

Trade relations with China: Is Madagascar doing well out of it?

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Abstract

In the face of the economic advancement experienced by China during the two last decades and the consistent growth of the trade relations maintained by China with the rest of the world, some questions emerge with regard to the possible impacts of these changes on the economy in each country, particularly that of developing countries. The objective of this paper is give its share of contribution in the elucidation of these questions by analysing the effects of the foreign trade carried out by China on the economy in Madagascar. A range of method, such as legal analysis, descriptive statistics and the Calculable General Equilibrium Model (CGEM), were applied in order to achieve this. The results reveal that some sectors of the Malagasy economy benefit from the growing Chinese foreign trade whereas others significantly suffer from it. The Malagasy State thus should put in place accompanying policies aiming not only at supporting these losing sectors in the short term but also at improving their competitiveness in the long term.

1. Introduction

The rapid economic expansion experienced by China over the last decades is inevitably disrupting the world economy. The economic magazine LesEchos reveals that the sustained and increasingly accelerated economic growth experienced by China (11.1% in 2006 and 11.4% in 2007) will probably soon enable her to be the third world economy in front of Germany and behind the United States and Japan¹. Besides this change of the world economic order, people are beginning to wonder about the possible impacts of China's rapid economic expansion on the economy of developing countries and particularly on the economy of sub-Saharan African countries.

The trade channel appears among the identified transmission channels through which Chinese growth is assumed to affect the economy of developing countries.. According to Kaplinsky (2007), China's share in commodity trade has increased very rapidly since the middle of the 1990s and reached 6.7% in 2004. This share has become even higher than that of Japan. During the same year, China's share in the exportation of manufactured products also increased to 8.3%, a growth higher than that of the United States and Germany. As a corollary to that, Sino-Africa trade is increasing exponentially.

Madagascar has had a trade relation with China for 46 years. The first agreement, signed in 1963² and renewed several times, testifies to this. As in most sub-Saharan African countries, this relation has intensified a great deal these last years. If Chinese products were little known by Malagasy consumers fifteen years ago, the Asian giant has risen to the top place in terms of origin of imports in Madagascar since 2003³. It should be recalled that this place was occupied by France before.

In the face of these observations, questions arise regarding for the possible consequences of this growing relation on the Madagascar's economy. Until when and to what extent do Malagasy exporters benefit from the price increases generated by the high Chinese demand? Do they enter into direct competition with China by exporting products already sold by China abroad, forcing them to face up to the fall of prices and to surrender part of its market share? Do imports at lower costs from China improve the standard of living of Malagasy consumers? Does the Chinese demand penalise Malagasy importers by pushing international prices upwards? Are there sectors which enter into competition with China on the domestic market and which undergo the negative aspects of this trade in terms of employment?

The answers to these questions invite other questions which are even more relevant to the political measures to be taken in order to maximise the benefits relating to the trade relation with China and to minimise its losses. Thus, it is important to know how Madagascar hopes to manage the positive repercussions of Chinese imports of commodities. Are there possibilities of diversifying exports to China (by exporting manufactured goods) through the

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¹ For further information, see LesEchos of 24 January 2008 on <http://archives.lesechos.fr/archives/2008/lesechos.fr/01/24/300236393.htm>

² Ministry for the Economy, Trade and Industry, Department of Trade Cooperation, 2008

³ See Figure 1 of section 4

application of preferential rates or other trade arrangements? What strategies should the country introduce to respond to the likely market and job losses generated by Chinese exports of manufactured products? How does the Malagasy government hope to protect the population against the risks of the profusion of low-quality Chinese products? Finally, how can Madagascar ensure that the net impacts of trade relations with China will benefit the poor and lead to a rapid and sustainable growth of the economy?

In order to answer the problems listed above, the present study sets a certain number of objectives which are as follows:

- an analysis of the structure and performance of the Malagasy economy by giving special attention to the role of trade with China;
- an analysis of trends of exports, by sector and destination, emphasising China's contribution in terms of volume, prices and revenue;
- an analysis of the relative gains and/or losses generated by exports to China, their sources (variations of volume and price) and their sectoral distribution;
- identification and analysis of the principal export stakeholders, classified by sectors, winners and losers with the sources of gains and/or losses;
- an analysis of the structure and performance of imports, by sector and origin, emphasising China's contribution in terms of volume and prices;
- an analysis of the relative gains and/or losses generated by imports, their sources and of their sectoral distribution;
- identification and analysis of the principal recipients of imports, classified by sectors, gaining and losers with the sources of the profits and/or losses;
- an analysis of the evolution of China's trade regime and trade policy, focusing on the export and import sectors concerned and conditions of access of Chinese exports on the Malagasy market;
- an analysis of the evolution of Madagascar's trade regime and trade policy, focusing on the export and import sectors concerned and the conditions of access of Chinese exports on the Malagasy market;
- an analysis of bilateral and regional trade arrangements and specific trade arrangements between Madagascar and China, paying special attention to the implications on the gains and/or losses;
- identification and analysis of the opportunities which the trade relations with China offer to Madagascar;
- articulation and analysis of response policies which would enable Madagascar to maximise the gains drawn from its relations with China;
- identification and analysis of the challenges that Madagascar must take up because of its relations with China, in particular: the challenge of the wise use of the revenue drawn from the trade in order to reduce supply constraints and to diversify the economy, the challenge of strategically responding to competition in terms of the prices of Chinese commodities, the challenge of surpassing the state of specialisation of exports to the only commodities, the challenge associated with the risk disindustrialisation, of job loss and dissuasion from exports brought about by low-cost Chinese imports, the challenge of facing the risk related to the quality of imports;
- articulation and analysis of responses in terms of policy in order to minimise the losses generated by the Sino-Madagascar trade relations; and
- articulation and analysis of responses in terms of policy in order to optimise the relations with China when it reaches the rank of industrialised economies with the changes that this will lead to on the characteristics and the model of trade partnership with other countries.

The paper revolves around five major sections covering all the objectives. The first section presents the context of the relations between Madagascar and China. It is in particular a matter of the analysis of the trend and structure of trade with China, the trade regimes and the various arrangements between the two countries. The second section presents a review of literature on the subject. The third section presents the theoretical framework of the study, the methodology used and the data used. The following section discusses in detail the impacts of trade with China in light of the empirical data. Lastly, the last section concludes the study and presents the principal policy recommendations.

2. Historical context

2.1. Background of Sino-Madagascar trade relations

Since the establishment of diplomatic relations between China and Madagascar in 1972, their relations and their cooperation have been developing continuously. These last years, the leaders of the two countries have attached a very great importance to the development of the economic relations and high-level trade are multiplying, which gives a great impetus to the rapid development of the Sino-Madagascar friendship and cooperation relations.

Bilateral cooperation in the economic and commercial fields is expanding unceasingly: bilateral trade is increasing rapidly, investments are increasing and trade in the cultural, educational and human fields are intensifying. Consultations between the two countries in international trade are intensifying. The construction of the Sports and Culture Stadium in 1997 testifies to the cultural cooperation and friendship relation between the two countries. Following an official visit of the Malagasy President in China in 2004, the economic cooperation between the two countries was strengthened with the creation of the Malagasy Chinese Business Council, which is a platform of dialogue and exchange between the Malagasy and Chinese economic operators. The Chinese President reiterated China's willingness to strengthen political and economic trade with reciprocal advantages between the two countries and to expand cooperation in the field of education, culture, health and human resources.

The signing of various official documents testifies to the excellence and dynamism of the multiform and multi-sector cooperation relations between the two countries. These last three years, the multiplication of trade of delegations of high-ranking officials of the two countries has not stopped making its contribution to accompany Madagascar's efforts in the promotion of its national economic development.

Among these signatures of official documents is that of 5 January 2007 which essentially constitutes the first axis in the Sino-Madagascar relation in trade matters. It was a matter of an agreement on the rules of origin of products benefiting from the special preferential customs treatment (SPT programme) tariff granted by the Peoples' Republic of China to the least developed countries of Africa. The signature of this agreement offers Malagasy enterprises the opportunity to penetrate the large Chinese market.

The products benefiting from the provisions of this agreement are essentially "materials or inputs", i.e. ingredients, spare parts, components, assembly or incorporation of a product into another product for the manufacture of another product as well as products resulting from

farming, mining, harvesting, breeding, reproduction, extraction, gathering, collection, hunting, fisheries, the craft industry and finally products resulting from a processing or an assembly of several products and as soon as they enter through the ports of entry into China, i.e. ports located at China's custom's areas except for those of Hong-Kong, Macao and Taiwan.

The second conventional instrument was Act n^o 2006-027 relating to the agreement on the reciprocal promotion and protection of investments between the government of the Peoples' Republic of China and the government of the Republic of Madagascar. Within this framework, aware of the existence of this high potential for cooperation as regards investment between the two countries, the Chinese government and the Malagasy government decided to sign an agreement on encouragement and reciprocal protection of investments. This agreement constitutes a formal legal framework favouring the attraction and the security of transactions and direct foreign investments in Madagascar.

Thanks to these efforts made in the promotion and security of foreign investments, the overall business environment has recently improved a great deal. In the classification of the "Doing business" of the World Bank in 2009, Madagascar gained 7 places by moving from the 151st rank in 2008 to the 144th rank in 2009. The noted efforts allowing this classification are expressed by the contents of table 1. Madagascar's place in the granting of building permits, transfer of property and cross-border trade increased enormously in one year.

Table 1: Evolution of Madagascar's classification in "Doing Business"

Ease of...	Doing Business 2009	Doing Business 2008	Variation in the classification
Doing business	144	151	7
Business creation	58	65	7
Granting of building permits	102	136	34
Hiring of workers	153	157	4
Transfer of property	145	168	23
Obtaining of loans	172	171	-1
Protection of investors	53	49	-4
Payment of taxes	92	89	-3
Cross-border trade	109	127	18
Execution of contracts	153	153	0
Closure of business	181	181	0

Source: Doing Business 2009: Country profile, Madagascar, World Bank

2.2. Analysis of the trade policy

After years of protectionism, Madagascar has since the end of the 1980s undertaken reforms aiming at liberalising the economy, promoting competition and extending trade with the rest of the world. The trade policy was centred on the reforms of the tariff policy, the diversification of exports, the intensification of actions of promotion of Malagasy exports, the promotion of access to regional and international markets, and especially the exploitation of the possibilities offered by regional and international organisations.

2.2.1. The tariff policy

The tariff policy underwent reforms between 1995 and 2005. These reforms consisted in simplifying the structure of customs tariffs and consolidating import duties. Thus, the number of tariffs moved from eight in 1995 to three in 2006. Quantitative import restrictions and controls as well as export restrictions were abolished from 2000. The average e MFN tariff rate (Madagascar grants the most favoured nation treatment to all its trade partners) dropped, moving from 16.2% in 2005 to 12.9% in 2007.

Nevertheless, since the beginning of the reforms there has been instability of the tariff policy which does not encourage private operators. The frequent changes of the rates and the customs nomenclature create uncertainty and have negative impacts on the investment decisions of local and especially international operators.

Table 2: Trend of the tariff headings and tariffs between 1995 and 2008

	2008	2007	2006	2005	2001	1995
Variations in the nomenclature (HS 8)						
% of tariff headings with a rate of 0%	2	2	2	24	40	30
% of tariff headings with a rate of 5%	22	22	12	4	40	31
% of tariff headings with a rate of 10%	34	34	43	36	12	26
% of tariff headings with a rate of 15%	0	0	0	0	2	3
% of tariff headings with a rate of 20%	42	42	44	9	6	3
% of tariff headings with a rate of 25% or above	0	0	0	27	0	8
Variations in the average tariff						
Average tariff	12.9	12.9	13.6	16.2	4.7	7.3
Average tariff (capital goods)	10.4	10.5	10.9	6.9	4.3	7.3
Average tariff (raw materials)	12.4	12.4	12.1	15.8	2.5	3.3
Average tariff (intermediate goods)	9.2	9.2	12	9.1	2.2	6.4
Average tariff (consumer goods)	16.6	16.8	17.4	18.4	8.8	9.8

Source: The World Bank, Country Economic Memorandum 2008

In addition, in spite of this simplification of the tariff structure, the level of the rates applied to the various categories of products increased and it seems that the tariff policy has become restrictive, penalising imports of raw materials and capital equipment (cf. table 2). Besides, Madagascar still remains far from international practises as regards the fixing of the prices of capital equipment.

According to the tariff restrictions index, Madagascar is classified in the 101st position out of 125 countries with a score of 12%, a level close to the average of the sub-Saharan African countries and low-income countries. Only 24.8% of imports benefit from zero rating according to the most favoured nation clause. According to table 3, this percentage accounts for 2.2% of all the zero-rated MFN tariff headings against 18% on average among the other sub-Saharan African countries (84% for Mauritius and 36% for Mozambique). The average tariff on capital goods applied to Madagascar is the highest in the sub-region (Indian Ocean, COMESA, SADC), and by adding the VAT which is 20% (against 15% in Mauritius or 17%

in Mozambique), it appears that nearly 40% of the imports bear a tax burden higher or equal to 40% and virtually three quarters of imports are taxed at at least 30%. This strong differentiation of the tax and customs burden between countries constitutes a considerable source of loss of competitiveness for the Malagasy exporting enterprises.

Table 3: An international comparison of tariffs

	Madagascar	Mozambique	Tanzania	Mauritius	Chile
% headings with a rate of 0%	2	2	36	84	1
% headings with a rate between 0 and 10%	22	63	0	0	99
% headings with a rate between 10 and 20%	76	0	23	8	
% headings with a rate higher than 20%	0	35	56	8	
Total average tariff	12.9	12.1	12.8	3.3	6.0
Average tariff on capital goods	10.4	7.3	4.8	2.0	5.9
Average tariff on raw materials	12.4	12.3	13.9	3.5	5.9
Average tariff on intermediate goods	9.2	8.8	10.3	0.9	5.9
Average tariff on consumer goods	16.6	18.6	20.0	6.9	6.0

Source: The World Bank, Country Economic Memorandum

The tariff policy is confronted with a delicate arbitration between protecting the local industry from foreign competition (and thus imposing high tariffs for certain products), satisfying the requirements of investors evolving in the sectors considered to be sensitive (by reducing tariffs or by introducing exemption regimes) and promoting foreign trade, while seeing to the budget balance. Import duties and taxes account for about half of the State's budget revenue.

