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Reserve Requirements on Foreign Currency Deposits in Sub-Saharan Africa—Main Features and Policy Implications

Arto Kovanen

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African Department

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Prepared by Arto Kovanen¹

Authorized for distribution by David T. Coe

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Abstract

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This paper reviews the reserve requirement arrangements of sub-Saharan Africa, focusing on the differences between reserve requirements on domestic- and foreign-currency deposits. The reserve requirement systems in sub-Saharan Africa are relatively simple and transparent, but in some countries high unremunerated reserve ratios impose a significant implicit tax on the banks. The currency denomination of the foreign-currency reserve deposits raises concern in countries undergoing large macroeconomic changes or experiencing exchange rate volatility.

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Author's E-Mail Address: akovanen@imf.org

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I. INTRODUCTION

Reserve requirements have been part of banking systems for a long time. The role of reserve requirements in controlling the creation of money and credit and providing financial stability has changed, however, reflecting financial market innovations and changes in monetary policy operating procedures. While reserve requirements were once viewed as an important element of prudential control, for the purpose of safeguarding depositors against illiquidity owing to bank runs, more recently their primary role has been to assist monetary authorities in liquidity control.² Many central banks consider reserve requirements as a useful but not essential part of monetary policy operating system, reflecting the use of interest rates as a key intermediate objective of monetary policy.

From the standpoint of monetary control, arguments supporting the use of mandatory reserve requirements on domestic currency deposits also apply to foreign-currency deposits. However, specific policy issues arise when reserve requirements are imposed on banks' foreign-currency deposits. Section II reviews the reserve requirement arrangements in sub-Saharan-Africa, with specific attention to the differences between the reserve requirements for domestic- and foreign-currency deposits. Section III discusses the use of reserve requirements for monetary control, while Section IV analyses the main policy issues. Section V concludes.

II. RESERVE REQUIREMENT SYSTEMS IN SUB-SAHARAN AFRICA

A. Exchange Rate and Monetary Arrangements

This study comprises data for 44 countries in sub-Saharan Africa, offering plenty of diversity as regards the degree of economic development, institutional structures, monetary systems, and exchange market arrangements. Sub-Saharan African countries have adopted a wide range of exchange rate regimes. The CFA franc zone countries (West African Economic and Monetary Union (WAEMU) and Central African Economic and Monetary Community (CAEMC)) peg their currencies to the euro, the currency of 12 European Union nations.³ More conventional fixed rate regimes comprise pegs to the U.S. dollar in Comoros, Eritrea, Namibia, and Zimbabwe; the South African rand in Lesotho and Swaziland; and basket pegs in Botswana, Cape Verde, and Seychelles. For these countries, the exchange rate is the key nominal anchor, although other nominal anchors (such as a monetary target within the

² Weiner (1992) and Sellon and Weiner (1996).

³ Before the introduction of the euro in January 1999, these African countries pegged to the French franc.

context of an IMF program) may also be used to supplement the exchange rate anchor.⁴ Among the countries using flexible exchange rate regimes, including managed or independent floating exchange rates, monetary policy is usually anchored to a monetary aggregate. Several sub-Saharan African countries use no specific nominal anchors to assess their monetary policy stance while monitoring a range of indicators. South Africa has adopted an inflation-targeting framework.⁵

Exchange Rate Regimes and Monetary Arrangements

<u>Exchange rate regime</u>	<u>No. of countries</u>
Fixed exchange rate	22
<i>Of which: CFA franc zone</i>	14
Managed floating exchange rate	11
Independently floating exchange rate	<u>11</u>
<i>Total</i>	<i>44</i>
<u>Monetary policy framework</u>	<u>No. of countries</u>
Monetary program or monetary target	27
Member of a currency union	9
Other 1/	<u>8</u>
<i>Total</i>	<i>44</i>

Source: *International Financial Statistics*, IMF, February 2002.

1/ South Africa (inflation targeting) and countries without specific nominal anchors that use a variety of indicators to assess the stance of monetary policy.

Table 1 offers information about the monetary policy targets used in sub-Saharan Africa. As mentioned earlier, national authorities choose their monetary targets based on country-specific circumstances, most importantly the exchange rate regime. Countries using exchange rate as the nominal anchor usually subscribe to no specific monetary target (e.g., the CFA franc zone countries). For countries with more flexible exchange rate arrangements, reserve money is a commonly used target. Broad money, comprising banks' local and foreign-currency deposits, has been adopted as the key intermediate policy target in several countries (Angola, Eritrea, Madagascar, Malawi, Mauritius, São Tomé and Príncipe, and Sierra Leone). In Burundi and Tanzania, the broad-money target excludes foreign-currency deposits.

⁴ Among the 18 African countries that have negotiated arrangements under the IMF's Poverty Reduction and Growth Facility (PRGF), 8 have fixed exchange rate regimes.

⁵ This information was provided by IMF economists and supplemented with information from other sources, including *International Financial Statistics* and the *Annual Report on Exchange Arrangements and Exchange Restrictions*.

