



Foreign Currency Borrowing and Regulatory Response to Currency Mismatch in Mozambique

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Foreign Currency Borrowing and Regulatory Response to Currency Mismatch in Mozambique

(The “Aviso 5”)

Shakill Hassan¹, Channing Arndt

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A. BANK INTERMEDIATION IN FOREIGN CURRENCY IN MOZAMBIQUE

A1. Extent of foreign-currency denominated intermediation in domestic banking

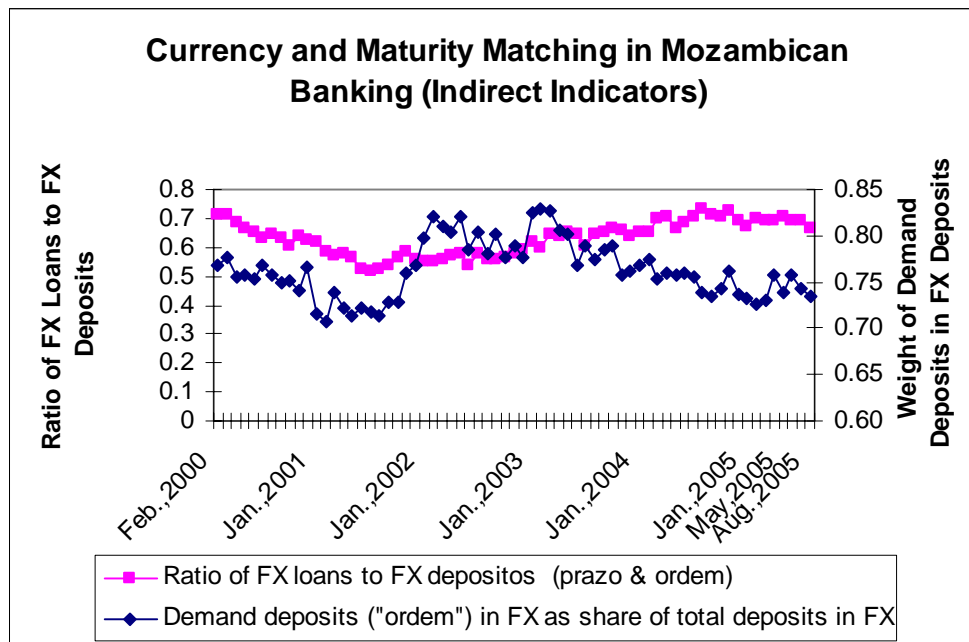
The weight of foreign currency deposits and loans in Mozambique's banking sector is high - higher than the African average, and comparable to Latin America, which is globally the most dollarized region.² The table below shows the recent annual evolution of foreign-currency loans and deposits (mainly held in US dollar) relative to metical loans and deposits, respectively, in Mozambique.

Table: *FX loans and deposits as percentage of total in consolidated banking sector 2000-2005*

In FX, as % of total	Dec-00	Dec-01	Dec-02	Dec-03	Dec-04	Aug-05
Loans	38.3	38.6	45.9	55.7	58.4	56.8
Deposits	49.2	52.3	50.6	46.8	39.6	43.5

{Data Source: Banco de Moçambique}

Foreign-currency loans as percentage of total were in an upward trend until 2004, and have exceeded foreign-currency deposits as a percentage of total deposits from 2002. In the absence of extensive foreign borrowing by banks, it is normal for the volume of deposits in foreign-currency (henceforth, FX) to exceed the volume of loans in FX, since part of the FX deposits are used for investments (particularly in FX-earning assets) other than domestic loans. The evolution of these ratios in Mozambique suggests that an increasing share of FX deposits (the volume of which exceeds the volume of FX loans throughout the analysis) have been transformed into FX loans. This is seen more clearly in the figure below.



{Data Source: Banco de Moçambique}

A2. Currency match but possible maturity mismatch in banking

² See De Nicolo, Honohan and Ize (2003). For another comparison see appendix in Jeanne, (2003).

The rate at which FX deposits are transformed into FX loans has risen gradually, but remains under 90 percent, so the banking sector as a whole does not have to resort to external borrowing to finance local investment. (This may however be the case for individual banks.) Assuming the remaining 10-20 percent of FX deposits which are not lent are held in liquid FX assets, FX liabilities (mainly deposits) in the aggregate local banking sector are largely matched by FX loans and other assets – suggesting no serious risk of currency mismatch in (aggregate) bank intermediation. Note however that over 70 percent of FX deposits consist of demand deposits – a ratio which has oscillated within a band between 71 and 83 percent between 2000 and 2005. The share of term deposits has been on a slow upward trend from the nadir of 17 percent reached in January-March 2003, but remains low. Hence even if the maturity of most loans is short (i.e. one year or working capital), FX loans are mainly financed by demand deposits, inducing a degree of maturity mismatch and liquidity risk that might deserve closer scrutiny than what the data available for this study permits.³

There is another risk. Banks have effectively transferred the currency exposure from contracting FX liabilities to the corporate sector, via (in many cases un-hedged) FX non-bank borrowing, and absorbed an indirect (credit risk) exposure: depreciation affects the quality of their FX loan portfolios. Large currency depreciations weaken the financial position of domestic FX borrowers dependent on metical income streams. Their reduced ability to meet debt obligations translates to increased default rates and a rise in non-performing assets in bank balance sheets. Because of currency mismatch in borrowers' balance sheets the banks are indirectly exposed to exchange rate risk though their borrowers. **The Mozambican central bank is clearly aware of the exposure in the financial system due to currency mismatch in borrowers' balance sheets, and it has correctly and repeatedly manifested its concern with this risk.** Aviso 5 (and amendment in Aviso 7) is the central bank's prudential response.

B. THE REGULATORY MEASURE

B1. Aviso 5⁴

The regulatory measure (henceforth, the “Aviso 5”) requires that banks make a provision of 50 percent of the amount lent, for foreign exchange loans to non-exporting borrowers. As written, it aims explicitly at: (a) the control of risk associated with lending in foreign currency; and (b) the promotion of exports.⁵ Precisely which form of risk is meant in (a) is not explicit in the Aviso, but it is understood that it refers to financial fragility due to currency mismatch in borrower balance sheets – a consequence of un-hedged foreign currency borrowing.

Given the increased cost (to banks) of such lending, we expect the measure will manifest itself mainly through a contraction in FX lending, rather than increased provisions against FX loans to non-exporters – in all likelihood the provision is too steep for these loans to remain profitable.⁶

³ According to IMF Country Report 04/52, March 2004, the Mozambican banking sector is relatively well capitalized and profitable, with an aggregate risk-weighted capital asset ratio of over 14 percent and average return on equity of nearly 20 percent. Annual reports of the two largest banks (BIM and BCI) corroborate this. The four banks which together represent circa 90 percent of the market have all majority foreign shareholders which may be expected to provide liquidity if necessary. Data on degree of leverage in Mozambican corporate sector is not widely available.

⁴ Aviso 5 and Aviso 7 of 2005 (annexed) with which this note is concerned are available for download from the Banco de Moçambique website.

