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Zambia: Selected Issues

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INTERNATIONAL MONETARY FUND

ZAMBIA

Selected Issues

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Approved by the African Department

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I. CREATING FISCAL SPACE TO IMPLEMENT THE FIFTH NATIONAL DEVELOPMENT PLAN[1]

1. **If the government is to implement its development strategy, more fiscal space is needed.** The Fifth National Development Plan (FNDP)—Zambia's PRSP—sets out a policy framework for boosting growth and enhancing employment and income opportunities for the poor. The five-year plan (2006–10) has a strategic focus on investments in infrastructure and human resources, and provides detailed expenditure plans in these areas. However, the estimated financial requirements exceed projected resources by about 1.4 percent of GDP a year through 2010. This paper assesses how fiscal space can be created to fully implement the FNDP.

2. **Full implementation of FNDP projects will not by itself ensure rapid progress toward the Millennium Development Goals** (MDGs). The cost of meeting the MDGs is uncertain, in part because the relationship between government spending and outcomes is not clear.[2] Some studies indicate that spending on education and health has a positive and significant impact on growth but stress that other policy interventions are also important, such as improving governance and containing inflation.[3] Capacity to efficiently implement a larger number of projects also needs to be evaluated. Finally, the development of a vibrant private sector is critical, which requires a better business environment.

3. In this paper, Section A defines fiscal space and outlines channels through which it can be created. Section B briefly summarizes recent developments and the broad outlook for fiscal space. Section C then discusses each channel and assesses which are the most feasible for Zambia at the moment. Section D presents the conclusions.

A. Defining Fiscal Space

4. **While the term "fiscal space" is relatively new, the concept is not.** Fiscal space is generally understood as room in the government's budget that allows it to provide resources for a desired purpose *without jeopardizing the sustainability of its financial position or the stability of the economy*. Though this challenge has always confronted governments, it has recently been receiving considerably more attention as low-income countries look for ways to finance the costs of meeting the MDGs.

5. **Fiscal space can be created in many different ways.** One set of channels involves increasing the resource envelope. This can be done through revenue mobilization, securing additional aid inflows, or borrowing resources from domestic or external sources. The other

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[1] Prepared by Brenton Goldsworthy.

[2] Mphuka (2005) estimates that to reach the MDGs both the government and cooperating partners would need to double their financing to this area between 2006 and 2015.

[3] See, for example, Baldacci, Clements, Gupta and Cui (2004).

set of channels involves better utilizing existing resources. Specifically, lower priority spending can be cut to make room for higher priority spending, or existing expenditure could be made more effective. In each situation, the fiscal space must be created in such a way that fiscal sustainability and macroeconomic stability are protected.

6.   **The fiscal sustainability constraint suggests utilizing a medium-term expenditure framework.** Higher expenditures in the short term, and any associated increase in future expenditures (e.g., to maintain capital investments or continue programs that require a long-term spending commitment, such as antiretroviral treatment) must be matched by an increase in current and future resources. This requires the difficult assessment of the impact of expenditures on growth and the future revenue base, and the sustainability of an increase in resources, which is particularly difficult for aid inflows.

7.   **The macroeconomic stability constraint also forces attention on the medium term.** This constraint is most obvious in considering the impact higher aid flows may have on the exchange rate and the competitiveness of export industries (i.e., Dutch disease). However, it is also important for other channels. For example, eliminating accelerated depreciation allowances may increase company income tax revenue in the short term, but it may also deter capital investment, jeopardizing future growth. This constraint also rules out printing money to finance additional government spending.

B.   Recent Developments and Outlook for Fiscal Space

Table 1. Fiscal Space Indicators

8.   **Fiscal space in Zambia seems to have shrunk in recent years.** In 2003–06, declining donor inflows and poor revenue performance, combined with the need to reduce domestic borrowing to stabilize the economy, caused a sharp compression on expenditures (Table 1). However, the 2007 Article IV review suggests that this should now reverse. Specifically, higher revenues and falling domestic interest payments should more than offset a reduction in domestic borrowing. The external contribution is expected to hold steady. In regard to the use of fiscal space, capital expenditure is projected to increase quite sharply in line with the priorities of the FNDP. These issues are discussed in detail below.

	2003-2006	2006-2010[1]
Source of fiscal space	-5.2	1.1
Domestic contribution	-2.7	1.3
Revenues	-1.1	2.1
Domestic interest payments[2]	1.0	0.6
Domestic financing (net)	-2.6	-1.4
External contribution	-2.5	-0.2
Grants	-2.4	-0.6
External financing (net)[3]	-0.1	0.4
Use of fiscal space	-5.2	1.1
Wages	-1.2	1.4
Other current spending	2.6	-2.5
Capital expenditure	-7.3	3.5
Discrepancy[4]	0.7	-1.2

[1]Based on IMF staff projections.

[2]A positive number indicates domestic interest savings.

[3]Net of amortization and interest payments.

[4]Reflects cash float. Nature of expenditure cannot be determined.

C. Channels for Creating Fiscal Space

Revenue mobilization

9.   **Revenue mobilization is a favored source of fiscal space because it avoids many of the difficulties with aid and borrowing** (see below). However, the extent to which revenues can be increased is limited.[4] One consideration is that revenues involve a transfer of resources from the private to the public sector. The benefit of greater public spending therefore needs to be balanced against the costs of reducing the resources of the private sector. An additional consideration is that taxes tend to have a distortionary impact on the decisions of firms and employees. Such distortions can be kept to a minimum by broadening the tax base so that rates can be kept as low as possible.

Central Government Revenue
(Percent of GDP)
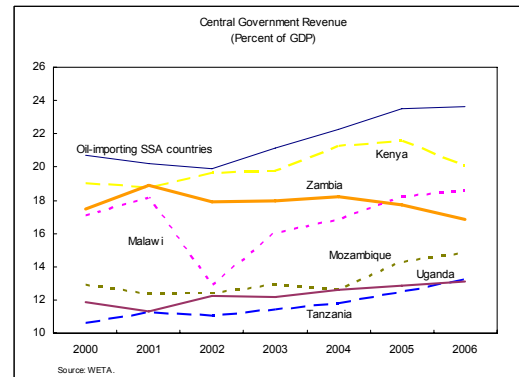
10.   **There seems to be scope to increase revenue to at least 19 percent of GDP.** While Zambia's revenue effort is reasonable by regional standards, the decline in 2001–2006 contrasts starkly with an increase on average elsewhere. Explanations for the decline include an increase in tax evasion, tariff reductions, frequent suspension of excises and customs duties on petroleum products, and, in 2006, a sharp appreciation of the kwacha. The FNDP projects that revenues will increase from 16.8 percent of GDP in 2006 to 18.2 percent by 2010 as administration improves and the contribution of the mining sector increases (see below). The projections have since been revised upward, but a financing gap remains.[5]

11.   **Strengthening administration will be a key to increasing revenue.** A significant decline in VAT productivity during a period of largely unchanged exemptions suggests an increase in tax evasion. After peaking at almost 36 percent in 2001, productivity fell to 26 percent in 2006, well below the average in selected African countries (Table 2).[6] Current efforts to improve administration focus on two areas. First, funding to the Zambia Revenue

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[4] According to Heller (2005), a minimum objective for low-income countries should be to raise the tax share to at least 15 percent.

[5] The draft MTEF 2008–2010 projects that revenues will reach 18.7 percent of GDP by 2010 (updated staff estimates suggest revenues could reach 19 percent), reflecting a higher expected base in 2007.

[6] VAT productivity here is VAT revenue expressed as a percentage of GDP divided by the VAT rate. A fall in the share of consumption in GDP could explain part of the decline in reported productivity. Similarly, variances across countries may in part be explained by different consumption shares.

Authority (ZRA) has been increased to correct the gradual erosion in staffing and enforcement. Second, the ZRA is moving toward an integrated and taxpayer-segmented structure. These reforms, similar to those undertaken in Kenya, Uganda, and elsewhere should in time boost revenues and efficiency. An increase in productivity to the regional average would generate almost 1 percentage point of GDP in additional revenue.

Table 2. Cross-Country Comparison on VAT Productivity

Country	Applicable Year	Standard VAT Rate (percent)	VAT Revenue (percent of GDP)	VAT Productivity (percent)
South Africa	2004	14.0	7.0	50.0
Ethiopia	2005	15.0	5.7	37.7
Botswana	2006	10.0	3.6	36.2
Malawi	2004	17.5	6.3	36.0
Kenya	2004	16.0	5.4	33.8
Ghana	2005	12.5	4.2	33.7
Namibia	2004	15.0	5.0	33.3
Mozambique	2004	17.0	4.7	27.5
Tanzania	2005	20.0	5.3	26.5
Zambia	2006	17.5	4.5	25.7
Madagascar	2005	18.0	4.4	24.5
Uganda	2005	18.0	4.2	23.3
Average (excluding South Africa)	...	16.0	4.8	30.7

Source: IBFD, IMF country documents and IMF staff calculations.

12.   **Broadening the tax base would further increase revenues.** Most VAT systems contain some exemptions due to equity considerations. However, this needs to be weighed against the cost of complicating administration and distorting decision making. Moreover, well-off families typically benefit more in absolute terms because they tend to consume more of the exempted items than poor families. Studies in Ethiopia (Munoz and Sang-Wook Cho, 2003) and South Africa (Alderman and del Ninno, 1999) suggest that exempting basic food items can help make VAT more progressive, but other exemptions tend to be regressive. Eliminating selected exempt and zero-rated items would boost revenue slightly.[7] Amending Section 89 of the Customs and Excise Act to limit its use to reduce rates—it has been used to suspend or reduce taxes on petroleum products when the refinery is shut down to protect the consumer from higher prices—would also help to protect revenues.

13.   **The use of tax incentives should be strictly limited.** Investment incentives based on tax holidays were reintroduced in early 2007 for companies operating in multi-economic facility zones and a long list of priority sectors. While additional investment is needed, international experience demonstrates that investors give lower priority to tax incentives than

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[7] A 2006 IMF technical assistance mission estimated that eliminating certain exempt and zero-rated items (e.g., package tours and nonbasic food items) would boost VAT revenue by 0.16 percentage points of GDP.

to a competitive investment climate characterized by sound economic policies and institutions; political and economic stability; quality infrastructure; a productive workforce; and transparent tax rules and administration.[8] In any case, a recent study by the Foreign Investment Advisory Service showed that the effective tax burden in Zambia is already regionally competitive. The government should take stock of all tax incentives and begin reporting them in the budget documents, with a view to quantifying the cost and streamlining them to broaden the revenue base.

14.   **There is limited scope to raise tax rates.** The VAT rate (17.5 percent) and the standard corporate income tax rate (35 percent) are already quite high, there is a desire to reduce rather than increase the burden on personal income taxpayers, and import duties are declining as trade is being liberalized. Rate increases should only be contemplated for excises and in terms of unifying corporate rates to reduce tax-induced distortions.[9] However, unifying corporate rates at 30 percent would involve a revenue loss because the increase from sectors currently paying 15 percent would be less than the reduction in revenue from those now paying the higher rates.

Corporate tax rates	
Agriculture, nontraditional exports, fertilizer	15
Mining[1]	30
Banking	
First K250 million	35
Remainder	40
Manufacturing and other	35

[1]Increased from 25 to 30 percent for new investments in the 2007 Budget.

15.   **Generous fiscal terms and the write-down of large investments have limited fiscal revenues from the mining sector.** As part of the privatization process that began in late 1994, the government entered into long-term development agreements with the companies taking over public mining assets. The agreements provided generous fiscal terms and helped to promote investment in the sector when copper prices were low. The fiscal terms included a royalty of 0.6 percent of gross value; corporate income tax at 25 percent; depreciation for tax purposes at 100 percent; withholding taxes at zero percent, except on construction and technical services supplied by nonresidents; customs duty exemptions for capital equipment imports; and limits on duties payables for consumables. These terms and the write-down of large investments have limited the government's share from the copper boom, although revenues have started to pick up (Figure 1) and the dates at which companies begin to declare taxable profits has been brought forward.

16.   **The fiscal regime for new mining operations has been revised and the government is renegotiating development agreements.** In recognition of high copper

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[8] See, for example, Zee, Stotsky, and Ley (2002).

[9] In the 2007 budget, excise rates were increased on cigarettes, clear beer, and motor vehicles, and the personal income tax burden was reduced by adjusting the thresholds and reducing the top marginal rate.

prices and the generally more favorable investment climate, the government has revised the mining sector fiscal regime to be more consistent with international standards. Changes announced in the 2007 budget included raising the royalty rate to 3 percent, the corporate income tax rate to 30 percent, and the withholding tax rate to 15 percent. These terms currently apply only to new investments, but government is renegotiating with mining companies the fiscal terms of current development agreements, arguing that copper prices far exceed the levels anticipated by either party when most of the agreements were signed.[10]

17.   **Government revenues from the mining sector could increase significantly.** To estimate possible future revenues, a simulation model was used to project revenues from the three largest mines. The model excludes large tax payments from a fourth mine that imports ores from outside Zambia. Estimates were generated using three alternative copper price projections (IMF *World Economic Outlook* projections, a more gradual decline, and a sharper decline) and using the fiscal terms in existing development agreements and the revised regime from 2008 (Figure 1). The results, which should be viewed as illustrations of possible outcomes rather than precise forecasts, show that mining revenues could rise significantly. However, the size and sustainability of the increase will be sensitive to changes in copper prices and the outcome of renegotiations, and the sharp pick up projected for 2008 could be delayed.[11]

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[10] Some development agreements were signed as late as 2006 when prices were already very high. IMF technical assistance missions have emphasized that fiscal regimes should not depend on output price forecasts. A resource rent tax or variable income tax are useful devices for securing a share of additional mineral rents for the government if mineral prices rise unexpectedly.

[11] The large increase in 2008 reflects the model projection that the two mines not currently paying company income tax will begin to do so. If those mines are still writing off capital investments not captured in the model, the date at which they start recording taxable profits could be delayed beyond 2008.

Figure 1. Projected Government Revenue from the Mining Sector
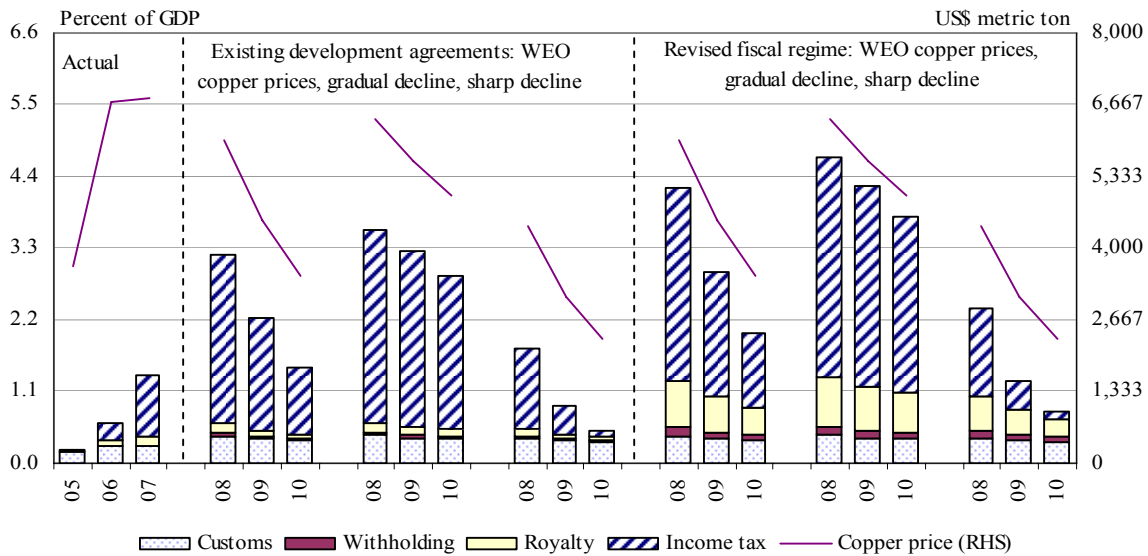
**Changing the composition of expenditure**

18.   **Changing the composition of spending in favor of priority sectors is another favored source of fiscal space.** A sharp decline in total expenditure—brought on by the fall in revenue, a decline in donor financed spending, and a reduction in borrowing to more prudent levels (see below)—highlights the need to prioritize spending. The data on health and education spending in sub-Saharan Africa is poor because donor-financed off-budget activities

are not completely covered, but the data available suggests that the share Zambia allocates to health is reasonable by regional standards but still below indicative targets[12]; funding for education is considerably below average (Figure 2).
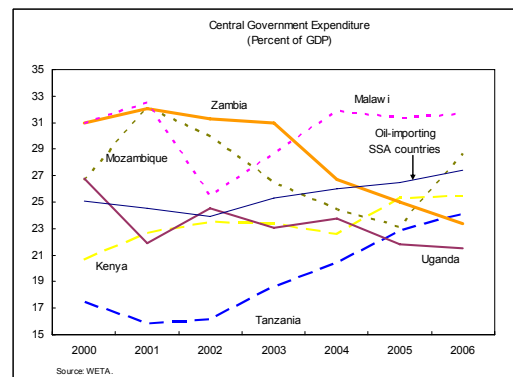
19.   **Changing the composition of expenditure requires sound budget planning.** With limited resources and many competing priorities, governments must assess the marginal benefit of increased spending to some sectors against the marginal cost of reducing spending

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[12] At a 2001 health summit in Abuja, Nigeria, member governments of the Organization of African Unity set a target of allocating at least 15 percent of their annual budgets to improvement of the health sector. The WHO Commission on Macroeconomics and Health suggests that US$40 per person is the minimum amount necessary for effective delivery of a basic public health intervention.