2.2.2. Access to markets

One of the principal aspects of the trade policy is promoting the access of Malagasy products to international markets. Madagascar can improve the allocation of its resources by reforming and liberalising its trade regime. However, this is not sufficient to fully take advantage of trade because it would be necessary that the partners agree to reduce tariff and non-tariff barriers to Malagasy exports.

European (in particular France) and American markets are the principal destinations of Malagasy exports (39% and 19% respectively of exports were to France and the USA in 2007). Although the Chinese market recently became a prized destination of exports (in 2007, China was classified the 9th partner even if it did not appear in the top 20 partners in 1995), only a negligible part of total exports is to China (2.2% in 2007).

Malagasy exports for years benefited from preferential treatments coming from the countries of Europe and the United States, such as the reduction of import duties and taxes below the MNF rates. Several initiatives of these partners, following the example of AGOA with the United States, the Economic Partnership Agreements (EPAs) as well as the "Everything But Arms" Agreement with the European Union, made enabled exports to enter these two large markets more easily

AGOA

AGOA is an American initiative in favour of a certain number of sub-Saharan African countries giving them preferential access to US markets. Madagascar is a beneficiary of AGOA. Most African countries already benefited, under certain conditions, from preferential rates under the Generalised System of Preferences (GSP). The provisions of AGOA come to strengthen the provisions of the GSP, insofar as 1,800 tariff headings in addition do not pay customs duties on entry (including clothing subjected to the Multi-fibre Agreement). Let us note that the advantages of the GSP have lasted longer for sub-Saharan African countries (until September 2008) compared to other countries.

The rules of origin of the products under AGOA exempt customs duties and do not impose any quota on the exports of clothing manufactured from fabrics and fibres coming from the USA, but also from countries eligible to AGOA. A special clause intended for the least developed countries (according to the criterion of a GNP lower than US\$1,500 in 1998) authorises the latter to use fabrics coming from any country until September 2004. It is this clause which especially encouraged the investors to set up in Madagascar. The establishment by the Malagasy Government of the free zones regime towards end of the 1990s in addition was a big factor of attraction of investors in the clothing and textiles sector. AGOA made it possible to create thousands of jobs in Madagascar and contributed to the rapid expansion of the manufacturing sector. Unfortunately, the successive political crises that the country went through seriously thwarted these advantages and the stopping of AGOA for Madagascar cannot be avoided at present as long as the return to stability is not assured.

Economic partnership agreements (EPAs)

In spite of several years of preferential access under the successive Lome agreements, then the Cotonou Agreement, the trade performance of the ACP countries (Africa, Caribbean, Pacific countries) on the European market is hardly encouraging. The share of these countries in the imports of the EU only decreased. The ACP and EU countries today recognise that access to markets alone is not enough. They have agreed on the need for set up of new and more integrated trade arrangements, hence the EPAs, which will have to tackle the problems encountered in various fields related to trade. In addition, trade and development policies will be implemented jointly in order to stimulate exports, investments and development of the ACP countries.

The EPAs should include all the aspects on which trade depends, whether it is a matter of tariff or non-tariff measures on export markets, fields related to trade or domestic policies, or production capacities in the ACP countries. These agreements will strengthen the already existing regional integration initiatives in the ACP countries. The latter will end in the progressive creation of free exchange zones between the parties. They will make it possible to strengthen and intensify regional integration and consequently to enlarge the markets of the ACP countries. This will favour the emergence of economies of scale, make it possible to improve the levels of qualification, to reduce production and transaction costs, and to improve the competitiveness of the ACP countries. More importantly, it will make it possible to attract more investments in the economies of the ACP countries.

The EPA between Europe and Madagascar is still being negotiated. The European Union remains a big economic partner of Madagascar and the EPAs constitute a framework of security of trade with the latter. Within the framework of this agreement, the European countries offer the ACP countries a completely free access without customs duties and any

restriction on its market. All products which are still subjected to quantitative restrictions or schedule constraints in the Cotonou agreement will henceforth be freed, except for sugar and rice for which a transitional period is planned. This agreement gives free access to fruits, vegetables, cereals, dairy products, rums, cut flowers, canned tomatoes and others. It is an advantageous measure insofar as more than 40 % of Madagascar's exports go to Europe.

Moreover, it is an international treaty ratified and notified by the World Trade Organisation. It guarantees a legal stability of the conditions of trade and at the same time offers a long-term predictability. However, the interim agreement which is currently in force remains incomplete. It is an agreement which does not take account of the realities of globalisation and the dematerialisation of trade in the future. However, the final versions of the EPA are designed as general agreements which will contribute to the establishment on regional market and the diversification of the economies in each ACP region.

The “Everything But Arms” initiative

Launched in 2000, the “Everything But Arms” initiative gives exports coming from the least developed countries (LDCs), except arms and ammunition, free access to the European market (no duty and no quota). At the beginning, the initiative relates to three sensitive agricultural products: bananas, rice and sugar. A progressive reduction of customs duties, even their cancellation, on these three products is provided for in 2009. Quotas for which rice and sugar are exempted from customs duties nevertheless were introduced to compensate for the time limits of access to the market. These quotas are calculated on the basis of the best level of exports reached by each country.

Madagascar has obtained quotas for its sugar and rice exports since the middle of 2001. The European meat market is also scheduled to be liberalised from the moment that products respect sanitary and hygiene standards.

The impacts of the “Everything But Arms” initiative on Madagascar foreign trade have nevertheless been limited for the agricultural sector. Malagasy exports, in spite of the advantages offered by the agreement, encounter problems mainly due to the inability of Malagasy products to respect sanitary and hygiene standards and to environmental protection measures (restriction of exports of endemic species). The rules of origin imposed by the “all except” initiative are in addition more constraining than those of the Cotonou agreements.

2.2.3. Regional trade arrangements

Madagascar is a party to three principal trade arrangements with its African and Indian Ocean neighbouring countries. It is member of the Common Market of Eastern and Southern Africa (COMESA), the South African Development Community (SADC) and the Indian Ocean Commission (IOC).

COMESA

Madagascar integrated COMESA in 1995. Created in 1993 in Kampala, COMESA aims at eliminating in a first phase internal tariff and non-tariff barriers and, in a second phase, at adopting common external tariffs, liberalising human and capital movements, harmonising the standards of products, harmonising taxation, strengthening cooperation as regards laws on

investments and intellectual property with a view to the creation of a monetary union in the long term.

A free trade zone was created within the COMESA in October 2000 of which Madagascar is a member. The adoption of common tariffs was planned for 2004. Trade liberalisation within the region has resulted in the reduction of intra-region transport costs (by approximately 25%) and the rapid increase in trade between the member States (18.6% of the average annual growth since 1993). Trade between Madagascar and the region has also increased by 18.1% per annum for imports and 36% for exports since 1993.

However, the share of trade with the region in total foreign trade remains very minimal compared with that of trade with the other partners, in particular with Europe. Only 16% of imports come from COMESA compared with 32% for Europe and 24.6% of exports to the region against 57% for Europe. Mauritius is in addition the quasi-exclusive partner of Madagascar in the region with 90% of its intra-region trade whereas COMESA has about 20 members. It is the country which has benefited most from the liberalisation of trade within the region through the adoption of the vertical trade strategy. Mauritian enterprises have indeed sub-contracted most of their operations requiring a great deal of labour in the neighbouring countries such as Madagascar. This strategy has especially been justified by the access to the preferential rates and advantages granted by AGOA and Europe, but which on the other side has allowed the Malagasy industrial fabric to develop.

The Indian Ocean Commission (IOC)

Created in 1984 in Victoria, the IOC is a regional cooperation agreement under the auspices of the European Union, grouping together the islands of the Indian Ocean as well as five other member States of COMESA. Its objective is to encourage trade and regional cooperation in the fields of the economy, diplomacy, the culture and in various sectors (environment, tourism, health, etc.).

A five-year programme for the development of regional trade, known as the Integrated Regional Trade Development Programme, was established in 1996 with the aim of speeding up trade liberalisation and harmonising trade and investment policies. The main result was the elimination of tariff barriers between Madagascar and Mauritius in January 2000. Madagascar should be able to draw the maximum benefit from these arrangements and to strengthen its presence within the IOC.

SADC

Madagascar became a member of SADC with the aim of entering the southern African market, which in addition is her principal partner in the region. Diplomatic and trade relations between the two countries were established well before the creation of SADC. Established in July 1992 by a treaty, SADC aims at strengthening of the growth and economic development of the member States by reducing dependence on the traditional partners and by strengthening regional integration and international cooperation. If at the beginning the security and solidarity of the member States constituted the main priorities of SADC, its scope of activity was thereafter extended to the political, commercial and investment aspects. Nineteen memorandums of understanding have been signed by the Member States in various fields such as trade, health, energy, water, norms and standards, corruption, transport, telecommunications, etc.

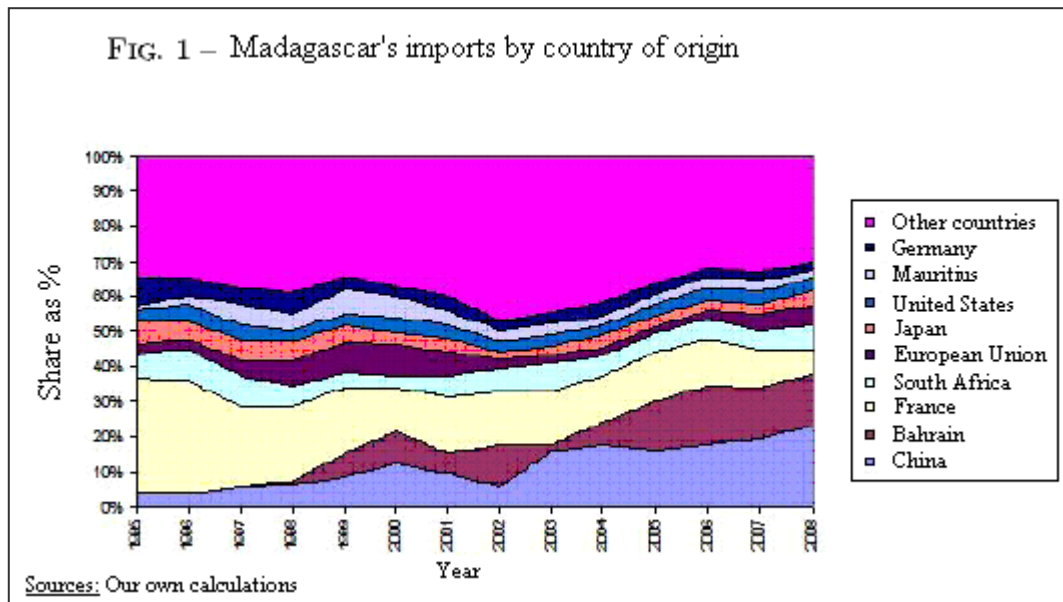
The trade memorandum was signed in 1996 and was launched in 2000. It aims at the establishment of a free trade zone which should have been effective in 2008. Eight-five per cent of trade should be liberalised on this date and trade in sensitive products which should not exceed 15% of the volume of trade should be completely liberalised by 2012.

2.3. Structure, performance and trend of Madagascar's foreign trade

After its independence, Madagascar plunged into a socialist political regime. From the middle of the 1970s to the middle of the 1980s, enterprises were nationalised and the country lived in a relative autarky. Economic relations with foreign countries were limited and were concentrated on trade with France⁴. However, in 1986, as a result of economic difficulties, particularly the suspension of payment undergone by the country, the leaders began an economic 180° turnabout and promoted liberalisation and the market economy.

Since this change, Madagascar has increasingly been opening up to the outside world. Trade relations with foreign countries are increasing with more varieties of traded goods and more partner countries. China appears among these recent partners. Admittedly, Madagascar had maintained the relations with China for a few years after her independence but these relations remained at the level of diplomacy and mutual aid. Trade relations developed only recently.

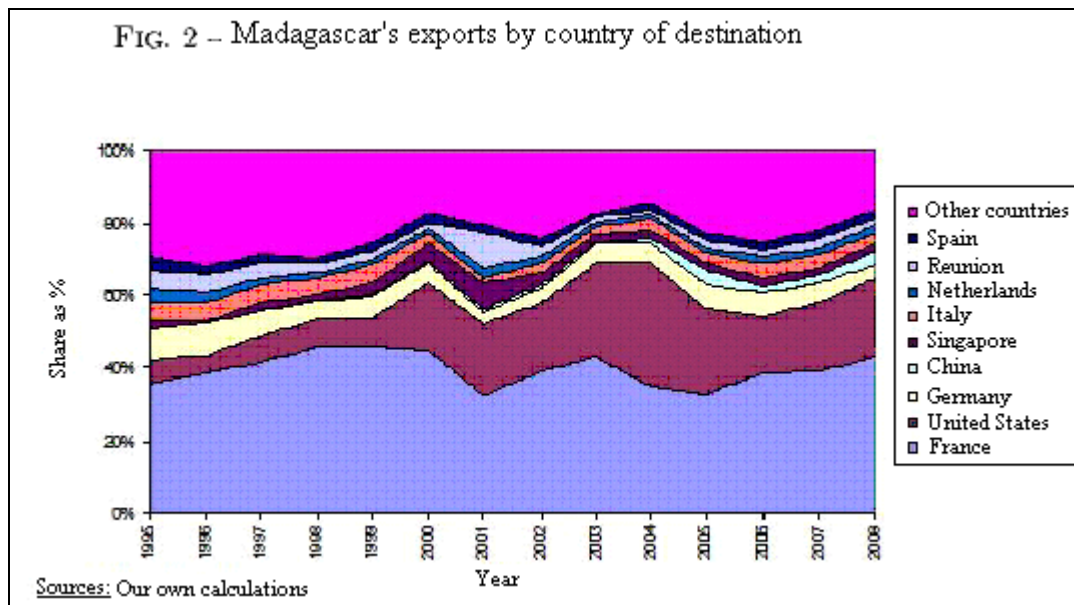
Despite being recent, these trade relations have, however, rapidly evolved. If, for example, the case of imports is considered, they have been growing exponentially since the beginning of the 2000s. If in 1997 the country brought in 1,204 varieties of products from China, ten years later, three times more types of goods have been imported from this country (3,053 products)⁵.



