

Precept 8. Stabilizing expenditure

Technical Guide

1. Introduction: Objectives, Trade-offs and General Principles

In Precept 7 it was suggested that the priority use for resource revenues lies in the support of sustained increases in broad-based economic growth and development. This requires high levels of investment in the domestic economy and suggests that accumulation of large Sovereign Wealth Funds (SWF) by developing countries is not appropriate. Yet at the same time there is, in general, no reason to believe that an efficient spending path will exactly match the time path of revenue. It is important that the two are 'decoupled', the difference between them being held in off-shore assets. We will use the term 'Sovereign Stabilization Funds' (SSF) to denote holdings of foreign assets held by government with the primary purpose of covering relatively short-run mismatches between spending and revenue, rather than with the long run objective of building a portfolio of foreign assets.

Objectives

The objective is to stabilize revenue mismatches. There are two main reasons for short- or medium-run mismatches between the paths of revenue and spending. The first is volatility of the revenue flow, typically generated by the extreme volatility of many commodity prices. In Section 2.1 we discuss alternative ways to handle volatility, and argue that active use of an SSF is the most important part of a successful strategy. The second arises from absorption constraints in the domestic economy. A country that is trying to increase spending (current or capital) rapidly may run into rising prices, shortages of capacity and lack of high quality investment projects. Funds then need to be 'parked' in an off-shore account until they can be effectively spent at home - this is the subject of Section 2.2.

Trade-offs

Decoupling spending from revenue is likely to be politically very difficult, as the government will come under intense pressure to spend. In Section 2.3 we discuss ways to handle this pressure, including the role of fiscal rules, under which

government is (to some degree) bound by law to save a fraction of resource revenues.

Managing volatility, adapting to absorption constraints and resisting spending pressure are the key objectives of any design that gradually builds up and smoothes expenditure and investment. This involves a number of trade-offs outlined in Section 2. Some alternative means of implementing such a design are then discussed in more detail in Section 3.

General Principles

- Allowing consumption or investment to vary as a result of commodity price volatility is usually costly for the economy. SSFs should be used to absorb this volatility instead.
- SSFs cannot feasibly eliminate all variability. Residual instability should be managed via: monetary policy; policies to allow flexible markets particularly labour markets; and prudent choices over which public expenditure can be exposed to volatile funding.
- Periods of intense public expenditure can be inefficient and inflationary. SSFs can be used to regulate the flow of public expenditure in the economy.
- Other policies can also mitigate these effects: opening up to international trade, removing bottlenecks in production processes, etc. Slow build up in expenditure, and investment in the process of investment (see also Precept 9) can also help.
- The pressure to spend revenues immediately must be resisted. Transparency, a strong finance ministry and a fiscal constitution can mitigate this pressure.
- SSFs should have clear operational rules, with good oversight and transparency on its operations'

2. Instruments and Design

2.1 Managing Volatility

The extreme volatility of commodity prices is well documented and the adverse impact of volatility on economic performance increasingly well understood. The evidence suggests that any short-run positive effects of a commodity price increase

are typically swamped by the longer-run negative effect of volatility on income levels.¹

Revenues can be hedged through futures contracts, forward markets, commodity swaps and other financial instruments, although these are typically short- to medium-term instruments that are less useful for long periods of low prices. To date only a few resource-rich countries (e.g. Mexico) have actually tried reducing exposure to commodity-price risk by these instruments, and the strategies have had only a marginal effect on overall volatility. That said, although such instruments may not reduce actual volatility, they may serve as indirect stabilizers in resource-dependent countries where short-horizon budgets make use of an assumed oil price, as is the case in Mexico.

In the absence of substantial hedging options, the broad policy question is: which other economic variables should fluctuate in response to fluctuating revenues, and which should be stabilized? There are three main options. Consumption in the domestic economy can fluctuate, passing the impact directly on to local consumers. Domestic investment can be varied, this being transmitted to variation in the domestic capital stock. Or an SSF can be used, with investment flowing into the fund when commodity prices are high and then being drawn out when commodity prices are low. Each of these strategies has costs associated with it; the task is to find the least bad combination.