Figure 2. Government Spending on Health and Education

Health Expenditure as Percent of Total
Government Expenditure

Health Expenditure in US$ per Capita
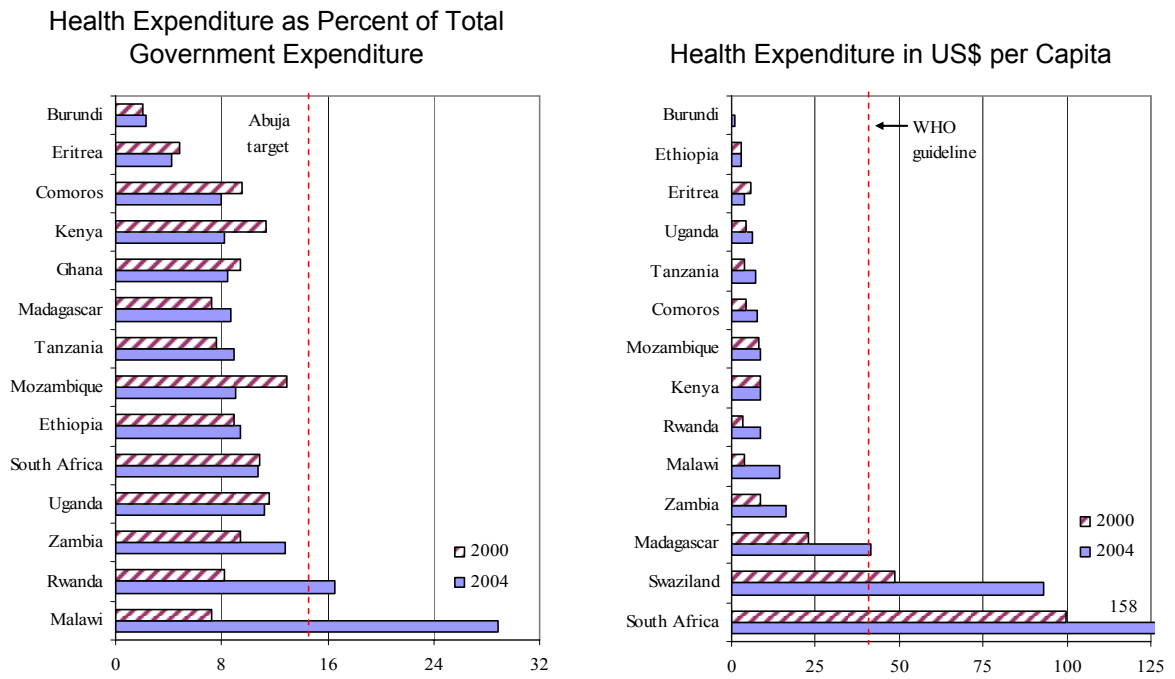
Source: World Health Organization. Figures are compiled to ensure comparability across countries; official statistics of the countries may be based on alternative methods.

Education Expenditure in Percent of Total Government Expenditure
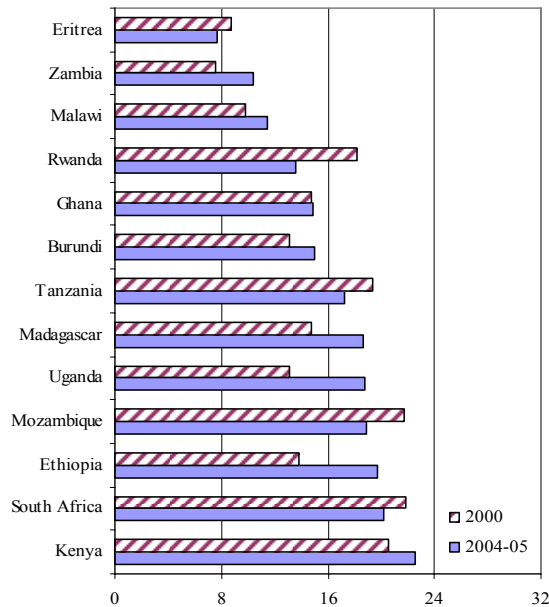
Source: IMF country documents and World Development Indicators.
Data for Kenya are for 2002 and 2004.

elsewhere. Such an assessment is complicated by the fact that many line ministries lack the capacity to present a compelling case for how additional funds would be used to produce

specific outcomes. Reprioritization in the short term is made even more difficult because a considerable share of spending is not discretionary—interest payments and wages comprised 40 percent of Zambia's total expenditure in 2006.

20.   **The FNDP calls for a significant increase in the share of the budget allocated to priority sectors**. However, slippages have already occurred with the 2007 budget allocation for education and health below FNDP targets (Table 3). It is vital that future targets are met, or priority sectors will be underfunded and the true financing gap—what is needed to meet objectives—may be greater than currently estimated. To achieve this, the government will need to constrain non-priority expenditures, including by stepping up implementation of civil service and pay reforms, and, more broadly, to better integrate the FNDP, the medium-term expenditure framework and annual budgets.

Table 3. FNDP Targets for Budget Shares[1]
(Percent of GDP)

	2006	2007	2007[2]	2008	2009	2010
Health	10.7	11.7	10.7	12.5	13.2	14.0
Education	16.1	17.1	15.0	17.8	19.5	20.3
Agriculture	5.7	6.9	8.8	8.5	7.8	9.2
Infrastructure[3]	12.5	12.0	...	10.7	11.3	9.2

Source: Ministry of Financing and National Planning and the Fifth National Development Plan.

[1]Includes government and donor funds. The figures for 2006 are actual spending.

[2]Budget allocation.

[3]Excludes some major infrastructure needs (for example, in the energy sector).

Increasing the efficiency of expenditure

21.   **Increasing the efficiency of expenditure is desirable whether or not there is a need for fiscal space.** While higher spending on priority sectors is important, greater efforts are needed to ensure that current and additional funding translates into improved outcomes. If this can be done, it may be possible to reach FNDP objectives and the MDGs with fewer resources than are currently envisaged. Moreover, if the health and education ministries can demonstrate a capacity to effectively use increased funds, government and donors may be more willing to commit the resources that are needed.

22.   **The efficiency of spending on health and education can be assessed by measuring how effective Zambia is in producing outcomes relative to other countries.** Data Envelopment Analysis (DEA) is a nonparametric technique that estimates efficiency by

relating inputs (e.g., health expenditure) to outputs (e.g., immunization rates).[13] The countries that produce the maximum output for a given level of inputs (or the minimum input for a given level of output) define the best-practice frontier; the distance of a country to the frontier is a measure of relative efficiency. The results, which should be interpreted with caution, indicate that in Zambia education spending is relatively more efficient than health spending (Appendix). Public expenditure tracking surveys can also be used to identify inefficiency and inform policy design (Box 1).

23.   **Reforming agricultural policy should be a priority.** Donors have heavily criticized the food strategic reserve and fertilizer support programs, which should end as planned starting with the 2009 budget. In the former program the Food Reserve Agency buys surpluses at substantial cost to the budget (2.2 percent of the 2007 domestic budget) in favor of allowing maize exports. The fertilizer subsidy program also absorbs significant resources (1.6 percent of the 2007 domestic budget). However, a recent poverty and social impact analysis found that the most vulnerable still had limited access to fertilizer, and those who do acquire it do not always use it effectively.[14]

Box 1. Public Expenditure Tracking Survey (PETS) on Education

PETS is a method used to track the flow of government resources through different levels of government and administration. It provides information on the leakage of funds, the degree of targeting, and household responses.

A 2004 World Bank study on education in Zambia distinguished between funds that were disbursed to provincial and district offices and then allocated to schools at the discretion of education officers and those that were allocated directly to schools through a transparent rule. It found that schools got less than 20 percent of discretionary funds but more than 90 percent of rule-based funds. Discretionary funds were also found to be allocated less progressively.

However, the study found that even rules-based funds did not improve test scores. One reason for this is that households responded to an increase in public funds by cutting back the same amount in private contributions. The other is that schools found it difficult to spend the money on much-needed teachers because there were few trained personnel (this would have reduced the first problem in that teachers are an input that households are unable to purchase).

These findings support the free basic education policy announced in 2002. The policy has been very successful in its stated aim of increasing attendance (primary school enrollment went from 65 percent in 2002 to 89 percent in 2005). Moreover, since households no longer have to contribute, it has also been beneficial in that an increase in government funds can no longer by offset by a reduction in private expenditure.

A mini-PETS update was carried out in 2007. This study documented that schools in the sample reported very high pupil-teacher ratios, insufficient infrastructure, and a lack of learning material. Despite an increase in overall funding, improvements in these areas have been slow because enrollment rose so sharply and teachers salaries were upgraded (to regionally comparable levels). The report also noted that funding is still substantially below the regional average, and the bulk of it is not received until the fourth quarter, which complicates budget execution.

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[13] There is a growing literature that uses the DEA method to measure the relative efficiency of public spending. See Herrera and Pang (2005) for a detailed description of the methodology. It is nonparametric in that there is no need to specify a functional form for the relationship between inputs and outputs. This is important because little is known about this relationship for education and health.

[14] S. Jorgensen and Z. Loudjeva (2005).

24.   **Current efforts to strengthen public financial management (PFM) should make spending more efficient.** Introduction of the automated payroll management and establishment control system has helped to eliminate a large number of ghost workers from public sector payrolls. However, a recent PFM assessment[15] identified other areas for improvement. The areas cover both budget planning and execution. In particular, the variation between budget allocations and outturns needs to be minimized, and funds need to be released earlier to enable ministries to implement programs as intended. Improved fiscal reporting and more active parliamentary, press, and civil society oversight would also help enforce accountability. The public expenditure management and financial accountability program (2005–09) aims to address many of these issues; progress is being made. Careful implementation of the fiscal decentralization plan may also help to improve the quality, efficiency, and targeting of public services.

25.   **The donor community can help to improve priority-setting and monitoring of poverty-reducing expenditures.** Large off-budget activities financed by donors hampers budget planning and monitoring. For example, the 2005 Financial Report suggests that the Ministry of Health received only 49 percent of budgeted funds. However, this figure is highly misleading. The budget incorporates only very approximate estimates of donor funding and related expenditures; actual receipts and expenditures are not monitored at all because they take place outside the government's financial management system. To improve priority-setting and monitoring, donors should give government timely and detailed information on off-budget project support, and increase the share of assistance delivered as budget support based on multiyear commitments (see below).

Increased donor support

26.   **A number of challenges need to be dealt with to maximize the benefits of any scaling up of aid.** In particular, the timing, magnitude, and duration of aid disbursements tends to be more uncertain and volatile than revenues.[16] This complicates medium-term fiscal planning and can translate into spending volatility. Donors can help by moving to predictable multiyear commitments.[17] Zambia can itself take some steps, such as subjecting medium-term expenditure plans to stress tests; smoothing expenditures by saving resources during aid surges; identifying ahead of time priority spending that would be protected from cuts if there is an aid shortfall; and incorporating flexibility into nonpriority spending programs. Another challenge is to build capacity to effectively absorb more aid, which could

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[15] "Public Financial Management Performance Report and Performance Indicators" December 2005.

[16] See Bulir and Hamann (2006) for a multicountry analysis of the volatility and predictability of aid flows. In Zambia, the standard deviation of revenue was 1.1, compared with 2.8 for gross aid for 1996–2006.

[17] Donors pledged to do this in the Paris Declaration on Aid Effectiveness that was issued at The Paris High Level Forum in 2005.

be demonstrated through PFM reforms and execution of annual budgets that are in line with the FNDP. The possibility that scaled-up aid would reduce incentives to mobilize revenues also needs to be guarded against.

27.   **The macroeconomic consequences of scaling up need to be managed.** This would require that fiscal and monetary policy be better coordinated. Decisions need to be made on whether to spend (increase the fiscal deficit excluding aid) and absorb (widen the current account deficit excluding aid). The economic effects will depend on the policy combination chosen; the appropriate choice will depend on initial conditions (see the matrix below). Circumstances in Zambia support a spend and absorb approach, although for short periods choosing not to spend nor absorb part of the aid could help build foreign exchange reserves and smooth the impact of aid volatility. Any exchange rate pressure should be managed by adapting the timing of foreign exchange sales rather than spending but not absorbing the aid, as some countries have done.[18]

Matrix: Spending and Absorbing Aid

Actions, Consequences, and Appropriateness for Zambia

	Absorbed	Not Absorbed
Spent	Bank of Zambia sells aid dollars and fiscal deficit rises as aid is spent. No change in foreign exchange reserves or the money supply. Risk of Dutch disease. Appropriate for Zambia. Appreciation pressures can be mitigated by initially using aid to build productive capacity and import goods, and back-loading expenditures on health and education. However, this may delay attainment of some MDG objectives.	Bank of Zambia holds on to aid and fiscal deficit rises as aid is spent. Foreign exchange reserves increase. If unsterilized, the money supply will rise, with a risk of inflation. If sterilized, the increase in the money supply will be contained but the private sector will be crowded out as domestic debt and interest rates rise. Not appropriate. Equivalent to fiscal stimulus in absence of aid.
Not Spent	Bank of Zambia sells aid dollars but fiscal deficit remains unchanged. Substitutes aid for domestic financing of government deficit. Can be useful in the short term to stabilize the economy if initial domestic financing is too high. However, this is not the case in Zambia.	Bank of Zambia holds on to aid and fiscal deficit remains unchanged. Foreign exchange reserves will increase. Can be useful in the short term to smooth volatile aid flows. However, it is not appropriate in the long run because it prevents a real resource transfer.

28.   **The prospect of greater donor support has increased with renewed international focus on accelerating progress toward the MDGs, but it is yet to materialize.** At the 2005 Gleneagles meeting, the G8 leaders agreed to double aid to Africa by 2010. Leaders reaffirmed this commitment at the 2007 G8 meeting but details, including a schedule for the

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[18] Berg et al. (2007) and others have found that conflicting priorities of central banks and fiscal authorities have led to incomplete absorption.

increased funding, have yet to be decided. From 1996 through 2005, aid flows to Zambia averaged 10 percent of GDP; however, in 2006 support fell to 5.2 percent of GDP. After discussions with donors, IMF baseline projections do not include any significant scaling up in the medium term.

29.   **The impact of debt relief on fiscal space is obscured by the recent decline in aid and the difficulties Zambia would have had in servicing the debt.** HIPC, MDRI, and bilateral debt relief has sharply reduced debt service; forward projections illustrate the significance of future debt-service savings from MDRI alone (Figure 3). However, just as the government would have had difficulty in servicing the debt, it will find it difficult to increase expenditure by the full amount of projected savings.

