INTERNATIONAL MONETARY FUND

The Role of Fiscal Institutions in Managing the Oil Revenue Boom

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EXECUTIVE SUMMARY AND CONCLUSIONS

Oil-producing countries (OPCs) have benefited from the rise in oil prices in recent years, with important implications for their external and fiscal balances. This paper examines the fiscal responses of OPCs to the oil boom and the role of special fiscal institutions (SFIs)—oil funds, fiscal rules and fiscal responsibility legislation (FRL), and budgetary oil prices—in fiscal management in OPCs, and draws some general lessons.

The paper first describes the fiscal responses of oil producers to the oil boom.

- On average, through 2005 governments used close to half of the additional fiscal oil revenue to increase non-oil primary spending and/or lower non-oil primary revenue. The average non-oil primary fiscal deficit relative to non-oil GDP rose by a half. OPCs turned overall fiscal deficits in the late 1990s into growing fiscal surpluses. The variance across countries, however, has been significant.

- Higher oil revenues have allowed OPCs an opportunity to increase public spending on priority economic and social goals, which can be an appropriate response to rising oil prices. At the same time, many OPCs that have increased spending rapidly show low indices of government effectiveness, which may raise questions about their ability to use the additional resources effectively. It also highlights the tradeoffs between pressing developmental needs and the institutional ability to address them effectively and efficiently.

- The long-term fiscal sustainability of a number of OPCs improved between 2000 and 2005, assessed on the basis of a sustainability benchmark, but in others it deteriorated, mainly due to the expansion in non-oil primary deficits; these results, however, are subject to some caveats. Some OPCs are vulnerable to oil shocks and the possible need for large adjustments.

A number of OPCs have established SFIs aimed at enhancing fiscal management and helping to achieve broader fiscal policy objectives.

- ***Oil funds.*** Many countries have had difficulty managing funds with rigid operational rules, as tensions have often surfaced in situations of significant exogenous changes or with shifting policy priorities. Earmarking the resources of oil funds for specific uses, and allowing extrabudgetary spending by the funds can complicate fiscal and asset management and reduce efficiency in the allocation of resources. Funds that finance the budget are integrated with the budget process and have avoided these problems. Transparency and accountability practices for funds differ across OPCs. There have been growing efforts to better integrate funds with budget systems.

- ***Fiscal rules and FRL***. The experience of OPCs with fiscal rules and FRL has been relatively limited. The evidence suggests that implementation of quantitative fiscal rules has proved very challenging, mainly due to the characteristics of oil revenue and political economy factors. Procedural FRL may hold more promise for improving fiscal management.

- ***Quantitative evidence.*** An econometric analysis of the impact of SFIs on the policy response of OPCs to the oil revenue boom (using panel regressions and controlling for relevant factors) shows no evidence that their introduction has had an impact on fiscal outcomes.

The experience with the recent oil boom highlights the importance of sound institutions and public financial management (PFM) systems, and lengthening horizons to ensure the quality of spending and the sustainability of fiscal policies.

- ***The evidence suggests that the quality of institutions matters for fiscal outcomes.*** This result confirms earlier findings that broader institutions (e.g., accountability and the quality of public administration) have a positive impact on economic policy. In a number of OPCs it will be important to strengthen institutional quality and promote fiscal transparency.

- ***Priority should be given to enhancing PFM systems where appropriate.*** Increases in spending associated with higher revenues are likely to put pressures on PFM systems. Depending on the circumstances, emphasis may need to be placed on reforms to enable PFM to perform at the level necessary to achieve desired policy objectives.

- ***A medium-term framework (MTF) can help link annual budgets to longer-term policies and fiscal sustainability objectives, and enhance risk analysis.*** The budgets of many OPCs are characterized by short-term horizons, with little reference to longer-term policies and objectives. MTFs that explicitly incorporate a longer-term perspective can help promote predictability, improve resource allocation, and enhance transparency and accountability. MTFs can be specifically designed to help address the fiscal risks posed by volatile, unpredictable, and exhaustible oil revenues. The implementation of MTFs should be gradual and consistent with institutional capacity.

Under appropriate institutional frameworks, well-designed SFIs may help support sound fiscal policies, though they are not a panacea. Successful SFIs require strong institutions and political commitment. The development of SFIs should not detract from other more fundamental PFM and governance reforms as appropriate. In addition, international experience suggests the advisability of adopting some specific principles for the design and implementation of effective SFIs.

- ***Oil funds*** should be integrated with the budget to enhance fiscal policy coordination and public spending efficiency. They should not have the authority to spend. Financing funds should be preferred to funds with rigid rules. Mechanisms to ensure transparency, good governance, and accountability should be in place.

- While the implementation of ***quantitative fiscal rules*** remains challenging in OPCs, ***FRL with comprehensive procedural and transparency requirements*** may work better to sustain the credibility of the fiscal framework. Success, however, hinges on proper design, consistency with PFM capacity, and enforcement of the provisions.

I. INTRODUCTION

1. **Oil-producing countries (OPCs) have benefited from rising oil prices in recent years, with important implications for their external and fiscal balances**. The average price of oil tripled from US$18 a barrel in 1999 to US$53 a barrel in 2005, and rose further in 2006. The associated increase in oil exports and fiscal oil revenues has had major macroeconomic and fiscal implications for OPCs heavily dependent on oil revenues. External current accounts and fiscal balances have strengthened in many OPCs. Moreover, policymakers have been conducting fiscal policy in a context where markets and observers have increasingly come to expect a significant portion of the rise in oil prices to be long-lasting.

2. **These developments have brought to the fore how governments of OPCS have managed their fiscal policies in light of changing oil market conditions and the role of special fiscal institutions (SFIs) in fiscal management.** In particular, there is a need to look into how fiscal policies have responded to the positive oil revenue shock and favorable oil price outlook, and the use of various SFIs to help fiscal management.