Consumption. Letting the impact of resource price volatility fall on domestic consumption (often via changes in wage income and employment) is the most costly option. People often find it difficult to rapidly change consumption patterns, and find it difficult to either insure themselves or to borrow against fluctuating income. The problems are particularly severe in low-income countries where private access to capital markets is poor and fluctuating incomes may drive substantial numbers of people into poverty or into forced asset sales. Current government expenditures are also difficult to cut as they are likely to be focused on basic services. There is therefore a strong case for trying to protect the current expenditure of both households and government from excessive fluctuation.

Domestic investment. Fluctuations in domestic investment are perhaps more manageable. The purpose of a *flow* of investment is to contribute to the capital *stock*. This stock–flow relationship creates an inherent degree of smoothing between

¹ Collier and Goderis (2008), Poelhekke and van der Ploeg (2009).

investment and the output that it produces, so fluctuating investment is consistent with a considerable degree of stability in productive capacity and output. In even the best functioning economies, investment is more volatile than other elements of national income, and coping with this volatility is not a fundamental problem for such economies. Volatility of investment is also likely to be less problematic than might initially appear likely since the strategy of using revenues for investment rather than for foreign assets means that investment as a share of GDP will be high in these economies. Nevertheless, even if less costly than fluctuating consumption, fluctuations in investment do come at a cost of lost efficiency and aggregate economic instability. This is because ramping up and ramping down public investment projects according to fluctuations in revenues leads to some high return projects being overlooked, or lower return projects being pursued, as well as a higher degree of uncertainty for the private sector.

International lending (SSFs). The third strategy is to use international capital markets to lend when times are good and to borrow when times are bad². In practical terms, the main instrument open to countries is to manage a stock of relatively liquid foreign assets, possibly in the form of a Sovereign Stabilization Fund (SSF). An SSF is the instrument in which the government can deposit funds when revenue exceeds planned spending, and draw down when the reverse is true. Since the rate of interest at which many developing countries can borrow exceeds the rate at which they can lend, it is better to hold a substantial reserve which reduces the likelihood of needing to borrow. This argument is reinforced by the fact that, as in the financial crisis that began in 2007-8, it may simply be impossible to get credit when times are bad; when commodity prices decline and countries need to borrow, they become less creditworthy, and may be shut out of capital markets altogether.

This strategy is not costless, as it postpones the spending of revenues on high priority and high return domestic projects, but it does have the effect of insulating the economy from volatility and, if the SSF is large enough, enabling it to ride out some of the impact of downturns and periods of low commodity prices. How large should such a fund become? The fund would need to be larger the greater the degree of prudence of the policymakers, the greater the volatility of the revenue flow, and the smaller the difference between the return on SSF investments and the return on alternative spending projects. The standard approach to this question requires knowledge of the preferences towards prudence, of the marginal returns, and of the

² In general accumulation of foreign assets should be preceded by a reduction in public debt since the return on foreign assets with typically be lower than the yield owed on domestic government bonds.

stochastic process driving the volatility. Recent work by Gelb and Grasmann (2008) looks at the size of fund that might be required not to fully smooth domestic spending, but to maximize a benefit function in which there are diminishing returns to spending. They find that it is optimal to save a full 80% of the (incremental) revenues associated with a short (5 year) resource boom. This is a much larger percentage than is suggested by applying the *theory of precautionary saving*³ in situations where there is no limit to how much the government can spend efficiently.

Managing residual instability. This work is necessarily speculative, and the policymaker is left with a difficult trade-off; if the SSF is to be large enough to offer a reasonable chance of successfully smoothing, domestic spending of the revenue is likely to be extremely low. It therefore has to be accepted that a SSF cannot provide complete smoothing, and that some combination of SSF and management of residual instability has to be found. This is particularly so since direct revenue flows to government are not the only source of commodity-induced instability; there are large private sector responses and international capital flows. Capital flows might be associated with investment in the oil sector (in Azerbaijan foreign direct investment peaked at 30% of GDP in 2003) or with short run speculative flows, such as the purchases of Zambian government domestic debt at the height of the copper boom in 2006, which led to a near doubling in value of the currency.