⁵ How the exception will benefit exporters is evident if they were previously constrained in access to FX. If they were not, in addition to ensuring the regulation will not constrain financing options in the export sector, it can be expected that there will be an increased pool of funds chasing the borrowing requirements of firms in this sector, and hence a reduction in their cost of capital. Because exporters generate revenues in foreign exchange, borrowing in foreign currency need not lead them to currency mismatch.

⁶ Exactly how the 50% requirement was determined is not known.

Moreover, in Mozambique (as in any country with an under-developed financial system and limited access to foreign borrowing) the emergence of FX-denominated liabilities in non-bank balance sheets reflects FX lending by domestic banks, which in turn is largely a reflection of deposit dollarization.⁷

B2. Remark on terminology

The term “dollarization” has been used in different contexts with different meanings, often leading to confusion. In this note the unqualified term “dollarization” (strictly speaking, the substitution of domestic currency by a foreign currency as legal tender) will be avoided.⁸ In line with recent international literature “financial dollarization” refers to the extent of FX-denominated loans (or “loan dollarization”) and FX-denominated deposits (“deposit dollarization”) in the banking system, or the degree of dollarization of financial intermediation; “liability dollarization” refers to foreign currency debt in (non-bank) corporate balance sheets – which in Mozambique reflects foreign-currency lending by domestic banks (due to limited private external borrowing). “Currency mismatch” refers to a situation where the liabilities of an institution are denominated in one currency and its assets and/or income in another.

We will avoid ambiguity in this note by adopting this more specific terminology and by fixing the following elementary idea. Because Mozambican firms have little or no direct access to foreign borrowing, FX lending by banks corresponds closely to FX debt in non-bank balance sheets. Thus currency mismatch in non-bank balance sheets and loan dollarization in the banking sector are inseparable issues in Mozambique. The fact that no formal restriction is imposed on FX lending by Aviso5 is trivial. The regulation *effectively* does so. It aims at protecting the banking system from the dangers due to currency mismatch in borrowers’ balance sheets, not at limiting FX lending. But it will (indeed, already does) work by doing so.

In brief, foreign-currency intermediation has led to currency mismatch in non-bank balance sheets, and a regulatory measure was adopted to protect the system from the associated risks. The rest of this note probes this issue: the reasons for and problems caused by currency mismatch and circumstances where these problems are mitigated by the market; the way exchange rate oscillation and monetary policy have affected the currency denomination of bank liabilities and assets in Mozambique; and the implications vis-à-vis the implementation of Aviso5.

C. PROBLEMS CAUSED BY CURRENCY MISMATCH

⁷ Note the contrast with the Asian countries that entered a crisis in 1997-1998. In Asia the pre-crisis growth in FX-denominated liabilities reflected easily reversible capital inflows, largely in the form of corporate debt. Their economies were then affected both by the effect of depreciation on mismatched balance sheets, as well as the capital outflows that precipitated the depreciation – since these outflows represented a reduction in the availability of external financing.

⁸ In a recent speech (to the currency dealers association) the governor of the central bank has also expressed concern with the challenges that increased dollarization poses to the conduct of monetary policy. (See discussion later in this note on this issue.) In the same intervention, the governor explicitly adds the desire to reduce dollarization as one of the objectives of Aviso 5. (See pages 5 and 6 of the document “Intervenção de S. Excia o Governador do Banco de Moçambique no encontro com os Dealers e Tesoureiros do Mercado Interbancário”, July 8, 2005, available on the Banco de Moçambique website.) These remarks seem to contradict the views subsequently expressed by another Banco de Moçambique official (the institution’s spokesman, in private discussions and Notícias, Friday 11 November), according to whom the measure is squarely aimed at protecting the financial system from the consequences of currency mismatch, and not at reducing dollarization. There is however no contradiction if we interpret the governor’s remarks to apply narrowly to liability dollarization, and the spokesperson’s remarks (showing concern with the confusion the term may cause) to refer to dollarization of the whole financial system, possibly including widespread unofficial substitution of domestic by foreign currency in economic transactions (the popular understanding of the term “dollarization”). Although we believe the two officials had different definitions of “dollarization” in mind, the appearance of contradiction may cause confusion and is best avoided.

C1. Fragility

According to Banco de Moçambique (and unsurprisingly given the data above) non-exporter firms represent the bulk of FX borrowers in Mozambique. When firms which generate revenues in domestic currency borrow in FX they become vulnerable to sudden or unexpected currency depreciation: depreciation causes an increase in the metical-value of FX-debt obligations, but no change on metical-revenues - subject to a limit in speed of exchange rate to prices pass-through.⁹ This leads to an increase in default rates, and thereby an increase in the share of non-performing loans in banking sector balance sheets. The reduction in loan repayment rates reduces the attractiveness of lending, and lower credit extension leads to reduced economic activity – with the possibility of extreme depreciation leading to a crisis from massive defaults and corporate bankruptcies. Depreciations can no longer be relied on to stimulate export-led economic growth. And as argued below, the monetary authorities' ability to prevent this cycle by reducing interest rates can be limited.

Caveat

According to the International Monetary Fund (Country Report 04-52, March 2004), “*most banks reportedly channel at present their dollar loans to dollar earning borrower*”, suggesting the possibility that a large share of *non-exporter* borrowers in fact generate *FX revenue* streams, or have the capacity to adjust their MZ earnings in response to exchange rate depreciations. This is consistent with the views expressed by some local bankers. And it would be consistent with extensive new evidence on the behaviour of FX borrowers in Latin America (mainly listed companies), who by and large effectively hedge their dollar liabilities through exchange rate sensitive income streams.¹⁰

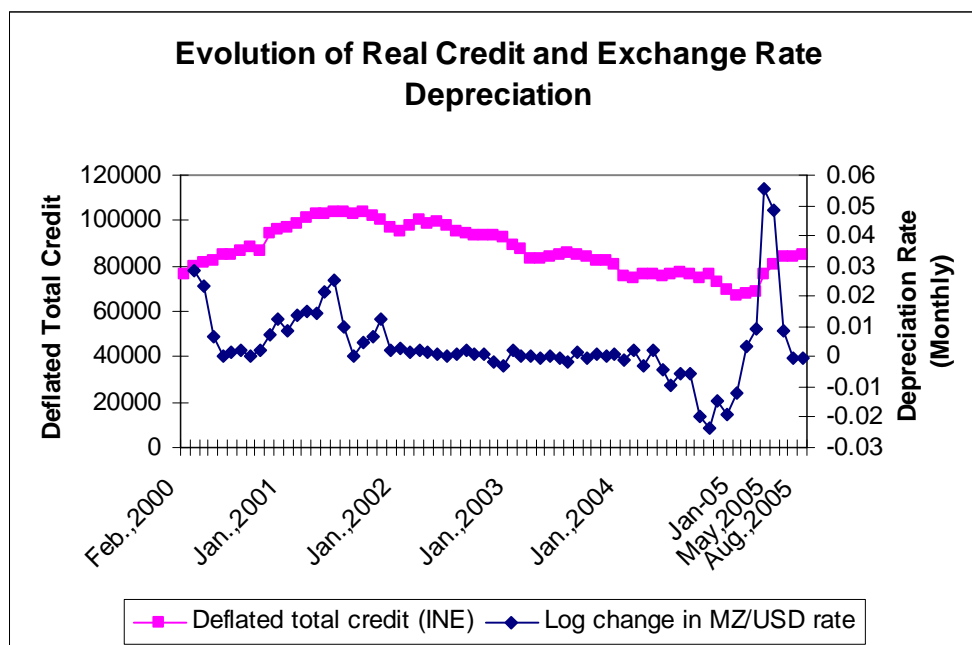
The IMF report is not specific nor does it provide any supporting data; and initial attempts to obtain data on the FX-earning ability of non-export FX-borrowers (or a sector breakdown of this group of borrowers) from Banco de Moçambique were not fruitful. If what the IMF suggests is a fact, it casts doubts regarding the exact extent of (or vulnerability due to) currency mismatch in borrower balance sheets. Unfortunately, this is difficult to verify without knowledge of the activities of non-export FX borrowers.

