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# Export Processing Zones in Madagascar: an Endangered Success Story

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## **EXPORT PROCESSING ZONES IN MADAGASCAR: AN ENDANGERED SUCCESS STORY**

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### **RESUME**

Le succès de la Zone Franche d'exportation à Madagascar depuis 1990 constitue un cas unique en Afrique avec celui de l'île Maurice. Ce papier montre que la Zone Franche a eu un impact macro-économique très important en termes d'exportations et d'emplois. Grâce à elle, Madagascar était ainsi devenu le deuxième exportateur africain de produits de l'habillement derrière l'île Maurice avant la crise politique de 2002. Les salaires moyens versés dans la Zone Franche sont inférieurs à ceux des autres secteurs formels d'activité. Mais cet écart est dû aux caractéristiques de la main-d'œuvre employée, sachant que nos estimations ne mettent pas en évidence de différences significatives dans le mode de rémunération salariale entre la Zone Franche et le reste de l'économie. Par ailleurs, les conditions sociales dans la Zone Franche sont meilleures. Nous concluons en montrant que l'avenir de la Zone Franche est menacé par le nouveau cadre commercial multilatéral.

### **ABSTRACT**

The success of export processing zones in Madagascar, or Zone Franche, since 1990 is an isolated case in Africa, apart from Mauritius. This paper explains that Zone Franche has had a very significant macro-economic impact in terms of exports and jobs. Thanks to Zone Franche, before the 2002 crisis Madagascar had become the second largest African exporter of clothing, after Mauritius. The average wages paid in Zone Franche are lower than in the other formal sectors of activity, which is due to the characteristics of the labour employed. On the contrary, social conditions are better. The paper concludes that the future of Zone Franche is threatened by the new multilateral trade framework.

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## INTRODUCTION

There has been a significant increase in the numbers of Export Processing Zones (EPZs) set up in developing countries in recent years. According to the ILO (2003), 116 countries had introduced such systems in 2002 compared with just 25 in 1975. During the same period, total employment in EPZs worldwide rose from less than 1 million to 13 million employees excluding China (ILO, 2003). This expansion can be explained by the fact that nearly all of these countries have now adopted export-led growth policies, which have encouraged them to actively promote foreign investment.

In economic theory, EPZs are a second-best optimum, consisting in compensating for removing one distortion (a customs duty) by introducing another (a subsidy). This implies that the impact of these systems on well-being in the host country is, in principle, undetermined, if distributive or dynamic effects such as transfers of technology or competencies are not taken into account (Jenkins, Esquivel & Larrain., 1998). Whatever the case may be, such transfers are probably limited due to the low level of integration of the EPZs into the local economy (by nature, duty free imports encourage minimal local integration) and the poor qualifications of the labour employed (Cling, Gros, Letilly, Martinet & Valersteinas., 2002).

Despite this uncertainty, most empirical cost-benefit analyses underline the returns generated by the EPZs, particularly in terms of external revenues and employment (Jayanthakumaran, 2003; Warr, 1989; Jenkins *et al.*, 1998).

The results of these studies are less categorical when it comes to the wages paid by the EPZs in comparison to those paid by the rest of the economy. They all agree that the situation varies enormously from one country and from one sector to another. If we limit our study to the textile and clothing sector, Kusago & Tzannatos (1998) consider that there are no significant differences between the wages paid in Asian EPZs in this sector and those paid by other companies in the same sector. Economic literature on the subject suggests that, given that most of the labour is female, the low average wages can be explained by low levels of qualifications and by the wage discrimination generally suffered by women, without EPZs seeming to practice a systematic policy of specific remuneration for given jobs (Madani, 1999). However, it has to be noted that none of the above mentioned studies is based on individual wage data but only on sector wages.

As EPZs do not practice specific wage discrimination, their poor image as regards social issues mainly stems from the fact that the working conditions are generally considered as more difficult than in the other economic sectors. Social legislation is not applied as strictly as elsewhere, and sometimes not applied at all (ILO, 2003; ICFTU, 2003); working hours are longer and the pace of work is higher; trade unions are often forbidden (this was the case until recently in Bangladesh) or at least discouraged, etc.

With Mauritius, Madagascar is the only example of success for EPZs in sub-Saharan Africa, where all the other free zone initiatives have failed despite numerous attempts. The example of Mauritius is well known, but this is not the case for the Madagascan EPZs, or *Zone Franche*<sup>1</sup>. Yet *Zone Franche* has developed in a quite remarkable way in just one decade: it has gained considerable importance in terms of exports and formal employment, making a significant contribution to the economic recovery observed in the second half of the 1990s. In 2000, the 190 active *Zone Franche* companies employed 75,000 workers; total employment exceeded 100,000 people in 2001 on the eve of the crisis (Razafindrakoto & Roubaud, 2002).

The open political conflict that followed the contested presidential election in December 2001 had a drastic impact on the *Zone Franche*. During the first part of 2002, the island suffered simultaneously from the government being split in two, from a blockade of the capital where most *Zone Franche* companies are to be found and a general strike (Raison-Jourde & Raison, 2002; Roubaud, 2002).

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<sup>1</sup> For example, the working paper on EPZs in Africa published by Watson in 2001 does not even mention them.

Although the crisis came to a peaceful conclusion after a few months, with the challenger Marc Ravolomanana replacing Didier Ratsiraka as President, by then a large number of companies had left for good and, according to the preliminary estimates of exports figures for 2003, activities have not recovered their pre-crisis levels.

In this article, we will look at the macro- and micro-economic impact of *Zone Franche* in Madagascar, in a view to determining whether the effects generally observed in the rest of the world hold in this case too, and we will also examine its future prospects. Our study uses the international databases for foreign trade to help make up for the failings in the national customs statistics, but also mobilises a certain number of national statistical sources with no other equivalent in sub-Saharan Africa, notably the employment surveys carried out annually in the Madagascan capital within a research program conducted by the authors. Thanks to the sum of this data, we are able to conduct an in-depth analysis and to compare the results obtained in Madagascar with those obtained in other countries or regions of the world (Mauritius, Latin America, Asia).

In section 2, we describe the *Zone Franche* rapid development in Madagascar during the 1990s, assessing its impact in terms of both foreign trade and jobs. In section 3, we look at the impact of *Zone Franche* on income, by estimating earnings equations in a view to comparing the wages paid in the *Zone Franche* companies and in other sectors of the economy. We also compare social conditions. We conclude in section 4 by presenting an initial analysis of the impact of the political crisis on the *Zone Franche* and by reflecting on its medium-term prospects.

## **1. THE MACRO-ECONOMIC IMPACT OF *ZONE FRANCHE***

The introduction of a special regime for free zone companies in Madagascar in 1990 followed the decision to favour an export-led growth strategy in line with the structural adjustment policies adopted from the end of the 1980s in compliance with recommendations from the Bretton Woods Institutions. The law 91.020 dated 13 August 1991<sup>2</sup> defined the field of application and the tax incentives offered to *Zone Franche* companies (GEFP, 2002), which are under no obligation to set up in specific zones. Companies wishing to benefit from the free zone regime must intend to export at least 95% of their production. Companies providing services to *Zone Franche* can also benefit from the free zone regime.

The *Zone Franche* companies are exempt from all duties and taxes on exports and imports alike. In terms of domestic tax, they are exempt from excise taxes but have been subject to Value Added Tax (VAT) on imported inputs since 1997, although this can be reimbursed at a later date against proof of export. This measure was introduced to limit tax evasion and prevent companies supplying the local market from setting up as *Zone Franche* companies. The *Zone Franche* offers total exemption from tax on profits for a grace period of two years for intensive basic production companies (farming, fishing) and four years for industrial and service companies. They are subject to a fixed rate of 10% in the following years, a rate that is far lower than the common law rate of 35%. They also benefit from reductions in tax on profits corresponding to 75% of the cost of new investments. Finally, *Zone Franche* companies are granted special access to foreign currency and total freedom for capital transfers.

To begin with, the success of *Zone Franche* was mainly assured by French investors, attracted by a French-speaking environment where a large number of their compatriots had already set up business. But the origin of investors became progressively more diversified. First of all, companies sought to make the most of the low labour costs in Madagascar. According to Cadot & Nasir (2001), the monthly wage for an unskilled machine operator in the textile industry is less than a third of the equivalent wage in Mauritius, around a half of that in China and only about 60% of that in force in India. Even though work productivity is apparently very much lower in Madagascar than in Mauritius or China (and equal to that in India), unit production costs are among the lowest in the world and lower than levels in the three other countries mentioned above. The choice of Madagascar also helped

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<sup>2</sup> Completed by decree 92.809, 16 November 1992 and orders dated 14 May and 12 March 1993.

get round the textile quotas imposed by the developed countries in the Multi-Fiber Arrangements (as the quotas of many Asian countries were already saturated)<sup>3</sup>, which was a key factor in attracting investments from Mauritius. As of 1997-1998, investments in *Zone Franche* were made in anticipation of the African Growth and Opportunity Act (AGOA) which granted Madagascan exporters quota-free and duty-free access to the American market as of 2000 (Gibbon, 2003). In 1997, the last year for which official data is available, French investors (companies in which this country has a majority holding) represented 46% of jobs in *Zone Franche*, investors of Mauritian origin 28%, Madagascans 11% and Asian investors 7% (the remaining 8% were from various different countries of origin) (MADIO, 1999). According to Banque Centrale de Madagascar (2002), clothing accounted for 90% of the *Zone Franche*'s production in 2001. The remaining 10% was split between the food-processing business, the crafts industry and services (data processing).

