TRADE, ENVIRONMENT AND DEVELOPMENT: THE BRAZILIAN EXPERIENCE

(Draf Paper)

Luciana Togeiro de Almeida
Mário Ferreira Presser
Stela Luiza de Mattos Ansanelli*

* Luciana Togeiro de Almeida, Department of Economics/UNESP-Araraquara, former President and current member of the Executive Board of ECOECO (ltogeiro@fclar.unesp.br); Mário Ferreira Presser, Institute of Economics/UNICAMP-Campinas (presser@eco.unicamp.br); Stela Luiza de Mattos Ansanelli, PhD candidate, Institute of Economics/UNICAMP-Campinas (stelanas@yahoo.com.br). The authors wish to thank the information provided by the MDIC, especially by Júlio Baena from SECEX, and by INMETRO/CAINT.
TRADE, ENVIRONMENT AND DEVELOPMENT: THE BRAZILIAN EXPERIENCE

Luciana Togeiro de Almeida
Mário Ferreira Presser
Stela Luiza de Mattos Ansanelli

Introduction

The outlook of Brazilian economy, as it emerges from the neoliberal reforms implemented in the last decade, poses a difficult challenge to the sustainable development of the country. This paper argues that there is a need for reconsideration of the conventional methodologies applied to the study of the relationships of mutual causality involving trade, environment and development, giving priority to historical-inductive approaches. Developing this line of thought, the paper begins reviewing studies that addressed the linkages between trade, environment and development in Brazil, focusing on two topics: (a) the sustainability assessment of foreign trade and its relation to trade reforms; (b) environmental requirements and technical barriers faced by Brazilian exports. The analysis of such studies and of the recent performance of Brazilian economy makes it possible, firstly, to identify which areas are still in need of further investigation, and then develop recommendations for policies destined to foster a positive interaction of trade, environment and development. Internally, we recommend to foster stronger linkages between the trade and environmental policies, which can be

* Luciana Togeiro de Almeida, Department of Economics/UNESP-Araraquara, former President and current member of the Executive Board of ECOECO (ltogeiro@fclar.unesp.br); Mário Ferreira Presser, Institute of Economics/UNICAMP-Campinas (presser@eco.unicamp.br); Stela Luiza de Mattos Ansanelli, PhD candidate, Institute of Economics/UNICAMP-Campinas (stelanas@yahoo.com.br). The authors wish to thank the information provided by the MDIC, especially by Júlio Baena from SECEX, and by INMETRO/CAINT.
promoted by inserting the commitment with sustainability in two topics that receive the foremost attention from official trade policies: to build up competitive production chains and to overcome technical barriers to trade. Regarding multilateral trade negotiations, we emphasize the importance of solving the implementation issues of the SPS (Sanitary and Phitosanitary Measures) and the TBT (Technical Barriers to Trade) Agreements promoted by the World Trade Organization (WTO), especially making operational the rights to technical assistance and cooperation that are established by these agreements.

**Economic Liberalization: Challenging the “Scale” Effect**

As from the early 90’s, economic reforms aiming at promoting closer integration of the Brazilian economy into the world economy were implemented during the Fernando Collor de Mello administration (1990-1992) and continued with renewed impulse over the two terms of office of Fernando Henrique Cardoso (1995-2002), especially the first one (1995-1998).

Over the last twelve years, the performance of Brazilian economy very evidently contradicts the dynamic effects announced by the upholders of economic neoliberalism. The *per capita* GDP, after a marked downfall at the beginning of the 1990s, has, in the last few years, presented a meager recovery, returning to values comparable with those of the 1980s (below US$ 3,000). In other words, the *per capita* income in the country has stagnated, back to values equivalent to those of the so-called “lost decade” (see Graph 1).

The stagnation of the economy in this period is further confirmed by the rise and persistence of high unemployment rates, around 8% in the main metropolitan regions in the last five years (see Graph 2).\(^1\)

The social consequences of such a low economic growth in Brazil are still more perverse owing to the persistence of high rates of concentration of income in the

---

\(^1\) These data are based on the methodology employed by IBGE for the calculus of the open unemployment rate until 2002. Employing a new methodology, the open unemployment rate in the major metropolitan regions averages 12% since 2003.
period subsequent to the economic liberalization, as made evident by Graph 3. In 2003, the Gini Index shows an acutely unequal distribution of income, well above the Latin American average.  

Concerning the trade impacts of the economic liberation, the Brazilian case confirms the general trend observed for many developing countries, i.e., that economic liberalization has been unable to promote a more dynamic integration of these countries into the world economy (UNCTAD, 2002).

Brazilian imports outstripped exports between 1992 and 1998, reversing the positive trade balance inherited from the external adjustment carried out in response to the debt crisis in the 80’s (see Graph 4). This trade imbalance was only overcome by the strong depreciation of the exchange rate, after the foreign exchange crisis of early 1999 and, especially, by the upsurge for products of the agribusiness sector by the foreign markets in 2001-2003: in this period, the growth rate of Brazilian exports of commodities was higher than that of semi-manufactured and manufactured goods (see Graph 5).

The low dynamism achieved from the integration of many developing countries into the international markets is confirmed by their meager shares in the world manufacturing value added. Brazil’s share in world exports of manufactures in 1997 was similar to that of 1980 (0.7%); however, its share in world manufacturing value added dropped from 2.9% to 2.7% over the same period (UNCTAD, 2002, p. 81). Throughout the 1990s, there was a strong attraction of foreign direct investment, thus increasing the rate of internationalization of the domestic production, which became increasingly subordinated to the competitive strategies of the global productive chains of transnational companies. In the Brazilian case, such strategies aimed mainly the domestic and regional markets and resulted in a major increase in the imported content of the domestic output. As an aggravating circumstance for the country’s export perform-

---

2 The Gini Index measures income inequality: the closer to zero, the lower the inequality of income distribution, and the closer it is to one, the higher the concentration of income. In 2003, the Gini Index reaches 0.61, well above the average of 0.52 for Latin America in the 1990s. In the same period, the averages for the Organization for European Economic Cooperation, the European East and Asia were much lower: 0.34, 0.33 and 0.41, respectively (Ferranti, 2003).

3 Exceptions to this general trend were observed especially in the economies of Eastern Asia (UNCTAD, 2002).
ance, foreign direct investment was mostly directed to non-tradable goods (including the services sector).

The trade pattern of Brazilian economy underwent no perceptible change after the economic liberalization. Much to the contrary, the pattern has been actually strengthened: exports are still concentrated on manufactured goods and commodities with a low dynamism in the world market. Low dynamism characterizes both the supply side of exports – standardized products intensive on unskilled labor and natural resources – and the demand side – low income and price elasticities for these exports in the world markets.