Table 1: Monetary Policy Targets

Country	Monetary target
Angola	Broad money, which includes foreign currency deposits, is used as an intermediate target.
Benin	A member of the WAEMU and the currency is pegged to the euro.
Botswana	Currency is pegged to a basket of currencies consisting mainly of the South African rand and the SDR
Burkina Faso	A member of the WAEMU and the currency is pegged to the euro.
Burundi	Broad money, which excludes foreign currency deposits, is used as the intermediate target.
Cameroon	A member of the CAEMC and the currency is pegged to the euro.
Cape Verde	Currency is pegged to the euro.
Central African Republic	A member of the CAEMC and the currency is pegged to the euro.
Chad	A member of the CAEMC and the currency is pegged to the euro.
Comoros	Member of the French franc zone. The currency is pegged to the euro.
Congo, Democratic Republic of	Reserve money is used as the target.
Congo, Republic of	A member of the CAEMC and the currency is pegged to the euro.
Cote d'Ivoire	A member of the WAEMU and the currency is pegged to the euro.
Equatorial Guinea	A member of the CAEMC and the currency is pegged to the euro.
Eritrea	Broad money, which includes foreign currency deposits, is used as an intermediate target.
Ethiopia	Reserve money is used as the target.
Gabon	A member of the CAEMC and the currency is pegged to the euro.
Gambia (The)	Reserve money is used as the target.
Ghana	Reserve money is used as the target.
Guinea	Reserve money is used as the target.
Guinea-Bissau	A member of the WAEMU and the currency is pegged to the euro.
Kenya	Reserve money is used as the target.
Lesotho	Reserve money is the operational target, limited by the peg to the South African rand.
Liberia	No specific monetary aggregate is targeted since the U.S. dollar is legal tender.
Madagascar	Both monetary base and broad money, which includes foreign currency deposits, are used as the targets.
Malawi	Broad money, which includes foreign currency deposits, is used as the intermediate target.
Mali	A member of the WAEMU and the currency is pegged to the euro.
Mauritius	Broad money, which includes foreign currency deposits, is used as the intermediate target.
Mozambique	Net domestic assets of the central bank are used as the target.
Namibia	Part of Common Currency Area (CMA). Central bank targets interest rates.
Niger	A member of the WAEMU and the currency is pegged to the euro.
Nigeria	Reserve money is used as the target.
Rwanda	Reserve money is used as the target.
Sao Tome and Principe	Broad money, which includes foreign currency deposits, is used as the intermediate target.
Senegal	A member of the WAEMU and the currency is pegged to the euro.
Seychelles	The central bank targets banks' liquidity and interest rates.
Sierra Leone	Broad money, which includes foreign currency deposits, is used as the intermediate target.
South Africa	Central bank targets inflation directly, using various indicators.
Swaziland	Currency is pegged to the South African rand.
Tanzania	Broad money, which excludes foreign currency deposits, is used as the intermediate target.
Togo	A member of the WAEMU and the currency is pegged to the euro.
Uganda	Reserve money is used as the target.
Zambia	Reserve money is used as the target.
Zimbabwe	Reserve money is used as the target.

Sources: National authorities and staff estimates.

B. Reserve Requirements on Local- and Foreign-currency Deposits

In most sub-Saharan African countries, foreign-currency deposits represent a negligible share of banks' deposit liabilities, largely owing to the exchange controls prohibiting the opening of foreign-currency accounts by residents (Table 2). Therefore, changes in reserve requirements on foreign-currency deposits will only have a small monetary impact. However, in a number of sub-Saharan African countries (Angola, Democratic Republic of Congo, Ghana, Guinea, Kenya, Liberia, Madagascar, Malawi, Mozambique, Rwanda, São Tomé and Príncipe, Sierra Leone, Tanzania, Uganda, and Zambia), the share of foreign-currency deposits is significant and their monetary policy implications need to be considered carefully.

There are a number of common features of reserve requirements on local and foreign-currency deposits in sub-Saharan Africa, but also many important differences. First, countries typically apply a uniform reserve ratio across various maturities of deposits, except in Cameroon, Chad, Republic of Congo, Gabon, Madagascar, Uganda, and Zimbabwe. The required reserve ratios range from zero to 50 percent (Liberia and Zimbabwe) for local-currency deposits and from zero to 24 percent (Madagascar) for foreign-currency deposits. Second, the required reserve ratios on local- and foreign-currency deposits are often identical, except in Angola, Botswana, Burundi, Democratic Republic of Congo, Malawi, Seychelles, Sierra Leone, and Zimbabwe; in these countries foreign-currency deposits are not subject to reserve requirements, while in Liberia a lower reserve requirement ratio is applied to banks' foreign-currency deposits.

There are no clear patterns regarding the currency in which the reserve balances on foreign-currency deposits must be maintained; in most cases, however, the reserve requirements on foreign-currency deposits are maintained in the local currency. A large shift in the exchange rate can significantly impact the deposit balances denominated in the domestic currency and banks' domestic currency liquidity. The monetary authority of CAEMC, the Bank of Central African States, and the central bank of São Tomé and Príncipe partially remunerate required reserves balances.