- Rather than relying solely on standard budget processes, a number of OPCs have turned to SFIs to help address the challenges posed by the volatility of oil export revenues and the nonrenewable nature of the resource, and manage the additional fiscal revenues arising from higher oil prices (and in some countries higher oil output). In some cases, the creation of SFIs may also have been motivated by transparency and political economy considerations, and by the desire to engage in more active management of public financial assets.

- SFIs include oil funds, fiscal rules, and fiscal responsibility legislation. In addition, the surge in oil prices in recent years has highlighted the role played by budgetary oil price forecasts for fiscal policy formulation and implementation.

3. **This paper examines the fiscal response of OPCs to the oil boom and the role of SFIs in fiscal management in OPCs, and draws some general lessons.** Section II provides an overview of the fiscal responses of oil producers to the recent oil boom.[1] Section III reviews recent experience with SFIs in selected OPCs to help fiscal management. Based on the evidence, Section IV draws some general lessons for fiscal management in OPCs. In doing so, it links findings on best practice regarding the design of SFIs with broader fiscal management advice to OPCs.

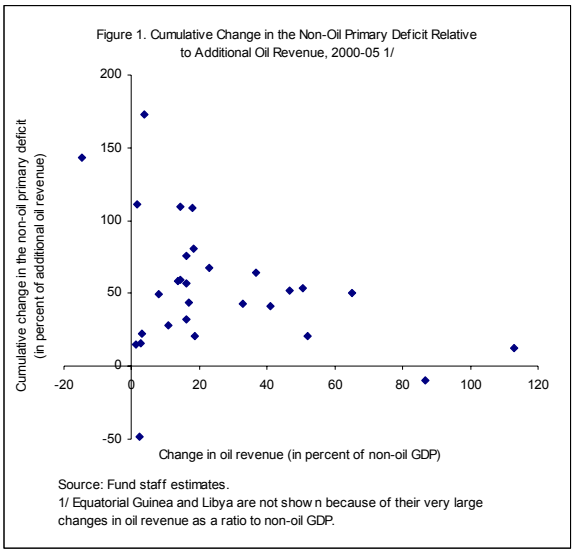
[1] The analysis covers OPCs where fiscal oil revenue accounted for at least 20 percent of total fiscal revenue in 2004, and where sufficient information was available: Algeria, Angola, Azerbaijan, Bahrain, Brunei, Cameroon, Chad, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, Indonesia, Iran, Kazakhstan, Kuwait, Libya, Mexico, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, Sudan, Syria, Timor-Leste, Trinidad and Tobago, United Arab Emirates, Venezuela, Vietnam, and Yemen.

II. THE RECENT OIL BOOM

4. **This section provides an overview of the fiscal policy responses of OPCs to the recent oil boom.**[2] While the analysis focuses on broad trends, the significant diversity of the OPCs in the sample should be borne in mind. In particular, country-specific factors that show great differentiation among OPCs include: level of development; institutional capacity; macroeconomic situation; fiscal dependence on oil revenue; public debt and liquidity positions; and the stock and expected duration of oil reserves in the ground.

A. Fiscal Policy Responses to the Current Oil Boom

5. **The current oil boom is defined to have started in 2000.** Following a sharp decline in 1998 and a recovery in 1999, oil prices increased by more than 50 percent in 2000 and broadly stabilized in 2001-03 at that level.[3] Oil prices accelerated again in 2004-05, reaching US$53 per barrel on average in 2005, their highest level in real terms since 1984.



6. **On average, through 2005 governments used close to half of the additional fiscal oil revenue in the form of higher non-oil primary spending and/or lower non-oil primary revenue.**[4] This is measured on the basis of the cumulative increase in non-oil primary deficits in 2000-05 relative to the cumulative change in fiscal oil revenue (or in the fiscal oil balance in those countries with public sector coverage in the fiscal accounts) in the same period (Figure 1). The average non-oil primary fiscal deficit increased from 26 percent of non-oil GDP in 1999 to 37½ percent of non-oil GDP in 2005.[5] Additional oil revenues not spent were used in part to lower debt stocks and accumulate financial assets. However, the size of the oil boom and the fiscal response have varied substantially across countries.

7. **OPCs turned overall fiscal deficits in the late 1990s into growing fiscal surpluses**. The average overall balance changed from a deficit of 3½ percent of GDP in 1999 to a

[2] Throughout the paper, the term "oil" is used as substitute for the more encompassing terms "hydrocarbon" or "petroleum," since gas is also an important resource in several countries.

[3] Crude oil prices are computed as the simple average of three spot prices (Brent, WTI, and Dubai) and deflated by the U.S. CPI. The coefficient of variation fell from 0.6 in 1970-1985 to 0.2 in 1986-99.

[4] The quantitative analysis of fiscal developments focuses on the central or general government for most OPCs in the sample, and on the public sector for Ecuador, Mexico, and Venezuela.

[5] Non-oil primary revenue increased on average by about 1 percentage point of non-oil GDP during the period.

surplus of 12 percent of GDP in 2005. The variance across countries, however, has been significant.

8. **The increase in total government spending in real terms averaged around 12 percent a year during 2000-05, with capital spending growing faster than current spending**. The average rate of growth of primary current spending in real terms accelerated from around 3½ percent a year during 1992-99 to 12 percent a year during 2000-05. Capital spending increased on average by about 19½ percent a year in real terms during 2000-05. The average ratio of capital spending to non-oil GDP surged from 8 percent in 1999 to 14½ percent in 2005 (Figure 2, and Appendix I).[6] Interest payments, on the other hand, declined in a number of countries as gross public debts were reduced.