Two indirect indicators suggest the high level of FX-borrowing may give an exaggerated perception of the risk from currency mismatch in Mozambique: first, there was an expansion in real credit from the banking sector despite large depreciations in early 2005, as shown in the graph below and again later in this note.¹¹

⁹ The current speed of pass-through in Mozambique is not known. This is an area for future research work at the DNEAP.

¹⁰ In arguably the first detailed empirical analysis of the interaction between currency mismatch and firm performance (across Latin America) it is shown that firms with large dollar debt report increases in revenues following currency depreciations, and do not reduce investment, despite the worsening of the liability side of their balance sheets. See Bleakley and Cowan (2005).

¹¹ “Real credit” is the sum of FX and MZM loans, divided by a domestic price index.



{Data Source: Banco de Moçambique and Instituto Nacional de Estatística}

Second, and more importantly, the share of non-performing loans in bank's balance sheets has been steadily declining since 2001, and continued to decline in 2005 *despite very large depreciations*. (Data on the recent evolution of non-performing loans was not available for the purpose of this study. We are relying on public pronouncements by top central bank officials and discussions with members of the banking sector.¹²) Recall that Aviso5 applies to new loans and not the stock of existing loans, a substantial part of which will continue to represent the liabilities of non-exporters after the Aviso is introduced. Thus, these facts are not consistent with widespread reduced investment and increased default rates following large depreciations, as one expects in the presence of currency mismatch. A reduction in non-performing loans despite high depreciation suggests that a substantial number of non-export FX borrowers either generate their earnings in FX or are able to adjust their revenues in response to exchange rate changes. Such borrowers are effectively hedged, and banks' exposures were not as open as the level of loan dollarization suggests.

C2. Effectiveness of monetary policy

The fragility caused by currency mismatch is aggravated by the limits it can impose on monetary policy.

C2.1. Textbook story

The textbook story of counter-cyclical monetary policy: reduce (resp., increase) interest rates to stimulate activity (resp., reduce inflationary pressure) and increase output (resp., reduce aggregate demand) by reducing (resp., increasing) the cost of debt financing and allowing currency depreciation (appreciation). Note that the interest rate and exchange rate effects go in the same direction. (Reducing interest rates is associated with depreciating exchange rate and the direction of effect of both changes on output is the same – namely, a boost to output.)

¹² See for example the document "Intervenção de S. Excia o Governador do Banco de Moçambique no encontro com os Dealers e Tesoureiros do Mercado Interbancário", July 8, 2005, available on the Banco de Moçambique website, and remarks by António Abreu to the press as quoted by Daniel Cuambe in "Situação Económica em Moçambique", Jornal Notícias, Friday, 11 November 2005.

C2.2. Currency mismatch can complicate the conduct of monetary policy

In countries subject to large capital flows (especially short-term portfolio flows),¹³ the expansionary effect of relaxing monetary policy is at least partly eroded by the negative effect of exchange rate depreciation on output: lower interest rates cause depreciation which leads to increased competitiveness (or profitability) of exporters, but also reduced profitability of firms with dollar liabilities but dependent on domestic currency revenues. As a consequence, monetary policy as a counter-cyclical tool is limited or lost due to currency mismatch. Decreasing interest rates might not serve its textbook stimulatory role to prevent recessions, and may in fact cause them. Note also that now the real-sector effects of changes in interest and exchange rates may work in the opposite directions. (Exchange rate depreciations become contractionary.) But to what extent this impediment applies in Mozambique depends on whether interest parity holds for Mozambican variables. This is not established and seems improbable. If it does *not* hold, currency mismatch does *not* impede monetary policy through the channel in this paragraph. See section E for further elaboration on this point.¹⁴

D. HOW EXCHANGE RATE STABILITY AFFECTS THE CURRENCY COMPOSITION OF LIABILITIES IN MOZAMBIQUE

This section examines how exchange rate stability creates incentives for FX borrowing when the rate of interest on the latter is significantly lower than that on domestic currency loans.¹⁵ We consider first the incentives of credit market participants, and then confront these with the recent evolution of deposits and loans in FX as ratios of deposits and loans in MZ, respectively, against variability in the exchange rate.

D.1.1. Depositor incentives

Ignoring interest rate differences, expected depreciation induces a preference for holding dollar assets and expected appreciation induces a preference for metical assets. Interest differentials (between deposits in FX and MZ) determine the optimal denomination of deposits when the currency is stable.

D.1.2. Lender incentives

Particularly in the early/mid-1990s, Mozambique experienced a period of very high inflation, macroeconomic volatility and policy uncertainty, inducing a natural preference for FX deposits – onshore if possible, offshore if necessary. Onshore FX deposits lead to FX liabilities in the banking

¹³ To some extent variability of aid flows may affect the Mozambican economy in similar ways, in particular on growth and exchange rate movements. Of course, these flows are not driven by interest arbitrage.

¹⁴ On inflation. Recent empirical evidence indicates that worldwide, periods of increased banking sector dollarization coincided with *declining* inflation. (See Nicolo, Honohan, and Ize, 2003.) It is not clear whether dollarization impedes or *facilitates* the Banco de Moçambique in its ability to control inflation. There is a possibility that FX borrowing might increase the speed of transmission of exchange rate depreciation to prices (exchange-rate pass-through), in which case although dollarization does not cause inflation it increases sensitivity of domestic prices to currency changes. Of course, if this is indeed the case, then in Mozambique currency mismatch does *not* create heavy currency exposures.

¹⁵ Other reasons for foreign currency borrowing, not discussed here, include moral hazard by lenders (who expect to be bailed-out if depreciations lead to large scale default – see Burnside, Eichenbaum and Rebelo, 2000), limited liability leading to moral hazard by borrowers (who can elect not to repay once depreciation passes a threshold – Aghion, Bacchetta and Banerjee, 2004), and foreign currency debt as a signal of balance-sheet strength, lowering cost of capital (see Jeanne, 1999). Each of these is likely to also play a role in Mozambique. The view taken here, focused on the effects of monetary and exchange rate policy on risk and financing costs, is more easily verifiable by available data, and consistent with empirical findings on divergent evolution of foreign currency denominated deposits, and loans (see Arteta, 2005) – a divergence generally not accounted for in the moral hazard views.

sector, which have to be balanced (to limit currency exposure) by either lending domestically in FX or buying FX-yielding securities (or equivalently, holding foreign deposits).