⁴It should be noted that Madagascar is a former French colony

⁵ These numbers of products come from the classification of Malagasy Customs.

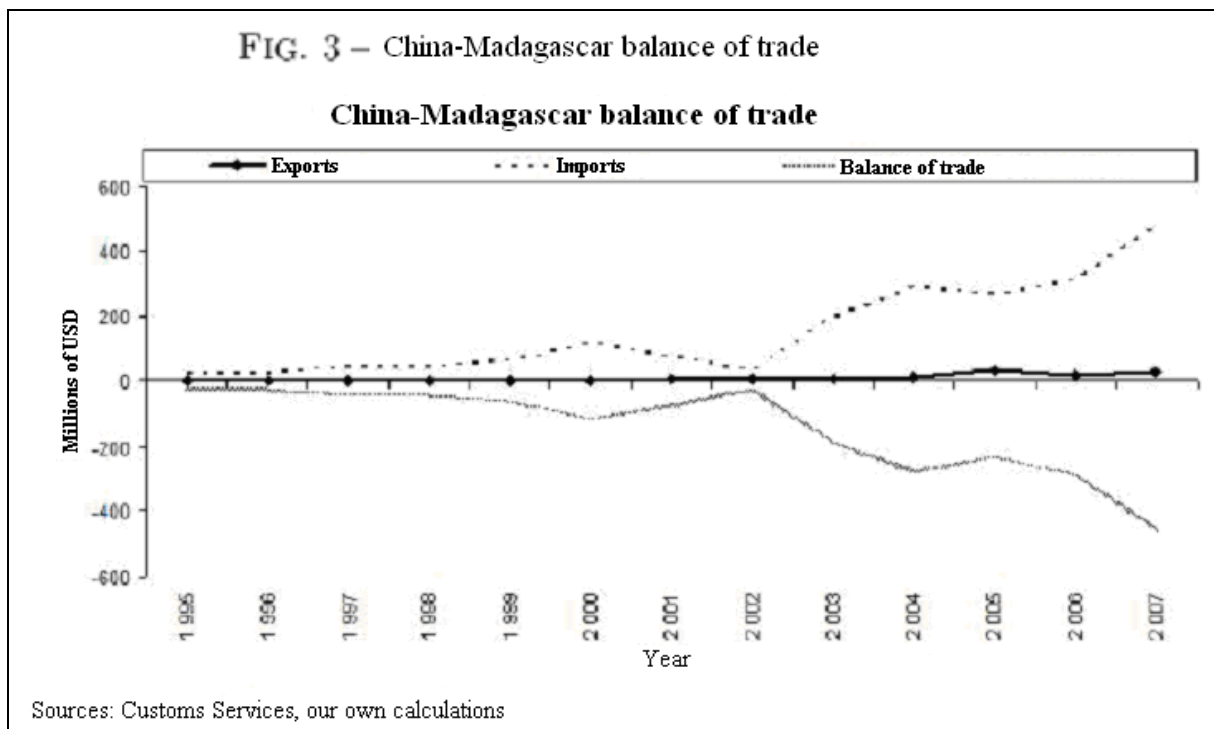
Parallel to this, the value of these Chinese imports is experiencing considerable rapid expansion. Figure 1, for example, shows that the Chinese products are taking a greater and greater share in Madagascar's domestic market and this is happening at an accelerated speed. Indeed, if the top country of origin of imports has always been held by France, this crown has gone to China since 2003. In a space of ten years, the share of Chinese products in Madagascar's imports almost multiplied by four by moving from a rate of 6% in 1997 to that of 23% in 2007.



Exports to China also experienced an explosion during the last decade. As Figure 2 shows, the share of exports to China in Madagascar's total exports moved from 0.11% in 1997 to 2.16% in 2007. If ten years before China was not even part of the 20 top destinations of goods from Madagascar, in 2007 it reached the 12th place right after Reunion. With the exports realised in the first half of 2008, it even reached the 8th place.

Furthermore, exports to China have also diversified a great deal. If in 1997 the country sold to China only 17 varieties of products, ten years later, six times more goods were exported there. Indeed, according to the classification of the Malagasy Customs, Madagascar exported 111 types of goods to China in 2007.

The trend of Madagascar's exports to China is promising but the balance of trade between the two countries still remains negative and to the advantage of China. According to figure 3, this deficit is rising even with the years. This situation is explained by the fact that not only is the volume of imported goods higher than that of exported goods but also the acceleration of trade is faster in the former than in the latter.



This observation implies that in spite of the growing degree of opening up of China and the existence of preferential agreement between this country and Madagascar, Malagasy enterprises are not succeeding in penetrating the Chinese market and the flow of Malagasy products to China is consequently not managing to compensate for the flow of products from China. Indeed, according to Yang (2003), the level of the import tax rate was initially very high in China in spite of the existence of an extensive non-tariff barrier. However, with time, these tax rates were continuously reduced and the non-tariff barriers weakened. In 2003, more than half of Chinese imports enter the country duty-free and the collected taxes amount only to 3% of the value of imports.

Table 4: Chinese imports coming from Africa in billions of dollars in 2005

COUNTRY	IMPORTATIONS
Angola	6.6
South Africa	3.4
Congo	2.3
Guinea	1.4
Nigeria	0.46
Sudan	2.6
Others	3.24

Source: China Statistical Year Book

It is also interesting to note that in spite of the rapid growth of trade between Madagascar and China, the traded goods still remain minimal for the Asian giant. As tables 4 and 5 testify, Madagascar does not yet appear among China's principal trade partners in Africa. It neither forms part of the main origins of Chinese imports nor of the main destinations of this country's exports.

Table 5: China's exports to Africa in billions of dollars in 2005

COUNTRY	EXPORTATIONS
South Africa	3.8
Benin	0.75
Ghana	0.66
Sudan	1.3
Togo	0.52
Nigeria	2.3
Others	5.67

Source: China Statistical Year Book

3. Literature review

To our knowledge, no thorough study has yet been carried out on the possible impacts of the Chinese rapid economic expansion on Madagascar's economy. Admittedly, studies revolving around the African continent refer to the case of Madagascar but no study has been solely devoted to this country's case. Thus, literature's answers given in this section mostly come from the analyses carried out at the level of the African continent or on developing countries. Most of these studies are based on statistical approaches carried out on the basis of disaggregated data. The remaining part is based on general equilibrium models.

3.1 Studies based on disaggregated statistical data

Jenkins and Edwards (2005) sought to determine the consequences of the growing relations between Africa and the two Asian giants, China and India. Their studies essentially concentrated on the impacts of poverty in 21 sub-Saharan African countries and were based on the analysis of disaggregated data of international trade.

The results they obtained reveal that the exports of African countries to China are mainly made up of mining products, minerals, oil and wood and are thus not likely to have a significant positive impact on the poor. Concerning competition on third manufactured goods markets, China does not present more threat for sub-Saharan Africa than for the countries of South-East Asia. The latter are more specialised in the export of labour-intensive manufactured goods such as and clothing textiles.

The analysis of imports shows that some countries such as Ghana, Uganda and Tanzania, which import a relatively high proportion of basic consumer goods from China and India, are likely to experience a significant increase in the real income of the poor thanks to these cheap imports. It also seems that except for Ethiopia and Nigeria, most of the imports from China in sub-Saharan Africa have replaced imports coming from outside the region, suggesting very few movements of the domestic production and a low negative effect on employment and the local activity.

Stevens and Kennan (2006) introduce an innovative approach in the field of analysis of the impacts of trade relations with China on the economy of small countries. Using much more disaggregated trade data (6-digit HS classifications), they start by calculating trade complementarity indices by identifying the products most imported and exported by China and whose trade variation was fast and which are at the same time intensively traded by developing countries. This method has the advantage of taking into account both the direct and indirect effects.

Through this process, they select seven imported products (animal feeds, chemicals and five other primary products) and eight products exported by China (ferrous metals, aluminium and six manufactured goods). Then, they determine for each product the principal importing or exporting countries in Sub-Saharan Africa. The winning countries are those which export the products that China imports (an opportunity for extension of the market) or the countries that import goods exported by the Chinese (prices drop). The losing countries are those which export products exported by China (competition of exports and lower prices) or those which import products imported by China (increase in prices).

The results show that there are more winning than losing sub-Saharan economies. Most of the gains come from the importation of goods that China exports although other countries are also winners thanks to the exportation of products which are demanded by the Asian giant. Some countries are penalised by Chinese competition on the export market and very few countries are losers by importing the same products that China demands.

In the case of Madagascar, this study reveals that there is both a winning sector and a losing sector in the trade with China. The gain essentially comes from the importation of goods exported by China, hence the possibility of getting supplies cheaply. Loss on the other hand comes from the importation of a product which is also imported by the Asian giant. In this case, Madagascar is penalised by the rise of the international price of the good generated by the additional Chinese demand.

Basing themselves on the analysis of the available statistical data, Raphael Kaplinsky and Morris (2007) concluded that the presence of China in Sub-Saharan Africa is mainly motivated by the search for raw materials (oil and other commodities) necessary to support the development of its manufacturing industry and its investments in infrastructures. If this Chinese presence has given a positive impetus to some exporting sub-Saharan economies in primary goods, its impacts on the manufacturing industry (whether it is intended for the domestic market or export) have been unfavourable. Even some of the advantages linked to the boom of the prices of commodities are ambiguous because they are often associated with a rise of foreign exchange rates, corruption and violent conflicts. Production based on the primary products also has an unfavourable effect on distribution when it is compared with the manufacturing output.

In their analyses on the indirect impact of Chinese growth on the textile sector of sub-Saharan African countries, these authors found that following the removal of the Multi-fibre Agreement, clothing exports of sub-Saharan African countries are losing competitiveness in the face of the Chinese supply. The proof is that exports of textile products to the United States are dropping for sub-Saharan countries which are beneficiaries of AGOA whereas they posted a consequent rise for China between 2004 and 2006. For Madagascar, this fall is estimated at -24.2%. The authors nevertheless mention that this drop experienced by Madagascar is also partly due to a directing of exports to other markets such as the European Union⁶ and South Africa.

Noting the massive arrival of the cheap imports coming from Asia and particularly from China, Egziabher (2007) sought to assess not only the impact of this change on the economy of Ethiopia but also to detect the adaptation strategies adopted by local enterprises in this face this foreign competition. To this end, the author worked on statistical data received from micro, small and medium enterprises of the shoe manufacturing sector.

The data collected revealed that the arrival of Chinese products has heavy consequences for the sector and threatens the competitiveness of local enterprises on the domestic market. Indeed, Chinese shoes are superior in design and have a higher quality-price ratio than those produced locally. The impacts of Chinese imports on the sector then vary from the drop of activity to collapse, loss of ownership or switching to the informal sector.

⁶ Contrary to China, which faced up to duties and taxes during the exportation of clothing to the European Union (generally exceeding 12 percent, but variable according to the product), sub-Saharan African benefited from zero rating during the entry of their clothing into the Union

The data collected also showed that enterprises which resist try to thwart this Chinese competition by improving design and quality, lowering prices and profit margins or mixing both. These adaptation strategies seem to be differentiated according to the size of enterprises and to have a certain association with their performance.

As in Kaplinsky and Morris (2006), the same authors also conducted in 2008 research on the impacts of the rapid economic expansion of the Asian giants on the export industries of Sub-Saharan African countries. On the basis of the analysis the available statistical data, Kaplinsky and Morris (2008) showed that the entry of China (and to a lesser extent, of India) as a large exporter of manufactured goods in the world economy raises serious problems for the growth of export industries in sub-Saharan Africa.

The recent experience of the clothing and the textile sector, often considered as the first stage of the development of the export industry, proves the existence of this concern. Without a sustained policy with relation to the Asian producers, Sub-Saharan Africa's textile and clothing industries will be excluded from the world markets and will face serious threats on its domestic market. This will also have a generalised impact on other sectors, especially on low-income producers.

3.2. Studies based on general equilibrium models

Ianchovichina and Martin's article (2001) appears among the studies using the general equilibrium models in the analysis of the consequences of the reforms and changes occurring in China. With model GTAP (Global Trade Analysis Project), the authors assessed the impacts of the liberalisation process in China and particularly of the effects of the accession of China to the World Trade Organization.

The results obtained reveal that China and its principal trade partners are gaining from her accession to WTO. Her trade partners are benefiting from the consequent increase in China's supply of exports and its demand for imports. For some developing countries, these gains are nevertheless destroyed by the negative effects generated by Chinese competition on third markets.

Still in this line, Yang (2003) also examines the implications of China's accession to WTO but this time this concerns only developing countries. To succeed, she also used GTAP model. The distinctive characteristic of this paper lies in the fact that the author first analyses the impacts of China's accession to WTO on developing countries by identifying the areas in which these countries are penalised by this accession and the areas in which they are gaining. Then, the author places the accession in the context of a process of China's long-term growth and economic opening up and examines to what extent the results differ from the first analysis in terms of impacts on the economy of developing countries

Actually, the results obtained suggest a difference between the short- and medium-term impacts of China's accession to WTO and the long-term impacts of Chinese growth and economic opening up on the economy of developing countries. Historically, China's exportation of textile and clothing products to the industrialised countries is subjected to more constraints compared to that of developing countries to these same industrialised countries. The removal of these restrictions following China's accession to WTO tends to induce losses for some developing countries.

Contrary to this, the long-term economic opening up and growth experienced by China are leading to a development of trade on a much broader range of commodities. Imports and exports are growing at similar rates. After two decades of rapid growth, Chinese exports have improved and diversified. Imports have also increased and have been oriented to goods for which several developing countries have a comparative advantage: agricultural products, ores and other commodities.

Simulations then indicate that on the whole the Chinese economic opening up and growth do not seem to have an unfavourable impact on the economy of developing countries. Indeed, countries which have built up a strong trade and of investment relation with China have drawn benefit from this process. The mechanism through which these developing countries are important: building up a relation with a large economy in strong growth will improving the terms of trade will increase the volume of trade. This could more than compensate for the possible losses generated by Chinese competition on third markets.