In short, economic liberalization has not promoted a more dynamic integration of the Brazilian economy into the world economy. The trade performance after the liberalization: (a) has not developed internal dynamic linkages that could contribute towards a virtuous circle leading to convergence of domestic per capita income to that of developed countries; (b) has not led to structural changes in the country’s specialization.

The preceding evidences show that serious concerns with the environmental impacts of trade liberalization associated with the “scale effect” are misplaced. On the other hand, the persistence of the trade pattern explains the negative results obtained from the empirical studies regarding the environmental impacts of the economic liberalization in Brazil, pointing out to the evidence of environmental vulnerability of the Brazilian exports. In fact, what emerges is a very adverse scenario for the outlook of sustainable development in Brazil. From a political economy point of view, the extreme external vulnerability of the Brazilian economy nowadays curtails the policy space for addressing environmental vulnerability, which must give way to the strategic interests of the traditional exporting sectors in charge of balancing Brazilian foreign trade.

---

4 For the impact of recent foreign direct investment into the Brazilian economy, see Lacerda (2004).
5 The usual methodology for analyzing the environmental impacts of trade liberalization divides them into scale, composition and technology effects. According to the scale effect, trade liberalization promotes economic growth, entailing stronger environmental pressures. The composition effect – sometimes called sectoral effect – depends on the relative changes of each sector in the total domestic value added. The technology effect refers to the aggregated changes in the intensity of pollution as a result of the introduction of innovations in each sector. For further details, see Grossman and Krueger (1992).
**Sustainability Assessment of Trade**

On this section, we present a synthesis of the main conclusions reached by empirical studies on sustainability assessment of Brazilian foreign trade. Based on these reviews, some lessons are drawn for guiding new studies and policy recommendations.

Firstly, one must underline the fact that there are not many available studies and for the most relate to the manufacturing sector. Very few of them focuses on the sustainability assessment of agricultural exports in Brazil. One finds case studies on environmental issues of specific sectors, but neither related to trade nor to trade reforms, and some other studies about aggregated and sectoral economic impacts of trade agreements, which do not address environmental issues.

**The manufacturing sector**

The environmental vulnerability of Brazilian exports is a common conclusion drawn by studies focused on the manufacturing sector. Veiga et al (1995), analysing data from the 1975-1993 period, was the first to point out the environmental vulnerability of the Brazilian exports. The reason is that the comparative advantages of the Brazilian economy lie in the intensive use of natural resources and of energy, and that the more dynamic exports sectors are potential large-scale polluters.

In the same sense, Schaper (1999) remarks the increasingly important role played by “environmentally sensitive industries” (with a high pollution potential as well as making intensive use of natural resources) in the total Brazilian exports between 1980 and 1995. Young et al (2002), analysing data from the 1990-1996 period, came...
to the conclusion that the Brazilian industrial output oriented for exports shows a higher polluting potential than that of the industrial output oriented for the domestic market.\textsuperscript{10}

Given that economic liberalization has reinforced the traditional trade pattern of Brazilian economy, whose leading manufacturing sectors are precisely those identified as “environmentally sensitive” (steel-milling, mining, pulp and paper, chemical, petrochemical, etc.), the environmental vulnerability of Brazilian exports stressed by such studies becomes much more understandable.

Thus, although economic liberalization might not have entailed environmental problems related to the scale effect, problems related to the composition effect can be noticed in the Brazilian manufacturing exports.

Concerning the positive environmental impacts associated to the technology effect, the evidence that has been assembled by empirical studies is somewhat contradictory. Young et al (2002) and Ferraz & Seroa da Motta (2002) support the view that the major domestic exporters and transnational corporations adopt a proactive environmental behavior and thus tend to display a better environmental performance than domestic companies producing for the domestic market. They thus converge to the conclusion that economic liberalization might entail a positive contribution to the environment, insofar as it fosters a corporate behavior tuned to environmental protection.\textsuperscript{11}

Almeida (2001) qualifies this thesis, based on a research on the environmental situation of the Brazilian petrochemical industry, with data referring to the year 2000. When testing hypotheses about the profile of corporations with a proactive environmental management, this research has arrived at the following findings:\textsuperscript{12}

- Large companies are the leaders;
- Quality management is a necessary condition, though not by itself sufficient, to further promote environmental management;

\textsuperscript{10} Estimates of manufacturing emissions were based on the database of the World Bank (Industrial Pollution Projection System – IPPS, 1985 as a base year) and of the CETESB (1996 as a base year). \textsuperscript{11} Young et al (2002) and Ferraz e Seroa da Motta (2002) refer to the same database: the Survey of Economic Activity, prepared by the SEADE Foundation for the Great São Paulo, with information referring to the year 1996. \textsuperscript{12} Almeida (2001) conducted a research through interviews with representatives of a sample of companies of the Brazilian petrochemical industry.
• A larger share of exports in total output is not by itself a guarantee of a proac-
tive environmental management. There are companies that have a leading posi-
tion regarding environmental management but export very little or relatively lit-
tle, whereas companies very strongly directed to exports are still in the first stages of environmental management;

• The foreign origin of the capital does not by itself determine the stage of envi-
ronmental management, being the collected evidence very heterogeneous.

Even if we admit that more advanced environmental management can be an indicator of a better environmental performance, the thesis that corporations with a larger insertion into the world markets are those that present a better environmental performance requires empirical evidence to be sought for each branch of the manufacturing sector. Furthermore, empirical studies should preferably be based on data regarding levels of actual and not potential pollution in order to assess the environmental performance of the industry, no doubt a major difficulty in the Brazilian case where an emission database is not available.

Seroa da Motta (2003) also focuses on the manufacturing sector in his ex-
ante analysis of the likely environmental impacts of the FTAA (Free Trade Area of the Americas). He draws the conclusion that the aggregated environmental impacts of the FTAA on the Brazilian economy tend to be fairly modest and more likely to translate in lower air pollution caused by particles and SO2 and reduced use of energy, on one hand, and in higher water pollution and increased emission of CO2, on the other.