How should this residual volatility be managed? First, active monetary management may be needed. Since these are foreign exchange flows—public or private—foreign exchange intervention will be needed to maintain the stability of the exchange rate. Associated with this there will be a need to *sterilize* the monetary implications of flows.⁴ Second, it is particularly important that economies subject to these sources of volatility are flexible—with flexible labour markets and a minimum of other rigidities. Third, in so far as some fluctuations are coming through public spending,

³ Saving more as a precaution against lower than normal income.

⁴ Resource revenues are likely to be in the form of a foreign currency, such as dollars. So domestic citizens can spend the resource revenues, these dollars must be exchanged in the foreign exchange market for domestic currency. This exchange increases the demand for domestic currency relative to dollars and leads to an appreciation or rise in value of the domestic currency relative to dollars. An appreciation makes the country's exports more expensive for foreigners to buy, so should be avoided. In addition, the currency exchange increases the amount of domestic currency in the economy which leads to inflationary pressures. Both these effects can be mitigated by the country's central bank undertaking a sterilization operation which effectively removes domestic currency from the system to counteract these pressures.

government should form a view about what sorts of expenditure can be varied (increased and decreased) through time at little cost, and what are hard to reverse. For example, increases in the pay of government employees, given during a time of boom, are almost impossible to reverse. The over-generous Dutch benefit system installed during the natural gas boom of the 1970s took a generation to unwind. More generally, spending that leads to increases in consumption is hard to reverse, because habits are formed and political resistance will be high, while, as argued above, fluctuations in levels of investment are easier to manage.

2.2 Adjusting to Resource Wealth: Absorption and Structural Change

Mismatch between revenue flows and an efficient path of spending occurs not just because of short-run fluctuations in revenues, but also because of the difficulty of making rapid changes in the level of spending in the economy. In particular, a rapid buildup of spending following a resource discovery is likely to be highly inefficient as the economy will face absorption problems. The spending path needs to be set at a rate that is efficient for the economy as a whole.

Building-Up Spending. A number of factors determine the rate at which expenditures can be built up efficiently. One is the capacity of government to identify and implement projects and policies which are cost-effective uses of resources. There is a fuller discussion of this in Precept 9.

Another factor operates at the macroeconomic level. Spending resource revenues in the domestic economy (either on consumption or investment) typically raises the demand for both imports and domestically produced goods and services. If a country seeks to ramp up spending (public or private) too fast, then it will encounter supply bottlenecks. Instead of delivering extra output, spending will bid up prices. The basic argument is that where supply is not responsive—particularly the case for non-tradable goods, services, and inputs to production⁵—extra spending translates into higher prices and lower value for money.

What determines the responsiveness of the economy? Extra spending will in general be met partly by bringing more resources into employment, and partly by bidding

⁵ 'Non-tradables' are goods or services that cannot be readily imported, such as construction services.

resources away from an alternative use (and so ‘*crowding out*’⁶ the alternative use). In the former case, where the economy has unemployed (or underemployed) resources, then the increase in spending is welcome as it will draw these into use, without bidding up prices. In this case, government spending will have a more positive effect on economy⁷. This case may be of relevance for developing economies, although there are also bottlenecks which can significantly prevent such responsiveness. One likely bottleneck is in the construction sector, where resource booms are often associated with price inflation and consequently poor value for money. Resource-funded infrastructure investment might coincide with private sector resource-related investment, (e.g. worker accommodation and office construction) leading to a construction boom and a rapid increase in the price of non-traded inputs. As a consequence, the purchasing power of public expenditure is reduced and this brake on infrastructure investment creates other bottlenecks in the economy—in road capacity and traffic congestion, for example.

If extra spending is met predominantly by bidding resources away from an alternative use, then it is likely to be associated with price increases and concern about the activities being ‘crowded-out’. Sector effects aggregate into economy-wide changes in relative prices including higher wages and a higher price of domestic output as a whole relative to the price of foreign goods. This shows up as a real appreciation of the currency, and is the basis for the ‘*Dutch disease*’⁸ and crowding out of non-resource exports. It is sometimes argued that the private sector exports crowded out by resource-funded spending are of particularly high social value. This is because private sector export sectors can help foster range of economic benefits

⁶ ‘Crowding out’ refers to the problem where government activity may prevent or discourage private economic activity. For instance, a government project might use all the available labour in a region. Private projects looking to hire would have to offer higher wages to attract workers. This may not be affordable and the private initiative becomes unviable.