Finally, following the introduction of quotas for imports of clothing and textile products from China by South Africa in August 2006, Naudé and Rossouw (2008) sought to assess the impact of this policy on the economy in this country. As in the case of the two studies cited earlier, they also use a calculable general equilibrium model (CGEM) to achieve their purpose.

They noted that contrary to the reasons which underlie the implementation of quotas, the effects of this measure on the overall economy, the sectoral economy and households are negative and lead to a greater inequality between rich and poor households. They concluded by maintaining that the imposition of these quotas could be regarded as a political error and that South Africa could have drawn more advantages if she had concluded a free-trade agreement with China.

4. Theoretical framework, methodology and data used

4.1 Theoretical framework

As the literature review developed testifies in the previous section, the impacts of economic growth and development of Chinese trade on the economy of Sub-Saharan African countries differ according to the country under review, the sector studied and even according to the method of analysis used. It is then relatively difficult and complex to say that Madagascar's economy or its economic sectors are winners or losers in the growing trade maintained with China. This requires a synthetic and exhaustive approach of all the possibilities leading to a gain or a loss potential. To this end, we base ourselves on the theoretical framework developed by Kaplinsky (2007) and we distinguished as regards importation and exportation the direct and indirect effects of trade with China on Madagascar's economy.

Table 6: Effects of imports

EXPORTATION		
EFFECT	Gain	Loss
Direct	Madagascar exports to China	
Indirect	Madagascar exports to other countries goods highly demanded by China <i>(Increase in the prices of goods)</i>	Madagascar enters into competition with China by exporting a good which is also exported by China <i>(Drop in the prices of products)</i>

As table 6 shows, Madagascar's exports to China generated by Chinese growth is regarded as a direct advantage for the country. It makes it possible to extend the market share outside of the country and to increase the national revenue. The indirect effect can be both positive and negative. If Madagascar exports to other countries a good highly demanded by China it is beneficial for the country insofar as the international price of the good increases. The effect is on the other hand penalising when Madagascar enters into competition with China by exporting a good which is also exported by China. Indeed, their international price of the good drops in this case.

Table 7: Effects of imports

IMPORTATION		
EFFECT	Gain	Loss
Direct	Madagascar imports low-priced products from China <i>(Increase in real income and improvement of the welfare of consumers)</i>	Madagascar imports Chinese products which are in competition with local products <i>(Drop in the prices of products and loss of employment)</i>
Indirect	Madagascar imports goods which are also exported by China <i>(Drop in import prices)</i>	Madagascar imports goods which are also imported by China <i>(Increase in export prices)</i>

With regard to imports (See table 7), if Madagascar allows China to bring in low-priced goods, this will have a positive direct effect on the country's economy. The subsequent drop in price leads to an increase the real income and an improvement of the welfare of consumers. Importation could, however, have an unfavourable direct effect when Chinese products enter into competition with domestic products and destroy local industries. Madagascar can also be indirectly penalised through importation when it imports a good from another country which is also imported by China. This is, for example, the case of oil. Because of the increasing Chinese demand, the international price of this good shoots up. On the other hand, if Madagascar imports goods sold by China on the world market, it will benefit from the drop in prices generated by the Chinese supply and will gain in terms of the costs of importation.

4.2. Methodology

Basing ourselves on the theoretical framework developed previously, we carry out the analysis of the possible impacts of Chinese growth through the trade channel on Madagascar's economy. A range of methods are exploited to achieve this objective. These methods were drawn from the economic literature whose review is presented in the second section of this study.

In order to understand the evolution of Madagascar and China's economic regimes and policies and to grasp the scope of trade agreements and arrangements linking the two countries, we begin by conducting documentary studies of the legal interpretations of the existing laws⁷. Similar methods were used by Lardy (1993) when he studied the reforms of China's economy and international trade and by Bates Gill and Morrison (2007) when they sought to understand the growing influence of China in Africa.

Then, we carried out descriptive analyses such as the ones carried out by Jenkins and Edwards (2005), Raphael Kaplinsky and Morris (2007) and Kaplinsky and Morris (2006) in order to study the structure, the performance and the evolution of Madagascar's foreign trade. These analyses essentially revolve around the study of the role played by China in this trade.

We also use the tools developed by Jenkins and Edwards (2005) and Stevens and Kennan (2006). They consist in bringing out the indicators that make it possible to identify the gaining losing economic sectors in trade with China.

The last tool to be used concerns modelling. As Yang (2003) and Naudé and Rossouw (2008) have done, we use a calculable general equilibrium model (CGEM) to assess the impacts of trade with China on Madagascar's economy. This model, whose equations appear in the annex, is a multi-sector dynamic model. The fact that it has already been used in the case of Madagascar by Dorosh (1994) is a considerable asset for the study.

Table 8: Synthesis of the methodology

SPECIFIC OBJECTIVES	METHODS OF ANALYSIS	INSPIRING ARTICLES
1. Analysis of the economic structure and performance, stressing the role of trade with China	Descriptive statistics Calculable general equilibrium model (CGEM)	- Dorosh (1994) - Yang (2003) - Naude and Rossouw (2008)
2. Analysis of imports and exports by sector and country of destination	Descriptive statistics	- Kaplinsky, McCormick and Morris (2007)
3. Analysis of the gains and losses generated by imports from and exports to China	Descriptive statistics	Stevens and Kennan (2006)
4. Analysis of the evolution Madagascar and China's trade regimes and policies	Legal approaches and analyses of interview data	Lardy (1993)
5. Analysis of bilateral and/or	Documentary studies	Lardy (1993)

⁷ The results of these documentary and legal analyses are already inserted in the first section of the paper devoted to the historical context.

regional trade agreements and/or special trade arrangements between Madagascar and China	and analyses of interview data	
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4.3. Data used

The data used in the present research are generally annual data covering the period 1997-2007. They were drawn from three different sources: the data used in the sectoral analyses emanated from the Malagasy customs database and the Chinese customs database⁸. The data used in the overall analysis are drawn from the database of the National Institute of Statistics (INSTAT).

5. Empirical analysis

5.1. Sectoral analysis

If the first section of this paper was limited to a descriptive analysis of the structure, the performance and the overall trend of the trade relations maintained by Madagascar with China, the present section tries to go further by identifying the gaining and losing sectors in this trade. To this end, we start with the theoretical framework and we use the tools developed in the section devoted to the methodology.

5.1.1 Gaining and losing sectors in exports

Direct effects

As it has previously been shown, some sectors are directly affected by trade with China whereas others are only indirectly affected. In order to assess the direct impacts of exports to China on Madagascar's economy and to identify the gaining sectors, we start by calculating the average of exports in value (in USD), relative to each product over the period 1997-2007. Then, we identify the top ten products exported to China and we consider the sectors of origin of these goods as direct gaining sectors in trade with China. We assume that thanks to the additional demand expressed by the Asian giant, these sectors are managing to extend their market shares and consequently to produce more.

Table 9: The top ten products exported to China

DESCRIPTION	SHARE IN EXPORTS TO CHINA BETWEEN 1997 AND 2007
Raw wood	44.65
Chrome ore and other ores	16.39
Raffia and other plant matters for basket-making	8.06
Sisal, jute and other plant fibres	5.92
Hides and skins	5.01
Jewellery precious stones	3.71
Woodworks	2.97
Essential oils	2.32
Quartz and other industrial stones	1.99
Spices	1.68

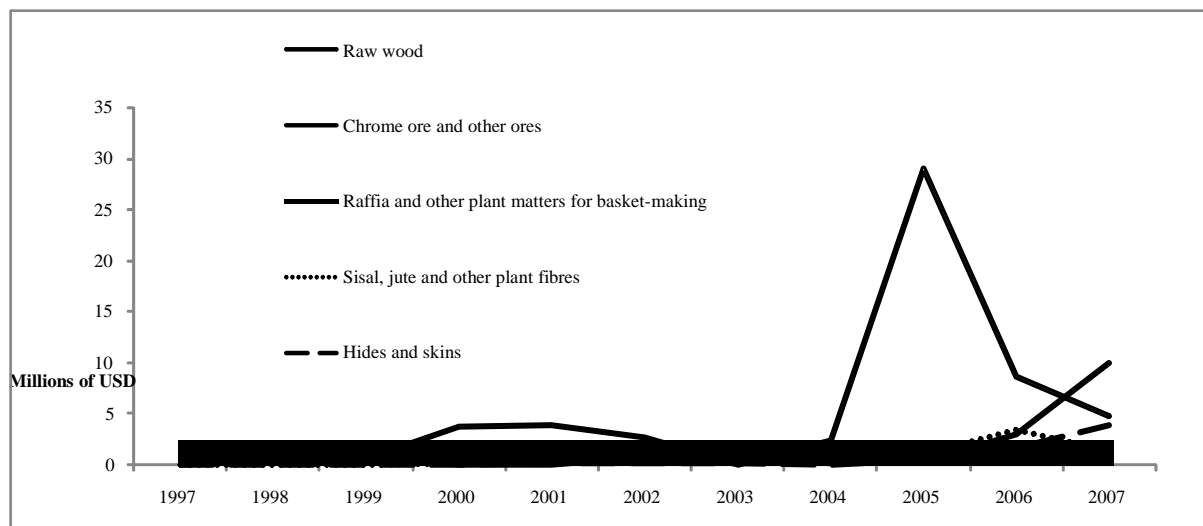
Sources: Customs Service, our calculations

⁸ Entry into the Chinese customs database was possible thanks to access to the international database *DATASTREAM*.

Table 9 presents these ten products and the ten corresponding sectors. It is noted that most of these products are commodities which did not undergo sufficient processing. Exports of raw wood, hides and skins, raw sisal and raffia are examples. Only some exports such as those of essential oil and woodworks come from an industrial processing and yield more value added.

It is clear that the access of Malagasy enterprise to the Chinese market and the increasing demand expressed by China enables Madagascar to increase exports and her economic activities. As figure 4 shows, the sectors which export to China, except for those which are related to forestry development (wood, raffia and sisal) have all experienced significant growth these last years. Unfortunately, as it has just been mentioned, the products concerned are goods with low value added.

Figure 4: Trend of the top five products exported to China



One of the important points to be noted in this direct trade with China is that during the last ten years, exports to China were essentially based on two types of goods: wooden products and chromium ores. At the beginning, more specifically in 1995 and 1998, chromium ores accounted for more than half of Madagascar's exports (in value) to China. This share in total exports to China still reached 38% in 2007. Admittedly, Madagascar is not yet a large mineral-exporting country although it has quite a big potential of mineral and oil resources. Over the period 1995-2007, mineral exports, essentially made up of chromium, accounted for only 6.8% of total exports. But this share increased considerably from 2009 when the large mining projects of ilmenite extraction in the South (Quit Madagascar Minerals) and of cobalt in the East (Dynatec) will begin exporting.

It would also be necessary to mention that chromium exports have benefited from a favourable trend of prices since 2002. This improvement of prices is explained by the rise of the world demand, mainly that of China. This interest of China for chromium ores is justified by the increase in its need for the raw materials necessary for its expansion. In addition to the increase in Chinese demand for oil products, China is prospecting throughout the world and particularly in sub-Saharan Africa for the basic mining products to develop its industries. Oil and mining products on average accounted for 13% of Chinese imports between 1993 and

2007 and the annual growth of these imports reached 28% over this period, against 18% for all imports.

With regard to wood and woodworks, the export of this type of good took the place of chromium ores during the first half of the years 2000s. The sale of wood and woodworks constituted most of the goods exported to China for this period. In 2005, 83% of the value of exports to China came from the sale of this type of product. Nevertheless, within the framework of the promotion of the new “Madagascar naturally” vision and in order to slow down deforestation, the Malagasy authorities decreed the closing of forestry sites. This policy change led to a fall of the sale of wood and of wood works from 2006 and considering the importance of the sectors related to forestry development (wood, raffia and sisal) in trade with China, the overall value of exports to China also decelerated between 2005 and 2006 (a drop of 37%).

Indirect effects

Kaplinsky (2007) said that as regards the impacts of trade with China, the indirect effects would be much greater than the direct effects. However, if the latter are easier to assess, the former are much more complex to determine and difficult to quantify. Here, in order to assess the indirect impacts of China’s foreign trade on Madagascar’s exports, we began by determining the top ten export products of the Madagascar. Then, among these ten products, we identified those which are also exported by the Asian giant and those which are imported by the latter.

As already shown in the section devoted to the methodology, the sectors whose products are at the same time exported by Madagascar and sold by China are regarded as losing sectors because the entry of the Asian giant on these markets is assumed to cause a drop in prices. On the other hand, the sectors whose products are at the same time exported by Madagascar and bought by China are classified as gaining sectors insofar as the strong Chinese demand makes their prices increase.

Table 10: The top ten products exported by Madagascar

DESCRIPTION	SHARES IN EXPORTS BETWEEN 1997 AND 2007
Clothing and clothing accessories	34.47
Fish, crustaceans, molluscs and other aquatic invertebrates	17.09
Coffee, tea, cocoa, spices and derivatives	13.36
Petroleum, petroleum derivatives and related products	5.11
Vegetable and fruits	4.68
Papers, cartons and cellulose paste works, in paper or in carton	1.6
Manufactured non-metallic mineral articles	1.28
Raw fertiliser and raw minerals	1.21
Raw animal or plant matters	1.12
Sugars, sugar or honey preparations	1.12

Sources: Malagasy Customs Service, our own calculations

Table 10 presents Madagascar’s top ten export products between 1997 and 2007. Alone, these ten products brought in 79% of the country’s export earnings for this period. This table still shows a low diversification of Madagascar’s sources of foreign currency because the

export sales concentrate on three types of products: clothing, aquatic products and cash products (coffee, cocoa and spices). More than 60% of the value of the goods exported by Madagascar comes from the sale of these three types of products. The hundreds of varieties of other products share the remaining 40%.