Within the framework of the wide-range trade liberalization which is assumed to be promoted by signing the FTAA, the sugar, iron and steel, footwear and leather, and vegetal products processing industries dominate the potential increases in the levels of emission and use of natural resources. Being sectors primarily directed to

---

13 Seroa da Motta’s estimates of industrial environmental impacts of the FTAA are based on a study that makes use of a stationary model of computable general equilibrium – CGE – to simulate the impacts of the FTAA both on the macroeconomic level and on each sector of the Brazilian economy, considering 1998 as the base year. The limitations of such a model are well known, including the extensive use of unrealistic assumptions (perfect competition, given prices and exchange rates, perfect knowledge of market access conditions being negotiated etc.). Since the acknowledgement of such limitations requires a specific training in economic theory, the results of CGE models are usually misinterpreted by policy makers and by the general public, being regarded as forecasts for changes in the economy after the im-
exports, it is supposed that they already have a better environmental performance, as compared to sectors producing for the domestic market. According to Seroa da Motta (2003), it follows that there is no big reason to worry about the environmental impacts of the FTAA related to the manufacturing sector in Brazil, since they tend to be very small, and might, in fact, entail positive effects.\textsuperscript{14}

**The Agribusiness Sector**

Brazil’s position as a very competitive exporter of agricultural products represents a high potential of negative environmental impacts associated to the increasing production of export commodities (especially soy, meat, coffee and sugar – see Graph 6). The growth rate of these exports has been outstripping the rate for manufactured goods in the last three years (see Graph 5). This trend is reflected, for example, on the domestic consumption of pesticides and fertilizers. According to data from the IBGE (2002), the quantity of fertilizers sold per unit of cultivated land grew 85.5\% between 1992-2000 and the use of pesticides increased 21.6\% between 1997-2000.\textsuperscript{15}

A specially relevant study was prepared by the World Wide Fund for Nature (WWF) focusing on the environmental impacts of the growing Brazilian exports of soy (Muller et al 2003). It provides a thorough survey of the economic, social and environmental dimensions of the productive chain of soy in Brazil, aiming at proposing alternative international and national policies. The environmental concerns are motivated by the reasons summarized below, which are analyzed in greater detail in Muller et al (2003).

\textsuperscript{14} According to Seroa da Motta (2003), regarding the industrial environmental impacts of the FTAA, Brazilian environmental policy makers should pay more attention to: (a) water pollution, recommending the application of taxes levied on the use of water resources; (b) the sectors which process vegetal products (cocoa, rice, tobacco, fruits, etc.), since these are less concentrated sectors, very diversified in terms of production and location, and for which no common R&D efforts can be found among producers, factors which render difficult any significant improvement in their environmental performance.

\textsuperscript{15} The intensive use of pesticides and fertilizers may entail wide-ranging and varied environmental impacts, e.g. erosion and acidification of the soil, eutrophication of rivers and lakes (excess of nutrients in water bodies, especially nitrogen and phosphorus, occasioning an excessive growth of aquatic plants such as algae), contamination of water reservoirs, deforestation, threat to biodiversity, risks to the health of the population (consumers and rural workers) etc. IBGE (2002) contains data on the quantity of fertilizers and pesticides sold per unit of cultivated area, as well as indicators of arable land and deforestation.
Firstly, the consequences of the growing scale and the increasing productivity in the production of soy are shown. Between 1995-1996 and 2001-2002, the Brazilian output of soy increased from about 23 millions of tons to 40 millions of tons, and the cultivated land expanded at a lesser pace from 11 to 16 million hectares. On one hand, the growing production entails a positive economic impact: it generates and aggregates value in the productive chain and asserts itself as the main export crop of the Brazilian agribusiness (see Graph 6), although facing falling unit export prices (see Graph 7). On the other hand, the nature of such increased production must be examined to accurately determine any potential negative environmental and social impacts.

The expansion of the soy production frontier towards an ecologically sensitive area, with risks for the fauna and the flora - the Cerrado, in the Mid-Western Region - is another reason for concern. The soy production in the Cerrado has to a large extent been conducted in high-risk areas. Furthermore, the environmental concern is not only related to the problem of deforestation: the soy production entails intensive use of machinery and additives (fertilizers and pesticides), with potentially negative consequences for the soil and the water, even in already deforested areas.

Similarly, the so-called “soy export corridors”, large projects of physical infrastructure for grain transportation being implemented to connect the crop areas in the Mid-Western region to the processing regions, located closer to the large urban centers, and to the ports, are also a matter of concern. As the transportation infrastructure is being set up in such regions, it fosters the expansion of soy production towards the North, penetrating the areas of even higher environmental sensitivity of the Amazonian region.

Especially relevant nowadays is the debate on the liberalization, however provisional, of the cultivation of transgenic soy in Brazil.\textsuperscript{16} Over and above the controversial risk assessments to the environment and to human health, the major argument

\textsuperscript{16} At the very beginning of his term of office, in March 2003, the Luis Inacio Lula da Silva administration issued a provisional measure to provide legal coverage for harvesting transgenic soy. It claimed it had inherited \textit{a de facto} situation from the preceding administration and that this course of action was adopted to avoid imposing harsh losses on rural producers. In September 2003, a new provisional measure was approved, regulating the cultivation and marketing of transgenic soybeans for the 2003-2004 harvest, restricting it to the use of seeds retained from the preceding crop by the farmers. This measure
against the production of transgenic soy in Brazil is the risk of losing international market share in soy exports as a result of an increased consumer sensitivity regarding food safety, especially if one takes into consideration that the leading market for the Brazilian exports is the European Union, where such higher sensitivity is especially evident.

An important aspect stressed by Muller et al (2003) is the need to strike an adequate balance between the liberalization of the market and the implementation of appropriate regulations and domestic institutions. Market access negotiations must be matched with the design of environmental policies and the bolstering of institutional capacities that will ensure the conditions of sustainability for the expansion of soy production, such as the agro-ecological zoning of the production and the environmental control of the process of production. The growing soy production has so far taken place without the benefit of any strengthening of domestic environmental policies and institutions. Concerning market access, tariff escalation policies on processed products in importing countries favour the export of Brazilian raw-materials, rather than meal and oil of soy, resulting in lower value added and higher potential environmental impacts. Thus, fighting against policies that establish higher levels of protection for products of higher value added (tariff escalation) in the Doha Round, might result in economic and environmental gains.

The productive chain approach taken by Muller et al (2003) favours a more precise sector diagnosis, closely identifying problems and actors involved, exploiting environmental issues related to the trade dynamics and to the strategic decisions of the corporations, including the foreign firms, in the relevant sector. This approach is very close to the one advocated by FAO to ensuring that the food we eat is free from food-borne hazards - everything from pesticides and industrial chemicals, through to unwanted bacteria and contaminants - the "Food Chain Approach". Both contributions can be taken as an analytical reference for further sustainability assessment studies of the agribusiness sector, integrating the production of agricultural commodities and their proc-

_________

compels producers cultivating transgenic soy to sign a statement of commitment, liability and course of action.