⁷ This extent to which aggregate demand in the economy responds to government spending is described in the Keynesian multiplier. The multiplier arises as spending creates income which is in turn spent, and so on. In the simplest Keynesian model \$1million of spending financed by foreign exchange from a resource windfall would raise income by \$1million times the share of spending that goes on imports.

⁸ ‘Dutch disease’ is named after the consequences for Holland’s economy of the discovery and subsequent extraction of natural gas in the North Sea from 1959. The main effect is that the large inflow of resource revenues, relative to the size of the economy, increases the value of the country’s currency against other currencies (an appreciation). This makes the country’s other exports more expensive for foreigners to buy, so reduces the competitiveness of the country’s other export industries.

such as knowledge acquisition, entrepreneurial activity, etc amongst the domestic population. (e.g., van Wijnbergen, 1984; Sachs and Warner, 1997). If spending from resource revenue crowds out these activities it will have a disproportionately large negative effect on the overall performance of the economy.

Box 1 demonstrates the macroeconomic results of rapid spending in an economy that cannot absorb it.

Box 1: Ghana's overspending of oil revenue

Ghana's experience following the 2007 discovery of offshore oil is an example of how fiscal mismanagement can emerge under the auspices of expenditure smoothing. The 2007 discovery of offshore oil in Ghana followed seven years of improving governance and macroeconomic management. Soon after the discovery the government increased spending dramatically. Expenditure smoothing justifies some increase in spending, though Ghana went significantly beyond this. The higher spending coincided with the lead-up to the 2008 elections. This spending had adverse effects on the economy as there were difficulties in absorbing it. If spending had been smoother the adverse effects would have been reduced.

The 2007 discovery of offshore oil in Ghana followed seven years of improving governance and macroeconomic management. In the build-up to the first democratic elections in 2000 there was a large fiscal expansion. This saw inflation peak above 40% p.a. and the currency depreciate by 50% against the US dollar. In the years that followed an independent central bank was established in 2002 and stability was restored with inflation falling to 10.9% in 2006. The only major disruption was a jump in government spending before the second democratic elections in 2004.

Soon after the discovery of oil the Ghanaian government again increased spending dramatically. The overall fiscal deficit rose from 7.8% of GDP in 2006 to 14.5% in 2008, with total revenue remaining relatively stable. This was financed by both domestic and foreign public borrowing, which rose from 7.9-10.5% and 4.5-5.2% of GDP from 2006-2008 respectively (World Bank, 2009).

Expenditure smoothing justifies some increase in spending, though Ghana went significantly beyond this. A simple application of the permanent income hypothesis suggests that when oil is discovered, expenditure should increase by the amount of permanent income from the windfall. This may be financed by borrowing if the windfall isn't received immediately. In Ghana's case, the present value of the windfall amounted to approximately \$14bn, yielding an appropriate rise in

government expenditure in the order of 1% of GDP (Stefanski, van der Ploeg and Wills, 2011).

The spending coincided with the lead-up to the 2008 presidential elections. Previous elections had also been characterised by jumps in government spending. In 2007/08 the government sought to protect the public from exogenous shocks to the world price of oil and food, through tax cuts and subsidies. The government also spent the \$750m proceeds of a dollar-denominated Eurobond issued in 2007, that had been prepared before the discovery of oil (approximately 3% of 2007 GDP).

The sharp jump in government spending had adverse effects on the economy because there were difficulties in absorbing it. The spending on non-traded services, alongside food and fuel price rises, saw inflation rise from 10.9% in 2006 to 18.1% in 2008. The exchange rate depreciated by 20.1% in 2008 and gross international reserves declined from \$2.26b (3.0 months of import cover) in 2006 to \$2.03b (1.8 months) in 2008.

If the spending increase had been smoother the adverse effects would have been less. Inflationary pressure would have been reduced. The government would not have borrowed as heavily in the domestic credit market once oil production began in 2010, avoiding crowding out domestic borrowers. The government would also have satisfied its public by not borrowing against future income, as indicated in a 2010 survey (Amoako-Tuffour, 2011).