Aquatic products and cash products have for a long time been the country's traditional sources of foreign currency. In the category of aquatic products are mainly found shrimps and in the group of cash products vanilla and coffee account for most of the exports. It should be noted that Madagascar is the first vanilla exporter in the world. Indeed, if the world demand for vanilla was estimated at 2,344 tons in 2005, Madagascar exported only 1,806 tons of it. Concerning the textile sector, it started taking off in 1989 when the country set up the special free zone regime. The special treatments granted to the enterprises benefiting from this regime have made it possible to attract many investors into the sector. This attraction has also been strengthened by the selection of Madagascar as a beneficiary of the African Growth and Opportunity Act (AGOA) programme initiated by the United States and intended to support development in Africa. Between 1997 and 2007, the textile and clothing sub-sector was consequently exporting a third of the goods which left Madagascar.

Table 11: Indirect gaining and losing sectors in exports

Top ten export products of Madagascar	Exported by China (losing sector)	Exported by China (gaining sector)
Clothing and clothing accessories	X	
Fish, crustaceans, molluscs and other aquatic invertebrates	X	
Coffee, tea, cocoa, spices and derivatives		
Petroleum, petroleum derivatives and related products		X
Vegetable and fruits	X	
Papers, cartons and cellulose paste works, in paper or in carton	X	
Manufactured non-metallic mineral articles		
Raw fertiliser and raw minerals		
Raw animal or plant matters		
Sugars, sugar or honey preparations		X

Table 11 reveals that among the ten sectors identified previously, only six are indirectly affected by China's foreign trade. Three of them manage to benefit from the existence of this trade whereas the remaining three others are penalised by it. In the group of gainers are found oil products, papers and sugar. In that of the losers are clothing and textile items, aquatic products and fruits and vegetables.

The sector exporting oil products can be regarded as an indirect gaining sector in the trade relation with China since the increasing demand expressed by China on this type of product should normally draw the prices upwards. Indeed, if one compares the trend of the export prices of these products in Madagascar with that of the value of the imports of oil products made by China, one finds that these two variables evolve in the same direction. Figure 7 contained in the annex testifies to this.

The same situation is also noted in the sector exporting sugar and preparations containing sugar and honey. This type of good is also imported by the Asian giant and this Chinese demand positively influences the trend of export price of this type of product. Figure 9 contained in the annex reveals that the trend of export prices of this type of good in

Madagascar on average follows that of the value of sugar imports from China with a short interval of one on average per year. When China buys more sugar, the export prices of this type show a rise one year afterwards in Madagascar; and conversely when the Chinese demand decelerates, export prices in Madagascar also drop the following year.

The case of the paper-making sector is a little special. In the 1990s and until the beginning of the 2000s, China's balance of trade on this sector was largely negative. China imported a great deal of paper and exported little of it. Madagascar benefited indirectly from this Chinese demand because as shown in figure 8 contained in the annex, the trend of the export prices of this type of product in Madagascar bears little resemblance to that of the value of China's exports in the 1990s. However, from 2003, China's paper sold abroad increased exponentially and this reversal of the situation generated an abrupt fall of prices which penalised Madagascar's paper-making industry.

Among the top potentially losing sectors is the textile and clothing sector. The exportation of this type of product constitutes one of Madagascar's main sources of foreign currency since the 1990s. However, when Chinese trade data are analysed, it is seen that this sector is entering into competition with China insofar as China also sells the same products abroad. Admittedly, figure 10 in the annex exposes a negative impact of the growth of the textile export of China on the prices the export of this product to Madagascar; but this effect of Chinese competition is relatively limited since Madagascar's exportation of this type of product is mainly intended for the US market and benefits from the specific advantage procured through the AGOA agreement.

The aquatic products export sector is also confronted with Chinese competition on the world market. In figure 12 in the annex, the export prices of Madagascar's aquatic products in the medium and long term evolve in the same direction as the value of the exports of China's aquatic products. But in the short run, one notes a weak negative relation between the two variables. When the increase in Chinese exports accelerates, the level of Malagasy export prices drops and, conversely, when the increase in Chinese exports decelerates, the level of Malagasy export prices rises. In this case, the sale of aquatic products on the world market by the Chinese threatens the Malagasy aquatic products sector.

The last export sector which would be penalised indirectly by the increasing trade relation with China is that of the fruit and vegetables exports. Indeed, these products are part of the top ten goods sold by Madagascar abroad. However, on the world market, they enter into competition with Chinese products insofar as China also exports vegetables. The consequence of this competition is visible in figure 13 in the annex. The growth of Chinese exports from the end of the 1990s and to half of the 2000s led to a fall of the export price of fruits and vegetables in Madagascar.

4.1.2. Gaining and losing sectors in imports

Direct effects

As pointed out earlier, the trade relation between Madagascar and China has considerably increased since the beginning of the 2000s. This trend is nevertheless unbalanced insofar as Madagascar's imports from China is largely more dynamic than exports to this country and the balance of trade deficit between the two countries becomes larger from year to year.

It is nevertheless necessary to note that these increasing imports from China are not necessarily bad for the Malagasy economy. According to the theoretical framework developed previously (see section 3), the Malagasy economy and the sectors concerned would be penalised by this trade only if Chinese imports enter into direct competition with the local industry. On the other hand, if this is not the case, the Malagasy economy and the sectors concerned would on the contrary benefit since they would benefit from low-cost imports.

In order to analyse the impact of the entry of Chinese products into Madagascar and to identify the gaining and losing sectors in this trade, we use approaches identical to those used in the analysis of exports. We thus start by identifying the top ten sectors concerned with direct imports from China. Then, we regard as losing sectors those whose types of imported goods are also produced at the local level and as gaining sectors those whose types of imported goods cannot be locally manufactured.

Table 12 - The top ten products imported from China

DESCRIPTION	SHARE IN IMPORTS COMING FROM CHINA BETWEEN 1997 AND 2007
Silk, woollen, cotton, linen threads and fabrics	29.1
Clothing and clothing accessories	12.4
Electric generators, transformers and conductors	9.78
Mechanical, electric and electronic engines, machines and apparatuses	6.85
Synthetic threads and fabrics	5.98
Vehicles, tractors and motorcycles	3.99
Iron, steel, iron and steel works	3.23
Rice and other cereals	2.69
Chemicals, drugs and pharmaceuticals	2
Shoes	1.89

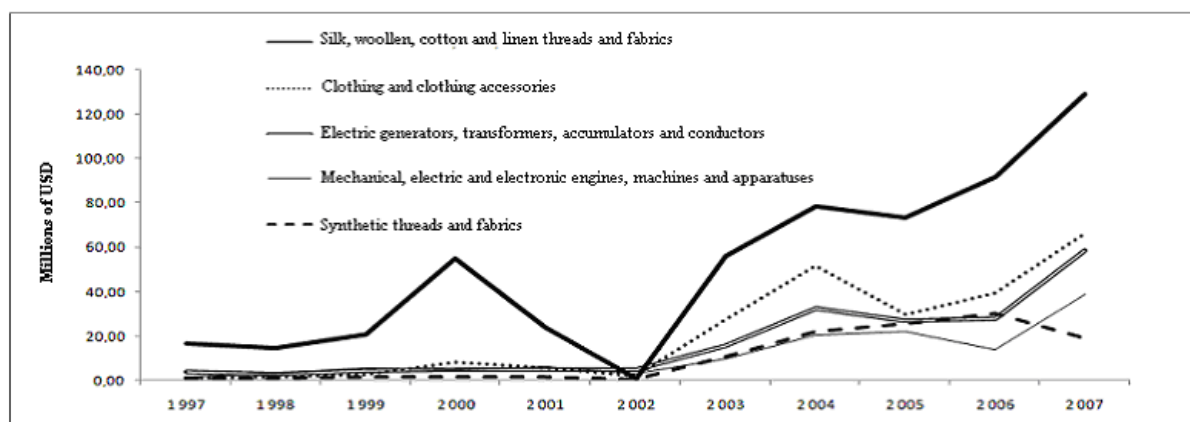
Sources: Customs Services, our own calculations

The top ten sectors and products concerned with imports from China are presented in table 12. The majority of these products relate to the textile sector. Indeed, almost half of the Madagascar's imports from China are made up of textile products. The statistics reveal that 35% of the products imported from China consist of raw materials intended for the textile industry such as silk, wool, cotton, linen or synthetic threads and fabrics and 12.4% are made of clothing and clothing accessories.

Electric generators, transformers, accumulators and conductors as well as engines, machines and mechanical, electric and electronic apparatuses are also part of these the top ten products imported from China. Thanks to these imports, "Made in China" electric household appliances are now increasing flooding the local market in Madagascar. A similar case is also noted on the automobile market because Chinese manufacturers are beginning to participate in the Malagasy local market.

Among these the top ten products are also found rice, cereals, iron and steel works, chemicals, drugs, pharmaceuticals and shoes. It should be noted that rice constitutes most of the rice and other cereals rubric of table 12. Indeed, even if Madagascar already produces a considerable quantity of rice, she still imports some from China.

Fig. 5 – Trend of the top five products imported from China



Sources: Customs Service, our calculations

Figure 5 presents the evolution in time of the entry of the top five products imported from China between 1997 and 2007. This history reveals a considerable growth of imports on almost all the five products after the socio-political crisis of 2002. The pace of the imports of raw materials intended for the textile sector is nevertheless slightly distinguished from those of the other products. The growth is more accelerated there. This is explained by the need for clothing-exporting enterprises to obtain low-cost supplies. It has been seen in the analysis of exports that clothing constitutes Madagascar's top source of foreign currency since the 1990s and it would then be necessary to find low-cost raw materials in order to be able to maintain the favourable trend of this activity.

Table 13 - Gaining and losing sectors in imports from China

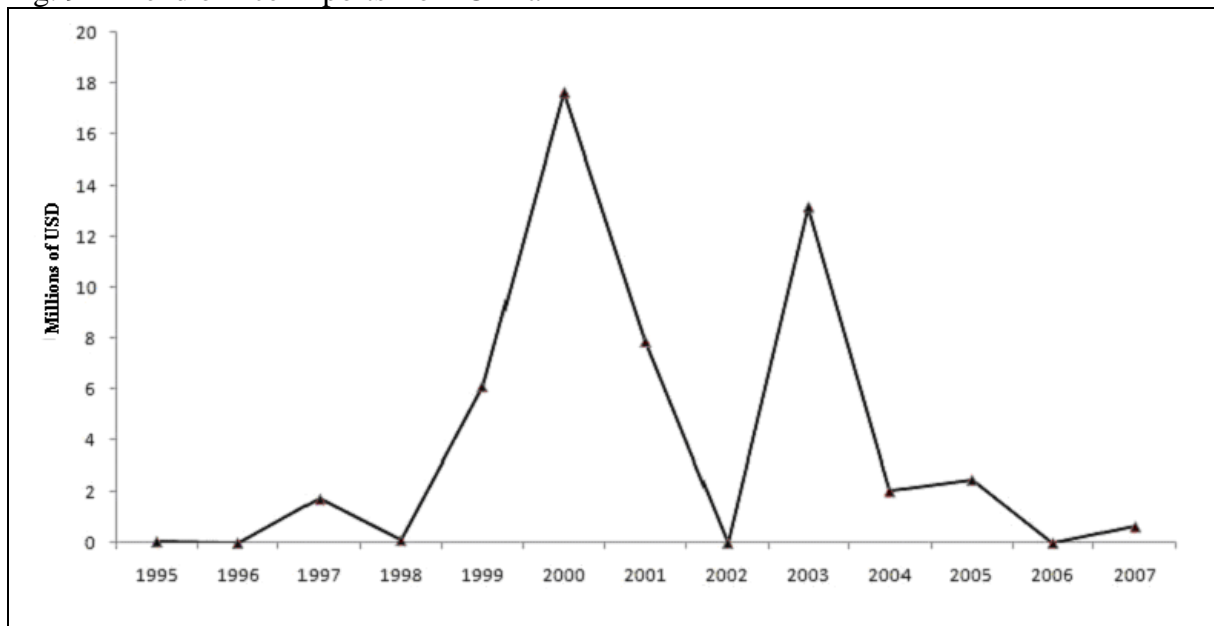
	Already produced locally (losing sector)	Not manufactured locally (gaining sector)
Top ten goods imported from China		
Silk, woollen, cotton, linen threads and fabrics	X	
Clothing and clothing accessories	X	
Electric generators, transformers and conductors		X
Mechanical, electric and electric engines, machines and apparatuses		X
Synthetic threads and fabrics		X
Vehicles, tractors and motorcycles		X
Iron, steel, iron and steel works		X
Rice and other cereals	X	
Chemicals, drugs and pharmaceuticals		X
Shoes	X	

This possibility of obtaining low-cost supplies is certainly a beneficial side for the clothing and clothing accessories sector but on the other hand it penalises the local enterprises which provide intermediate textile products. This Chinese competition puts local enterprises such as Cotona in difficulty and has even led to the closing of certain local enterprises such as

Hasima and Sotema. For this reason, the silk, wool, cotton and linen threads and fabrics manufacturing sector is classified among the losing sectors in the trade with China in table 9. As in most countries, the clothing and clothing accessories sector also suffers from the fierce competition of Chinese products in Madagascar. It is one of the most losing sectors insofar as “Made in China” clothing is increasingly gaining ground to the detriment of local manufactures on the Malagasy market. It is also the same in the case of the shoe-importing sector since Chinese shoes are currently flooding the local market and this is negatively affecting the activity of some local companies such as Bata and Aigle d’Or.

When table 13 is re-examined, it is found that the rice sector also appears among the losing sectors in trade with China. The case of this sector is, however, difficult to analyse insofar as on the one hand, rice imported from China competes ferociously with local producers but, on the other, it makes it possible to mitigate food insufficiency for critical periods. Indeed, rice is the staple food of Madagascans and yet its cultivation is often devastated by cyclones or tropical storms. After the passage of these natural disasters, the supply can hardly satisfy the demand and imports from China constitute the appropriate solution. It is for this reason that the Chinese rice imports presented in figure 6 seem to be occasional.

Fig. 9 – Trend of rice imports from China



This shared case of rice leads us to the sectors which would rather benefit from imports from China. The latter are primarily made up of the sectors which import manufactured goods such as electrical equipment, engines, machines, electric household appliances, etc. The vehicle, iron and steel works, like those of chemicals and pharmaceuticals sectors, are also part of the sectors which would manage to benefit from trade with China.