In addition, despite notable improvements and years of relatively stable macroeconomic policy from the late 1990s, the authorities might not yet have a solidly established reputation for monetary credibility – in the specific sense that market participants are likely to associate a non-trivial albeit small probability to the event that the authorities either permit or are unable to prevent macroeconomic changes that affect the real value of debt obligations. Government incurs large fiscal deficits and its expenditures are largely dependent on aid flows, which internationally tend to be variable and difficult to predict.¹⁶ The role of the central bank as a possible source of government financing presents the possibility of inflationary pressure from government financing requirements. The country is susceptible to shocks beyond the authorities' control. Domestic inflation remains volatile and unanticipated inflation reduces real return on MZ loans. Benchmark interest rates are also relatively volatile. (See IMF Country Report, 04-52, March 2004)

These facts induce a preference for banks to lend in FX instead of MZ (all else constant). To have an incentive to lend in MZ, banks require a risk premium (beyond inflation differentials), creating a wedge between interest rates on MZ and FX domestic loans.

D.1.3. Borrower incentives

Once this risk premium on MZ rates becomes so high as to threaten borrowers ability to repay, the cost of insurance (in the form of protection against exchange rate depreciation) implicit in the higher cost of MZ loans becomes too high. Borrowers with MZ revenues face the following trade-off: either borrow in FX and be exposed to currency depreciation; or pay for insurance against this exposure by accepting a higher rate on MZ loans.

From the borrower's perspective the choice depends on expected depreciation over the term of the loan and its ability to translate currency depreciation into higher output prices (pass-through) or revenues, compared to the MZ-FX loan differential. Ignoring exchange rate pass-through, if expected depreciation is lower than the interest differential, there is a financial incentive to borrow in FX and face the risk of depreciation.

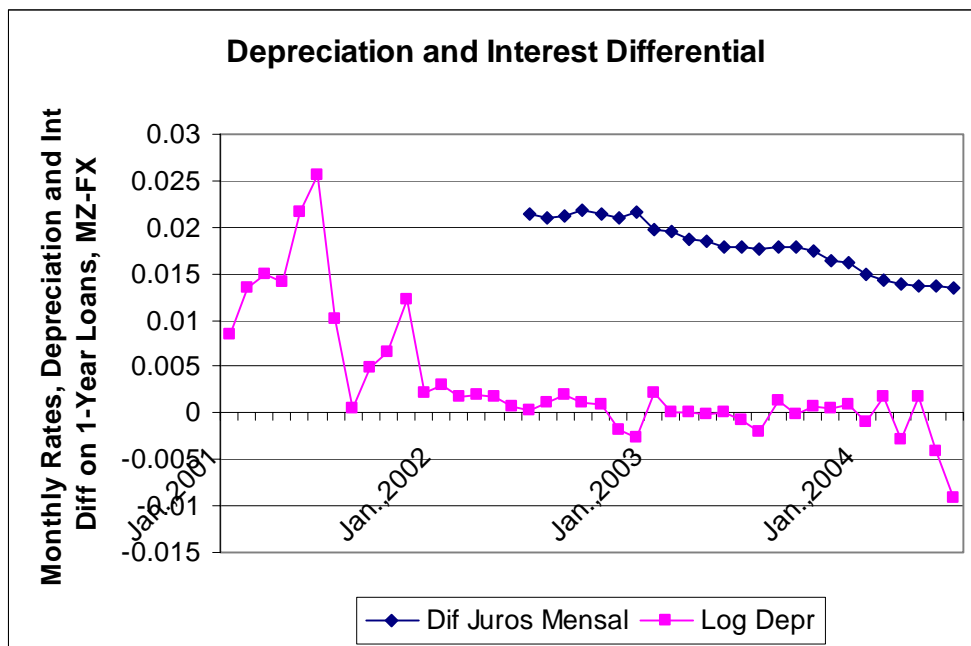
As shown below, this was largely the case over the period from 2002-2004, when metical exchange rates were relatively stable (and appreciating relative to the US dollar during 2004) yet the difference between interest rates on MZ loans and FX loans, although in a general downward trend, remained large.

D.2. Stylized facts

***Fact 1:** The difference between nominal interest rates on metical and dollar loans has normally exceeded the rate of depreciation, and exchange rate stability contributed to a gradual reduction in this difference.*

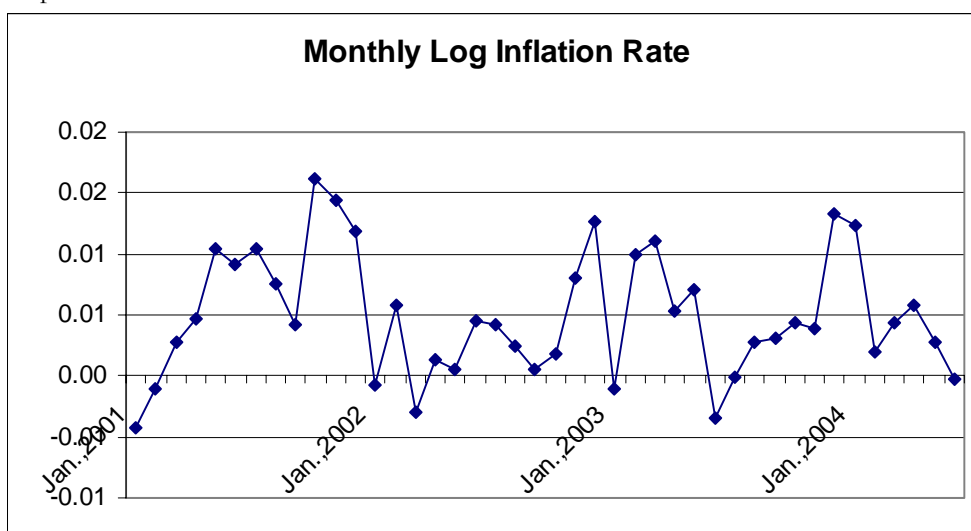
[INCOMPLETE INTEREST RATE DATA]

¹⁶ See for example the collection of articles in the September 2005 issue of Finance and Development.