B. Government Effectiveness, Sustainability, and Vulnerability Issues

9. **Higher oil revenues, and the prospect that a significant portion of the rise in oil prices may be long-lasting, have provided OPCs an opportunity to increase public spending on priority economic and social goals and/or reduce taxes**. For countries with relatively strong financial positions, a sustainable fiscal position (taking into account oil reserves in the ground and net public financial assets) and a reasonable capacity to identify and implement good spending programs, a gradual increase in the non-oil fiscal deficit may be an appropriate response to higher oil revenues, provided it does not lead to excessive demand pressures.

10. **The quality of government institutions and public financial management is critical for the effectiveness of scaling up public spending.** In this connection, while expenditures have increased in almost all OPCs in recent years, many countries that have raised spending rapidly are characterized by low indices of government effectiveness. This may raise questions about their ability to use the additional resources effectively. The analysis suggests an inverse relationship between spending growth and government effectiveness (Figure 2, third panel).[7] Institutional capacity—which includes the collection of laws, organizations, and behaviors that define the way fiscal policy is determined, managed, and governed—is positively correlated with the countries' level of income (with a correlation coefficient of 0.8). Thus, countries that arguably have more urgent needs and spending pressures tend to be those where the quality of spending may be most affected by institutional weaknesses. This poses tradeoffs between pressing developmental needs on the one hand, and the institutional ability to address them effectively and efficiently on the other. Preliminary indications of a significant acceleration of spending in some OPCs in 2006 make this issue more pressing.

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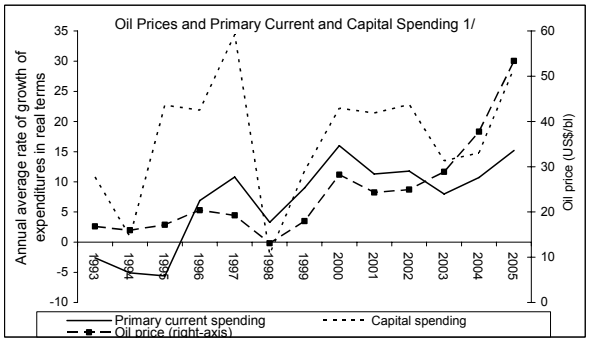
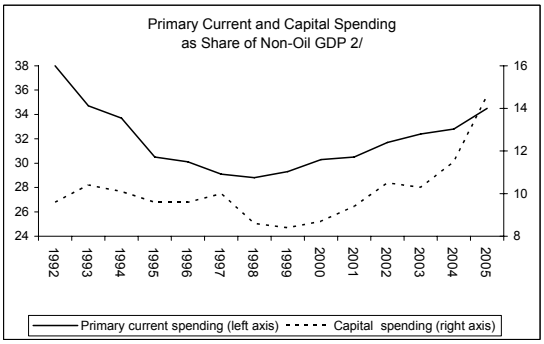
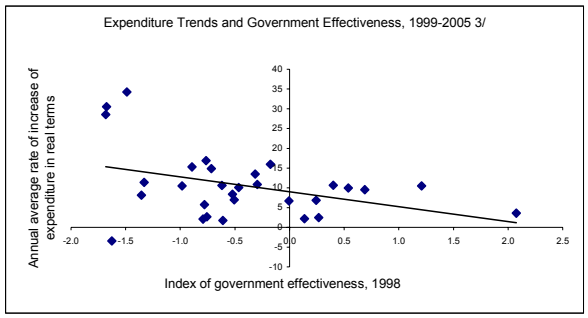
[6] Excluding Angola and Equatorial Guinea.

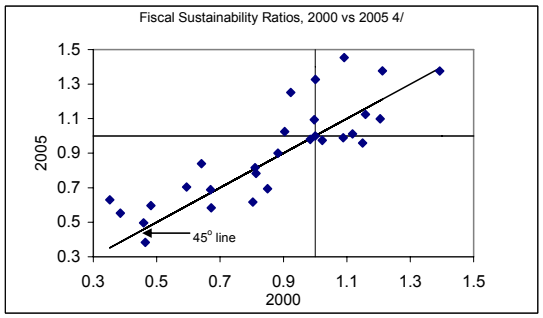
[7] The government effectiveness indicator, developed by Kaufmann, Kraay, and Mastruzzi (2005), was used as a proxy of spending quality. The indicator is measured in units ranging from -2.5 to 2.5, with higher values corresponding to better effectiveness outcomes.

Figure 2. Expenditure Growth and Sustainability Analysis









Source: Fund staff estimates.
1/ Excludes Angola.
2/ Excludes Angola and Equatorial Guinea.
3/ Excludes Timor-Leste.
4/ The sustainability ratios are computed as the ratio of sustainable primary expenditure relative to actual primary expenditure. In the chart, countries with a value lower than 1 would have to adjust to reach the sustainable benchmark. Countries that are above the 45 degree line improved their fiscal sustainability position between 2000 and 2005. The analysis excludes Chad and Timor-Leste.

11. **To analyze trends in the long-term sustainability of fiscal policy in OPCs, the actual fiscal position was compared to a "sustainable fiscal benchmark" calculated for each country in the sample**. The sustainable fiscal benchmark is defined as the (permanent) annual non-oil primary deficit derived from government net wealth, which is the present value of projected future oil revenues plus the value of net government financial assets. This exercise, based on a permanent income hypothesis model, assesses whether the fiscal position at a specific point in time could be sustained indefinitely given that fiscal oil wealth is finite (Appendix II describes the methodology in greater detail and provides a discussion of some of the issues not addressed by this approach).