In the majority of sub-Saharan African countries, only deposits at the central bank and cash in vault are considered as eligible assets to meet reserve requirements, regardless of the currency of denomination of the deposit liabilities. In some countries, banks' foreign-currency deposits abroad, and also with domestic banks, may be included (e.g., WAEMU).

III. RESERVE REQUIREMENTS AND MONETARY CONTROL

The primary goal of monetary policy in most countries is to maintain the internal and external value of the domestic currency, that is, to keep inflation low and stable. In order to accomplish this goal, the authorities need to decide what are the targets against which the implementation of monetary policy will be assessed; they also need to decide the instruments that will be used to achieve these targets.⁶

⁶ Gray et al. (1998).

Table 2: Reserve Requirement Systems

Country	Reserve ratios		Remuneration		Share of FCD 1/	Reserve assets by type of deposit liability 2/
	Local	Foreign	Local	Foreign		
Angola	30.0%	0.0%	No	N/A	65.0%	L: Central bank deposits; F: N/A.
Benin	3.0%	3.0%	No	No	Negligible	L: Central bank deposits, consolidated bonds, and banks credits; F: Foreign currency deposits abroad and with local banks.
Botswana	3.25%	0.0%	No	N/A	3.0%	L: Central bank deposits; F: N/A.
Burkina Faso	3.0%	3.0%	No	No	Negligible	L: Central bank deposits, consolidated bonds, and banks credits; F: Foreign currency deposits abroad and with local banks.
Burundi	7.5%	0.0%	No	No	12.0%	L: Central bank deposits and cash in vault; F: N/A.
Cameroon	0.5%-1.0%	N/A	Yes	N/A	Negligible	L: Central bank deposits; F: N/A.
Cape Verde	18.0%	18.0%	No	No	6.3%	L and F: Central bank deposits.
Central African Republic	0.0%	N/A	N/A	N/A	Negligible	L and F: N/A.
Chad	1.5%-2.5%	N/A	Yes	N/A	Negligible	L: Central bank deposits; F: N/A.
Comoros	35.0%	N/A	Yes	N/A	Negligible	L: Central bank deposits; F: N/A.
Congo, Democratic Republic of	2.0%	0.0%	No	No	81.0%	L: Central bank deposits and short-term paper with local banks.
Congo, Republic of	0.5%-1.0%	N/A	Yes	N/A	Negligible	L: Central bank deposits; F: N/A.
Cote d'Ivoire	5.0%	5.0%	No	No	Negligible	L: Central bank deposits; F: N/A.
Equatorial Guinea	0.0%	N/A	N/A	N/A	Negligible	L: Central bank deposits, consolidated bonds, and banks credits; F: Foreign currency deposits abroad and with local banks.
Eritrea	20.0%	20.0%	No	No	2.4%	L and F: Central bank deposits.
Ethiopia	5.0%	N/A	No	N/A	1.0%	L: Central bank deposits; F: N/A.
Gabon	0.5%-1.0%	N/A	Yes	N/A	Negligible	L: Central bank deposits; F: N/A.
Gambia (The)	14.0%	N/A	No	N/A	N/A	L: Central bank deposits and cash in vault; F: N/A.
Ghana	9.0%	9.0%	No	No	36.0%	L and F: Central bank deposits.
Guinea	5.5%	5.5%	No	No	33.2%	L: Central bank deposits; F: Central bank deposits in foreign currency.
Guinea-Bissau	3.0%	3.0%	No	No	Negligible	L: Central bank deposits, consolidated bonds, and banks credits; F: Foreign currency deposits abroad and with local banks.
Kenya	10.0%	N/A	No	N/A	16.0%	L: Central bank deposits and cash in vault; F: N/A.
Lesotho	3.0%	N/A	No	N/A	N/A	L: Central bank deposits; F: Foreign currency accounts are not permitted to be opened by non-bank public.
Liberia	50.0%	18.0%	No	No	75.4%	L and F: Central bank deposits.
Madagascar	3%-24%	3%-24%	No	No	19.3%	L and F: Central bank deposits and cash in vault.
Malawi	30.0%	0.0%	No	No	17.0%	L and F: Central bank deposits, cash in vault, and balances with discount houses (up to 25% of total reserves).
Mali	5.5%	3.0%	No	No	Negligible	L: Central bank deposits, consolidated bonds, and banks credits; F: Foreign currency deposits abroad and with local banks.
Mauritius	5.5%	5.5%	No	No	11.4%	L and F: Central bank deposits and cash in vault.
Mozambique	11.50%	11.50%	No	No	52.8%	L and F: Cash and liquid (local currency) assets with other domestic banks.
Namibia	1.0%	1.0%	No	No	3.0%	L and F: Central bank deposits.
Niger	5.0%	5.0%	No	No	Negligible	L: Central bank deposits, consolidated bonds, and banks credits; F: Foreign currency deposits abroad and with local banks.
Nigeria	12.5%	12.5%	No	No	Negligible	L and F: Central bank deposits and cash in vault.
Rwanda	8.0%	8.0%	No	No	30.0%	L and F: Deposits in Rwandese Francs and in foreign exchange, other sums owed to customers, and cash vouchers.
Sao Tome and Principe	22.0%	22.0%	Yes	Yes	51.8%	L and F: Central bank deposits.
Senegal	9.0%	9.0%	No	No	Negligible	L: Central bank deposits, consolidated bonds, and banks credits; F: Foreign currency deposits abroad and with local banks.
Seychelles	2.5%	0.0%	No	N/A	8.0%	L: Central bank deposits; F: N/A.
Sierra Leone	10.0%	0.0%	No	N/A	28.1%	L: Central bank deposits, consolidated bonds, and banks credits; F: Foreign currency deposits abroad and with local banks.
South Africa	2.5%	2.5%	No	No	3.5%	L and F: Central bank deposits and cash in vault.
Swaziland	4.0%	4.0%	No	No	Negligible	L and F: Central bank deposits and cash in vault.
Tanzania	10.0%	10.0%	No	No	33.2%	L and F: Central bank deposits and 50 percent of vault cash.
Togo	1.5%	1.5%	No	No	Negligible	L: Central bank deposits, consolidated bonds, and banks credits; F: Foreign currency deposits abroad and with local banks.
Uganda	9%-10%	9%-10%	No	No	30.3%	L and F: Central bank deposits and 30 percent of vault cash.
Zambia	12.5%	12.5%	No	No	45.0%	L and F: Central bank deposits, vault cash, holdings of government treasury bills and term deposits.
Zimbabwe	30%-50%	0.0%	No	N/A	7.0%	L: Central bank deposits; F: N/A.