{Data Source: Banco de Moçambique}

The natural response of the banking sector to the high dollar return on metical loans, given the combination of a substantially higher rate of interest on the latter than on dollar loans, with currency stability, was to start reducing the interest rate on metical loans. This is confirmed by the limited data at our disposal. The data also show however, that between at least June 2002 and June 2004, the interest differential was consistently larger than the (past) rate of depreciation, confirming the lower (metrical) cost of borrowing in dollars for domestic firms. Also note that the reduction in nominal interest rates on metical loans is not explained by the evolution of the domestic inflation rate over the same period.¹⁷

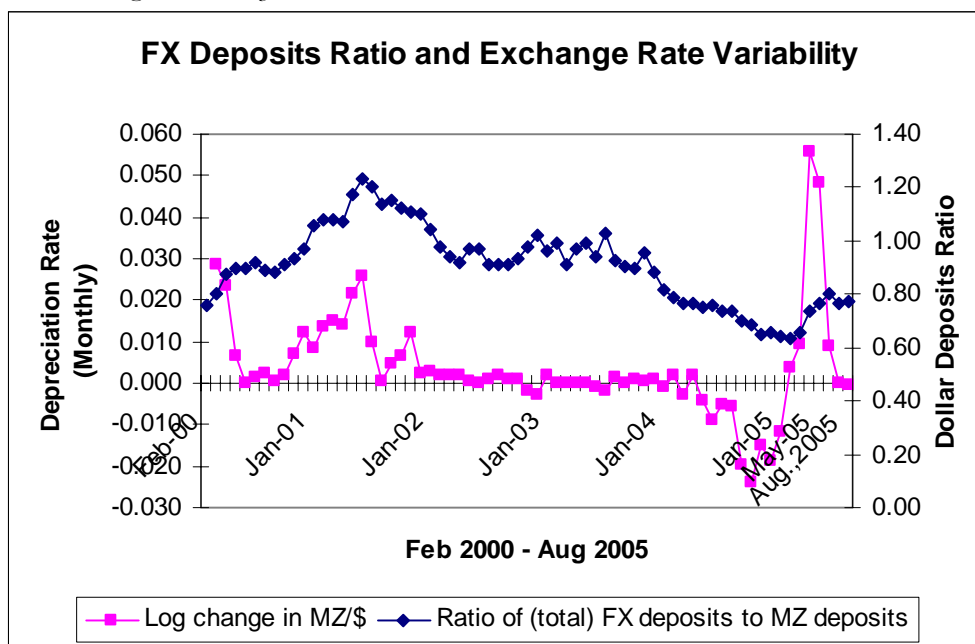


{Data Source: Instituto Nacional de Estatística}

¹⁷ Oscillations in the Mozambican rates (of interest and inflation) generally drive the differences between domestic and foreign rates (of interest and inflation).

In the graphs that follow, we use the ratio of FX deposits to MZ deposits as an indicator of deposit dollarization, and the ratio of FX loans to MZ loans as an indicator of loan dollarization (or the intensity of FX lending). These were preferred to the more common ratios with *total* deposits and *total* loans in the denominators so that changes in the composition of new deposits and loans are quickly reflected in the indicator.¹⁸

Fact 2: *The ratio of FX deposits to MZ deposits tends to increase when the metical is depreciating and volatile, and to decrease with exchange rate stability.*

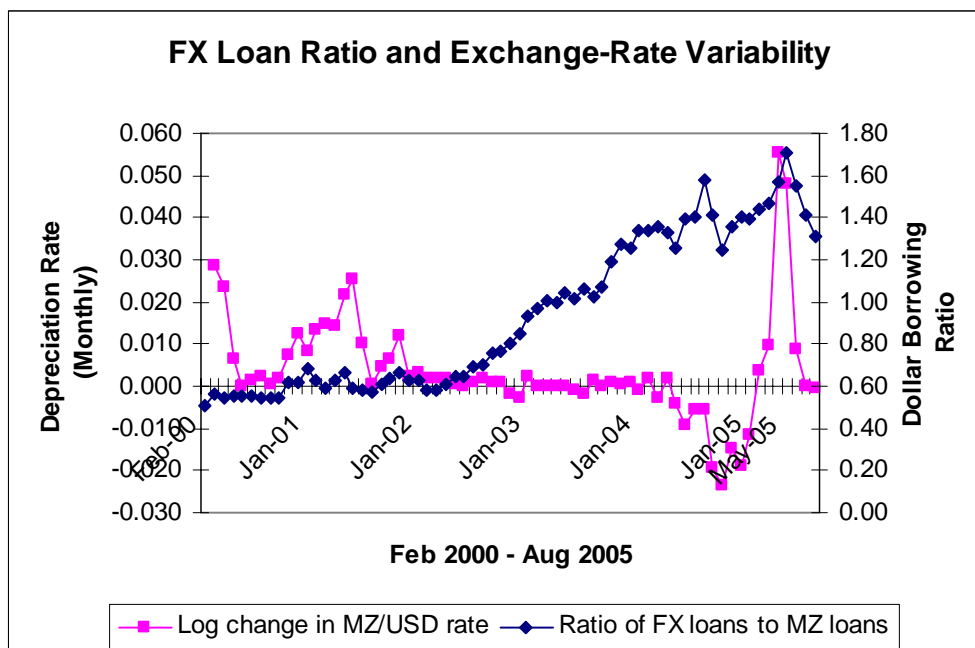


{Data Source: Banco de Moçambique}

FX-denominated deposits were in an accentuated upward trend from the beginning of our period of analysis (February 2000) to June 2001, rising from 0.76 to 1.23. This increase coincided with significant currency depreciation. There is then a reduction and then stabilization when the currency begins to stabilize. Following a period of sustained exchange rate stability from early 2002 and moderate appreciation of the metical relative to the US dollar during 2004, there was steady decrease in deposit dollarization (with an accentuated decrease in 2004 when appreciation of metical to dollar was more pronounced and systematic). The reductions in deposit dollarization coincide with reductions in the rate of depreciation. We then see a reversion of the downward trend in deposit dollarization starting circa March 2005, coinciding with the onset of an accentuated depreciating trend in the metical observed since then.

Fact 3: *For a given spread between rates of interest on MZ and FX loans, the ratio of FX loans to MZ loans tends to remain stable or decrease when the metical is unstable and depreciating, and it tends to increase when the metical is stable and/or appreciating.*

¹⁸ To see the disadvantage of using totals in the denominator consider the following scenario. Imagine that FX loans are 100 and MZ loans 10. Suppose FX loans increase by 10% and MZ loans by 20%. If we use the ratio of FX loans to total loans (which is unchanged at 0.9), there is no change in the intensity of FX lending. Yet, the share of new loans in MZ (16%) exceeds the previous average (9%). This is captured by the decrease in the ratio of FX loans to MZ loans (from 10 to 9), reflecting an increasing share of new loans denominated in MZ (i.e. decreasing loan dollarization).



{Data Source: Banco de Moçambique}

The ratio of FX loans to MZ loans was relatively stable between 2000 and mid 2002, a period characterized by high currency volatility and significant depreciation. (Note that 2001-2002 was also a period of prohibitively high domestic real interest rates, which may have prevented a reduction in FX-borrowing relative to MZ-borrowing due to expected depreciation.¹⁹) Thereafter the MZ begins to stabilize (and occasionally to appreciate) relative to the dollar, and the ratio of FX to MZ loans starts rising steadily. The upward trend is reversed in May 2005, after the onset of currency depreciation from February 2005 (particularly pronounced only in April-May 2005), and the introduction of Aviso5.