12. **The long-term fiscal sustainability of a number of OPCs improved between 2000 and 2005 but, despite the large additional oil revenue, in some countries the improvement was limited, and in others sustainability deteriorated.** Sustainable fiscal benchmarks were calculated for 2000 and 2005.[8] While some countries recorded substantial improvements, the average increase in sustainability between those years was limited, and a number of countries were running unsustainable fiscal policies compared to the sustainability

[8] Proven reserves and actual oil prices prevalent in those years were used in the exercise.

benchmark (Figure 2, fourth panel).[9] Even some countries that saved a significant share of the additional oil revenue experienced a deterioration in their sustainability position. The key explanation is that several countries had an expansion in the non-oil primary deficit that was larger than the change in the long-term sustainable non-oil primary deficit associated with the changes in government net wealth.[10]

13. **These results are subject to some caveats.** First, any estimate of the permanently sustainable non-oil primary deficit is subject to considerable uncertainty, including about oil reserves and future oil prices. This implies that the benchmark results should be updated regularly with the availability of new information. Second, the quality of government spending, including public investment, can have effects on growth, fiscal revenues, and thus on fiscal sustainability, which are not captured in the exercise. In particular, public investment could stimulate growth, yield returns to the government, and improve sustainability, provided that the investment is of high quality and governments are able to reap sufficient fiscal dividends from the additional growth to cover the costs of the investment. The relationship between public investment and growth is difficult to model and generalize, and should be looked at on a country by country basis, partly because major determinants of growth are connected to the quality of policies, institutions, and decision-making, and the management of exogenous shocks.[11]

14. **Oil price fluctuations may expose some OPCs to the need for significant adjustments.** Fiscal policy decisions should take into account the vulnerability of OPCs to cash flow shocks. There is ample evidence that oil prices exhibit significant volatility in the short run and large fluctuations over the medium term.[12] Moreover, market forecasts have often been wrong in the past (Figure 3). In a number of OPCs the fiscal stance and sustainability position in 2005 were comfortable, and many of them accumulated substantial public financial assets and/or reduced their liabilities in recent years. Others, however, were exposed to the possible need for large fiscal adjustments. If the oil price in 2005 had been one standard deviation lower, the average overall fiscal balance of OPCs in the sample would have been nearly 10 percentage points of GDP lower, and about half of the countries in the sample would have recorded overall fiscal deficits.[13]

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[9] The sustainability ratios are computed as the ratio of the implied sustainable expenditure relative to actual expenditure, i.e., countries with a value lower than 1 would have to adjust to reach the sustainable benchmark. In the chart, countries that are above the 45 degree line improved their fiscal sustainability position between 2000 and 2005.

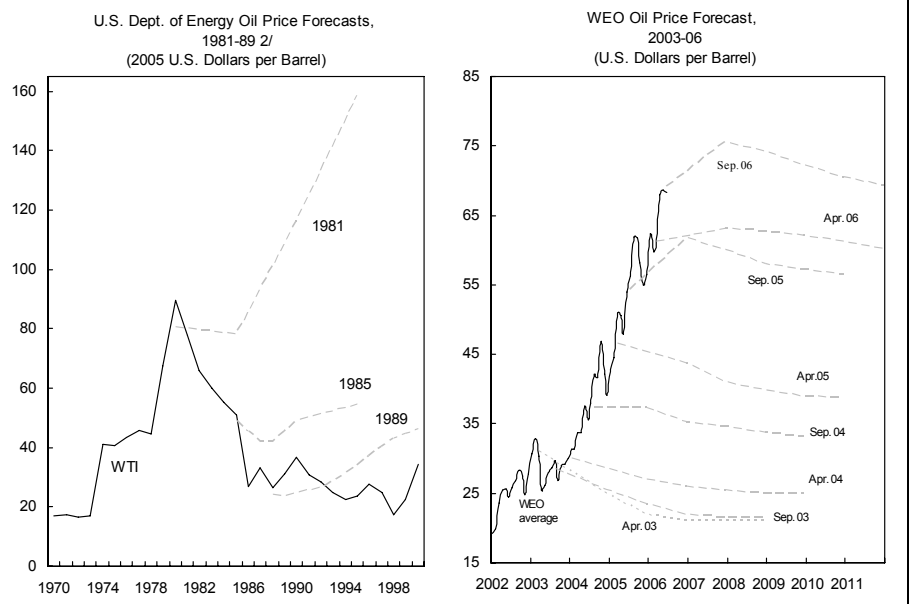
[10] In addition, the appreciation of the currencies in real terms of a number of OPCs reduced the domestic purchasing power of higher international oil prices, and growth in the non-oil sector reduced the relative size of the increase in oil wealth relative to non-oil GDP.

[11] See IMF (2004, 2005a, 2006).

[12] According to Cashin, Liang, and McDermott (1999), there is a one-in-three chance of a monthly oil price change greater than 8 percent. The average annual oil price change in 1970-2005 was 27 percent.

[13] These estimates refer to the first round effects and do not allow for policy responses. They also assume local linearity between oil export revenues and fiscal oil revenues, as well as between oil prices and oil GDP.

Figure 3. Oil Price Projections 1/



Source: U.S. Dept. of Energy Annual Energy Outlook (1982, 1986, 1989); and WEO documents.
1/ The hard lines are spot oil prices. The dotted and dashed lines are price forecasts.
2/ West Texas Intermediate (WTI) crude oil.

III. Special Fiscal Institutions and the Management of Oil Revenue—Recent International Experience

15. **Many OPCs have had difficulties in addressing the challenges posed by dependence on oil revenues.** Countries with large oil resources can benefit substantially from them. Some characteristics of oil revenue, however—its volatility and uncertainty, exhaustibility, and the fact that it largely originates from abroad—have posed challenges to policymakers. In particular, many OPCs have found it difficult to smooth government expenditure and decouple it from the short-term volatility of oil revenues, which has sometimes led to boom-and-bust cycles.