Official Development Assistance
(Percent of GDP)

Grants - budget support · Grants - project · Loans - budget support · Loans - project · Amortization · Total net ODA
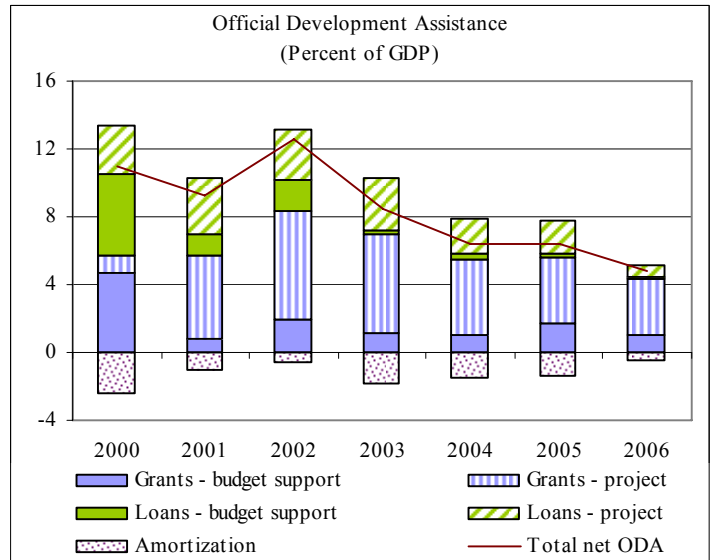
Figure 3. External Debt Service and Official Development Assistance
(Percent of GDP (LHS) and US$ millions (RHS))

External debt service
Gross ODA less external debt service

Implied IMF MDRI Savings
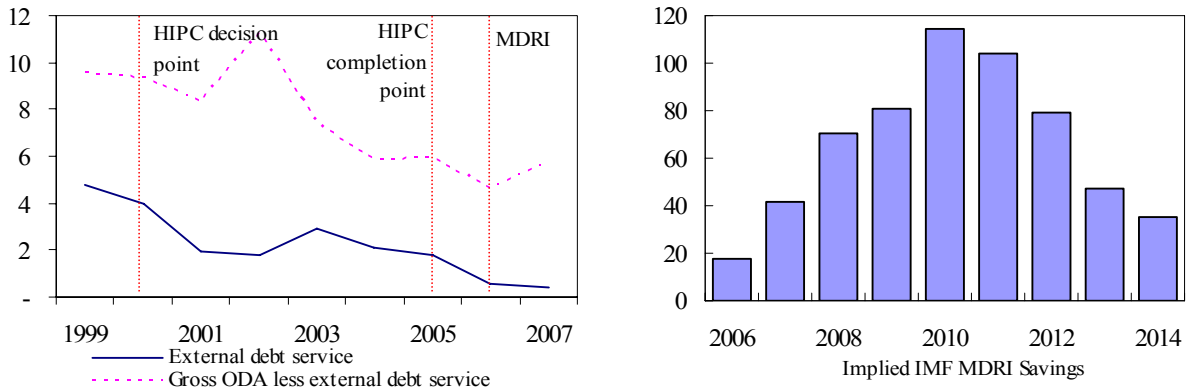
Borrowing

30.   **Debt relief has provided scope for external borrowing to finance a limited number of projects.** Domestic borrowing is expensive, with domestic interest rates far exceeding international rates. Moreover, a heavy reliance on domestic borrowing may place

further upward pressure on interest rates because the pool of domestic savings is limited, crowding out private sector investment and increasing the fiscal burden—unwinding the benefits brought by recent fiscal consolidation.[19] Concessional external loans are less

expensive than domestic borrowing, while debt relief has raised the prospect of nonconcessional external borrowing. As past difficulties attest, however, nonconcessional borrowing should be used with caution and only be for amounts that ensure debt sustainability. A public debt management strategy and guidelines for effective project selection and monitoring should be in place before nonconcessional debt is contracted.

Central Government Balance Including Grants
(Percent of GDP)

Source: WETA.
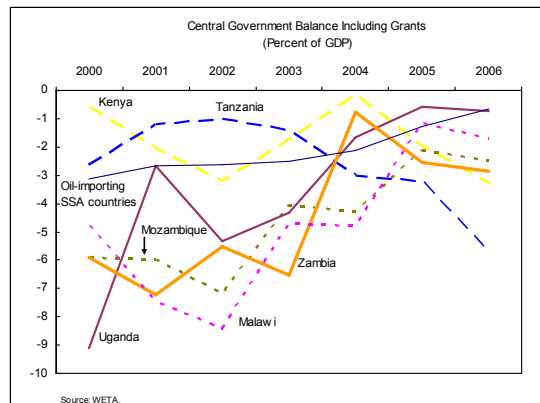
D. Conclusion

31.   **Efforts to create fiscal space need to be spread across a number of areas.** Strengthened administration should help to increase revenues over time. An increase in the contribution from the mining sector could provide a quick and substantial boost, particularly if the government can renegotiate with mining companies the fiscal terms of current development agreements. Options to broaden the tax base, including by eliminating unwarranted VAT and import duty exemptions and restricting the use of tax incentives, should be explored, although the gains that can be expected are limited. More effective use of resources by constraining nonpriority spending and reforming PFM to increase spending efficiency is a priority. Better PFM should also help the authorities in their efforts to encourage donors to scale up aid. If donor assistance does not increase, nonconcessional external borrowing could be considered for a limited number of clearly viable projects that do not jeopardize debt sustainability.

32.   **Risks associated with full implementation of the FNDP will need to be carefully managed.** While there is an urgent need to increase spending on infrastructure and human resources, the authorities will need to closely monitor the effects of accelerated public spending on inflation and the real exchange rate. Front-loading infrastructure investments and other projects that are import-intensive and increase the productive capacity of the economy would help to limit crowding-out of the private sector. However, delaying social spending could slow the initial advance of the non-income-related human development

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[19] Domestic interest payments fell by over 1 percentage point of GDP from 2004 to 2006 as the debt burden and interest rates declined.

MDGs. If increased spending is financed by a scaling up of aid, close coordination of fiscal and monetary policy will be important. The authorities' capacity to efficiently implement a larger number of projects also needs to strengthen. It would be helpful for donors to increase the predictability of their aid and harmonize it with existing government programs.

APPENDIX

33.   Based on a sample of 40 African countries, efficiency frontiers were estimated for six education indicators and six health indicators (data were not available for all countries for all indicators).[20] The education indicators were literacy rate, primary school enrollment, persistence until grade 5, ratio of girls to boys, ratio of young literate females to males, and trained teachers in primary education. The health indicators were the measles immunization rate, infant survival rate; under-5 survival rate, maternal survival rate, health worker density ratio, and births attended by skilled health staff. All indicators reflect the latest data from the World Bank *World Development Indicators* (WDI) database. On the input side, data were sourced from IMF country documents, the WDI database, and the World Health Organization, and are measured in purchasing power parity (PPP) dollars to correct for differences due to relative prices.

34.   DEA methods have a number of limitations:

a.   First, the results are sensitive to the quality of data, which raises a number of concerns. On the inputs, donor funding is very important for the health sector but is not always fully captured, and the data on education only cover public spending. On the outputs, indicators may not accurately reflect outcomes; for example, enrollment rates are not a direct measure of learning. The use of aggregate input data and disaggregated output data is also an issue. It would have been preferable to split education expenditure into primary and secondary education.

b.   Second, outcomes can be influenced by factors other than spending, such as culture, lifestyle, and the environment.

c.   Finally, the results can be very sensitive to the sample and the presence of outliers.

35.   Figure A1 illustrate the efficiency frontier for representative input-output combinations. Based on efficiency scores (distance to the frontier), Zambia had an average country ranking of 3.5 across the six education indicators (average sample size: 27 countries) and 16.5 across the six health indicators (average sample size: 39 countries). Gupta and Verhoeven (2001) found that the efficiency of education spending is lower in African countries than in Asian and Western Hemisphere countries, which suggests that if the sample were broadened, Zambia's relative standing—along with the other countries in the sample— might decline.

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[20] To account for the influence that GDP per capita has been estimated to have on efficiency, the country sample was restricted to countries in Africa where data were available.

Figure A1. Relative Efficiency of Public Expenditure on Education and Health
for 39 Countries from Sub-Saharan Africa
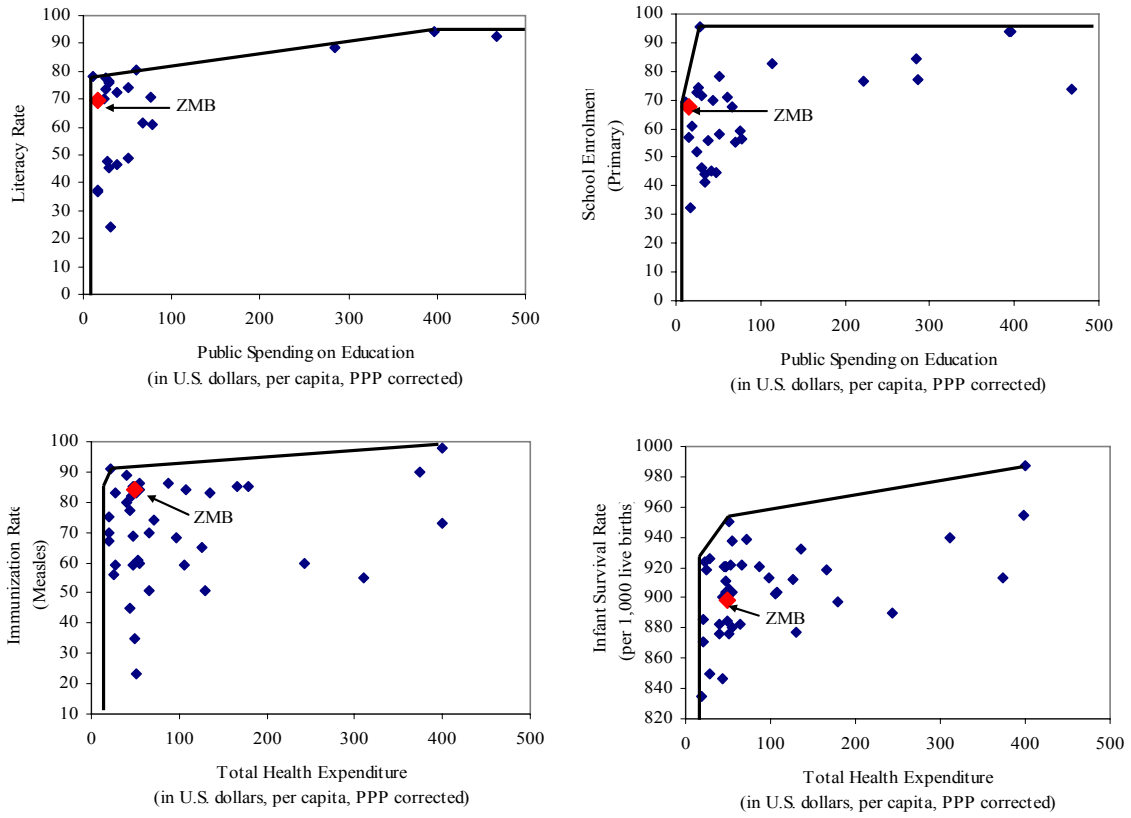
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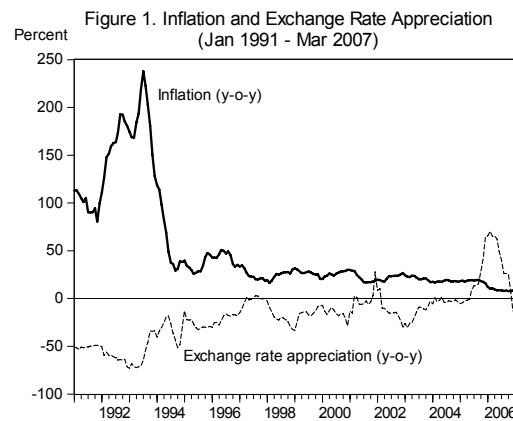
II. MONETARY POLICY AND INFLATION[1]

A. Introduction

1.   **After decades of persistent high inflation, the stabilization efforts the Zambian authorities have made since the mid-1990s have reduced inflation and increased economic growth.** Particularly in the last few years, firm monetary policy, gradual fiscal consolidation, and structural reforms helped reduce headline inflation to below 10 percent in 2006. Yet significant supply shocks and high exchange rate volatility have complicated the conduct of monetary policy and raised questions about how the money growth affects inflation developments.[2] Against this background, this paper examines the role of monetary policy in determining future inflation and discusses policy options to achieve low inflation.

2.   **Despite recent positive economic achievements, the current economic environment in Zambia poses challenges to maintain low and stable inflation.** The conduct of monetary policy is complicated by volatile food inflation—mostly connected to supply shocks in agriculture triggered by adverse weather—large donor inflows, and significant foreign currency inflows stemming from booming copper exports and portfolio investments. The foreign exchange inflows financing domestic government spending inject liquidity that needs to be sterilized to keep the money market orderly. In the past, liquidity has sometimes not been sufficiently mopped up due to concerns about exchange rate appreciation and limitations on the use of open market operations. These problems have been exacerbated by relatively shallow markets for foreign exchange and domestic securities.

3.   The remainder of this paper is organized as follows: section B reviews inflation developments in Zambia; section C discusses the inflation model; section D presents model estimations; and section E draws conclusions.

Figure 1. Inflation and Exchange Rate Appreciation
(Jan 1991 - Mar 2007)

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[1] Prepared by Jan Mikkelsen.

[2] For example a recent Bank of Zambia working paper (Noah Mutoti, 2006, "Monetary Policy Transmission in Zambia," WP/06/2006) concludes that the link between money and inflation is weak, so the stock of money is not a reliable signal of the stance of monetary policy. Moreover, it stresses that stabilizing inflation requires an increase in domestic food production and stabilization of the exchange rate.

B. Inflation Developments

4.   **Inflation has until recently been a persistent problem in Zambia.** In the wake of failed attempts to reform the Zambian economy in the second half of the 1980s and early 1990s, the annual CPI (headline) inflation rate remained in three digits (Figure 1). However, in 1992 the Zambian authorities embarked on more fundamental market-oriented reforms—including privatization, price and interest rate liberalization, and the floating of the kwacha—that quickly pushed annual inflation to below 50 percent and stabilized the exchange rate. Nevertheless, during the 10 years after the initial correction, inflation declined only gradually and remained relatively volatile. However, in 2006, headline inflation fell below 10 percent.

5.   **While the decline in inflation was shared by all the main categories of the CPI, food prices were generally more volatile (Figure 2).** Prices of food items, which represent about 57 percent of the CPI, have been influenced by supply shocks (mostly related to adverse weather) and a marked seasonal pattern driven by harvest cycles. As a result, the monthly standard deviation of food prices (2.2. percent for 1995–2006) exceeded the standard deviation of nonfood prices by about 70 percent (Table 1). The standard deviation of headline inflation, however, was only slightly higher than for nonfood inflation, because there is low correlation between monthly changes in food

Figure 2. Annual Inflation
(Jan 1995 - Mar 2007)

and nonfood prices.[3] Not surprisingly, the standard deviation of seasonally adjusted food inflation was smaller and more aligned with the standard deviation of nonfood inflation. Nonfood prices contain no significant seasonality. Thus it would appear that for monetary policy purposes either nonfood inflation or seasonally adjusted headline inflation is the preferred price indicator.
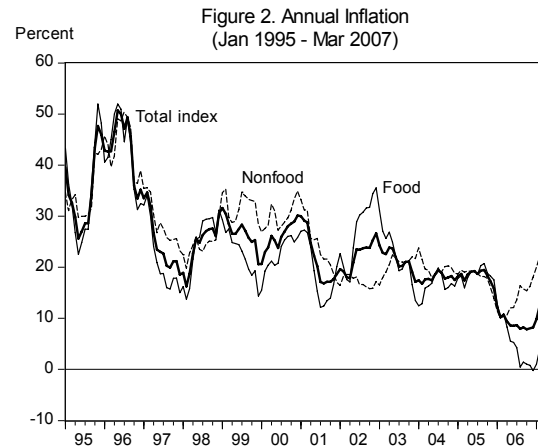
C. Inflation Model

6.   **The model emphasizes the role of monetary factors in an augmented Phillips curve, where inflation is determined by both the real money and the output gaps.** As an alternative to the traditional form of the Phillips curve, where the output gap is the main

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[3] The correlation coefficient between monthly changes in food and nonfood prices was 0.23 for January 1995 through March 2007.

Table 1. Zambia: Statistical Properties of Key Variables

(Monthly changes in percent, Jan 1995 – Mar 2007)

	CPI	Food CPI	Nonfood CPI	NEER	Oil Prices in US$	Nominal Interest Rate[1]	Currency Outside Banks	Reserve Money
Mean	1.8	1.7	1.9	-0.8	0.9	-0.6	2.3	2.7
Std. deviation	1.4	2.2	1.3	4.5	7.8	2.9	6.2	8.5
Test of seasonality[2]	36.8*	53.4*	2.8	1.3	3.5	3.1	49.4*	7.5*
Std. dev. of seasonal adj. series	1.2	1.7	…	…	…	…	4.4	7.0
Integration[3]	-2.1*	-3.2*	-1.9*	-1.2*	-2.1*	-4.1	-1.0*	-1.3*

[1] Average treasury bill interest rate in changes of percentage points.

[2] F-test for seasonality. An * indicates evidence of seasonality on the 1 percent significance level.