17 The key is to strengthen each and every link in the complex process of food reaching the consumer - from the way it is grown or raised, to how it is collected, processed, packaged, sold and consumed. The system was discussed during a week-long high-level Committee on Agriculture meeting (31 March - 4 April 2003). See COAG/2003/5 in www.fao.org.
essing by the manufacturing sector, with the advantage of adopting an approach (pro-
ductive chain) which is also privileged by the trade policy makers, both at the Ministry
of Agriculture (MAPA) and the Ministry of Development, Industry and Trade (MDIC).
In principle, studies adopting this approach can promote a renewed dialogue between
the interests defended and the issues addressed by the Ministry of Environment and
those supported by the MAPA and the MDIC, much more than balancing the results of
aggregated studies, specially those based on CGE models.

Moreover, if the aim is to integrate environmental and trade policies and in
consequence to influence the positions defended by the Brazilian diplomacy on trade
negotiations, the theme of technical barriers to trade and their interfaces with environ-
mental issues requires special attention, as shown in the following section.

Environmental Requirements and Technical Barriers to Brazilian Exports

Technical standards and regulations (including sanitary and phytosanitary measures)
are becoming one of the most controversial issues of international trade, an issue that is
being dealt with under the label “implementation” of the SPS and TBT Agreements in
the Doha Round. In this Round, the developed countries aim to achieve a “balance”
between affording developing countries a better access to their markets and setting up
new rules which will regulate such access, and which include stricter disciplines under
the SPS and the TBT agreements. The debate on this matter is more heated in the nego-
tiations on the liberalization of agriculture, in which the European Union defends the
establishment of rules that reflect national preferences in issues such as environmental
protection and food safety. The United States tends to associate environmental issues
to “fair trade”, a principle normally evoked when highly competitive products from
developing countries penetrate the US market.

The growing importance of environmental requirements and technical barriers to inter-
national trade stands in contrast to the sparse treatment this subject has received in stud-

18 For the position of the European Union, see the testimony of its Trade Comissioner, Pascal Lamy, in
the European Parliament, on September 24, 2003, Résumé de la réunion de l’Organisation Mondiale du
Commerce (Cancun, 10/14 septembre 2003), in
ies applied to Brazilian trade. In this sense, based on a review of the main domestic and of certain international studies, this section seeks to identify the major technical barriers to international trade which arise from environmental requirements, in order to set up a diagnosis and to consider the possible alternatives to overcome such obstacles in an environmentally sustainable fashion in Brazil. It is our intent to echo the discussions on technical barriers into the environmental policy making areas in Brazil, so as to provoke a reaction in the opposite direction, viz., to echo environmental concerns into foreign trade policy and commercial diplomacy areas, within which the theme of technical barriers has hitherto been confined.19

The growing importance of environmental requirements in international trade

As a consequence of the significant trade liberalization achieved under the Uruguay Round, specially in tariff barriers, the trade policies of developed countries have been growingly resorting to the use of non-tariff barriers. Among these, a prominent position is held by technical requirements – including sanitary and phytosanitary measures – which have been increasingly employed, sometimes in a discretionary fashion, against developing countries.

Technical requirements almost always reflect legitimate purposes, but, in certain instances, they may be used to favor domestic producers. Generally speaking, protectionist intents manifest themselves in requirements for adopting innovations, in the widest sense of the term, which developing countries find difficult to internalize and which generally result in higher production costs. The growing importance of these requirements as a protectionist tool had already lead to a plurilateral agreement, the 1979 "Standards Code" negotiated in the Tokyo Round, though the Code was limited to those countries which ratified it. The issue was more thoroughly addressed in the two multilateral agreements (the TBT and the SPS) negotiated in the Uruguay Round, aim-

19 This was the approach also privileged by the “Technical Standards and Regulations for Sustainable Development” Project, under the overall coordination of Tom Rotherham (International Institute for Sustainable Development – IISD, Canada). Local coordination in South America was conducted by Recursos e Investigación para el Desarrollo Sustentable (RIDES, Chile) and Luciana Togeiro de Almeida was the Brazilian adviser.
ing at averting the use of such requirements for protectionist purposes, as a substitute for tariff barriers.\textsuperscript{20}

Technical requirements include standards, technical regulations and procedures for conformity assessment, which, according to INMETRO,\textsuperscript{21} are defined as:

- Technical standard: a document approved by an accredited institution, which provides, for common and repetitive use, rules, guidelines or features to be adhered to by products or related processes and production methods, conformity to which is voluntary. It may also contain recommendations for the use of terminology, symbols, packaging, marking or labeling applied to a given product, process or production method, or deal solely with such matters.

- Technical regulation: a document approved by government bodies, which define the features of a product or related processes and production methods, including relevant administrative provisions, conformity to which is mandatory. It may also contain instructions for the use of terminology, symbols, packaging, marking or labeling applied to a given product, process or production method, or deal solely with such matters.

- Conformity assessment: any procedure directly or indirectly used to determine that the relevant instructions of a technical standard or a technical regulation are applied. The procedures for conformity assessment include but are not limited to sampling, testing and inspection; evaluation, certification and conformity assurance; registration, accreditation\textsuperscript{22} and approval, either separately or in various combinations.

Each of these requirements implies different consequences to foreign trade: if a product does not comply with a specific technical regulation established by the importing country, its commercialization is forbidden in the country; if a product does not

\textsuperscript{20} According to the SPS and TBT Agreements, legitimate goals can be used as justification for implementing trade protection mechanisms in the face of threats to national and human security, to human, animal and vegetal health, and to the environment. For a definition of legitimate goals under these agreements, see section 2.2 of the TBT and section 2.1 of the SPS.

\textsuperscript{21} INMETRO - the Brazilian Institute of Metrology, Standardization and Industrial Quality - is the Focal Point of technical barriers in Brazil, being a federal agency linked to the Ministry of Development, Industry and Trade. See www.inmetro.gov.br.
comply with a technical standard determined by the importing market, this fact does not prevent the product from being commercialized in the country, but it may be detrimental to its local market share. These situations characterize, respectively, the market access and market entry conditions. Market access conditions are determined by “the legal and administrative conditions imposed by the importing countries under internationally agreed trade rules”, whereas the ability to enter a market is “a function both of the competitiveness of the exporter (determined by the relative cost and quality of the product, including environmental/health aspects), and of the characteristics of supply chains and the structure of markets”. Market access conditions are under the WTO rules, whereas the market entry conditions are not; both, however, are decisive for a better export performance (UNCTAD, 2003, p. 2).