16. **Against this background, a number of OPCs have established SFIs aimed at enhancing fiscal management.** SFIs include oil funds, fiscal rules and fiscal responsibility legislation (FRL), and budgetary oil prices.

17. **In a number of cases, the creation of SFIs has been prompted in part by political economy and institutional considerations.** SFIs have been seen as potentially helpful instruments in some countries where governments have had difficulty in containing spending pressures, or where their credibility to properly manage oil revenues is low. The establishment of SFIs in certain cases may also have been a response to weak institutional frameworks—in such a context, SFIs have been seen as a "second best," but more credible mechanism to protect oil resources and use them effectively, rather than managing them solely through weak public financial management (PFM) systems.

18. **Nevertheless, there are significant challenges to ensure that SFIs are effective in OPCs.** Countries that adopt SFIs need to ensure they are well designed and there are appropriate supportive institutional arrangements. The challenges in OPCs to design and implement effective and long-lasting SFIs are magnified by the degree of uncertainty and long-term consequences of present policies—e.g., a very large and unanticipated increase in oil revenue or net wealth can make a rule or policy irrelevant over time. Other key factors are the need to ensure high levels of transparency of SFIs and accountability, which can be difficult if the overall institutional framework is weak or if SFIs lack broad political consensus.

19. **This section describes selected country experiences with SFIs.** It provides a brief description of SFIs and a qualitative assessment of their operations—with a special focus on the extent to which they have helped manage the recent oil boom. A quantitative assessment of the impact of SFIs on fiscal responses is presented in Box 2 at the end of the section.

A. Oil Funds

20. **The basic framework of oil funds can be summarized as follows:**[14]

- The overarching *policy objectives* of oil funds include *macroeconomic stabilization* (smoothing government expenditure in view of volatile and unpredictable oil revenue); financial *saving* (intergenerational equity); and/or *enhancing transparency* in the management of oil revenue and fiscal policy.
- The *operational objectives* of oil funds are typically formulated in terms of smoothing the net flow of oil revenue into the budget, depositing a share of revenue into the fund, and providing information about oil revenue inflows and changes in gross financial assets. *Operational rules* cover specific principles for the accumulation and withdrawal of resources; asset management principles; and governance, transparency, and accountability provisions.

21. **There has been a recent proliferation of oil funds.** Of the 31 OPCs in the sample, 21 have established funds, 16 of which were created after 1995. Two funds were abolished in 2005–06.[15] Ten funds focus on stabilization, and eight have both stabilization and saving objectives. A few funds coexist with other SFIs.

22. **While the newer oil funds predominantly focus on stabilization objectives, the recent increase in oil prices has added emphasis to saving objectives, and in some cases enhanced asset management.** Following a period of the lowest oil price levels in real terms since the early 1970s, several funds created in 1999-2000 included as a key objective the stabilization of oil revenue accruing to the budget. Nevertheless, as oil prices have risen, countries are now focusing more on long-term saving objectives. For example, following

[14] The legal framework that establishes an oil fund varies considerably among OPCs. In order to clearly identify an oil fund, this paper requires that it be established through explicit legal provisions.

[15] Ecuador's oil fund (FEIREP) was abolished in 2005, and an earmarking account (CEREPS) and a new oil fund (FAC) were created. Chad's Fund for Future Generations was abolished in 2006.

significant accumulation of assets in its oil stabilization fund, Russia is now considering establishing a separate savings fund. Legislation has been drafted in Trinidad and Tobago to establish a savings and stabilization fund. In addition, some countries that increased production substantially in recent years (e.g., Azerbaijan, Chad, and Ecuador) created funds to help improve the management of additional oil revenue.

Country evidence and assessment of operational effectiveness

23. **The assessment of oil funds in this section is based on a *qualitative* analysis of country cases, with a focus on recent experience.** The performance of funds is looked at mainly from an operational perspective, focusing on the following: operational rules; integration with the budget; asset and liability management; and transparency.

Operational rules: rigidity versus flexibility

24. **Many oil funds have relatively rigid operational rules for the deposit and withdrawal of resources**.[16]

- Many oil stabilization funds have or have had price- or revenue-contingent deposit and/or withdrawal rules (e.g., Algeria, Iran, Libya, Mexico, Russia, Trinidad and Tobago, and Venezuela).

- Most saving funds are revenue-share funds, where a pre-determined share of oil or total revenues is deposited in the fund (e.g., Equatorial Guinea's Fund for Future Generations, Gabon, and Kuwait).

- By contrast, only a few are financing funds, where the operations of the fund are linked directly to the budget's non-oil deficit (Norway and Timor-Leste).

25. **The introduction of funds with rigid rules has been mostly based on the expectation that removing "high" oil revenues from the budget would help moderate and/or make expenditures more stable, and as a means of reducing policy discretion.** However, rigid operational rules could be inconsistent with actual fiscal policy (if the government is not liquidity constrained). The specification of proper and financially and politically sustainable operational rules has often been complicated by difficulties in identifying permanent and temporary components of oil price changes (Barnett and Vivanco, 2003) and by political economy factors. In addition, an emphasis on oil fund gross assets should not detract attention from assessing the government's overall net financial position.

26. **A number of countries have dealt with rigid accumulation rules by changing, bypassing, or eliminating them**. Tensions have often surfaced in the operation of rigid rules, particularly in situations of significant exogenous changes, shifting policy priorities or increased spending pressures, or because of broader asset and liability management objectives. In the 1980s and 1990s, the operating rules of funds in Alaska, Alberta, Oman,

[16] See Davis et al (2001) for a detailed classification.