Two types of data are available for measuring the evolution of Madagascan exports of goods: first, a direct estimate based on national customs statistics; and second, an indirect estimate based on the sum of world imports from Madagascar (using the "mirror-data" method), as given in the International Trade Centre (ITC) data base<sup>4</sup>. The customs statistics provide a direct estimate of total exports from *Zone Franche*, which are subject to specific declarations. The mirror-data, on the contrary, does not distinguish between exports from *Zone Franche*. Given that nearly all exports of clothing come from the *Zone Franche* and that most of its companies are specialised in clothing, it can be assumed that the total exports of clothing products are roughly equivalent to total exports from the *Zone Franche*.

Table 1 shows that both types of data highlight the same trends over the past decade. This agreement leads to the robust conclusion that there was a remarkable expansion both in total exports of goods and of those from the *Zone Franche*. Both sources confirm that exports from Madagascar nearly tripled between 1991 and 2001 in current dollars. Starting from negligible amounts at the beginning of the period, growth in exports from the *Zone Franche* was even more rapid.

**Table 1: Comparative figures for customs and ITC data on total exports of goods and exports from EPZs (1995-2001)**

In millions of dollars

	Total Exports			Exports from EPZs		
	Customs	ITC	Ratio	Customs	ITC (1)	Ratio
1991	333.4	373.3	89.3%	7.8	17.8	43.8%
1992	324.0	395.3	81.9%	18.2	24.9	72.9%
1993	334.9	418.0	80.1%	49.3	54.8	90.0%
1994	447.4	545.6	82.0%	48.2	98.8	48.8%
1995	522.9	620.5	84.3%	105.8	115.4	91.7%
1996	512.3	682.8	75.0%	175.5	169.4	103.6%
1997	506.8	695.1	72.9%	186.8	206.6	90.4%
1998	522.4	761.2	68.6%	194.6	248.4	78.3%
1999	583.5	795.0	73.4%	223.8	294.4	76.0%
2000	830.3	945.1	87.9%	327.8	369.7	88.7%
2001	962.5	1,111.7	83.0%	339.3	467.3	72.6%

Source: Central Bank and Ministry of the Economy and Finance; International Trade Centre PC-TAS database

(1) Exports of clothing.

Over the whole period, the mirror-data assessments are systematically higher than the national customs data assessments (except for *Zone Franche* exports in 1996). For total exports, the latter represent between just under 70% and nearly 90% of the former depending on the year; this ratio is more erratic for *Zone Franche* exports. The gap is partly due to differences in methods, as the customs statistics use FOB (Free On Board) measurements, whereas the mirror-data, based on imports, is built

<sup>3</sup> These results differ from Gibbon (2003), who holds that ownership in the EPZs was mainly Mauritian. This observation is not backed by quantitative data.

<sup>4</sup> Founded by UNCTAD and the WTO, the International Trade Centre produces an annual foreign trade database, PC-TAS, using data on foreign trade collected by the United Nations. In this paper, we use the 1991-1995, 1995-1999 and the 1997-2001 bases.

using CIF (Costs, Insurance and Freight) measurements, which include additional transport and insurance costs.

Exceptionally large differences occur in certain years, manifestly due to problems encountered by the Madagascar customs authorities in recording the data. Customs statistics also seem to have encountered difficulties in evaluating strong growth in exports in a precise manner. For example, the *Zone Franche* exports fell in 1994 according to the national statistics, whereas they nearly doubled in the mirror data. In 2001, this problem was combined with the impact of the political crisis that began in December, bearing in mind that the customary delays in recording foreign trade flows mean that statistics for the past year are completed at the beginning of the following year. Hence, the *Zone Franche* exports grew by 26.4% according to the mirror-data and only 3.5% in the customs data, with the result that exports from *Zone Franche* and total figures were greatly underestimated.

This lack of reliability in customs data is not specific to Madagascar. It explains why most studies on African foreign trade use mirror-data of this sort (see, for example, Gros, Letilly & Martinet, 2002 and Ng & Yeats, 2001), as it is also the only way of making international comparisons using a coherent nomenclature. Therefore, despite the fact that this data does not explicitly identify exports from *Zone Franche*, in the rest of this article we refer to the ITC's mirror data only, given, as we have seen, that the customs data gives the same results in terms of general trends.

Between 1991 and 2001, exports from Madagascar grew by 198% in current dollars according to the ITC's mirror-statistics, corresponding to an average yearly growth rate of 11.5%. During the same period, exports from sub-Saharan Africa as a whole increased by only 15%, i.e. an average yearly rate of less than 1%. Madagascar growth rate for exports in the last decade was exceptional by African standards, given that exports practically stagnated in most countries on the continent. Performance in Madagascar even appears excellent in comparison to world trade, as the latter grew by only 60% between 1991 and 2001, representing annual growth of nearly 5%, i.e. less than half the rate of Madagascan exports.

Table 2 shows that the breakdown of exports changed considerably between 1991 and 2001. In 1991, Madagascar almost exclusively exported agricultural products, but these products' share of the total fell by over thirty points. This reduction mostly concerned exports of coffee, which practically stopped. The reduction in the share of fishing products in the total was combined with significant growth in the amounts exported (but less than that of the total), particularly for exports of shrimps, which became one of the leading export products. Exports of spices (vanilla, cloves, etc.), which had fallen significantly at the beginning of the 1990s, have risen since then, mainly due to price increases. This is the only product for which Madagascar holds a significant share of the world market.

On the other hand, the share of manufactured products, which was negligible in 1991, increased regularly to reach nearly half of the total in 2001. This mainly concerns exports of clothing products, i.e. exports from *Zone Franche* (knitted pullovers are the leading product exported by these companies).

**Table 2: Breakdown of exports by product in % (1991-2001)<sup>a</sup>**

	Percentage of exports			Share of world market		
	1991	1996	2001	1991	1996	2001
<b>Total</b>	100	100	100	0.01	0.01	0.02
Of which:						
Manufactured products	15.5	31.3	48.4	-	-	
- Clothing	4.8	24.8	43.1	-	0.1	0.2
Agricultural products	77.4	56.8	45.0	0.1	0.1	0.2
- Spices	23.3	9.4	22.0	12.7	7.0	16.8
- Fishing products	24.4	22.1	17.1	0.3	0.3	0.3
- Coffee	9.6	13.0	0.7	0.5	0.7	0.2

Source: PC-TAS, SITC nomenclature, authors' calculations.

<sup>a</sup> according to the usual classification, the item "manufactured products" corresponds to item 5 to 8 in the CTCI nomenclature. The item "agricultural products" corresponds to item 0 of this nomenclature. In our definition, clothing corresponds to items 84 and 85 of the nomenclature. Spices (excluding pepper = item 0751) correspond to item 0752, fishing products to 03 and coffee to items 0711 and 0712. All the figures are rounded to one decimal point except for Madagascar's share in the world market.

We can therefore assume that *Zone Franche* was the source of nearly half of total exports from Madagascar in 2001, a proportion that is unequalled in any other least-developed country (LDC). If we compare the situation in Madagascar with that in middle-income countries, we can note that the weight of *Zone Franche* in exports is equivalent to that observed in Mexico, but is still less than that in Mauritius (whose EPZs are also mostly specialised in clothing), where it exceeds three-quarters of total exports (Cling *et al.*, 2002). Overall, nearly three-quarters of the exceptional growth in Madagascar's exports of goods between 1991 and 2001 was accounted for by *Zone Franche*.

Exports of clothing products are concentrated on the European and American markets. The European market bolstered growth in sales until 1998, but they stagnated from then onwards. Sales to the American market, which were marginal until 2000, then took over as a result of the AGOA to become the driving force of growth in the *Zone Franche*. Madagascan exports of such products to the United States nearly tripled from 1999 to 2001, reaching a total amount almost equivalent to those destined for the European Union. In 2001, Madagascar became the second largest exporter of clothing in sub-Saharan Africa, after Mauritius.

Thanks to the contribution of *Zone Franche*, Madagascar is the only African country to have succeeded in becoming an exporter of manufactured goods in the last decade.<sup>5</sup> This evolution led to a significant increase in Madagascan exports' share of world trade (Table 2), whereas the market share of LDCs and sub-Saharan Africa continued to erode during the past decade (UNCTAD, 2002).

The extent to which the boom in exports of manufactured products resulted in diversification of exports on a global level can be measured by studying the evolution of two diversification indexes during the period 1991-2001.

The first, *absolute* index, simply measures the number of products exported for a total annual amount exceeding one million dollars.<sup>6</sup> We can also construct a diversification index, called *the equivalent number of products*. This index is the inverse of the Herfindahl-Hirschman index and calculates how many products of equal importance in the total of national exports would give a degree of concentration of exports identical to the degree of product concentration observed.<sup>7</sup> The value of the indicator varies between 1 and  $+\infty$ . The greater its value, the more the exports are diversified. If its value is 1, the country's exports concern a single product (which is the case for oil-exporting countries such as Nigeria, for example).

Madagascar is the country showing the strongest and the most regular progression of the first diversification index (Graph 1a). The growth in Madagascan exports logically led to a strong increase in the number of products exported (70 products exported for over 1 million dollars, compared with merely 38 in 1991). This number also increased significantly in Ghana, but stagnated in Mauritius. For equivalent total amounts of exports (1.1 billion dollars for Madagascar in 2001, 1.3 billion for Ghana and 1.6 billion for Mauritius), Madagascar appears to be far more diversified than Ghana (48) and Mauritius (66). Taking into account a much higher figure for total exports (3.1 billion dollars in 2001), Côte d'Ivoire appears to be more diversified according to this absolute index, whereas Senegal, on the contrary, is far less with very modest total exports (0.5 billion dollars).

<sup>5</sup> Strictly speaking, we should also mention the case of Lesotho, but its total exports are relatively negligible.

<sup>6</sup> The index was also calculated with a threshold of 50,000 dollars and 100,000 dollars. The results are equivalent in terms of quality.