According to the stricter WTO definition, technical barriers are either technical requirements used in a non-transparent way or which do not abide by internationally accepted standards; or procedures for conformity assessment which are not transparent or too expensive; or also exceedingly rigorous inspections. In short, the WTO defines as technical barriers requirements that determine market access conditions. The INMETRO adopts a broader definition of technical barriers: these are all requirements related to the technical characteristics of goods and services or to their process of production which are established by the importing country, and which affect market access and market entry, by rendering such access and entry difficult, onerous or outright impossible.

As for the actual use made of the SPS and TBT Agreements, the consumers’ concerns in developed countries with food safety and the environment have considerably increased over the last years, a fact evidenced by the frequent updates of

---

22 Accreditation is the procedure whereby an authorized entity formally acknowledges that a given institution or natural person is entitled to certify conformity assessment procedures.

23 This concern with healthier and safer food is reflected in the international meetings of the Codex Alimentarius Committee, which is charged with defining scientifically-based standards to regulate the production and international trade of foodstuffs, ensuring, at the same time consumer safety and fair trade practices on the international food market. The strategic vision of the CAC is to attain the greatest possible protection for consumers, including food safety and quality. The standards approved by the CAC are not necessarily adopted by the member countries. This circumstance results in international standards which are stricter than domestic regulations adopted in many developing countries. Several analysts point out that the adoption of new measures generally contains a bias favorable to the interest of the industry of developed countries (Charnovitz, 2002).
food safety and quality standards, codes of rules and practices of the \textit{Codex Alimentarius} (Prasidh, 1999). In this context, two positions have appeared in international negotiations, frequently mixed up in the debates concerning market access: the first one, upheld especially by the European Union and other developed countries, is that increasing market access must be dependent upon rules that establish minimum standards for products and production processes; the second, upheld by non-governmental organizations (NGOs), is that the process of international harmonization of these requirements has a huge potential for promoting exports from developing countries and sustainable development in the context of globalization.

A recent study by the International Trade Center (ITC) proves that the majority of foreign trade involves goods that may be potentially affected by environmentally-related trade barriers, based on the number of measures notified to the WTO for the protection of the environment, wildlife, human, animal and vegetal health, as well as human safety (Fontagé, Von Kirchbach and Minoumi, 2001). Out of the 5,000 different products traded in 1999, over \(\frac{3}{4}\) have had at least one environmentally-related barrier notified to the WTO, by at least one importing country. For around 2,000 products, such barriers are fairly widespread, having been notified by at least five different countries. However, only 14\% of the value of foreign trade in 1999 overcomed these barriers. This fact – the high number of measures directed to certain products, but whose impact seems to be somewhat limited in the global trade flows – allows the authors to raise the hypothesis that, in practice, these barriers restrict the international trade for the products that they call “sensitive” to environmentally-related barriers, mainly those of the agricultural and food chains. To denounce such a barrier and start a trade dispute with the country that established such regulation is a process involving considerable time and resources, whence the typical attitude of exporters in developing countries, who try to avoid these barriers by abandoning the markets that impose them and going after other importing markets with more favorable access conditions.

In the case of developing countries, the situation brought about by the existence of a growing number of environmentally-related barriers is more complex and demands more attention, since, in the absence of a certain degree of institutional infrastructure, such countries cannot benefit from the rules established by the SPS and TBT
Agreements. This fact is once more confirmed by Rotherham (2003), in his comprehensive analysis of the experience of developing countries in implementing technical regulations and standards intended to protect the environment, wildlife, human, animal and vegetal health and human safety, with emphasis on the TBT. According to Rotherham, without some basic institutional structures in the fields of standardization, conformity assessment and accreditation, developing countries cannot benefit from the provisions of agreements and technical standards and regulations can restrict the exports of developing countries. The author draws the conclusion that the growing number of technical standards and regulations for the protection of the environment, health and safety raises barriers to trade in the three areas which concern the “institutions of quality” (standardization, conformity assessment and accreditation), and the very real problems faced by developing countries in these areas actually restrict their access to the markets of developed countries, irrespective of their being used for legitimate or protectionist purposes.

Rotherham (2003) holds the opinion that developing countries should use more intensely the provisions of technical assistance in their favor, contained in the TBT and SPS Agreements, in order to realize the necessary investments in the “institutions of quality”. International agencies responsible for technical assistance, and which compose the Integrated Framework for Trade-Related Technical Assistance, also admit that the expanding use of technical barriers has become one of the critical matters that regulate access of exports from developing countries to the markets of developed countries.24

**The incidence of environmental requirements on Brazilian exports**

The environmental requirements (taken in their broader meaning, according to the ITC methodology) that apply to Brazilian exports under certain circumstances constitute technical barriers (also in their broader sense, as defined by the INMETRO), e.g.: the complexity of the regulatory system of the main destination markets; the excessive strictness of standards and regulations in these markets in relation to international standards; the delay in the processes of certification; and the specific labeling requirements.
Brazil, as a major exporter of commodities, especially those of the agri-business, is particularly affected by the incidence of technical barriers based on environmental requirements affecting the exportation of primary products (mainly fruits, vegetals, livestock and meat, fish, tropical woods and organic products).

Such technical barriers can be observed in the main destination markets of Brazilian exports. Table 1 presents a compilation of some environmentally-related technical barriers imposed on Brazilian exports of specific products by the United States, the European Union and Japan.

The United States has a complex regulatory system, with many standards and regulations at the three levels of government (federal, state and local). Lack of transparency in establishing the appropriated requirements, delays in the process of conformity assessment and small use of international standards and regulations are frequent complaints made by Brazilian exporters. The main food safety requirement for certain products consumed in the United States (tinned food of low acidity, fish products, juices and miscellaneous meat products) is the implementation of Hazard Analysis and Critical Control Point System – HACCP, which might be quite onerous. The requirements of the HACCP (hazard analysis, identification of critical control points in the productive chain, establishment of measures, corrective actions, certification and maintenance of records) are imposed on the exports of meat and fish from Brazil (verified by the importer or by the exporter). Other barriers include a certain inconsistency between American and international labeling requisites, as well as the new Bioterrorism Act, which tends to become an important potential barrier to Brazilian exports, owing to restrictive standards applied to the exportation of products related to agribusiness, especially food.²⁵

Under the Doha Round negotiations, the European Union attempts to extend the right to establish rules that reflect national and regional preferences in matters such as the environment and food safety. There is a wide range of regional and national

²⁴ See www.integratedframework.org/
²⁵ The Bioterrorism Act contains five articles, which, in turn, are made up of sections. Article III, Protecting Safety and Security of Food and Drug Supplies, deals with the rules for controlling imports of food and beverages to the US, the implementation of which is conducted by the Food and Drug Administration (FDA). The provisions are further discussed in ITAL: www.ital.org.br/CETEA/web_bioterrorismo/lei_bioterrorismo.html.
environmental legislation, a circumstance which explain EU’s insistence that the WTO should provide ample legal coverage for the precautionary principle and for the product’s lifecycle approach, privileged by the regional regulations in this matter. Its sanitary and phitosanitary requirements are also considered to be very strict, controlling or forbidding the importation of certain livestock, meats and vegetables, and entailing a greater delay in the processes of certification and testing for approval of exports, owing to the lack of uniformity among members. A relevant issue is the Common Program for Environmental Labeling, which establishes trade barriers by influencing the behavior of the consumer and by defining requirements for labeling and for the collection of recyclables according to specific standards.26

In Japan, besides the more general tendencies identified in the United States and the European Union, there is a strict sanitary and phitosanitary legislation (especially for fruit imports) and an onerous system for the certification of organic products.

