



# REPUBLIC OF MADAGASCAR

## SELECTED ISSUES

January 2015

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# REPUBLIC OF MADAGASCAR

## SELECTED ISSUES

December 18, 2014

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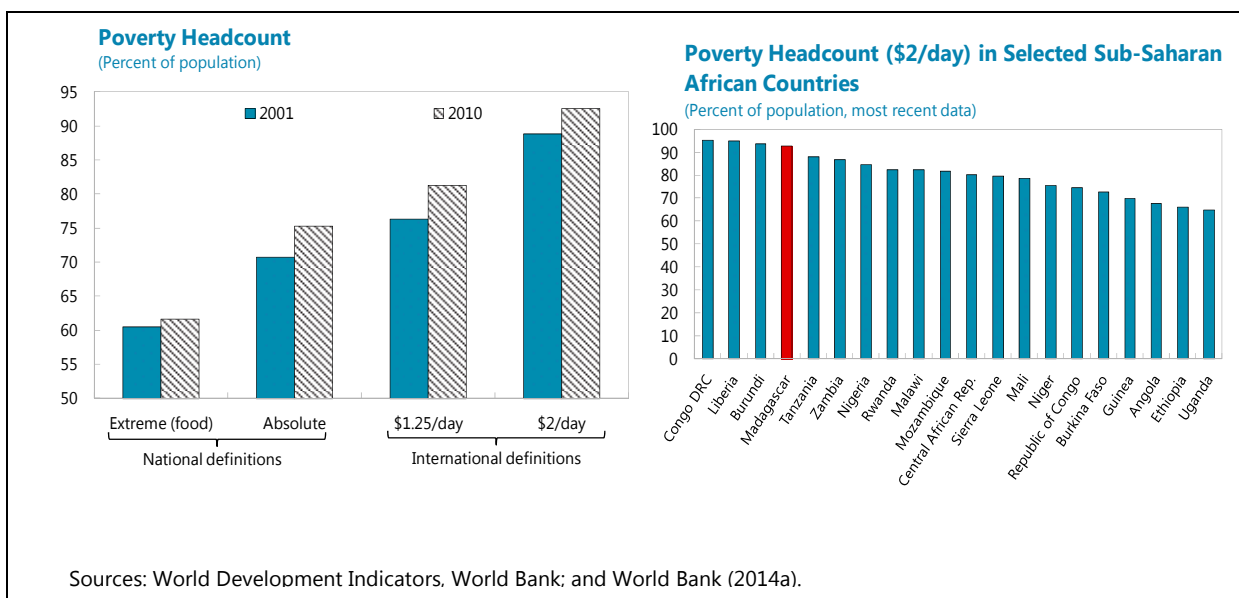
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# POVERTY IN MADAGASCAR<sup>1</sup>

Madagascar is a country with general, widespread, and increasing poverty. A majority of the population is extremely poor and struggling to pay for food. Madagascar has the potential to grow rapidly. It is endowed with abundant natural resources, a unique wildlife, and a young, vibrant, and rapidly growing population. Taking full advantage of the young population will require higher investment in education and healthcare.

## A. Poverty

**1. Poverty is widespread in Madagascar.** A majority of the population is extremely poor and can hardly afford to pay for food. About 62 percent of the population live below the extreme (food) poverty line (that is, with an income that is less than the cost of consuming 2100 calories a day); (ii) three out of four people live below the absolute poverty line; and (iii) over ninety percent of the population live on US\$2/day or less, which is about the same proportion as in Congo DRC, Liberia, and Burundi (which are all post-conflict countries coming out of a civil war). These numbers confirm that Madagascar has become one of the poorest countries in the world. By all definitions (Box 1), poverty has worsened between 2001 and 2010.



<sup>1</sup> Prepared by Lars Engstrom.

**Box 1. Different Measures of Poverty**

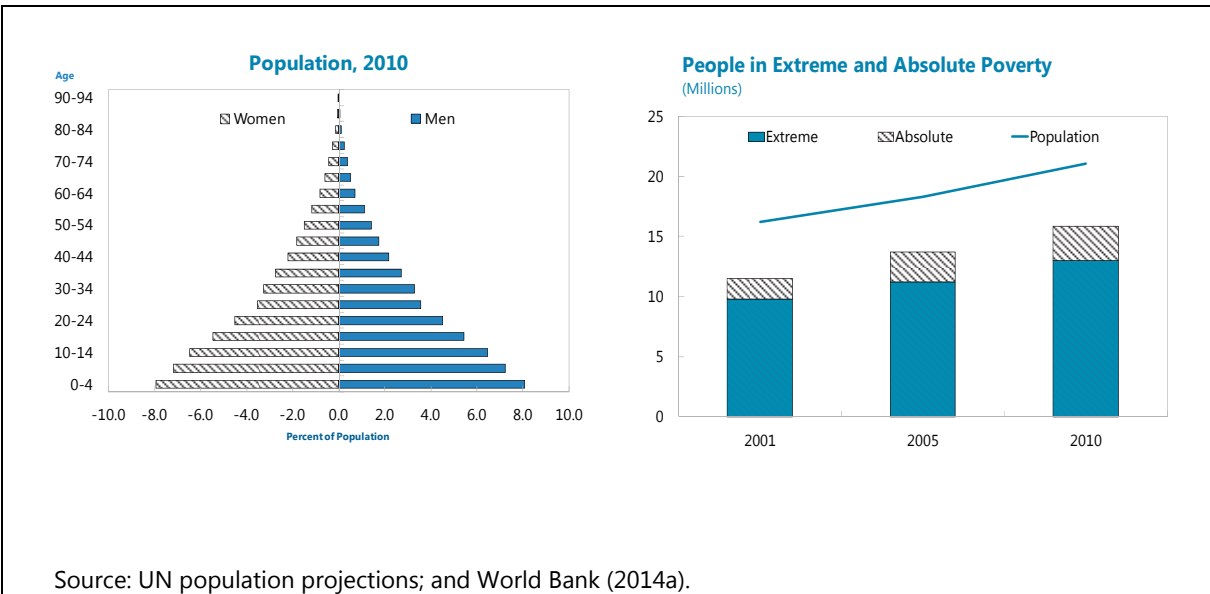
**National definitions:**

*Extreme (food) poverty line:* Percentage of the population living on an income that is less than the cost of consuming 2,133 calories a day (the WHO recommended calorie needs). *Absolute poverty line:* Percentage of the population living on an income that is less than the extreme (food) poverty line plus about a 30 percent allowance for non-food goods.

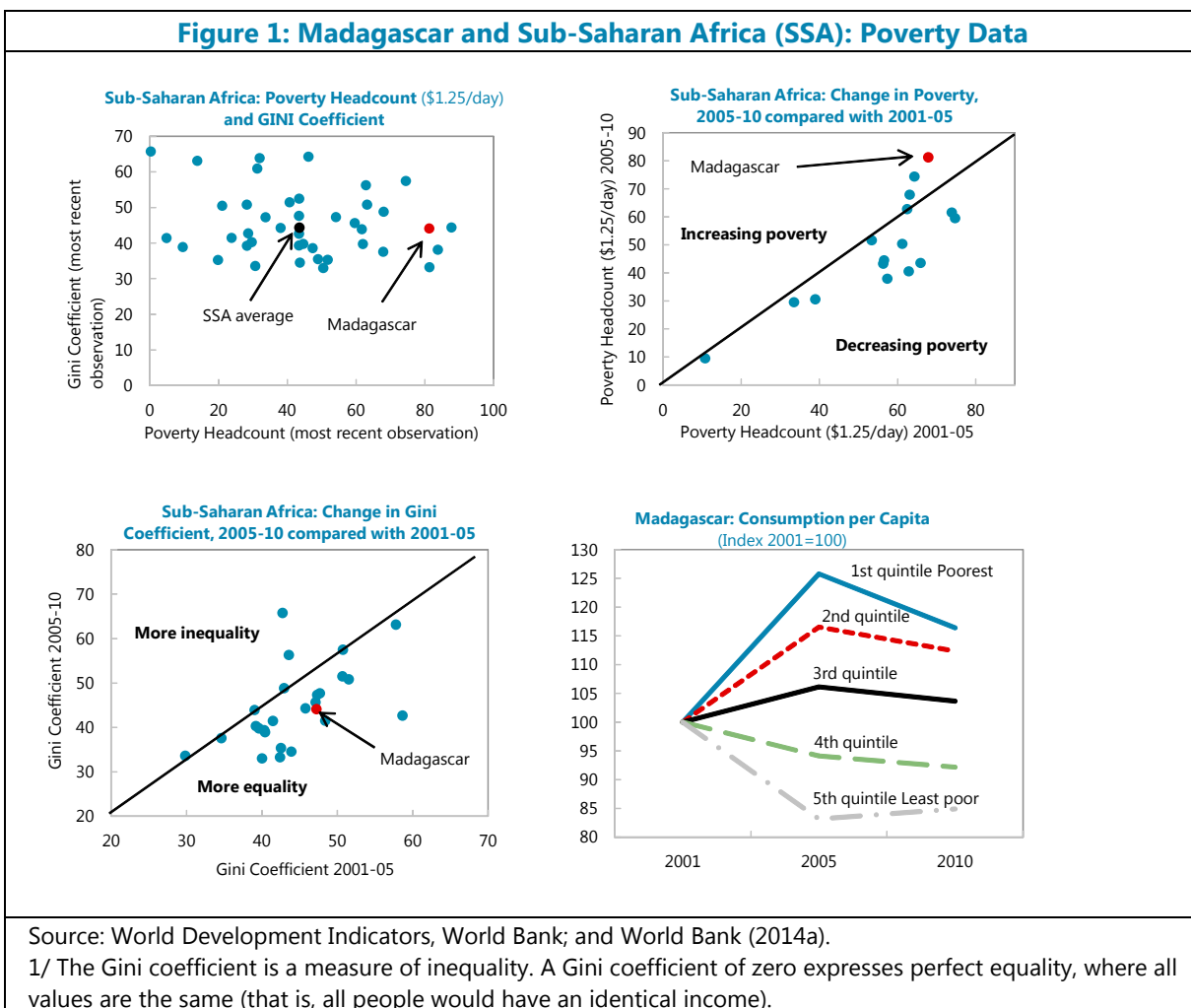
**International definitions:**

Based on the percentage of the population living on less than \$1.25/\$2 a day at 2005 international prices.

**2. Madagascar has a young and rapidly growing population.** Half the population is less than 20 years old and the population is growing at 2.8 percent a year, which corresponds to a population increase of about 600,000 people a year. Taking account of population growth, the number of people in extreme poverty grew from about 10 million (60.5 percent of the population) in 2001 to 13 million (61.7 percent of the population) in 2010—a 30 percent increase over nine years.



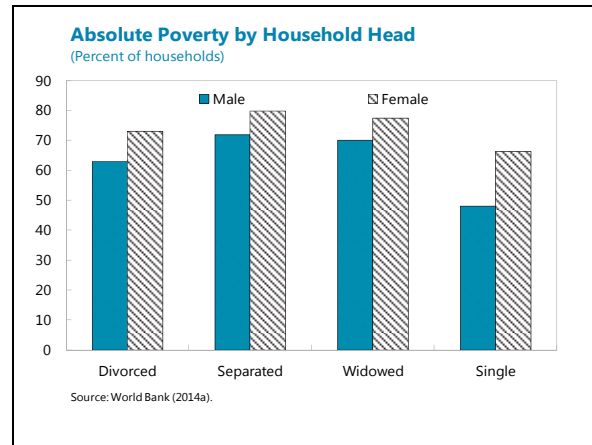
**3. Although poverty is extensive and has been growing, Madagascar is not among the most unequal countries and inequality has not been growing.** Income inequality, measured by the Gini coefficient, is close to the average of countries in Sub-Saharan Africa (SSA) and did, in fact, decrease over 2001–10. When dividing households into quintiles from the most poor (first quintile) to the least poor (fifth quintile), it is noticeable that the consumption distribution has been progressive (benefiting the poorest) over 2001–10 and particularly so over 2001–05. While households in the first three quintiles increased their consumption over 2001–10, households in the fourth and fifth quintiles reduced their consumption. According to the World Bank, an economic shift favoring agriculture could be the reason for the decreasing inequality (Figure 1).



## B. Who are the Poor in Madagascar?<sup>2</sup>

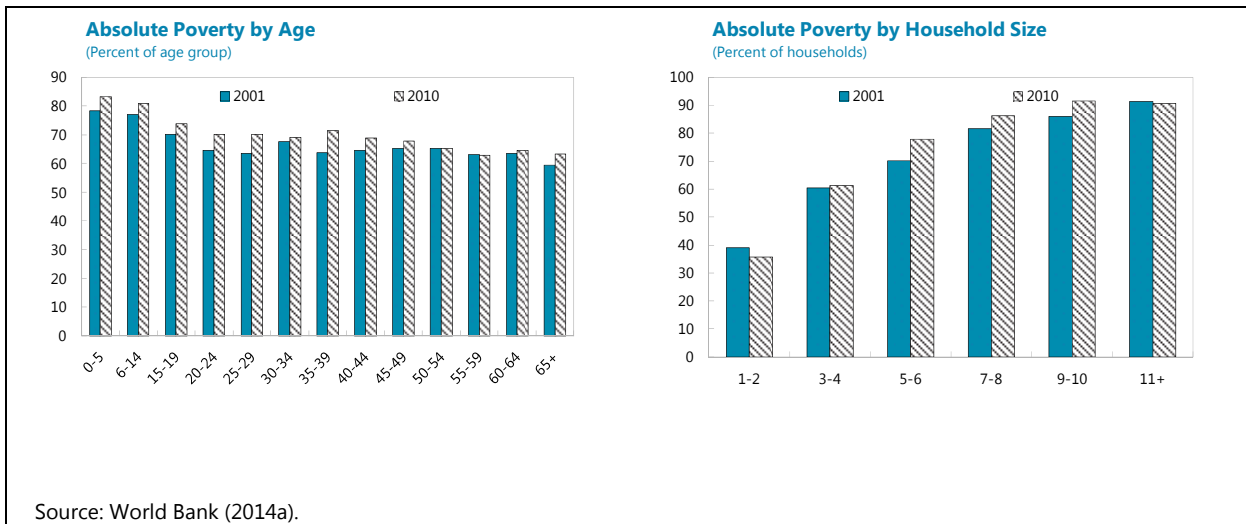
### Gender

**4. There are differences in poverty between men and women when comparing families with only one parent.** Families headed by a female who is divorced, separated, or widowed are poorer than corresponding male-headed households. Single women are also significantly poorer than single men.



### Age and household size

**5. Younger people and large families are on average poorer than older people and small families.** Younger people and large families with many children also became poorer between 2001 and 2010, while older people (50–59 years) and smaller families did relatively better. Families with seven or more members (representing about 38 percent of the population) had a poverty incidence of 86 percent compared with 36 percent for families with one or two members in 2010.

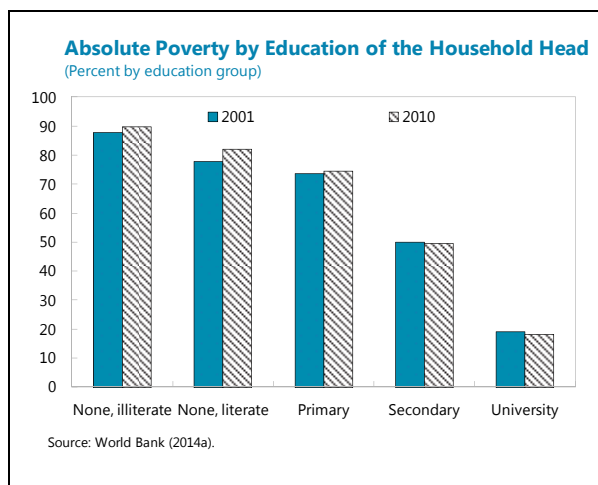


<sup>2</sup> The discussion in this section is based on the analysis in “Face of Poverty in Madagascar,” World Bank 2014a.



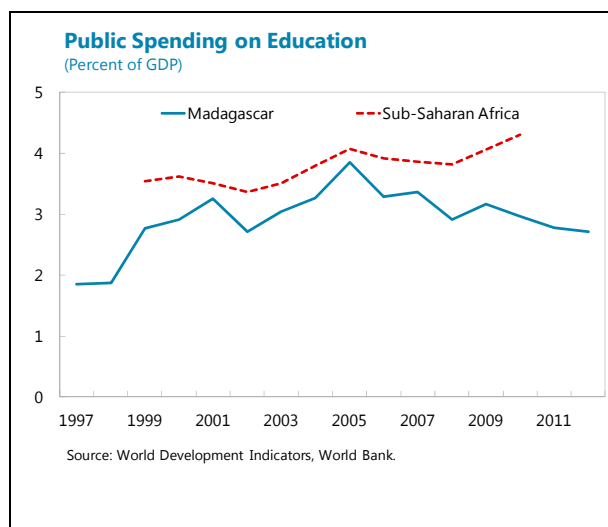
## Education

**6. There is a strong connection between poverty and lack of education.** Households headed by an individual with no or little schooling are significantly more likely to be poor. The growth in poverty between 2001 and 2010 also occurred primarily in households where the household head had no formal education. While education makes a difference, the World Bank's poverty analysis concludes that the positive impact of increasing literacy rates has been relatively weak and the strongest poverty-reducing effect is among people with secondary or higher education. Against this background it is worrying to note that the proportion of the population with secondary or higher education declined from 16 percent in 2001 to 11 percent in 2010.

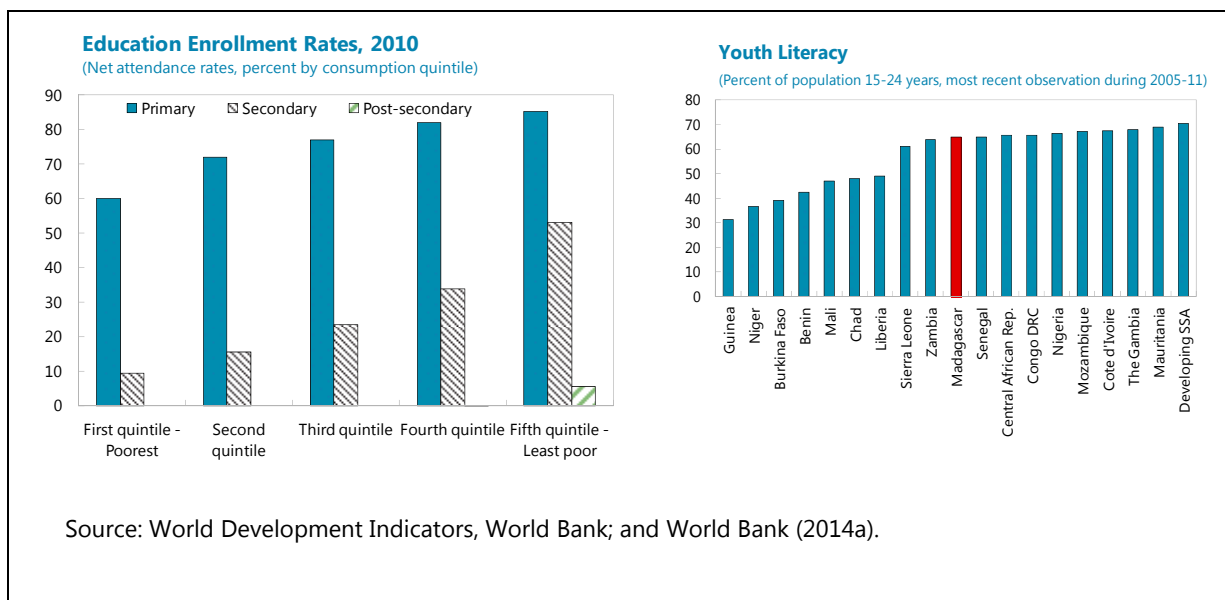


**7. Many education indicators are weak and some have deteriorated in recent years.** Enrollment in primary education has fallen since 2009. Many children do not attend school, particularly in rural areas, or leave after only a few years. World Bank estimates indicate that about half a million children who should attend primary education are absent. The strategy to use so-called community teachers supported by the Association of Parents (FRAM) has improved access to education, but it may also have had a negative impact on the quality of education. The community teachers, which now constitute about two-thirds of all primary school teachers, have not received the full educational training that had been planned.

**8. Public spending on education has declined** from a starting point where Madagascar was already spending less than other SSA countries. Madagascar's public spending on education amounted to 2.7 percent of GDP in 2012, while the SSA average was 4.3 percent of GDP in 2010. In addition, GDP per capita adjusted for purchasing-power parity was on average about the double in SSA compared with Madagascar and thus, the difference in actual resources set aside for education was even larger than the difference in share of GDP.