[3] Augmented Dickey-Fuller test. An * indicates that the existence of a unit root in the level series cannot be rejected at the 5 percent significance level. The existence of a unit root, or that the series is integrated of order 1, implies that the differenced series is stationary.

determinant of inflation, the real money gap—defined as the difference between the real money stock and long-run equilibrium real money demand—also explains inflation. As for the output gap, a positive money gap indicates excess demand that generates inflation.[4] In economies with less developed financial markets, like Zambia, where money demand for speculative balances is relatively small, the money gap may be a particularly good indicator of excess demand, since attempts to raise demand above potential output without monetary effects (e.g., through a bond-financed fiscal expansion) tends quickly to be offset by high interest rates and lower private sector (investment) demand.[5] The inflation equation (all variables below are in logs, except for the domestic interest rate) may be written as

$$\Delta p_t = \Delta p_t^e + \alpha_m (m_{t-1} - \widetilde{m}_{t-1}^d) + \alpha_y (y_{t-1} - \widetilde{y}_{t-1}) + \alpha_z \Delta z_t + \varepsilon_t, \qquad (1)$$

[4] See Stefan Gerlach and Lars Svensson, 2003, "Money and Inflation in the Euro Area: A Case for Monetary Indicators," Journal of Monetary Economics, Vol. 50, pp. 1649–72 for further discussion. The use of the real money gap in the inflation equation corresponds to the so-called P* models (see Jeffrey J. Hallman, Richard D. Porter, and David H. Small, 1991, "Is the Price Level Tied to the M2 Monetary Aggregate in the Long Run?" American Economic Review, Vol. 81), where P* is the price at which the current real money stock would equal the long-run equilibrium stock. See also Regis Barnichon and Shanaka Peiris, 2007, "Sources of Inflation in Sub-Saharan Africa," IMF Working Paper WP/07/32 for application of a similar model to a panel of sub-Saharan African countries.

where the inflation rate, Δp_t, is determined by (i) inflation expectations, Δp_t^e; (ii) the lagged real money gap, $(m_{t-1} - \tilde{m}_{t-1}^d)$, defined as the difference between money supply and long-run money demand; (iii) the lagged output gap, $(y_{t-1} - \tilde{y}_{t-1})$, defined as the difference between real GDP and potential real GDP; (iv) exogenous cost push factors, Δz_t, such as supply shocks and changes in import prices and the exchange rate; and (v) a residual cost push shock, ε_t. The long-run real money demand equation takes the form

$$\tilde{m}_t^d = \beta_0 + \beta_y y_t - \beta_i i_t, \tag{2}$$

where y_t is real GDP and i_t is the rate of return on alternative interest-bearing assets to money. Due to data limitations the output gap is not explicitly modeled but will instead be approximated by decomposing GDP into a stationary term and a trend. The impact on inflation from an increase in output, other things being equal, is ambiguous—output affects inflation negatively via the money gap and positively via the output gap. By inserting (2) in (1) and assuming expected inflation is determined by past inflation, $\Delta p_t^e = \gamma \Delta p_{t-1}$, we have

$$\begin{aligned}\Delta p_t &= \gamma \Delta p_{t-1} + \alpha_m (m_{Nt-1} - \beta_p p_{t-1} - \beta_0 - \beta_y y_{t-1} + \beta_i i_{t-1}) \\ &\quad + \alpha_y (y_{t-1} - \tilde{y}_{t-1}) + \phi \Delta z_t + \varepsilon_t\end{aligned} \tag{3}$$

where $m_{Nt} = m_t + p_t$ is nominal money and β_p is a parameter that allows for non-homogeneity of money demand with respect to prices. All coefficients are expected to be positive, except for ϕ_z, where the sign depends on the specific variables representing z_t.

7.   **In long-run steady-state equilibrium, money and output growth are consistent a constant inflation rate.** By assuming $\Delta p_t \equiv \Delta p_t^e \equiv \dot{p}^*$, $\Delta y_t \equiv \Delta \tilde{y}_t \equiv \dot{y}^*$, $i_t \equiv i^*$, $\Delta m_t \equiv \dot{m}_N^* - \dot{p}^*$, $\Delta z \equiv 0$ and $\varepsilon_t \equiv 0$, the equilibrium inflation is determined as

$$\dot{p}^* = \frac{\dot{m}_N^* - \beta_y \dot{y}^* + \beta_i i^*}{\beta_p} \tag{4}$$

Accordingly, for $\beta_p = 1$, excess money growth in the long-run is equal to long-run inflation, which is identical to expected inflation. To achieve an inflation target in the long run, this relationship prescribes how the central bank sets nominal money growth to meet the target.

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[5] This situation corresponds to the textbook case of the ineffectiveness of fiscal policy when demand for money is inelastic.

D. Model Estimation

8.   **To strengthen the policy emphasis of the analysis, the model estimation will focus on identifying the transmission to inflation from an operational monetary policy target.** One obvious choice is to use reserve money, but for Zambia this option is less attractive because there were very large swings in excess reserves during the estimation period.[6] Since changes in excess reserves may not be correlated with overall liquidity, currency outside banks is used below to estimate the real money gap.[7] As expected, currency outside banks has been fluctuating substantially less than reserve money since the mid-1990s (Table 1 and Figure 3). The upper panel of Figure 4 depicts on a monthly basis currency outside banks, the CPI headline price level, and real GDP.[8] The lower panel suggests that the inverse currency velocity, $m_N - p - y$, despite significant short-term volatility, is close to stationary—a condition that supports the long-run relationship in (3) for $\beta_y=1$ and $\beta_i=0$.

9.   **The coefficients of the inflation model (3) are estimated using a vector error correction model (VECM).** The VECM is a restricted vector autoregression (VAR) designed for use with nonstationary series that are cointegrated. The VECM restricts the long-run behavior of the endogenous variables to

Figure 4. Currency Outside Banks, Prices and Real GDP
Jan 1995 - Mar 2007
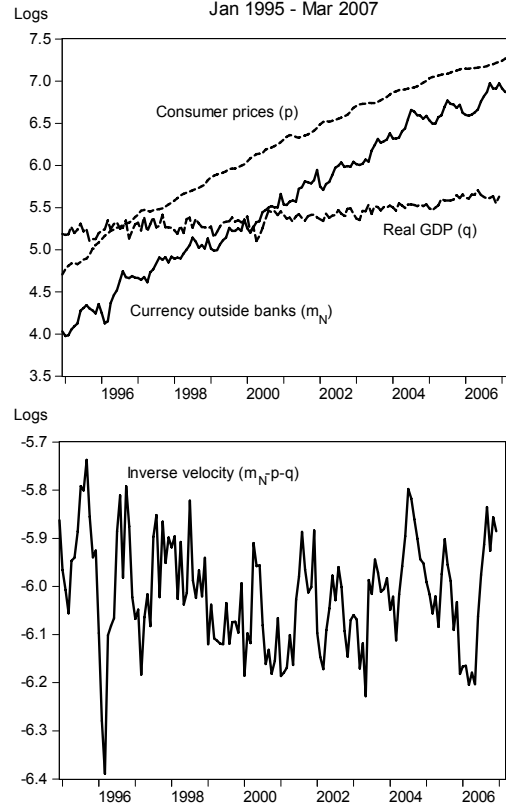
Figure 3. Annual Reserve Money and Currency Growth
(Jan 1995 - Mar 2007)

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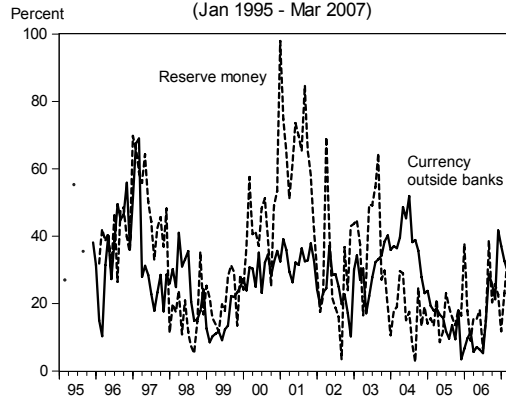
[6] Reserve money is defined as currency outside banks plus required and excess bank reserves.

[7] Currency outside banks plus required reserves could be used as well assuming no changes in reserve requirements, but a sufficiently long time series were not readily available.

[8] The monthly real GDP series are estimated from monthly copper production data by benchmarking published annual real GDP data. The technique used is based on one of the so-called Denton family of least-squares benchmarking methods where the sum of the logarithm of the relative difference in growth rates between the two series is minimized under the restriction that the sum of the monthly GDP estimates equal the observed annual GDP number for each year.

converge to their cointegrating relationships while allowing for short-run adjustment dynamics. The advantages of the VECM are that it treats of all relevant variables as endogenous and has a rich dynamic structure. The VECM can be written as

$$\Delta x_t = \sum_{i=1}^{k} \Gamma_i \Delta x_{t-i} + \alpha \beta' x_{t-1} + \Phi z_t + \varepsilon_t ,$$
(4)

where x_t is a vector of endogenous variables, z_t is a vector of exogenous variables, and Γ, Φ and $\alpha \beta'$ are parameter matrices. β is holding the cointegrating vectors and α is holding the adjustment parameters to long-run equilibrium. In the estimates below $x_t = (m_{Nt}, p_t, y_t, i_t)$ and $z_t = (y_{t-1} - \tilde{y}_{t-1}, \Delta neer_{t-1})$, where $neer_t$ is the nominal effective exchange rate.[9] The single equation inflation model (3) is represented by the second equation of the VECM.

10.   **Table 2 shows the estimation results of the VECM.**[10] Irrespective of the inflation measure used, the standard Johansen test for cointegration indicates the presence of one cointegrating vector between the four endogenous variables. This provides support for a stable long-run money demand relationship and a stationary money gap. The estimated cointegrating vectors suggest a long-run money demand elasticity with respect to prices of close to one (as expected), and the elasticity with respect to real GDP is 1.5–1.7. There is no significant long-run relationship between money demand and domestic interest rates (approximated by the average interest rate on treasury bills).

11.   **There is a positive relationship between the real money gap and inflation, but the output gap has no significant effect on inflation.** The money gap adjustment coefficient, α_m, is significant and is estimated at 0.15 for headline inflation and 0.06 for nonfood inflation. Without taking into account the full dynamic structure, a coefficient of 0.15 corresponds to reducing the money gap by about 50 percent through inflation in only four quarters. A positive money gap also tends to significantly lower the money stock the following quarter, which helps to reduce the money gap as well. This adjustment of the money stock may reflect a monetary policy reaction to disequilibrium in the money market. The pass-through to prices from lagged NEER appreciation has the expected negative sign, but the short-term elasticity is relatively small (0.04 for headline inflation and close to zero for nonfood inflation). Changes in oil prices were insignificant for both inflation measures

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[9] Changes in oil prices were included as well, but were found insignificant.

[10] The inflation equation (3) was also estimated using single equation techniques. The results were very similar to the estimation of the VECM with respect to the long-run coefficients and the impact on inflation from changes in the real money gap.

Table 2. Zambia: VECM Estimation and Cointegration Tests [1]

(Estimation period: 1995Q1–2007Q1; endogenous variables: *p, m, y, i*)

Price Variable: Headline Inflation

Johansen test for cointegration:
Trace statistic indicates one cointegrating vector at the 1 percent significance level.

Estimated money gap (cointegrating vector):

$$m_t - 0.95\ p_t - 1.50\ y_t + 0.02\ i_t + 8.4 = e_t$$
$$\quad\ \ [-25]\qquad [-6.4]\qquad [0.2]$$

Estimated key coefficients:[2]	Δm	Δp	Δy	Δi
e_{t-1}	-0.64 [-3.4]	0.15 [2.6]	-0.09 [-0.7]	0.12 [0.6]
$y_{t-1} - \widetilde{y}_{t-1}$	0.17 [0.4]	-0.08 [-0.6]	-1.2 [-3.7]	-0.08 [-0.2]
$neer_{t-1}$	-0.09 [-0.9]	-0.4 [-1.3]	0.12 [1.7]	-0.32 [-3.0]
R-squared	0.52	0.70	0.74	0.53
Standard error of regression	0.055	0.017	0.038	0.058

Price Variable: Nonfood Inflation

Johansen test for cointegration:
Trace statistic indicates one cointegrating vector at the 1 percent significance level.

Estimated money gap (cointegrating vector):

$$m_t - 1.00\ p_t - 1.77\ y_t - 0.01\ i_t$$
$$\quad\ \ [-12]\qquad [-3.9]\qquad [-0.4]$$

Estimated key coefficients:[2]	Δm	Δp	Δy	Δi
e_{t-1}	-0.33 [-3.5]	0.06 [1.6]	-0.11 [-1.5]	0.03 [0.4]
$y_{t-1} - \widetilde{y}_{t-1}$	0.46 [1.1]	-0.12 [-0.8]	-1.0 [-3.0]	-0.31 [-0.7]
$neer_{t-1}$	-0.05 [-0.5]	-0.01 [-0.1]	0.10 [1.1]	-0.28 [-2.4]
R-squared	0.52	0.54	0.67	0.51
Standard error of regression	0.055	0.020	0.043	0.059

[1]T-values of estimated coefficients are in square brackets. All variables with significant seasonality (see Table 1) were seasonally adjusted using ARIMA X12.
[2]The estimated coefficients of lagged changes of the four endogenous variables are not reported. Three quarterly lags were included in the VECM estimation.

(coefficients are not shown). While the R^2 of the estimated models is satisfactory, at about 2 percent per quarter, the residual standard errors of the inflation estimates are still relatively large given an average quarterly inflation of about 5 percent over the estimation period.

12.   **Variance decomposition of the variables in the VECM provides information about the importance of shocks to the endogenous variables to explain variation in an endogenous variable (Figure 5).** Allowing for the full effect of shocks, which is reached after about eight quarters, about 50 percent of the variation in prices is explained by their own innovations and 30 percent is explained by money (or in this case currency) shocks. About 20 percent of the variation is explained by real GDP shocks.

Figure 5. Variance Decomposition of Headline Prices
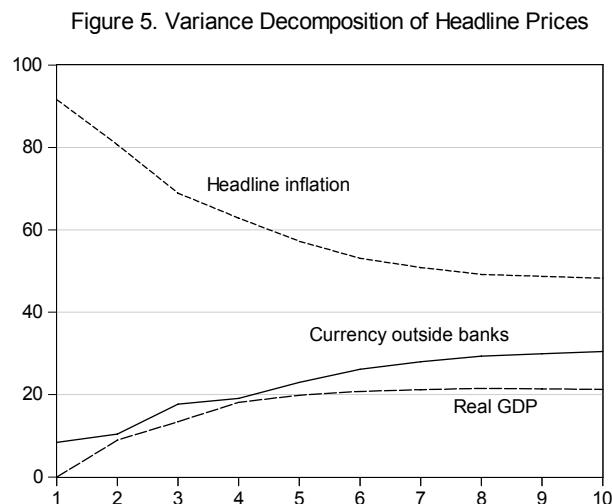
E.   Concluding Remarks

13.   **Zambia's experience since the mid-1990s demonstrates that the real money gap matters for price developments, particularly in the medium-term.** This result is achieved for an operational real money gap, defined as the difference between currency outside banks and the estimated long-run equilibrium currency demand. Notwithstanding significant short-term price volatility, which is explained mostly by non-monetary factors, money growth consistent with a stable money gap is vital to controlling long-run inflation. The output gap, however, seems to be much less important for Zambia. The pass-through of changes in the exchange rate is significant, but relatively small, and the role of domestic interest rates is found to be insignificant in determining money demand and inflation. Although the impact of supply shocks and seasonality is much less pronounced for nonfood inflation, a given change in the real money gap has a larger and more significant impact on headline inflation adjusted for seasonality. But both inflation measures are useful candidates for medium-term monetary policy targeting.

14.   **The analysis supports to maintain the existing money targeting regime.** This is supported by the presence of a stable long-run money demand equation combined with a positive relationship between inflation and the real money gap. The strategy for achieving price stability is therefore for the Bank of Zambia to keep money growth stable, consistent with a low inflation benchmark and a low and stable long-run real money gap. Of course, in the future, this still requires regular reassessments of money demand, particularly as inflation is declining to its steady state level and expectations are settling down. The stance of

monetary policy in the short-term will likely continue to be complicated by significant non-monetary factors effecting short-term price developments. These shocks may need to be accommodated, but in most cases only partly to prevent long-lasting changes in inflation expectations. While eventually adoption of a formal inflation targeting regime would be preferable, it is still premature for Zambia. In addition to the need to perfect market-based instruments, the launch of a credible inflation targeting regime would have to wait until inflation has declined further and model prediction errors have come down to more moderate levels.