The Malagasy industrial fabric is still remains at the start-up stage and local enterprises are not yet capable of manufacturing these types of products. Thus, their imports from China do not at all constitute a threat either for the sectors concerned or for enterprises. On the contrary, imports from China constitute an alternative to the buying of these types of products at relatively high prices from the traditional trade partners such as France, Germany, the United States and Japan.

Indirect effects

As in the case of exports, Madagascar's imports could also be affected indirectly by China's foreign trade. If the large island imports goods which are also bought by China, it is penalised by it in so far as this Chinese demand pushes the prices upwards. On the other hand, if Madagascar imports goods which are already sold by China on the world market, it benefits from it because this Chinese supply pushes the prices downwards.

In order to identify gaining and losing import sectors as a result of these indirect effects, we first determine the top ten foreign products which enter into Madagascar because we cannot work on the thousands of products bought by the large island abroad. These the top ten imported products are presented by table 12. They are mainly made up of fuels, textile products, food products, vehicles and machines.

Table 14: The top ten products imported by Madagascar

DESCRIPTION	SHARES IN IMPORTS
Oil, derivatives of oil and related products	17.47
Threads, fashioned textile articles and related products	11.21
Road vehicles	6.01
Textile fibres and other combed wools and their wastes	5.17
Cereals and cereal preparations	4.33
Iron and steel	3.43
Machines and industrial appliances of general use	3.38
Papers and cartons	3.25
Electrical machines and appliances	2.86
Fish, crustaceans, molluscs and other aquatic invertebrates	2.35

Sources: Malagasy Customs Service, our own calculations

Table 14 shows the importance of fuels in Madagascar's imports. Almost a fifth of the value of Madagascar's imports come from the purchase of fuels abroad. This sector, however, appears among the losing sectors according to table 13 since China also imports oil and derivatives of oil. In addition, the Chinese demand for this type of product even manages to push prices upwards. Figure contained in the annex proves this.

Table 13: Indirect gaining and losing sectors in imports

Madagascar's top ten import products	Exported by China (gaining sector)	Imported by China (losing sector)
Oils, derivatives of oil and related products		X
Threads, fabrics, fashioned textile articles and related products		
Road vehicles		X
Textile fibres and other combed wools and their wastes	X	
Cereals and cereal preparations		

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Iron and steel		X
Machines and industrial appliances of general use	X	
Papers and cartons	X	
Electrical machines and appliances		
Fish, crustaceans, molluscs and other aquatic invertebrates	X	X
	X	
	X	

Among the losing sectors are also those of the importation of intermediate textile products such as threads and textile fibres, fabrics, etc. These products are also demanded by China to keep the textile sector working. Thus, it is possible that Malagasy enterprises enter into competition with China in the purchase of this type of goods on the world market. On the other hand, it has been seen earlier in the analysis of the direct effects of imports that a considerable part of Malagasy imports of textile inputs comes from China.

The last losing sector is that of importation of machines and industrial appliances. In her industrialisation process, China imports many industrial machines and appliances. In this case, she enters into competition with Malagasy local industries when the latter want to change their production equipment or when they want to increase their production capacity by buying new machines. The investment of the Malagasy industrial sector is then penalised by this Chinese industrialisation process. As in the preceding case of textile inputs, this conclusion is also to be relativised and necessitates a thorough distinction of the types of machines for which Madagascar enters into competition with China as regards imports.

Besides these losing sectors, table 15 reveals six gaining sectors. Among the latter are those of importation of vehicles and electric machines. Indeed, the latter are part of the Chinese goods which are currently flooding the world market. The arrival of China on these market segments is giving alternatives to consumers and making prices much lower. In addition, Malagasy consumers, like those of other countries, are also taking advantage of this change.

The food importation sector is also entering the group of the sectors benefiting from the foreign trade maintained by China. Cereals and cereal preparations as well as fish and preparations of aquatic products, which appear among the top ten import products of Madagascar are also sold by China abroad and consequently undergo a drop in prices.

5. Overall analysis

As mentioned earlier, this study also used as a much more sophisticated method, the calculable general equilibrium model of (CGEM) to analyse the impacts of trade with China on Madagascar's economy. This model, which is used by the Malagasy administration, is inspired by that of Cameron and is the same as that of Davis, De Mello and Robinson in 1970. In the beginning, this model considered only three sectors (agriculture, industry and service), but to take account of the activities most affected by the China-Madagascar relation, we disaggregated it into ten branches. These ten branches are presented in table 16 below:

Table 16: The activities most affected by the economic relation with China

SECTOR	DESCRIPTION
AGR	AGRICULTURE
OAS	OTHER AGRICULTURAL SECTORS
MA	MINING ACTIVITY
OMA	OTHER MINING ACTIVITY
TEX	TEXTILE AND LEATHER MANUFACTURING
IND	OTHER INDUSTRIES
PWB	PUBLIC WORKS AND BUILDINGS
OS	OTHER SERVICES
COM	COMMERCE
ADM	ADMINISTRATION

5.1 Hypothesis on the variation of imports from China and of exports to China

In this analysis, we began with the hypothesis on the variations of exports to China and of imports from China and we simulated the consequences of these variations on global variables and sectoral variables by making the model work. The hypotheses selected are presented in table 17. They correspond to the variations of imports from China and exports to this country between 2006 and 2007.

Table 17: Variations of imports and exports between 2006 and 2007

	Imports from China	Exports to China
OMA	1.05	0.03
AGR	1.01	0.91
MA	0.31	0.02
IND	0.33	0.02
OS	0.04	0.00

The choice of this period is conditioned by the search for reliability for the analysis. It is justified by the stability of the economic situation during this period. The data of the earlier years either are affected by the political and socio-economic crisis of 2002, or influenced by the massive tax reduction of 2003-2004. In addition, the variations of imports and exports presented in table 15 really reflect the evolution of the Madagascar's trade with China these last years. In fact, since 2003, imports from China show a much larger acceleration compared to that of exports to this country and the trade deficit between the two countries is increasingly growing larger.

Between 2006 and 2007, five branches are directly and mainly concerned by the trade relations with China. As regards exports, four branches are affected: mining activity (MA),

other mining activities (OMA), agriculture (AGR) and other industrial activities (IND). As regards imports, one more branch has been added to these four already cited within the framework of exports: the other services (OS) branch.

5.2. Effects of the variation of imports from China

The variations of imports from China presented in table 17 lead to changes both at the sectoral level and at the global level. When one looks at the consequences on prices (see table 18), one finds, for example, that the growth of the inflows of Chinese products cause a drop in prices whatever the branch. This confirms the hypothesis according to which Chinese products have relatively lower costs and consequently push prices downwards.

The real effects are on the other hand divided. On the one hand, the increase in imports from China is generating an improvement of the activity for some branches such as those of agricultural activity (AGR) and public works and buildings (PWB). The arrival of low- priced fertilisers and building materials from China would give a breath to these two branches by offering an opportunity to produce at lower costs. However, on the other hand, one also notes that the increasing inflows of Chinese products leads to a deceleration of activity in other branches such a those of other agricultural activities (OAS), of industrial activities (IND) and other services (OS). This would be partly due to the difficulty encountered by local enterprises in the face of the ferocious competition exerted by these Chinese products.

Tab. 16: Implications of imports on sectoral activities

Variable	Single value	Sector					
		AGR	OAS	IND	PWB	OS	ADMIN
pd		-0,35	-0,30	-0,24	-0,20	-0,20	-0,20
pm		0	0	0	0	0	0
pe		-0,10	-0,10	0	0	0	0
pk		-0,10	-0,10	-0,10	-0,10	-0,10	-0,10
px		-0,15	-0,10	-0,20	-0,20	-0,20	-0,20
p		-0,20	-0,30	-0,14	-0,20	-0,20	-0,20
pva		-0,05	-0,16	-0,23	-0,22	-0,14	-0,15
pwtm		0	0	0	0	0	0
pwe		-0,12	-0,06	-0,02	-0,02	0	0
tm		0	0	0	0	0	0
x		0,01	-0,04	-0,03	0,03	-0,01	0
xd		0,04	0,03	-0,05	0,03	0	0
xcd		-0,14	-0,04	-0,11	0,03	-0,01	0,00
e		0,11	0,08	0,07	0	0,07	0
m		0,50	0	0,02	0	-0,05	0
k		0	0	0	0	0	0
wa	-0,28						
ls		0	0	0	0	0	0
l		0,10	0	-0,02	0	0	0
int		0,01	-0,06	-0,02	-0,02	0	-0,02
cd		-0,001	0	-0,05	-0,06	-0,02	-0,02
gd	0						
ld		0,01	0	0,02	0,05	0	0
dsc		0,04	0	-0,09	0	0	0
y	-0,21						
gr	-0,07						
tariff	0,04						
indtax	-0,16						
duty	0						
gdtot	0						
mps	0						
hhsav	-0,21						
govsav	0,30						
deprecia	-0,09						
savings	-0,07						
fsav	0						
dk		0,01	0	0,01	0,00	0,06	0,07

These sectoral effects, particularly the nominal effects, are also reflected at the global level. According to table 19 summarising the effects of Chinese imports on the overall economy in Madagascar, the positive variation of the inflow of Chinese products in Madagascar leads to a deceleration of inflation in the country. The buying of Chinese products constitutes a financially attractive alternative that would greatly benefit not only Malagasy consumers but also entrepreneurs needing imported inputs.

TAB. 17 – **Global effects of the variation of imports**

Variable	Variation as %
GDP	0.01
<i>Inflation</i>	-0.21
<i>pd</i>	-0.25
<i>pm</i>	0.00
<i>pe</i>	-0.03
<i>pk</i>	-0.10
<i>px</i>	-0.18
<i>p</i>	-0.21
<i>pva</i>	-0.16
<i>pmw</i>	0.00
<i>pwe</i>	-0.04

* Estimation on the basis of the value added

5.3 Effects of the variation of exports to China

The effects of the increase in exports to China seem to be in part the opposite of what one sees in imports, especially as regards price. Indeed, the increase in the sale to China would raise the overall demand and push prices upwards. It is for this reason that one finds an increase in the prices of domestic goods (*pd*) in most of the sectors appearing in table 20.

TAB. 18 – Implications of the variation of exports on sectoral activities

Variable	Valeur unique	Sector					
		AGR	AAG	IND	BTP	SCE	APU
pd		0.20	6.60	0.10	0	0.10	0.10
pm		0	0	0	0	0	0
pe		0.05	-0.20	0	0	0	0
pk		0	0	0	0	0	0
px		0.1	1.4	0.08	0	0.1	0.1
p		0.1	6.6	0.06	0	0.1	0.1
pva		0,053	2.08	0	0	0,138	0,154
pwm		0	0	0	0	0	0
pwe		0,052	-0,210	0	0	0,025	0
tm		0	0	0	0	0	0
x		-0,012	0,014	-0,012	-0,019	0,009	0,002
xd		-0,019	0,875	-0,052	-0,019	0,002	0,002
xxd		-0,238	0	-0,046	-0,019	0,006	0,002
e		-0,023	1,13	-0,072	0	-0,021	0
m		0,243	4,35	0,036	0	0,034	0
k		0	0	0	0	0	0
wa	0,054						
ls	0						
l		-0,034	0	0,003	0	0	0
int		-0,035	-0,130	-0,042	-0,065	-0,012	-0,045
od		0,007		0,009	0,026	0,031	0,027
gd	0						
id		-0,015	0,001	-0,009	0	0	0
dst		-0,028	0,878	-0,033	0	0	0
y	0,092						
gr	0,059						
tariff	0,025						
indtax	0,085						
duty	0						
gdtot	0						
mips	0						
hhsav	0,093						
govsav	0,052						
deprecia	0,030						
savings	0,054						
fsav	0						
dk		0,0004	0	0,0185	0,0097	-0,0171	-0,0194

This stimulation of demand, generated by the increase in export to China, boosts economic activity in three branches: those of other agricultural activities (OAS), other services (OS) and administration (ADM). Following the increase in exports to China, the supply of composite goods (x) and domestic production (xd) in these branches of activity increases. It is also interesting to note the existence of a domino effect in the branch of agricultural activities: (AGR) and (OAS). If in the hypotheses exports of the agriculture branch (AGR) increases by 0.91 points, this leads to an increase in export of 1.13 points and domestic production of 0.875 points in the branch of other agricultural activities (OAS).

What seems to be counter-intuitive in the results presented in table 20 is to find a negative effect of the variation of exports to China on the supply of composite goods and domestic

production in the branches of agriculture (AGR), other industries (IND) and public works and buildings (PWB) whereas normally, one expects a stimulation of activity.

TAB. 19 – Global effects of the variation of exports

Variable	Variation as %
GDP	0.13
Inflation	1.16
<i>pd</i>	1.18
<i>pm</i>	0
<i>pe</i>	-0.03
<i>pk</i>	0
<i>px</i>	0.30
<i>p</i>	1.16
<i>pva</i>	0.40
<i>pwm</i>	0
<i>pwe</i>	-0.02

* Estimation of the variation on the basis of the value added

In spite of this unexpected effect, the impacts on the overall economy seem to be in conformity with economic intuition. According to the results presented by table 21, as a result the positive variation of exports to China, the gross domestic product gains an additional 0.13 points and inflation increases by 1.16 points.

5.4 Combined effects of the variation of imports from China and exports to China

In economic reality, trade relations with China do not stop solely with the importation of goods from China or exports to this country. In order to reach more realism in the results, it is necessary to combine the two phenomena. This combination of the hypotheses on the variations of imports from China with those on the variations of exports to China enables us to obtain the final effects on the Malagasy economy.

The sectoral effects of the combination of the hypotheses on the variation of imports from China with those on the variations of exports to this country are developed in table 22 below. The table reveals that the initial increase in Chinese imports and exports to China stimulates activity in the branches of agriculture (AGR), other agricultural activities (OAS), public works and buildings (PWB) and other services (OS). Domestic production (xd) indeed shows an increase in these branches.