Sources: National authorities and staff estimates.

1/ Share of foreign currency deposits (FCD) as percent of total deposits.

2/ L stands for local currency deposits and F stands for foreign currency deposits.

A. Monetary Policy Targets

In general, the monetary authorities choose between a monetary and an exchange rate target. This choice has important implications for monetary policy independence, because the central bank cannot for very long maintain an independent monetary policy, while at the same time targeting an exchange rate, particularly when the domestic currency is fully convertible. By adopting an exchange rate anchor, a common policy strategy in sub-Saharan Africa, domestic monetary policy becomes secondary to the monetary policy of the country to whose currency the monetary authorities peg. In a currency union (WAEMU and CAEMC), policy credibility is further strengthened by subordinating policy autonomy to a supra-national entity. Sometimes, monetary authorities attempt to enhance the control of domestic money in a fixed exchange rate regime by sterilizing foreign-currency inflows, or by imposing controls on capital flows (for instance, in the form of a higher reserve requirements on foreign-currency deposits), in order to drive a wedge between domestic and foreign interest rates. However, such measures tend to be costly and largely ineffective over time while the controls are circumvented by the market participants.⁷

Alternatively, the monetary authorities may choose to target a domestic monetary aggregate, such as reserve money in many sub-Saharan African countries, broad money, or some other aggregate. It is important that the chosen target remains meaningful for the achievement of the ultimate policy objective, that is, there needs to be a strong correlation between the monetary target and inflation. In a number of countries the link between quantitative monetary targets and inflation has become weaker, reflecting financial market developments, and many central banks have thus begun to target a short-term interest rate while letting the supply of reserve money vary in line with the demand for it. This approach has gained prominence among the industrial countries, and some sub-Saharan African countries are also pursuing interest rate targeting (Namibia and Seychelles). Central banks may target a specific policy interest rate and intervene in the market using open market operations to achieve this target (e.g., the U.S. Federal Reserve Board), or alternatively, may introduce standing deposit and lending facilities to limit fluctuations in market interest rates without a constant need to engage in open market operations (e.g., the European Central Bank).

Some countries have adopted an explicit inflation targeting framework, in recognition of the difficulties in practice to achieve the inflation objective through an exchange rate target or a quantitative monetary target (e.g., South Africa). In this framework, reflecting the long and variable lags from monetary policy actions to inflation, a quantitative monetary target as the key intermediate policy objective has been replaced by an inflation forecast. The target will only be met in the medium-term, while the target horizon varies across countries, reflecting, among other things, the initial level of inflation.⁸

⁷ Ariyoshi et al. (2000) and Eichengreen and Mussa (1998).

⁸ Masson et al (1998).

Among the sub-Saharan African countries, monetary policy effectiveness is often hampered by weak institutions and legal systems, while monetary policy is also viewed as a vehicle to achieve other policy objectives. Moreover, it has been only relatively recently that African countries began to grant autonomy to the central bank, establish price stability as a primary monetary policy objective, and rein in central bank financing of the public sector. This has been in response to the need to bring inflation under control, in many cases resulting from the monetization of the government deficit.⁹ In practice, however, the efforts to pursue independent monetary policy aimed at price stability have not been all that successful. Despite institutional reforms to enhance the independence of the central bank, monetary and fiscal policy decisions are nevertheless made by the same authority, often the president, undermining central bank's credibility and giving rise to policy inconsistencies.