<sup>7</sup> The index of the equivalent number of products is calculated as follows:

$$NE_{i,K}^t = \frac{1}{\sum_{k=1}^K (X_{ik}^t / X_i^t)^2}$$

with:

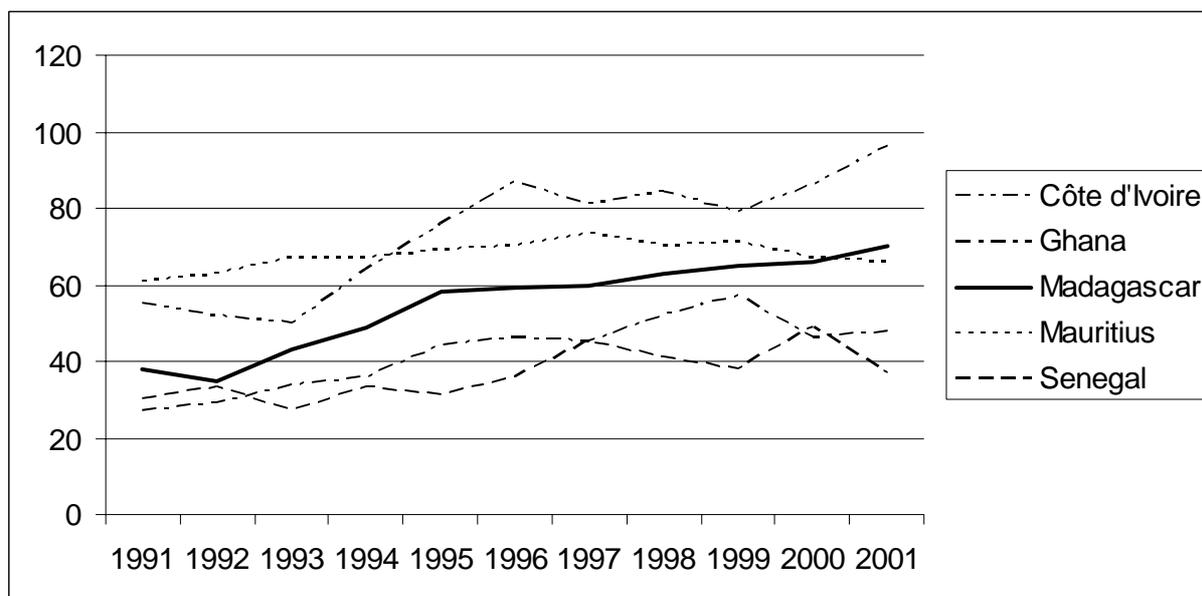
$K$ : number of products exported

$X_{i,k}^t$ : exports of product  $k$  from country  $i$  in year  $t$

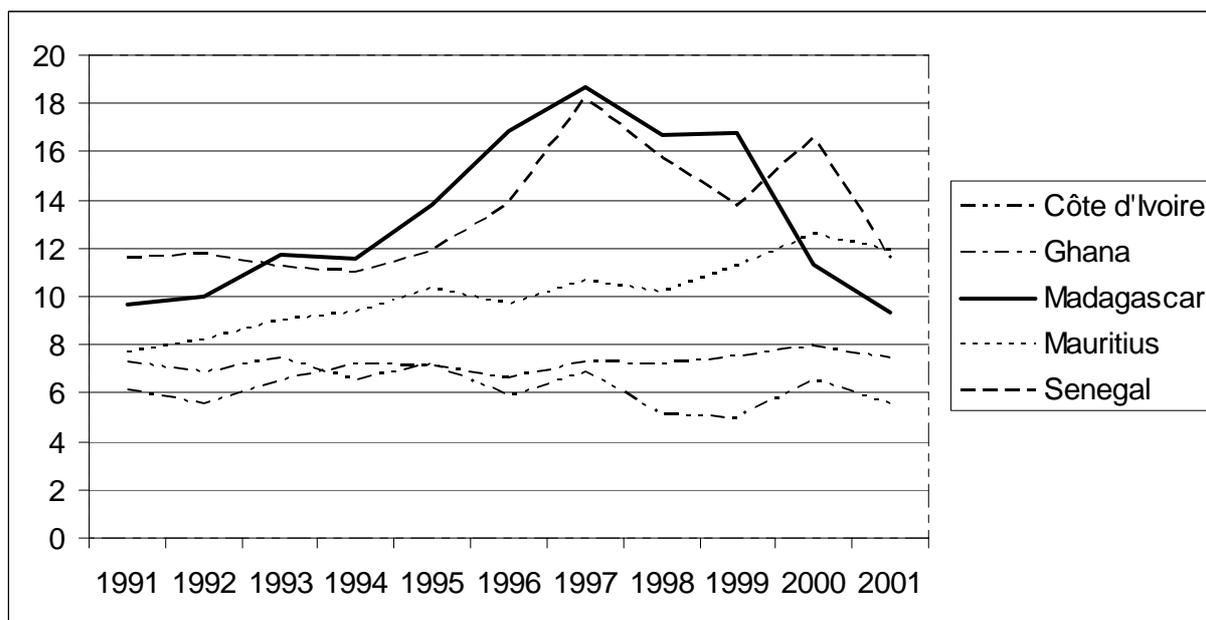
$X_i^t$ : total exports from country  $i$  in year  $t$

$X_{ik}^t / X_i^t$ : share of exports of product  $k$  in total exports of country  $i$  in year  $t$

**Graph 1 a: Export diversification index for several African countries**  
(number of products exported at 1 million dollar threshold)



**Graph 1 b: Export diversification index for several African countries**  
(number of equivalent products)



Paradoxically, we can see a decline in the diversification of exports from Madagascar in equivalent numbers of products at the end of the period (Graph 1b), although this number had become one of the highest in sub-Saharan Africa (excluding South Africa) in the second half of the 1990s. This decline is in fact above all the consequence of the extremely rapid increase in exports of clothing, and also of the rise in exports of spices (particularly vanilla and cloves) which were at their highest levels in the past ten years in 2001, whereas exports of coffee collapsed. The first five products exported (spices, knitted pullovers, frozen seafood, men's trousers and women's trousers) accounted for 63.2% of the total in 2001, compared with only 37.8% in 1997, the year when the index reached its maximum value. With an index at the value of 9.3 in 2001, Madagascar appears less diversified than Mauritius (11.9%) or Senegal (11.6), but more so than Ghana (7.4) or Côte d'Ivoire (5.5).

In an economic context characterized by massive under-employment<sup>8</sup> and widespread poverty, the analysis of the contribution of *Zone Franche* to the local economy takes on vital importance, particularly in terms of the jobs created and the income redistributed<sup>9</sup>.

The employment surveys carried out each year since 1995 in the Madagascar capital confirm the exceptional dynamism of *Zone Franche* in recent years. Between 1995 and 2001, the rate of job creation in *Zone Franche* was six times higher than in the Antananarivo labour market as a whole. The average annual growth rate for employment reached 27% compared with 4.5% for the whole, which is by far the best performance, all sectors taken into account (Table 3). Even though the informal sector is the main provider of employment, it is left far behind in this respect. Over the period in question, the *Zone Franche*'s contribution to job creation was as strong as that of the informal sector. Out of a total of 125,000 new jobs, 38% could be attributed to the informal sector, whereas *Zone Franche* generated 34%, enabling it to triple its share of total employment, which rose from 3% initially to 10% in 2001. In the formal private sector, nearly one employee out of three worked in *Zone Franche* in 2001 compared with scarcely one out of ten in 1995. During the same year, there were more women employed in *Zone Franche* than in the rest of the formal private sector (Glick, Randrianasolo & Roubaud., 2004).

**Table 3: Evolution in the breakdown of employment in Antananarivo by institutional sector from 1995 to 2001 (%)**

INSTITUTIONAL SECTOR	Average annual	Contribution	Structure	
	growth rate		1995/2001	1995
Public administrations	-1.4	-3	11.6	8.1
Public companies	4.1	2	2.7	2.6
Formal private companies	9.1	61	26.7	34.6
- of which EPZs	27.2	34	3.1	10.2
Informal private companies	3.1	38	57.6	53.1
Associative enterprises	4.9	2	1.4	1.5
Total	4.5	100	100	100

Sources: 1-2-3 Surveys, phase 1 (employment) 1995-2001, INSTAT/MADIO, authors' calculations.

To these direct jobs relating to the *Zone Franche* companies' activities should be added the jobs generated by demand from the latter satisfied by local companies. Admittedly, their integration into the country's economy is modest, as three-quarters of their raw materials and supplies are of foreign origin, whereas this share amounts to 50% for companies as a whole according to the 1998 industrial survey (MADIO, 1999). However, the services that they use should also be added to the local inputs, and also the share of their investments spent in the domestic market. If we assume a constant average productivity for local companies used by the *Zone Franche* companies, the number of jobs generated by the latter's demand can be calculated using an input-output matrix for the Madagascar economy. According to Razafindrakoto & Roubaud (2002) who use this method, the ratio between indirect and direct jobs created by the *Zone Franche* is approximately 0.7.

In a country where most of the State's revenues come from external tax, the impact of *Zone Franche* on tax revenues is obviously essential. Imports for *Zone Franche* are exempt from duties and taxes, meaning a loss of revenue for the State. But they are not fully exempt from tax. They pay directly all taxes for the employees hired, plus other para-fiscal employment-based taxes such as employees' and employers' social contributions, which are far from negligible. In 1998, for instance, 20% of

<sup>8</sup> The overall rate of under-employment (visible, invisible and unemployment) was estimated at over 80% of Madagascar's active population in 1993/1994. Visible under-employment, defined as working less than 35 hours per week, affects 54% of the labour force. Invisible under-employment, defined as all the people receiving less than the minimum wage, concerns 78% of the active population. The overall rate of under-employment was estimated at 54% of the active population in urban areas in 2000.

