Rest of Latin America	489	0.6	4,068	4.0	5,362	4.5	6,458	5.3
Rest of world	2,125	2.7	5,368	5.3	6,995	5.9	12,411	10.1
Total	79,424	100.0	101,547	100.0	119,314	100.0	122,522	100.0

Source: Authors' calculations based on DATAINTAL.

**TABLE 8: Paraguay: Origin of Imports
1989-1996**

Origin	1989		1993		1995		1996	
	US\$ thousands	%						
MERCOSUR	10,417	84.9	18,280	84.3	31,423	81.5	32,990	83.5
-Argentina	2,912	23.7	5,354	24.7	9,879	25.6	9,236	23.4
-Brazil	7,494	61.1	12,619	58.2	21,327	55.3	23,551	59.6
NATFA	244	2.0	485	2.2	2,712	7.0	2,426	6.1
Asian NICs + Japan	28	0.2	158	0.7	895	2.3	384	1.0
CEE	1,416	11.5	2,167	10.0	3,014	7.8	2,567	6.5
Rest of Latin America	69	0.6	551	2.5	495	1.3	539	1.4
Rest of world	98	0.8	33	0.2	35	0.1	584	1.5
Total	12,272	100.0	21,674	100.0	38,574	100.0	39,490	100.0

Source: Authors' calculations based on DATAINTAL.

**TABLE 9: Index of Regional Orientation
1986-1996**

	Argentina			Brazil		
	86/88	91/93	94/96	86/88	91/93	94/96
Basic	0.	1.36	0.86	2.83	0.98	1.81
Intermediate	4.46	1.53	1.47	6.62	3.24	2.36
Final	1.53	2.13	1.62	3.83	2.39	3.84
Total petrochemicals	2.06	1.85	1.48	4.67	2.42	3.08

Source: Authors' calculations based on DATAINTAL.

**TABLE 10: Argentina and Brazil. Elasticity of Petrochemical Imports with
Respect to Joint GDP
1986-1996**

	1986-1988	1993-1996
Intra-subregional imports	13.5	4.7
Extra-subregional exports	-7.4	5.4
Total imports	-2.4	5.3

Source: Authors' calculations based on data from INTAL and Inter-American Development Bank

TABLE 11: Argentina and Brazil: Index of Contribution to Trade Balance

	Argentina			Brazil		
	86/88	91/93	94/96	86/88	91/93	94/96
Basic	0.20	0.24	-0.28	0.27	-0.19	-0.22
Intermediate	-4.81	-1.62	-1.17	0.67	0.42	0.22
Final	-4.71	-2.34	-3.88	1.23	-1.17	-2.15
Total petrochemicals	-9.32	-3.72	-5.33	2.04	-0.94	-2.15

Source: Authors' calculations based on DATAINTAL.

**TABLE 12: Argentina and Brazil: Intra-Industry Trade
(thousands of US\$ and percentages)**

	86/88	91/93	94/96
Coefficient of intra-industry trade			
-Basic	30.7	86.5	46.4
-Intermediate	49.3	28.5	43.6
-Final	32.4	55.5	53.5
Total	42.8	48.8	50.2
Argentine exports to Brazil			
-Basic	1,64	9,586	10,613
-Intermediate	24,021	10,769	23,942
-Final	8,598	28,986	73,959
Total	33,682	49,341	108,514

(cont...)

(continued)

	86/88	91/93	94/96
Argentine imports from Brazil			
-Basic	5,860	12,590	35,117
-Intermediate	73,390	64,912	85,831
-Final	44,487	75,401	202,585
Total	123,737	152,903	323,533
Trade balance (in absolute value)			
-Basic	4,796	3,004	24,504
-Intermediate	49,369	54,143	61,889
-Final	35,889	46,415	128,626
Total	90,055	103,562	215,019
Value of intra-industry trade			
-Basic	2,128	19,171	21,225
-Intermediate	48,042	21,538	47,884
-Final	17,196	57,973	147,918
Total	67,364	98,682	217,027

Source: Authors' calculations based on DATAINTAL.