Mitigating adverse effects. These adverse effects can be avoided, or at least mitigated, by several policy approaches. One is to be open to international trade, since imports can mitigate supply scarcities in particular sectors. This should extend to opening up sectors that might traditionally have been closed (such as construction and services) to international providers. A second is to identify and target potential bottlenecks in the economy, such as capacity constraints in the construction sector or in particular types of skilled labor. A third response is to make public investments that are complementary to these private sector activities--such as improvement of productive infrastructure or labor skills. And a fourth is to undertake policy reform that will increase the flexibility of the economy. This may include removing regulatory or other barriers to setting up new firms, simplifying and speeding up trade regulations, and simplifying labor market regulations that make it difficult to hire labor.

These arguments suggest that it will generally be desirable for spending to increase quite slowly--they also point to the need to *start* spending early. Countries need to

undertake preparatory work and to ‘invest in investing’ if they are to manage this adjustment process effectively (this concept is covered in Precept 9). But this profile of spending may be quite different from the actual profile of resource revenue, creating a mismatch between spending flows and resource income. Access to international capital markets—as either borrower or lender—is the way to bridge this mismatch.

Early ‘investments in investment’ may require borrowing. Following a resource discovery, a country may well find its access to international private capital markets much improved. However, there are good reasons for using public rather than private borrowing channels. It is critically important that the government uses—and is seen to use—any borrowed funds for genuine investment in preparation for the resource boom. An international lending facility, such as the International Bank for Reconstruction and Development (IBRD), may therefore be most appropriate; the costs of borrowing may be lower and the institutional procedures may afford greater oversight and analysis of the spending, assisting government in achieving (and being seen to achieve) an efficient investment program.

As resource revenues come on stream, the slow buildup of spending may well mean that income exceeds spending. This surplus can be put to two uses; paying off existing public overseas debt, and being ‘parked’ in a SSF until domestic absorptive capacity has increased to the point where it can be efficiently invested domestically.

2.3 Resisting Spending Pressure: Fiscal Rules and Resource Funds

A resource windfall will create both opportunities and demands for spending, even if it is low quality spending. Section 2.2 argued that rate of spending should be controlled, yet significant political pressure may hinder this process.

The difficulty arises from both the demand and supply sides. On the supply side, funds become available not just from the revenue itself, but also as resources provide collateral for borrowing; newly resource-rich economies are likely to find that international capital markets are suddenly opened to them and credit constraints are removed. This has led to surges in international borrowing; the spending may be unproductive and low return, but the collateral provided by the resource means that lenders are nevertheless willing to lend⁹.

⁹ For a description of Ghana’s experience see Bawumia (2011)

On the demand side, increased availability of funds will typically increase calls for spending. The value of political incumbency increases, since the present politician anticipates the future revenue flow and the possibility that this will enable him to better meet political (or private) goals. Since the value of incumbency is increased, so too is the incentive to use public funds in pre-election spending booms.

A resource boom will increase pressure to spend not just on the part of incumbent leaders, but also by others with claims on public funds. Spending ministries, regional governors, city mayors, members of parliament and private individuals are likely to step up bids for funds. This may be perfectly legitimate—spending ministries and regional governors are supposed to promote the interest of their department or region—but it creates a bias towards excess current expenditure from public funds. The tax base is shared, while the benefits of these projects accrue only to members of a particular group. This common property feature of the shared tax base means that groups will over-bid for funds, even if they recognise that their own projects have low returns and displace higher return national projects. This is sometimes described as the '*voracity effect*', and captured in economic models in which fiscal discipline is weak and groups are powerful enough to obtain public spending for their projects. A property of these models is that an increase in the shared tax base—such as that associated with natural resource revenue—will lead to an increase in spending by the groups and a possible decrease in funds left for national projects; the overall effect on economic performance can then be negative.

How can such spending pressures be countered? There are three standard answers.

The first is to have high levels of transparency. The president's spending spree is thereby visible and she can be held accountable for inefficient spending; spending agencies are accountable to parliament and the public.

The second is to ensure that the polity has a centralized system of financial control and authority. The finance ministry is, in principle, the body that can trade-off the competing demands of spending ministries, regional authorities, or other lobby groups. It is best placed to internalize the free-rider problem associated with a common pool of government revenues. However, to play this role effectively the finance ministry has to have control of incoming revenues and the political power to be able to resist competing demands.

