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Findings

23098

Africa Region . Number 30 . January 1995

Findings reports on ongoing operational, economic and sector work carried out by the World Bank and its member governments in the Africa Region. It is published periodically by the Africa Technical Department on behalf of the Region.

Macroeconomic Risk Management in Nigeria : Dealing with External Shocks

In Nigeria, oil accounts for more than 90 percent of its exports, 25 percent of its Gross Domestic Product (GDP), and 80 percent of its public revenues. Thus, a small oil price increase can have a large impact. A US\$1 increase in the oil price in the early 1990s increased Nigeria's foreign exchange earnings by about US\$650 million (2 percent of GDP) and its public revenues by US\$320 million a year. Nigeria's reliance on oil production for income generation clearly has serious implications for its economic policy management. This study, *Nigeria : Macroeconomic Risk Management, Issues and Options* addresses the policy choices before the Nigerian government that will enable it to manage external oil shocks and those emanating from exchange and interest rates, which affect debt service obligations.

In resource-based economies, such as those dependent on oil, exports and government revenues are uncertain and highly volatile. Uncertainty means that a variable, say, the oil price for the coming years, is simply unpredictable. Volatility means that even if another variable, such as oil production, changes from year to year, its level is still predictable. Consequently, eliminating uncertainty may not eliminate volatility (Box 1).

Uncertainty of revenues can be addressed by using hedging instruments which, for a fee, provide insurance against an expected price fluctuations. Hedging instruments allow governments, corporations and individuals in developing countries to reduce their vulnerability to fluctuations - currency, interest rate and commodity price - by "selling" them to other agents better able to bear such risks. Such hedging may allow a country to forecast the oil revenue it would receive, say, next year. But it may not reduce the volatility of revenue, because the prices of these instruments are also volatile.

This volatility can, however, be managed by an oil stabilization fund, which complements the

hedging.

Box 1: Is Uncertainty the same as Volatility?

Standard economic theory has a hard time trying to make the distinction between uncertainty or instability (or volatility). But the distinction is clear in common usage.

Volatility or instability is associated with something not firm or fixed, readily changing, not steady in action or movement. According to this definition, oil production may not be steady through time, but its fluctuations may be known in advance: they may be predictable. A country may know that oil production could increase next year by 10 percent, and fall by 5 percent thereafter during the following five years.

Uncertainty is associated with lack of knowledge about an outcome or result. When an event or variable is uncertain, it cannot be predicted. The event or variable might also be unstable, and that instability or volatility cannot be anticipated either. In this sense, uncertainty encompasses volatility or volatility might be deemed as a subset of uncertainty.

Although markets for hedging instruments tend to be limited to short maturities and costly, they may help to eliminate at least a share of oil revenue uncertainty. The remaining uncertainty and volatility can be managed by an oil stabilization fund.

The use of these instruments can lessen the authorities' agonizing as actual revenues depart from budgeted numbers. If revenues increase, should expenditures be increased accordingly? If revenues fall, should expenditures be

reduced? If there is a revenue variation after the budget is approved, should finance ministers assume that the revenue variation is permanent? Or transitory? And if transitory, how transitory?

The 1991 World Development Report, recognizing the difficulty in ascertaining whether a shock will be permanent or transitory, argued that "prudence calls for treating all favorable shocks as temporary, at least until the dust settles." But, the Report did not explain what ministers have to do to know when the dust settles. In fact, the dust never settles. And this is precisely the difficulty in managing resource and commodity-based economies.

Nigeria is exposed to more than oil price changes. Its exposure to exchange and interest rate uncertainty and volatility affects its debt service obligations, and thus needs managing as well. With public external debt amounting to 100 percent of GDP, a large share of debt is in currencies other than the US dollar. As some interest rates are not fixed, the economy is sensitive to changes in cross-currency exchange rates and interest rates. Adverse movements in these rates, which have been extremely volatile in the past two decades, explain much of the increase in the rapid growth of

Nigeria's debt burden in the 1980s.

The Costs of External Exposure

Unmanaged external shocks bring difficulties and costs to the Nigerian economy such as:

- Fiscal and monetary disequilibria and inflation.
- Exchange rate appreciation that affects non-oil tradable sectors such as agricultural cash crops.
- Lower private investment.
- Lax public project selection criteria.
- Private capital flight.
- Decision-making process weakened by political lobbying for windfalls.