B. Monetary Policy Instruments

In the process of financial liberalization, countries have moved away from direct controls on credits and interest rates toward indirect instruments of monetary control. Indirect monetary instruments, comprising statutory reserve requirements, open-market operations, and standing deposit and lending facilities at the central bank, to be used at the initiative of a bank, rely on market mechanisms to affect conditions in the financial markets.¹⁰ Most central banks use all of these instruments, albeit the mix varies from country to country. Open-market operations and statutory reserve requirements are the primary tools for central banks to set monetary policy in most countries, while standing facilities are used to limit the volatility of market interest rates. Financial market developments have permitted central banks to also engage in active market operations (such as repurchase operations) to influence conditions in the money market. Reserve requirements, albeit a simple instrument, are only used for "rough tuning" (to create a structural shortage) rather than to manage daily liquidity.

Open-market operations, including outright sales and purchases of securities and repurchase operations with these securities, have become the preferred method of conducting monetary policy in all industrial countries, and in many developing countries, where financial markets are sufficiently developed. The frequency of central bank intervention in the financial market had varied across countries, reflecting differences in their monetary control arrangements and the stage of development of their financial markets.

Open-market operations play a central role in the interest-rate operating framework. However, the effectiveness of open-market operations for monetary control is critically dependent on the development of financial markets, particularly markets for repurchase transactions, which is a serious shortcoming in developing countries where secondary

⁹ Honohan and O'Connell (1997).

¹⁰ Alexander et al. (1995) and Baliño and Zamalloa (1997).

markets are often illiquid.¹¹ In this case, instruments used to transmit monetary policy signals may be ineffective and fail to convey the intended information. For example, even a small shift in liquidity can generate substantial swings in market interest rates if markets are shallow. The information contained in interest rates may also be distorted by structural weaknesses in financial markets.

Statutory reserve requirements, administered by the central bank, supplement other monetary instruments to help facilitate liquidity control. Unlike active policy instruments, they provide a degree of "automaticity" to the monetary control operated through the money multiplier and their effectiveness does not depend on the presence of liquid money or securities markets, thereby making reserve requirements a feasible instrument for any country. An increase in the required reserve ratio will lower the money multiplier, and vice versa.¹²

While significant progress has been made during the past ten years to modernize the financial systems of sub-Saharan African countries, there is still a long way to go. Sizeable disparities exist between countries, with largely developed financial systems already in place in Ghana, Mauritius, South Africa, and Zambia, while the financial systems of many other sub-Saharan African countries are still undeveloped or minimally developed. Reflecting the institutional weaknesses, the lack of financial market depth, limited range of financial products offered to the customers, and slow progress with financial market liberalization, the central bank's ability to conduct a wide range of monetary operations remains constrained. Gelbard and Leite (1999) find that only a few of sub-Saharan African countries have largely developed monetary policy instruments (CAEMC, Swaziland, Tanzania, South Africa, Zambia, and Zimbabwe), while in others the ability to conduct open-market operations is limited, among other things, due to the lack of secondary markets and large-value payment systems for interbank transfers to support market operations. Developing a deep and liquid secondary market for public debt securities (typically treasury bills and bonds) will also take time. Among the countries of sub-Saharan Africa, only South Africa has a liquid secondary market for government paper. Consequently, reserve requirements have retained their prominence as a monetary policy instrument in many African countries, despite being cumbersome to administer.

There are a number of arguments for and against the use of reserve requirements for monetary control. First, reserve requirements can stabilize money market interest rates if averaging of daily reserve balances is permitted. However, the buffer created by the reserve requirement system has to be sufficiently deep to be helpful. A low reserve requirement level can force the central bank to intervene in the market frequently in order to smooth out

¹¹ Gray et al. (1998).

¹² Define the central bank's monetary liabilities as the sum of currency outside deposit money banks and banks' required and excess deposits with the central bank ($C+RR+ER$), and broad money as the sum of currency in circulation and deposit liabilities of banks ($C+D$). Then the money multiplier can be defined as $mm = (C/D+1)/(C/D+rr+ER/D)$, which depends in part on the reserve ratio $rr = RR/D$.

fluctuations in daily interest rates, in the absence of other instruments (e.g., standing deposit and lending facilities).

Second, a reserve requirement system artificially increases the demand for reserve money and therefore may be used to create a liquidity shortage in the money market; this could enhance central bank's monetary control since banks, on average, will be forced to borrow from it.¹³

Third, when the public is allowed to maintain domestic bank accounts denominated in foreign currencies, the monetary authorities may differentiate between reserve requirements imposed on domestic and foreign-currency deposits. A differentiated reserve requirement system may be introduced to attract, or discourage, foreign-currency deposit inflows, albeit at the cost of complicating central bank's liquidity management.

Fourth, *unremunerated* reserve requirements impose an implicit tax on banks, which could be high when the effective reserve requirement ratio is high. This is likely to discourage financial intermediation through the banking system as the requirements are being circumvented by the banks. In order to limit the adverse consequences of unremunerated reserve requirements, the effective reserve ratios should be kept relatively low. Remuneration at or near market interest rates would impact central bank profits and reduce its seignorage income, and hence needs to be introduced with caution.