<sup>9</sup> The customs statistics also provide estimates of imports made by *Zone Franche*. The trade balance for *Zone Franche* was estimated at SDR 29.6 million in 2000, i.e. a cover ratio of 89.3%. However, this estimate is not very reliable as foreign trade flows are underestimated by the customs data. In addition, a large share of imports consists of capital equipment relating to new investments in *Zone Franche* (an average of nearly 60% according to Razafindrakoto & Roubaud (1997)). If we exclude these purchases of capital goods, the *Zone Franche*'s cover ratio increases to over 200%.

employers' social contributions came from *Zone Franche* companies (MADIO, 1999). In addition, *Zone Franche* injects revenues into the economy which, with the Keynesian multiplier, contribute to increased demand and thereby to State revenues. Indirectly, all the taxes collected thanks to the use of revenue generated by them (customs duties, property tax, VAT, etc.) can only be collected because they are present. A macro-economic model serves to assess the multiplier effect of demand generated by the revenues distributed locally by *Zone Franche* in the form of work remuneration, spending on intermediate consumption and on investment. According to Razafindrakoto & Roubaud (2002), if the spillover effects are taken into account, the *Zone Franche*'s contribution to the GDP rises from 2 to 7% and leads to an additional 5% in tax revenues<sup>10</sup>.

Finally, the study carried out in this first part of the paper shows the positive impact of *Zone Franche* on the economy of Madagascar. It is not only a dynamic sector of the economy since it was introduced in the early 1990s, but it has also remained the main driving force behind growth for a decade. However, we must go beyond this overall diagnosis to check whether the positive impact of *Zone Franche* on a macro-economic level does not have the corresponding disadvantage of over-exploiting the labour force, as claimed by the theory of the *race to the bottom*, resulting from the fact that the main motivation for investing in *Zone Franche* is a concern to minimise the costs of producing labour-intensive consumer goods by unskilled workers. We will attempt to answer this question in the next part of the paper, by addressing the issue of the quality of the jobs created by *Zone Franche* and the wages and working conditions in force there.

## 2. REMUNERATION AND SOCIAL CONDITIONS IN *ZONE FRANCHE*

Surveys conducted on companies clearly show the structural weakness of wages in *Zone Franche*. Average gross remuneration<sup>11</sup> for employees in *Zone Franche* is about a third lower than that of employees working in the formal industrial sector as a whole (MADIO, 1999). Even if we only take into account permanent workers, the great majority in the *Zone Franche* companies are less generous, with differences of 15 to 20% depending on the year. Data from household labour surveys confirm these results. Not only is the average monthly wage indeed lower than that paid by other types of industrial companies, but it is also one of the lowest in the market. Despite a slight improvement during the period (from 77% in 1995 to 84% in 2001), it is still lower than the average earnings for all paid workers. Only the informal sector pays its workers less. These results are somewhat tempered if we compare median monthly wages (with the advantage of being less sensitive to extreme values): the median monthly wage in *Zone Franche* is equivalent to that of all the paid workers but is still lower than that of other industrial firms.

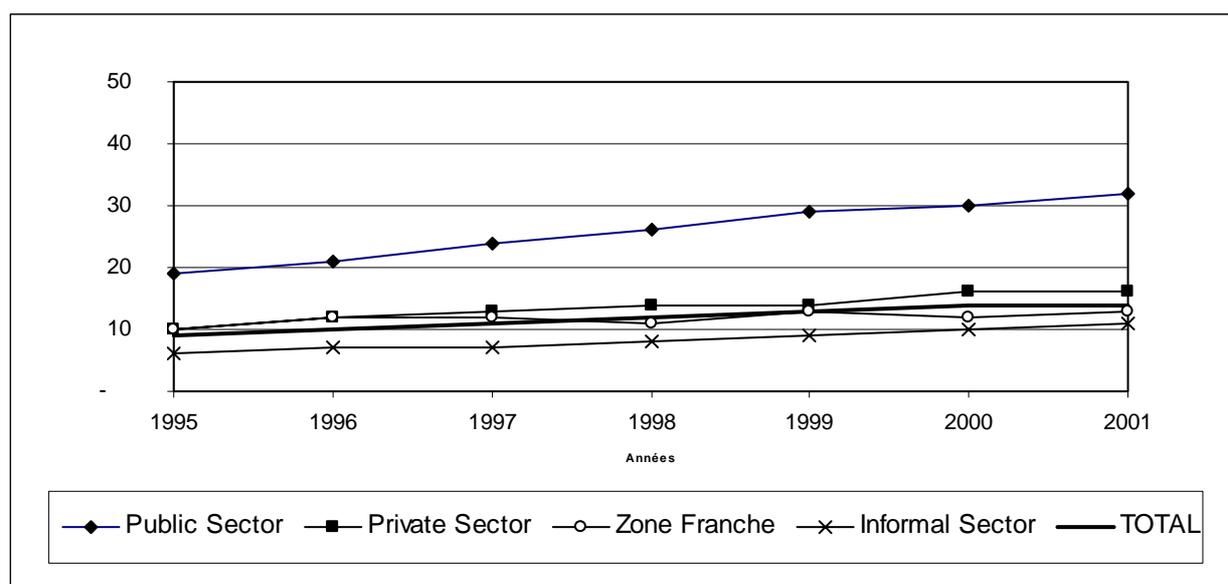
*Zone Franche* companies appear to have granted more generous wage increases than others. Whereas the purchasing power of monthly income grew by an average of 7.3% per year for all paid workers, the rate was 9.1% in *Zone Franche*. But this good result is partly due to increasingly heavy working hours, which tended to increase the monthly income compared with the other sectors: in 2001, employees in *Zone Franche* worked an average of 9 hours longer per week than their counterparts in non-*Zone Franche* private industrial companies (53 and 44 hours/week respectively). Hence, the diagnosis is reversed when comparing hourly earnings. Improvement in real median hourly earnings per worker in *Zone Franche*, although very appreciable (5.3% per year), is one of the smallest found in all the sectors of the labour market taken together, where it amounted to 7.5% (Graph 2).

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<sup>10</sup> Strictly speaking, a precise assessment of the fiscal impact of *Zone Franche* involves knowing whether the investment decision was linked to the tax incentives offered (if this is not the case, *Zone Franche* is responsible for a net loss for the State, excluding indirect effects). It does seem to be the case as 66% of the *Zone Franche* companies, accounting for 87% of exports, would not have been created had it not been for the specific regime according to the answers given by the managing directors of the *Zone Franche* companies interviewed for the industrial survey in 1998 (Razafindrakoto & Roubaud, *ibidem*).

<sup>11</sup> The gross remuneration includes the basic wage, bonuses and benefits in kind, plus the worker's contributions, retained at source by the employer; it excludes the employer's social contributions and direct benefits (health, etc.).

**Graph 2: Evolution of median hourly earnings by institutional sector (1995-2001) in US cents 1995**



Sources: 1-2-3 Survey, Phase 1, 1995-2001, MADIO, authors' calculations.

However, these differences in average or median earnings are misleading, for two reasons. First, the remuneration taken into account above does not include different benefits, in money or in kind (bonuses, paid holidays, various benefits). These benefits add to the basic earnings to form the total earnings. Second, as shown in Table 4, the characteristics of the jobs and wages are not identical from one sector to another. Some of them weigh on earnings in *Zone Franche*, such as the low percentages of managerial staff, of seniority in the company and of professional experience, and the great preponderance of female staff, all these characteristics being common to most EPZs worldwide (Madani, 1999). Indeed, women represented over 70% of the labour employed by *Zone Franche* in 2001 (a significant reduction compared with 1995, when they accounted for nearly 84%), i.e. more than twice the percentage of women in formal industrial jobs outside *Zone Franche* (32.8%). On the other hand, other characteristics play in favour of earnings in *Zone Franche*. This is the case, in particular, of the rate of trade union presence in the companies, which is almost as high as in the public sector and double the rate observed in the rest of the industrial sector (this characteristic can notably be linked to the large average size of *Zone Franche* companies compared to the other industrial companies).

**Table 4: Characteristics of the labour force in the EPZs compared with the other sectors (Antananarivo), 2001**

	Public sector	Formal private sector	Of which: Industrial (excl. EPZ)	Of which: EPZ	Informal sector	Total
Monthly income (USD)	597	347	391	260	224	308
Hours worked per week	40.9	47.4	43.8	52.8	40.9	43.3
% women	36.4	44.3	39.7	69.4	52.0	47.3
% managerial staff	35.8	12.0	12.7	9.7	0.3	8.3
% trade union presence	47.6	20.3	22.9	41.7	0.6	12.7
Years of schooling	11.8	8.9	8.6	7.8	6.3	7.8
Potential experience	26.2	17.8	19.9	13.6	22.4	21.2
Seniority	13.2	5.2	7.0	2.4	7.0	7.0
Size of company (% >=100 employees)	85.9	36.2	31.0	93.0	0	23.2

Source: 1-2-3 Survey, Phase 1, 2001, MADIO, authors' calculations.

To fine-tune our calculations, we must check all these "structural effects" in order to measure the earnings levels, all other things being equal, i.e. for comparable jobs and human capital dotations. These estimates will be made first on the basic earnings and second on the total earnings relating to the exercise of a job. In both cases, we will compare the positive or negative premium gained by employees in *Zone Franche* compared to the labour force as a whole, but also compared to employees in the non-*Zone Franche* formal private industrial sector.

