West Africa Conference: A Primer on Macro-Fiscal Frameworks for Resource-Rich Countries

I.   PRINCIPLES FOR NATURAL RESOURCE REVENUE MANAGEMENT

1.   **Effective management of natural resource revenue is essential for a country to achieve sustained benefits and to avoid the natural resource curse**. Once a proper fiscal regime is in place, a key starting point is the design of an appropriate macro-fiscal framework that provides for the management of the revenue flow. This note sets out principles that countries should consider as they design an appropriate fiscal policy framework to meet their developmental needs.

2.   While every country is unique, natural resource revenue presents key challenges that justify a special fiscal policy framework, such as:

- **The revenue flows can be very large….** When this is the case, there is a justification for a macro-fiscal framework focusing on the management of these revenue flows. On the other hand, if natural resource revenue is not as large, the case for a special macro-fiscal framework is less compelling.

- **…and volatile….** The macro-fiscal framework should provide a buffer to avoid transmitting revenue volatility to government expenditure. This can be achieved by saving part of the resource revenue in good times and draw on these financial savings in bad times. In principle, this should allow a country to have a more stable and less pro-cyclical expenditure path.

- **…as well as uncertain**. This highlights the importance of a macro-fiscal framework that can adapt to different outcomes.

- As the resources are finite, **ultimately the resource revenue flow will come to an end.** However, the time horizon for the revenue flow will differ significantly between countries. This may be quite short (10-30 years) for new producers with only a few discoveries, while much larger for countries with large and well-established extractive industries.[1]

3.   **The macro-fiscal framework should support the following objectives,** which can at times be conflicting:

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[1] In the very long run, of course, the impact of climate change policy and eventual decarbonization of the economy may make some hydrocarbon resources obsolete and the fiscal framework should be adjusted accordingly.

- **Macroeconomic stability:** Fiscal policy plays a key role in providing short to medium term macroeconomic stability. The main objective is to manage the aggregate demand impact arising from fiscal spending financed from natural resource revenue. In contrast to general tax revenue, financing government expenditure from natural resource revenue does not draw domestic resources away from other activities. There is a tendency for government spending to be procyclical – e.g., during commodity price booms, natural resource revenue-financed expenditure increases, with the reverse effect during commodity price slumps. This can be countered by delinking expenditure from the revenue volatility by building adequate precautionary savings. Drawing on these precautionary savings can help sustain spending following temporary shocks or facilitate a more gradual adjustment to permanent shocks.

- **Macroeconomic sustainability:** Fiscal policy is critical to ensure that the use of natural resources is sustainable in the long run: loosely defined to ensure that the chosen fiscal path can be sustained in the long run without the government defaulting. However, reflecting the finite nature of the resources, the sustainability also touches upon how the benefits from natural resources should be shared between generations. One way is through inter-generational savings to provide benefits for future generations. With sufficient savings of a temporary revenue flow, a permanent level of spending can be provided in perpetuity benefiting all future generations.

- **Address developmental needs:** In recent years, academic and policy-oriented research has focused on how investment that enhances the growth potential of an economy also can benefit future generations (although this hinges critically on the quality of the public investment and continued maintenance spending countering any depletion of the capital assets). This provides a compelling case for a more flexible sustainability focus in developing countries with large unmet development needs. A variant of this argument is that the marginal benefits from public investment may be higher in a capital constrained economy. This provides justification for more front-loaded use of natural resource revenue to finance a gradual scaling-up of growth-enhancing expenditure. Given absorption constraints, the scaling-up is often best achieved by a gradual pace to circumvent inefficiencies arising from bottlenecks.

4.   **A macro-fiscal framework should contain the following components:** an indicator to assess the macro fiscal policy stance; an anchor or rule to guide fiscal policy in the short to medium term; and a benchmark for long run sustainability.

5.   **Fiscal policy indicators:** These are indicators that will be used to assess whether the fiscal policy stance is contractionary or expansionary. They will also show whether the government is saving or borrowing. For economies with significant natural resource revenue, the two key fiscal policy indicators are:

- **Overall fiscal balance**: The difference between total revenue and total expenditure. It measures the change in net financial assets and gross financing needs. For countries that are accumulating financial assets from natural resource revenue, the overall fiscal balance will be positive.

- **Non-resource primary balance:** This is the difference between non-resource revenue and primary expenditure (total expenditure minus net interest payments), for consistency scaled by non-oil GDP. Usually expenditure is also adjusted for any expenditure directly associated with the resource revenue generation (e.g., cash call payments). The non-resource primary balance provides a measure of the underlying fiscal policy stance and domestic demand impact associated with fiscal policy. In most instances, a stable path for the non-resource primary deficit is optimal reflecting either a counter-cyclical or neutral policy stance.

6. **Benchmarks for long run sustainability**: These provide a measure of the sustainable long run fiscal policy. The current stance of fiscal policy can be assessed against this benchmark. If the fiscal policy stance is judged to be unsustainable, the benchmark provides an indication of the adjustment in fiscal policy that is required to ensure long run sustainability.