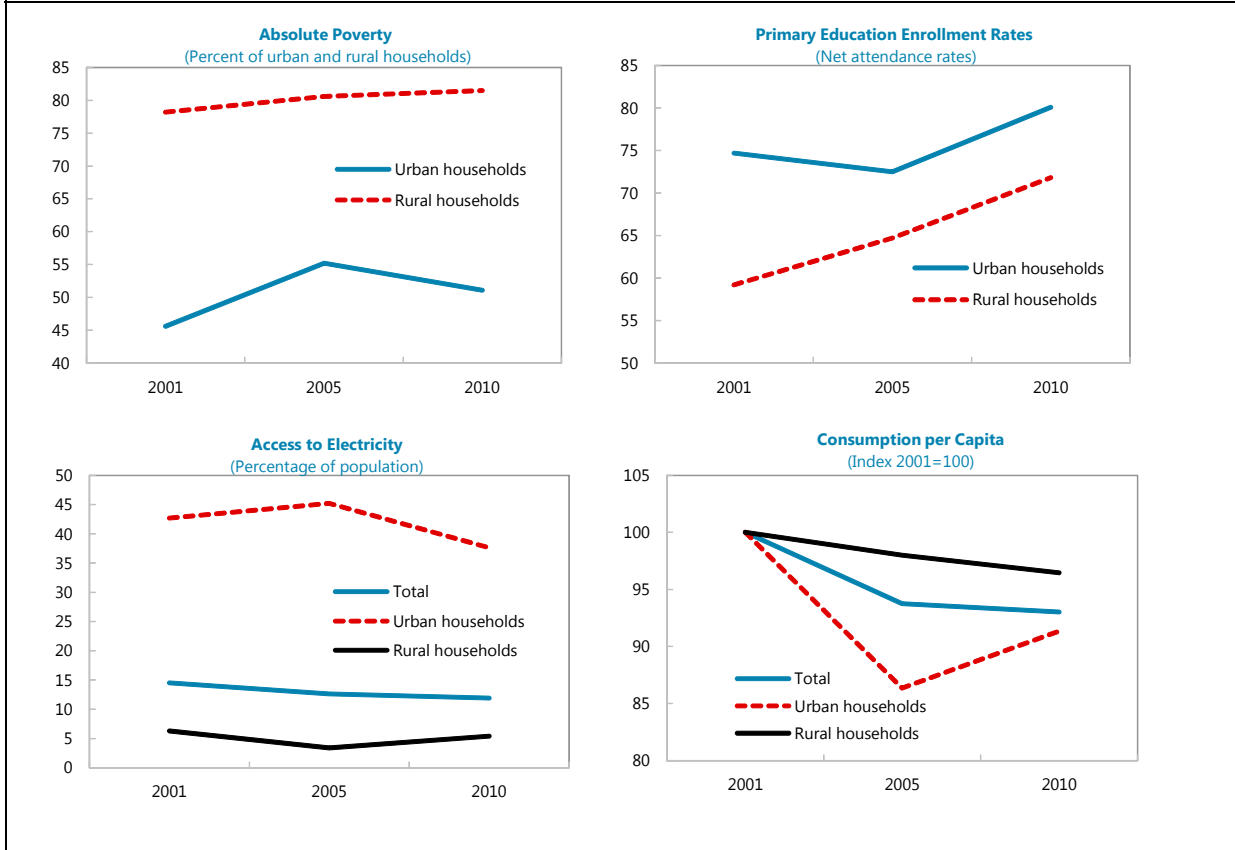
**9. Access to education is rationed by income.** In primary education, 85 percent of children from the fifth quintile (least poor) attend school, while only 60 percent of children from the first quintile (poorest) do so. Few children from the lower quintiles have a chance of going through secondary education and only children from the highest quintile have a chance (albeit small) of attending post-secondary education. Notwithstanding these shortcomings, Madagascar's youth literacy rate (70 percent) is more or less on par with the average for SSA. That said, the fact remains that more than a quarter of the youth are entering the labor market without being able to read and write.



### Urban and rural areas

**10. The poor live prevalently in rural areas.** Close to 80 percent of the population live in rural areas, where absolute poverty is almost twice as high compared to urban areas. As a result, 86 percent of the poor live in rural areas. Most farmers practice subsistence farming with yields that are barely enough to feed their families. Real per capita value added in agriculture has been falling by about 1 percent a year since 1960. Not just poverty, but also other development indicators are less favorable in rural areas. Infant mortality is higher, life expectancy is shorter, literacy is lower, malnutrition is more widespread, school attendance is lower, and only an extremely small minority of the rural population has access to electricity and safe drinking water. That said, as a reflection of decreasing inequalities and the progressive consumption distribution (see paragraph 3), consumption declined faster in urban areas than rural areas over 2001–10 (Figure 2).

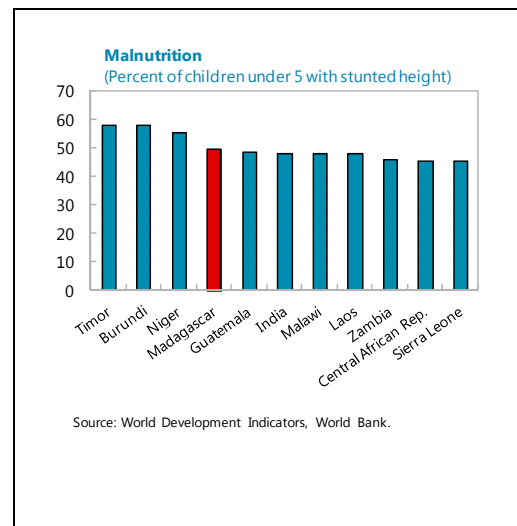
**Figure 2: Madagascar: Indicators in Urban and Rural Areas**



Source: World Bank (2014a).

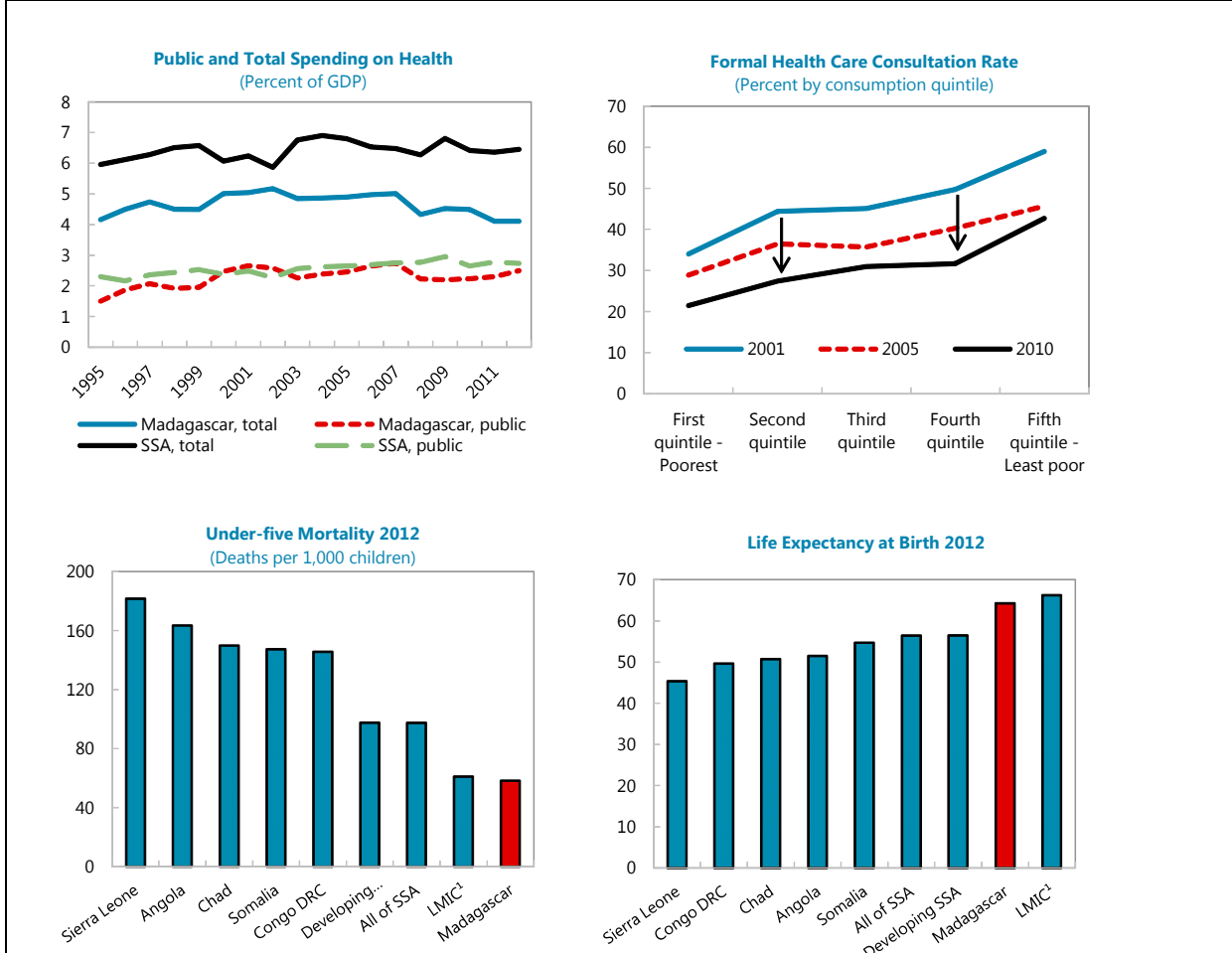
## Healthcare

**11. Spending on health is lower than in other SSA countries.** A declining proportion of the population is choosing or can afford to visit a health center, the use of formal healthcare varies significantly depending on the income of the households, and inequalities have grown since 2001. In 2010, the consultation rate in case of illness for the poorest quintile was 22 percent (down from 34 percent in 2001), to be compared with 43 percent (down from 59 percent in 2001) for the least poor quintile. Furthermore, the prevalence of malnutrition in children under five (stunted height incidence of 49 percent in 2009) is one of the highest in the world. That said, Madagascar has made significant progress on some key health indicators. Mortality in children under five (62 deaths per 1,000 births in 2012) is significantly



below the SSA average and life expectancy (64 years in 2012) is significantly above the SSA average. In fact, these indicators are similar to those in lower middle income countries. These favorable results are probably positively influenced by the climate and by lower prevalence of malaria and HIV than in many other parts of SSA (Figure 3).

**Figure 3: Madagascar: Health Indicators**

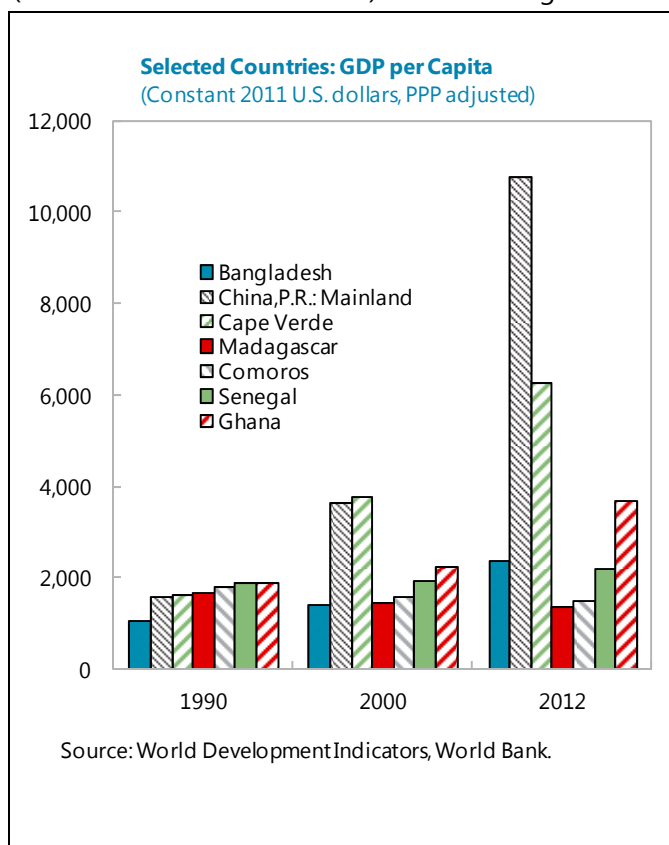


Sources: World Development Indicators, World Bank; and World Bank (2014a).

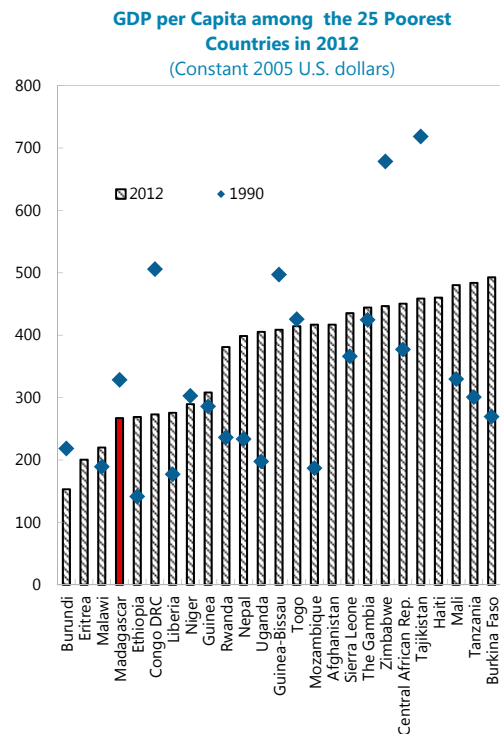
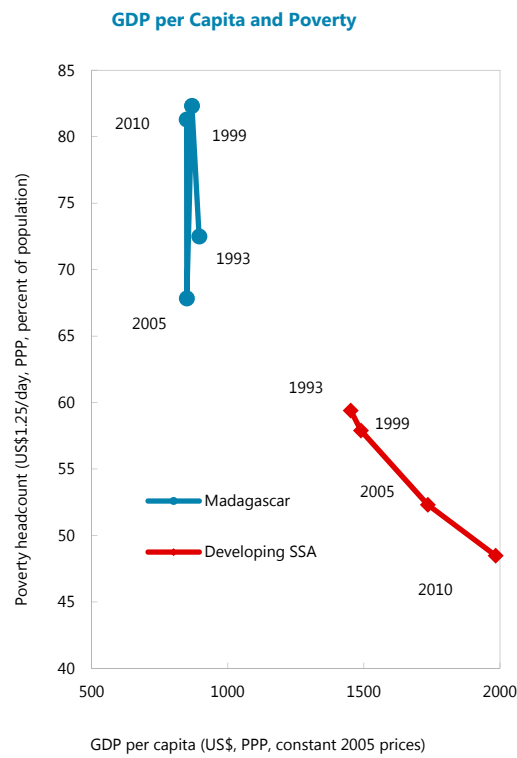
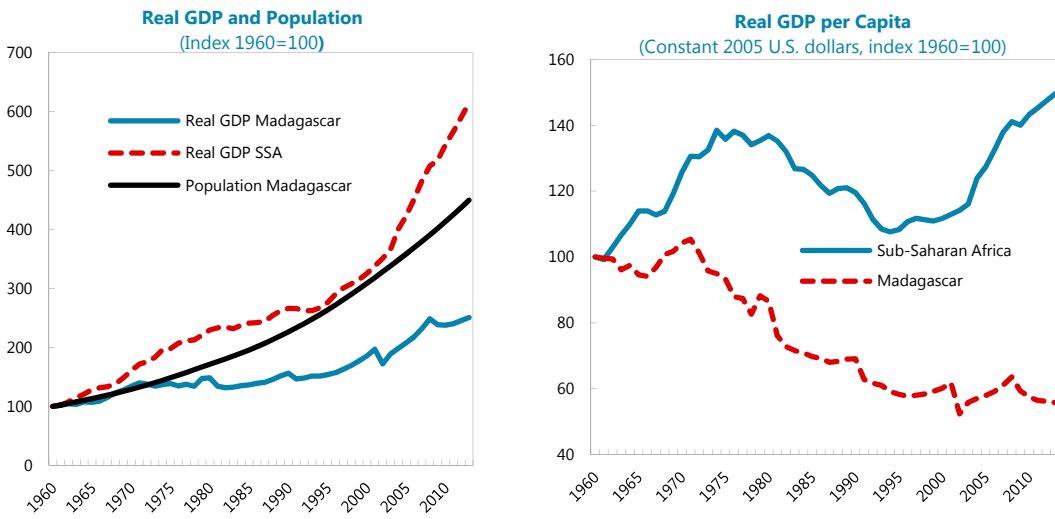
1/ Lower Middle Income Countries.

## C. Growth

**12. A key reason for Madagascar’s persistent and increasing poverty is weak economic growth.** Madagascar’s long-term economic growth has been underperforming in comparison with the average in SSA and has lagged relative to population growth. The result is declining per capita GDP and a widening gap versus SSA (Figure 4). This relative decline is confirmed whether measured in constant U.S. dollars, current U.S. dollars, or adjusted for purchasing power parity (PPP). Madagascar has also underperformed in comparison with a peer group consisting of 25 countries with the lowest GDP per capita (in constant 2005 U.S. dollars). While Madagascar’s GDP per capita fell by 19 percent over 1990–2012, the average country among the poorest 25 reported a 26 percent increase. Only four countries (Burundi, Congo DRC, Zimbabwe, and Tajikistan) reported a larger drop in per capita GDP than Madagascar. A comparison with six countries that had a similar PPP adjusted GDP per capita in 1990 (Bangladesh, China, Cape Verde, Comoros, Senegal, and Ghana) is also informative. All countries with the exception of Comoros outperformed Madagascar. While Madagascar’s PPP adjusted real GDP per capita fell by 19 percent over 1990–2012, Senegal’s real GDP per capita increased by 17 percent, Ghana’s by almost 100 percent, Bangladesh’s by over 100 percent, Cape Verde’s by close to 300 percent, and China’s by close to 600 percent.



**Figure 4: Madagascar and Sub-Saharan Africa (SSA): Economic Growth**

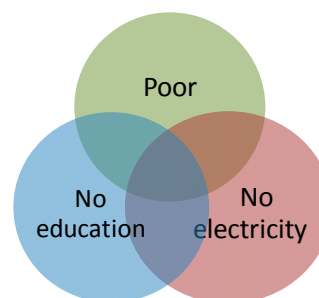


Source: World Development Indicators, World Bank.

## D. Conclusions

**13. Madagascar has not been able to reduce poverty since 2001.** Poverty has increased and become more widespread from already high levels and overall per capita consumption fell over the period 2001–10. This is the general conclusion of the poverty analysis. A further analysis of more detailed data reveals several notable aspects on poverty:

- Economic inequality appears to have declined and the poorest have in fact increased their consumption. Thus, while it is true that more people are poor today than in 2001, on average those who are deepest into poverty appear to be economically better off today than in 2001.
- Poverty is primarily a rural challenge. An overriding majority of the population lives in rural areas and rural poverty rates are almost double those of urban areas.
- Access to education and healthcare is very unequal and rationed by income. With a young and rapidly growing population, spending on education and health should be a key priority. However, the resources set aside for education and health in Madagascar are less than in most SSA countries and have decreased as a percent of GDP. That said, some general health indicators like under-five mortality and life expectancy are encouraging and comparable with lower middle income countries.
- About one third of Madagascar’s population is deprived on multiple dimensions. For example, people who are poor, with no formal education, and without access to electricity constituted 26 percent of the population in 2010.
- Alleviating poverty will require structural reforms with the potential of raising economic growth. This has to be accompanied by higher investment in education, healthcare, and infrastructure to give the young generation better opportunities.



## References

World Bank (2014a), “Face of Poverty in Madagascar,” World Bank Report No. 78131-MG, 2014.

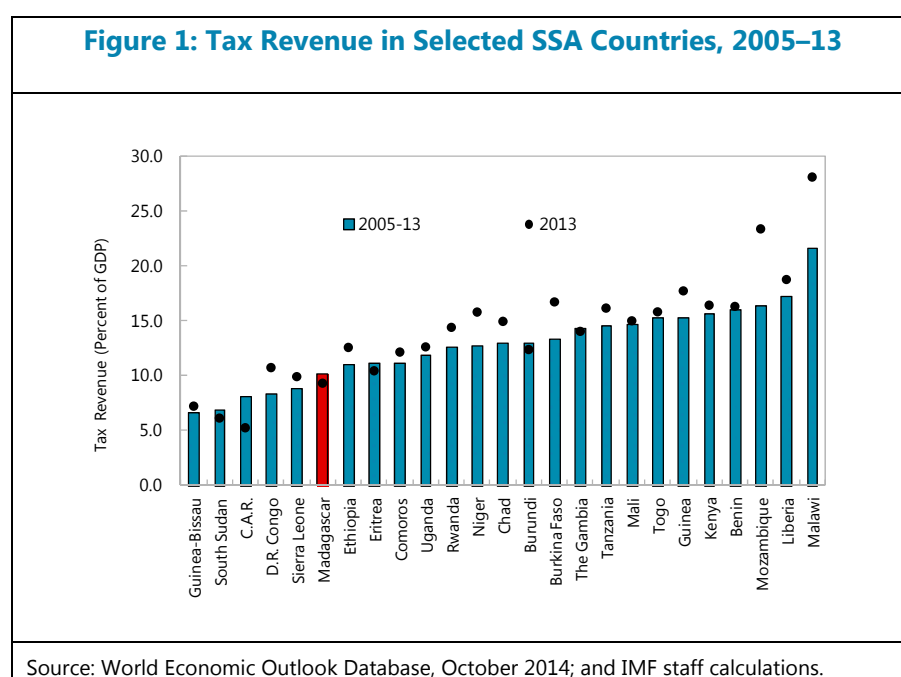
World Bank (2014b), “Opportunities and Challenges for Inclusive and Resilient Growth: Compendium of policy notes for Madagascar,” 2014.