For each year from 1995 to 2001, we have estimated extended Mincer earnings functions to explain the level of hourly earnings (both basic earnings and total earnings)<sup>12</sup>.

$$\text{Log } W_{it} = a_t + b_t \text{Sco}_{it} + c_t \text{EXP}_{it} + d_t A_{it} + e_t A_{it}^2 + f_t \text{CSP}_{it} + \text{DUMMY EPZ} + \varepsilon_{it} \quad (1)$$

Dependent variables are the usual explanatory factors: gender, number of years of schooling and potential professional experience. We also include seniority and seniority squared in the explanatory variables<sup>13</sup>. The socio-professional category broken down into nine groups (including six categories of workers) is alternatively included or excluded from the regressions, to take into account its potential endogeneity. Finally, we introduce a dummy *Zone Franche* variable to estimate the earnings premium linked to this sector. Each of these estimations is made first, for all paid workers and second, for wage workers (excluding non-wage workers such as self-employed) in the formal industrial sector with seemingly comparable working conditions. We proceeded to both OLS and selection corrected for participation and sectoral choice (*Zone Franche* vs non-*Zone Franche*) estimations (Heckman type). But, as the results were very similar and as the database does not provide any convincing instruments for correcting potential selection biases, we only present here the OLS estimates.

At the same time, we estimated a global model on stacked data for the seven years from 1995 to 2001. This time, the dependent variable was the real hourly income at 1995 prices<sup>14</sup> and dummies were introduced for each year:

$$\text{Log } W_{rit} = a + b \text{Sco}_{it} + c \text{EXP}_{it} + d S_{it} + e S_{it}^2 + f_t \sum \text{CSP}_{it} + g_t \sum \text{DATE}_t + \text{DUMMY EPZ} + \varepsilon_{it} \quad (2)$$

Table 5 presents the results of estimates of the real hourly wage for the formal industrial sector on stacked data, excluding bonuses (models 1 and 2) and including bonuses (models 3 and 4), without socio-professional group (models 1 and 3) and with socio-professional group (models 2 and 4). The quality of regressions is good and in line with international literature on the subject ( $R^2$  between 0.36 and 0.44), and the coefficients for the four chosen models are close to and comply with the theory. Remuneration, whether or not we take into account the different types of bonuses, is a growing function of schooling level, seniority and professional experience. For example, each added year of study was equivalent to a net wage increase of nearly 7% in 2001, whereas benefits from seniority and professional experience are less marked (less than 2% and around 0.5% respectively).

<sup>12</sup> In fact, the basic wage is only one element of the remuneration, even if it is the most important. The growing competition faced by the *Zone Franche* companies encourages them to favour more individualised wage policies and productivity incentives, by offering productivity bonuses or profit-sharing schemes. All the different variable components of remuneration are far from negligible as they represent 11 to 22% of basic wages depending on the year. But non-wage benefits are not found exclusively in *Zone Franche*. All types of companies offer them, with the notable exception of the informal sector. The public sector (administration and public companies) is extremely generous in this respect. Ultimately, the estimates obtained from the basic wage alone, which are not presented here, are very close to those based on total earnings.

<sup>13</sup> We also tested for non-linearities on the return on education and professional experience by including years of schooling and professional experience squared among the explanatory variables. But the coefficients were found non-significant.

<sup>14</sup> Using the consumer price index for the capital as deflator (base 100 in 1995).

**Table 5: Equation of hourly wages in EPZ / rest of formal industrial sector (1995-2001)**

	Wages (excluding bonuses)				Wages (including bonuses)			
	Model 1		Model 2		Model 3		Model 4	
Intercept	-1.604	(-42.48)	-1.522	(-39.29)	-1.557	(-39.01)	-1.483	(-36.22)
Sex (Man=1)	0.139	(8.35)	0.122	(70.89)	0.147	(8.40)	0.130	(7.92)
Years of schooling	0.097	(40.19)	0.065	(25.67)	0.100	(39.27)	0.066	(24.71)
Seniority	0.020	(6.17)	0.019	(6.08)	0.029	(8.34)	0.027	(8.32)
Seniority squared	-0.0003	(-3.06)	-0.0003	(-3.18)	-0.0005	(-4.58)	-0.0005	(-4.78)
Experience	0.013	(12.91)	0.008	(19.30)	0.013	(12.46)	-0.010	(9.82)
Year:								
1995	-0.480	(-16.40)	-0.404	(-14.59)	-0.499	(-16.11)	-0.412	(-14.06)
1996	-0.294	(-10.32)	-0.201	(-7.40)	-0.295	(-9.79)	-0.190	(-6.62)
1997	-0.194	(-6.90)	-0.135	(-5.13)	-0.159	(-5.36)	-0.094	(-3.39)
1998	-0.135	(-4.88)	-0.063	(-2.38)	-0.129	(-4.42)	-0.045	(-1.63)
1999	-0.075	(-2.76)	-0.018	(-0.73)	-0.055	(-1.93)	0.008	(0.29)
2000	-0.018	(-0.72)	0.001	(0.05)	-0.021	(-0.76)	0.001	(0.04)
2001	-		-		-		-	
Socio-prof. group:								
Senior managers			1,444	(24.09)			1,500	(23.67)
Middle manager			0.611	(16.77)			0.669	(17.37)
Empl., skilled workers			0.222	(9.83)			0.259	(10.89)
Empl., non-skilled workers.			0.111	(4.85)			0.123	(5.10)
Labourers			-				-	
Dummy EPZ (=1)	<b>0.002</b>	<b>(0.11)</b>	<b>0.008</b>	<b>(0.47)</b>	<b>0.019</b>	<b>(1.01)</b>	<b>0.022</b>	<b>(1.24)</b>
Number of observations	4,651		4,651		4,651		4,651	
R-squared	0.36		0.44		0.36		0.44	

Source: 1-2-3 Surveys, Phase 1, 1995-2001, MADIO, authors' calculations.

In brackets, the absolute value of T-Student

Reading the results: in model 1, a man's average hourly wage exceeds that of a woman by 14.9% (coefficient 0.139) all other things being equal.

Growth in average hourly wages is not only due to improved skills during the period, as proved by the significant positive trend of the year dummies. Madagascar was experiencing unprecedented dynamic endogenous urban growth (Cogneau, 2000; Razafindrakoto & Roubaud, 2000). The hourly wage also greatly depends on the position in the company, according to a strict wage scale going from senior management to unskilled workers. When the socio-professional group is taken into account, this partly absorbs the return on human capital, highlighting the two-stage mechanism whereby the latter is beneficial to employees: on the one hand, by giving them access to more highly skilled jobs and on the other, by giving them additional income in a given job. Hence, the return on education is reduced by around a third (from 10.2% to 6.7%) when the socio-professional group is included in the equation. Finally, women appear to be subject to a form of wage discrimination, amounting to around 15% in the industry. Nicita & Razzaz (2003) observed an even higher level of discrimination in the case of the Madagascan textile industry, in wage equations of the same kind.

As for our variable of interest, the *Zone Franche* dummy is not significant in any of the models estimated. Although employees in *Zone Franche* were paid, on average over the period 1995-2001, hourly wages 25% lower than those of their counterparts in the non- *Zone Franche* private formal industrial sector, this gap can be attributed entirely to differences in the composition of the labour force in the two sectors.

Table 6 presents the results of the same estimations made for all paid workers (salaried and non-salaried). In this case, we will refer to earnings rather than wage as some workers are non wage-workers. The quality of adjustments is slightly better than for the estimates commented on above, for relatively similar results. Gender discriminations are the most notable exception: they are approximately twice as high in the economy as a whole as those estimated for formal industry. This

result can mainly be attributed to the presence of the informal sector, where there are very significant differences between men and women. Return on human capital is higher than that observed in the model restricted to the industrial sector, whereas the time trend is flatter. In the models with socio-professional group, we find the same wage scale that we observed earlier, with non-salaried groups being inserted into the scale<sup>15</sup>. Hence, the employers' earnings appear to be lower than that of senior managers, but higher than that of middle managers, whereas self-employed workers earn the same as non-skilled employees; apprentices and family workers come last. But this time, contrary to the estimates concerning the formal industrial sector only, employees in *Zone Franche* always have a significant premium, varying from 6 to 17% depending on the models. Introducing the socio-professional group into the regression reduces the earnings premium obtained by *Zone Franche* employees very significantly, by nearly half in the model without bonus and by nearly two-thirds in the model including all the elements of remuneration. At an equivalent level of human capital, *Zone Franche* employees have lower level jobs. This phenomenon can partly be explained by the specific labour organization (low percentage of managerial staff and little job differentiation). It could also come from a deliberate policy on the part of the employers to hire over-qualified workers. Estimates broken down into the different institutional sectors<sup>16</sup> show that the premium for *Zone Franche* workers is always significantly lower than those for workers in the public sector (administration and public enterprises) and higher than that of the informal sector, and is not significantly different from that obtained by the other employees in the formal private sector.