Papua New Guinea, and other countries were changed, in some cases several times. Some countries have adjusted upward the reference oil prices that govern deposits to, and withdrawals from, the oil funds, or changed the revenue base, in response to the recent sustained increase in international oil prices (e.g., Kazakhstan, Russia, and Trinidad and Tobago). Mexico's legislature authorized the depletion of the oil fund in 2002. Venezuela has changed the operating rules of its stabilization fund several times since its creation and suspended its operation for an extended period. Gabon has yet to comply fully with provisions to set aside part of its oil revenue in its Fund for Future Generations. Chad, Ecuador, and Papua New Guinea found their funds operationally or politically unworkable and abolished them.

27. **Provisions for the use of oil funds' resources have also been used to moderate the effects of rigid accumulation rules**. In several countries, the rules allow discretionary transfers from the oil fund to the budget (e.g., Bahrain and Libya). In Algeria, while the oil fund's deposit and withdrawal rules were based on a conservative reference oil price of US$19 per barrel between 2000 and 2005, the authorities simultaneously issued debt to finance the budget, which was then serviced by the oil fund (the spread between the higher interest rate paid on debt and the returns on oil fund assets representing a cost to the government).

28. **The resources of some oil funds are earmarked for specific purposes.** Some earmarking provisions are based on political economy considerations, such as creating a constituency supportive of the oil fund (e.g., Alaska), making it easier to resist political pressures to use oil revenues inappropriately, or prioritizing the use of resources for special purposes, such as poverty-reduction or debt service (e.g., Azerbaijan, Chad, and Ecuador). Earmarking would, in principle, help limit the discretionary powers of governments to reallocate spending inappropriately. However, it results in resources being placed outside the allocative budget process and can reduce flexibility, complicate liquidity management, and affect the efficiency of government spending (Potter and Diamond, 1999). In the absence of liquidity constraints, the impact of earmarking is also uncertain, as resources are fungible.

- In Alaska, the payment of annual dividends by the oil fund to the population was partly conceived as a safeguard against pressures to spend the oil revenue. In practice, the dividends have come to be seen as entitlements, and the government has borrowed substantially at times to finance increased spending. This accumulation of debt runs against the intended intergenerational transfer of resources.

- A struggle by interest groups to capture resource rents in Ecuador has led to increased earmarking, which has contributed to liquidity problems, made fiscal policy procyclical, and expenditure quality has weakened. The explicit earmarking of oil fund revenues to service debt, aimed at improving the net financial position of the government, was controversial and exacerbated political opposition to the fund. In the end, Ecuador replaced the oil fund with a greater degree of revenue earmarking.

Integration with budget systems

29. **The operation of an oil fund may be assessed in terms of how well it helps (or hinders) the budget system in meeting its basic objectives**. The experience with oil funds points to several key issues, in addition to earmarking and transparency:

- ***Extrabudgetary spending authority.***[17] This may lead to fragmentation of policymaking, a loss in control over expenditure, and reduced efficiency in the allocation of resources. Around half of the oil funds have the authority to spend or invest assets domestically separate from the budget system. For example, the resources in the oil funds in Azerbaijan and Kazakhstan can be spent off-budget through presidential directives.[18] The Libyan oil fund has also financed substantial extrabudgetary spending. The oil funds in Iran and Kuwait may invest or lend to the private domestic economy outside the budget process.

- ***Creation of "islands of excellence."*** When public financial management (PFM) systems are perceived to be weak, as in many developing countries, it is sometimes argued that the creation of a fund with separate procedures and controls might yield better results than the budget. There is little tangible evidence, however, to support the creation of such "islands of excellence." Moreover, such an approach would also have to consider the potentially negative impact on the development of a national public financial management system.

- ***Cash management.*** Some countries have experienced difficulties in asset and liability management associated with rigid oil fund rules and fragmentation of cash management. In Chad, given concerns about institutional capacity and governance and the objective of putting oil resources to good use, separate cash management systems were established to support a complex arrangement of multiple budgets and an oil fund, with revenues earmarked for specific purposes. Spending pressures in the country's main operating budget resulted in arrears and costly borrowing, while low-yield assets were being accumulated in the oil fund. In early 2006, the government abolished the oil fund to ease liquidity constraints on its operating budget. In Venezuela, the government could only make deposits into the oil fund (that were mandated by law) in 1999-2000 with recourse to expensive financing, as the budget remained in deficit. In late 2000, the operation of the oil fund was temporarily suspended. In Ecuador, extensive oil revenue earmarking (including to the oil funds) and cash fragmentation contributed to the accumulation of domestic arrears despite large deposit holdings.

30. **Financing funds are integrated with the budget process**. These funds provide an explicit link between fiscal policy and the accumulation of financial assets, and address

[17] See Allen and Radev (2006) for a detailed discussion.

[18] In Kazakhstan, any spending proposals would have to be approved by parliament. New rules for the fund, including transfers to the budget, will be fully operational with the 2007 budget.

fungibility issues. They do not attempt to "discipline" expenditure through the removal of some resources from the budget—the flows in and out of the fund depend on oil revenue and policy decisions embodied in the non-oil fiscal stance. Their establishment has been linked to the desire to enhance transparency and promote public awareness of intertemporal constraints.

- Norway's oil fund is formally a government account at the central bank that receives the net central government receipts from petroleum activities and transfers to the budget the amounts needed to finance the non-oil deficit. The oil fund has no authority to spend and the decisions on spending and the fiscal policy stance are made within the budget process. In addition, the fund is ruled by stringent transparency and accountability provisions.

- The oil fund in Timor-Leste was designed along the lines of Norway's fund. It is fully integrated into the central government budget and managed with a high standard of transparency and accountability.