**Lessons and recommendations from the studies on technical barriers to Brazilian exports**

The available studies on technical barriers to Brazilian exports usually focus on market access and market entry concerns, and bypass concerns about the environmental sustainability of exports. This is due to the fact that they have for the most been conducted by institutions related to trade promotion.27

These studies point to internal and external causes for the problems posed by technical barriers to Brazilian exports. Among the internal causes, the following should be particularly noted:

- Lack of information on the part of the Brazilian firms concerning technical barriers and international legislation (especially by small and medium-size enterprises);

---

26 Out of the 44 environmental barriers detected over the last decade in a study conducted for APEC, 34 were set up by the European Union (OXLEY et al, 2003).
• Lack of capacity (poor internal development of the standards system, lack of homologation of Brazilian laboratories, poor internal conformity assessment systems and reduced interaction with international standardization bodies) to win the confidence of trade partners in developed countries;
• Lack of technical support by government institutions;
• Low level of the domestic demand for international standards and regulations, causing a general lack of conformity with international requirements;
• The Brazilian Focal Points of the TBT (INMETRO) and SPS (SDA – Secretary for Agriculture and Livestock of the MAPA) lack a more integrated approach: the INMETRO is more proactive, but is still lacking in technical capacity (e.g., absence of chemistry and materials laboratories which could ensure progress in new areas of metrology, such as chemistry and biology), and only recently has begun to take a more active part in international negotiations; the SDA, in turn, adopts a more reactive approach, and faces technical, material and institutional insufficiencies in relation to the vast number of private and public actors involved, given the importance of agricultural exports for Brazil. A major source of concern is the lack of integration among official institutions in different levels of the government, since their actions are to a large extent decentralized.

As from 2002, the INMETRO has made many additional services available to exporters. The INMETRO holds technical and institutional capacity in the field of technical standards and regulations that is beginning to gain international recognition. It supervises the Brazilian Program for Conformity Assessment, which covers 55 products, processes or services liable for certification, which were defined after ample discussion with many stakeholders, based on three criteria: impact on health, safety and the environment, impact on the trade balance and strengthening of the domestic market. The aim of this certification is to improve the competitiveness of Brazilian products, enabling them to gain access to new markets. Within the scope of the TBT, Brazil has forwarded a number of notifications to the WTO - 349 in the period 1995-2001- that is fairly significant for a developing country, a clear indication of its intention to play a more active role in the process of international standardization.
According to the SDA, the institution has already the capacity to respond immediately to the demands of exporters when they face technical barriers. In fact, Brazil is considered to be very active in forwarding specific trade concerns to the SPS Committee (Barros et al, 2002). As all major agricultural exporters, Brazil also participates in the process of international sanitary standardization through notifications forwarded to the SPS Committee of the WTO. However, out of the 1248 notifications forwarded by members of the Western Hemisphere between 1995 and 2001, Brazil was responsible for no more than 43, a relatively small number, which puts the country in the seventh position in the process of international standardization in the Western Hemisphere (Barros et al, 2002).

Regarding internal adequacy to international sanitary standardization, hazard analyses are performed on imports, and exporters have to strive for conformity. The international standards of the Codex Alimentarius are rarely internalized in the domestic food production, hampering the increase of food exports. It is recognized that the absence of certain best practices on the part of the producers – the registration of pesticides used in the agricultural production, for example – hampers exports. To overcome the lack of best practices in production and commercialization methods, the SDA has been also adopting a more proactive and systemic productive focus within its field of action, organizing markets according to productive chains, as much to prevent risks as to promote corrective actions and more intensive inspection. For example, the integrated system of fruit production (PIF) is being implemented in the production of apples and other fruits, in certain areas of the Northeastern region (Petrolina and Juazeiro). However, the pioneering PIF experience with strawberries, in São Paulo, failed to reach the desired certification, showing the difficulties in implementing this approach even in the areas with a higher average income in the country.

Abroad, the main difficulties identified for overcoming technical barriers to Brazilian exports are:

- Escalation of standards (as soon as the Brazilian exporters comply with certain requirements, others are posed);

---

28 As an example of the SDA’s response efficiency, it is asserted that the Chinese and Russian markets were opened thanks to successful negotiations conducted by the Brazilian sanitary authorities.
• Virtual market reserve for domestic services of conformity assessment in the importing developed countries;
• High costs of the national participation in the international process of standardization and of the adequacy to foreign certification and testing procedures;
• Technical requirements which are not always scientifically justified by the importing countries (firms in developing countries are, almost always, standard-takers);
• Slow adoption of “technical equivalence” by importers when there is no international standardization;\(^{29}\)
• Lack of significant progress, up to this moment, in the WTO, to solve problems regarding the implementation of the TBT and SPS agreements;
• Potential threats posed by new restrictions associated to negotiations conducted in related fields, such as Agriculture, Services and TRIPS, and concerning the relationship between the rules of the WTO and of Multilateral Environmental Agreements in the context of the Doha Round.

The recommendations suggested by these studies emphasize certain priorities: a more thorough understanding of the SPS and TBT Agreements; the setting up of an internal information system capable of identifying barriers; a continuous effort to achieve consistency with international standards; the build up of an internationally accepted system of conformity assessment; to fully participate in the international standardization bodies; to require Technical Assistance and Cooperation as prescribed by the SPS and TBT Agreements; to improve capacity in specific areas (health, environmental and safety issues); and to incentive a more proactive presence of exporters in the protection of their interests.

To achieve these goals, both governmental support and greater cooperation among the different levels of government are needed, as well as the provision of technical and financial assistance from developed countries (cooperation programs with standardization and conformity assessment entities as well as a more intense transfer of

\(^{29}\) “Technical equivalence” should be acknowledged when the measures adopted endure a degree of safety deemed to be adequate, even if they differ in methods and procedures. This enables countries to adopt different procedures, provided the equivalence in results is ensured.
technology), besides developing closer regional cooperation within the Mercosul aiming at harmonizing technical and sanitary regulations.