Methodological Annex

PCI raw materials are those derived from petroleum (virgin petroleum and heavier cuts) and from natural gas (natural gas, ethane, liquid propane gas and refinery gases). Petrochemical products can be divided into three categories:

a) basic products result from the processing of petrochemical raw materials. They generally serve as inputs for the intermediate and final products of the sector. The main ones include: i) olefins: ethylene, propane, butane, butadiene; ii) aromatics: benzene, toluene, o-xylene, p-xylene; iii) synthesis gas; iv) methanol; v) ammonia;

b) intermediate products result from the processing of basic products. They are used in the production of final petrochemicals or in other industrial sectors (particularly the chemical sector). Examples are: adipic acid; terephthalic acid; acrylonitrile; caprolactam; cyclohexane; vinyl chloride; dimethyl terephthalate; styrene; ethylene glycol; phenol; formaldehyde;

c) final products are obtained from the processing of basic or intermediate products and are widely used as inputs by the manufacturing sector. Most of the goods in this group are polymers, which are made up of four product families:

i) thermoplastics are plastic materials whose primary characteristic is their ability to change shape via different processes when exposed to heat. The main thermoplastics are addition and polycondensation polymers. Polyethylene is one of the most important addition polymers, and it has several varieties (high density polyethylene, low density polyethylene and low density lineal polyethylene), polystyrene (classified as expandable, conventional and high impact), polypropylene, vinyls (for example, polyvinyl chloride) and acrylics (for example, methyl polymethacrylate). Condensation polymers include polyamides, the main varieties of which are nylon 6.6 and nylon 6. There are also engineering plastics. These are high impact and corrosion resistant polymers, and constitute one of the most advanced products of the PCI. The main ones include polycarbonates, polyacetals, polyphenylene sulphide, polyphenylene oxide, polyester ketone, polyamide-imide, polyamide;

ii) thermostables or thermorrigids are materials that cannot be moulded with heat. This group includes different types of resin (phenolics, alkyds, maleics, epoxy, polyesters) and aminoplastics (resins and moulded urea compounds and melamine-formaldehyde);

iii) elastameres are different types of synthetic rubber – butadiene styrene (SBR), polybutadiene, polyisoprene, etc;

iv) synthetic fibres and threads: polyamides (nylon), polyesters, acrylics, and polypropelenes.

There are four other groups of final petrochemicals: i) fertilizers: urea, diamonic phosphate, etc.; ii) detergents: DDB/ABL, tensoactives, etc.; iii) solvents: acetone, carbon tetrachloride etc.; iv) plasticizers.

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Comments by Renato Fonseca

I would like to thank the organizers for the invitation to participate in this event and stress that my comments are based on the executive summaries of the papers as the complete versions were not distributed. This marred the analysis as it was impossible to evaluate the conclusions in the light of the methodologies adopted and the available data bases.

The papers intended to evaluate the impact of MERCOSUR on the automotive, petrochemical, dairy and machine-tool sectors in member states. The choice of diversified sectors in terms of productive structure and performance in the period provides a great opportunity to infer more general conclusions on the impact of MERCOSUR.

The papers in their complete format apparently stress the evolution of the selected sectors with emphasis on the role of regional trade and third markets. They also discuss structural factors and relevant institutional framework. The papers, however, miss their main objective. That is, they do not answer the question they propose to answer. At most, here and there, effects of MERCOSUR are mentioned but a comprehensive and convincing evaluation is not presented. I recognize the difficulties entailed by such a task since the main economies of MERCOSUR, Argentina and Brazil, were marked by profound changes in the period of implementation of the integration initiative. As underlined in the papers, at the same time of implementation of MERCOSUR, these two economies started a process of unilateral trade liberalization, deregulation, privatization of state enterprises and monetary stabilization. These changes importantly affected the performance of these economies over time and also, of course, the sectors under study.

In spite of the difficulties of isolating the different effects on the evolution of specific sectors I believe that the information gathered would make possible *thought experiment*, an abstraction exercise. So I would ask: would the evolution of such sectors be significantly different if the MERCOSUR integration process had not been started? Would the outstanding increase in productivity not have occurred? Or the structural and managerial changes in the firms? Or the structural changes in the markets?