31. **A number of countries have made or are making efforts to better integrate their oil funds with budget systems**. This reflects growing awareness of the potential loss in fiscal control and the importance to public spending efficiency of unifying expenditure policy and subjecting approval and execution of outlays to the same budgetary standards, and of enhancing the efficiency of asset/liability management. For instance, since 2005, Azerbaijan has reported the operations of the oil fund in the annual budget presented to parliament (although parliament does not approve the oil fund's budget). In Libya, the government has indicated its intention to eliminate the practice of using the oil fund to finance extrabudgetary spending. The rules of the Kazakhstani oil fund have recently been amended to provide better integration with the budget. Alberta discontinued the extrabudgetary operations undertaken by its original oil savings fund in light of their disappointing performance. The Algerian authorities are moving towards implementing oil fund rules that will increase integration with the budget and transform the existing oil fund into a financing fund.

Asset management

32. **Oil funds' financial balances have increased substantially in recent years**. For the countries for which consistent public information is available, oil fund balances rose from US$69 billion in 2000 to about US$323 billion in 2005 (Table 1). A simultaneous build up of deposits and debt, which partially resulted from rigidities in fund accumulation rules, was observed in some countries (e.g., Azerbaijan, Chad, and Iran). Other countries were active in reducing debt (e.g., Algeria, Kuwait, Libya, and Russia), and some explicitly tried to avoid the impact on domestic liquidity that would have resulted from repaying domestic debt more rapidly (e.g., Norway), or sought to issue debt to develop the domestic debt markets.

33. **Only a few of the oil funds examined have a clear, comprehensive, and transparent investment strategy**. In particular:

- There is a general preference to place funds assets abroad, mainly to allay fears about appreciation of the domestic currency. Many governments place their deposits at the

central bank (e.g., almost all of African and western hemisphere countries, Algeria, Kazakhstan, and Russia), which in some cases acts as the government's investment agent. Funds in Kuwait and Oman are believed to have some domestic investments, while the oil fund in Iran is allowed to invest up to 50 percent of its balance in foreign currency loans to the domestic private sector.

- Returns on the assets held by oil funds vary, but are generally low. Average real returns were below 2 percent in relatively active funds in the first few years of this decade (e.g., Alaska, Alberta, and Azerbaijan).[19] This was partly due to the sharp fall in returns in international capital markets at the beginning of the decade. CEMAC countries, including those with oil funds, have expressed concerns about the remuneration of their deposits at BEAC, the regional central bank. In a few countries, oil fund deposits with the central bank do not earn interest, although the government may nonetheless receive income indirectly from central bank dividend payments.

Table 1. Oil Funds: Gross Financial Assets 1/

		2000		2005	
Country	Coverage of assets	Billions U.S. dollars	Percent of GDP	Billions U.S. dollars	Percent of GDP
Algeria 2/	Oil fund	--	--	9.9	11.8
Azerbaijan	Oil fund	0.3	5.2	1.4	11.1
Chad	Oil fund	--	--	0.02	0.4
Ecuador	Oil fund	0.0	0.0	0.4	1.2
Equatorial Guinea 3/	Gross public financial assets	0.1	12.3	2.9	43.5
Gabon	Oil fund	0.0	0.0	0.4	4.3
Iran, Islamic Rep.	Oil fund	5.9	6.2	11.7	7.2
Kazakhstan	Oil fund	--	--	8.0	14.4
Libya 3/	Gross public financial assets	13.3	40.7	26.0	68.7
Mexico	Oil fund	1.0	0.2	1.5	0.2
Norway	Oil fund	43.7	26.3	206.7	73.8
Russian Federation	Oil fund	--	--	53.0	7.0
Sudan	Oil fund	--	--	0.3	1.0
Timor-Leste	Oil fund	--	--	0.6	171.8
Venezuela, Rep. Bol.	Oil fund	4.6	4.0	0.7	0.6

Source: Fund staff estimates.

1/Data on oil fund assets or gross public financial assets are not publicly available for Bahrain, Brunei, Kuwait, Oman, Qatar, and Trinidad and Tobago.
2/ 2004 figures.
3/ Data on oil fund assets are not available.

[19] World Bank (2006).

Transparency and accountability

34. **Transparency and accountability practices for oil funds differ substantially across OPCs**. The oversight of oil funds takes several different forms, in particular regarding provisions for compliance by governments and national oil companies with stated deposit and withdrawal rules, audit of the accounts of the fund, whether investment decisions are taken in compliance with an agreed investment framework, and standards for the disclosure of information. The approach to disclosure of oil fund's assets and investments often mirrors general attitudes to public sector transparency (World Bank, 2006).

35. **While in many countries information is made available on the operations and financial position of the oil fund, some countries prefer not to disclose such information.** The authorities in a few countries argue that public disclosure of the extent of official assets might strengthen pressures to spend. Hence, some oil funds do not disclose such information. For example, the Kuwaiti Reserve Fund for Future Generations is prohibited by law from disclosing its assets and investment strategy (although parliament receives periodic information), and the operations of oil funds in Qatar are not disclosed. This argument, however, can cut both ways—in the absence of information, the public may just as well have exaggerated perceptions of government financial wealth. In addition, lack of information about oil fund operations hampers analysis of the fiscal stance, savings/investment balances, and public and external sustainability and vulnerability.