According to an informal inquiry addressed to SECEX,\textsuperscript{30} very rarely do importers complain about environmental barriers in their sales to foreign countries. The timber sector is recognized as one of the leading complainers, because of the growing demand of certifications for tropical timber. The general appraisal made by SECEX is that major Brazilian exporters have enough capacity to comply with international standards and benefit from such compliance (more demanding standards entail higher competitiveness, a typical win-win solution). Nevertheless, a few issues are still far from achieving consensus: how to conduct the harmonization of environmental issues between developing and developed countries and how to harmonize the WTO regulations and multilateral environmental agreements. Lack of consensus in these matters generates insecurity regarding potential new environmental restrictions to Brazilian exports.

The occurrence of serious sanitary crises in important meat and poultry producer markets (“mad cow” in the US and “chicken flu” in Asia) has generated increased concern on the formulation and speedy implementation of an adequate sanitary policy in Brazil. In the case of meat exports, the small market share hold by Brazilian meat in the Japanese, US and Mexican markets has become an obstacle to a faster increase of exports. It results from the existence of sanitary barriers that, for many years, have obstructed the entry of Brazilian meat into such markets, which adopt a common external policy for importing meat.\textsuperscript{31} Domestic specialists often remark that Brazil has yet much to invest in sanitary defense so as to ensure adequate prevention of other dangers and diseases and suggest the creation of an extensive domestic regulation capable of averting the mistrust of the international consumer.

In these studies it is therefore possible to identify Brazil’s shortcomings in avoiding technical capacities and its delay in adopting wide-ranging international stan-

\textsuperscript{30} The Secretary of Foreign Trade (SECEX) of the Ministry of Development, Industry and Foreign Trade (MDIC) is the body charged with providing support to Brazilian exporters subjected to trade defense investigations abroad. The replies sent by SECEX on issues concerning technical barriers and environmental matters have, as a rule, been provided by Júlio Cesar Baena (foreign trade analyst of the International Negotiations Division).

\textsuperscript{31}
dards and regulations, as well as the lack of external support. Particular emphasis is placed on the fact that substantial improvements require strong governmental support, as well as the *bona fide* cooperation of developed countries, while, at the same time, identifying major obstacles to the realization of both aims. The severe fiscal constraint prevailing in the country in the last years is an obstacle to public investments needed for implementing an adequate quality assurance policy. As for international cooperation, it should be noted that a greater technical assistance to developing countries is provided under sections 3.6 and 5.4 of the Decision on Implementation approved in Doha, but is restricted to the least developed countries. Another important matter is the demand made by certain developing countries with the support of the UNCTAD, to obtain international cooperation for the removal of “restrictions on the supply side” which inhibit export diversification and the retaining of an increased value added of their exports. An argument in favor of this modality of international cooperation is the evidence that any market rewards (better prices) obtained by products conforming to voluntary quality requirements are usually appropriated by wholesalers in the importing country and exporters rarely benefit from them (Jha, 2002).

Finally, with respect to the environmental issues and their relation to trade policies, very little is actually suggested in the existing studies. The need to work on this interface is stressed by Rotherham (2003), who emphasizes that developing countries face serious problems arising from the environmentally-related barriers erected by developed countries. To overcome them, the institutional structure to establish technical standards and regulations (such as environmental measures or standards for organic agriculture) cannot remain disconnected from the public and private institutions charged with promoting foreign trade. The solutions that, at the same time, raise international competitiveness and yield benefits to the environment in sectors sensitive to environmentally-related barriers depend on national efforts to increase coordination and

---

31 Brazil faces obstacles in its meat exports to these countries since it is still considered as a producer which has not controlled the mouth-and-foot disease; despite the fact that Brazilian cattle is vaccinated against the disease, foreign regulators demand a strict evaluation of the disease risk.

32 The technical assistance provided for the implementation of the TBT and SPS Agreements has been until now exceedingly limited, around US$ 185 million in 2001-2002 (WTO/OECD, 2003).
coherence among the many domestic actors affected by the regulations contained in the
SPS and TBT Agreements.

**Final Remarks and Policy Recommendations**

There still is much to be done regarding empirical studies dealing with the
relationship between trade, environment and development in Brazil. Studies focused on
the manufacturing sector, even though more numerous, have the disadvantage of being
based on potential and not actual emissions level, once emissions database are not
available in Brazil.

The small number of studies concerning the agricultural sector contrasts
with the high environmental potential impact of the agribusiness, so much so in face of
the clear reinforcement of the exporting pattern of Brazilian economy highly dependent
on the agribusiness exports, deem crucial for attaining the equilibrium of the current
account since 1999.

This paper suggests to stimulate sectoral studies that may allow, by means
of field research, to identify the environmental performance of firms as well as their
strategic behavior regarding environmental matters. Especially, studies that employ the
approach of the productive chain allow a better specification of environmental ques-
tions and to identify the relevant actors involved in each stage of the chain. Once this
approach is also privileged by the trade policy makers, studies based on such approach
may foster a positive dialogue at the intra-governmental level, i.e., between trade pol-
icy makers and environmental policy makers. Given the regulatory intensity of envi-
ronmental matters and the range of sectors involved, proper co-ordination and informa-
tion across agencies and government levels is critical to attain national objectives.

The problems identified in studies on environmental technical barriers to
Brazilian exports render explicit the difficulties faced by developing countries posed by
the trend of escalation of standards, regulations and other requirements demanded by
the final consumer market that are actually more suited to developed countries and their
firms. The ecological efficacy and, especially, the economical efficiency of environ-
mental standards or regulations tend to be different in developed and developing coun-
tries. In the latter, knowledge, infrastructure and financing are lacking to meet the requirements of developed countries, a problem that particularly affects small and medium-size companies.

The Brazilian experience shows that the issue of technical barriers further supports the thesis of the environmental vulnerability of Brazilian exports, especially those of the agribusiness. In spite of strong evidence in favour of the growing importance of technical barriers environmentally-related, this still is an issue restricted to discussions on trade promotion policies in Brazil, including trade diplomacy. The participation of the environmental stakeholders in these discussions may result in economic and environmental gains: to argue, when this is the case, against illegitimate and unjustified technical barriers; to contribute for building domestic capacity to comply with legitimate environmental requirements, making use, among others, of the rights to technical assistance and cooperation that are established by the SPS and TBT Agreements; finally, to refuse political support to exporting efforts conflicting with sustainability commitments.