15. **The operational monetary policy variable needs to be considered carefully.** While complicated by significant volatility in excess bank reserves, reserve money remains a useful indicator of overall banking system liquidity. However, to gauge the stance of monetary policy and its impact on inflation, the money gap, using either currency outside banks, as used in the analysis above, or currency outside banks plus statutory bank reserve requirements, is a valuable complement.

III. Progress and Challenges of Financial Sector Reform in Zambia[1]

A. Introduction

1.   Zambia about two years ago embarked on a financial sector development plan (FSDP) for 2004–09 that is designed to create a sound, well-functioning financial system that will support economic diversification and sustainable economic growth.[2] The plan draws on the findings of the financial sector assessment exercise undertaken by the IMF and the World Bank in 2002 and follows more than a decade of economic reform during which key prices and various restrictions, including on capital flows, were liberalized. Zambia began the current reforms from a relatively low starting point in terms of financial development, which the country's stage of economic development alone cannot explain, so the potential for early improvement was arguably considerable.

2.   This paper takes a look at progress made about half-way into the agenda to identify areas where the reform strategy needs more attention. It suggests that while progress is being made in several areas, a tighter focus on obstacles to more rapid growth of financial intermediation would support the growth objective. Also, reforms of financial system regulation need to be speeded up to assure the stability of the system.

B. Recent Developments in the Financial System

3.   **The economic and financial environment in Zambia has improved markedly in the last several years.** In 2002 when a financial sector assessment was carried out, the economy was characterized by high government deficits, very high interest rates, high external debt, and sluggish growth (see table). Under those conditions,

Zambia: Selected Economic Indicators, 2001-2006 (In percent; unless otherwise indicated)						
	2001	2002	2003	2004	2005	2006
Real GDP growth	4.9	3.3	5.1	5.4	5.2	6.2
Inflation rate (average)	21.7	22.2	21.4	18.0	18.3	9.2
External current account/GDP[1]	-19.9	-15.3	-14.8	-10.3	-5.1	2.9
Internation reserves (in months of imports)	1.4	4.1	1.7	1.9	1.5	2.2
Overall fiscal balance/GDP[1]	-4.4	-7.2	-5.1	-1.7	-2.6	-2.8
External debt/GDP	…	…	156.5	126.8	86.0	8.8
Interest rates:						
Average yield on 90-day Treasury bills	49.1	31.3	20.8	17.8	16.2	9.3
Yield on 2-year government bonds	55.4	41.6	26.1	22.0	19.0	10.7
Commercial lending rate	46.7	42.4	38.4	29.8	26.7	21.6
[1]Including grants.						

financial sector development was severely constrained; Zambia's indicators in that area were among the lowest in sub-Saharan Africa (see Figure 1). In the past few years, with improved management of the economy, extensive debt relief, and the boom in copper prices, constraints on financial sector development have eased considerably. The fiscal deficit has

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[1] Prepared by Patrick Akatu.

[2] The FSDP was adopted by the government in 2004 and was put into operation in the fourth quarter of 2005 after an implementation and monitoring arrangement had been put in place. The plan became an integral part of the Fifth National Development Plan (2006–2011) officially launched in January 2007.

declined to sustainable levels, interest rates have plunged, inflation has recently come down to single digits, and growth has been robust for several years.
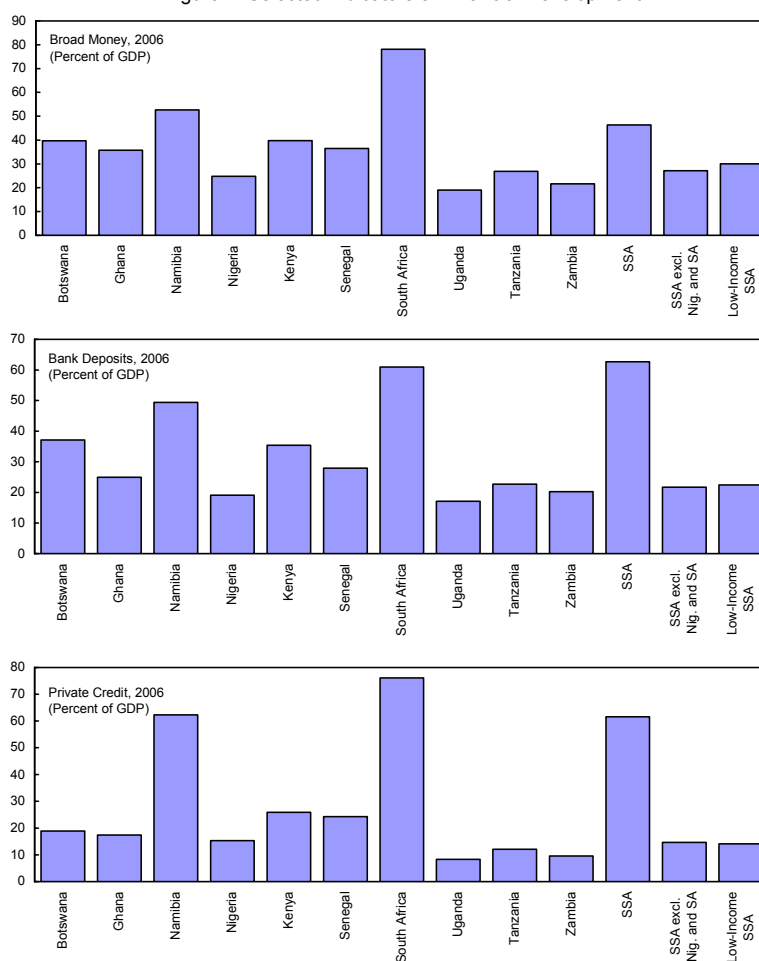
4. **Nevertheless, financial intermediation as measured by indicators of financial depth has grown only modestly.** The ratios of broad money to GDP and bank deposits to GDP are both flat. The ratio of private sector credit to GDP, on the other hand, rose markedly in 2006. Zambia's indicators are somewhat below the average for sub-Saharan African countries excluding South Africa and

Zambia: Indicators of Financial Deepening (Percent)						
	2001	2002	2003	2004	2005	2006
Broad money/GDP[1]	21.0	22.3	21.8	22.4	18.0	21.6
Bank deposits/GDP	17.9	19.6	18.9	21.4	17.1	20.2
Private sector credit/GDP	7.2	6.3	6.8	7.9	7.5	9.6

Source: Calculations based on data from the Bank of Zambia.
[1] Broad money is end-period M3.

Nigeria. They are also generally below the average for the group of low-income sub-Saharan African countries and are well below the group of African middle-income countries (Figure 1).[3]

Figure 1. Selected Indicators of Financial Development

Sources: IFS; IMF, African Department database.

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[3] The group of low-income sub-Saharan African countries comprises Benin, Burkina Faso, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Senegal, Tanzania, Uganda, and Zambia.

5.   **Commercial banks remain the dominant financial intermediaries; they have about 70 percent of total financial sector assets.** In 2006 total assets of the banking sector were about 27 percent of GDP; the sub-Saharan average was 67.4 percent (2005) and the average for low-income countries in the region was 38.3 percent.[4] The banking system is relatively well capitalized; the ratio of capital to risk-weighted assets is above the statutory requirement, which is in line with international best practice; indicators for nonperforming loans and liquidity are generally satisfactory; and profitability is relatively high, all of which suggest that the banking sector as a whole is sound (Table 1).

Table 1: Zambia: Financial Soundness Indicators, 2002–2006
(Percent)

	2002	2003	2004	2005	2006	2007 Jun
Regulatory capital to risk-weighted assets	28.0	23.0	22.2	28.4	20.4	18.9
Past due loans (NPL) to total loans	11.4	5.3	7.6	8.9	11.3	8.5
Loan loss provisions to nonperforming loans	73.9	89.3	102.8	90.7	83.3	104.9
Return on average assets	6.5	5.4	3.1	6.5	5.1	4.7
Return on equity	52.8	48.5	29.8	46.4	30.6	30.9
Net interest margin	15.3	13.2	11.8	11.8	12.8	10.9
Liquid assets to total assets[1]	78.6	74.7	66.6	41.0	41.3	36.5
Liquid assets to total deposits	69.7	73.5	73.7	51.0	49.6	44.7
Advances to deposits ratio	29.9	33.3	37.3	44.5	49.0	56.6
Foreign currency loans to total gross loans	42.8	46.8	41.2	36.2	34.0	30.3
Foreign currency liabilities to total liabilities	62.2	58.4	58.4	31.0	61.2	…
Household debt to GDP	0.0	0.0	0.0	1.5	1.2	…

Source: Bank of Zambia
[1]Liquid assets were redefined to exclude one-year Treasury bills beginning in 2005.

6.   **Other than pension funds, which hold about 25 percent of the assets of the financial system, the contribution of nonbank financial institutions (NBFIs) is small**. Most of the pension industry, which comprises the National Pension Scheme Authority (NAPSA) and occupational pension schemes, is generally sound. However, the two state funds, the Public Service Pension Fund (PSPF) and the Local Authority Superannuation Fund (LASF), both have continuing deficits that are projected to climb sharply over the medium term. The eight insurance companies and various other

Zambia: Structure of Nonbank Financial Institutions		
Average, 2005-2006		
		As Percent of Total
	Number	Financial Assets	GDP
Pension funds	21	21.5	7.9
Insurance companies	8	3.7	1.3
Other NBFIs		5.1	1.9
Leasing companies	9	1.8	0.7
Microfinance institutions[1]	12	1.0	0.4
Building societies	3	0.8	0.3
Savings and loans	1	0.6	0.2
Development finance institutions	1	0.6	0.2
Other NBFIs	…	0.2	0.1

Source: Computed from data provided by Zambian authorities
[1]Covers seven institutions registered by the Bank of Zambia and six of about 50 other NBFIs.

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[4] Gulde, et al. (2006).

financial institutions, which include leasing companies, microfinance institutions (MFIs), building societies, and one development finance institution, together account for about 9 percent of total financial system assets.

7.   **Despite the growth of credit and the decline in interest rates on commercial lending in the last few years, financial intermediation by the banking sector is low by regional standards, and lending interest rates are high.** Intermediation spreads are wide and profitability is relatively high despite high overhead costs. Although banks have responded to the robust growth in economic activity and the marked decline in the yield on government securities by expanding credit to the private sector, even the increase in private sector credit to 9.6 percent of GDP in 2006 still leaves Zambia below the low-income sub-Saharan average of 12.3 percent in 2004.[5] Based on the average commercial lending rate in 2006, the real lending rate was over 12 percent. The sector's net interest margin, a measure of the cost of intermediation, is at the high end of the regional average, and the ratio of overhead costs to total assets is above the regional average for low-income countries (Figure 2). Profitability as measured by return on equity was 5.1 percent in Zambia in 2006, compared to the low-income sub-Saharan average of 3.2 percent (2004)[6].

Figure 2: Indicators of Intermdiation Costs

Overhead Costs/Total Assets (Percent)

Net Interest Margin/Total Assets (Percent)

Sources: World Bank Financial Structure database; Gulde, Anne-Marie, Catherine Patillo, Jakob Christensen with Kevin Caray and Smita Wagh.

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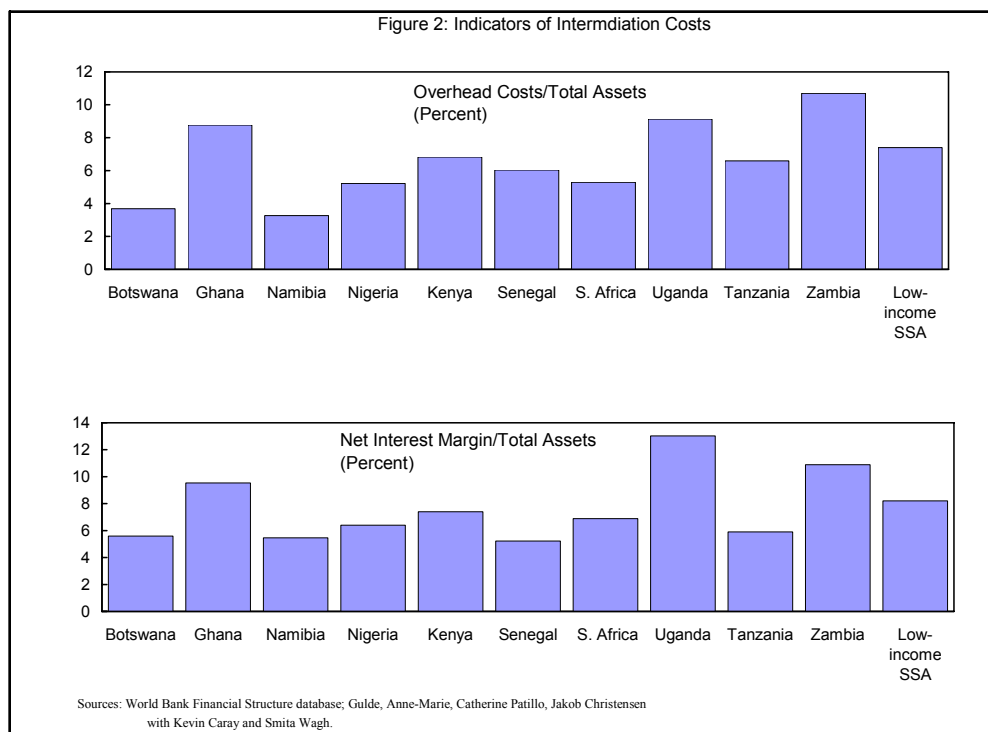
[5] Gulde, et al. (2006)

[6] Gulde, et al (2006)

8.   **Various factors push up intermediation costs.** Relatively high overhead costs in particular reflect the comparatively high cost of doing business in Zambia associated among others, with high transportation and communications costs. Given the economies of scale in banking, the cost of providing services on a relatively low scale is likely to be an important contributor. Inefficiencies associated with the lack of competition could also be a factor where services are concerned. However, bank concentration ratio—the market share of the leading three banks—which is moderate in Zambia relative to the regional average of 75 percent suggests that competition may be less of a factor than in most countries in the region.[7] An important contributor to the high interest spread was the large amount of unremunerated required reserves, which were only recently reduced from 14 percent to 8 percent. More to the point, perhaps, high interest rates are symptomatic of a weak credit culture and a lack of institutional infrastructure for obtaining credit information, registering collateral and enforcing contracts, and enforcing creditor rights more generally.

Source:World Bank Financial Structure database.
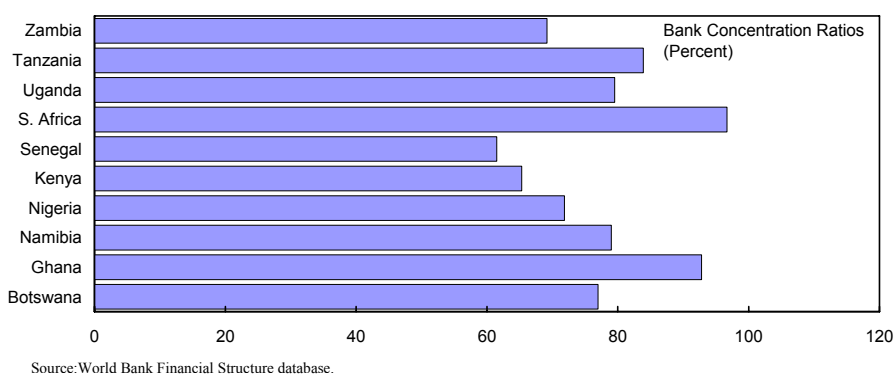
9.   **A large proportion of the population has no access to financial services, even though access to institutions, both formal and informal, compares favorably with the rest of sub-Saharan Africa.** A FinScope survey in 2005 found that 15 percent of the population were served by banks and another 8 percent had access to other formal financial institutions. Informal providers accounted for

Access to Financial Services[1]				
	Botswana 2004	Namibia 2004	South Africa 2005	Zambia 2005
Banks	43	51.5	47	14.6
Formal and informal institutions	11	3.3	16	19.1
Financially excluded	46	45.2	37	66.3

Source: FinScope
[1]Percentage of the population served with financial services

another 11 percent, making for a total of 33 percent that had some access to financial services. Similar surveys carried out in 2004 and 2005 found the proportion of the population with access to banking products to be over 43 percent in Botswana, 47 percent in South Africa, and over 51 percent in Namibia. Access to nonbank providers, however, was

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[7] Gulde, et al. (2006).

comparatively lower in these countries, underscoring the importance of the growth of NBFIs in achieving a more inclusive financial sector. The findings of the survey also touched on the use of bank products by small enterprises run by the self-employed: A full two-thirds of such businesses kept their business cash at home, and 96 percent had never applied for a loan.