## TAX REVENUE MOBILIZATION IN MADAGASCAR<sup>1</sup>

Madagascar's tax revenue ratio is among the lowest in Sub-Saharan Africa and falls far short of the levels required to meet the country's sizeable development needs. The government's objective is to raise the tax ratio to about 14 percent of GDP in the medium-term. Reaching this target will require actions to broaden the tax base, including limiting tax incentives raising compliance and reducing opportunities for avoidance. In order to boost tax morale, these efforts will also have to go hand-in-hand with improved public service provision. This paper reviews the level and structure of tax revenues in Madagascar, analyzes tax effort and efficiency, and discusses strategies to increase revenues. It also draws lessons from other countries' experiences.

### A. Background

**1. Madagascar has one of the lowest tax-ratios in Sub-Saharan Africa.** Over the period 2005–13, it raised on average about 10 percent of GDP in total tax revenue (Figure 1). This placed it ahead of only five low-income Sub-Saharan African (SSA) economies, primarily post-conflict countries (Guinea-Bissau, South Sudan, Central African Republic, Democratic Republic of Congo and Sierra Leone), and stands about 2–3 percentage points of GDP below other economies with similar characteristics (Uganda and Tanzania).

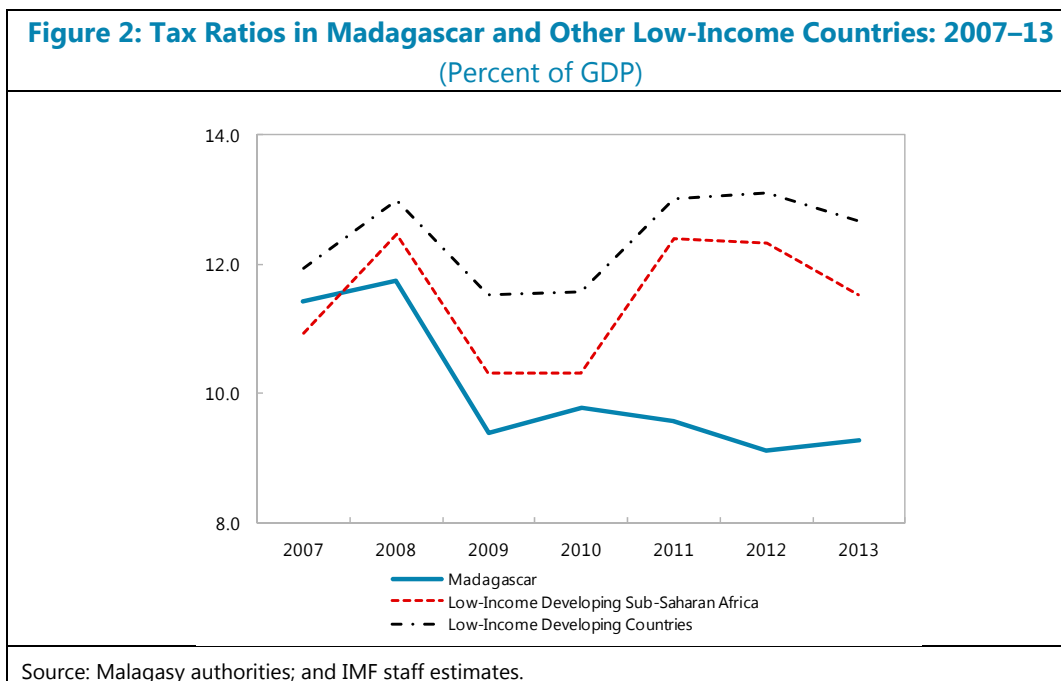


In addition, Madagascar's tax ratio has been declining since 2008. In 2013, it was below the

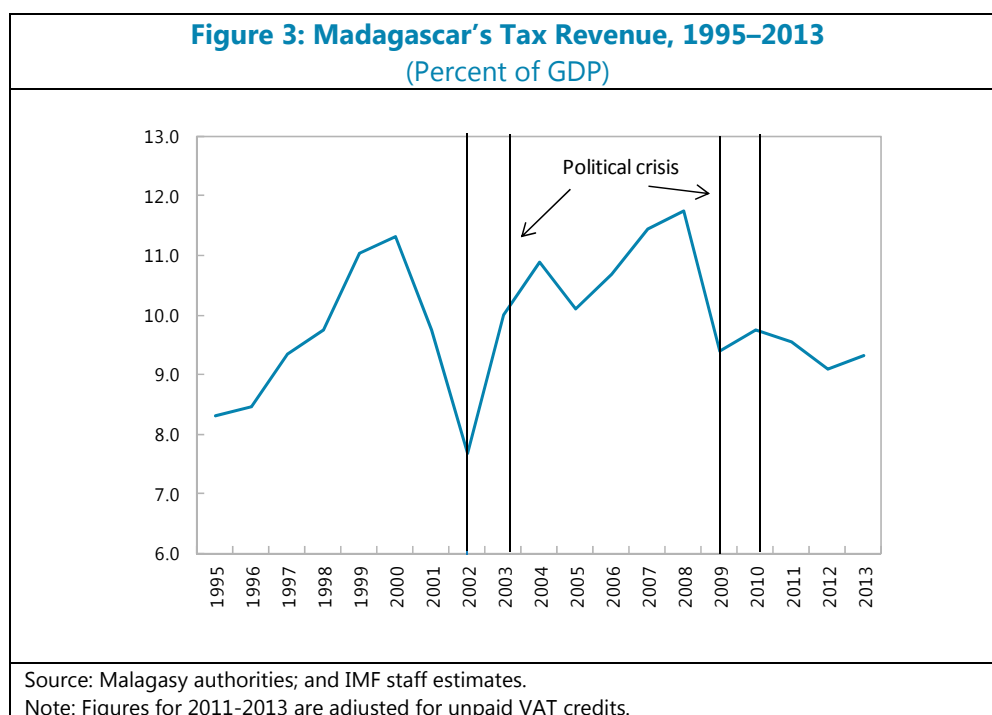
<sup>1</sup> Prepared by Priscilla Muthoora.



average of the past nine years. This trend is in sharp contrast to the improvements in the tax ratio observed in other low-income developing economies, both within Africa and elsewhere (Figure 2).



**2. Tax revenue mobilization is thus now more pertinent than ever.** Over the last two decades, Madagascar’s tax ratio ranged between 7.7 percent and 11.8 percent of GDP, consistently ranking among the lowest in the world. At end-2013, it reached 9.3 percent of GDP, 1 percentage point above its 1995 level. This performance is underpinned by a “boom-bust” pattern of tax revenue collection that reflects not only tax policy changes (IMF, 2007), but also the political crises and the ensuing economic contractions (Figure 3). The 2009 domestic political crisis and related uncertainties have had deleterious effects on growth and have set back progress initiated with the tax reforms of 2008.



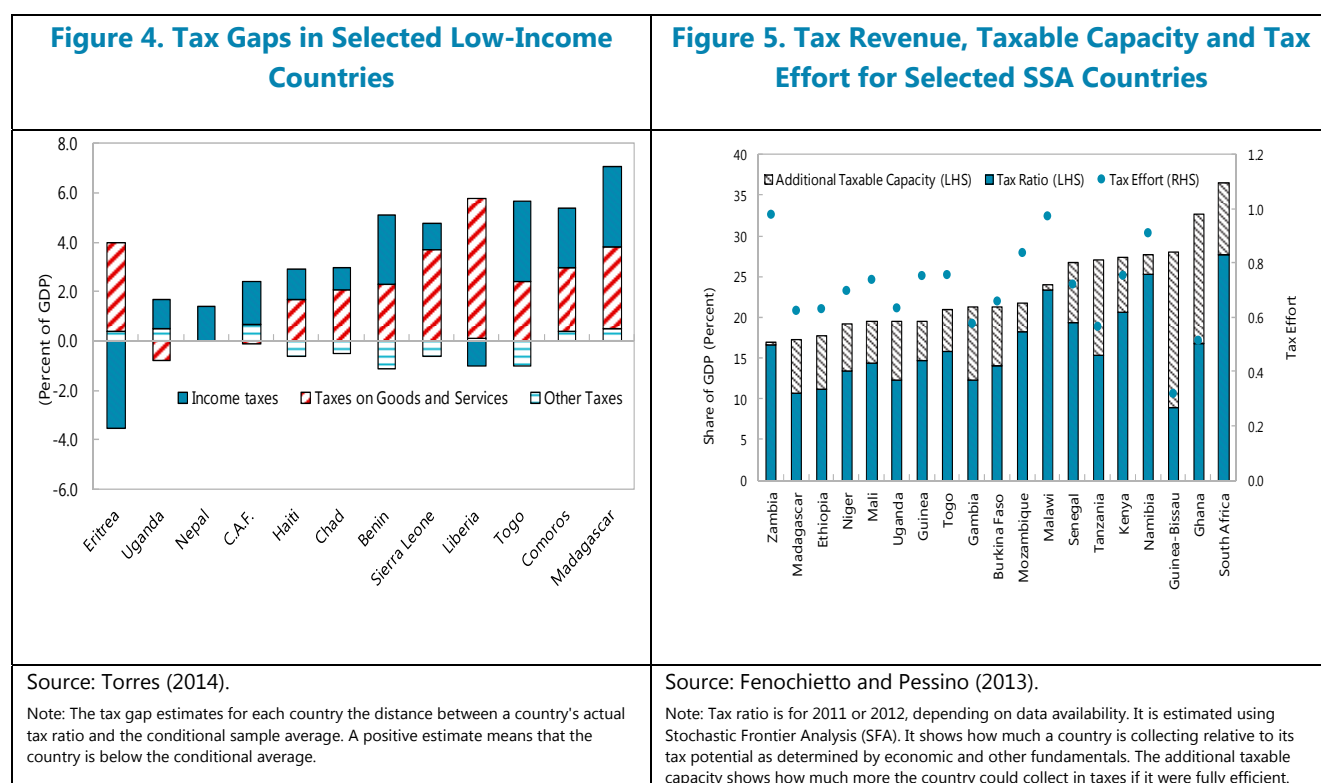
**3. The government's objective is to raise the tax ratio to about 14 percent of GDP in the medium-term.** This targeted magnitude is consistent with various estimates of tax potential for Madagascar, but will require concerted actions to address policy and compliance gaps. Policy gaps include those related to tax rates and exemptions and compliance gaps are those related to weaknesses in tax and customs administration and low tax morale.

**4. This paper analyzes why Madagascar's tax revenues have been underperforming and what can be done about it.** The rest of the paper is structured as follows. Section B reviews the level and structure of taxes in Madagascar in a cross-country setting. Section C discusses options to mobilize revenue. Section D reviews the experience of countries in mobilizing revenues and draws lessons for Madagascar.

## B. Diagnostics: How Low is Madagascar's Tax Ratio and Why?

**5. A large empirical literature links tax revenue performance to a wide range of developmental, structural and institutional factors.** Results differ depending on the dataset and estimation methods, but there is some convergence in findings. Tax performance is positively associated with higher income per capita, trade openness, financial sector depth and better institutions. By contrast, larger shares of agriculture in total value-added and higher inflation are negatively associated with tax revenues. The effect of demographics, public debt and aid dependency is ambiguous (IMF, 2011).

**6. Studies of tax performance and tax effort suggest that, based on its developmental, structural and institutional features, Madagascar could increase its tax ratio up to 17 percent of GDP.** In IMF (2007), cross-country regressions using tax revenue data for 2005 found that Madagascar’s tax potential was about 15 percent of GDP.<sup>2</sup> Torres (2014), applying the same methodology but using panel data covering 165 countries for 2007–13, finds similar magnitudes for the tax potential. Moreover, he estimates that the gap of roughly 7 percentage points of GDP between Madagascar’s tax revenues and the sample average could be filled roughly equally by direct and indirect taxes (Figure 4).<sup>3</sup> Fenochietto and Pessino (2013) employ a different methodology, namely stochastic frontier analysis (Box 1), for 113 countries during 1991-2012 and also report estimates of the tax potential for Madagascar at about 17 percent of GDP (Figure 5).<sup>4</sup>



<sup>2</sup> The characteristics controlled for were the share of agriculture in GDP, imports to GDP and real GDP per capita.

<sup>3</sup> Recent IMF technical assistance suggests that meeting the revenue objective of the government will require improving customs revenue from about 5 percent of GDP currently to 7 percent of GDP in the medium term.

<sup>4</sup> I would like to thank Jose Torres and Ricardo Fenochietto for sharing their data.

### Box 1. Tax Potential: A Comparison of Two Empirical Approaches

There are two commonly used approaches used to determine tax performance and tax potential.

The first, referred to as “peer analysis” in the October 2013 IMF *Fiscal Monitor*, defines revenue ( $r_i$ ) in country  $i$  (in percent of GDP) as a function of observable characteristics  $x_i$  (such as income per capita, the share of agriculture in value-added, trade openness, the old-age dependency ratio and political participation). The ‘potential’ for additional revenue is the fitted residual,  $\hat{\varepsilon}_i$ .

$$r_i = \alpha + \beta' x_i + \varepsilon_i \quad (1)$$

This method has been applied, for example, in IMF (2007) using cross-section data and, more recently, by Torres (2014) who extended the methodology in by applying it to panel data and to sub-categories of taxes using data constructed from IMF WEO and country documents such as Article IV reports. Results suggest that the tax potential is positively associated with per capita income, the old-age dependency ratio and political participation.

An alternative approach determines tax potential by estimating empirically a *tax frontier* using the stochastic frontier analysis (SFA). SFA models revenue potential according to the following function:

$$R_i = U(z_i)M(x_i)e^{v_i} \quad (2)$$

Where  $M$  denotes maximum revenue, dependent on observables exogenous to policy, and  $U$  is an index between zero and one capturing ‘effort’ (which depends on inefficiencies in tax administration and policy choices regarding tax legislation, rates and exemptions).  $z_i$  is analogous to  $x_i$  above.

The concept of tax potential differs slightly across methodologies. In “peer analysis”, tax potential is derived indirectly based on the difference between actual tax performance and the fitted value of the tax ratio. This difference, the fitted residual  $\hat{\varepsilon}_i$ , averages zero by construction over the sample. As a result, using this methodology, about half of the countries will be estimated to be operating above their revenue potential. By contrast, SFA calculates tax potential directly as the maximum attainable revenue given that the effort index is at its maximum value (of one).

**7. A closer look at the structure of taxes in Madagascar provides some insights as to the proximate causes of tax revenue underperformance.** The greater reliance on indirect taxes relative to direct taxes is in line with what is observed in other countries in SSA. However, a few issues are evident<sup>5</sup>, especially in the light of the 2008 tax reforms which drastically simplified the tax structure and brought it closer to those of middle-income countries in SSA (Box 2, Figure 6):

- Revenue from direct taxes is low, both in relation to other taxes and to other countries in SSA.
- The value-added tax (VAT) is the mainstay of the tax system, accounting for close to 50 percent of all taxes on average during 2004–13. Its performance has however declined since 2004, particularly for VAT levied on domestic goods.
- Excises raised about 1 percent of GDP on average during 2004–13, almost the same as customs duties.

#### Box 2. Madagascar's 2008 Tax Reform

In 2008, Madagascar implemented a wide-ranging domestic tax policy reform. The reform's objectives were to increase the tax yield and improve the business environment. It included the following elements:

- Reduction in the number of taxes from 28 to 14;
- Harmonization of taxes on income and consolidation into a single tax rate of 25 percent;
- Elimination of excise duties on several items;
- Increase of the VAT rate from 18 to 20 percent and of the VAT threshold;
- Announcement of the elimination of the Export Processing Zone (EPZ) regime for new firms, with 'grand-fathering' of existing firms. No firm date had however been announced for this measure and it was subsequently never applied.

In parallel, tax administration procedures were overhauled, resulting in the revitalization of the directorate for large enterprises, the restructuring of several regional service centers, and the modernization of procedures for tax filing and payment.

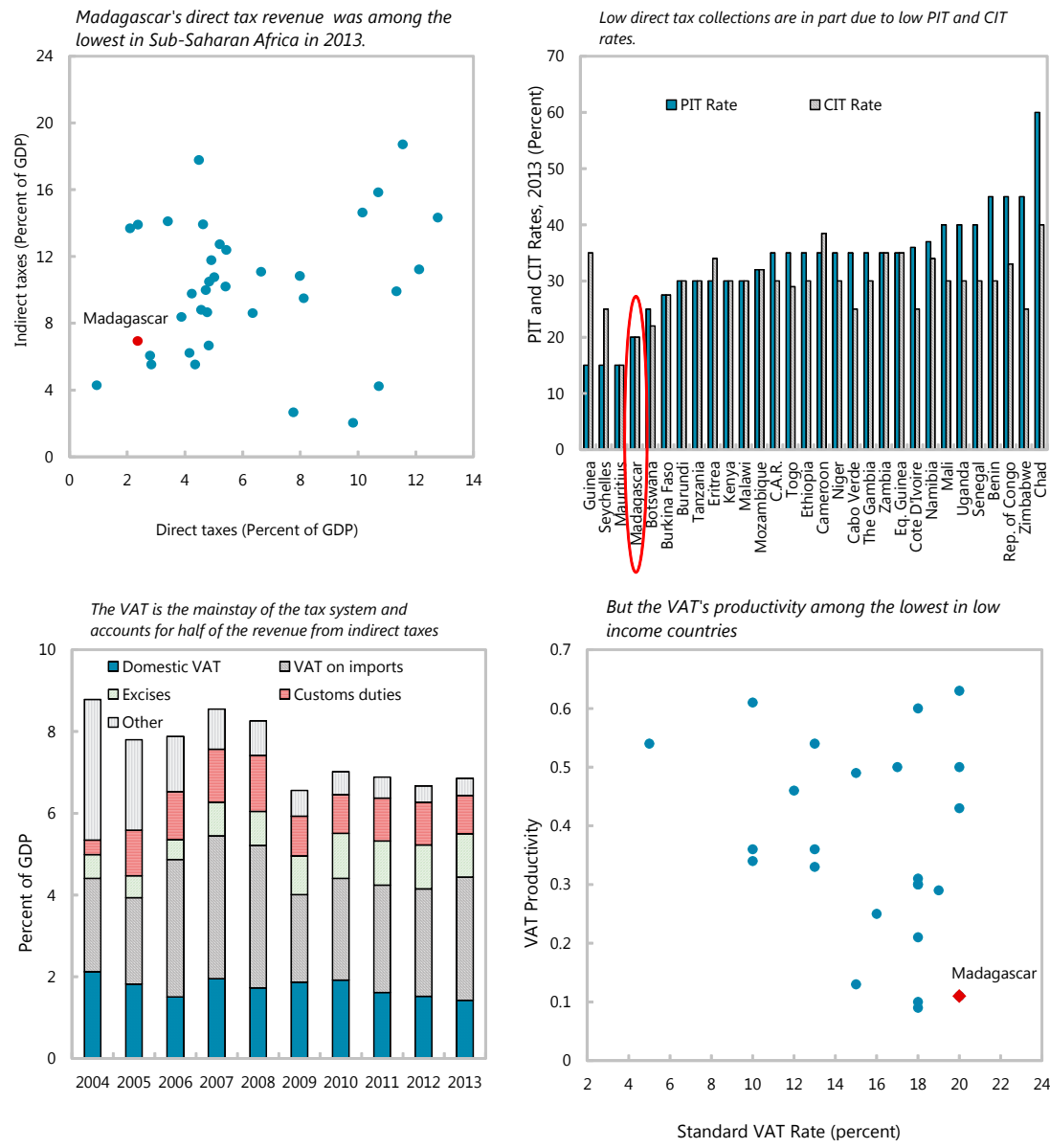
**8. VAT.** A cross-country comparison with other low-income developing countries suggests that Madagascar's standard VAT rate is among the highest, but its productivity<sup>6</sup> is very low. Thus, VAT underperformance appears to be linked to policy gaps other than the rate, such as those related to the refund of VAT credits, and importantly to compliance gaps. Available data suggests that about a fifth of enterprises with turnover of between MGA 50 and 200 million are not complying with their obligations to file VAT returns. Moreover, the share of these non-compliant enterprises has been increasing since 2010. Another indicator of weaknesses in VAT

<sup>5</sup> Based on the recent analysis of the main features of Madagascar's tax system (World Bank, 2014).

<sup>6</sup> Defined as the ratio of revenue collected to the standard rate.

collection is the high share of enterprises submitting nil VAT obligations or requesting VAT credits. This share was 65 percent for large enterprises in 2013 and related not only enterprises of the Export Processing Zone (EPZ), but in all sectors of the economy.

**Figure 6: Madagascar: Performance of Major Tax Categories**



Sources: Malagasy authorities; IBFD (2013); USAID Collecting Taxes 2011/12; and IMF staff estimates.

Note: In the bottom right chart, VAT productivity is measured as the ratio of VAT collections to the standard VAT rate.

**9. Income Taxes.** The tax reform of 2008 envisaged a reduction of Madagascar's PIT and CIT rates from 30 percent in 2007 to 25 percent in 2008 and a progressive downward adjustment to 20 percent from there. Madagascar now has a flat tax of 20 percent on personal and corporate income taxes, but there is also a simplified regime for small businesses. In 2013, the rates were at the lower end of the range for selected SSA economies and closer to those in middle-income economies. However, direct tax collection is significantly lower than in middle-income economies, suggesting that low rates are only part of the explanation for the low income tax yield. The narrowness of the tax base and compliance issues also appears to be at play. In 2013, less than half of all enterprises filing returns declared a taxable profit.