We believe this change reflects changes in both lending and borrowing decisions. Considering that borrowing and deposit decisions have historically been responsive to exchange rate changes, it is probable that at least some borrowers would have voluntarily shifted towards MZ loans. In addition, the introduction of Aviso5 shifted lending decisions towards reduced FX loans. The simultaneous sudden increase in MZ loans may also have been due to Aviso5, but for a tactical reason: most loans are short to medium term in Mozambique. Borrowers with longer financing requirements are obliged to roll their short-term debt (which may also facilitate monitoring and control of asset substitution by lenders). Once it is evident that some borrowers will not be able to borrow in FX to roll their FX debt (they will have to borrow in MZ and buy FX to repay), bankers have an incentive to convert FX loans immediately. Domestic banks may have done this, by lending in MZ to un-hedged FX borrowers who then used the new MZ loans to repay their FX loans (thus replacing the FX liability by an MZ liability). This partly explains the sudden decrease in FX loans and simultaneous increase in

¹⁹ Data from the Annual Report of Banco Internacional de Moçambique (Relatório e Contas), 2004, indicates the following lower bound on the annual evolution in lending interest rates.

	2000	2001	2002	2003	2004
Inflation (average)	12,7	9,1	16,8	13,4	12,6
MAIBOR (3 months)	23,0	35,1	32,3	27,6	21,1
Real interest rate	9,2	23,4	13,3	12,5	7,5

MZ loans in June 2005.²⁰ It does not mean however that Aviso5 will lead to continued increased transformation of deposits into MZ loans. We will return to this point later.

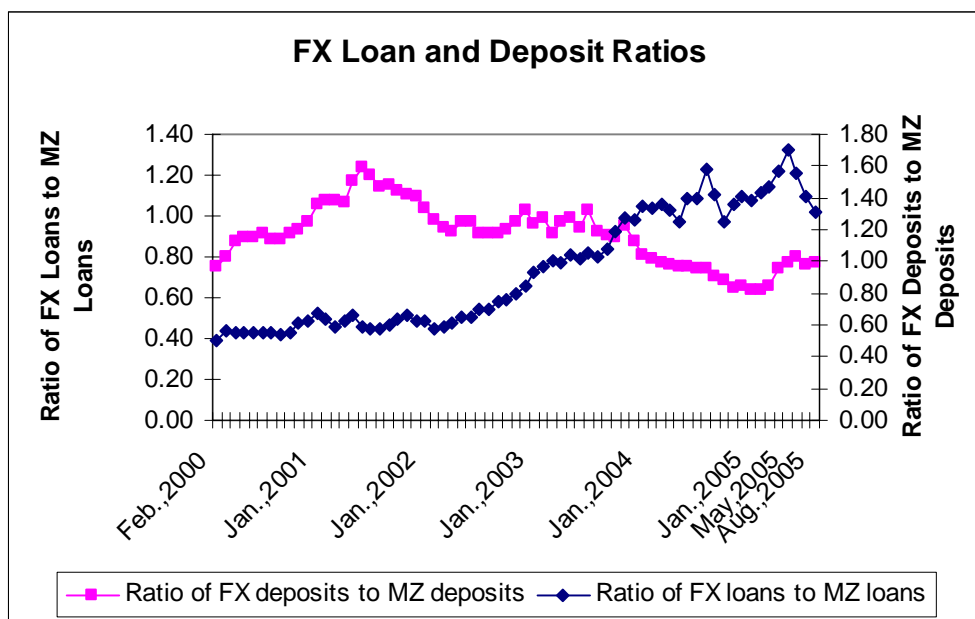
These observations are consistent with the incentives described above, suggesting that exchange rate expectations played a central role in determining the currency composition of corporate debt. Given the high differential between interest rates on dollar loans and metical loans, borrowing in FX proved to be significantly less costly than borrowing in MZ to Mozambican borrowers, even if their earnings were exclusively in MZ. This caused a continued increase in the level of FX indebtedness, originally due to instability and simply the need by banks to prevent exposure.²¹ **Note** that the alternative would have been a higher cost of capital. And **observe** that increased FX borrowing may have been at last partly a response to increased confidence in the central bank's ability to maintain a stable currency.

Implication: over the past five years prior to Aviso5, monetary policy both *contributed to increased dollar borrowing and protected the system from its adverse consequences.* It contributed by 'allowing' (or, as in 2000 following the floods, being understandably unable to prevent) inflation and interest rate volatility, which reduce incentives for metical lending, while exchange rate stability (2002-2004) tilted borrowers towards the lower rate of interest on FX loans. In turn, maintenance of exchange rate stability (and appreciation through 2004) protected the system from the adverse effect of devaluations on mismatched balance sheets, namely increased default and bankruptcies.

Finally, depositors and borrowers respond in opposing ways to exchange rate expectations. The figure below reflects these incentives by showing divergent trends in loan and deposit dollarization following the period of exchange rate stability of 2002-2003 and appreciations over 2004. Observe that the latter period, from March 2005, shows a reversion in this trend.

²⁰ Note that the borrowers subject to this conversion would have put pressure on the local currency market if once received by the banks, the FX is kept as cash (in FX) in the asset side of banks' balance sheets to prevent mismatch. Also, it is pressure that would have occurred later even if the banks had not converted the loans.

²¹ This tendency may have been aggravated by moral hazard associated with the expectation of government bail-out in the event of bankruptcy, a belief likely to have been strengthened by the costly interventions in the banking sector (to rescue BCM and Banco Austral).



{Data Source: Banco de Moçambique}

Remark. Renewed exchange-rate volatility and high depreciation rates stimulate the incentive for savers to increase FX deposits relative to MZ deposits, and for investors/consumers to reduce borrowing in FX relative to MZ – i.e. an increase in deposit dollarization but a reduction in loan dollarization. This can increase commercial banks’ currency exposure (assuming no increase in the rate of interest on MZ loans), and leads to currency mismatch between banking sector assets and liabilities. By restricting FX lending, Aviso5 restricts banks’ ability to match (or fine-tune if matching is sub-optimal) the increase in their FX liabilities with domestic FX assets.

E. ANTICIPATED CONSEQUENCES OF AVISO 5²²

E.1. FX liabilities in non-bank sector

FX borrowing by non-exporting domestic firms will naturally reduce due to Aviso 5. To the extent that borrowers do not hedge their FX liabilities this is a desirable outcome. But the analysis above suggests that: 1) this would to some extent happen without the regulation, due to renewed exchange rate volatility and depreciation; 2) some non-export FX borrowers generate revenues streams which are sensitive to exchange-rate variation; and 3) bank substitution of FX loans by increased MZ loans is likely to partly shift the mismatch to banking sector balance sheets.

E.2. Reduction in overall credit extension

Credit to domestic firms stands at 14% of GDP - close to *half* the average for sub-Saharan Africa (26%) and significantly lower than the average for low-income countries (18%).²³ In the absence of reductions in the domestic cost of financing, further reduction in credit can be expected due to reduced demand for *and* supply of funds, for the following reasons.

E2.1 Reduced project viability

²² The analysis ignores the possibility of bank behaviour exploiting loopholes that may exist in the current regulation.