Finally, the deepening of financial markets in many countries has brought new products that could be regarded by the public as close substitutes for traditional bank deposits (e.g., money market funds). This has radically altered the nature of financial intermediation and changed the monetary transmission mechanism. As a result, targeting various monetary aggregates has become more difficult because these aggregates have become unstable and the volatility of the money multiplier has increased. Therefore, their usefulness as a guide for liquidity control has eroded, which has forced the monetary authorities to look for alternatives such as interest rate and inflation targeting, where the money multiplier plays a lesser role.¹⁴

The evolution of financial instruments has made arguments for utilizing reserve requirements to enhance monetary control less persuasive.¹⁵ Furthermore, reserve requirement regimes tend to be cumbersome to administer, prompting central banks to reduce reserve ratios to very low levels and use them mainly for prudential purposes. In some countries, reserve

¹³ The case for this argument is substantially weaker when close substitutes for bank deposits are available, which is not typical in sub-Saharan Africa.

¹⁴ Inflation targeting tries to overcome this problem by replacing the quantitative monetary target (e.g., reserve or broad money) with an inflation forecast as an intermediate monetary policy target.

¹⁵ Di Giorgio (1999).

requirements have been completely eliminated (e.g., Canada, Sweden, and the United Kingdom). While concerns that the lack of reserve requirements, or low reserve ratios, will raise the risk of banks not being able to meet their end-of-day settlement obligations have been raised, in the end changes in the reserve requirement systems have not altered significantly the effectiveness of monetary policy. Central banks have adopted other tools that provide flexibility to respond to changing market conditions, for example owing to the increased sensitive of capital flows to changes in interest rate.

IV. RESERVE REQUIREMENTS ON FOREIGN-CURRENCY DEPOSITS: POLICY IMPLICATIONS

There are a number of policy issues that arise from the introduction of reserve requirements on banks' foreign-currency deposits.¹⁶ In particular, the type of reserve requirement system imposed on banks' foreign-currency deposits could make a significant difference when the share of foreign-currency deposits is large relative to banks total deposits or when the country is undergoing significant macroeconomic or exchange rate adjustment. In these cases, reserve requirements on foreign-currency deposits can impose a high implicit tax on banks and make the cost of intermediating in foreign currencies prohibitive, giving rise to disintermediation and capital flight, and complicating liquidity control. The main policy issues are discussed below.

Uniformity of reserve requirements. When domestic and foreign-currency deposit liabilities are subject to a uniform reserve requirement, the central bank acts in a neutral manner with respect to the currency in which the banks' deposit liabilities are denominated; this is the case with a large number of sub-Saharan African countries. Then the role of reserve requirements is largely to assist in central bank's liquidity control, regardless of the source of liquidity. The monetary authorities sometimes create a bias by differentiating the reserve requirements on foreign and domestic currency deposits (Angola, Botswana, Burundi, Democratic Republic of Congo, Liberia, Malawi, Seychelles, Sierra Leone, and Zimbabwe).¹⁷ In these cases, a lower or zero reserve requirement on foreign-currency deposits is often done to encourage foreign-currency inflows. A differentiation can also be introduced with the view to limit the growth of foreign-currency deposits. Whether or not the schemes affect the deposit inflows, owing to various other factors influencing these flows, such as the macroeconomic environment and political stability, multiple reserve requirements tend to complicate central bank's liquidity management due to unforeseen shifts between different types of deposits, making the money multiplier less stable. Furthermore, to avoid double taxation, reserve requirements should not be applied to interbank deposits.

¹⁶ For reference, see Ize (1995) and Marston (1996). In this section, we mainly focus on those sub-Saharan African countries where foreign-currency deposits represent a substantial portion of banks' total deposits.

¹⁷ We abstract from differentiation with respect to maturity in this section.

Remuneration. The lack of remuneration of reserve balances represents an implicit tax on the banks, increasing as the reserve ratio becomes higher. This tax should be minimized to help reduce intermediation spreads and avoid putting banks in a competitive disadvantage vis-à-vis non-banks not subject to reserve requirements. When unremunerated reserve requirements are denominated in the local currency (regardless of the currency denomination of bank deposits), the opportunity cost of holding reserve balances at the central bank would be equalized across the different types of deposits. When inflation is high, domestic nominal interest rates will be much higher than the rates abroad. Then the implicit tax on the reserve base comprising banks foreign-currency deposits tends to be high and could put banks' profitability at risk, unless the banks are able to shift the tax burden to their customers in the form of wider intermediation spreads. However, lowering interest rates offered by banks on their foreign-currency deposits can cause shifts in their foreign-currency deposits as the customers want to withdraw deposits from the banks or refuse to open new foreign-currency accounts; disintermediation and capital flight could therefore accelerate. Denominating required reserves on foreign-currency deposits in foreign currencies thus lowers the burden on banks when reserves are not remunerated.