**10. Taxes on international trade and transactions.** The contribution of international trade to tax revenue has declined over time, reflecting in part lower imports during the political crisis. But this performance is also symptomatic of more wide-ranging challenges in customs administration. In particular, exemptions, evasion and challenges in administration are the key issues to tackle following recent diagnostic exercises. Policy measures on rates include the lowering of customs tariff rates in 2007, the reduction of excise duty rates with the 2008 tax reform, and more broadly, the pursuit of trade liberalization, including in the context of trade agreements. In terms of challenges, the following appears to be relevant:

- Current procedures do not allow for adequate tracking of the activities of importers despite the fact that a few large importers account for the bulk of all imports. Many of these importers benefit from accelerated customs procedures, but are not followed by ex-post verification.
- As a result, at least partly, false declarations are an issue. First, there is the intentional misreporting of content of imported containers to benefit from lower duties and tariffs and exemptions. The second concerns the declared value of imports. About 70 percent of all imported containers have a declared value of less than US\$ 20,000, which is abnormally low as it translates into a declared value of less than US\$1/kg for imports.
- The duty and tariff structure also leads to incentives to divert lower-taxed products for unintended uses. This is the case, for example, for fuel products such as kerosene which can be mixed with diesel and used to operate machinery.
- Special procedures for customs clearance also give rise to opportunities for fraud. Derogations introduced during the transition years have weakened the purview of the customs administration. EPZ companies, for example, are no longer required to declare to customs the value of their sales in local market. Consequently, the risk of unauthorized duty free sales on the domestic market has increased.
- A relatively high share of imports (16 percent) is granted temporary admission. This seems to stem from the fact that temporary admission is often granted on an ad-hoc basis and for relatively long periods of time.
- Last, but not least, there is anecdotal evidence of governance issues at customs.

**11. Summary.** Overall, it would appear that Madagascar’s low tax revenue yield is not so much related to rates, but to policy gaps linked to exemptions, non-compliance, and to weaknesses in revenue administration. Achieving the government’s medium-term objective will require priority actions in these areas. Moreover, there is increasing evidence in the theoretical and empirical literature that non-compliance is also linked to low tax morale, which in turn reflects “trust in government”.<sup>7</sup> Therefore, tax revenue mobilization has to go hand-in-hand with a strategy to increase the quality and efficiency of government services and to tackle corruption.

## C. Strategy for Tax Revenue Mobilization

**12. The diagnosis on the causes of weaknesses in revenue collections in Madagascar as well as international experience with revenue mobilization strategies (IMF, 2011), point to several areas for policy action. These include:**

### **Broadening the tax base by limiting tax exemptions and improving tax administration**

Madagascar’s 2008 tax reforms drastically simplified the tax structure, making it more comparable to that of middle-income countries in SSA such as Mauritius than other low-income developing countries. As such, the scope for further substantive gains through further changes in the tax structure is limited. However, an important policy gap which remains relates to tax incentives, including tax exemptions. According to Gupta and Tareq (2008), although the number of countries offering tax holidays, including through free zones, has increased dramatically since the 1980s, foreign direct investment in Sub-Saharan Africa, other than in the resource sector, has increased very little over the past two decades. Instead, these incentives not only shrink the tax base but also create challenges for tax administration and are a major source of revenue loss and leakage from the taxed economy. They argue that rationalizing tax incentives can also generate substantial tax revenues without hurting the investment climate.

With regards to revenue administration, the immediate focus should be on improving collections from existing taxes and taxpayers as the integration of the informal sector into the formal sector can take time.<sup>8</sup> However, it is also important that measures to deal with non-compliance be carefully designed to preserve tax morale among existing compliant taxpayers. In the light of the diagnostics in section B, the main priorities are the following:

- *Improving the ability of the tax and customs administration directorate to detect taxpayer fraud.* In the case of the tax administration, this could be achieved by a rebalancing of the

<sup>7</sup> Torgler (2007) provides theoretical and empirical evidence for Latin America, Germany and Switzerland. Cummings and others (2009) use survey and experimental data for Botswana and South Africa to illustrate. Finally, Bursian, Wiechenrieder and Zimmer (2013) present evidence from the Eurobarometer survey showing that tax revenue tends to be lower in European countries with the least trust in government.

<sup>8</sup> IMF (2007) noted that in the pre-political crisis period the size of the informal sector was estimated to be about 39 percent (Schneider, 2002), a high share but close to the average for low-income countries, and that as such it was unlikely to explain weak revenue performance. Anecdotal evidence and data on employment point to an increase in the size of the informal sector since, but this cannot alone explain the declining revenue yield.



responsibilities of the large corporate taxpayers unit (DGE) and regional service centers (SRE) to enable the DGE to focus on very large enterprises. For the customs administration, it will be important to increase physical inspections of containers, verifications of the declared value of imports and ex-post verifications once merchandises have cleared customs.

- *Greater use of risk-based management tools.* Collection and analysis of taxpayer data can help identify trends, patterns and flag potential irregularities.<sup>9</sup> It can thus help more focused, pertinent and timely controls for the tax and customs administration.
- *Modernization and simplification of procedures.* For domestic taxes, the focus should be on improving procedures for filing and paying taxes and for taxpayer audit to make them as taxpayer friendly and cost-effective as possible. At customs, a move towards more paperless and automated processes could help achieve the dual objectives of limiting opportunities for fraud while facilitating trade.

In addition to the above, it will also be important to implement policies and procedures that limit opportunities for rent-seeking and help identify and punish inappropriate behavior in the tax and customs administrations.

### **Exploring the revenue potential of mining and hydrocarbons**

Madagascar's Mining Code is generally sound, but mining-related revenues (royalties) currently contribute relatively little to the government budget.<sup>10</sup> A cross-country comparison of mineral royalty rates within SSA suggests that Madagascar's royalty rate on mining of 2 percent is at the lower end of the range and could be increased to 3 or 4 percent. It would be important that such an increase, if envisaged, be applied to future projects only and that the fiscal stability clause of existing mining projects be respected. The Petroleum Code of 1996, on the other hand, is outdated and would benefit from being brought up-to-date to international best practice before more licenses for exploration and production are granted.

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<sup>9</sup> In this regard, the recent steps to move towards greater and more systematic information exchange between the tax and customs directorates is a welcome first-step. The creation of a database on indicative import values at customs would be another improvement.

<sup>10</sup> Per the provisions of the General Tax Code (GTC) of 1999, the royalty rate of 2 percent (1 percent for processed minerals) is split according to the following formula: 70 percent for local governments, 35 percent of the remaining 30 percent to the Bureau du Cadastre Minier de Madagascar (an autonomous agency) and the rest to the budget. The effective royalty rate for the budget is thus 0.4 percent for unprocessed minerals.

## D. Lessons from Other Countries' Experience

**13. Other countries' experience with revenue mobilization can offer some useful lessons for Madagascar.** A recent study by Drummond and others (2012) suggests that almost all LICs in SSA were able to increase their revenue ratios by more than 2 percentage points of GDP in the short-to-medium term, and at least once in the last two decades. Over half of the LICs in SSA increased their revenue ratios by 5 percentage points of GDP or more in at least one 3-year period in the last two decades. Five countries achieved double-digit increases in their revenue ratios. They also find that fragile countries were less able to sustain these gains over time and sustainability tended to be associated with relatively modest but steady increases in revenues rather than a few large exceptional increases. Analysis by the IMF (2013) emphasizes that the political economy can and does constrain tax reform along several dimensions, namely the scope of the reform, its objective, its timing and "quality", the timeframe for implementation. Abstracting from the specifics, there seem to be three main lessons from these studies:

- Macroeconomic stability and strong governance aid revenue mobilization.
- Extensive political consultation and a clear and broad communication strategy can help ease resistance to reforms and have figured large in the landmark reforms such as the 1986 tax reform in the United States. There are several other advanced economies examples where reforms relied on consultations with the business community, labor unions and other stakeholders, a public relations program and the use of the media, and the appointment of a "champion" for the reforms. These include New Zealand (VAT reform, 1984), the Netherlands (PIT, 2001) and Denmark (2010).
- Reforms should be adapted to the domestic institutional setting, including the structure of the government, such as the degree and nature of fiscal decentralization, and institutional capacity. A recent example, among developing countries, is Bangladesh where the introduction of a VAT was preceded by a strengthening of tax administration capacity in order to increase the chances of a successful implementation.

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## Summary of the Tax System

Tax	Type and Scope of Tax	Exemptions	Tax Rate
<b>Taxes on income, profits and capital gains</b>			
Income Tax (Impôts sur les Revenus, IR)	Income tax on companies and individuals not subject to income tax on employment income (IRSA) with annual turnover of MGA 20 mn or above. There is a simplified regime if the turnover is between MGA 20 mn and MGA 200mn.	Reduced rate under EPZ and Large Mining Investment regimes MGA 320,000 for individuals or companies affiliated with an agreed management center (CGA).	20% Minimum levy: 0.5% of turnover plus MGA 100,000 for agricultural, crafts, industrial, mining, hotel, tourism or transport activities. 0.5% of turnover plus MGA 320,000 for other activities. 0.1% of turnover for retailers of petroleum products.
Global Tax (Impôt Synthétique, IS)	Applies to companies and individuals with an annual turnover below MGA 20 mn. It is a representative tax and exempts from income tax and the VAT.	Reduction of 30 % of taxable income (up to MGA 500,000) for individuals or companies affiliated with an agreed management center (CGA).	5 % of either turnover, gross revenues or realized profits at 31 December of the previous year Minimum levy: MGA 16,000
Income Tax on Employment Income (Impôt sur les Revenus Salariaux et Assimilés, IRSA)	Withheld at source by employers on wages and salaries. Deductible income of MGA 2000 per month for each dependent family member.		Minimum levy: MGA 2000 on income below MGA 250,000 (introduced with the 2014 supplementary budget, and suspended in October 2014). 20% on income above MGA 250,000. Special regimes apply to one-off remunerations: 2% on remuneration based on a unit rate below MGA 700; 4% on remuneration based on a unit rate between MGA 700 and MGA 2000; 10% on remuneration based on a unit rate exceeding MGA 2000. The special regime was suspended in October 2014.
Tax on Investment Income (Impôt sur les Revenus des Capitaux Mobiliers, IRCM)	Levied on the payment of the distributions made by limited companies to their shareholders. Withheld at source by distributing companies.	Interest received by banks on their lending operations, interest on short-term deposits, on deposits with the Caisse d'Épargne de Madagascar and microfinance institutions and on external borrowings for investment, borrowing obligations relating to government securities.	20%
Real Estate Capital Gains Tax (Impôt sur les plus-values immobilières, IPVI)	Levied on sales of property and real estate.	Sales of property or real estate belonging to the government (central and local) or those stemming from expropriation in the public interest.	20%

<b>Taxes on Goods and Services</b>			
Value-Added Tax (Taxe sur la valeur ajoutée, TVA)	Applies on goods sold and services rendered in Madagascar. Entities with a turnover below or at MGA 200 mn can opt out of the VAT regime. The VAT threshold is MGA	Health services, education, banking insurance and reinsurance, farming and transportation.	20% Zero-rating for exports.
Excises Duties (Droits d'Accises, DA)	Applied on certain goods (domestic and imported) goods and services rendered in Madagascar such as: Tobacco, Alcoholic beverages (beer, wine, spirits), lighters, mobile phone communications. Specific and ad-valorem rates	Imported goods under bond-note transit, goods used in the manufacture of medicines, undenatured alcohol and Ethyl alcohol.	Ad-valorem rates range between 7 and 325 %. The tax base is the following: For domestic goods: the sales price, provided it is not inferior to the cost price plus a profit margin; For imported goods: The declared CIF value plus customs duties; Goods such as alcohol, domestically-produced alcoholic beverages and malt beer are subject to specific excises.
<b>Other Taxes and Duties</b>			
Special Tax on alcoholic beverages, manufactured tobacco and gambling (Taxe Spéciale sur les boissons alcooliques, les tabacs manufacturés et les jeux de hasard)	Applies to manufacturers and importers of alcoholic beverages, manufactured tobacco and gambling operators. This is an earmarked tax which is assigned to the National Fund for the Promotion and Development of Youth, Sports and Leisure (FNPDJSL).		The rate is determined jointly by executive decision.
Levy on Alcoholic Beverages	Monthly levy on the manufacture of alcoholic beverages This levy is earmarked to finance efforts to reduce taxpayer fraud.	Alcoholic beverages intended for export.	MGA 4 per litre.
<b>Registration and Stamp Duties</b>			
Registration Duties (Droit d'enregistrement)	Levied on transactions relating to movable and immovable property (rentals, sales, gifts) Specific and ad-valorem rates		Specific rates vary from MGA 2000 to MGA 200,000. Ad-valorem rates range between 0.5 % and 6%.
Stamp Duties (Droit de Timbre)	Passport stamps for visitor visa requests  Also applies to new applications for and renewal of firearm licenses.	Reduced rates (50%) for resident missionaries and foreign students enrolled in the "grandes écoles" in Madagascar	Rates range between MGA 0 to MGA 200,000 depending on the length of stay and type of visa. MGA 20,000 (on top of the annual tax on firearms of MGA 20,000)
Taxes on Insurance Policies (Taxes sur les Contrats d'Assurance)	Levied on insurance agreements and contracts	reinsurance, insurances exempt from registration duties and insurance contracts on the transport of goods.	Rates range between 3% and 20%, depending on the nature of the insurance.

<b>Local Taxes (collected by decentralized levels of government)</b>			
Property Tax, undeveloped property (Impôt Foncier sur les Terrains, IFT)	All non-exempt undeveloped property	property belonging to government, property used for medical, educational, social or religious purposes or properties used by charities. Adjoining land (e.g. gardens) not exceeding an area of 20 ares are also exempt. Temporary exemptions for up to 5 years can be granted.	Variable depending on the type of property. Minimum tax of MGA 500. For certain types of property, a lump-sum tax is determined by the municipal council and reviewed every 4 years; 1 percent of commercial value otherwise.
Property Tax, developed property (Impôt Foncier sur la Propriété Bâtie, IFPB)	Annual tax levied by the communes on: all finished and unfinished buildings; industrial or commercial land; ground equipment for industrial purposes;	property belonging to government, property used for medical, educational, social or religious purposes or properties used by charities. Temporary exemptions for up to 5 years can be granted for new buildings or additions.	Variable depending on the type of property. Minimum tax of MGA 2000. Rates range between 5 % and 10 %.
Tax on licenced sale of alcohol and alcoholic products (Impôt de Licence sur les Alcools et les produits Alcooliques, IL)	Levied on all individuals and entities licenced to sell alcoholic beverages.	Wholesale transactions by distillers, manufacturers of fermented alcoholic beverages, army canteens, restaurants of universities, the national assembly and senate, hotels and authorised restaurants, pharmacists and medical traders.	Depends on the type of licence (wholesale or retail) and are determined by the municipal councils or communes. Minimum: MGA 100,000; Maximum: MGA 200, 000.
Annual Tax on gambling machines (Taxe Annuelle sur les Appareils Automatiques)	Levied by communes on gambling operators		Slot machines: MGA 400,000 per machine; Other gaming machine: MGA 100,000 per machine.
<b>Duties and Taxes on Foreign Trade</b> (Droits de Douanes)	Levied on the CIF value of imports	Rice Elimination of duty per the provisions of the EPA and SADC	0%: raw materials 10%: equipment and intermediate goods 20%: Finished products

Source: Ministry of Finance and Budget, IMF (2007) and Deloitte Africa Tax Guide 2013.

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**Special Tax Regimes/Provisions**

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Export Processing Zones (EPZs)	Exempt from Income tax for the first five years of operations; reduced rate of 10 % thereafter.
Mining (Common Law Regime)	Royalty of 2 percent on value of first sale Income tax at 20 % Alternative minimum tax : MGA 100,000 +0.5 percent of turnover
Mining (Large Mining Investments)	Applies to companies with investments of at least MGA 50 bn Royalty of 2 percent on value of first sale; 1 percent of the value of transformed minerals if they are the first sale Income tax exemption for the first five years from the start of exploration. Thereafter, income tax rates of 25 percent for mining and 10 percent for the transformation company. Higher rates apply for mining of precious metals and precious stones, depending on the internal rate of return. Alternative minimum tax : MGA 100,000 +0.5 percent of turnover VAT exemptions on imports directly related to mining and processing during exploration and construction phases; VAT exemptions on goods imported by transformation company after the start of operations.

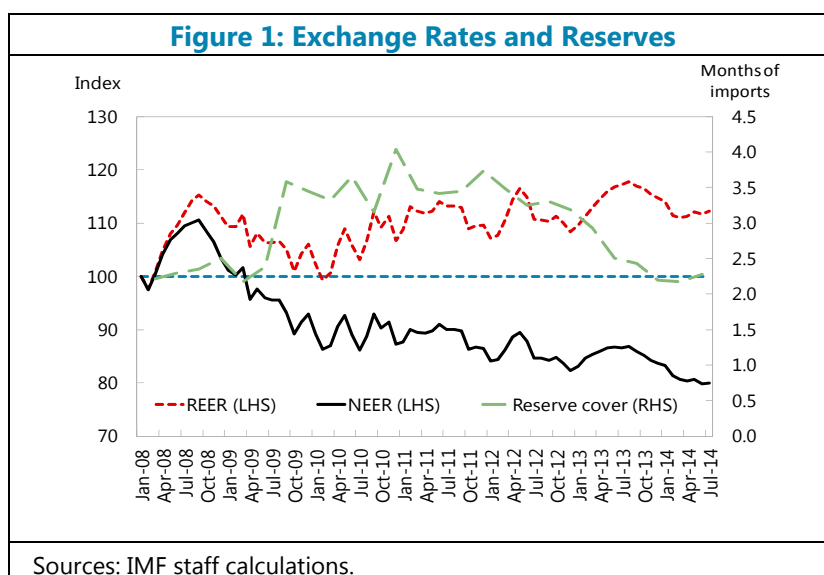
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## EXCHANGE RATE ASSESSMENT<sup>1</sup>

*In recent years, Madagascar has experienced considerable volatility in balance of payment flows. This volatility was driven by large-scale investment in mining projects and by the economic instability stemming from the recent crisis. This makes it difficult to make a definitive assessment of Madagascar's external stability and competitiveness. While the exchange rate models do not give clear assessment on valuation, a broader range of evidence highlights competitiveness weaknesses.*

### A. Background

**1. Madagascar operates a floating exchange rate regime**, but at times has accumulated or sold foreign exchange reserves in order to stabilize the exchange rate in response to volatile balance of payment flows. Recent years have witnessed considerable changes to the structure of Madagascar's balance of payments. In 2007, two world class mining investment projects began construction. This led to a widening of the current account deficit as these companies imported capital goods and raw materials. This period was also associated with a spike in the price of energy and food - two major import components. The rising current account deficit was largely financed by FDI and private debt inflows. At the same time, donor flows declined abruptly following the political crisis in 2008. On balance, however, these capital inflows dominated current outflows, and the authorities were able to build foreign exchange reserves, which peaked at 4 months of import cover at end-2010 (Figure 1). This period was also associated with a large appreciation of the REER, which rose 18 percent from 2008 to mid-2013.



<sup>1</sup> Prepared by Alex Pienkowski.



**2. From 2012 onwards, capital inflows declined markedly as the construction phase of the mining projects ended, which put pressure on the balance of payments.** The central bank also sold foreign exchange to fuel importers at preferential exchange rates in 2012 and 2013. As a result, reserves declined significantly and now stand at around 2 months of import cover. The gradual resumption of donor flows in 2014 has led to some stabilization, and the authorities have not actively intervened in the foreign exchange market since May 2014. However, the foreign exchange market has become illiquid while banks are holding large deposits in foreign currency.

## B. Exchange Rate Assessment Models

**3.** In order to assess Madagascar's REER against fundamentals, three standard models—the macro-balance approach; the external stability approach; and the equilibrium real exchange rate approach—are each applied in turn.