The third mechanism is to legislate fiscal rules (sometimes called a 'fiscal constitution') that imposes ceilings (and perhaps also floors) on public spending from resource revenues, or public funds more generally. These rules are typically used in conjunction with either SWFs or SSFs, in which savings are deposited.

Fiscal rules will typically specify the criteria for depositing or withdrawing revenue from the fund. These could in principle be linked to resource prices, total revenues, or to other macro-economic considerations that reflect the economic cycle or the state of public finances. For example, in 2001 Chile instituted a fiscal rule whereby government expenditure is a function of structural revenues and is set to achieve a target structural fiscal balance, originally set at a surplus of 1% of GDP. In other words resource revenues could be used as long as a surplus of 1% of GDP was maintained.¹⁰ Structural revenues are computed on the basis of resource prices being at long-run equilibrium and GDP being at long-term trend level; judgements on both these variables are made by an independent committee. Differences between actual revenues and those needed to attain the target structural balance are paid into the Fund for Social and Economic Stabilization (now supplemented also by the Pension Reserve Fund). The policy has been highly successful, with the funds attaining a value of nearly \$20bn in late 2008,¹¹ and then being run down following the collapse of the copper price and the financial crisis.

The legal status of fiscal rules and associated funds varies widely. At one extreme are discretionary practices; virtually all resource-rich countries have Central Bank monetary operations which use foreign exchange reserves as a stabilization mechanism. At the other extreme are the formal rules, perhaps best exemplified by Chile, as described above. Formal rules have a number of advantages. If people perceive them to be credible, they can stabilize private sector economic expectations, and facilitate economic management. Since they are binding on politicians, they constrain discretionary spending in the medium term as well as in the short run. Importantly, they help prevent future politicians reneging on the promises, since they will inherit the same legal structure.

Setting up a Stabilization Fund which is credible and politically robust requires considerable political will. It is noteworthy that Chile, a country that has done this successfully, is also a country with fairly recent experience of reckless economic management and of hyper-inflation, which has created widespread support for fiscal discipline. However, although fiscal rules have legal force, they can of course be changed. In a democracy, it is appropriate that an elected government has some control; in Chile, the size of the target structural balance is set by the current government. And of course, governments can repeal legislation. A SSF which is not sustained through time is perhaps worse than no fund at all. Nigeria's experience

¹⁰ See case study: "Structural Balance Policy in Chile: What has been done and what has been learnt."

¹¹ Equivalent to 84 per cent of Chile's GDP in 2008.

with the Excess Crude Account saw a stabilization fund rise to \$30bn during the period to 2008,¹² only to fall to zero by 2011. Part of the fall was due to lower oil prices, but most was due to poorly controlled withdrawals from the Account. Essentially, this was a transfer from the well-intentioned politicians who set up the fund to the less well-intentioned who ran it down. Ghana's approach to establishing a stabilization fund has been exemplary in terms of transparency and public participation thereby increasing the likelihood of its stability and permanence (see Box 2 below and Tuffour 2011).

¹² Equivalent to 10 per cent of Nigeria's GDP in 2008.

Box 2 Public Participation in the Making of Ghana's Petroleum Revenue Management Law

Following major oil discoveries in 2007 and recognizing the potential for major revenue flows, the Government of Ghana tasked the Ministry of Finance and Economic Planning (MoFEP) with the preparation of a law to guide petroleum revenue management. Under the leadership of the MoFEP an inter-ministerial team comprising the Ministry of Energy, the Ghana National Oil Company and the Bank of Ghana conducted nationwide consultations with stakeholders from government, civil society, academic institutions and the private sector. The consultations, which included town hall meetings and distribution of questionnaires, were also seen as an opportunity to educate the public on the petroleum sector and manage expectations respecting its revenue impact.

Questions put to stakeholders covered the full range of issues critical to resource revenue management: assessment, collection and accounting of revenues; spending-saving trade-offs; budgetary allocation of resource revenues; establishment or not of petroleum fund(s), their structure and management ; and safeguards against abuse (transparency, public oversight, etc). References were made to international practice, but these consultations were considered as critical to ensuring the fit of any legislation with Ghanaian capacity and culture.