C. Development Challenges and the Government's Reform Strategy

10.   The **financial sector has some way to go to meet the medium-term objectives set out in the Fifth National Development Plan, which are to expand financial intermediation and access to finance to support strong and broad-based growth and poverty reduction.** The major challenges are to improve the ability of the banking system to lend profitably at lower spreads by addressing obstacles to bank lending; deal with the legal and regulatory deficiencies that impede the operation and growth of NBFIs, which have the potential to offer services different from those typically provided by banks, such as contributing to the supply of long-term finance for investment; and create regulatory structures to support the soundness of the financial system as whole.

11.   **The FSDP is a comprehensive response to the stability and development needs of the financial system.** In general, the plan is designed to create a regulatory and supervisory framework for banks and NBFIs to underpin the development of a sound financial system; promote competition to foster growth and expansion of financial services at affordable costs; and establish or reinforce supporting infrastructures, especially the legal and informational structures that are essential to the growth of financial intermediation:

- On regulation and supervision, key reforms are to make the Bank of Zambia (BoZ) independent and strengthen bank supervision; establish an autonomous Pensions and Insurance Authority (PIA), with adequate funding to exercise its supervisory responsibilities; create an agency to regulate the National Pension Scheme Authority; and introduce legislation to strengthen the Securities and Exchange Commission with a sustainable funding base.

- Major reforms designed to foster competition in order to lower costs and widen access to financial services include promotion of a second tier of banks; formulation of a scheme to provide financial services to the rural population; and consumer education to stimulate competition, in the banking sector in particular. The cash reserve requirement, which was high by regional standards, would be reduced to lower the cost of funds to banks.[8] New regulation would be introduced to encourage the orderly development of MFIs, which were viewed as central to the strategy for expanding credit to small and micro enterprises and the rural sector. Priority was

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[8] On October 1, 2007, the reserve requirement was reduced from 14 percent to 8 percent.

given to the resolution of three state-owned NBFIs seen as filling specific gaps in the financial sector including the provision of banking services for rural and low-income households and small businesses.

- Reforms to address the support infrastructure of the financial system include a wide range of legislative initiatives, the most extensive being harmonization of all legislation relating to the financial sector, with a view to among other things reducing or eliminating the scope for supervisory arbitrage. Other legislative initiatives are laws on money laundering, credit bureau services, consumer protection, the payments system, and deposit protection. To make it easier to enforce contracts, the administration of insolvency, bankruptcy, and banking laws would be harmonized and legal processes for repossession of leased assets strengthened. Staffing and training would be improved to enhance delivery of the justice system. Accounting and auditing practices would be aligned with international best practice, and well-defined corporate governance codes would be introduced for banks and other financial institutions.

- To promote money and capital markets, which are largely illiquid, market-makers would be introduced to develop secondary markets in securities. The BoZ would move to repos as the main instrument of monetary policy and, to improve liquidity management, government cash management would be enhanced.

12.   **Though considerable progress has been made in implementing the FSDP in the past two years, much remains to be done.** In particular, while a number of the reforms to reinforce financial system infrastructure have gone forward, progress has been less notable on reforming the regulatory framework, promoting competition and access to services, and deepening money and capital markets. One major achievement was the licensing of a credit bureau in January 2006, after the BoZ had developed the necessary guidelines. Progress has also been made on introducing a payments system law to underpin the continuing modernization; adoption of international accounting guidelines for banks and NBFIs, which will strengthen the integrity of financial reporting; and issuance by the BoZ of corporate governance guidelines to banks and NBFIs that lay down standards for management based on best practice. Regulations for MFIs have been introduced; the BoZ will supervise deposit-taking MFIs and the larger institutions among non-deposit MFIs in terms of capital. The pension and insurance laws have both been amended and investment guidelines issued, to pave the way for more effective supervision and of those industries by the PIA. Work on the necessary regulations and funding arrangement for the PIA is underway.

13.   **Where FDSP implementation is lagging is in certain areas critical to the objective of supporting growth and diversification, as envisaged in the Fifth National Development Plan.** Considering the importance of banks in the financial system, giving priority to reforms that address obstacles to bank lending has considerable potential to speed up the expansion of lending to the private sector, at lower spreads. At the same time,

measures to support competition are necessary to induce banks to take advantage of new opportunities.[9] Laws relating to the use of collateral and the operation of leasing companies are another area that is critical for lending to medium and to some extent small-scale enterprises that are important for achieving broad-based growth. The regulatory structures especially for NBFIs, is also worth more immediate attention.

14.   **The poor credit culture, which has been identified as the major obstacle to lending, deserves special consideration.** The licensing of a credit bureau is a major step; it can help unlock access to credit for many more in the private sector while reducing the high risk premium that is currently priced into credit. To realize its full potential, however, it is important that the information available from the bureau is not limited to data on loan defaults, as some market participants have suggested, but covers as comprehensively as possible other borrowers and credit in its various forms. The World Bank's Doing Business in 2006 Survey suggests that countries that only went half-way in this reform achieved little from it.[10] In addition, to help boost the growth of credit, practice and regulations on the creation and use of collateral need prompt reform, considering how attracted banks are to salary-backed loans. Anecdotal evidence suggests that these loans are being used for a wide variety of purposes, including investment, housing improvements, and new construction. The FSDP recognizes the considerable potential of leasing as an instrument for providing credit, especially for medium and small-scale enterprises, given that the enterprise's receivables serve as collateral, helping to address one of the main constraints on access of smaller businesses to bank credit. However, the legislation that is seen as necessary to remove the obstacles has not materialized, and leasing activity has stagnated in recent years.

15.   **Only limited progress has been made on reforming the institutions regulating the financial system, which has important implications for the stability of the NBFIs in particular.** Although amendments to the Pension and the Insurance Act have clarified the authority of the PIA as supervisor, the vital issue of sustainable funding for the agency has yet to be resolved. The lack of resources meanwhile, continues to hamper PIA operations and make it difficult for it to train and retain staff. Even more pressing, the plan to draw up a regulatory arrangement for NAPSA, which in 2006 held about 10 percent of the assets of the financial system, has yet to be implemented. Because insurance companies and pension funds are the major contractual savings institutions in the system and the main sources of long-term finance, timely action is crucial to ensure that they are well-managed. The operational independence of the BoZ is also recognized as critical for it to avoid undue forbearance in case of insolvency or liquidation and to perform its role as lender of last

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[9] Competitive pressure in recent years has come from the squeeze on margins from the decline in interest rates, especially on government securities, and on earnings from foreign exchange transactions.

[10] World Bank (2007).

resort. However, although the FSDP clearly identifies the changes required, this critical reform still has no clear timetable.

16.   **Reform of the money and capital markets is also high on the list of priorities, but not much is happening.** Introduction of longer-term government bonds has established a reference point that could encourage private bond issues. Three- and 5-year government bonds were introduced in 2005, and 7-, 10-, and 15-year bonds were introduced in August 2007. There have also been a small number of private bond issues. However, the weaknesses of the money and capital markets identified in the FNDP are yet to be addressed. The lack of liquidity of the secondary market impairs its price discovery role and the guidance it can provide for operators in the financial markets. Moreover, the lack of clear settlement rules in the secondary market is a source of risk. The lack of liquidity together with the highly punitive rate on borrowing by banks from the discount window contributes to large bank holdings of idle balances. Also, weak liquidity management by BoZ associated with difficulties in forecasting government cash flow contribute to volatility in the money market. The need to create a role for some type of market-makers to encourage trading in securities has been recognized but has yet to take a concrete form.

17.   **A clear strategy for promoting access to the financially excluded is still evolving.** A supervisory arrangement for MFIs is in place, although they have responded slowly to the BoZ's calls for them to register, as is required. The FinScope surveys on the demand and supply of financial services are expected to provide information on which to base a strategy to broaden access to financial services. Meanwhile, the government has unveiled a rural credit program, with support from International Fund for Agricultural Development (IFAD). The National Savings and Credit Bank, which has been insolvent for several years, is being recapitalized to provide banking services for low income households and emerging entrepreneurs throughout the country. There are also indications that the Zambia Building Society is to be recapitalized to offer savings services and loans for home improvement and new construction. There are questions, however, about the long-term viability of these initiatives, especially as commercial banks expand into these markets. One major bank recently embarked on an aggressive plan to expand its branch network to both urban and rural low-income locations. Moreover, while the governance structures in these institutions are being realigned to ensure that they are managed on a commercial basis, the new arrangements may yet be tested.

D. Conclusion

18.   The FSDP is adequate for promoting development of the financial sector. While significant progress has already been made across a broad front, elements of the reform agenda that are key to expanding financial services so as to support the growth and diversification objectives of the FNDP needs to be given priority. The licensing of a credit bureau should ease informational constraints on the expansion of credit, but this initiative needs to be followed through. Furthermore, to facilitate credit appraisal by lending

institutions, the goal should be to ensure that this translates into more readily available information not only on bad credit but on as broad a range of credit as possible. To enhance the expansion of credit to medium- and small-scale enterprises in particular, the law relating to the creation and use of collateral is demonstrably an important area of reform, as experience in several countries has shown. Facilitating the use of collateral, including movable assets, would boost private credit, which to date has largely taken the form of salary-backed lending. Reform to remove the distortions and constraints in the leasing area should also bring increased lending to small and medium-scale industries.

Beyond these, the planned reforms of the regulatory institutions—the BoZ, PIA, and NAPSA—are vital to a sound financial system. Also of high priority are reforms to address the volatility that characterizes the interbank market and facilitate the flow of long-term and risk finance from institutional and other investors into productive enterprises. Central to the development of the financial markets, is the reform of the secondary market in government securities.

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IV. ZAMBIA: ASSESSING RESERVE ADEQUACY[1]

A. Introduction

1. **Zambia has gradually increased its gross official reserves over the past few years.** Reserves reached about US$600 million (2.2 months of import coverage) in 2006, from about US$110 million (1.0 month of import coverage) in 2000. By September 2007, reserves stood at about US$900 million (2.5 months of import coverage). The authorities consider 3 months of import coverage, the so-called "rule of thumb," to be the goal for the medium term. They are building up reserves to insure themselves against a shock, but whether 3 months is enough reserves for Zambia to cope with external shocks needs to be assessed.

2. **The main reasons for holding reserves are to enable central banks to reduce exchange rate volatility and to create a buffer against external shocks that could affect domestic welfare.** Reserves mitigate the impact on welfare of balance of payments crises by reducing the fall in domestic output and by diffusing the impact on domestic absorption (Jeanne, 2007). Reserves give the authorities time to put in place the necessary corrective policies. Moreover, higher reserves may themselves reduce the probability of a crisis. However, because building up reserves has a cost, it is necessary to understand the probability and the likely size of shocks.

3. **Two approaches are used in this paper to assess reserve adequacy in Zambia.** Section II discusses traditional reserve adequacy measures (rules of thumb), such as reserves-to-imports, reserves-to-short-term external debt, and reserves-to-money. Section III presents the results of applying the cost-benefit approach to the optimal level of reserves proposed in Jeanne (2007). Section IV draws conclusions. The analysis suggests that Zambia would benefit from further strengthening its reserves.

B. Reserve Adequacy Measures for Zambia

4. **Reserve adequacy needs to be assessed broadly.** The assessment should take into account macroeconomic policies, institutional conditions, and factors that affect the probability and magnitude of external shocks. Thus, we present below some stylized facts before discussing reserve adequacy measures for Zambia.

Macroeconomic policies

5. **The Zambian authorities continue to pursue sound economic policies.** These policies together with a favorable external environment and extensive debt relief have

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[1] Prepared by Cecilia Mongrut (PDR).

brought sustained economic growth, lower inflation, a stronger current account, and reserve accumulation. One of the most important ways to protect against balance-of-payments shocks is to implement sound macroeconomic policies. Policies of particular relevance to reserve adequacy are:

- *Exchange rate policy*: Zambia's exchange rate is flexible and market-determined. The central bank intervenes in the foreign exchange market only to maintain market conditions orderly. The real effective exchange rate has appreciated since the early 2000s (in line with the rise in the price of copper); the nominal exchange rate has been highly volatile. While a more flexible exchange rate has been found to reduce demand for reserves (Frenkel, 1983), the impact of exchange rate volatility is not clearly defined.

- *Public debt policy*: Zambia is at low risk of external debt distress and overall its public debt is sustainable.[2] Extensive HIPC and MDRI debt relief has substantially improved the debt outlook. As of 2006, external debt amounted to about 9 percent of GDP, down from 86 percent in 2005. The external debt service-to-export ratio, which has also drastically declined, is expected to hold at about 1 percent over the medium term. Furthermore, the Zambian government issues treasury bills and bonds denominated in local currency only. As of 2006 the value of government securities had reached K 5.1 trillion (about 13 percent of GDP). While the debt sustainability analysis considers this to be domestic debt, it is estimated that nonresidents hold 13 percent (about US$155 million or 1½ percent of GDP) of government securities, 67 percent of which are short-term debt. This suggests that the possibility of pressure on reserves because of a change in sentiment by foreign investors is moderate.
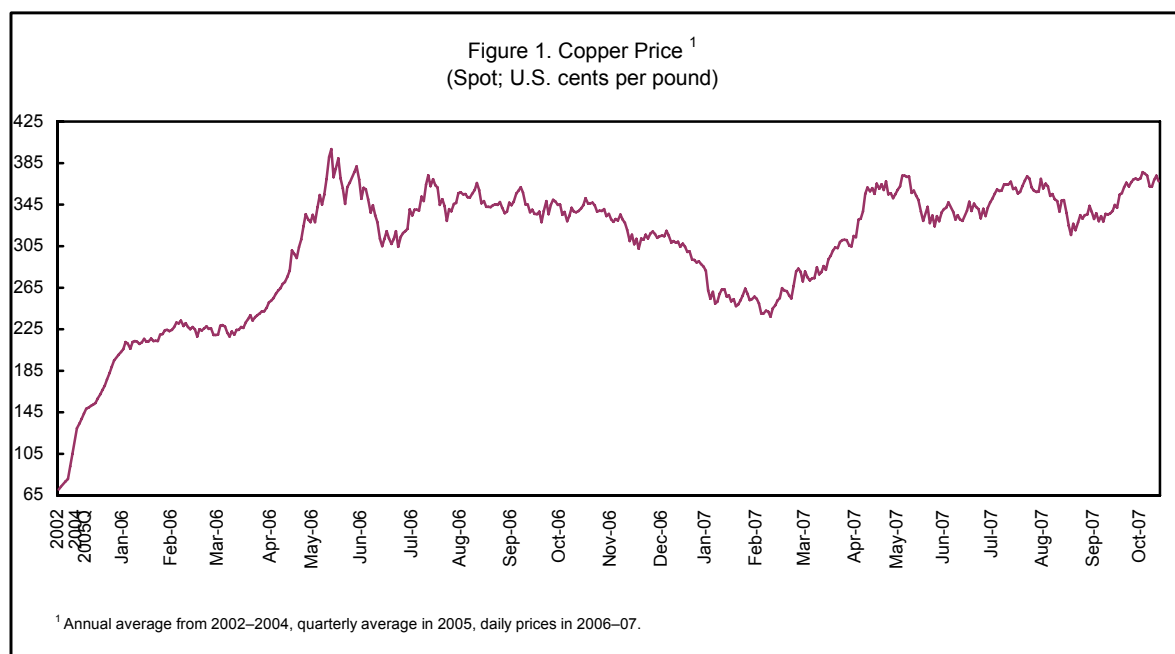
Institutions

6.   **Zambia has been making efforts to build its institutions.** Public debt as a whole is low, and domestic public debt, which is about 68 percent of the total, is fully denominated in domestic currency. Public external debt is mostly long-term. The government has been trying to lengthen the maturity of its securities and has not been granting guarantees to the private sector or to public enterprises. Moreover, it is committed to borrowing from abroad mainly on concessional terms. To manage its debt better, the government is finalizing a public debt strategy. Although banks are well-capitalized and liquid, the authorities are planning to further enhance banking supervision and central bank independence. Capital transactions in Zambia are free of controls. Sound institutional arrangements and practices have been found to reduce pressures on reserves.