At the level of prices, a fall is witnessed in the prices of domestic goods (pd) in most of the branches. The branches of other agricultural activities (OAS) and other industrial activities (IND) are nevertheless an exception since domestic prices increase in them. This inflation is particularly higher in the branch of other agricultural activities because it reaches the 6.3 points.

TAB. 20 – Combined effects of the variations of exports on sectoral activities

Variable	Single Value	Sector					
		AGR	AOS	IND	PWB	OS	ADMIN
pd		-0,2	6,3	0,917	-0,1	-0,1	-0,1
pm		0	0	0	0	0	0
pe		-0,1	-0,1	-0,1	-0,3	0	0
pk		0	0	0	0	-0,1	-0,1
px		-0,1	1,3	-0,1	-0,1	-0,1	-0,1
p		-0,1	6,3	-0,08	-0,1	-0,1	-0,1
pva		-0,053	1,92	-0,228	-0,222	-0,138	-0,154
pwm		0	0	0	0	0	0
pwe		-0,063	-0,273	0,004		-0,021	
tm		0	0	0	0	0	0
x		-0,005	-0,028	-0,038	0,011	-0,004	-0,001
xd		0,062	0,905	-0,108	0,011	0,005	-0,001
xcd		-0,377	-0,056	-0,149	0,011	-0,002	-0,001
e		0,095	1,195	0,004		0,050	
m		0,719	8,696	0,059		-0,019	
k		0	0	0	0	0	0
wa	-0,054						
ls	0						
l		0,068	0	-0,026	0	0	0
int		-0,026	-0,178	-0,064	-0,093	-0,014	-0,061
cd		0,006	0	-0,040	-0,026	0,007	0,009
gd	0						
id		0,015		0,016	0,037		
dst		0,016	0,878	-0,119			
y	-0,119						
gr	-0,013						
tariff	0,064						
indtax	-0,071						
duty							
gdtot	0						
mps	0						
hhsav	-0,119						
govsav	0,348						
deprecia	-0,061						
savings	-0,015						
fsav	0						
dk		0,013	0,006	0,015	0,005	0,049	0,046

With regard to the global effects, one witnesses not only an acceleration of inflation but also more economic growth. These results are presented in table 23. Following the increase in imports from China and exports to China, inflation increases by 0.97 points and the GDP increases by 0.15 points.

TAB. 21 – Global effects of the variations of imports and exports

Variable	Variation as %
GDP	0.15
Inflation	0.97
<i>pd</i>	1.12
<i>pm</i>	0
<i>pe</i>	-0.1
<i>pk</i>	-0.03
<i>px</i>	0.13
<i>p</i>	0.97
<i>pva</i>	0.19
<i>pwm</i>	0
<i>pwe</i>	-0.09

* Estimation of the variation on the basis of the value added

6. Conclusion

The rapid economic expansion and foreign trade maintained by the Chinese in the last few years raise many questions with regard to their possible impacts both on the world economy and on the economy in each country. At the level of developing countries on the one hand, one is content with the trend of the situation insofar as China is turning to them in its search for the raw materials necessary for its industrialisation. However, on the other hand, one is concerned about the consequences of Chinese competition on domestic activities.

In order to answer these questions, the present research attempts to assess the possible impacts of the growing trade maintained by China on the Madagascar's economy and to determine if the country benefits from this situation or is instead penalised by it. Three different but complementary methodological tools are used in order to achieve this objective: a documentary and legal study, a descriptive analysis and a calculable general equilibrium model (CGEM).

The legal and documentary analysis reveals that Malagasy products are given a preferential rate on entry into China and consequently have the possibility of penetrating the Chinese market. On the other hand, as regards investment, an agreement has been signed between the government of the Peoples' Republic of China and the government of the Republic of Madagascar in order to ensure reciprocal promotion and protection of investments between the two countries.

The putting in place of these legal frameworks favourable to business has born fruits since trade with China has considerably increased lately. Imports from China have multiplied by four in a space of ten years. As regards exports, if China was not even among the top 20 destinations of the Malagasy products, currently it is in the 8th place.

In spite of these favourable trends, the balance of trade between Madagascar and China still remains negative and the deficit has been increasing from year to year since 2003. The reasons are multiple but the primary sources are two. The first lies in the difference of acceleration of the variations. Imports in volume increase more quickly than exports in volume. The second comes from the very nature of the goods traded. If exports comprise the sale of primary goods such as wood and raffia, imports are instead made up of goods with high value added such as television sets and recently road vehicles.

This deficit of the balance of trade between the two countries is not necessarily bad for Madagascar. The imports surplus could be beneficial for Madagascar when these purchases of Chinese products do not compete with the local industry but constitute an alternative to the more expensive imports coming from other countries, particularly from the West. The importation of tires, bicycles, television sets and clocks enters into this situation. In this case, the local industry will not be destroyed but is able on the contrary to be supplied with low-cost inputs. Consumers also benefit from it since they can satisfy their needs while spending less.

Some sectors also indirectly benefit from the foreign trade maintained by China. The importation of road vehicles, cereals and cereal preparations, iron and steel and machines and electrical appliances benefit, for example, from the Chinese supply. As China exports these

products on the world market, their international prices show a downward trend and the Malagasy sectors concerned consequently manage to reduce their costs of importation.

Imports can on the other hand be directly or indirectly penalising for the economy in Madagascar. It acts directly and negatively when Chinese products which enter into Madagascar destroy the local industry and makes the economy lose jobs. Here, one can cite the case of imports of textile products which negatively affect the activity of some local enterprises such as Hasima and Cotona. Some enterprises such as Sotema have even had to close their doors. Imports are indirectly and negatively affected by China's rapid economic expansion and opening up when products strongly demanded by China are bought abroad. Here, one can cite the case of oil. Because of China's increasing demand the world price of this product shoots up and Madagascar is forced to obtain supplies at high prices.

Concerning the case of Madagascar's exports, the sale of Malagasy products in China should normally be beneficial both for the sector concerned and for the whole economy. If the Malagasy sector manages to penetrate the Chinese market, the market share of the sector concerned and the country abroad increases and the overall economic activity also follows this trend thanks to domino effects. The wood and raffia sectors are among those which directly benefit from this Chinese opening up.

Malagasy exports can also benefit indirectly from the growing external trade maintained by China. The sugar export sector is, for example, among the sectors concerned about this situation. China buys this type of product and even if Madagascar does not sell its sugar to China directly, the demand expressed by China on the world market pushes up prices and will make Malagasy export earnings increase.

In some cases, this indirect effect can on the other hand be both negative and penalising for the sector concerned and the economy in general. This is typically the case of the exportation of clothing. The exportation of clothing and clothing accessories constitutes one of Madagascar's top sources of foreign currency. However, by selling this category of goods abroad, Madagascar and the exporting sector enter into competition with China and will be penalised by a drop in prices. Fortunately, most of the clothing exported by Madagascar aims at the US market and benefits from the preferential tariff offered by the AGOA programme.

The results obtained in the calculable general equilibrium model (CGEM) are consistent with those of the sectoral descriptive analyses which have just been presented. This model reveals that the growing entry of Chinese products causes a drop in prices and engenders a deceleration of activity in some economic branches. This is typically the case of the branch of industrial activities. This model also reveals that Madagascar's exports to China push prices upwards and stimulates the activity of the economic branches concerned.

The analyses carried out in this research show that whereas the trade relation with China can at the same time be beneficial and penalising both for the sectors of activity and for Madagascar's overall economy. However, despite the existence of the negative effects, it is no longer a matter of backtracking in the trade relation with China, considering the importance of the globalisation process in the life of contemporary society. What it would be necessary to do is to find a policy which would minimise the damage caused by these possible negative effects.

Within this framework, since some sectors, like that of textiles, undergo full force of the tough competition of Chinese products, it would be preferable introduce measures intended to support them so that they resist and maintain their existence. Temporary measures such as tax exemption or the granting of subsidies would, for example, come in handy for the short and medium term. However, for the long term, it would be necessary to go further by helping them to improve their competitiveness.

This progression of competitiveness could be achieved if the State offers material support by developing and improving infrastructures, facilitating investment, giving enterprises the opportunity to get equipment with modern technologies which enable them to increase their productivity and by strengthening training in order to improve competence of the workforce. These last measures would allow enterprises to bank on quality products and to distinguish themselves from Chinese products.

As shown by Winters and Yusuf (2007), even if some of the above-mentioned measures are implemented, the competitiveness of local enterprises can worsen when, following the exportation of commodities to China, the real foreign exchange rate, for example, appreciates. In this case, it would be necessary that the State manages not only to manage its monetary policies well in order to avoid abrupt monetary fluctuations but also to redeploy the resources drawn from exports of commodities in the projects aiming at improving the competitiveness of the other sectors.

Finally, in order to avoid dependence on some sectors and to decrease the risks of economic shocks, the Malagasy State should aim at the diversification of the economic exchanges carried out with China. This diversification could be achieved by putting Malagasy entrepreneurs in touch with their Chinese colleagues and by encouraging Chinese capitalists to invest in Madagascar. Admittedly, the creation of Malagasy Chinese Business Council and the signature of Act n° 2006-027 relating to an agreement on the reciprocal promotion and protection of investments between the government of the People's Republic of China and the government of the Republic of Madagascar contribute to this objective but this is still far from being sufficient. It would be necessary not only to implement this new law well but also to sensitise investors with regard to its existence so that the latter are reassured and encouraged to invest in Madagascar.

ANNEX A

A.1 Graphs comparing the trend of export prices with that of China's exports in value

FIG. 8 – Trends of oil imports by China and of the export price of this product in Madagascar

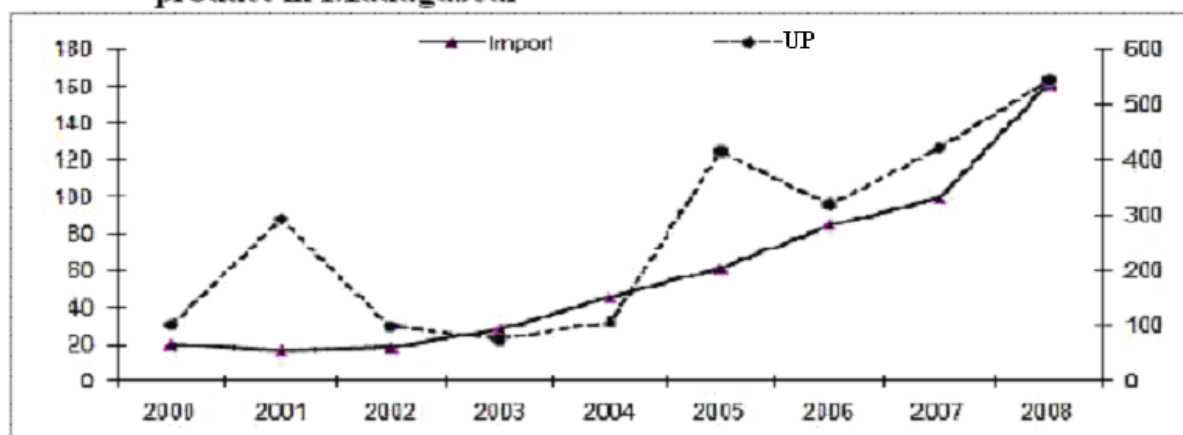


FIG. 9 – Trends of the importation and exportation of paper by China and the export price of this product in Madagascar

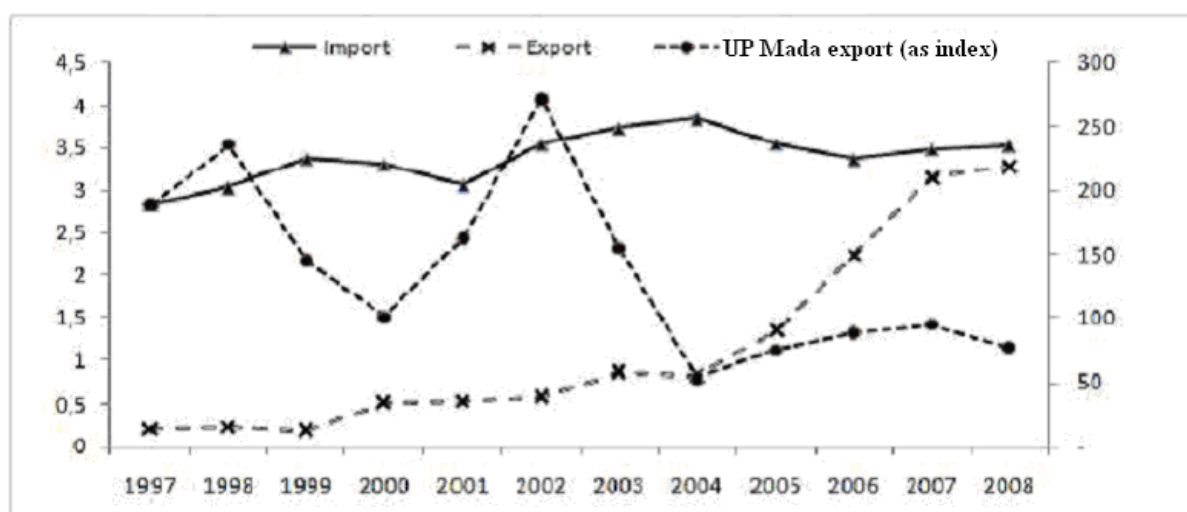


FIG. 10 – Trends of the importation of sugar by China and of the export price of this product in Madagascar