- Debt sustainability assessments provide an indicator of the sustainable fiscal policy stance that can be implemented in the long run without risking debt default. For economies with natural resource revenue, the sustainability assessment should be done on net debt taking account of financial assets (and the discounted value of future revenue from resource still in the ground).

- A common option is an application of the permanent income hypothesis (PIH) including natural resource revenues (treating the discounted value of the resources in the ground as an asset). Total government wealth is the sum of the net financial assets (financial savings minus debt) and the resource wealth estimated by discounting the expected flow of government revenue from resources still in the ground. Multiplying the total government wealth with an estimated long run return provides a benchmark for the non-resource primary deficit that can be financed in perpetuity drawing down on financial savings and future revenues.

- The Bird-in-Hand indicator provides a tighter measure of sustainability by only including financial assets saved from past natural resource revenue, but not including the value of future revenue from resource still in the ground until these are extracted, and part of the revenue may be converted into financial assets.

7. **Medium-term fiscal policy rule/anchor**: This is often the part of the macro-fiscal framework that is most visible in the public eye. A fiscal rule anchors the short to medium-term fiscal policy stance. The key question is to ensure the credibility of the chosen fiscal

rule. A common dilemma is whether a fiscal rule is more credible if defined in a very tight and rigid manner, or if the fiscal rule is more flexible to adapt to different circumstances.

- **Price-based rules**: Under this type of fiscal rule, the overall deficit is either balanced or capped at a specific level (typically expressed in percent of GDP) using a long-term commodity price or assumed "budget" price. These rules are simple to apply (and to explain to policymakers and the public) but require credible and independent price forecasts. Otherwise, the process can become politized or manipulated through the choice of the long run price. The most common price-based rules are not directly linked to any measure of long-run sustainability. They may be more appropriate for countries with a long-term horizon for expected natural resource revenue.

- **PIH-type rules**: Under this type of rule, the non-resource primary deficit is capped at the estimated sustainable use of revenue from natural resources. A PIH rule can be made more flexible to accommodate gradual front-loading spending offset by higher savings in the future. The main attraction is that these rules are conceptually linked to the sustainability framework. They may be more appropriate for countries with a shorter time horizon for resource revenue. One disadvantage is that they are more complex rules to apply and build political consensus around. Another challenge is how to make these rules more flexible in a manner that does not introduce excessive volatility.

- **Revenue rules**: Under this type of rules, resource revenue is allocated to consumption and savings using fixed parameters, and can be refined by using long-term commodity prices. These rules are simple to apply but have conceptual shortcomings. They are not linked to any concept of long term sustainability and may also not provide short term stability if the rules do not restrain the budget deficit in a consistent manner.

8.   **For countries with a natural resource fund or a sovereign wealth fund, the deposit and withdrawal rules for the fund should be consistent with the fiscal rule**. A common shortcoming of macro-fiscal frameworks is that the resource fund withdrawal and deposit rules are not consistent with rules on fiscal policy or the budget. This could lead to a situation where resource revenue is saved in a fund according to tight deposit and withdrawal rules at the same time as the budget deficit implies an unsustainable and inconsistent level of borrowing.

II. PREREQUISITES FOR EFFECTIVE NATURAL RESOURCE REVENUE MANAGEMENT

9.   **In addition to the design of an appropriate macro-fiscal framework, countries need to develop capacity to effectively manage the natural resource revenue flows**. The key prerequisites are:

- A credible medium to long term horizon in fiscal policy formulation: this requires having capacity to develop credible medium term fiscal framework incorporating natural resource revenue and medium-term expenditure frameworks/budget frameworks.

- Capacity to prepare medium to long run revenue forecasts for natural resources, including different scenarios to test uncertainty. The approach to revenue forecasts will depend on the specific country. For example, a country with only a few large mining or petroleum projects may be able to develop a detailed project specific revenue forecast. Countries with more diversified mining or petroleum sectors may adapt a more aggregate approach to revenue forecasting.

- Ability to effectively design and implement public investment to ensure that resources in the ground are converted into real assets (either physical or human capital). This often requires improvements in the public investment management capacity from project identification, appraisal, implementation and evaluation.

- Natural resource revenue flows being integrated with the budget and public financial management frameworks. It is particularly important to not fragment the budget process. This suggest that any resource funds should not have their own expenditure authority, but that withdrawals from the funds should instead only be used to finance the budget in accordance with the fiscal.

III. MACRO-FISCAL POLICY FRAMEWORKS IN SELECTED WEST AFRICAN COUNTRIES

10.   This final section provides a brief overview of macro-fiscal policy frameworks and fiscal rules in West Africa, and a brief discussion of how the existing rules address natural revenue management issues.

- **West African Economic and Monetary Union (WAEMU)**. First-order convergence criteria include a balanced budget (excluding budget grants and foreign-financed capital expenditures) or better and public debt no higher than 70 percent of GDP. In January 2015 changes to the WAEMU convergence criteria were agreed. The convergence criteria on balanced budgets specify that the overall fiscal deficit (including grants) should remain below 3 percent of GDP. The nominal debt-to-GDP ratio was kept at 70 percent of GDP. There are no specific rules taking into account natural resource revenue management.