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[2] See the 2007 Debt Sustainability Analysis (to be published, www.imf.org)

Possible shocks

7.   The most common shocks for developing countries are terms of trade shocks, sudden stops in capital inflows (including grants), global interest rate hikes, and oil price hikes (Becker et al., 2007). To determine the frequency and nature of the shocks that Zambia is exposed to, we take into account its specific characteristics by focusing on the first two types of shocks:

- **Terms of trade shocks**. Zambia's exports (about 38 percent of GDP) are highly concentrated in copper (about 78 percent of export receipts), the price of which is volatile (Figure 1). Copper prices are projected to decline sharply over the next three years (WEO, September 2007 forecasts). However, large investments in copper mines are expected to raise production substantially, largely offsetting the projected decline in prices. The baseline scenario assumes that during 2008–10, copper export volumes will grow at an average annual rate of about 16 percent, while copper prices will fall at an annual average rate of about 20 percent. Receipts from copper exports are projected to increase by 4 percent in 2008 in nominal terms. However, if the projected increase in volume does not materialize, receipts could decline by 12 percent and the current account deficit could widen by 2¼ percent of GDP. Zambia's risk of a terms of trade shock is therefore high.

Figure 1. Copper Price [1]
(Spot; U.S. cents per pound)

[1] Annual average from 2002–2004, quarterly average in 2005, daily prices in 2006–07.

- **Sudden stops in capital inflows**: To assess this risk, it is necessary to understand the composition of Zambia's capital inflows. Here we analyze inflows for 2000–06.

- Annual average foreign direct investment (FDI), which is mainly in the mining sector, is estimated to have been about US$300 million (5¾ percent of GDP), and is expected to increase because large new mining projects are now getting underway. FDI is projected to total US$810 million in 2007 (7.2 percent of GDP).

- Annual average grant inflows, including current transfers, were about US$300 million. While the standard deviation for grants is lower than for loans and FDI, the inability to predict when these inflows will arrive within a given year could affect the build-up of reserves.

- Annual average loan disbursements held steady at about US$160 million.

- Foreign investment in government securities began in early 2005, after Zambia reached its HIPC completion point. The estimated stock of government securities in the hands of foreigners has increased from about US$150 million at the end of 2005 to about US$200 million by the end of September 2007. Annual average portfolio inflows have been only about US$70 million for 2005–07.

Becker et al. (2007) recommend that countries adopt a less debt-intensive structure of external finance to reduce the risk of a crisis. Further, FDI has been found to be more stable than other capital inflows. Zambia's increasing dependence on FDI in recent years, therefore, suggests it is at low risk to sudden stops in capital flows.

Measures of reserve adequacy

8.   **Traditional reserve adequacy measures are useful, but are only a starting point for further analysis.** We compare Zambia's position to that of a sample of selected African countries, "mature stabilizers" that have gone from a PRGF arrangement to a PSI or are expect to do so (Table 1).[3] All selected countries are low-income countries, except for Cape Verde (a lower-middle-income country) and six of them have benefited from HIPC and MDRI relief.

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[3] Nigeria is not included because as an oil producer it significantly differs from the other selected countries.

Table 1. Comparison of Reserves in Selected African Countries

|	Months of Imports			Ratio to Short-Term Debt			Ratio to M2			Percent of GDP		
	2000	2004	2006	2000	2004	2005	2000	2004	2006	2000	2004	2006
Cape Verde	1.0	2.6	3.8	0.9	2.3	2.7	0.1	0.2	0.2	5.2	15.1	20.5
Ghana	0.9	3.7	3.2	0.6	3.7	3.4	0.2	0.6	0.5	4.9	18.5	17.9
Kenya	2.9	3.3	3.6	1.8	4.0	4.0	0.2	0.2	0.3	7.3	9.4	10.5
Mozambique	5.6	5.9	4.5	0.9	2.2	0.3	0.7	0.6	0.6	19.5	19.2	15.5
Senegal	2.6	5.2	3.9	4.4	6.0	7.5	0.3	0.5	0.4	8.4	17.2	13.9
Tanzania	5.7	9.3	5.3	3.7	16.5	23.5	0.6	0.8	0.6	10.7	20.2	16.2
Uganda	7.1	8.3	6.1	6.4	8.8	3.8	0.9	0.8	0.7	13.7	19.2	15.2
Zambia	**1.0**	**1.1**	**2.2**	**0.3**	**0.5**	**0.5**	**0.2**	**0.2**	**0.3**	**3.5**	**4.1**	**5.5**
Memorandum items :												
Threshold			**3.0**			**1.0**			**0.05-.20**			
Average	3.4	4.9	4.1	2.4	5.5	5.7	0.4	0.5	0.4	9.2	15.4	14.4
Minimum	0.9	1.1	2.2	0.3	0.5	0.3	0.1	0.2	0.2	3.5	4.1	5.5
Maximum	7.1	9.3	6.1	6.4	16.5	23.5	0.9	0.8	0.7	19.5	20.2	20.5

Source: IMF, *World Economic Outlook* .

9.   **The traditional reserve adequacy approach looks at four measures**:

- **Reserve-to-imports:** This is particularly relevant for countries that are exposed to terms of trade shocks but do not have significant access to international capital markets. It represents the number of months a country can support its level of imports after all inflows stop. Reserves equivalent to 3 months of imports is the rule of thumb most commonly used (Wijnholds, 2001). While there is no theoretical basis for this rule, in many cases it is justified by the need to meet unexpected external shocks with reserves to avoid a sudden stop in essential imports. On this measure, Zambia was the only country among those analyzed that did not have adequate reserves at the end of 2006; even though its import coverage had doubled since 2000, it had only 2.2 months of coverage. The average for the countries compared, was 4.1 in 2006 (Figure 2).


Figure 2: Reserves in Months of Imports of Selected African Countries
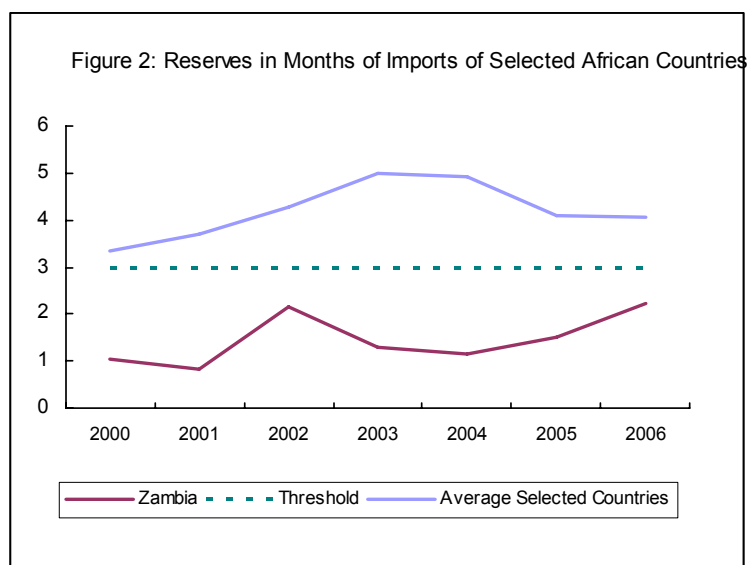
- **Reserves-to-short-term external debt by remaining maturity:** This measure is useful for countries that have significant access to international capital markets and are therefore vulnerable to a capital account crisis. Countries can benefit by holding enough reserves to cover all obligations falling due within the coming year. The Guidotti-Greenspan rule recommends that reserves be at least equal to short-term debt, thus the threshold for this measure is 1. Of the eight countries, seven had ratios higher than the threshold. Although Zambia's reserve-to-short-term debt ratio has increased from 0.3 to 0.5, it is still below both the threshold and the average recorded by the countries analyzed (Figure 3). On this measure, Zambia does not have enough reserves.

Figure 3. Reserves-to-Short-Term Debt of Selected African Countries
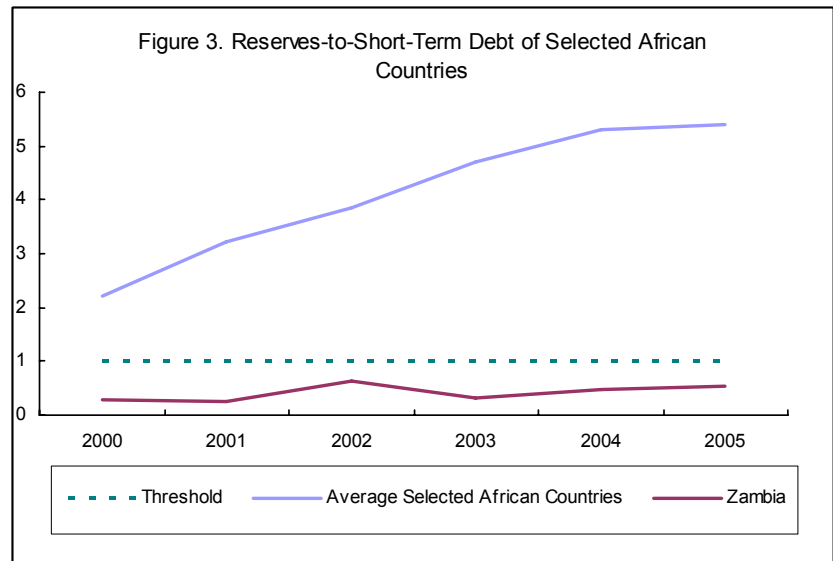
- **Reserves-to-M2:** This is relevant for countries facing a risk of capital flight and is particularly appropriate for countries with a pegged exchange rate. However, even countries with flexible exchange rates must be concerned about the possibility of a run on their currency, because contagion can affect their economies. The usual benchmark range for this measure is 5%–20% (Wijnholds, 2001). Countries with more flexible exchange rates can hold a lower ratio. On this measure all countries considered, including Zambia, score above the upper bound of the suggested threshold (Figure 4).

Figure 4. Reserves-to-M2 of Selected African Countries
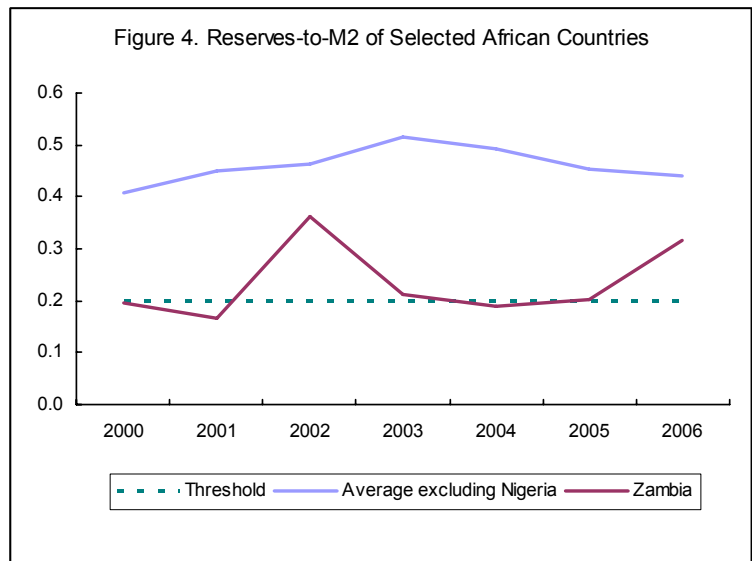
- **Reserves-to-GDP:** While there is no threshold for this measure, it allows for cross-country comparison by other means. By this measure, Zambia's reserves are only about 1/3 of the average recorded by the selected countries (Figure 5), but has strengthened over time. As of 2006, Zambia's reserves had reached 5.5 percent of GDP, though that is still well below the average of about 14 percent of GDP registered by the comparison countries.

Figure 5. Stock of Reserves of Selected African Countries (Percent of GDP)
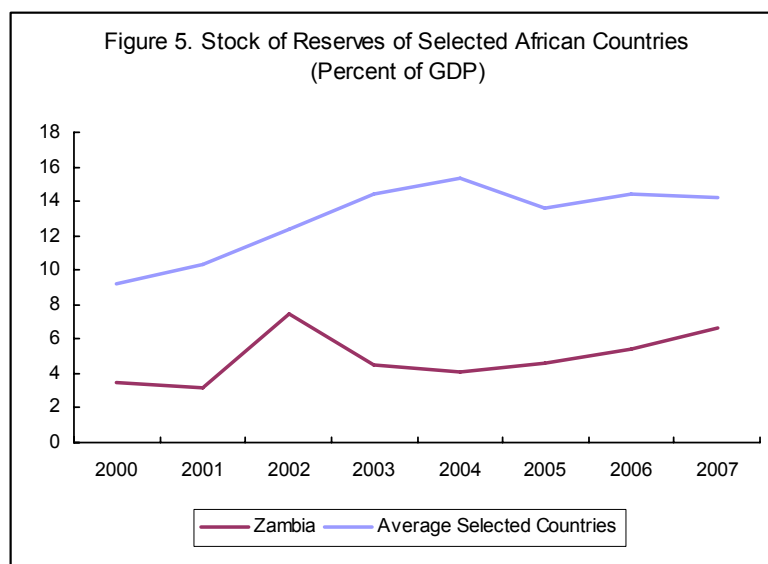
10.   **Zambia's current account risks suggest a need for it to increase reserves**. Given that the current account is the main factor behind the balance of payments instability in low-income countries, we consider it useful to assess the reserve adequacy against a possible current account shock. Thus, besides reviewing the traditional measures, we have quantified the import coverage required to face an external shock. The analysis assumes that the shock will be fully absorbed by a change in reserves. Moreover, since Zambia's reserves are still below the suggested 3-month threshold and the risk of a terms of trade shock is high, we also quantify the level of reserves that will allow Zambia to face a current account shock (Table 2).

11.   **We calculate the standard deviation of the current account as a share of GDP and assess the import coverage necessary to face a two-standard-deviation move in the current account.** By this measure, the import coverage required for Zambia is 3 months, right at the threshold. Zambia is moving in the right direction; by September 2007, it had reached 2.5 months of imports. If the assessment were based on the standard deviation of export receipts as a percent of GDP, the import coverage required would be 2.3 months, below what is required based on a current account shock. Thus the analysis shows that at the end of 2006 Zambia's reserves, though adequate for facing an export shock, were below what is needed to face a current account shock. Zambia would benefit from building up reserves further.

12.   **The analysis of implied reserve needs suggests that most of the countries analyzed have more reserves than they need.** Of the eight countries, six have more reserves than they need to face a current account shock—four have accumulated more than 150 percent of the estimated need. With an average of 4 months of import coverage, the eight countries seem to have reserves in excess of the implied need of 3.2 months.

Table 2. Implied Reserve Need for Selected African Countries

| | Exports | | Current Account | | 2006 |
	St. Dev. [1]	Implied Reserve Need [2]	St. Dev. [1]	Implied Reserve Need [2]	Actual [3]
Cape Verde	9.3	3.8	3.4	1.4	3.8
Ghana	10.7	5.5	5.8	3.0	3.2
Kenya	3.2	2.7	2.9	2.5	3.6
Mozambique	8.4	5.2	8.2	5.0	4.5
Senegal	2.8	1.8	3.5	2.3	3.9
Tanzania	3.7	2.9	6.1	4.7	5.3
Uganda	2.6	2.6	4.1	4.0	6.1
Zambia	**3.8**	**2.3**	**5.0**	**3.0**	**2.2**
Memorandum items:					
Average	5.6	3.3	4.9	3.2	4.1
Minimum	2.6	1.8	2.9	1.4	2.2
Maximum	10.7	5.5	8.2	5.0	6.1

[1] Standard deviation (percent of GDP), 1990-2006.
[2] Reserve coverage in months of imports needed to cover a two-standard deviation shock.
[3] Reserves in months of imports.

C. Assessing the Optimal Reserve Level for Zambia

13.   **An alternative approach to assessing reserve adequacy compares the costs and benefits of holding reserves.** The model developed by Jeanne (2007) is used to estimate the optimal level of international reserves for Zambia.

Model and Assumptions

14.   The model assumes a small open economy, with one single homogeneous good, that is subject to crises, defined as a loss of access to external credit associated with a fall in output. The representative consumer who populates the economy benefits from the country accumulating reserves in two ways: (i) lower probability of a crisis, and (ii) lower welfare cost of a crisis.

The full insurance level of reserves is the level that allows the consumer to continue consuming at the desired level in a crisis:

$$R=L+\Delta Y \ ,$$

where R is the level of reserves, L the level of short-term debt, and ΔY the output loss in a crisis, each expressed as a percent of GDP.

The optimal level of reserves minimizes the loss function:

$$\text{Loss} = \delta R + \pi \, f(R, L, \Delta Y, \sigma) \ ,$$

where δ is the opportunity cost of accumulating reserves; π is the probability of a crisis; and $f(.)$ is the welfare cost, which depends on R, L, ΔY, and the risk aversion of the consumer, σ. It is equal to:

$$R = L + \Delta Y - (1 - (1 + \delta/\pi)^{-1/\sigma}),$$

that is, the optimal level of reserves is equal to the full insurance level minus a term reflecting the opportunity cost of holding reserves. It increases with the probability of a crisis and consumer risk aversion but decreases with the opportunity cost of holding reserves.