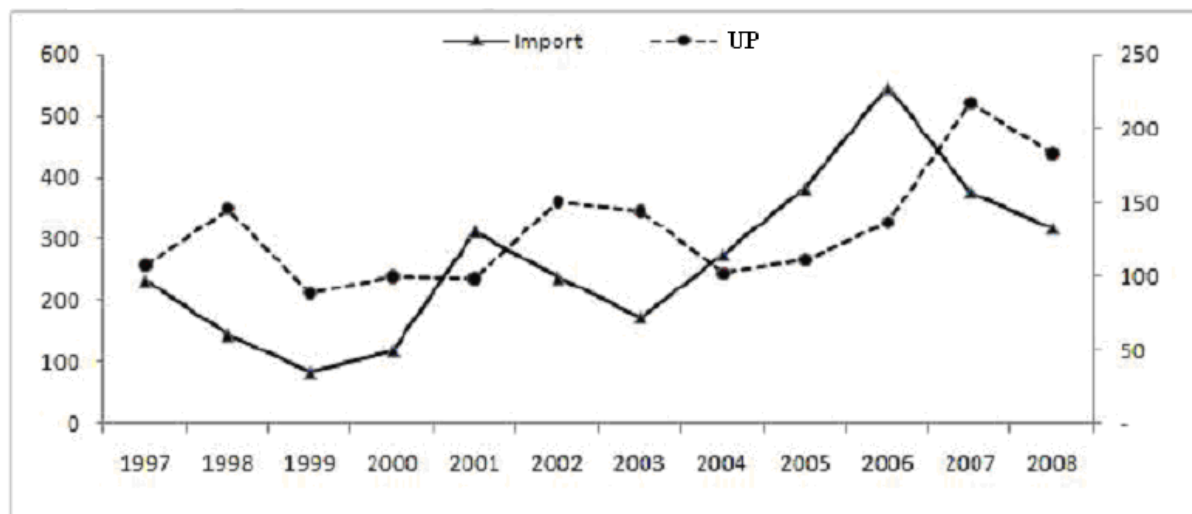


FIG. 11 – Trends of the exportation of clothing by China and the exportation of this product in Madagascar

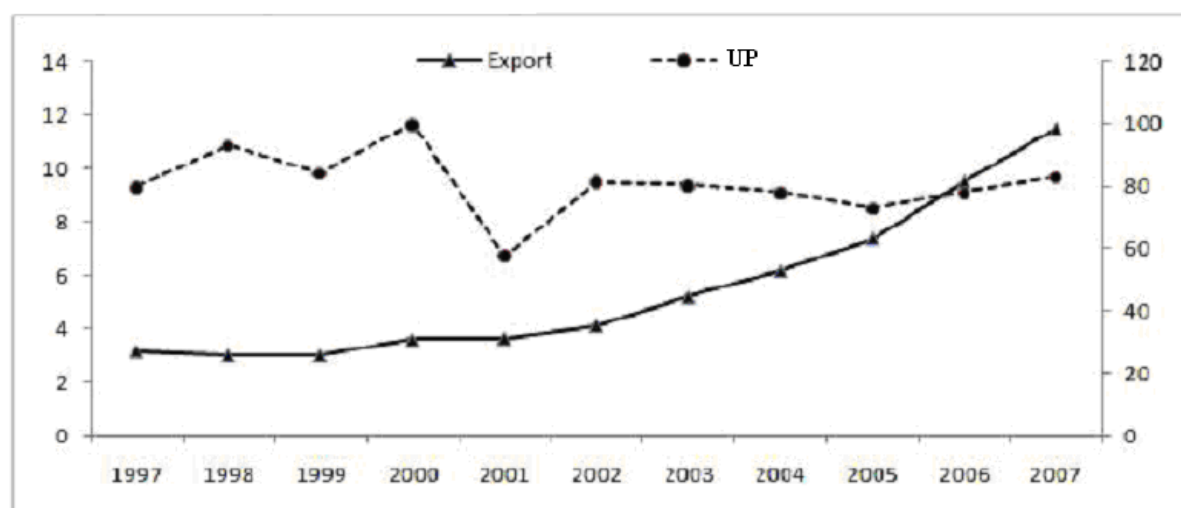


FIG. 12 – Trends of the exportation of threads and fabrics by China and the export price of these products in Madagascar

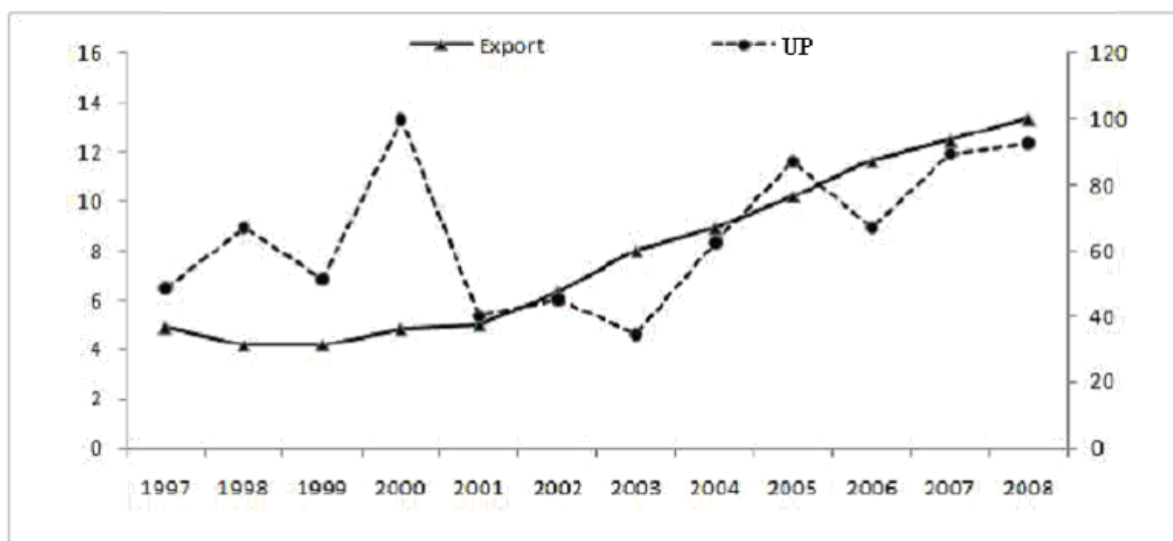


FIG. 13 – Trends of the exportation of aquatic products by China and the export price of these products in Madagascar

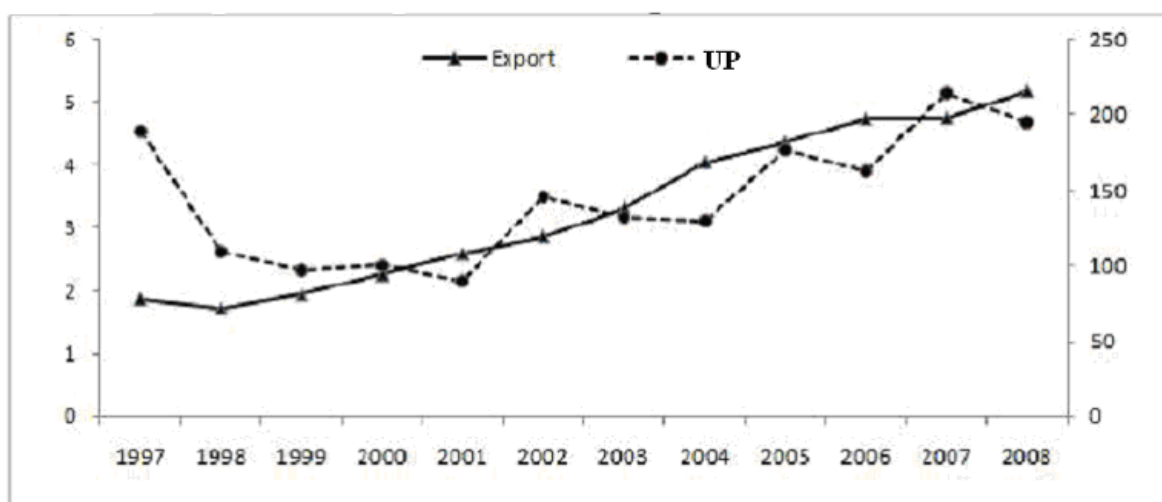
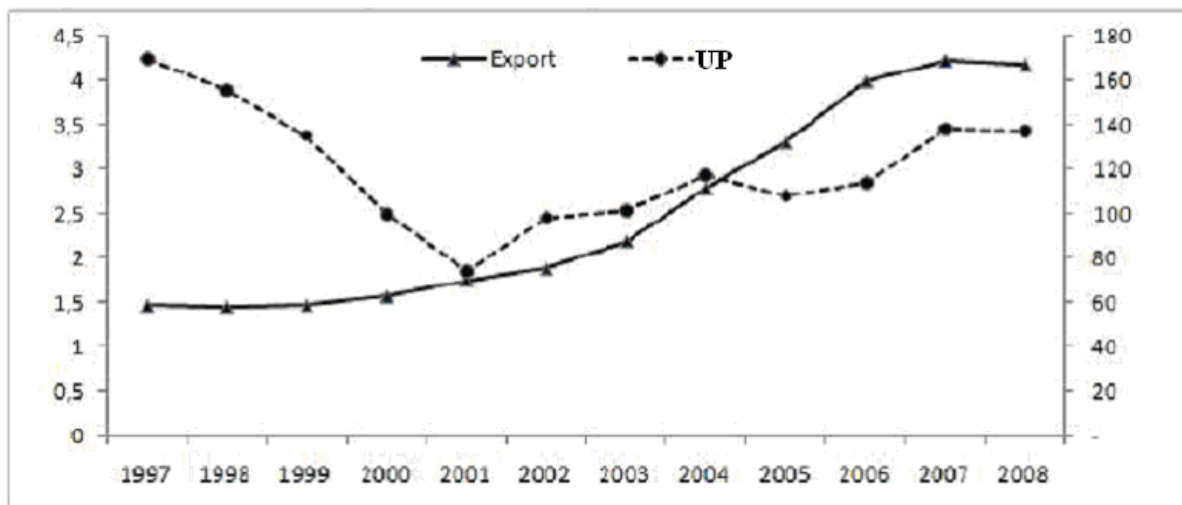


FIG. 14 – Trends of the exportation of vegetables by China and the export price of fruits and vegetables in Madagascar



ANNEX B

B.1 Equations of the static CGE model in an open economy

Wages, employment

$$X_i = f(\bar{A}_i, \bar{K}_i, LD_i)$$

$$w = PVA_i \frac{\partial X_i}{\partial LD_i}$$

$$\sum_i LD_i = \bar{L}S$$

Formation of incomes and savings :

Household incomes :

$$YM = \sum_i w.LD_i$$

Income of enterprises :

$$YE = \sum_i (PVA_i X_i - LD_i)$$

Government revenue :

$$YG = \sum_i LD_i + \sum_i ts_i (PVA_i X_i - wLD_i) + \sum_i x_i P X_i X_i \\ + \sum_i \tau_{mi} \bar{E}.PWM_i^* M_i + \sum_i \tau_{ei} \bar{E}.EX_i$$

Total savings :

$$S = sm.(1 - \tau_y)YM + (1 - ts)YE + YG - \sum_i p_i CG + \bar{E}.F'$$

Demand for goods and services

Final consumption of households :

$$CM = (I - sm - ty) . YM$$

Consumption of households by product :

$$Ci = \beta_i^c \frac{CM}{Pi}$$

Public consumption :

$$(O)$$

Prices of investment : $PKi = \sum_i Pi . aij$

Intermediary goods :

$$Cii = \sum_i aij . Xj$$

Exports :

$$Xi = B_i^e . [yi . EX_i^{\sigma_e} + (I - yi) . DS_i^{\sigma_e}]^{\frac{1}{\sigma_e}}$$

$$\frac{EXi}{DSi} = \left[\frac{I - yi}{yi} \right]^{\sigma_e} \cdot \left[\frac{PEi}{PDi} \right]^{\sigma_e}$$

Imports :

$$Q_i = B_i^m \cdot [\delta_i M_i^{\sigma_i} + (I - \delta_i) DD_i^{\sigma_i}]^{\frac{1}{\sigma_i}}$$

$$\frac{M_i}{DD_i} = \left[\frac{\delta_i}{I - \delta_i} \right]^{\frac{1}{\sigma_i}} \cdot \left[\frac{PD_i}{PM_i} \right]^{\frac{1}{\sigma_i}}$$

Prices :

$$PM_i = \overline{PWM_i} \cdot \bar{E} \cdot (1 + tmi)$$

$$PE_i = \frac{\overline{PWE_i} \cdot \bar{E} \cdot (I + tmi)}{I + te_i}$$

$$Pi = \frac{I}{B_i^m} \cdot [\delta_i^{\sigma_i} PM_i^{I - \sigma_i} + (I - \delta_i)^{\sigma_i} PD_i^{I - \sigma_i}]^{\frac{1}{\sigma_i}}$$

$$PX_i = \frac{I}{B_i^x} \cdot [(y_i^{\sigma_i} PE_i^{I - \sigma_i}) + (I - y_i)^{\sigma_i}]^{\frac{1}{I - \sigma_i}}$$

$$PVA_i = PX_i \cdot (I - xi) - \sum_j a_{ji} \cdot P_j$$

Condition of equilibrium on the goods and services market :

$$Q_i = C_i + CG_i + CI_i + I_i$$

$$DS_i = DD_i$$

Equilibrium of the current balance (in foreign currency)

$$\sum_i PWM_i \cdot M_i - \sum_i PWE_i \cdot EX_i - F' = 0$$

Cash :

$$\sum_i Q_i \cdot P_i = \overline{PINDEX}$$

Total of equations: 18n+8 of which 18n+7 are independent :

B.1.1 Variables and parameters of the CGEM model

Endogenous variables:

X_i : production in volume

W : Wage rates

Y^M : Household incomes :

Y^G : Domestic prices of exports

$P E_i$: Prices of composite goods

P_i : Total household consumption

C^M : Public consumption of good i (in volume)

$C G_i$: Prices of capital

$P K_i$: Exports in volume

$E X_i$: Prices of domestic goods

$P D_i$: Imports in volume

F^* : External financing in foreign currency

Exogenous variables :

K_i : Stock of capital

$P I N D E X$: Level of prices

$P W E^*$: World prices of exports in foreign currency

$C G$: Total public consumption in volume

Parameters

A_i : coefficient of technical progress

T_i : Taxation rate

S_m : propensity to save

F_i : coefficient of distribution of public savings

H_i : coefficient of distribution of investment

H_{ij} : matrix of investment coefficients

A_{ij} : matrix of technical coefficients

B_i^* : parameter of dimension of the CET function

B_i^m : parameter of dimension of the CES function

LD_i : demand for labour

PVA_i : price of the value added

YE : income of enterprises

PX_i : production price

S : total savings

S_i : household consumption of good i

L_i : investment by sector of origin

C_{li} : intermediate consumption of good i

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