Foreign-currency deposits represent a significant share of banks' total deposits in several sub-Saharan African countries (Angola, Democratic Republic of Congo, Ghana, Guinea, Liberia, Mozambique, Rwanda, São Tomé and Príncipe, Tanzania, Uganda, and Zambia). Angola and Democratic Republic of Congo, however, impose no reserve requirements on these deposits. São Tomé and Príncipe remunerates banks reserve balances with the central bank.¹⁸ In other countries, high reserve requirements and no remuneration often give rise to an implicit tax, which can be significant in some cases (Box 1).

¹⁸ Only a small portion of reserve balances are remunerated at the central bank's benchmark interest rate.

Box 1: Implicit Tax on Unremunerated Reserve Requirements for Foreign-Currency Deposits 1/

Country:	Implicit tax:		RR ratio	Share
	% of GDP:	% of M2:	on FCDs:	of FCDs:
Ghana	0.36%	1.52%	9.0%	36.0%
Guinea	0.04%	0.30%	5.5%	33.2%
Liberia 2/	0.00%	2.99%	18.0%	74.5%
Mozambique	0.60%	1.94%	11.5%	52.8%
Rwanda	0.05%	0.31%	8.0%	30.0%
São Tomé and Príncipe 3/	0.60%	1.79%	22.0%	51.8%
Tanzania	0.06%	0.29%	10.0%	33.2%
Uganda	0.05%	0.29%	9-10%	30.3%
Zambia	0.44%	2.48%	12.5%	45.0%

Source: *International Financial Statistics*, IMF, January 2002, and author's own estimates.

1/ These estimates are sensitive to the choice of interest rate and scale variables (GDP or money aggregate), and hence should only be considered as suggestive.

2/ In Liberia, the reported M2/GDP ratio is very low.

3/ Not adjusted for the partial remuneration of banks' required reserves.

Currency denomination of reserve assets. In general, the choice between local and foreign-currency denomination of reserve assets on foreign-currency deposits should be based on the macroeconomic situation. In particular, a stable macroeconomic environment and limited currency substitution call for denominating reserve assets, regardless of the corresponding liabilities, in the local currency; this would also facilitate the administration of the reserve balances at the central bank and simplify the central bank's liquidity management.

However, exchange rate instability complicates monetary management and makes it difficult for the banks to manage their liquidity when local currency liquidity changes, reflecting the revaluation of banks' foreign-currency reserve liabilities. This concern arises when reserve requirements on foreign-currency deposits are denominated in the local currency while the corresponding liabilities are denominated in foreign currencies (e.g., Mozambique).

When the exchange rate depreciates, the local currency value of banks' liabilities denominated in foreign-currency increases, forcing banks to increase their reserve balances at the central bank, although the banks' foreign-currency liabilities have not increased in foreign-currency terms. This could squeeze the banks' domestic currency liquidity and force them to either sell foreign currencies to obtain local currency, or borrow funds from the

central bank, possibly at a high interest rate.¹⁹ Disruptions in the payments system could emerge as banks become hard pressed for domestic currency liquidity. An “unanticipated” liquidity squeeze can also become problematic for the monetary authority, because the central bank may experience difficulties in accommodating the higher liquidity demand through other operations. However, lowering interest rates may not be feasible since it may weaken the exchange rate further. The lack of alternative monetary instruments and a limited development of the financial markets increase the potential for liquidity problems. Therefore, the currency denomination of reserve balances needs to be considered carefully, which strengthens the case for denominating reserve assets on banks’ foreign-currency deposits in foreign-currency.

Eligible reserve assets. In sub-Saharan Africa, reserve assets usually consist of local currency deposits at the central bank and cash in vault. Other assets, such as government securities and other liquid assets of the banks, are also permitted in some cases (Mozambique and Zambia). However, accepting government securities as reserve assets creates a captive market for these securities and weakens central bank’s monetary control, and therefore should be avoided. In addition, foreign-currency deposits held with either local or foreign banks may be included in the set of eligible reserve assets (Guinea, Liberia, and Rwanda), while foreign-currency cash as a reserve asset would be comparable to accepting domestic cash in vault toward the reserve requirement. As is the case with domestic cash in vault, allowing foreign-currency cash as part of reserve assets raises the issue how effectively the central bank can monitor banks’ holding of foreign-currency balances abroad.

Monetary targets consistent with reserve requirements. As was discussed earlier, choosing a monetary target should be reflective of its usefulness to project future movements in prices. Among the sub-Saharan African countries, reserve money is a commonly used intermediate monetary target. Broad money is used as a monetary target in Angola, Madagascar, Malawi, São Tomé and Príncipe, Sierra Leone, and in Tanzania where foreign-currency deposits are excluded from the monetary aggregate. In these countries, foreign-currency deposits represent a significant share of banks’ total deposits.

The reserve requirement regime of a country, however, should be consistent with the design of the monetary policy target. In particular, when foreign-currency deposits are included in the broad money target and represent a substantial portion of banks’ total deposits, these deposits should also be subject to a mandatory reserve requirement because it would facilitate the control of foreign-currency liquidity (in the same way that a reserve requirement on domestic currency deposits helps to control domestic currency liquidity). In sub-Saharan Africa, foreign-currency deposits are often exempted from reserve requirements while being included in the monetary policy target (Box 2).