### The Macroeconomic Balance Approach

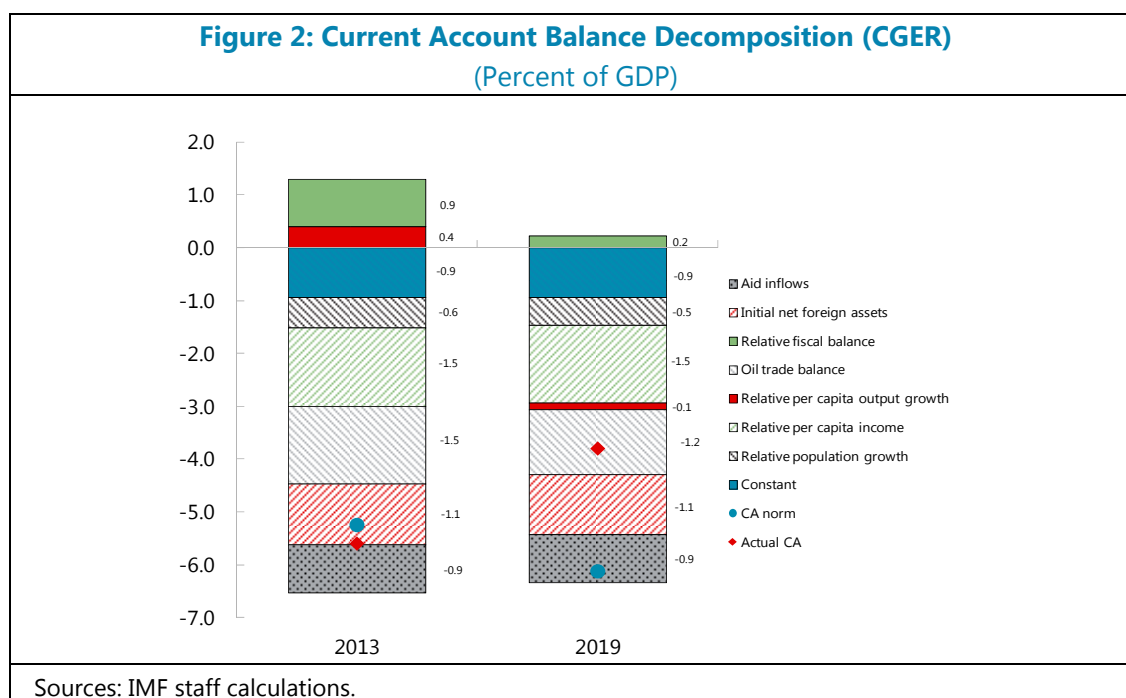
**4. The macroeconomic balance (MB) approach focuses on the current account balance.** It compares Madagascar's actual balance with that of a model-predicted result, designed to reflect the saving-investment decisions in the economy. If the actual and model predicted values are close, this suggests the current account largely reflects underlying fundamentals. If they are divergent, this may be evidence of external imbalances, implying the need for a real exchange rate adjustment. Two related model variants are used in this MB approach—the Consultative Group on Exchange Rate (CGER)<sup>2</sup> based toolkit and a variation of the External Balance Assessment (EBA)<sup>3</sup> model, which is referred to here as 'EBA-Lite'. Both use reduced form equations with the current account as the dependent variable, and a number of explanatory variables designed to capture the saving and investment decisions of the economy. The IMF is currently transitioning from the CGER-based toolkit to the EBA-Lite model, but for consistency and comprehensiveness, both results are reported.

**5. The CGER-based model gives ambiguous results.** The CGER-based version of the MB approach seeks to determine the 'current account norm' for Madagascar over the medium-term—a horizon over which domestic and partner-country output gaps are closed and the lagged effects of past exchange rate changes are fully realized. Figure 2 shows that the current account norm is slightly less than the actual level realized in 2013, implying a slight overvaluation of the exchange rate. Using a trade elasticity of -0.4, a REER depreciation of 1 percent would close the gap. Under current forecasts, the model implied current account deficit grows to

<sup>2</sup> This uses a similar methodology to the official CGER analysis outlined here [Exchange Rate Assessments: CGER Methodologies](#)

<sup>3</sup> The model uses a similar framework to the External Balance Assessment, but for a wider sample of countries. See [External Balance Assessment \(EBA\): Technical Background of the Pilot Methodology](#) for more details on the original model.

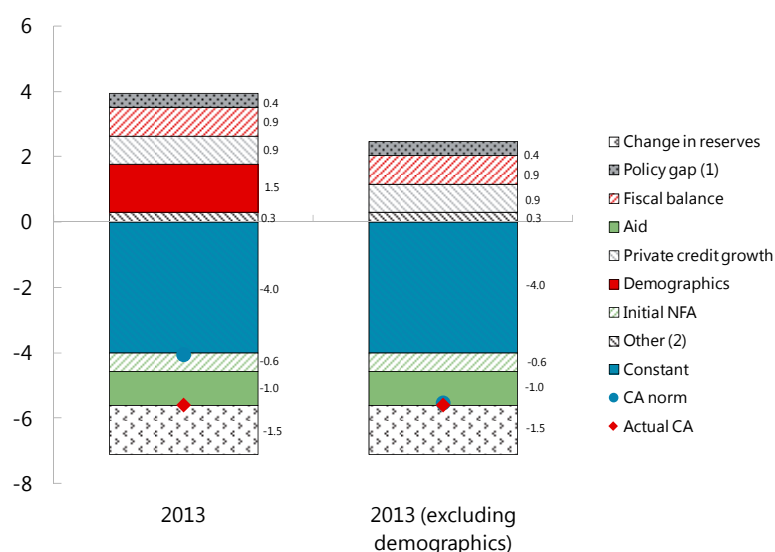
6.1 percent of GDP. This is partly driven by a return to more normal growth rates, but mainly because fiscal balances in the rest of the world are expected to tighten relative to Madagascar. This implies a REER appreciation of 5 percent would be enough to close the gap by 2019.



**6. The EBA-Lite methodology builds on the CGER-based model** in three main regards. First, the analysis concentrates on present day fundamentals, rather than a medium term perspective, by controlling for cyclical factors. Second, it differentiates between factors under the control of the authorities ('policy' variables) and structural factors. Third, it has wider country coverage and a better model fit (although it has larger confidence intervals).

**7. The EBA-Lite methodology predicts that Madagascar should have a current account balance of -4.1 percent of GDP**, compared to the actual level of -5.6 percent. This would require a 3.6 percent depreciation to close this gap. The decomposition (Figure 3) of this estimate shows that the large decline in reserves in 2013 played an important role in maintaining this deficit. Projections for 2014 and onwards suggest that this 'policy variable' will not be as large. The decomposition also shows that demographic factors, in particular Madagascar's relatively young population, boost saving and hence raise the current account norm. However, while this may be the case in many advanced and emerging markets, it is not clear that this relationship would hold for low-income countries where subsistence consumption (virtually all income is consumed) is more prevalent. Stripping out the theoretically ambiguous demographics factors gives a current account norm of -5.5, which is closer to the actual. A REER *depreciation* of 0.2 percent would close this gap.

**Figure 3: Current Account Balance Decomposition (EBA-Lite)**  
(Percent of GDP)



Source: IMF staff calculations.

1/ This is attributed to policies which differ from 'desirable' levels. The effect here is small as the impact from selling reserves cancels out the effect of an overly tight fiscal policy.

2/ Includes: relative productivity; oil and natural gas trade balance; projected GDP growth; safer institutional/ political environment index; the output gap and the commodities terms of trade.

## The External Stability Approach

**8. The external stability approach compares the current account balance to a country's net foreign asset (NFA) position.** It determines what level of balance would stabilize the NFA position at its current level, using the following equation:

$$CA_s = \frac{g+\pi}{(1+g)(1+\pi)} NFA_s \quad (1)$$

where:  $CA_s$  – stabilizing level of the current account balance;

$g$  – estimated steady state growth rate of GDP;

$\pi$  – estimated steady state deflator;

$NFA_s$  – initial NFA position which is stabilized.

**9. The NFA ratio in 2013 is estimated to be -48 percent of GDP, implying that a current account of around 3 percent is required to stabilize this ratio.** Table 1 summarizes the assumptions for Madagascar. This suggests a relatively large gap with the 2013 level, with an implied required REER depreciation of 5 percent. This analysis, however, assumes that the current NFA is equal to Madagascar's 'steady-state'. In practice, a low-income country such as Madagascar may find it optimal to borrow and invest at present in order to boost growth and reduce poverty in the future. An alternative experiment, therefore, might be to consider where the NFA position would stabilize assuming that the current account remains at current levels.

Using Equation 1, the implied NFA position for Madagascar would be -81 percent of GDP. This is arguably too high a level for a low income country, so should be viewed as an upper bound.

<b>Table 1: Debt Stabilizing Current Account</b>		
<b>(Percent)</b>		
	Actual	Alternative
Benchmark NFA/GDP	-48%	-81%
Nominal GDP growth rate	7.1%	7.1%
L-T real GDP growth (\$ terms)	5.0%	5.0%
L-T US inflation	2.0%	2.0%
NFA-stabilizing current account/GDP	-3.2%	-5.4%
Actual current account/GDP (2013)	-5.4%	-5.4%
Current account gap	2.2%	0.0%
Required exchange rate adjustment	-5.2%	0.0%

Sources: IMF staff calculations.

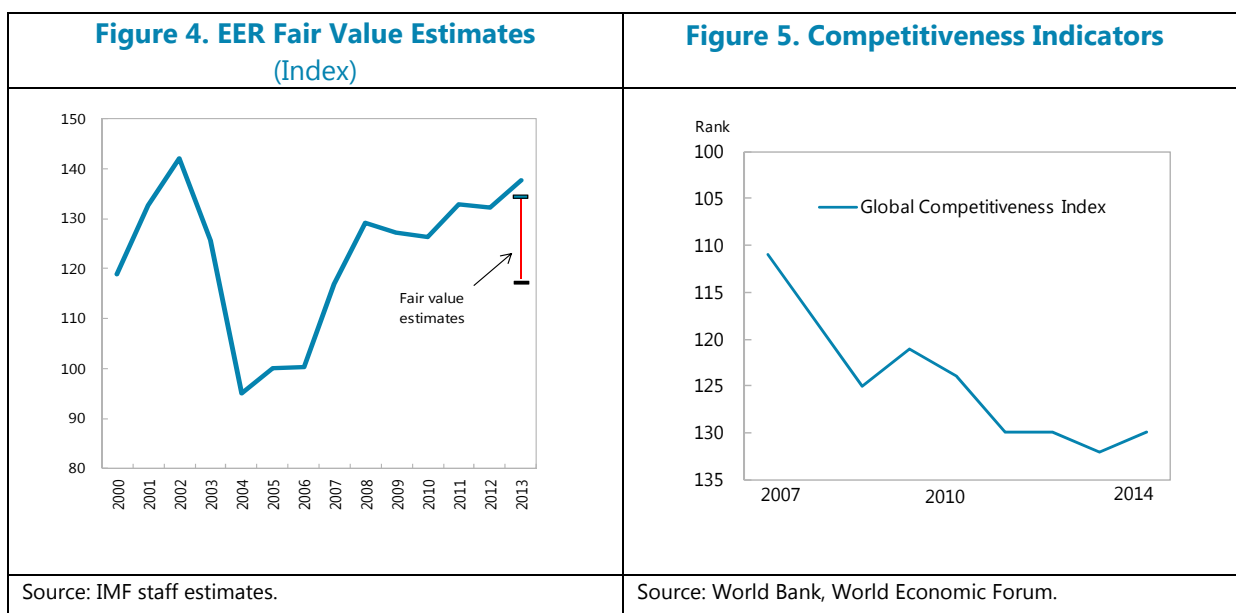
## The Equilibrium Real Exchange Rate Approach

**10. In contrast to the previous two methods, the equilibrium real exchange rate (ERER) approach focuses directly on the exchange rate as the dependant variable**, instead of the current account. It is a reduced form model (based on the CGER-toolkit), which includes five key explanatory variables—terms of trade, productivity, government consumption, initial NFA and remittances. The baseline ERER model suggests a fairly significant currency overvaluation of around 17 percent. This result is driven in large part by Madagascar’s relatively weak productivity vis-à-vis the rest of the world. The model results are, however, sensitive to structural breaks in the data. The large-scale mining investments, which began in 2008, subsequently caused a significant shift in the composition of Madagascar’s exports and private capital flows. If this potential structural break is controlled for, the model-implied overvaluation falls to a more modest 2.5 percent (Figure 4).

## C. Survey Measures of Competitiveness

**11. There has been a deterioration in survey measures of competitiveness over the last few years.** While it is difficult to make a direct assessment of how these structural factors may affect the equilibrium exchange rate, they can be useful in identifying bottlenecks in trade and foreign investment, which have an important bearing on external equilibrium. The World Bank Doing Business Report ranks Madagascar 163<sup>rd</sup> out of 189 countries in the overall index for 2014, a deterioration from 157 the year before (Table 2). The World Economic Forum’s Global Competitiveness Index also shows deterioration in recent years. Since 2007, Madagascar’s rank has declined from 111 to 130 according to this measure (Figure 5). The deterioration in surveys

of competitiveness is consistent with the apparent deterioration of the REER.



<p><b>Table 2A. Doing Business Indicators for Madagascar</b></p>			
<p>Topics</p>	<p>DB 2015 Rank</p>	<p>DB 2014 Rank</p>	<p>Change in Rank</p>
<p>Starting a Business</p>	<p>37</p>	<p>33</p>	<p>-4</p>
<p>Dealing with Construction Permits</p>	<p>177</p>	<p>175</p>	<p>-2</p>
<p>Getting Electricity</p>	<p>189</p>	<p>188</p>	<p>-1</p>
<p>Registering Property</p>	<p>153</p>	<p>152</p>	<p>-1</p>
<p>Getting Credit</p>	<p>180</p>	<p>178</p>	<p>-2</p>
<p>Protecting Minority Investors</p>	<p>87</p>	<p>84</p>	<p>-3</p>
<p>Paying Taxes</p>	<p>65</p>	<p>60</p>	<p>-5</p>
<p>Trading Across Borders</p>	<p>109</p>	<p>110</p>	<p>1</p>
<p>Enforcing Contracts</p>	<p>146</p>	<p>145</p>	<p>-1</p>
<p>Resolving Insolvency</p>	<p>123</p>	<p>127</p>	<p>-2</p>
<p><b>Overall</b></p>	<p><b>163</b></p>	<p><b>157</b></p>	<p><b>-3</b></p>
<p>Source: World Bank.</p>			

## EXCHANGE RATE PASS-THROUGH IN MADAGASCAR<sup>1</sup>

The exchange rate pass-through to domestic prices is estimated to be around -0.35 at its peak, which is similar to estimates for other Sub-Saharan African countries. There is also evidence that larger shocks to the exchange rate have a greater pass-through to prices relative to smaller shocks. This suggests that the authorities should allow the exchange rate to respond to shocks, rather than allowing imbalances to build, which will eventually lead to larger and more disruptive corrections.

### A. Background

**1. Exchange rate pass-through – the mechanism whereby fluctuations to the exchange rate impact domestic prices – has been an often-raised source of concern to low income countries (LICs).** This can lead to a reluctance to allow the exchange rate to move in the face of shocks, which closes off an important economic adjustment channel. In Madagascar, inflation has been a source of economic vulnerability in the past – in the mid-1990s, consumer price inflation (CPI) peaked at close to 50 percent. And because high and volatile inflation can hit the poorest particularly hard, it is important that the authorities are mindful of these risks, while at the same time avoiding the build-up of harmful external imbalances. This chapter explores the degree of pass-through from changes in the nominal effective exchange rate (NEER) to the CPI in Madagascar.

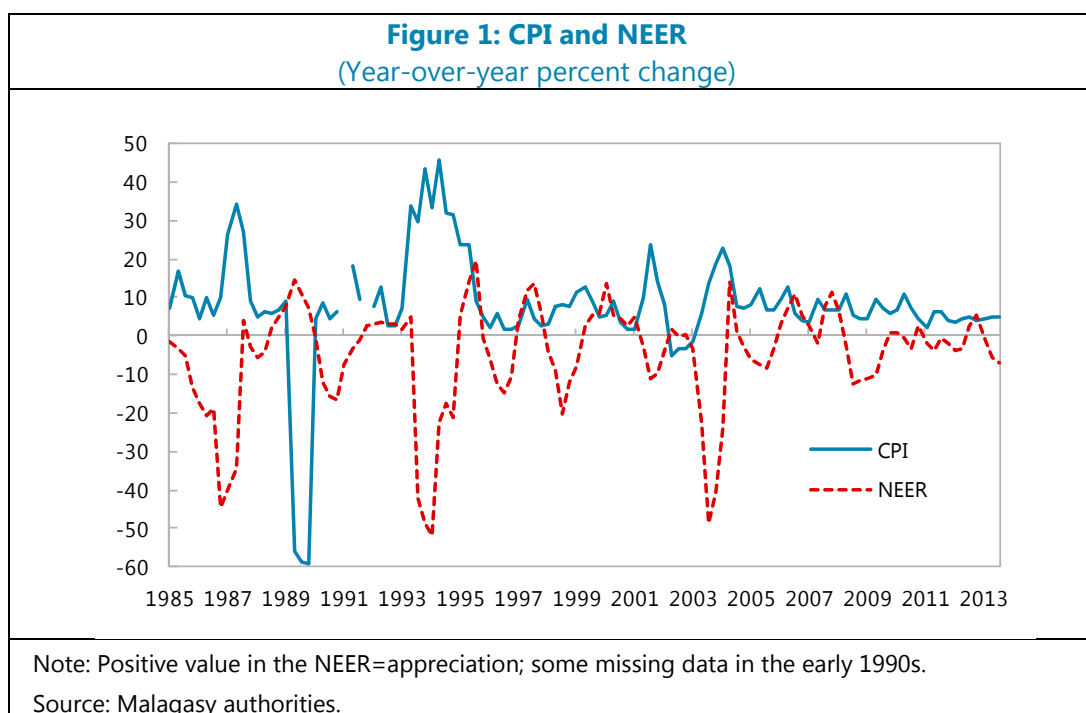
**2. Historically, both the change in CPI and NEER has been high and volatile in Madagascar** (Table 1). The late 1980s and early 1990s witnessed particular instability in his regard, as Madagascar like other Sub-Saharan African (SSA) countries, unwound large internal and external imbalances. This period was also accompanied by weak economic growth.

Exchange rate depreciations also followed political crises – such as in 2002 and 2009 – when confidence effects had a significant impact. Since 2003, however, inflation has been much more stable than previous years. A look at the data suggests there is some correlation between changes in NEER and CPI (Figure 1), especially during times when the variables experience significant spikes. The correlation coefficient between the two series is -0.44. But correlation does not necessarily imply causation. This study will test for casual relationships between the two variables, as well exploring the *direction* of causation. It will also explore whether other ‘omitted variables’ might be jointly determining innovations in these two series.

**Table 1: Summary Statistics: CPI and NEER\***  
(Year-over-year percent change)

	CPI	NEER
Mean	8.0	-5.0
Std Dev.	9.6	13.7
Max	45.6	19.3
Min	-5.0	-51.9
*Positive = appreciation; 1985Q1-2014Q2		

<sup>1</sup> Prepared by Alex Pienkowski.



## B. Literature and Methodology

**3. There is an extensive literature on exchange rate pass-through**, which can be divided into three main categories: i) structural macroeconomic models, including DSGEs, where economic theory determines model specification (see for example, Corsetti, Dedola and Leduc (2005)); ii) micro-econometric studies, which focus on individual markets or firms (see for example, Nucci and Pozzolo (2001)); and, iii) macro-econometric studies, predominantly using vector auto-regression (VAR) models, which are largely agnostic on the precise nature of the exchange rate and inflation shocks identified in the model and their transmission channels<sup>2</sup>. This study uses the VAR model approach. The advantage of the VAR method is that it is more robust to model specification errors, and the results are easier to interpret. The basic VAR structure is as follows:

$$Y_t = c + BY_{t-n} + CZ_{t-n} + u_t \quad (1)$$

where  $Y_t$  is a vector of  $p$  *endogenous* variables;  $c$  is a vector of constants;  $B$  is a  $p \times n$  matrix of coefficients for the endogenous variables;  $Z_t$  is a vector of  $q$  *exogenous* variables;  $C$  is a  $q \times n$  matrix of coefficients for the exogenous variables; and  $u_t$  is vector of error terms, with a column length  $p$ .

<sup>2</sup> For example, a structural model might differentiate between productivity and nominal shocks both in Madagascar and abroad, which would have theoretically different implications on inflation and exchange rates. The VAR approach can, at best, approximate these relationships, and so should be viewed as identifying 'reduced form' relationships.

**4. The most basic potential VAR specification in this literature simply includes the NEER and CPI in the system.** In equation 1, CPI and NEER would appear in the  $Y_t$ , and  $Z_t$  would be a vector of zeros. This technique is used by Razafimahefa (2012), surveying most SSA countries. In this paper, the average pass-through across all countries is estimated to be -0.2 after one-quarter, and -0.4 at four-quarters, after which the affect is small. There is significant heterogeneity between countries—in particular, those with more flexible exchange rate regimes and those with a higher income, tend to have a lower pass-through. Furthermore, the degree of pass-through has declined in the SSA region since the mid-1990s.

**5. The disadvantage of this technique is that it is not able to control for reverse causality**—specifically, that domestically generated inflation may be driving exchange rate shifts rather than vice-versa. This is particularly a problem if one believes that these relationships are not identically symmetric. Other studies attempt to control for demand and supply side shocks by including additional variables. McCarthy (1999) includes oil price inflation (as a proxy for supply shocks) and the output gap (as a proxy for demand shocks) in a study of nine OECD countries. Pass-through is estimated to be generally low, although it is larger for countries with a greater import share of GDP. Mwase (2006) uses a similar approach for estimating pass-through in Tanzania, and also includes money supply to help to control for demand shocks. By including import and producer prices as endogenous variables in the VAR, McCarthy (2000)<sup>3</sup> explores how exchange innovations can be traced through the production distribution chain. Here exchange rate shocks first impact import prices, then affect producer prices, which in turn affect consumer prices.

**6. There is also evidence that the size and direction of exchange rate movements can affect the degree of pass-through.** Delatte and Lopez-Villavicencio (2012) find that exchange rate depreciations have a greater impact on consumer prices than exchange rate appreciations. They attribute this result to weak competition structures, whereby importers are able to increase profits rather than reduce prices as the exchange rate appreciates. In addition to finding evidence of asymmetric pass-through, Pollard and Coughlin (2003) find that the pass-through coefficient increases with the size of the exchange rate movement. For instance, a larger depreciation implies a greater share of the change will be passed on to prices. This may be because firms view larger changes in exchange rates as more permanent, thus requiring a more comprehensive change in pricing policy.