**Table 6: Equation of hourly earnings in EPZ / rest of labour market (1995-2001)**

	Earnings (excluding bonuses)				Earnings (including bonuses)			
	Modèle 1		Modèle 2		Modèle 3		Modèle 4	
Intercept	-2.145	(-116.4)	-2.088	(-48.89)	-2.075	(-112.6)	-2.039	(-47.54)
Sex (Man=1)	0.276	(31.14)	0.247	(28.87)	0.276	(31.05)	0.238	(27.66)
Years of schooling	0.140	(129.55)	0.106	(84.39)	0.141	(130.79)	0.105	(82.77)
Seniority	0.028	(22.95)	0.021	(17.41)	0.030	(24.69)	0.022	(18.91)
Seniority squared	-0.0005	(-16.71)	-0.0004	(-13.61)	-0.0006	(-17.50)	-0.0004	(-14.23)
Experience	0.015	(35.74)	0.011	(26.50)	0.014	(32.93)	-0.010	(24.60)
Year::								
1995	-0.386	(-23.22)	-0.332	(-20.79)	-0.351	(-21.10)	-0.303	(-18.89)
1996	-0.371	(-22.66)	-0.332	(-21.12)	-0.369	(-22.50)	-0.330	(-20.90)
1997	-0.273	(-16.87)	-0.256	(-16.51)	-0.251	(-15.51)	-0.235	(-15.13)
1998	-0.182	(-11.26)	-0.150	(-9.70)	-0.173	(-10.66)	-0.144	(-9.23)
1999	-0.114	(-6.97)	-0.078	(-4.95)	-0.055	(-1.93)	-0.077	(-4.89)
2000	-0.052	(-3.19)	-0.043	(-2.75)	-0.021	(-0.76)	-0.032	(-2.06)
2001	-		-		-		-	
Socio-prof. group:								
Senior managers			-				-	
Middle managers			-0.256	(-8.44)			-0.258	(-8.57)
Empl., skilled workers			-0.521	(-18.94)			-0.573	(-20.75)
Empl., non-skilled workers			-0.721	(-24.55)			-0.803	(-27.24)
Labourers			-1.120	(-37.13)			-1.155	(-38.14)
Employers			-0.096	(-3.07)			-0.262	(-8.27)
Self-employed			-0.641	(-22.77)			-0.817	(-28.91)
Fam. help & Apprent.			-0.974	(-22.95)			-1.113	(-26.11)
Dummy EPZ (=1)	<b>0.121</b>	<b>(6.70)</b>	<b>0.065</b>	<b>(3.59)</b>	<b>0.161</b>	<b>(8.91)</b>	<b>0.063</b>	<b>(3.51)</b>
Number of observations	35,718		35,718		35,718		35,718	
R-square	0.40		0.45		0.40		0.45	

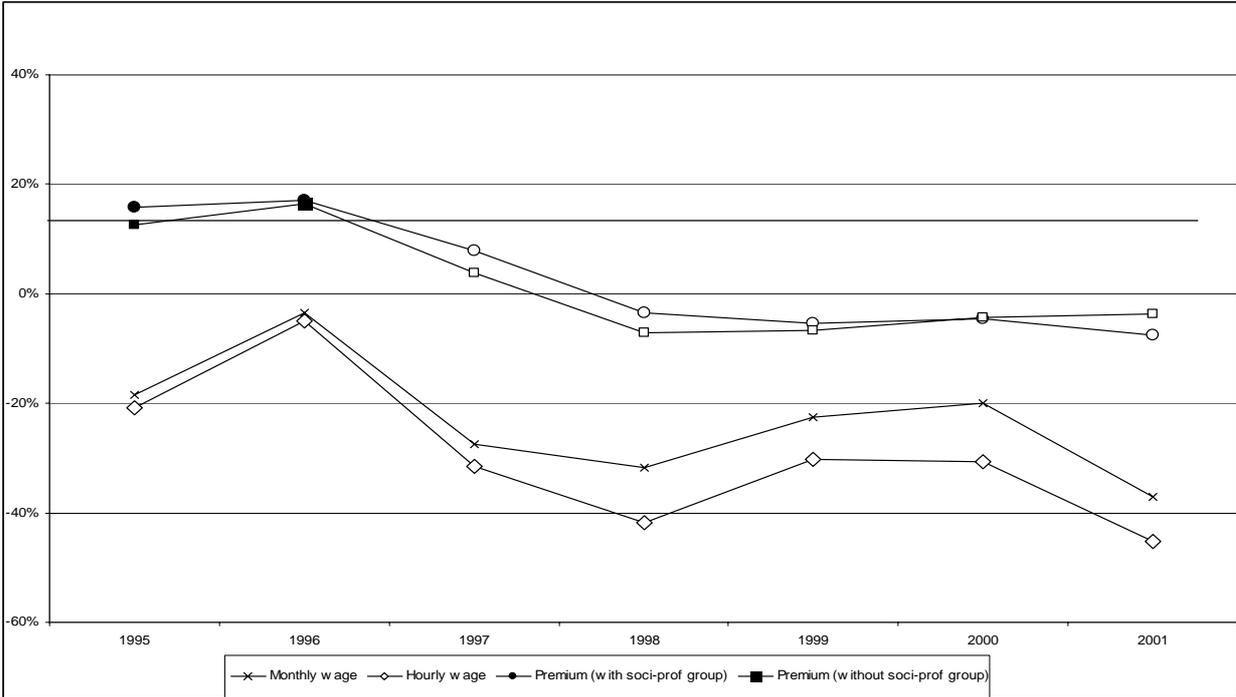
Source: 1-2-3 Survey, Phase 1, 1995-2001, MADIO, authors' calculations. Note: idem Table 5.

<sup>15</sup> We should note that, contrary to wages, work income for non-wage groups includes returns on both human and physical capital. Although not directly estimated in the equation, the return on physical capital is partly captured by the socio-professional group (employer vs self-employed worker).

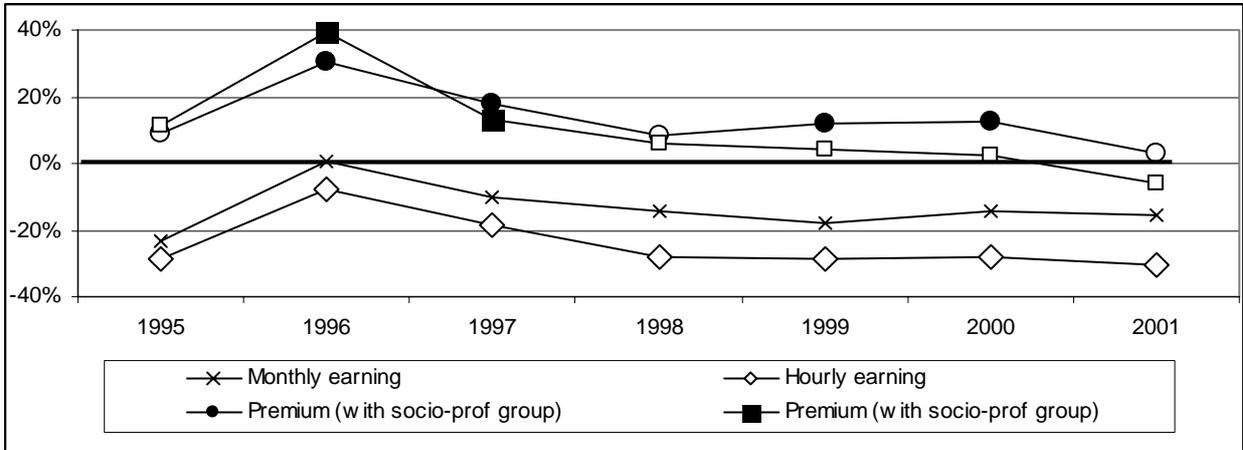
<sup>16</sup> The estimated models are similar to those presented here, but have not been included. They cover the entire labour market, broken down into five institutional sectors (public administration, public enterprises, formal private sector excluding *Zone Franche*, *Zone Franche* and the informal sector). The results are available from the authors on request.

By studying the time profile for the premium for *Zone Franche* workers, we can go beyond the average effects over the whole period (Graph 3). If we compare wages in the formal industrial sector, the gap in average income widens, particularly for hourly wages, to the detriment of *Zone Franche* employees. In 1996, hourly wages (excluding bonuses) were similar in the two sectors, but there was a 45% difference in 2001. The profile of the premium also decreased: significant and positive during the first two years (1995 and 1996), it became negative (although non significant) as of 1998. Compared with all paid workers as a whole, we can also note a fall in relative earnings for *Zone Franche* workers, with an even more marked loss of ground for hourly earnings, as the rise in hours worked essentially concerned *Zone Franche*. Although the premium was still positive in 1999 and 2000 for the model without socio-professional group, this was no longer the case in 2001. As for the model with socio-professional group, the premium was no longer significant after 1998 and even became negative in 2001.

**Graph 3 a: Evolution of relative wages and wage premium in Zone Franche from 1995 to 2001: Zone Franche vs. Non-Zone Franche Formal industrial private sector**



**Graph 3 b: Evolution of relative earnings and earnings premium in Zone Franche from 1995 to 2001: Zone Franche vs. Rest of the economy**



Sources: 1-2-3 Survey, Phase 1, 1995-2001, MADIO, authors' calculations.  
 Note: Remuneration excludes bonuses. The monthly and hourly wage curves correspond to the ratio of wages in *Zone Franche* compared with the other sectors. The premium corresponds to the coefficients of models 1 and 2, estimated for each year. For each curve, the significant coefficients (5%) are shown in black.

This trend can doubtless be explained to a large extent by the fact that the exceptional activity seen in the internal market did not benefit *Zone Franche* companies, which export to highly competitive international markets. In addition, the rise in the exchange rate from the second half of 2000 reduced the *Zone Franche* companies' room for manoeuvre. The downward trend in the premium highlights a gradual aligning of wages in *Zone Franche* with the conditions in force in the labour market. Despite the rapid growth in *Zone Franche* employment, there was no shortage of salaried labour, which could have weighed on wages.

The quality of a job is not only a question of money, but also of the non-monetary elements attached to it: the social cover it gives access to, the security of employment or the possibilities of promotion, for instance.

Table 7 shows that for all these benefits *Zone Franche* companies protect their employees better than all the other formal industrial companies in the private sector. This is particularly true of the three main types of benefits that are systematically more common in *Zone Franche*: registration with an official social security body, access to paid holidays and the possibility of consulting a company medical service. But the *Zone Franche* companies' employees are most advantaged when it comes to security of employment. A higher percentage of them have permanent jobs and are provided with pay slips. They are also more often covered by a written work contract and they are paid on a monthly basis. All these elements contribute to formal, secure working relations. Although fewer employees in *Zone Franche* have been promoted within the companies, this can be explained by their lesser seniority. Once the differences in jobs and qualifications have been taken into account, the differences are no longer significant. Finally, the *Zone Franche* companies adopted an extremely active policy to promote labour qualification: in 2001, nearly one out of three employees followed a professional training course paid for by the company, compared with one in five in the formal private sector outside *Zone Franche*. The logit models that we tested - where the dependent variable corresponds to a form of cover or protection and the independent variables are the same as for the earnings equations - show that the employees of *Zone Franche* have significantly better cover on all these benefits<sup>17</sup>. In many respects, employees of *Zone Franche* are in as favourable a situation as employees in the public sector, who are the most highly protected in the labour market.