¹⁹ Open position limits could constrain the extent to which banks can offset a shortfall in the local currency liquidity by selling foreign currencies.

Box 2: The Structure of Broad Money Aggregate in Selected Countries

<u>Country:</u>	<u>Monetary target includes FCDs:</u>	<u>Reserve requirements: 1/</u>	<u>Share of FCDs: 2/</u>
Angola	Yes	Differentiated (0%)	65.0%
Madagascar	Yes	Uniform (3%-24%)	19.3%
Malawi	Yes	Differentiated (0%)	17.0%
São Tomé and Príncipe	Yes	Uniform (22%)	51.8%
Sierra Leone	Yes	Differentiated (0%)	28.1%
Tanzania	No	Uniform (10%)	33.2%

Source: Staff estimates.

1/ Compared to the reserve requirements on domestic currency deposits (required ratios for foreign-currency deposits (FCDs) are in brackets).

2/ As percent of banks' total deposits.

V. CONCLUSIONS

Reserve requirement systems of the sub-Saharan African countries are generally transparent and relatively simple. Typically reserve ratios are uniform across different deposit maturities and reserve balances are not remunerated. However, differentiation between local- and foreign-currency deposits is rather common, typically to exempt the latter from reserve requirements. High and unremunerated reserve requirements on banks' foreign-currency deposits, when in place, impose a high implicit tax on the banks in a few countries. The use of local currency as the only eligible reserve asset to meet the mandatory reserve requirements on foreign-currency deposits complicates banks' liquidity management in countries suffering from large economic imbalances or exchange rate volatility. In some cases, the broad-money aggregate targeted by the central banks is not fully compatible with the reserve requirement system, which becomes an issue when foreign-currency deposits represents a substantial share of total deposits.

This paper provides some guidance on policy issues arising from the introduction of a reserve requirement on banks' foreign-currency deposits. A uniform ratio is preferable for monetary control purposes since it makes shifts in the money multiplier more predictable, while using domestic currency as the reserve asset simplifies liquidity control. Structural changes in the financial markets can destabilize the money multiplier for reasons unrelated to the reserve requirement system and could render a monetary policy based on a quantitative intermediate target ineffective. Although the remuneration of required reserves eliminates the implicit tax on banks—a relevant consideration for countries with high reserve ratios—remuneration of required reserves should be considered carefully since it could have a significant impact on central bank profits. Remuneration of required reserves does not solve the liquidity squeeze arising from a large exchange rate change. The preferred method would be to reduce reserve requirements while the central bank adopts other instruments to control liquidity.

REFERENCES

- Alexander, William E., Tomas J.T. Baliño, and Charles Enoch, "The Adoption of Indirect Instruments of Monetary Policy," IMF Occasional Paper, 126, 1995.
- Ariyoshi, Akira, Karl Habermeier, Bernard Laurens, Inci Ötker-Robe, Jorge Iván Canales Kriljenko, and Andrei Kirilenko, "Capital Controls: Country Experiences with Their Use and Liberalization," IMF Occasional Paper, 190, 2000.
- Tomas J. T. Baliño, and Lorena Zamalloa, eds. *Instruments of Monetary Management: Issues and Country Experiences*, (Washington: International Monetary Fund), 1997.
- Di Giorgio, Giorgio, "Financial Development and Reserve Requirements," *Journal of Banking and Finance*, 23, 1999, pp. 1031-41.
- Eichengreen, Barry and Michael Mussa, "Capital Account Liberalization: Theoretical and Practical Aspects," IMF Occasional Paper, 172, 1998.
- Gelbard, Enrique A. and Sérgio Pereira Leite, "Measuring Financial Development in Sub-Saharan Africa," IMF, Working Paper, WP/99/105.
- Gray, Simon, Glenn Hoggarth, and Joanna Place, "Introduction to Monetary Operations," Bank of England, Handbooks in Central Banking, 10, Centre for Central Banking Studies, revised second edition, 1998.
- Honohan, Patrick and Stephen A. O'Connell, "Contrasting Monetary Regimes in Africa," IMF Working Paper, WP/97/64.
- International Monetary Fund, 2001, *Annual Report on Exchange Arrangements and Exchange Restrictions*.
- International Monetary Fund, *International Financial Statistics*, (January 2002).
- Ize, Alain, "Reserve requirements on foreign-currency deposits," IMF, MAE OP/95/1, March 1995.
- Marston, David, "The use of reserve requirements in monetary control: Operational features and country practices," IMF, MAE OP/96/1, May 1996.
- Masson, Paul R., Miguel A. Savastano, and Sunil Sharma, "The Scope for Inflation targeting in Developing Countries," IMF Working Paper, WP/97/130.
- Sellon Jr., Gordon H. and Stuart E. Weiner, "Monetary Policy Without Reserve Requirements," *Economic Review*, Federal Reserve Bank of Kansas City, 81, 4, 1996, pp. 5-24.

Weiner, Stuart E., "Reserve Requirements in Monetary Policy," *Economic Review*, Federal Reserve Bank of Kansas City, 77, 4, 1992, pp. 45-6.