In view of my frustration since this question was not broached I will take leave and try to answer it. In fact, based on the summaries presented, I conclude that the answer to the questions I raised would be no, with the possible exception of one sector.

In the papers here "presented" there seems to be a consensual, although not explicit, conclusion that the important factor to explain the productivity and

efficiency gains in the Argentinean and Brazilian economies was the trade liberalization process, unilaterally implemented by both countries. This conclusion is common to several other studies on the consequences of trade liberalization in Brazil.

It can also be inferred from the summaries that the most important effect of MERCOSUR is related to scale, that is the increased size of the domestic market which results from integration. I would like to stress two points related to this. The first is that the growth of domestic markets in the relevant period was also the result of the recovery of economic growth in response to economic stabilization. Thus, a significant part of market growth was independent from MERCOSUR's favourable effects. Secondly, in view of the considerable difference in scale between the economies involved, the stimulus due to an expanded market affects these economies asymmetrically favouring the smaller economies and being a less relevant factor for the Brazilian industry.

I would like to make some specific comments on each of the studied sectors. In principle, it would seem that the petrochemical sector was the most significantly affected by MERCOSUR. The sectoral paper emphasizes the shift in managerial strategy in Argentina and Brazil favouring binational investments and growth of intra-industry trade. Even in this case, it is stressed that the most important changes resulted from competition from suppliers outside MERCOSUR, from deregulation in both countries and from market growth. I would like to stress that the growth of intra-industry trade in the chemical and petrochemical sectors precedes the mid-1980's, it was relevant that a trade agreement between the two countries was conceived. I believe that the sectoral paper should address this point so as to improve the understanding of the interactive process between firms in both economies.

The paper on dairy products underlines the effects of competition between imports from third markets and market growth for Argentinean and Uruguayan producers. In the words of the authors, Brazil would be the locomotive of intra-MERCOSUR dairy trade. But even then, according to the study, this effect is being cancelled by Brazilian progress towards self-sufficiency.

I would not have much to comment on the paper on the machine tool sector which, according to it, was not affected by MERCOSUR due to, among other reasons, the prior dismantlement of the sector in Argentina and to the Brazilian system of "ex tariffs" which, by providing import duty exemption to some capital goods imports, neutralizes the preference which could favour MERCOSUR suppliers. However, attention is drawn by some of the policy suggestions included in the article as, for instance, the elimination of "ex tariffs" and, especially, the introduction in the whole region of capital goods procurement policies similar to "the present Brazilian regime for domestic purchases". Such recommendations,

which could be justified in the context of the harmonization of commercial systems, contradict the basic ideas that justify the creation of free trade areas or common markets, that is to allow participating members to reap the benefits generated by the transition to freer trade regimes.

In relation to the automotive sector it can be verified, once again, that the increase in productivity as well as the structural and strategic changes in firms have resulted from trade liberalization. I recognize the progress in the integration of plants installed in Argentina and Brazil, although this trend precedes MERCOSUR. MERCOSUR may have speeded up the process of integration but the vision of integrated Argentinean and Brazilian plants owned by multinational firms precedes even the 1986 bilateral Program of Co-operation and Economic Integration. This is evident in the evaluation of the history of negotiations between automotive producers and government. A good example of a plant integration strategy which precedes MERCOSUR is that adopted by Saab-Scania, when installing their Argentinean unit in the end of the 1970's.

It needs to be stressed, however, that the establishment in Brazil of plants of automobile producers which were already installed in Argentina may be an indication that in fact MERCOSUR has not been working properly. If the two markets are integrated, why should these firms engage in parallel investments when they could expand their existing plants and sell their output in the neighbouring country? This is a point I would like to have seen researched in the paper on the automotive sector.