- **Ghana:** Benchmark oil revenue at 7-year moving average price, with 70 percent used to finance the budget. Remaining revenue allocated between stabilization and heritage funds. There is no explicit fiscal anchor limiting the budget deficit. During the initial application of the rule, challenges were encountered with the moving average price as

adjustments to the moving average were lagging the falling price during the commodity price slump. As there were insufficient financial savings built up, the inbuilt stabilization of the expenditure path could not be realized.

- **Nigeria:** Overall deficit for the federal government budget at 3 percent of GDP at budget oil price. The price at times adjusted through political negotiations during budget formulations and there is no independent mechanism to determine the sustainable level of the price.

- **Liberia:** The Public Financial Management Act of 2009 and regulations to the 2009 PFM Act introduced a debt ceiling rule limiting public debt to 60 percent of GDP and requiring that any borrowing be used to finance capital spending only.

- **Sierra Leone:** The Public Financial Management Act will contain fiscal rules.

Appendix: Other Examples of Fiscal Rules for Resource Rich Countries

- Chile: Structural balance rule with long-term price of copper and molybdenum (10-year forecast by an independent committee). The fiscal balance target has been adjusted in recent years.

- Mexico: Balanced budget rule at reference price. Investment by PEMEX excluded while containing an escape clause.

- Mongolia: Structural deficit calculated at 16-year average of mineral prices. Deficit target at 2 percent of GDP, although limit temporarily increased. Introduced debt ceilings.

- Russia: Oil revenues above the "base" oil price saved in Reserve Fund until 7 percent of GDP target reached. Above that, half goes to National Wealth Fund. 5-year backward looking average price.

- Trinidad and Tobago: 40 percent of oil and gas revenue above estimated revenue at 11-year price average used to finance the budget. The remainder goes to Heritage and Stabilization Fund.

- Norway: Non-oil structural deficit capped by the expected return on resource fund (Government Pension Fund Global), estimated at 4 percent. Deviations allowed over the business cycle.

- Timor Leste: Non-oil deficit capped by estimated sustainable income (ESI), calculated annually as 3 percent of the sum of the petroleum fund balance and the present value of expected future petroleum receipts. Deficits can exceed the ESI if justified and approved by Parliament. In recent years, scaling up of public investment has led to significant deviation.

Appendix: The Basic Math of Fiscal Sustainability for Natural Resource Revenue

The overall fiscal balance for a country with natural resources can be decomposed in any year t into resource revenue (RT_t), non-resource revenue (NRT_t), primary expenditure (E_t), income from the initial stock of financial assets (A_{t-1}), and interest payments on the initial stock of debt (D_{t-1}). In nominal terms, the ***overall fiscal balance*** can then be written as

$$OB_t = NRT_t - E_t + RT_t + i_t^a A_{t-1} - i_t^d D_{t-1},$$

where i_t^a and i_t^d are, respectively, the interest rate earned on the stock of assets and the interest rate paid on the stock of debt. The overall fiscal balance is equal to the change in net financial assets, $OB_t \equiv \Delta(A_t - D_t)$. The ***non-resource primary balance*** is defined as $NRPB_t \equiv NRT_t - E_t$. Resource-rich countries often run overall fiscal surpluses (for example during resource-revenue booms), which enable these countries to accumulate large stocks of financial assets on their fiscal balance sheet at the same time that the non-resource primary balance can be in deficit.

The ***intertemporal budget constraint*** requires that the initial stock of net financial assets of the government equals the present value of future primary balances. For countries with exhaustible natural resources, this can be decomposed into the non-resource primary balance and net resource revenue (for a fixed period of time, N).

$$A_{t-1} - D_{t-1} = -\sum_{s=t}^{\infty} \frac{NRPB_s}{(1+i)^{s-t+1}} - \sum_{s=t}^{N} \frac{RT_s}{(1+i)^{s-t+1}}.$$

The asset the government holds in the form of natural resources is derived from the present value of the future path of resource revenue (the "resource wealth"). The net wealth (W_{t-1}) of the government at the end of period $t-1$, thus, is the initial stock of net financial assets $(A_{t-1} - D_{t-1})$ plus the present value to the government of the natural-resources asset in the ground (V_{t-1}).

$$W_{t-1} \equiv A_{t-1} - D_{t-1} + V_{t-1} = -\sum_{s=t}^{\infty} \frac{NRPB_s}{(1+i)^{s-t+1}}, \quad \text{where } V_{t-1} \equiv \sum_{s=t}^{N} \frac{RT_s}{(1+i)^{s-t+1}}.$$

There are potentially many alternative paths for the non-resource primary balance consistent with this intertemporal constraint. One of those is the ***permanent income hypothesis approach (PIH)***, which provides a simple benchmark assuming the non-resource primary balance is constant over time. To be sustained for an infinitely long period, the annual level of the primary balance should be no greater than the return on net wealth (adjusted for inflation, the notional real return on wealth is the real interest rate $\left(\tilde{r} = \dfrac{i-\pi}{1+\pi}\right)$, where π is the constant long-term inflation rate). In that context, the following rule is consistent with keeping the real non-resource primary balance constant: $(NRPB_t = -\tilde{r}W_{t-1})$.