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<sup>3</sup> And adopted by Duma (2008) in the case of Sri Lanka.



## C. Results

**7. Running the simple VAR with just CPI and NEER in the system generates a pass-through estimate of -0.34 for Madagascar after four quarters**, after which the impact stabilizes (Table 2). The impulse response functions are shown in Figure A1. Further analysis (Table A1) provides evidence that shocks to NEER ‘Granger cause’ innovations in CPI. This suggests that the pass-through estimates can be viewed as *not* suffering from a reverse causality problem, although we cannot rule out that both series are driven by a common variable (omitted variable bias).

Period after shock	Simple VAR	Output gap and oil prices	M0 and rice harvest	M3 and rice harvest	‘Large’ depreciations
0	-0.03	-0.14	-0.01	0.03	0
2	-0.30	-0.44	-0.26	-0.28	-0.22
4	-0.34	-0.48	-0.33	-0.35	-0.33
6	-0.36	-0.49	-0.35	-0.35	-0.42
8	-0.36	-0.48	-0.36	-0.33	-0.42

**8. In order to control for this (following McCarthy (1999)), the output gap<sup>4</sup> and international oil prices<sup>5</sup> are introduced into the model.** These results show a much higher pass-through rate, both contemporaneously (-0.14) and after 4 quarters (-0.48). However, the results here are less robust. The impulse response (Figure A2) shows that the change in CPI to changes in NEER is not statistically significant. Furthermore, a Granger causality test suggests that neither NEER (nor the output gap) *causes* changes in CPI. On further consideration, there are two important reasons why the specification used by McCarthy (1999) for advanced economies, may not be appropriate for Madagascar. First, the output gap is a difficult concept to measure in LICs, especially using a HP-filter, not least because supply side shocks are more important in determining output fluctuations than in advanced economies. Second, the authorities in Madagascar have in the past prevented changes in oil prices from being passed onto consumer prices (at often significant fiscal expense). These two factors suggest that the output gap and international oil prices are poor proxies for demand and supply shocks in Madagascar.

<sup>4</sup> Following Mwase (2006), the quarterly data is interpolated from annual observations, and an HP-filter is used to construct the output gap estimate.

<sup>5</sup> International oil prices are included as an exogenous variable; including the output gap as an exogenous or endogenous variable does not materially change the pass-through estimates (the latter specification is reported).

**9. An alternative specification, better tailored for Madagascar, might be to include money supply and the rice harvest as better proxies for demand and supply shocks,** respectively. Both narrow money (M0) and broad money (M3) are separately included in the VAR specification, although both give similar results. The rice harvest is included as an exogenous variable, while money supply is considered as endogenous to the system. The pass-through estimate is negligible on impact, rising to around -0.25 after two quarters, peaking at around -0.35 after 1 year. The impulse response functions are shown in Figure A3 and A4, and these results are robust to changing the Cholesky factorization. Both specifications suggest that money supply and the NEER Granger cause changes to CPI.

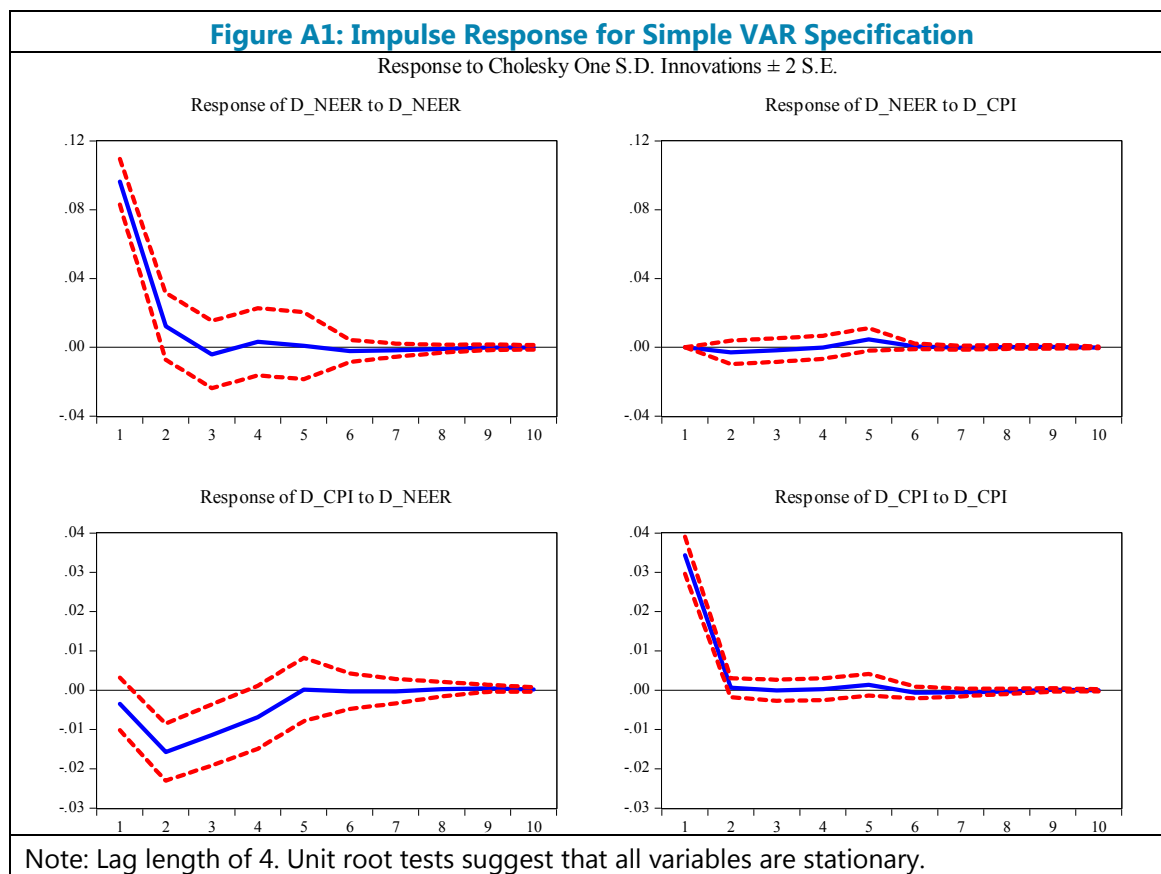
**10. There is evidence that the size and direction of exchange rate movements affects the pass-through estimate.** When focusing on exchange rate appreciations, the pass-through estimate is statistically insignificant, suggesting that prices do not fall in such circumstances. The pass-through estimate for depreciations is unchanged at -0.35 after four quarters. Therefore there is evidence of asymmetric pass-through depending on the direction of the exchange rate movement. Caution, however, is needed when interpreting this result, as there are only a few events of appreciation in the sample, suggesting there may be a small sample bias. Perhaps it is more interesting to consider how the size of the depreciation impacts the pass-through coefficient. Dividing the sample into depreciations of above and below 2 percent in a quarter (around the sample median) gives very different estimates. ‘Small’ depreciations have a statistically insignificant impact on consumer prices, while ‘large’ depreciations have a higher pass-through estimate. The pass-through rate in this latter specification is -0.42 after 4 quarters, significantly higher than the estimate for the entire sample.

## D. Conclusions

**11. Exchange rate pass-through in Madagascar is estimated to be around -0.35,** under the preferred model specification (including money supply and the rice harvest). This is similar to estimates for other SSA countries, especially those with a floating exchange rate regime. This suggests that Madagascar is not especially vulnerable to pass-through relative to its peers. Furthermore, pass-through is transmitted gradually over four-quarters, suggesting that the authorities have some time to implement mitigating policy measure, if necessary.

**12. The size and direction of exchange rate movements also matter.** There is some evidence that depreciations are more likely to be transferred to consumer prices than appreciations. But perhaps more importantly, larger exchange rate movements are more likely to be pass-through to prices than smaller shocks. This suggests that gradual and frequent movements in the exchange rate are preferable to large infrequent movements. The policy implication therefore is that the authorities should be cautious when adopting a policy of preventing exchange rate movements, especially if it’s not clear that these are temporary. This strategy is preferable to closing off the exchange rate adjustment channel, which is important for absorbing external shocks and preventing the build-up of imbalances.

## E. Annex



**Table A1: Granger Causality Test (simple specification)**

VAR Granger Causality/Block Exogeneity Wald Tests  
 Sample: 1984Q4 2014Q2 IF D\_CPI > -0.8  
 Included observations: 106

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Dependent variable: D\_NEER

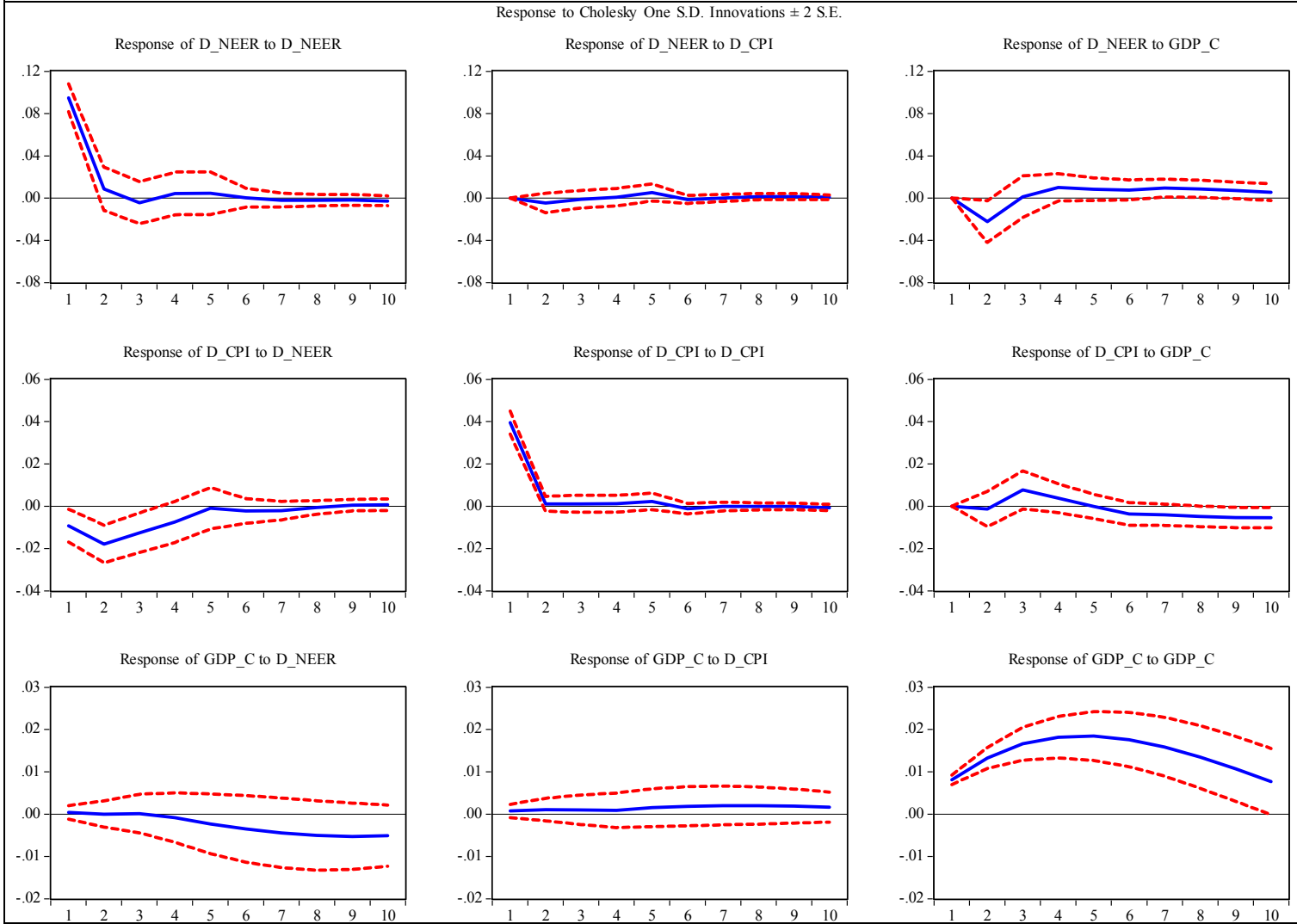
Excluded	Chi-sq	df	Prob.
D_CPI	2.870707	4	0.5797
All	2.870707	4	0.5797

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Dependent variable: D\_CPI

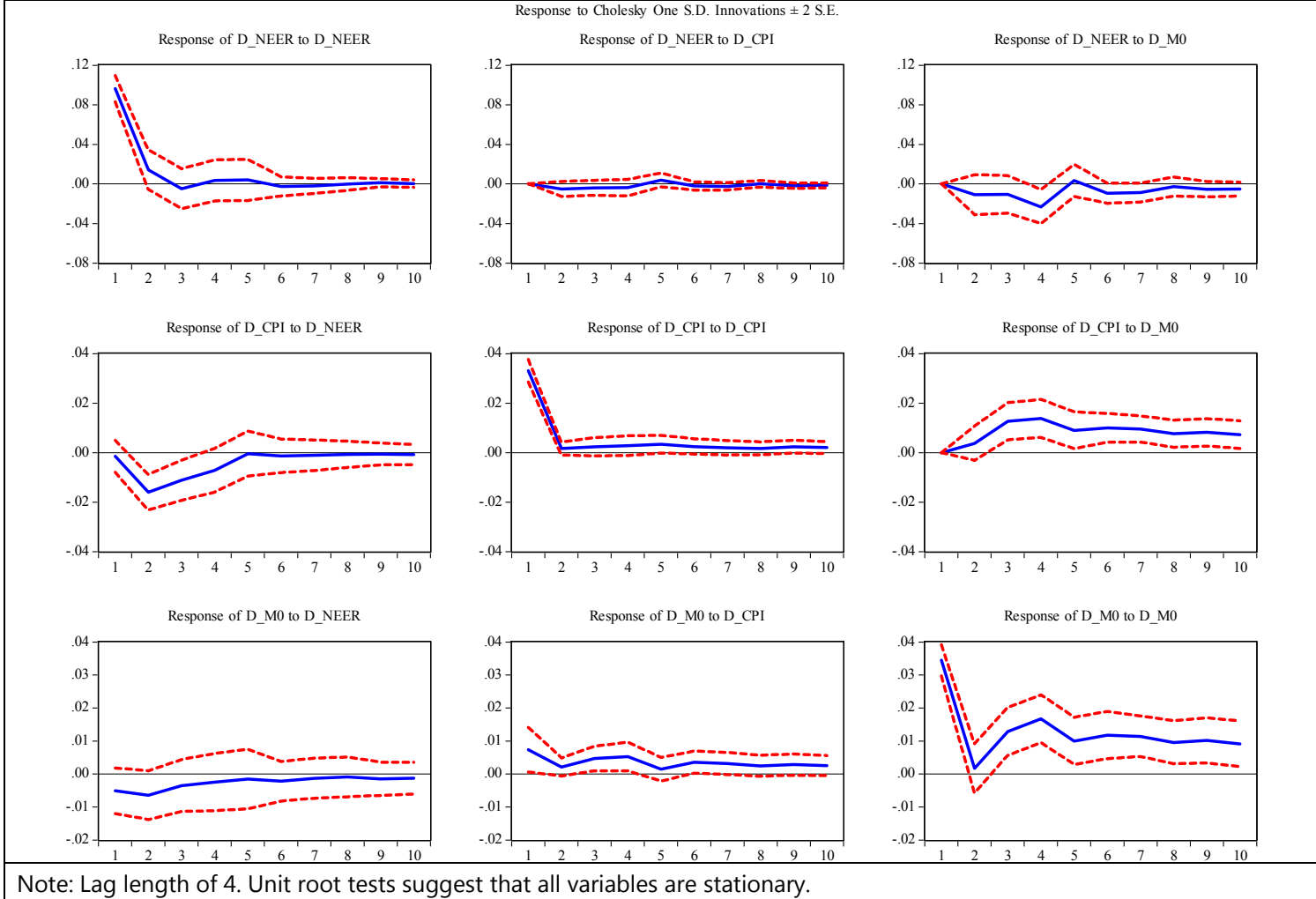
Excluded	Chi-sq	df	Prob.
D_NEER	32.24971	4	0.0000
All	32.24971	4	0.0000

**Figure A2: Impulse Response for VAR Specification with Output Gap and Oil Prices**



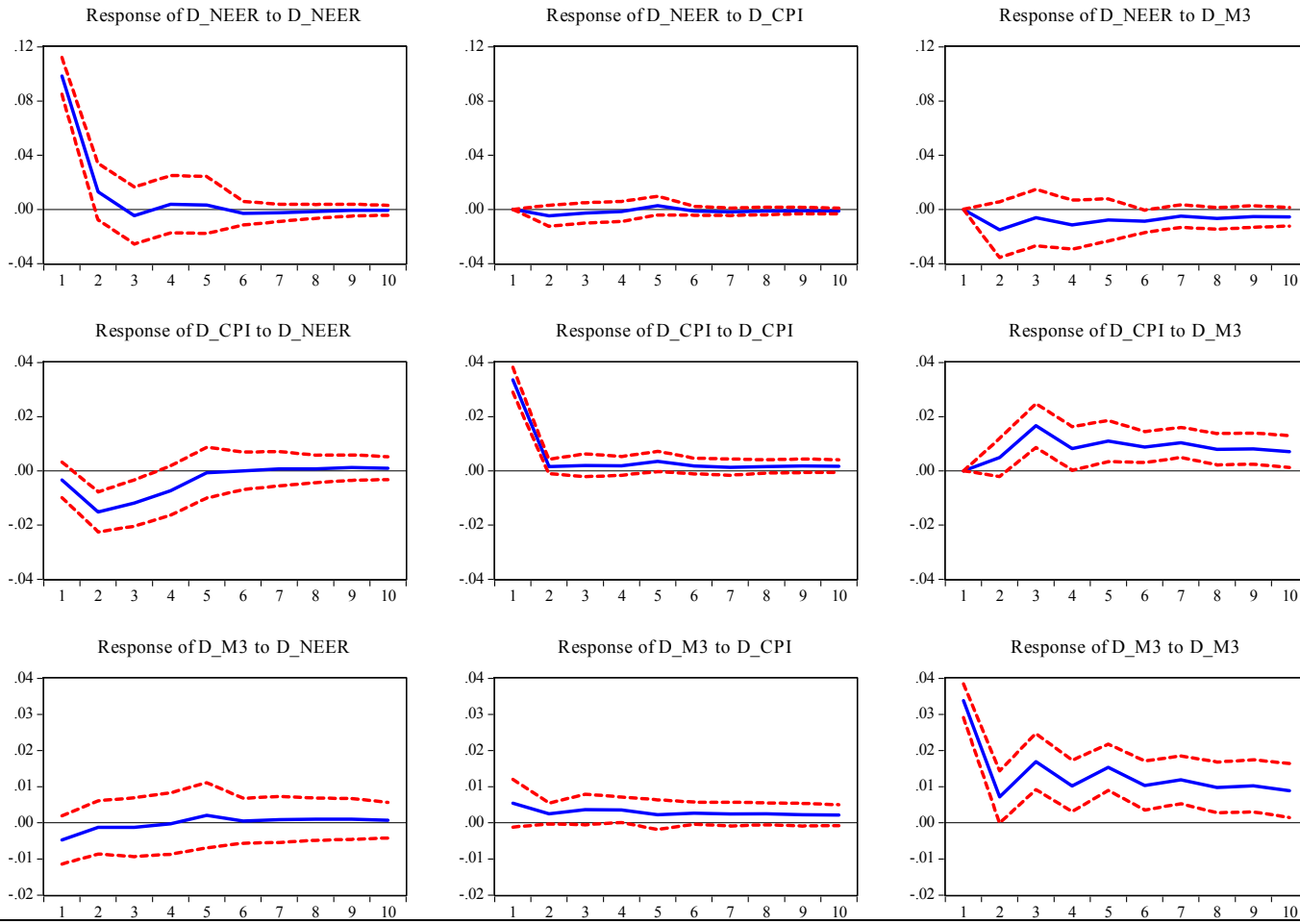
Note: Lag length of 4. Unit root tests suggest that all variables are stationary.

Figure A3: Impulse Response for VAR Specification with M0 and Rice Harvest



**Figure A4: Impulse Response for VAR pecification with M3 and Rice Harvest**

Response to Cholesky One S.D. Innovations  $\pm$  2 S.E.



Note: Lag length of 4. Unit root tests suggest that all variables are stationary.