An important point that should be emphasized is the need for adequacy between market liberalization and the implementation of appropriate domestic environmental regulations and institutions. Negotiations on market access must be balanced with enacting domestic environmental policies and strengthening institutional capacities that ensure sustainability conditions for the expansion of domestic production.
<table>
<thead>
<tr>
<th>Destination Market</th>
<th>Product</th>
<th>Nature of the barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Shrimp</td>
<td>Losses imposed to shrimp exports arising from the demand for domestic legislation consistent with US regulations; requirement of turtle escape devices (TED) to be used by shrimp fishing vessels and specification thereof in the Brazilian certification.</td>
</tr>
<tr>
<td></td>
<td>Gasoline</td>
<td>Losses imposed on gasoline exports, by discrimination on the basis of calculation for foreign producers, with arguments claiming control of pollutant emissions.</td>
</tr>
<tr>
<td></td>
<td>Tropical Woods</td>
<td>Restrictions to exports of tropical woods posed by sub-federal legislations demanding certification for governmental procurement.</td>
</tr>
<tr>
<td></td>
<td>Fruit</td>
<td>Prohibition of imports for phitosanitary reasons (papaya and melon, citric fruits, figs, avocado, persimmon, passionflower and carambola); prior license and specific treatment for entry (pineapple, watercress, garlic, apple, yam, grape, mango-fruit, etc.); delay in the processes of certification (five years for approving the importation of papaya); inconsistency with international regulations.</td>
</tr>
<tr>
<td></td>
<td>Meat</td>
<td>Problems with certification and strict sanitary controls, as well as demanding from exporters practices equivalent to US practices (bovine); prohibition of imports and demand that the Brazilian inspection system issue certifications in a form equivalent to the US system before submittal to the regulatory procedures (chicken).</td>
</tr>
<tr>
<td></td>
<td>Organic Products</td>
<td>Expenses and delays in label certification procedures conforming to US legislation.</td>
</tr>
<tr>
<td>European Union</td>
<td>Livestock and Meats</td>
<td>Prohibition of imports, stringent requirements, which differ from the internationally accepted requirements, and sluggish procedure of certification due to mouth-and-foot disease, “mad cow” and biological residues.</td>
</tr>
<tr>
<td></td>
<td>Fruits and Vegetables</td>
<td>Requirements related to residue levels and disease control stricter than international practice, and stringent certification requirements.</td>
</tr>
<tr>
<td></td>
<td>Organic and Biological Products</td>
<td>Product certification and acknowledgment of certification agencies according to the strict require-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>**Processed Food-</td>
<td>Requirement of labels for</td>
<td>identifying biotechnological ingredients.</td>
</tr>
<tr>
<td>stuffs</td>
<td>identifying biotechnological</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ingredients.</td>
<td></td>
</tr>
<tr>
<td>**Chemical Products</td>
<td>Potential barriers stemming</td>
<td>from the implementation of the Precaution Principle for</td>
</tr>
<tr>
<td></td>
<td>for substances which might</td>
<td>damages to health and to the environment, even in</td>
</tr>
<tr>
<td></td>
<td>cause damages to health and</td>
<td>the absence of scientific evidence of such hazards.</td>
</tr>
<tr>
<td></td>
<td>to the environment, even in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the absence of scientific</td>
<td></td>
</tr>
<tr>
<td></td>
<td>evidence of such hazards.</td>
<td></td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td>Vehicles</td>
<td>Specific requirements for noise tests, inconsistent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with international practice.</td>
</tr>
<tr>
<td></td>
<td>Biotechnology</td>
<td>Labeling of products processed or semi-processed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with biotechnology.</td>
</tr>
<tr>
<td></td>
<td>Food Supplements</td>
<td>Requirements concerning the enforcement of rules and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>regulations to food supplements treated as drugs.</td>
</tr>
<tr>
<td></td>
<td>Processed Food-stuffs</td>
<td>Greater restrictions than common international</td>
</tr>
<tr>
<td></td>
<td></td>
<td>practice.</td>
</tr>
<tr>
<td></td>
<td>Fruits and Vegetables</td>
<td>Strict requirements: problems with the quarantine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>system; poor transparency in the required treatments;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>delays in conformity evaluation processes, detrimental</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to the quality of the products; prohibition of imports</td>
</tr>
<tr>
<td></td>
<td></td>
<td>of items which could introduce pests in the country.</td>
</tr>
<tr>
<td></td>
<td>Organic Products</td>
<td>Requirement of certification of already certified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>products.</td>
</tr>
<tr>
<td></td>
<td>Meats</td>
<td>Importation of ox-meat prohibited, even from areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>certified as free from mouth-and-foot disease.</td>
</tr>
</tbody>
</table>
REFERENCES


UNCTAD (2003). Report of the expert meeting on market entry conditions affecting competitiveness and exports of goods and services of developing countries: large distribution networks, taking into account the special needs of LDCs. Geneva: UNCTAD.


Statistical Annex

Graph 1. Brazil: GDP per capita constant prices (US$), 1989-2003

Source: IPEA
* Estimated series using nominal GDP implicit price deflator, the real exchange rate (R$/US$ average 2003 and the resident population in 1st July.


Source: IBGE/PME several months/years
Graph 3. Brazil: Measure of Income Inequality, the Gini Index, 1992-2003


*There are methodological differences in the 1992-99 and 2001-03 series regarding the sources used, however there is no significant difference of indicator.

**The Gini Index summarises the degree of inequality with values closer to 0 representing a lesser degree of inequality, and values closer to 1 representing greater inequality.
Graph 4. Brazil: Trade Balance Result (US$ millions, FOB), 1990-2003

Source: The Brazilian Central Banking, Bulletin, Payment Balance Section *apud* IPEA.

Graph 5. Brazil: Exports Growth Rate of Primary, Semi-Manufactured and Manufactured Products, 1994-2003 (1994 base year)

Source: Brazil–Ministry of the Industry, Development and Trade/Secretariat of the Foreign Trade (MDIC/SECEX)
Graph 6. Brazil: Exports of Primary Commodities, 1995-2003 (US$ millions)

Source: Brazil - Secretariat of the Foreign Trade (SECEX)/AliceWeb (www.mdic.gov.br) apud Ministry of Agriculture, Cattle Raising and Supplying (MAPA)
Graph 7. Brazil: Exports of Soy in Volume and Value (mil ton and millions), 1989-2003 and value/volume rate (US$/ton) In Index Number (1989 base year)

<table>
<thead>
<tr>
<th>Years</th>
<th>Volume</th>
<th>Value</th>
<th>Value/Volume Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Brazil - Secretariat of the Foreign Trade (SECEX)/AliceWeb (www.mdic.gov.br) *apud* Ministry of Agriculture, Cattle Raising and Supplying (MAPA)