**Table 7: Share of employees with job benefits in *Zone Franche* compared with the other sectors (Antananarivo), 2001**

	Public sector	Formal private sector	Of which: Industrial (non- <i>Zone Franche</i> )	Of which: <i>Zone Franche</i>	Informal sector	Total
Social security registration	85.1	61.8	65.0	88.2***	1.9	52.9
Company medical service	68.1	57.5	60.1	83.7***	11.7	49.3
Paid holidays	85.7	60.2	64.0	79.0***	7.7	53.4
Pay slip	95.8	76.0	79.0	96.1***	6.2	64.2
Written contract	96.3	65.1	73.6	93.3***	9.8	64.6
Company-paid training	37.2	20.6	17.9	32.6***	2.6	19.8
Do not want to change job	85.3	72.5	69.3	73.1	59.4	72.2

Source: 1-2-3 Survey, Phase 1, 2001, MADIO, authors' calculations.

Note: \*\*\* : significant positive coefficient at 1% threshold (logit models in private formal industrial sector).

Apart from this relative advantage for *Zone Franche* companies' employees, there has been an accelerated process of "formalisation" of work relations in these companies over the past decade. For example, whereas in 1995 only 21% of employees working in *Zone Franche* were affiliated to the social security system, this percentage rose constantly, reaching 88% in 2001. The same phenomenon can be observed for all social benefits (paid holidays, various bonuses, medical cover, etc.), to such an extent that the contractualisation of wage relations is now widespread in *Zone Franche*, which was far from being the case just a few years ago. This fundamental change, undertaken in record time, is all the more exceptional when we remember that it took several decades for the industrialised countries to

<sup>17</sup> The results of these models are not included here, but are available from the authors on request.

achieve the same result. During the 80's and 90's there has even been the opposite trend towards increased insecurity in wage relations in most of the emerging countries (for a study on Latin America, see Saavedra, 2003). This positive trend for the Madagascan workforce is gradually spreading to the formal sector as a whole. It is probable that the model introduced by *Zone Franche* was a driving force behind this.

Finally, the *Zone Franche* companies treat their employees rather better than their counterparts in the private formal sector and, all the more so, than workers in the informal sector, although, as we have seen, the wage premium is tending to disappear. Doubtless, this favourable treatment of employees in *Zone Franche*, albeit relative, should not be attributed to philanthropic tendencies on the part of their managers, given that their main reason for coming to Madagascar was the low cost of labour. We believe that the phenomenon can be explained in three ways: first, as they are in direct contact with the world market and often come from developed countries, the entrepreneurs in *Zone Franche* are more likely to take into account the social practices in force in the industrialised countries where wage-earning in companies is the norm. Second, as these companies are sometimes working in a hostile local environment, they are more vigilant in respecting legislation, particularly labour regulations, and this vigilance is further stimulated by active trade unions. Third and finally, the economic performance of export-oriented *Zone Franche* companies puts them in a better position to make concessions in terms of wage policy than other sectors that depend exclusively on the internal market. It is important to reverse the common assumption that EPZs deteriorate working conditions on the national labour market. In Madagascar's case, it is not the free zone companies that pull down the quality of salaried jobs, but the unfavourable conditions provided for employees, in force in the local labour market, that attract them to the country. On the contrary, their presence is likely to benefit the employees, by acting as an incentive to the other companies to align their social policies with theirs, which are usually more favourable.

However, employment in *Zone Franche* is not the ultimate horizon for wage earners, as shown by the employee satisfaction rates, which, albeit high, are no higher than the average (Table 7)<sup>18</sup>. Further proof of this is the high turnover of personnel, calculated by relating the number of employees who have left their companies during the year preceding the survey to the sum of those who left and those who are still employed there. It appears that the turnover is significantly higher in *Zone Franche*. Every year, about one out of five employees leave their job when they are working in *Zone Franche*, compared with a little over one out of ten in the formal private sector. This rate is notably far higher than that seen in Mauritius, where it is only around one out of twenty (Cadot & Nasir, 2001).

The advantages attached to working in *Zone Franche* mentioned above are in fact offset by a series of factors working in a negative way. These include the workload and the pace of work, both far higher than elsewhere. Integration in the world market and its demands in terms of competitiveness (costs, delivery times, quality) force the companies to tighten their labour management, with stricter controls on rates, assiduity and productivity. As for working hours, which increased steadily to reach 53 hours in 2001, they cause problems that are all the more acute as *Zone Franche* employs large numbers of women, who suffer, as elsewhere, from the phenomenon of the "double day", as they also have to cope with domestic tasks and the education of their children (Rambeloma, Rabeson & Andrianarison, 2002).

### **3. IMPACT OF THE CRISIS ON THE EPZs AND STAKES FOR THE FUTURE**

The Madagascan economy was sorely affected by the political crisis in 2002 and *Zone Franche* was the hardest hit of all. Although the first data available on the situation immediately following the crisis shows that activity picked up again rapidly - albeit partially - there are doubts as to whether there has not been a durable impact on the dynamics observed since the beginning of the 1990s. In fact, the

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<sup>18</sup> This relatively high satisfaction rate may seem to contradict the low average seniority levels for employment shown in Table 4. But the satisfaction index as defined here only concerns employees who have kept their jobs. It is overestimated in that it does not take into account employees who have left their jobs. Conversely, the low average job seniority levels is not only the result of a higher turnover in *Zone Franche*, but also of the fact that the special regime for free zone companies was created fairly recently and that their very strong recruitment campaigns automatically reduce the employees' average seniority.

following analysis shows that the main uncertainty is not so much a problem of the situation at home (evolution in the economic and political context in Madagascar) as that abroad, i.e. changes in the multilateral trade framework in the textile-clothing sector at the start of the new century.

The employment survey specially conducted in December 2002 and January 2003 in Antananarivo to measure the impact of the crisis enables us to make a diagnosis of the state of the labour market six months after the new President, Marc Ravelomanana effectively came to power, in July 2002. Although the capital's economy began to recover after the height of the crisis (at the end of the first quarter 2002), the negative marks were still very apparent. Between mid 2001 (date of the previous survey) and end 2002, the rate of activity fell by two points (from 59.7% to 57.8%), the numbers of unemployed increased by 71% and the rate of visible under-employment (defined as the proportion of people working less than 35 hours per week and who would like to work more hours) rose from 12% to 20%. Average real remuneration fell by nearly 6%, going hand in hand with an upsurge in income inequalities (Ramilison, 2003). The combination of the fall in work revenues and in the rate of employment resulted in a collapse in household purchasing power of 20.6% on average.

The crisis took a heavy toll among *Zone Franche* companies. Specialised in exports and using a high percentage of imported inputs, they suffered very badly from the blockade of the capital where nearly all of them are concentrated, which lasted several months. In addition, the breach of contracts in progress lead international buyers to cancel their orders and, given the political instability, to turn to more reliable suppliers. *Zone Franche* employment fell by over 60% in a year and a half, erasing in a single stroke the great progress made in the previous years. With 4% of jobs in the capital (compared with 10.2% in 2001), *Zone Franche's* share went back to its 1995 level. The adjustment to the downturn in demand was clearly made in terms of quantity (jobs, working hours), rather than price. Nominal wages, difficult to reduce, more or less followed inflation (+19% over the period), which meant that those who managed to keep their jobs were practically able to maintain their purchasing power. The other institutional sectors reacted differently. There were no layoffs in the public sector, where wages were partially deindexed. As for the informal sector, it acted as a refuge for employees who had been made redundant and for new arrivals. The number of jobs in this sector grew by 12%. This growth in employment in a context of weak demand resulted in a significant reduction in average real incomes, which lost over 11%.

**Table 8: Evolution of jobs and wages by institutional sector (Antananarivo), 2001-2002.**

Variation 2002/3-2001 (%)	Public sector	Formal private sector	Of which:		Informal sector	Total
			Industrial (non-Zone Franche)	Of which: Zone Franche		
Number of jobs	+5.0	-20.4	-16.8	-60.7	+12.0	-0.5
Real monthly wage	-4.4	+8.0	-16.4	-0.8	-11.1	-5.3
Number of hours/week	+2.2	-2.4	+1.8	-6.1	-2.9	-3.2
Median real hourly wage	-6.6	+6.6	+0.8	-2.7	-1.9	-8.8

*Source:* 1-2-3 Survey, Phase 1, 2001 and 2002/3, MADIO, authors' calculations. The wages and hours for the formal industrial sector only concern salaried workers.

To fine-tune the diagnosis, we mobilised the "Impact of the Crisis" survey, carried out in the Madagascar capital in May 2003. The survey tried to find the 3,000 households interviewed for the survey carried out two years previously in 2001, in order to question them about the causes and effects of the crisis and also their prospects. We managed to re-interview 2,500 of the households, i.e. an attrition rate of 16.6%. The first analyses show that, despite this high rate of loss, the resulting biases are weak, at least in the area that interests us here. Table 9 compares the impact of the crisis for all the households, compared with those in which one member worked in *Zone Franche* in 2001, distinguishing between those who continued to depend on it in 2003 and those who no longer worked there.