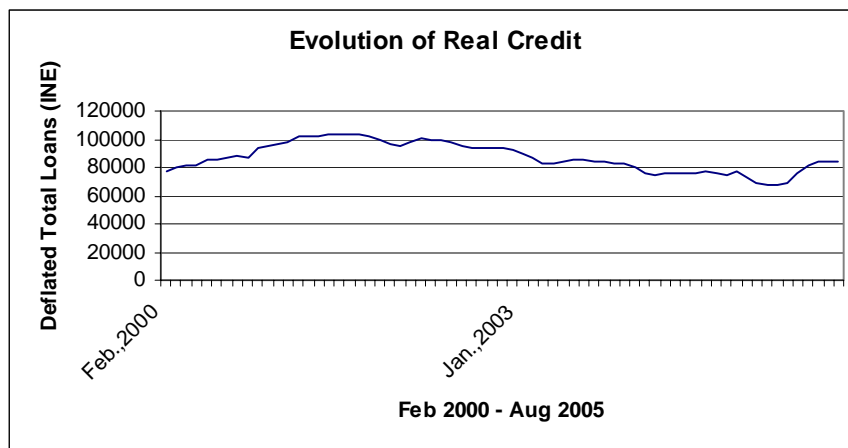
²³ IMF Country Report 04/52, March 2004. Note that GDP statistics may be computed differently in Mozambique, limiting the meaningfulness of this comparison.

High cost of metical debt (real interest rate) will discourage borrowing in metical by at least some agents that were willing to borrow in dollars (in a scenario of exchange rate stability). **Implication:** a limit to the extent to which dollar borrowing will be replaced by metical borrowing. Firms will continue to rely heavily on retained earnings and trade credit.

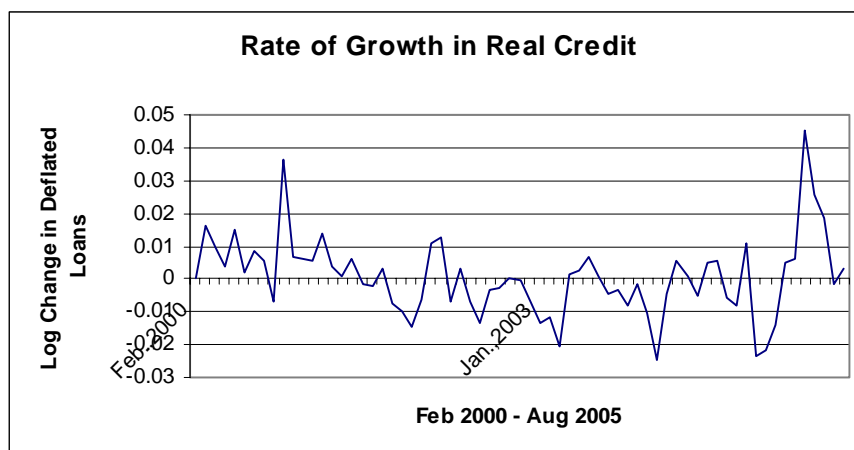
E.2.2. Limited substitution of dollar loans by metical loans in banking sector

Domestic banks have large domestic dollar liabilities (in the form of FX deposits). We expect these to increase over 2005 due to currency instability and depreciation. To balance the consequent exposure banks have to either lend in FX or buy FX-yielding foreign assets. Impeding the former will stimulate the latter. (To the extent that this is not the case the regulation will shift currency mismatch from borrower to lender balance sheets.) **Implication:** a limit to the extent to which dollar lending will be replaced by increased metical lending.

Remark. The real sector consequences and **implications for economic growth** could be significant: according to IMF Country Report 04/52 of March 2004 (page 20), the high cost of financing is the *most* severe obstacle to business performance in Mozambique, and difficulty in having access to credit represents the second most severe impediment to growth faced by national firms.²⁴ The graphs below show the evolution of total credit adjusted for inflation (using INE CPI data). Real credit was on a downward trend from early 2002 to January 2005, either constant or falling throughout most of this period.



²⁴ Unless the rate on dollar deposits falls, there is also the possibility, albeit small, that banks could respond to impediments to dollar lending by reducing dollar deposit taking, to prevent increased exposure. This could be preferred to buying foreign securities if rate of interest paid on dollar deposits is relatively high. The likely consequence would be an increase in offshore banking.



{Data Sources: Instituto Nacional de Estatística e Banco de Moçambique}

E.3. Risk transfer to banking sector inconsistent with prudential rationale

The alternative to the contraction in credit explained above is a transfer of currency mismatch from non-bank balance sheets to the banking sector. By August 2005 over half of bank lending was still in FX, of which less than 20 percent goes to exporters. Consider an extreme scenario: if all FX loans extended to non-exporters before Aviso5 are replaced by MZ loans (so there is a change in the currency composition of loan portfolios, and not the reduction in total credit explained above), less than 10 percent of loans will be denominated in FX. Yet, almost half of total deposits (which exceed loans by a factor of 1.5) are denominated in FX.

Since loans and deposits represent a very significant component of Mozambican banks' balance sheets, this would represent a situation of heavy currency mismatch in the banking sector. Currency depreciation would not increase defaults by borrowers, but it would increase the MZ value of bank liabilities without a matching increase in the MZ value of bank assets. (Equivalently, the erosion in the FX value of bank assets would exceed the erosion in the FX value of bank liabilities, which continue to include FX deposits.) This result would be inconsistent with what is regarded by many central-bankers and academics as the most compelling motivation for the regulation of banks, namely the protection of depositors.²⁵

The regulatory measure reverses the voluntary transfer of FX risk by banks to non-bank balance sheets in exchange for credit risk, previously alluded to. Credit risk might reduce (due to better matched non-bank balance sheets), depending on real interest rate on MZ loans and economic activity. But if there is a contraction in activity due to reduced overall credit availability (possible consequence of Aviso5), or the high cost of MZ debt causes an increase in the real cost of capital, defaults will increase and banking system will be negatively affected. Also, as note above, an obvious response to increased FX deposits is increased FX lending. Given a limited pool of exporters with borrowing needs, the Banco de Moçambique is restricting banks' ability to match their currency exposures.

Implication. We can be confident that the Aviso will have an *unambiguous* effect in reducing financial sector vulnerability only if banks do *not* respond by significantly substituting MZ loans for FX loans but increase their holdings of FX yielding securities instead. In this case, reduced overall lending will lead to reduced aggregate economic activity. That is, **unless the cost of MZ borrowing starts**

²⁵ See Dewatripont and Tirole (1994).

falling rapidly, the regulation is likely to be effective only under the conditions in which it also discourages economic growth.

F. POLICY RECOMMENDATIONS

Recommendation: extend existing exemption to include borrowers who have hedged their currency exposure or whose revenues are responsive to depreciations (including non-exporters), and let the banking system bear the burden of (demonstrably) verifying and monitoring their FX borrowers' exposure.