<b>Table A2: Granger Causality Test (M0 and rice harvest)</b>				<b>Table A3: Granger Causality Test (M3 and rice harvest)</b>			
VAR Granger Causality/Block Exogeneity Wald Tests Date: 10/31/14 Time: 11:21 Sample: 1984Q4 2014Q2 IF D_CPI>-0.8 Included observations: 106				VAR Granger Causality/Block Exogeneity Wald Tests Date: 10/31/14 Time: 11:27 Sample: 1984Q4 2014Q2 IF D_CPI>-0.8 Included observations: 106			
Dependent variable: D_NEER				Dependent variable: D_NEER			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
D_CPI	3.181631	4	0.5279	D_CPI	2.728338	4	0.6043
D_M0	9.745887	4	0.0449	D_M3	5.583009	4	0.2325
All	12.42640	8	0.1332	All	8.151647	8	0.4188
Dependent variable: D_CPI				Dependent variable: D_CPI			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
D_NEER	25.46265	4	0.0000	D_NEER	25.32685	4	0.0000
D_M0	47.85009	4	0.0000	D_M3	42.61493	4	0.0000
All	104.2882	8	0.0000	All	96.90969	8	0.0000
Dependent variable: D_M0				Dependent variable: D_M3			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
D_NEER	4.661665	4	0.3238	D_NEER	1.676249	4	0.7950
D_CPI	6.895631	4	0.1415	D_CPI	3.328309	4	0.5045
All	11.67683	8	0.1662	All	4.257073	8	0.8332

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# FINANCIAL SYSTEM IN MADAGASCAR—STRUCTURE PERFORMANCE AND RISKS<sup>1</sup>

*Madagascar is coming out of a five-year political crisis. It is important to do a stock-taking of the health of financial system, given the fragile environment. Overall, the financial system is starting from a small base, and risks, while emerging, are still contained. Nonetheless, reforms to support the development of the financial sector are critical, as it is currently not in a position to support economic diversification and growth, given limited financial access. A larger financial system would also enhance the impact of public policies—both fiscal and monetary—and ensure that access to credit becomes an engine of growth. Upgrading supervision, enforcing regulations more forcefully, and establishing a crisis resolution framework are all needed to ensure financial stability is maintained.*

## A. Overview of the Structure of the Financial System

- 1. The financial system in Madagascar is composed predominantly of the banking sector, making up 80 percent of the financial system.** It is composed of 11 commercial banks which are concentrated on Antananarivo. The banking sector is essentially foreign owned, dominated by French and Mauritian banks, but in recent times joined by other banking groups from China (1) and Africa (2). The top 4 banks account for 86 percent of assets and collect 88 percent of deposits. There are five non-deposit taking financial establishments. In addition, 31 microfinance institutions (MFIs) have emerged in recent years—four of which are considered large—that supply limited financial services to low-income households, notably in rural areas.
- 2. Insurance companies, although still in an early stage of development, account for most of the remainder of the domestic financial system.** There are three public and two private sector insurance companies. Life insurance is still in its early days, while non-life insurance has been growing, notably due to the rise of car ownership. Madagascar does not have a stock market, and the bond market has one active issuer in the form of government paper (there has only been one other issuer of a bond in 2012 so far).

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<sup>1</sup> Prepared by Patrick Imam.

**Table 1: Madagascar: Financial System Structure, end-2013**

	Number of		Total Assets		Deposits outstanding	Loans and disc. Outstanding
	Institutions as of end-2013	Branches	Amount (millions MGA)	(% of GDP)	Amount (millions MGA)	Amount (millions MGA)
<b>Private depository institutions</b>						
Banks	11	226	5,589,855	23.8%	4,440,072	2,807,049
Domestic Banks	0	0	0	0.0%	-	-
Foreign Banks	11	226	5,589,855	23.8%	4,440,072	2,807,049
Microfinance Institutions	31	644	371,475	1.6%	187,850	241,729
Financial Establishments	5	N/A	N/A	N/A	N/A	N/A
<b>Non-depository financial institutions</b>						
Insurance companies	5	N/A	609,765	2.6	-	-
Life	4	N/A	N/A	-	-	-
Nonlife	1	N/A	N/A	-	-	-
Pension Funds	N/A	N/A	N/A	-	-	-
Public						
Private						
Money market dealers/Securities companies	N/A	N/A	N/A			
Other	5	7	39,578	0.2%	584	25,332
<b>Public financial institutions (*)</b>	1	28	315,587	1.3%	283,628	N/A
Total financial system (excl. Central Bank)	58	905	6,926,260	28.6%	4,912,134	3,074,110

Source: Central Bank of Madagascar.  
 (\*) includes Caisse d'Epargne de Madagascar, but not CNAPS (Caisse Nationale de Prévoyance Sociale) and other public financial institutions due to lack of data

**3. Only about 6 percent of the population has a bank account, and this may be overstated, as some individuals hold multiple accounts.** This is a quarter of the rate found in lower income countries in SSA. Bank deposits account for 18.9 percent of GDP. The interbank market is small and illiquid, while leasing is in its infancy. There is no deposit insurance system in place. A credit registry was put in place at the central bank in 2009, which while operational, suffers from insufficient compliance by banks, in particular with respect to timely submission of information as well as completeness of the information transmitted.

### The Banking Sector

**4. The banking sector has continued its gradual expansion in recent years.** The political crisis over the last five years has, however, led to a change in behavior. It created a highly risk averse lending culture in most banks, focused on collateral lending and solid prime players. (This risk-aversion is compounded by the presence of foreign banks, which while they bring advantages—they improve governance, introduce technology to improve financial intermediation, and exploit economies of scale—but by relying on hard, as opposed to soft information, are less likely to lend to riskier borrowers). Most banks' core business consists in collecting deposits, lending to bigger firms, including subsidiaries of multinationals or holding government securities. There is emerging anecdotal evidence of some change in this behavior, with banks starting to lend to riskier clients, but from a very low base. Credit to the economy is mainly focused on service sector, with limited credit to the primary and secondary sectors (Figure 1).

**5. While lack of data does not permit the conduct of stress tests, discussions with the authorities and banks/MFIs suggest that there are pockets of vulnerabilities.** The system is most likely vulnerable to (i) sector risks, including default by the largest individual exposures (ii) overall credit risk (iii) default risk of a public entity (while the government accumulated budgetary arrears in recent years, these were not directly to the banking system). The large net open position of banks (Table 2) suggests that FX risk requires some monitoring. Not all banks respect the basic minimum regulatory requirements, and it appears that recent (smaller) entrants have profitability problems, requiring some monitoring (Table). Liquidity risks and interest risks are likely to have a limited impact on most banks, given that banks are mostly highly liquid and maturity mismatch between assets and liabilities are likely to be small, as lending tends to be for short-term projects. This is also corroborated by the Financial Soundness Indicator (FSI) tables (Table 2). With the usual caveats—FSIs are backward looking, pro-cyclical, and hide important variations among banks—Malagasy banks appear on average to be well capitalized, profitable and liquid, with asset quality being the main concern.

**Table 2: Madagascar: Non-Respect of Regulatory Norms**

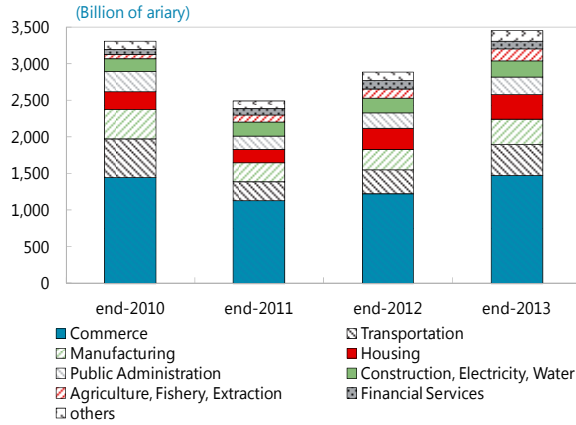
	December 2013	March 2014
<b>Minimum Capital Requirement</b> <i>(minimum requirement of 3 billion ariary for banks and 1 billion for financial establishments)</i>	1 Bank 1 Financial Establishment	1 Bank 1 Financial Establishment
<b>Solvency Ratio</b> <i>(minimum 8%)</i>	1 Bank 1 Financial Establishment	1 Bank 1 Financial Establishment
<b>Single Party Exposure Level</b> <i>(maximum of 35% of capital)</i>	1 Bank 1 Financial Establishment	1 Bank 1 Financial Establishment
<b>Net Open Position</b> <i>(20% of capital)</i>	2 Banks 1 Financial Establishment	2 Banks 1 Financial Establishment
<b>Related part lending</b> <i>(maximum 10% of capital)</i>	-	-

Source: Central Bank of Madagascar.

**Figure 1. Madagascar: Evolution of Financial Sector**

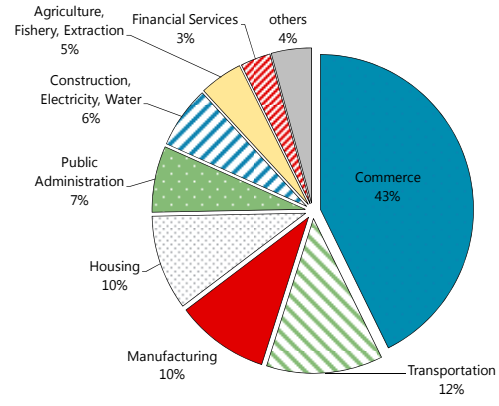
*Credit to the economy has recovered steadily*

**Credit by Sector, 2010-2013**



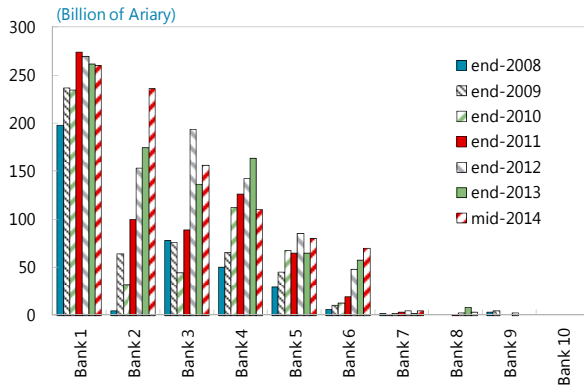
*...particularly to the trading sector*

**Credit by Sector, end-2013**



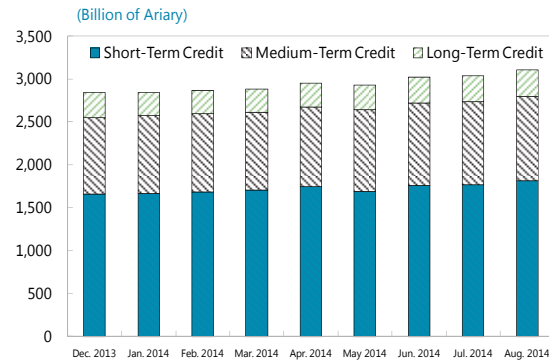
*... with lending to the sovereign dominated by a few banks ...*

**Purchases of BTA and Government Papers by Banks, end-2008-mid 2014**



*... and short-term credit dominating.*

**Short-, Medium-, and Long-Term Credit**



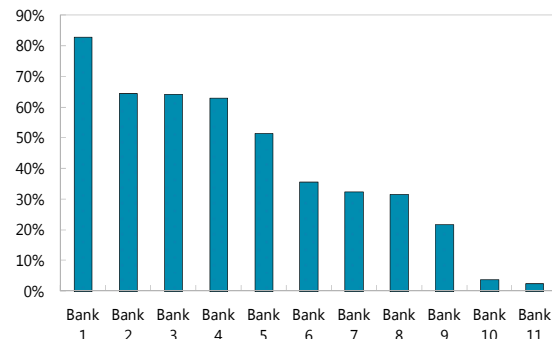
*All banks were foreign owned as of end-2013 ...*

**Description of Banking Groups, end-2013**

Number of Banks	Market Share		No. of Agencies	Nationality
	Credit	Deposit		
Bank 1	26.9%	27.2%	79	African
Bank 2	23.8%	21.7%	29	Mauritius
Bank 3	22.0%	20.5%	45	French
Bank 4	12.9%	18.3%	14	French
Bank 5	4.6%	4.4%	6	Mauritius
Bank 6	2.7%	1.2%	22	French
Bank 7	2.6%	1.4%	3	African
Bank 8	2.3%	1.4%	20	French
Bank 9	1.0%	3.0%	2	Mauritius
Bank 10	1.0%	0.4%	3	Chinese
Bank 11	0.1%	0.5%	3	Mauritius

*... with low concentration ratios for several banks.*

**Concentration Level: Lending to top-15 borrowers at end-2013**



Source: Central Bank of Madagascar.

**Table 3: Financial Sector Indicators, 2009–2014**

		2008	2009	2010	2011	2012	2013	2014
		Dec	Dec	Dec	Dec	Dec	Dec	Sep
Capital adequacy	Regulatory capital to risk-weighted assets	13.4%	14.6%	14.4%	15.3%	15.2%	14.5%	14.4%
	Regulatory Tier 1 capital to risk-weighted assets	13.6%	14.8%	14.9%	16.2%	15.9%	15.0%	14.9%
	Non-performing loans net of provisions to capital	14.0%	20.2%	19.2%	18.0%	13.5%	18.3%	16.3%
Asset quality	Non-performing loans to total gross loans	8.9%	11.3%	13.1%	14.6%	14.2%	13.8%	12.8%
Earnings and profitability	Return on assets	2.9%	1.6%	1.5%	1.8%	2.0%	2.4%	3.0%
	Return on equity	38.5%	21.9%	19.9%	22.9%	25.4%	30.2%	37.1%
	Interest margin to gross income	60.6%	60.7%	62.1%	63.2%	63.6%	64.0%	59.3%
	Non-interest expenses to gross income	45.5%	50.9%	52.3%	52.8%	56.0%	54.1%	50.1%
Liquidity	Liquid assets to total assets (liquid asset ratio)	45.5%	46.9%	45.9%	49.7%	50.4%	43.2%	41.2%
	Liquid assets to short-term liabilities	67.6%	69.7%	67.8%	71.0%	74.1%	63.7%	60.2%
Sensitivity to market risk	Net open position in foreign exchange to capital	10.6%	15.4%	15.1%	14.5%	11.9%	17.6%	10.1%
	Norme maximum	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
	Bank with highest ratio	15.5%	18.6%	24.9%	30.4%	17.7%	74.8%	18.0%

Source: Central Bank of Madagascar.

## Microfinance

**6. With the growth rate of the microfinance sector having been high over recent years, it appears in a more fragile position overall compared to the banking system.** With assets of less than 2 percent of GDP, the MFI sector is much smaller than the banking system in absolute size, but plays an important role in the underserved rural regions of the country. The number of registered MFIs has reached 31, up from 25 in 2009, with deposits and loans growing respectively at compound annual growth rates of 32 percent and 29 percent between 2009 and 2012 according to the MFI Association. The steady growth over recent years—is a reflection of the disengagement of the banking sector from riskier lending, which MFIs are starting to fill. This includes lending to the more volatile agricultural sector in particular.

**7. Although the existing legal and regulatory framework governing the microfinance sector is in line with many other countries, weak implementation explains why almost half of MFIs do not meet some of the prudential requirements.** While stress testing the sector was not possible due to lack of data, there is anecdotal evidence that several MFIs may be in a difficult position. The failure of an MFI recently—which has led to the loss of savings of its 100,000 members—in the context of a lack of deposit insurance system has harmed many individuals who have lost their deposits. The main source of the vulnerability of the sector appears to be governance problems, which must be addressed. The difficulty of processing and collecting data on MFIs and lack of action to freeze the activities of these entities once they are failing is problematic, as it leads to the continuation of poorly performing MFIs.

## Insurance

**8. The insurance sector has grown at a double digit growth rate in the last few years, but from a small base.** Non-life insurance has seen a particularly strong growth, largely because

of the significant increase in matriculated cars. About 3/4 of the revenues from the industry emanate from non-life insurance, with the remainder from life insurance. The penetration level of life insurance within the population is negligible (less than 1 percent of the population), given the low income per capita of the general population, with only few people having the means to buy life insurance.

**9. At present, an assessment of health of the insurance sector cannot be made due to lack of data.** One constraint facing insurance companies is asset shortages, the difficulty to invest their premiums beyond real estate and government for lack of investible assets, creating concentration risks in their portfolio. The variation in provisioning between the five insurance companies appears high (not reported), warranting a closer look at the sector, and a reinforcement of the supervisor at the Ministry of Finance—both in terms of number of staff and in the upgrading of skills.

## B. Systemic Risk in Madagascar

**10. At this juncture, systemic risk<sup>2</sup> in Madagascar is likely to be contained.** No economic sector—sovereign, household, corporations or financial sector—appears to be highly leveraged, based on available data (Box 2). All but one bank are foreign owned (change in ownership occurred in 2014, and is not always fully reflected in the tables, which often are only available for end-2013), mostly by large international groups, and finance mainly short-term trade finance. Time-series systemic risk is likely to be small at present, as the relatively modest financial system is unable to provide a large credit impulse to significantly impact GDP growth (correlation is small). The small size of the banking system, and limited leverage, explain this finding. In addition, there have not been significant capital in and out-flows that are often at the heart of time-series systemic risk.

### Box 1: Definition of Systemic Risk

**Systemic risk is defined as any threat of disruption to financial services that is caused by an impairment of all or parts of the financial system and that has the potential to have serious negative consequences for the real economy.** It is a negative externality that occurs when a bank failure, market seizure or breakdown of the infrastructure (e.g. payment system) can cause serious adverse implications for market participants. Systemic risk is decomposed into time-series and cross-sectional risk (see Borio, 2009):

- *Time-series dimension:* The build-up of risk over time interacts with the macroeconomic cycle. Financial institutions and borrowers take on large amounts of leverage during the upswing, to become excessively risk averse in the downswing. The amplification of the boom and bust cycle in the supply of credit (and by extension asset prices) is often damaging to the real economy.
- *Cross-section dimension:* The growing size and complexity of the financial system raises interconnectedness and common exposure that may increase contagion when problems arise. As a result, the failure of one institution—large in size or highly interconnected—can threaten the whole financial system.

<sup>2</sup> See Box 1 for definition.

**11. Similarly, most forms of cross-sectional systemic risk appear to be benign, though this would need to be confirmed with more refined data.** Interconnection among banks is small—given the limited interbank market. Risks arising from common exposure are, however, larger with many banks often having similar customers (e.g. government and large corporations). In addition, the interconnection between banks and other financial entities—notably microfinance institutions—merits close monitoring, as banks are often owners of, or refinance microfinance companies, implying that problems in microfinance companies can reverberate on banks. It is not clear how banks are connected to non-deposit taking financial institutions or the insurance sector, which again requires monitoring.

**12. The largest bank in Madagascar is probably too-big-to fail (TBTF), suggesting an important form of cross-sectional risk.** A TBTF bank is one whose demise would create havoc for the rest of the financial system or the financial system and the economy because of its size, interconnectedness, complexity, international linkages and/or the lack of available substitutes for the service it provides. Société Générale and BNP Paribas, which have subsidiaries in Madagascar, have been designed as Systemic International Financial Institutions by the Financial Stability Board. This is not the case of the parents of other foreign owned subsidiaries, or the domestically-owned bank.

#### **Box 2: Leverage in Madagascar**

While there are data weaknesses in Madagascar, most indicators suggest that leverage levels in Madagascar are low to moderate. The mirror image of a low credit-to-GDP ratio is low levels of formal indebtedness in the economy.

**Government:** although rising, government debt remains manageable at about 35 percent of GDP, in part because of its high level of concessionality. Nonetheless, the low government tax revenue levels, and implicit/contingent liabilities, the leverage of the sovereign balance sheet needs to be carefully monitored to avoid getting into difficulties.

**Banks:** They finance themselves essentially out of deposits, and don't issue bonds, keeping leverage levels contained. In addition, banks as a whole appear profitable and liquid, creating an additional buffer of security. There is important variability among banks, however, with this positive picture not necessarily holding for all of them.

**Households:** The household sector is essentially dual in nature, with only some well-off households having access to finance. As bank lending takes place mostly against guarantees (not future cash flows), only affluent households can borrow. Leverage levels therefore are low. The large incidence of poverty (80 percent of the population), the large level of rural and informal sector also mean that most households cannot get formal credit. While some households have increasing exposure to microcredit, data constraints prevent providing a close indication of the debt incurred by these households.

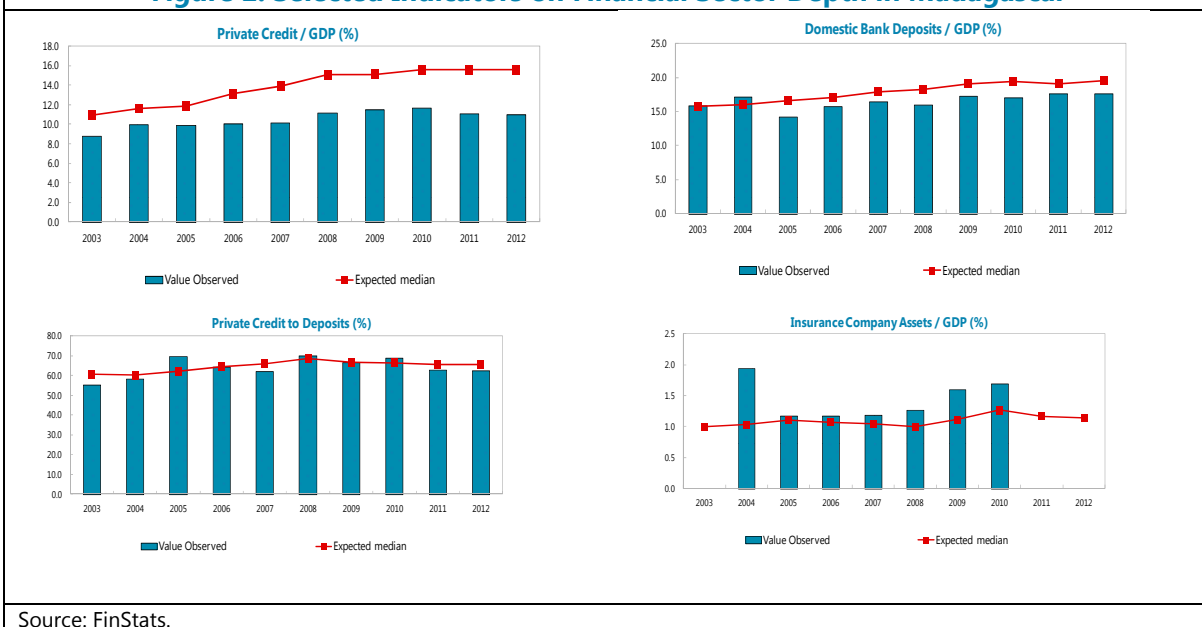
**Corporate Sector:** Only a few large corporations—composed of the traditional foreign companies and some local ones—have strong balance sheet and can borrow, largely for short-term trade finance. The vast majority of other companies—mostly small ones—cannot lever up, due to lack of access to credit.