Estimated model for Zambia

15.   It is assumed that Zambia is subject to crises associated with terms-of-trade shocks that reduce its output. The calibration is based on the following assumptions:

*   A crisis is caused by a terms of trade shock, which is defined as a 10 percent deterioration in the terms of trade.
*   Zambia's output loss is assumed to be 3.7 percent of GDP, which is the level estimated for the 44 sub-Saharan African countries for 1980 through 2006 (Sub-Saharan Africa Regional Economic Outlook—October 2007).
*   The probability of a terms-of-trade crisis, defined as the frequency of a worsening of the terms of trade by 10 percent or more that results in a loss of output, is assumed to be 5 percent (Sub-Saharan Africa Regional Economic Outlook—October 2007).
*   The value of the opportunity cost of accumulating reserves (0.3 percent of GDP) is estimated based on the spread between the interest rate on Zambia's treasury bills and the return on reserves. In 2006 the return on reserves was lower than the interest rate.
*   The benchmark value of relative risk aversion is set to 2, in line with the lower bound of the range assumed by Jeanne (2007).

16.   **With these assumptions we estimate that the optimal level of reserves is below the 2006 year-end level.** Since the optimal level of reserves is sensitive to the assumptions on output cost, probability of a crisis, and degree of risk aversion, we perform sensitivity analyses by re-estimating the model, modifying one parameter at a time. Changes in the

output cost have a linear one-to-one impact on the optimal level of reserves. If the output cost is increased by one percentage point f GDP, the optimal level of reserves increases by one percentage point from 2 percent of GDP (baseline) to 3.2 percent of GDP (alternative scenario 1). If the probability of a crisis is doubled to 10 percent, the estimate of optimal reserves increases to 4.5 percent of GDP (alternative scenario 2). Moreover, the optimal level of reserves increases to 5.1 percent of GDP if we assume that risk aversion also doubles (alternative scenario 3). As we increase the output cost, the probability of a crisis and the degree of risk aversion, the optimal level moves closer to the level held by Zambia at the end of 2006.

Table 3. Zambia: Application of Jeanne's Model

		Baseline	Alternative Scenarios		
			1	2	3
Output Cost[1]	ΔY	0.037 [2]	0.049 [3]	0.049	0.049
Probability of the shock	π	0.050 [2]	0.050	0.100	0.100
Short term debt[1]	L	0.009	0.009	0.009	0.009
Cost of holding reserves[1]	δ	0.003	0.003	0.003	0.003
Risk aversion[4]	σ	2.0	2.0	2.0	4.0
Model	$R = L + \Delta Y - (1-(1+ \delta/ \pi)-1/\sigma)$				
R [1]		0.020	0.032	0.045	0.051

[1]Expressed in percent of GDP.

[2]Assumes estimates calculated for 44 Sub-Saharan African countries for 1980 through 2006 (www.imf.org).

[3]Assumes an output loss equivalent to the cumulative median loss observed in periods t, t+1, and t+2.

[4]Jeanne estimates that risk aversion ranges from 1 to 10 percent.

D. Conclusions

17. **The analysis of traditional reserve adequacy measures suggests that Zambia would benefit from further building up its reserves**. In spite of recent increases, the ratios of reserves-to imports and reserves-to-short-term debt are still below the thresholds. However, the reserves-to-M2 measure suggests reserves are adequate. We have also used the thresholds of certain other countries as a yardstick. Zambia's reserves are below the average for the sample of comparator African countries that have already adopted PSI arrangements or plan to do so, but the reserves of most of the countries selected may be more than is necessary. This comparison, however, does not take into account the macroeconomic and institutional framework of each country. Furthermore, the analysis of the implied reserves needed to cover a two-standard-deviation current account shock suggests that Zambia needs to increase its reserves.

18. **Application of the cost-benefit approach proposed by Jeanne can justify higher reserves for Zambia**. While application of the model to baseline assumptions results in an

optimal level of reserves that is lower than the level attained in 2006, a higher output cost, probability of a crisis, and risk aversion would argue for a higher level of reserves.

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V. ELECTRIC POWER IN ZAMBIA—POTENTIAL OBSTACLE TO GROWTH[1]

A. Introduction

1.   **A secure supply of electricity at competitive cost is essential for economic growth.** Economic growth has rebounded in Zambia in recent years, not least because of the recovery of mining activity, and demand for electricity has soared. When the current recovery began, Zambia enjoyed an excess supply of electric power as generating capacity had been installed during the 1960s and 1970s on the expectation that the Zambian economy would expand over time. The opposite, of course, happened, leaving Zambia with a power surplus for export into the region.

2.   **The rapid expansion of mining and other activities in recent years and the need to take capacity out of generation for long-overdue rehabilitation have virtually exhausted Zambia's surplus of electric power.** Load-shedding is already extensive to non-mining business and residential electricity users during peak periods and is bound to get worse in the near term as demand continues to increase while supply remains stagnant.

3.   **Over the medium-term, a potential power shortage threatens to become an obstacle to the continued growth of the Zambian economy.** Further expansion of mining, agriculture, and manufacturing requires increased access to electricity. With the whole southern Africa region in power deficit, the increased supply will have to come largely from additional power generation within the country. While there is an abundance of hydro potential to be harnessed in Zambia, bringing on line new capacity will require heavy investment and in many instances long lead times. The poor financial condition and operating performance of ZESCO, the state-owned power company, render it ill-equipped to undertake the needed investment in new power generation capacity.

4.   **This paper reviews conditions in Zambia's power sector and examines options for addressing the key challenges.** It first looks at the background to the looming power shortage in Zambia. It then reviews key features of and institutional arrangements in Zambia's electricity sector. Next it focuses on the key player in the sector, ZESCO. Thereafter it considers a plan or roadmap for moving forward. A final section concludes.

B. The Looming Power Shortage

5.   **Zambia has not seen any significant addition to its power generating capacity since the mid-1970s.** Installed capacity is about 1,700 MW, mainly in two large power plants, one on the Zambezi River (600 MW) built in the 1960s, the other on the Kafue River

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[1] Prepared by Birgir Arnason.

(900 MW) built in the 1970s. When built, the power plants were mainly intended to supply Zambia's large copper mining sector. However, output from this sector shrank steadily during the 1980s and 1990s, resulting in declining demand for electricity.[2]

6.   **Available power from Zambia's hydroelectric plants is currently significantly below installed capacity.** Because of prolonged neglect of maintenance, the large power plants built in the 1960s and 1970s have in recent years required extensive and unexpectedly costly rehabilitation, which has taken individual turbines and generators out of commission for extended periods. Currently about 450 MW of generating power is being rehabilitated leaving available a peak power supply of only 1200–1300 MW, well below current peak demand of 1400–1500 MW. As the power purchasing agreements that the mining companies have with ZESCO and the Copperbelt Energy Corporation (CEC, see below) call for an uninterruptible supply, the shortage of power results in extensive load shedding for non-mining businesses and households during periods of peak demand. This situation will persist until the ongoing rehabilitation is completed in early 2009.

7.   **The completion of the rehabilitation of existing capacity will bring only short-term relief.** Power demand has increased by almost 50 percent since 2002 and could increase by another 30 percent over the next three-to-four years, in view of current plans to expand mining output and increase the population's access to electricity. Such an increase would raise demand above existing capacity, even when fully rehabilitated. In view of the limited import possibilities given the regional power deficit,[3] new domestic generating capacity is needed to meet the growing demand from mining and other economic activities, as well as the demand arising from the authorities' ambitious plans to expand and deepen the electrification of the country.

8.   **Zambia's hydropower potential is relatively abundant.** It is estimated that at least another 6,000 MW of power can be generated from Zambia's rivers. Specific options for expanding power generation capacity have been identified. These include projects that could be brought on line relatively quickly (within three-to-four years); these are the Itezhi-Tezhi project (120 MW) on the Kafue River and the Kariba North expansion (360 MW) on the Zambezi River. Further into the future (six-eight years) would be the Lower Kafue Gorge project (750 MW). A central challenge in developing these projects will be to obtain the required financing of up to $1.5 billion. ZESCO has reached preliminary understandings with TATA of India on developing the Itezhi-Tezhi project and with Sino-Hydroelectric of China

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[2] At its peak, output from Zambia's copper mines exceeded 700,000 tons per year. By the late 1990s, annual copper output had fallen to well below 300,000 tons.

[3] ZESCO is a member of SADC's Southern African Power Pool (SAPP) which aims to create a common market for electricity in the southern Africa region. In the past, ZESCO has sold excess electricity through the SAPP. With electricity demand in the region, particularly in South Africa, growing strongly, a regional power deficit is emerging that would make it difficult and costly for ZESCO to import electricity from neighboring countries.

regarding the Kariba North expansion. Whether ZESCO or a private sector party or consortium should be selected to develop these projects is a question that should be addressed.

C. Zambia's Electricity Sector

9. **Electricity use in Zambia is heavily concentrated in mining.** Mining accounts for about one half of electricity use in Zambia, and this share could grow in the future as mining expands further. In the mining sector, ZESCO supplies power mainly through a privately-owned intermediary, the Copperbelt Energy Corporation (CEC).[4] Access to electricity is largely limited to the urban centers of Lusaka, Livingstone, and in the Copperbelt. It is estimated that only 20 percent of the population of Zambia use electricity; 40 percent of the urban population but only 2 percent of the population in rural areas. Under the Fifth National Development Plan (FNDP), the government aims to raise the level of electricity use to 30 percent of the population over the next five years, particularly through rural electrification efforts.

10. **Electricity tariffs in Zambia are low, both by regional standards and relative to generating costs.** According to a Cost of Service Study prepared in 2006,[5] the average electricity tariff in Zambia amounted to 2.66 cents per kilo Watt hour (c/kWh), ranging from 2.34 c/kWh for mining to 5.87 c/kWh for commercial users; residential users paid on average 3.05 c/kWh.[6] The Cost of Service Study also estimated that full cost recovery for ZESCO would require a 48 percent increase in the average electricity tariff, ranging from 2.4 percent for commercial users to 148.5 percent for residential users; mining tariffs would need to rise by 28.5 percent to achieve full cost recovery. From 2002 to 2006, the ERB approved cumulative tariff increases for ZESCO of only 17 percent, while the CPI more than doubled. The low electricity tariffs are at least partly the result of the long legacy of overabundance of supply, as well as the political sensitivity of tariff increases. In the meantime, the structure of electricity tariffs tends to be anti-poor in that connection fees are high ($500–600).

11. **The Zambian power sector is governed by three pieces of legislation:** The Energy Regulation Act (1995), the Electricity Act (1995), and the Rural Electrification Act (2003). The Energy Regulation Act established the Energy Regulation Board (ERB), which is

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[4] Historical reasons account for this arrangement. Before hydro-electricity became available from ZESCO, the mining companies met their electricity needs through a jointly-owned company. Two new mines, Kansanshi and Lumwana, purchase electricity directly from ZESCO.

[5] Prepared for the Energy Regulations Board (ERB) and ZESCO by a group of consultants led by IPA Energy Consultants.

[6] For comparison, residential and commercial users in Kenya, Mozambique, Namibia, and Uganda pay three to five times more than their Zambian counterparts for electricity (Zambia Business Forum, Position Paper on the Electricity Industry in Zambia, July 2007).

responsible for the licensing, monitoring, and supervision of operators in the energy sector. The Energy Regulation Board, which is appointed by the Minister for Energy and Water Development, must also approve electricity tariffs. The Electricity Act abolished the statutory monopoly of ZESCO in the power sector and provided for new entrants although none have emerged since the Act was passed. The Rural Electrification Act aims to facilitate the expansion of electrification into rural areas. This relatively modern legal framework for the electricity sector has proved inadequate to attract private sector investment to the sector and provide a secure supply of electricity. Low electricity tariffs are one reason for the lack of private sector interest, while the absence of a guaranteed access to ZESCO's transmission and distribution networks is another.

D. ZESCO

12.   **While not a statutory monopoly, ZESCO handles virtually all generation, transmission, and distribution of electricity in Zambia.** ZESCO is a troubled company, beset by inefficiencies and high costs. According to the Cost of Service Study, ZESCO experienced five straight year of losses from 2002–06. Low electricity tariffs are certainly one reason for ZESCO's poor financial performance during this period. However, operating performance measured against key indicators was also exceptionally poor: (i) trade receivables were at 80–90 percent of turnover; (ii) one-third of all customers were unmetered and the lifeline tariff was 300 kWh, leading to revenue erosion; (iii) distribution losses, whether through theft or increased unmetered use, stayed high; and (iv) staffing levels and costs rose, the latter at a rate well in excess of the rate of inflation; with ZESCO employees well compensated by Zambian standards, ZESCO's wage bill has accounted for around 50 percent of operating costs and turnover. ZESCO's inefficiencies and high costs are well known in Zambia. This has undoubtedly contributed to the strong resistance to increases in electricity tariffs. ZESCO has accumulated substantial tax arrears, while a number of government agencies and parastatals, particularly water utilities, have failed to pay there electricity bills on time. At current revenue and cost levels, ZESCO is a financially unviable company that is incapable of mobilizing resources for the necessary expansion of power generation and the electricity grid.

13.   **ZESCO's problems have been known for a long time and considerable efforts have been put into improving its performance.** At Zambia's decision point under the HIPC Initiative in 2000, the privatization of ZESCO was set as a trigger for the completion point. The government abandoned the privatization option in 2003 and chose instead, in consultation with the World Bank and the IMF, a strategy of commercialization intended to achieve the same objectives as privatization. The commercialization strategy emphasized strengthened governance and business practices. ZESCO's Board of Directors was to be made more independent, with a clear majority to be nominated by private stakeholders. ZESCO was also to be required to operate on a commercial basis and to provide evidence of its capacity to do so, including through the formulation of a business plan, collection of

amounts owed by government, and the absence of financial support from government (including through tax arrears). While a formal assessment of the commercialization strategy is yet to be completed, it appears not to have led to the improvement in ZESCO's financial and operating performance that was the overarching objective of the strategy. Earlier it was envisaged that a negative assessment of governance and performance outcomes under the commercialization strategy would lead to the revival of the privatization option. However, this would not seem to be politically feasible.

E. A Plan for Moving Forward

14. **Key to any plan for responding to the looming electricity crisis is Zambia is an increase in electricity tariffs.** Electricity tariffs need to be raised to a level that can support the financing of the needed investment in expanded generation, transmission, and distribution capacity. This is a prerequisite whether the needed investment is undertaken by ZESCO, the private sector, or through public-private partnerships. Given the size of the tariff increases needed, they should be phased over an extended period to lessen the impact on customers. The terms of bulk sales agreements to mining companies also need to be renegotiated. The mining companies have indicated that they are ready to discuss revised terms, recognizing that current tariffs are unsustainable and unable to support the expanded power supply that they require. The mining companies have also indicated that they are prepared to form a consortium that could finance, build, and operate new power plants.

15. **It is also essential to revitalize efforts to improve ZESCO's efficiency and lower its costs.** ZESCO has submitted to the ERB a multi-year schedule of tariff increases that would bring tariffs to the estimated full cost recovery level. The ERB has indicated that it will condition approval of any tariff increases on a significant improvement in ZESCO's operational performance across a range of indicators. The successful implementation of such a plan would most likely require strengthened corporate governance, including the granting of greater independence to ZESCO's Board of Directors. It would also require a strengthening of the ERB to enable it to effectively monitor and enforce compliance with the indicator targets.

16. **Notwithstanding its reluctance to privatize ZESCO, the Zambian government should also re-evaluate the role of ZESCO in the expansion of the country's power sector and explore more fully the role that the private sector could play.** Even with an increase in tariffs, ZESCO will continue to have a hard time raising the needed financing for investment because of its track record and weak balance sheet. Once a decision has been taken to raise tariffs to cost recovery levels, it should be possible to attract private interest in investment in the power sector. This would require guaranteed access to the transmission network and suggests that the unbundling of ZESCO's generation, transmission, and distribution operations could be necessary.

F. Conclusion

17. **Zambia faces a looming power crisis.** Urgent multi-pronged action is needed to ensure the availability of sufficient electrical power to sustain economic growth at the rates envisaged in the FNDP. Electricity tariffs need be raised significantly to make investment in new capacity profitable and to attract private interest. ZESCO needs to improve its performance and its dominant role in Zambia's power sector should be reconsidered.