Comments by Jorge Chami Batista

I would like to thank the organizers of this seminar for the invitation to comment on the papers just presented. I would like to stress the relevance of these sector studies for the analysis of regional integration processes. Unfortunately, I have not had access to the manuscripts of the studies just presented, but to a summary of them. So, I offer my apologies in advance, if I have misunderstood some of the points made in the studies, since the summaries lack some basic information.

In my view, the central theme which brings together the four papers is the challenge to compete in third countries' markets (extra MERCOSUR) and to expand exports to these markets. This challenge is ever more pressing in view of the foreign exchange crisis with which the region has now to confront.

There are three basic propositions in the papers regarding this challenge:

1. to use MERCOSUR as the base for improving competitiveness and, thus, promote exports to markets outside the region. This proposition may have a more protectionist version, as the papers on petrochemicals and on machine tools seem to suggest;
2. to expand the set of regional agreements. This proposition should be seen in opposition to the first one. The paper on the automobile industry emphasises this proposition, especially with importing countries of South America, like Chile, Venezuela and Ecuador. The paper also points out the lack of a common regime for the industry, as the principal obstacle for these agreements. The paper on petrochemicals, on the other hand, explicitly reveals that the industry is very concerned with the possibility of expanding the process of economic integration to other countries and regions;
3. to make efforts for a new multilateral round of negotiations that would give first priority to reduce the advanced economies' protectionism on agricultural goods. The paper on the dairy industry argues that the current restrictions on trade in agricultural products are not likely to be eliminated within regional agreements with the United States or with the European Union. It should be noted that this proposition, rather than excluding the other two, may supplement them.

The 1990s have been marked by fundamental changes in the economic environment of the region. The countries of the region have, almost simultaneously, gone through programmes of trade liberalization, deregulation, privatization, price stabilization and regional integration. The effects of these programmes have combined and are still being felt in the economies and industries of the region. As a result, it is extremely difficult to separate the effects of a

regional integration process such as MERCOSUR's from the consequences of all other programmes.

The principal role of these industry studies is to help to formulate a common national and regional objective. They are in fact essential to help to define what these countries aim at as regionally integrated nations. It appears that we have stayed somewhat paralyzed by the dilemma as to whether go ahead with the integration process with other nations and regions or consolidate the integration process with MERCOSUR, or even go back to a less open regional integration. The risk of a more protectionist integration in the region looks especially more likely now, in light of the current international economic crisis.

I understand that we shall not be able to increase and upgrade exports as desired, without an open regional integration process. It is also my view that we shall attack in all fronts, pursuing both regional (Free Trade Agreements or Preferential Agreements) and multilateral agreements. The main aim is to negotiate greater access to other markets, outside MERCOSUR. But the prerequisite is to define what these countries' general strategy is and what they are looking for on a sector basis, since these negotiations are inevitably carried through by sector. In order to do that, it is essential to listen to businessmen and their representative associations. But, except in very unlikely circumstances, this is a game with a negative outcome. The public authorities tend to be pulled in all directions by different private interests. It is the public sector's responsibility to give direction and to transform the outcome of this game into a positive one.

The four papers seem to recognize the tremendous progress achieved by the industries studied in their process of modernization, re-structuring, improving competitiveness and raising labour productivity. They also seem to recognize the important role played by trade liberalization in these processes. The industries studied have at least survived, despite fierce international competition brought about by trade liberalization. In other words, the four papers seem to recognize that trade liberalization in the 1990s has not led to de-industrialization.

The papers on petrochemicals and machine tools emphasize the important role played by the import substitution phase of the industry for its success during the trade liberalization period: "The development of managerial and technological capacities has been much more significant than what the orthodox literature admits". Some success stories of import substitution industrialization (ISI) are undeniable. This is true, but it is only half the truth. It is important to avoid simplifications such as, when there is success, it is due to ISI, when there is failure, it is due to trade liberalization. The central question in the early 1990s was whether to open the economy or not. And here, the heterodox literature preached the maintenance of protectionism or an endless gradualism. The other half of the

truth could well be that the capacity of response of industry to trade liberalization was much greater than what the heterodox literature admitted.