## C. Benchmarking Madagascar's Financial Sector

**13. A benchmarking exercise allows an assessment of Madagascar's financial sector performance with respect to depth, breath, access and efficiency.** For each key financial sector indicator, a structural benchmark is estimated based on the country's economic and structural characteristics.<sup>3</sup> The difference between the observed value, and the benchmark provides an indication of whether there is scope for further policy action—in case of a negative difference—or whether a country's reforms have been positive—in case of a positive gap. The analysis is carried out for data from 1995–2013, with benchmark countries composed of Low-Income Countries (LICs).

**14. Depth:** Madagascar is below the benchmark for private credit to GDP. Given the political crisis, the banking sector has not deepened much in recent years. Despite its relative smallness, bank intermediation, measured by private credit to deposit ratio, is in line with the structural benchmark, suggesting that banks on-lend their deposits at rates similar to benchmark countries. Similarly, the insurance sector, measured by insurance assets to GDP, is in line with expectation: although low in absolute terms, the ratio of insurance sector assets and insurance premiums to GDP are similar to their benchmark values (Figure 2). With the absence of stock and fixed income market, Madagascar also underperforms in related benchmarks (not reported here) for capital market activities.

**Figure 2: Selected Indicators on Financial Sector Depth in Madagascar**

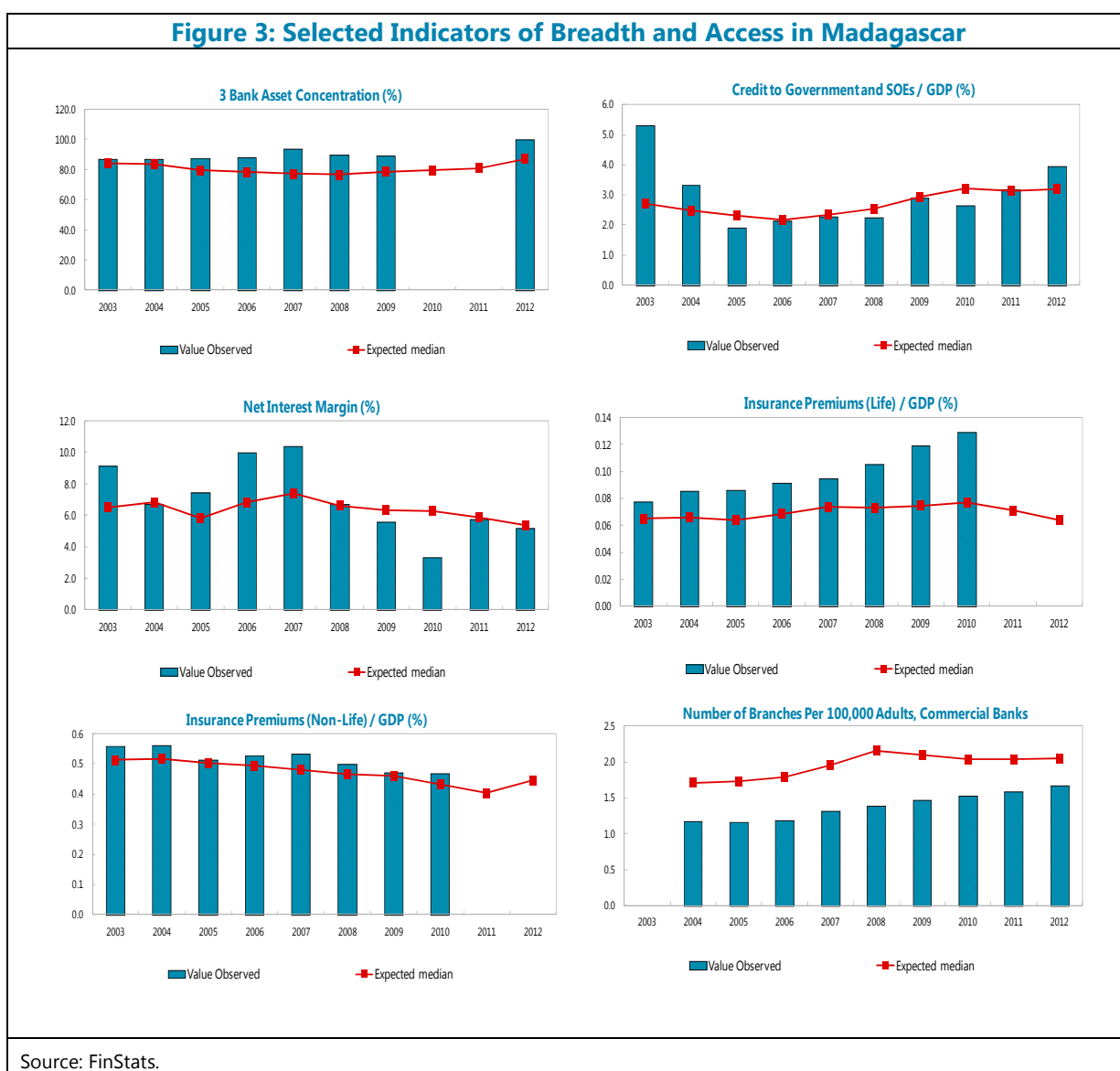


<sup>3</sup> The structural benchmarks are calculated based on FinStats data-set from the World Bank. For a large set of countries, each financial sector indicator is regressed on a set of structural characteristics, such as GDP per capita, population size, density, age-dependency ratio, country specific dummies and year fixed-effects (see Beck et al., 2013).



**15. Breadth:** The picture for Madagascar is varied in terms of the range of products, markets and providers. The level of competition in the banking system—proxied by the asset concentration of the three largest banks and the interest rate margin—is close to the benchmark (Figure 3). The ratio of credit to the public sector as a share of GDP is also in line with benchmarks, though it has increased in recent years. The insurance sector outperforms the benchmark, in particular life insurance (though we saw earlier that it is small in absolute terms), with non-life insurance close to the benchmark.

**16. Access:** Access to banks is below the benchmark, suggesting that there is a lot of room to have more inclusive banking system. Branches per 100,000 adults—a useful indicator of access—illustrate that Madagascar is below its benchmark, and that there is room to increase financial inclusion significantly (Figure 3).



**17. Efficiency and Profitability:** These metrics are both broadly in line with structural characteristics for the banking sector, as measured by cost-to-income ratio (Figure 4). Overhead costs, while historically above benchmarks, have recently converged on the benchmark, implying efficiency gains. This is also reflected in the Return on Equity, which has moved towards the benchmark. The one exception is the lending-deposit spread, which is significantly higher in Madagascar compared to the relevant benchmarks, implying that competition—at least on pricing—is not as high as in benchmark countries. Lack of data on NPLs in FinStats for Madagascar implies that we cannot benchmark the country (as NPL definitions must be homogenized with those of benchmark countries, one cannot simply use the NPLs of the BCM).

**Figure 4: Selected Indicators of Efficiency and Profitability in Madagascar**



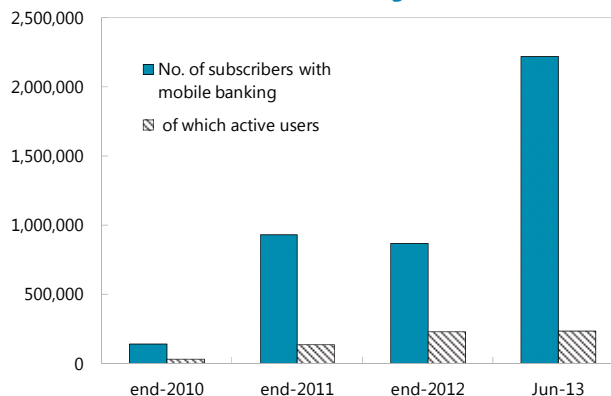
Source: FinStats.

**18. Although statistical benchmarking shows that Madagascar is not lagging significantly in terms of financial sector development, there is scope for further deepening.** Some of the constraints to further deepening are discussed in the section “Obstacles to further deepening”. While beyond the scope of this paper, an agenda for further analysis would be to better understand what drives differences relative to benchmark countries, and which reforms should be undertaken.

### Box 3: Mobile Banking in Madagascar

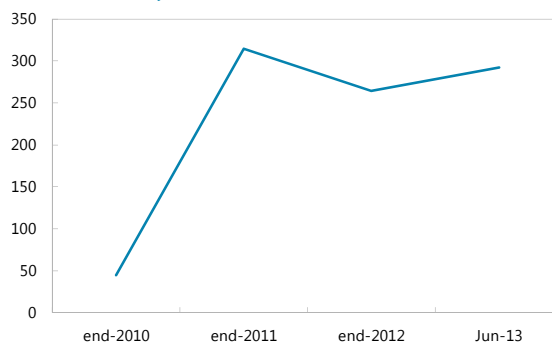
**Like in other parts of SSA, mobile banking has started to take off.** Mobile banking in East Africa has greatly improved access to finance, by reducing transactions costs, particularly in remote rural areas, turning more households into viable customers. In Madagascar, there are more individuals with mobile phone accounts than with actual banking accounts. With the number of mobile phone subscriptions having increased significantly, the active use of mobile banking has not been as strong, with the initial volume growth of transactions having, as least during the transition, plateaued.

Mobile Phone Users in Madagascar, 2010-2013



**Mobile banking in Madagascar goes beyond money transfers, and is helped by a legal framework that is being revised to comply with best practices.** Mobile banking is not simply used to transfer money, but also to deposit money, to pay suppliers, to buy goods and services, payment of wages, and of course receiving transfers from overseas. Legislation has been already established, and is being amended, to better align the institutional norms.

Volume of Mobile Transactions (Billion of Ariary)



Source: Central Bank of Madagascar

## D. Consequences of Lack of Further Financial Deepening

### Private Sector: Dealing with Volatility and Enhancing Growth

**19. Shallow financial markets make it more difficult for firms and household to access financial services, leading to the following constraints:**

- Higher volatility:** One of the key functions of banks—to enable economic agents to smooth consumption across time—is not performed in underdeveloped banking systems. Shocks have to be fully absorbed by households’ existing assets, and when they are insufficient, adjustment is

Country Ranking of Doing Business Indicators for Madagascar, 2015

Doing Business Rank	163
Starting a Business	37
Getting Electricity	189
Getting Credit	180
Protecting Minority Investors	87
Paying Taxes	65
Trading Across Borders	109
Enforcing Contracts	146
Resolving Insolvency	129

Source: World Bank, 2014

immediate, leading to destitution in extreme cases. Shallow banking systems tend to in fact create pro-cyclical financing conditions, providing private entities with credit in good times, but cutting back in downturns, enhancing volatility further. Financial sector development can thereby help reduce liquidity constraints, thereby attenuating volatility.

- **Lower growth:** Financial development affects economic growth by facilitating the mobilization of savings to finance investment and contributing to better allocation of resources. According to the doing business survey, access to credit is a binding constraint on growth in Madagascar.

### **Fiscal Policy: Removing financing constraints, and enabling counter-cyclical policies**

#### **20. Constraints on fiscal policy stemming from a shallow financial system are multiple, not always visible, and include:**

- **Liquidity (and interest rate) risk:** With a large part of domestic debt issued at relatively short maturities—the government is not able to issue large amounts of bonds with a maturity in excess of one year—liquidity risks faced by the government are significant. Rolling over its debt is always a risk in such an environment, resorting to financing itself through undesirable means such as arrears. Short maturities also expose sovereigns to significant interest rate risks.
- **Fiscal cost:** A deeper financial market, by creating more liquidity and allowing for economies of scale in debt issuance (reducing average cost of issuance by utilizing the same infrastructure), may reduce the marginal cost of borrowing to the sovereign. These costs tend to be high presently, particularly for longer maturities.
- **Scope for countercyclical policy:** Madagascar’s economy is susceptible to shocks. This puts a premium on fiscal flexibility. A deeper financial system would give the government more scope to run countercyclical policies in the event of a shock, potentially reducing the need for large fiscal adjustment, which would particularly affect the part of the population that lives close to the subsistence level and has itself limited access to credit. It would also help keep up the pace of execution of investment projects, which if delayed would generally result in higher fiscal costs (beyond lost output in the medium term).
- **Financing public investment.** A shallow financial system limits the ability of the government to finance long-term investment with large economic and/or social rates of return. This is particularly pertinent for Madagascar, given the need for timely infrastructure investments, including in energy and transportation.

## Monetary Policy: Removing constraints to enhance monetary policy effectiveness

**21. The shallowness of the financial system is the most likely reason why the transmission mechanism of monetary policy is not fully effective in Madagascar.** At this stage, given the structural breaks brought about by regular political crises, it is difficult to carry out an econometric analysis of the impact of the various monetary channels, especially with the interest rate not being used actively as a policy lever. It can probably be argued that most of the transmission mechanisms are unlikely to function strongly in Madagascar. Research on monetary transmission in low-income countries (Mishra, Montiel, and Spilimbergo, 2012) showed that for all the channels to be effective, a country should have a strong institutional setup, an independent central bank, a high degree of capital mobility, a floating exchange rate, and well-functioning interbank, government securities, equities, and real estate markets.

**22. Although some of these preconditions for an efficient transmission mechanism are met in Madagascar (e.g. floating exchange rate), others are constrained by the institutional setup (e.g. limited capital mobility, central bank not fully independent).** The low level of development of financial markets is an impediment for monetary policy effectiveness. The negligible interbank market explains why the bank credit channel is not fully effective. At the same time, there is virtually no secondary market for government securities, which does not allow the interest rate channel to fully perform its transmission function. Finally, there is no stock exchange, which impedes the functioning of the asset price channel. There are several additional factors hindering the effectiveness of the transmission mechanism of monetary policy:

- **Persistent excess liquidity:** The banking system is segmented—for instance some banks are mainly present to provide services to foreign companies, not to do business with local companies—including with regard to the distribution of liquidity. The reluctance of banks to trade liquidity means that liquidity needs of illiquid banks have to be met by injections from the Central Bank. In addition, banks also tend to hold large precautionary excess reserves due to weaknesses with the payments system (e.g., remote branches may need to hold large cash balances due to transportation problems). Such a context makes it very hard for the central bank to focus on overall liquidity management. Developing the interbank market and mopping up excess liquidity will be preconditions for a more effective credit channel.<sup>4</sup>
- **Credit rationing:** Imperfect information is an important issue in Madagascar, in particular for smaller firms and for the sizable informal sector. When a financial institution raises its lending rates following a change in policy rates, it may increase the riskiness of

<sup>4</sup> In addition, an added reason for high excess liquidity is the need to ease the financing of the budget deficit since late 2013—due to insufficient tax revenue and late arrival of budgetary support—that has led BCM to avoid mopping up excess liquidity.

new lending by only encouraging risky borrowers to take on more credit (adverse selection). If unwilling to accept higher risk, the bank may ultimately decide to keep its lending rates unchanged, muting the impact of monetary policy decisions.

- **Limited bank competition:** A number of factors, such as high average interest rates and profit margins and segmentation, suggest that competition in the banking market may not be very strong. In such circumstances, monetary policy changes might be partly and temporarily absorbed by changes in profitability.

## E. Obstacles to Further Deepening

**23. The development of the financial system should be pursued forcefully in a way that preserves financial stability.** Financial systems play a crucial role in facilitating growth and helping reduce vulnerability and poverty. From this perspective, further financial development is highly desirable in a low-income country like Madagascar. However, financial systems can also be a source of volatility and crisis, particularly when they become large and/or highly interconnected. There is large body of evidence that indicates that financial crises are usually preceded by rapid growth in financial aggregates. Since Madagascar's financial system remains relatively small and interconnectedness is limited, these risks are presently low, though they require monitoring. The main obstacles to financial sector development are well known (see also Demirgüç-Kunt et al. 2008):

- **Informational asymmetries:** Lack of information on borrowers, due to the limited size of the formal sector, the limited availability of audited company statements, and the limited information content of the credit registry at the central bank, increases adverse selection and moral hazard issues, and ultimately leads to credit rationing. This problem also affects microfinance institutions (MFIs), which tend to lend to some of the banks' customers too. Information asymmetries are also an issue for the development of the interbank market.
- **Business and judicial environment:** A key issue is the absence of formalized property rights in large parts of the country (both rural and urban), which increases the difficulty of using land as collateral in lending. Moreover, the judicial process tends to be costly and slow, with some recent judgments viewed by lenders as motivated by social and political considerations rather than legal merit. This inability to recoup losses at a reasonable cost, through collateral initially pledged, discourages lending further, particular to new segments.
- **Political Instability:** The repeated political instability in the country creates a risky environment in which banks are reluctant to lend longer-term, and prefer lending against collateral, making it hard for most individuals (who lack assets) to borrow.

- **Insecurity:** With ongoing insecurity in parts of the country, banks are reluctant to spread into areas where the security of the branches and staff is not guaranteed. The costs of opening branches in far away spots outweigh the benefits.
- **Skills.** The quality of human capital is critical for banks and MFIs, as it provides the necessary risk-management expertise and the ability to design and sell the products that customers need. The lack of appropriate skills may explain why in recent years some MFIs that moved from dealing with microenterprises to dealing with small to medium-sized enterprises (SMEs) saw their profitability decrease. Banks may face similar challenges moving from larger enterprises to SMEs.
- **Corruption:** The perceived corruption, as measured by the corruption perception index such as Transparency International, is very high (127<sup>th</sup> out of 177 countries), and has in fact increased in recent years according to these indices. As long as corruption hampers investment projects, projects will largely be selected based on individuals or connections, rather than on the merit of an expected rate of return.

## F. Conclusions

**24. The financial system in Madagascar, like in many other low-income countries (LICs), is dominated by the banking sector.** While banks are overall healthy, there are pockets of vulnerabilities, particularly among the less established players. A large number of MFIs supply limited financial services targeting lower income households, helping raise overall access to the financial system. Insurance companies account for most of the remainder of the domestic financial system. There is no equity market, and the bond market is a source of funding only for the government. Benchmarking exercises suggests that overall, the financial system in Madagascar is not significantly out of the norm, given the structural characteristics of the country.

**25. The banking system, while stable, has pockets of vulnerabilities, with lending concentration and asset quality being the main risks, while the situation of the microfinance sector requires careful monitoring.** FSIs suggest that most banks are on average adequately capitalized, profitable, and liquid. Financial depth has increased in recent years and is broadly in line with the country's structural characteristics. However, there is scope for further deepening, which would facilitate the conduct of fiscal policy, make it easier to deal with volatility, and foster investment and growth. The microfinance sector in particular requires careful watching, especially the governance of these institutions, with the recent closure of one institution being a clear warning sign.

**26. Micro-prudential regulation of banks and microfinance institutions could be enhanced and supervision strengthened.** This is already happening, with the reinforcement of staff at the Commission de la Supervision Bancaire et Financiere (CBSF). Many of the lacunas that were discussed in the Madagascar FSAP (2005) and many analyses and recommendations made at the time remain valid. Improving cross-border supervision and signing MoUs with foreign supervisor is an important step forward. Regulatory compliance should be improved further.

In addition, good supervision requires not just a sound regulatory framework—which exists to a large extent in Madagascar already—but also the will and ability to act, which is currently less perceptible. The ability to act must exist both in law and in practice. Supervisors need adequate resources, a skilled and sufficient staff, as well as accountability to balance operational independence.

**27. The authorities are encouraged to develop better statistics, and a deeper holistic view of the financial system and systemic risk.** The central bank set up a financial stability unit in January 2013, whose responsibility it is to provide macro-prudential oversight of the financial system and to identify the main systemic risks through developing early warning system. Developing this expertise is crucial, as the financial system is gaining in complexity, becoming more interconnected (between banks and non-banks). As the global crisis has illustrated, having a system-wide perspective helps the supervisor by complementing his micro-prudential approach by taking account of externalities that build up in the system. Such a function should be developed further. The forthcoming, self-assessed Financial Stability Report is one vehicle through which such an analysis could progress.

**28. Another area for further work is the financial crisis prevention and resolution framework.** The fact that technically insolvent banks have been allowed to continue operations for a while, or that it takes years to close down banks, may reflect weaknesses in the bank resolution framework. Developing the financial crisis prevention system, and Special Resolution Regimes for the closure of banks, are important tasks ahead.

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