External imbalances and fiscal and monetary disequilibria and inflation have been a recurrent problem because expenditure programs have not been cut when oil prices have fallen. This has been either because the price falls were seen as temporary, or because programs were difficult to stop or reduce when booms were over. In the 1970s and early 1980s, this problem was so severe that, even before oil prices began to fall, the excess of expenditure over revenues had become persistent, initiating the growth of Nigeria's large stock of external debt. Given that external and internal imbalances cannot be maintained indefinitely, expenditure cuts have been unavoidable. But those cuts have been too late, or too costly, or both.

Nigeria fell victim to the spending disease when oil prices and public revenues were high in the 1970s and early 1980s. Emerging export revenues were spent on the domestic economy, on non-tradable particularly, increasing the relative prices of non-tradable goods and wages. Although favoring the expansion of non-tradable sectors, such as services and construction, this response hurt the development of tradable (other than oil). So, Nigeria, a net exporter of agricultural products in the early 1970s, was importing more than US\$ 2 billion (2,000 million) a year in foodstuffs a decade later.

Private investment also suffered. With the public expenditure program expanding and contracting at the whim of oil revenues, the volatility and uncertainty that plague oil earnings were channeled to the domestic economy through changes in relative prices and in the associated structure of production. If the oil shock had been permanent, the response would have been the correct one. But because oil prices are uncertain and highly volatile, investors cannot predict when the next shock will take place. Nor can they predict the direction of the next shock or which sector will be favored and which one hurt. This uncertainty increases the risk investors face in non-oil activities, reducing the volume of private investment and slowing the growth of the non-oil economy. As several World Bank studies confirm, volatile relative prices are one of the main factors limiting private investment in developing economies.

With high oil prices and high revenues, project selection criteria became very lax. Belief in the oil booms' permanence encouraged Nigeria to finance large public expenditure programs. But the quality of much of the investment was so poor that many investments did not pay for themselves. Some projects that might have become viable had oil prices remained high turned non-viable when oil prices fell. For political reasons, however, the projects were not shut down.

There are other macroeconomic costs as well. Capital flight is often the private sector's response to a fear that, once oil revenues fall, unsustainable budget deficits will bring inflation and higher future

taxes. And there is often an unproductive political struggle among the economic players, trying to appropriate windfalls during the booms and to avoid losses during the busts. This process weakened decision-making in Nigeria.

Options for External Shock Management

A government can manage its external vulnerability in four ways. It can self-insure by selling oil reserves, or by creating an oil stabilization fund. It can transfer risk abroad through the use of hedging instruments and credit markets. It can transfer risk to the private sector by, say, privatizing the oil industry or changing production contracts with the oil companies, or by transferring windfalls to the private sector. And it can use a mix of these options.

Self-insuring

One option for managing oil shocks is to convert oil reserves into a secure financial asset, such as US treasury bills, or into a physical asset. The sale of oil is limited by economic, political, and institutional constraints. Economic uncertainty and volatility could also be avoided by reducing oil production, but the benefits of oil production for improving welfare more than offset the costs of economic uncertainty and volatility. As long as the rate of return on the assets that may be acquired with oil revenues exceeds the expected rate of growth of the real oil price, oil production should be limited only by the available extraction technology. Otherwise, it would be more advantageous to keep oil reserves underground when prices are low and to sell only when oil prices are high.

Another way to self-insure is with a stabilization fund, which is a basic rule or device to guide government expenditure. The government, by saving resources in some periods, can reduce the need to cut spending in other periods. By stabilizing expenditures, such a fund helps stabilize relative prices and the real exchange rate. If the oil price change turns out to be permanent, a well-designed fund can smooth expenditure adjustments upward or downward. This would avoid the need for sudden and traumatic expenditure cuts if shocks turn out to be negative. If the shock is positive, it permits the government to increase expenditures gradually, with sufficient advance warning to enhance its own programming, implementation, and management capacity. By permitting expenditure adjustments, the fund also reduces the possibility of a government running out of resources when permanent shocks are negative, or of its indefinite growth if permanent shocks are positive. Following the example of Chile, Nigeria could create an oil

stabilization fund, which the Chilean government created in cooperation with the World Bank

Box 2: Chile's Copper Stabilization Fund

The Chilean Copper Stabilization Fund was set up in 1985 as part of the Chilean Government's structural adjustment program with the Bank. The fund aims to stabilize export revenues by using foreign exchange reserves to absorb cyclical variations in revenues, i.e., it promotes the role of precautionary savings. Under the fund agreement, the Chilean Government deposits surplus revenues from the parastatal copper producer to the general budget with the Central Bank. It can withdraw these funds in case of a shortfall in export revenues.