Motivation for extending exemption to exchange-rate sensitive earners²⁶

The existing exemption to “exporters” leaves a substantial “grey area”:

- (a) Some firms which export part of their output might also sell a share of their output domestically, raising the possibility of currency-mismatch in balance sheets of exporters.
- (b) A significant number of firms which do not export any part of their output might either sell domestically in FX or (equivalently) frequently adjust MZ prices in response to exchange rate fluctuations. (Note that such firms can be less exposed to currency mismatch than exporters which do not sell their entire output abroad.)

As the rule stands, it is therefore possible (and probable) that:

- (i) Lending to exporter firms with only part of their revenues in FX, and therefore exposed to currency mismatch, is exempted from the provisioning requirement;
- (ii) Lending to non-export firms which either generate the bulk of their revenues in FX or are able to rapidly adjust their MZ prices to reflect exchange rate changes and are therefore not vulnerable due to currency mismatch, is not exempted.

Yet, it is not immediately evident which group of firms, between (i) and (ii) is least exposed to currency mismatch risk when borrowing in FX. *Under these circumstances the measure would not be less effective in its prudential role if FX loans to the second group were to be equally exempted from the 50% provision.* As banks have an interest in lending in FX to such borrowers, the onus ought to be on banks to verify and monitor the ability of FX borrowers to translate currency depreciation to increased MZ revenues.²⁷

Motivation for extending extension to hedged borrowers

The risks due to currency mismatch are not a consequence of FX borrowing in itself, but more specifically un-hedged FX borrowing. Firms whose earnings are sensitive to exchange-rate fluctuations are implicitly hedged. In addition, the FX risk due to currency mismatch can be explicitly mitigated by the effective use of currency derivatives. At present, domestic banks already offer a limited suite of derivative contracts.²⁸ Requiring that FX borrowers adequately insure the rate at which they will be able to convert their MZ revenues into FX to meet future debt obligations can be expected to further stimulate the embryonic derivatives market, and thereby the scope for risk management. Banks will have an incentive to invest more resources in acquiring the expertise to price such products, and borrowers will have a hard incentive to hedge.

²⁶ I am indebted to Channing Arndt for first proposing this recommendation.

²⁷ Guarantees from well-capitalised foreign institutions (effectively providing credit insurance) may play an effective role in protecting banks from default. Such guarantees may be obtainable for cases where the lender is satisfied with the ability of the borrower to translate depreciation into MZ earnings.

²⁸ See for example the 2004 Annual Report of Grupo BIM, page 31. The use of regional (esp., South African) or international derivatives markets may be worth investigating – in particular the introduction of MZ/ZAR or/and MZ/USD derivative contracts in existing derivatives exchanges.

Since the premium on a derivative contract with an option feature that permits the borrower to lock the future exchange rate will be an increasing function of the probability of depreciation and currency volatility, requiring that the borrower purchases such a contract before a FX loan can be extended to a non-exporter will ensure the borrower adequately factors in the risk of future depreciation before choosing to borrow in FX. Thus, insurance against the risk of depreciation becomes unavoidable.

G. OTHER ISSUES

It is not surprising that currency mismatch continues to exist in much of the developing world. There are no simple short-term measures to reduce it without imposing heavy economic costs. In addition to the above relaxations of the existing measure, the analysis in the document suggests:

- the potential merit in either relaxing the regulation (by *reducing the provision across the board*) or implementing complementary measures to prevent a credit contraction and increase in overall cost of borrowing that would be inconsistent with economic growth objectives
- the importance of complementing the measure with longer term measures aimed at the sources of FX borrowing, and
- the need to consider ways to mitigate the consequences of existing currency mismatch
- the need for quantitative evaluations of individual banks' exposures to exchange rate risk.

Other issues:

Exchange rate fluctuations will reduce FX borrowing

An important measure has already been taken by the central bank which we expect will have a significant impact in reducing the incentive to FX borrowing, namely the introduction of the exchange rate auction and concomitant reduction in the extent to which the central bank managed the rate of exchange and prevented wide variability. Caveat: the same measure exacerbates the consequence of mismatch if leading to depreciation.

Lower interest rates should stimulate less demand for FX borrowing

High volatility of domestic inflation (due to renewed exchange rate variability, external shocks and historically non-anticipatory monetary policy), a recent history of high default rates, poor contract enforcement, small size of the domestic credit market, and lack of competition in banking sector all contribute to keeping interest rates on metical loans high. However, a clearer understanding for the persistently high real rates, particularly in light of the rapid reductions in non-performing loans over the past two years, is warranted.

Monetary policy can help mitigate effects of mismatch in event of large depreciations

The remarks in part C rationalizes the preoccupation with currency mismatch as an impediment to effective monetary policy expressed by the central bank governor in his speech, with an **important caveat**: the *responsiveness* of the exchange rate to changes in domestic interest rates in Mozambique is not clearly established, but is expected to be small - the absence of large volumes of widely traded domestic-currency bonds and currency futures restrict the scope for the arbitrage transactions that drive the close links between interest rate and exchange rate movements. To be clear: the cyclical management dilemma faced by monetary policy makers due to currency mismatch in non-bank balance sheets depends on a close causal relationship from domestic interest rates to exchange rate changes which is not yet evident (nor probable) in Mozambique.²⁹

If reducing interest rates does not cause currency depreciation, the standard monetary policy channel is not closed by currency mismatch: if lower interest rates do not cause depreciation, the stimulus

²⁹ This ought not to be confused with the issue of interest differentials between dollar and metical loans in the Mozambican banking sector *responding to* (expected) exchange rate changes.

from lower interest rates will not be eroded by the negative effect of depreciation on indebted firms. This means that **in contrast to middle-income developing countries affected by crises attributed to corporate balance sheet problems**, the Mozambican authorities may have recourse to an effective expansionary monetary policy response to the imminent threat of a crisis: reduce interest rates.³⁰

H. CONCLUDING REMARKS

FX borrowing and the consequent currency mismatch cause financial vulnerability in the event of large currency depreciations in Mozambique. FX borrowing is largely a response to financial incentives which can normally be traced to macroeconomic unpredictability. As a prudential measure it is not clear that Aviso5 addresses the source of the problem as its effect will be directly at the symptom. The analysis presented here suggests that the effectiveness of Aviso5 as a prudential measure may be limited, as some of the risk may pass from non-bank balance sheets to the banking sector, or/and that it may lead to a credit contraction, with significant negative consequences to the real sector. In specific, the analysis suggests that unless interest rates on metical loans fall rapidly, Aviso 5 will be *unambiguously* effective as a prudential measure only if it is detrimental to real sector growth. We propose exempting loans to hedged non-export borrowers, including implicitly hedged foreign-exchange earning (or indexed) borrowers, and borrowers hedged through financial contracts, which is perfectly consistent with the central bank's stated aim of reducing the risks due to currency mismatch in borrowers balance sheets (with which we concur), yet will alleviate the negative impact the measure will have on growth. Hedging through financial contracts can prevent borrowers from avoiding the cost of insurance against depreciation implicit in the higher rate of interest in metical loans. Other parallel measures can help protect the financial system from the consequences of currency mismatch without imposing significant limitations on its operation.

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³⁰ See Hassan (2006) for a simple formalisation of this argument.

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