The consensus which emerged by and large represented good practice and was very close to the law which was finally passed. Specifically public preference favoured:

- assessment, collection and accounting by an inter-agency team led by the Revenue Authority;
- all petroleum revenues to go through a separate account at the Central Bank; integration or revenues and expenditures in the national budget;
- spending 50 to 70% of current revenues on social and physical infrastructure; placing 10 to 15% in a savings fund, and 5 to 20% in a stabilization fund;
- MoFEP oversight and Central Bank operational responsibility; full transparency and independent public oversight.

3. Implementation

3.1 Operational objectives and rules for Resource Funds

The objectives of a SSF should be clearly stated. These are likely to be as a temporary store for wealth and to be diversified with respect to the volatility of resource revenues. Since they are to provide a temporary store of wealth, funds should be held in safe assets such as money market accounts and short term bonds. Diversification requires selection of assets the prices of which have zero or negative correlation with resource prices.

There should be clear operational rules for moving money in and out of the fund and fund operations should be aligned with general budgetary practices. Spending out of SSFs should be undertaken through the government budget and normal budget appropriation processes. The fund should be externally audited and its activities and audit results published and presented to parliament. An independent supervisory board can help to assure good governance.¹³ Borrowing against the fund should be prohibited by law.

3.2 Resource Funds in Practice¹⁴

Most significant oil exporters now operate international funds, some of which have dual objectives (saving and stabilization, i.e. a combined SWF and SSF), while other countries have two (or more) funds with clearly stated objectives. For example, Botswana has both a long-run investment fund and a short-run liquidity fund with clearly stated objectives and different asset structures. This separation of fund according to objective is desirable for clarity, transparency and ease of administration.

The difficult problem is in the formulation of rules for payment into and out of the SSF. These can be formal (embodied in fiscal responsibility legislation) or may be more informal fiscal guidelines (ideally requiring justification of any significant departure from those guidelines). In some cases the rules are explicitly price and/or revenue contingent. For example, a number of funds work on paying in a fraction (typically between 50% to 100%) of 'excess revenue', 'excess' being defined on the basis of the deviation of the commodity price from a moving average price which

¹³ For a detailed discussion of the institutional and operational issues associated with the establishment and operation of a resource fund see Bell and Faria (2007)

¹⁴ See Ossowski et al. (2008).

may include futures indices. This is the approach Mexico follows on oil revenues. In other cases payments are made according to a rule on overall fiscal balance. For example, Chile specifies that there should be a structural government budget surplus over the economic and copper price cycles as forecast by a panel of experts.¹⁵

3.3 Alternatives: Depletion Strategies and Residual Volatility

An alternative to parking funds in an SSF is to alter rates of resource extraction, postponing revenue build-up until the economy's capacity to absorb spending has risen to match it. Whether or not this is wise is a matter of geology, politics and economics.

The geological objection is that it may be quite expensive to vary the extraction rates from the design capacity of the field or mine, so there could be a substantial real cost to using depletion policy to manage what is in fact a spending problem. Policies which call for retroactive changes in production profiles with consequential sharply diminished investor rates of return can also be expected to have a negative impact on investor interest.

The political argument goes the other way, and is based on the fact that SSFs—by their very liquidity—are easy for a government to plunder or draw down too fast. It is less easy to get a very rapid surge in funds from increasing the rate of extraction, so managed depletion is less open to political abuse. That said, it may prove politically impossible to manage public expectations in such a manner as to allow broad acceptance of leaving known resources in the ground, particularly if there are urgent unmet needs that warrant immediate increases in production and revenues. A compromise approach, adopted in some countries (e.g., Norway and Angola) is to manage the rate of extraction by managing the pace of license awards, and thus potential production, rather than the flow of existing production.

The economic case for postponed extraction relates to the opportunity cost of leaving resources in the ground. Here assets held above the ground (for example foreign assets in a SWF) might yield a given rate of return. A basic economic principle and useful rule of thumb says that the rate of return on assets left in the ground should be similar to the rate of return on assets invested in a fund¹⁶.