A reference price is defined and when the actual price is above the reference price, the scheme mandates a deposit of a proportion of the excess revenues (and, correspondingly, when the actual price is below the reference price, a withdrawal can be made). Surplus funds are viewed as international reserves. As copper prices remained high in the late 1980s and surpluses grew, the accumulated reserves were used in 1989 to buy back part of Chile's external debt and to deal with an unexpected fall in export earnings.

Transferring risk abroad

The Nigerian government could take advantage of world hedging markets, which, for a fee, provide insurance against unexpected revenue fluctuations.

In Nigeria, neither the government nor the private sector uses these instruments to reduce exposure. Why? Because of lack of information, lack of awareness of the benefits, the complexities of managing a hedging program, and lack of an adequate government institutional and policy framework. Another reason is that markets for relevant hedging instruments are generally limited or not of appropriate maturities. At the same time, developing countries' access to these growing international financial markets has been restricted by their lack of creditworthiness. Mexico's recent experience shows, however, that a developing economy can participate in these growing markets.

Transferring risk to the private sector

The private sector could help in managing external exposure. This might involve transferring ownership of the oil sector to the private sector through alternative financial and equity arrangements. It might involve transferring windfalls, which, during positive shocks, would mean reducing taxes, increasing subsidies, or appreciating the real exchange rate.

Transferring windfalls to the private sector while maintaining public ownership of the oil sector would be cumbersome. During positive shocks the windfalls could be transferred to the private sector through lower taxes, direct transfers, and handouts. Another way would be to set a target for the Central Bank's international reserves and sell windfall reserves to the public under a floating exchange rate. This option, however, appreciates the exchange rate. These measures would have to be reversed once the oil price fell back from its high levels, to prevent the budget deficit from widening. If (unpredicted) negative shocks were to occur, public expenditure would have to be cut or the real exchange rate depreciated because it might not be possible to increase taxation in the short run. Nor would it be possible to force the private sector to transfer resources to the government to sustain expenditure.

Mixing self-insurance and risk-transfer options

The best strategy to manage external exposure is to mix self-insurance mechanisms, such as an oil stabilization fund, and risk-transfer mechanisms such as hedging instruments. The two general options are complementary. Expanding the use of one widens the possibilities for using the other, and

each way of managing risk can address a different aspect of external exposure.

Self-insurance, such as an oil stabilization fund, can increase the country's international creditworthiness and thus improve its access to financial markets, including the markets for hedging instruments. Wider and deeper use of financial markets, in turn, may provide additional resources to diversify the economy away from oil. That can increase the economy's credibility abroad, expand its ability to borrow, and reduce its cost in the markets for hedging instruments.

In developing a comprehensive program to manage Nigeria's external exposure and the costs of the exposure, it is important to address both oil price *uncertainty* and oil price *instability*. Hedging instruments are ideal for reducing the exposure to uncertainty, and a stabilization fund can reduce the exposure to the instability of the oil price. Selling oil forward year after year, for example, might allow Nigeria to anticipate the price it would receive the following year thus reducing oil price uncertainty. But this strategy alone would not necessarily reduce the volatility of Nigeria's cash flow. The volatility of oil futures prices has always been pronounced sometimes almost as high as spot price volatility and this volatility can be managed by a stabilization fund. A well-constructed strategy would thus combine a self-insurance mechanism, such as an oil stabilization fund, with specialized financial instruments, such as hedging instruments.

Some of the volatility could, in principle, be managed by borrowing in

world capital markets. But Nigeria and many other developing economies have severely limited access to lending markets, particularly when they needed those markets most. International commercial lending to developing countries has tended to be available when not needed and unavailable when needed. A similar situation obtains with regard to contingent borrowing facilities, such as the Compensatory and

Contingency Financing Facility of the International Monetary Fund and the European Community's STABEX. Moreover, Nigeria does not qualify for these facilities because they do not cover oil. So, for Nigeria, an oil stabilization fund may be the best way of addressing oil price volatility.

Managing the country's vulnerability to oil price, and exchange and interest rates exposure, is thus a critical factor in addressing related serious macroeconomic policy issues.

Nigeria : Macroeconomic Risk Management- Issues and Options. Report No. 11983-UNI. 1994. Country Operations Division, Western Africa Department. This report was prepared by a team led by Santiago Montenegro and comprising Constantjin Claessens, Sudarshan Gooptu, Mudassar Imran, and Andrew Powell (consultant). This article was prepared by Santiago Montenegro. For copies, please contact Ms. Athena Azarcon, Room J 6-257, Western Africa Department, World bank, 1818 H Street, NW, Washington, D.C. 20433. Te. no. (202) 473-36049.

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