I would like to come back now to our central theme: the challenge to increase exports to markets outside MERCOSUR or to foster investment projects with output capacities that are larger than the regional demand. Generally, Brazil has failed to do that, except in the primary goods sector and in the agribusiness, where Brazilian exports have increased their share in world imports in the 1990s. This is particularly true if fuels are excluded or if only non-OECD countries (excluding MERCOSUR countries) are considered. This increase in competitiveness, nonetheless, does not offset the very poor performance of Brazilian exports of manufactured goods to countries outside MERCOSUR.

The paper on dairy products confirms this observation, since it is the only one that is optimistic about the capacity of the industry to export to markets outside the region. The paper reports a vigorous process of investment for the modernization and expansion of capacity in the region. All the other papers reveal that MERCOSUR has not been the basis to improve industrial competitiveness, and hence, increase export penetration in other markets. Generally speaking, firms have shown a regional strategy, investing in order to satisfy regional demand, exporting only occasional surpluses. The paper on petrochemicals points out that this reallocation of output towards the regional market has had some positive aspects, since traded output tend to concentrate on higher value-added products, generating larger profits. On the other hand, exports to other markets tend to concentrate on low value commodities.

Although manufacturing industry in Brazil has had success in improving its capacity to compete with foreign goods, through a substantial increase in labour productivity, on average, it has failed to expand output capacity compared with its level in 1989. A considerable part of the capital stock of manufacturing industry has been replaced, as trade liberalization unveiled its obsolescence. Thus, as Argentina's demand for Brazilian manufactured exports rose sharply, as a result of its unilateral trade liberalization, economic expansion and Brazil's margin of preference, Brazilian exports to other markets tended to decelerate in 1992/1993. The rise in Brazil's domestic absorption in 1994/95 combined with the regional demand to further reduce Brazil's capacity to export to other countries.

Moreover, Brazil already accounted for over 20% of Argentina's imports in 1992. In some sectors (at one digit level) this share rose to 35% between 1991 and 1992. Brazil's share in Argentina's imports of chemical products has risen steadily from 13.7% in 1991 to 20.2% in 1995. Only in the capital goods industry, Brazil has not increased its share in Argentina's imports between 1991 and 1995. So, it looks as though Brazil's share in Argentina's imports has come to a sort of top limit. Unless there is an expected change in trade and/or exchange

rate policies, Brazil's exports to Argentina should be expected to expand more or less in line with Argentina's import growth.

This is one of the reasons Brazil should look for gaining access to new markets through regional or multilateral agreements. The paper on the automobile industry reveals this need quite clearly, among other things, to compensate for the expected net importation of auto parts. But the paper was too benevolent with the policies adopted for this industry and rather timid as regards its proposals for the future.

The paper recognizes the redundancy of the incentives and of the tariff and non-tariff barriers of the automotive regime in the 2nd half of the 1990s. But it praises the results achieved, since the regime was able to reduce risk and thus induce investment projects. In point of fact, what Brazil needs are investment projects that take the risk of aiming at the world market (or at least to one of the main regional markets). Plants that produce world models for the world market. So far, in view of the incentive of the automotive regime, we have attracted a large (probably excessive) number of car assemblers whose plants are designed to produce for MERCOSUR's markets.

The paper proposals are rather timid as it suggests to expand the regional market through agreements with Chile, Ecuador and Venezuela. As far as this industry is concerned, I understand Brazil should negotiate with NAFTA countries, with the European Union and even with Asia. A free trade agreement with one of these regions would change completely the nature of the investment projects in Brazil. As in the 1950s, Brazil can increase its bargaining power by opening negotiations with all regions, but contrary to Juscelino Kubitschek's protectionism, the incentive now is a free trade market. It is true, as the authors of the paper on the automobile industry point out, that the domestic structure of this industry will largely depend on the strategy of the leading multinational firms. Nonetheless, this strategy will, in turn, depend strongly on Brazil's integration process with other countries and regions.

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A stylized world map is the background of the cover, rendered in a dark, textured brown color against a lighter, mottled grey and blue background. The map shows the outlines of continents, with a small star marking a location in North America.

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