¹⁵ See case study: "Structural Balance Policy in Chile: What has been done and what has been learnt."

¹⁶ This is the Hotelling principle (see e.g. Dasgupta and Heal 1979 'Economic theory and exhaustible resources', (CUP). Expected rates of return have to be equalized by the following argument. If the return to leaving resources in the ground is expected to exceed that on other assets, then people

Furthermore, since resources held in the ground are expected to make neither speculative gains nor losses on average, governments should avoid using changes in the rate of depletion as a tool to speculate in resource markets. In contrast, there is a strong economic argument for pursuing extraction in order to diversify national wealth. The assets of a resource-rich economy are generally relatively undiversified, and subsoil assets the least so. Even if the economy cannot yet absorb spending, pursuing depletion and then holding some wealth in financial assets which are relatively safe, or at least uncorrelated with the price of the resource, leaves the economy less at the mercy of commodity price fluctuations than does leaving the resource in the ground.

The size and expected lifetime of a resource has implications for the right balance between savings (accumulation of foreign or domestic assets) and consumption. In general, the shorter the lifetime of a resource deposit, the higher the rate of saving out of revenues. This implies that the optimal spending behavior by countries with relatively modest resource deposits will be very different to those possessing large and long-lasting reserves.

Key References

- Amoako-Tuffour J. (2011) "Public Participation in the Making of Ghana's Petroleum Revenue Management Law". *Natural Resource Charter Technical Advisory Group Working Paper*.
- Bacon, R. and Tordo, S. (2006) *Experiences with Oil Funds: Institutional and Financial Aspects*. ESMAP Report, World Bank.
- Bawumia, M. (2011) *Oil Discovery and Fiscal Discipline in Ghana: Oil Curse before the Oil?*. Draft paper, forthcoming.
- Bell, J. and Faria, T. (2007) "Critical Issues for a Revenue Management Law". In Humphreys, M., Sachs, J., Stiglitz, J., eds. *Escaping the Resource Curse*, New York, Columbia University Press.

would leave resources in the ground. This reduces current supply, changes the current price, and hence changes the expected rate of return.

- Collier, P. and Goderis, B. (2009) "Commodity Prices, Growth, and the Natural Resource Curse: Reconciling a Conundrum". MPRA Working Paper, University of Munich.
- Davis, J., Ossowski, R., Daniel, J.A., and Barnett, S. (2003) "Stabilization and Savings Funds for Nonrenewable Resources". In Davis, J.M., Ossowski, R., and Fedilino, A. eds. *Fiscal Policy Formulation and Implementation in Oil Producing Countries*. Washington, D.C. IMF.
- Dasgupta, P. and Heal, G. (1981) "Economic theory and exhaustible resources". *Resources Policy*. 7 (4)
- Gelb, A. and Grassman, S. (2008) "Confronting the Oil Curse". In: *Population and Natural Resources*. Proceedings of the 6th AFD-EUDN Conference.
- Ossowski, R. et. al., (2008) *Managing the Oil Revenue Boom: The Role of Fiscal Institutions*. IMF Occasional Paper No. 260.
- Poelhekke and Van der Ploeg, R. (2009) "Volatility and the Natural Resource Curse". *Oxford Economic Papers*. 61(4). p. 727 – 760.
- Sachs, J.D. and Warner, A.M. (1997). "Natural Resource Abundance and Economic Growth". *Harvard Institute of Economic Research Discussion Paper No. 517*, Cambridge, Massachusetts
- Sachs, J.D. (2007) "How to Handle the Macroeconomics of Oil Wealth". In Humphreys, M., Sachs, J.D., and Stiglitz, J.E. *Escaping the Resource Curse*. New York, Columbia University Press.
- Stefanski R., van der Ploeg F., Wills S. (2011) "Harnessing Oil Revenues in Ghana". *International Growth Centre Working Paper 12/0034*
- Tuffour, J. (2011) "Public Participation in the Making of Ghana's Petroleum Revenue Management Law", draft paper.
- van Wijnbergen, S. (1984). "The 'Dutch Disease': A disease after-all?". *The Economic Journal*. 94 (373). p. 41 – 55.
- World Bank (2009) "Economy-wide impact of oil discovery in Ghana". *World Bank publications*.