Although practically all the households declared that the crisis had had a negative impact on them and that it resulted in a loss of income, the form and intensity of the shock varies significantly depending on the type of household in question. Overall, households linked to *Zone Franche* were particularly

affected by technical unemployment; and those who kept their jobs paid for this by even more massive technical unemployment. *Zone Franche* employees seem to have suffered a greater decrease in income, both for those who had kept their jobs and those who had lost them. Whereas the last quarter of 2001 was the highest point in the economic cycle before the crisis, there was a drastic drop in the first quarter of 2002. It can be estimated at nearly 30% for households in *Zone Franche*, compared with less than 20% for the others. The *Zone Franche* companies laid off large numbers of their employees during the second quarter and they clearly had more difficulties in finding alternative sources of income, equivalent to those that they had previously enjoyed. For the three categories of households, incomes recovered in the third quarter, although they were still much lower at the end of the year than they had been at the end of 2001.

**Table 9: Impact of the crisis on households (Antananarivo), 2001-2003.**

Impact of the crisis shock (%)	>=1 member in Zone Franche in 2001		Total
	Zone Franche in 2002	Not Zone Franche in 2002	
Percentage of households having answered "yes" to the question:			
Negative impact	95.5	92.5	89.0
Fall in income	92.5	95.5	87.0
Loss of job	9.0	18.6	8.9
Technical unemployment	24.3	12.4	6.1
Reduction of activity	32.4	30.6	38.6
Quantitative variation in income:			
Q4 2001 - Q1 2002	-31.1	-25.6	-19.3
Q4 2001 - Q2 2002	-36.6	-45.6	-32.8
Q4 2001 - Q3 2002	-33.9	-40.4	-28.2
Q4 2001 - Q4 2002	-22.2	-27.9	-16.8

Source: 1-2-3 Survey, Phase 1, 2001 and Impact of the Crisis Survey 2003, MADIO, authors' calculations.

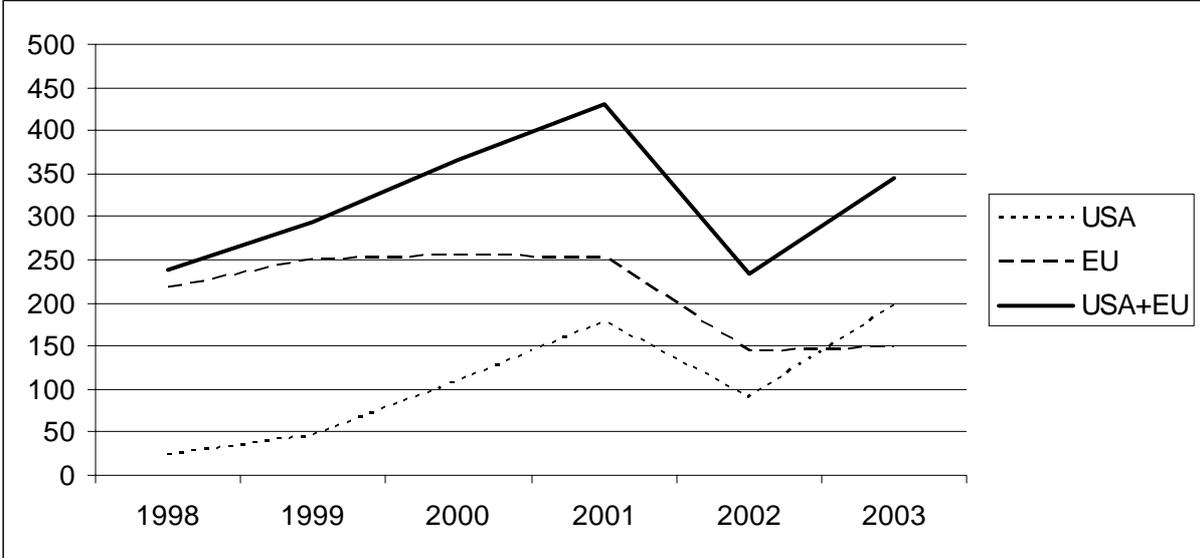
At the time of writing this article, we do not have data on employment after 2002. However, we do have information up to 2003 on the evolution of Madagascar's foreign trade, based on American and European national customs statistics, which enable us to give a more up-to-date diagnosis. Similarly to the employment statistics, the foreign trade figures point to the very strong plasticity of *Zone Franche* during the crisis and then to its remarkable responsiveness once the crisis was over.

For 2002 as a whole, total exports of clothing were practically halved to the American and European markets, which absorb nearly all such exports (Graph 4).<sup>19</sup> But as we can see, as soon as in 2003 there was a very rapid recovery of exports to the United States, which exceeded their pre-crisis level, making the US the *Zone Franche* main client, ahead of the EU. On the contrary, exports to the European Union only slightly recovered in 2003. In particular, the Mauritian companies which had relocated their textile production in Madagascar en masse, seem to be permanently discouraged by the political instability (Floréal and Novel, two of the main exporters of textiles to the EU have left for good). Still, the fact that total exports of clothing (USA+EU) were only less than 20% lower in 2003 than the pre-crisis level is a very promising result. Despite some companies having left, the immediate rise in the number of approvals for free zone companies as soon as the crisis was over confirms this continuing vitality. 30 authorisations were issued in 2003 (particularly for Asian companies), compared with 20 in 2002 and 43 in 2001.

<sup>19</sup> On writing this article we have not received the ITC's mirror-data for 2002 and 2003. We have therefore used the American and European customs data to back up our arguments.

**Graph 4: Madagascan exports of textile products to the USA and the EU (1998-2003)**

In millions of dollars



Source: Otxea and Eurostat.  
 For the EU, the data is only available for the first eleven months of 2003 (date for Greece being only available for the first 9 months) and is therefore extrapolated (x12/11) for the whole year.

The 2002 crisis highlighted the fragility of the *Zone Franche* system. Given that the investments in this sector are relatively light and hence very quickly profitable, companies can easily pull out whenever there is the slightest political, economic or social problem. Generally speaking, continued growth of *Zone Franche* in Madagascar will depend in the long term on whether or not they can remain competitive and on whether they continue to benefit from their present preferential conditions of access to the major markets. There is probably no need to be too worried about the first point, given the tax advantages offered to the *Zone Franche* companies and the current low level of wage costs, which guarantees an important competitive margin, although the business environment remains difficult. As is true in most LDCs, surveys carried out with investors are an opportunity for the latter to complain about the poor quality of infrastructures (transport, energy, etc.) which makes it difficult for them to run their factories, obtain supplies and distribute their products; to this must also be added the usual problems of governance, particularly with respect to corruption and incompetent administrations (Cadot & Nasir, 2001).

As far as market access is concerned, the AGOA is the main driving force behind the *Zone Franche* growth at present. Whilst authorising duty free access to the American market for the products concerned, the AGOA nonetheless imposes restrictive conditions in terms of inputs, which must come either from the United States or from other countries benefiting from the agreement. The extension until 2008 of the derogation granted to Madagascar authorising it to use Madagascan inputs in the clothing sector (Madagascar was initially supposed to benefit from the “third-party fabric provision” until 2004 only) will favour continuing growth of exports to the USA. However, it is only a temporary derogation and the obligation to respect the rules of AGOA in the long term by importing inputs from other African suppliers would lead to extra costs compared with the EPZs' current Asian suppliers. Madagascar also benefits from tax free access to the European market in the scope of the Cotonou Convention (signed between the EU and the ACP States) and since 1999 under the Everything But Arms (EBA) initiative, which covers all the LDCs. Under these agreements too, the rules of origin are particularly strict, notably for the EBA (inputs from third-party countries must not exceed 10% of the product's factory value compared with 15% under the Cotonou Convention). Yet, like the other ACP countries, after 2008 Madagascar will only be able to benefit from the Cotonou Convention if it signs an Economic Partnership Agreement with the EU. Failing this, it will be offered the less favourable conditions of the EBA initiative. Madagascar will be obliged to adapt in order to satisfy the requirements imposed by the USA and the EU in terms of rules of origin and thereby keep preferential access to their markets. This is a good opportunity to develop an internationally competitive cotton

industry in Madagascar, which would require major reorganization in the sector (Integrated Framework, 2003).

The main threat facing *Zone Franche* is the dismantling of the customs quotas imposed under the Multi-Fiber Agreement (MFA) on 1st January 2005. It is widely recognised that there is a strong correlation between growth in the EPZs and the MFA in general, given that for over thirty years the investments in these zones have served to get round textile quotas (Jayanthakumaran, 2003). Simulations designed to assess the impact of the ending of the MFAs suggest that there will be a concentration of textile production in certain parts of the world, mainly to the benefit of Asian countries, particularly China, a member of the WTO since 2001 (Fouquin, Morant, Avisse, Minvielle & Dumont, 2002). Even though one of the main motivations for Asian investments in *Zone Franche* will no longer exist (the latter are cashing in on the current situation to strengthen their sales networks in the American market), it is important to note that *Zone Franche* will continue to benefit from special tariffs granted under the preferential agreements concluded with the USA and the EU, whereas this is not the case for the Asian exporters. In addition, *Zone Franche* will benefit from the Agreement on Subsidies and Countervailing Measures (ASCM) signed in the framework of the WTO, which prohibits export subsidies for countries with per capita income exceeding 1,000 dollars (this agreement has been in force since 2003, but several countries, including Mauritius, have obtained a derogation until 2007), as Madagascar does not fit into this category. In the long term, the application of this agreement will strengthen Madagascar's competitiveness, as most of the EPZs in competitor countries are likely to disappear, or at least to put an end to their main tax incentive schemes.

Overall, the success of *Zone Franche* was the main impetus of growth in employment and exports in the last decade and made a major contribution to the economic recovery observed from 1995, after a long period of decline. Beyond the case of Madagascar, this success backed up the idea that the use of EPZs to develop a productive manufacturing base was a possible path for African countries. A contrario, the possible questioning of this success story would be fraught with consequences and lessons. First of all, it would oblige Madagascar to draw up an alternative growth model. Then it would suggest that these countries are condemned to keep their traditional specialisations in primary products and that there is no option but to base development strategies on these sectors, which are their true competitive advantage (Wood & Mayer, 1998).

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