B. Fiscal Rules, Fiscal Guidelines, and Fiscal Responsibility Legislation (FRL)

36. **Fiscal rules are defined, in a macroeconomic context, as institutional mechanisms that are intended to permanently shape fiscal policy design and implementation**. They are often enshrined in constitutional or legal provisions, such as fiscal responsibility legislation (FRL). Some countries opt for more informal fiscal guidelines. The design of fiscal rules and FRL varies considerably across countries, with important differences among numerical rules, which guide and benchmark performance against quantitative indicators (such as the fiscal balance or debt), and procedural rules that establish transparency, coverage, and accountability requirements.[20]

Use of fiscal rules and FRL in oil-producing countries

37. **In OPCs, fiscal rules and FRL often enshrine a desire to reduce the procyclicality of fiscal policy and/or to promote long-term savings and sustainability objectives.** While oil funds are more common, fiscal rules and FRL can have a more critical role, as they are intended to constrain overall fiscal policy.

38. **The design of appropriate fiscal rules in OPCs is more challenging than in other countries.** This is due to the characteristics of oil revenue—highly volatile, uncertain, and dependent on a non-renewable resource. As such, the applicability in OPCs of fiscal rules frequently used in other countries would be questionable. For instance, rules that target

[20] For a fuller discussion see IMF (2007), and Kopits and Symansky (1998).

specific overall or primary balances or particular debt ratios to GDP could be highly procyclical—as they would transmit oil fluctuations to expenditure and the non-oil balance.

39. **The past experience of OPCs with fiscal rules and FRL has been relatively limited, but a growing number of countries are starting to implement them**. There are only a few cases of FRL in OPCs. One of the first and more comprehensive was in Alberta in the early 1990s. Ecuador introduced FRL in 2002, but the main focus was on numerical fiscal rules. Venezuela passed an organic budget law in 1999 as a step toward improving fiscal policy and accountability. Mexico also passed FRL in 2006. In cases where countries have set numerical fiscal rules or guidelines, targets have typically been set on the non-oil balance (Norway and Timor-Leste), the overall balance (Alberta and Mexico), expenditures (Equatorial Guinea), or on several fiscal variables (Ecuador).

40. **Norway and Alberta have adopted different institutional frameworks that have been relatively successful in managing fiscal policy—although both face challenges.** While Norway implemented a relatively flexible framework, using the non-oil deficit as an anchor, Alberta introduced comprehensive FRL. Both cases have in common strong institutions and a broad consensus in favor of fiscal discipline.

- Under the fiscal guidelines that Norway introduced in 2001, the central government's structural non-oil deficit should not exceed 4 percent of the oil fund's total financial assets, equivalent to the expected long-run real rate of return of the fund's accumulated financial assets. The guidelines, which allow deviations for countercyclical fiscal policy and shocks to the value of the oil fund, were seen as a tool to help set a long-term benchmark for fiscal policy, reduce expenditure pressures, and insulate the budget from oil price volatility. While Norway has maintained moderate spending growth during the oil boom, the framework allows some degree of procyclicality—higher oil prices lead to a larger accumulation of financial assets, which in turn could lead to rising non-oil deficits. In addition, the fiscal guideline has not been met so far, which could reduce its credibility over time and intensify spending pressures.
- Following the deterioration of its fiscal position in the late 1980s, Alberta undertook a significant fiscal adjustment in the early 1990s. The province adopted comprehensive FRL (1993-95) to strengthen fiscal policy, prevent future deficits, and eliminate provincial debt by 2025.[21] The rules under the FRL have been tightened over time, requiring a balanced budget every year (since 1999) and no net debt (since 2005). The focus in recent years has shifted to how best to manage the additional oil revenues, given rising public pressures for investment spending, and how to avoid an excessively expansionary fiscal policy. This partly reflects the focus of Alberta's framework on the overall fiscal balance, which could lead to procyclical policies.

41. **The experience of other OPCs, mainly with fiscal rules, has highlighted the difficulties in implementing effective and durable rules—largely due to design problems**

[21] The reforms had wide-ranging institutional components. See Schwartz (1997).

and political economy factors. In particular, fiscal policy concerns have been mostly focused on short-term constraints, resulting in fiscal rules that are too rigid to adjust to economic fluctuations and lack robust political support. This has become more evident during the recent oil boom, which has reduced liquidity constraints and made it more difficult for some governments to contain spending pressures.

42. **In several cases, the fiscal rules or frameworks have been weakened over time or ignored.** In particular:

- Ecuador introduced FRL in 2002, which included three fiscal rules focused on the central government's non-oil balance, primary expenditure growth in real terms, and the public debt ratio to GDP. The legislation was intended to help improve the fiscal position, manage higher oil revenues, and reduce the procyclicality of expenditures. However, fiscal outcomes have often breached the deficit and spending rules. The limit on the public debt ratio has been met, partly due to the large rise in oil prices in recent years (and associated increases in nominal GDP). Eventually, as liquidity constraints diminished, growing political and social pressures led to the revision of the FRL in 2005 and a relaxation of the constraints on spending.

- Equatorial Guinea's expenditure rule, under which current spending should not exceed non-oil revenue, has been consistently breached in recent years. The rule is being re-interpreted as a medium-term objective, and expenditure has been growing substantially faster than non-oil revenue. Given the dramatic increase in the oil sector in Equatorial Guinea in recent years (to more than 80 percent of GDP), the rule no longer provides a realistic benchmark for fiscal policy.

- Venezuela approved an organic law for public finances in 1999, intended to strengthen fiscal policy and reduce expenditure volatility. The law focused on improving the budget process, including by using a multiyear framework, and introduced fiscal rules for the current balance, expenditure growth, and the public debt. Implementation of the law, however, has been postponed, while expenditures have continued to be highly correlated to oil revenue. In addition, the quality of budgetary institutions has deteriorated, in part due to a proliferation of extrabudgetary funds and quasi-fiscal activities.

43. **Other countries are beginning to develop rules-based frameworks in an attempt to better manage the additional oil revenues**. Although it is too early to assess their effectiveness, some of these cases already provide some further evidence of the challenges in designing and implementing such strategies.

- In Nigeria, where a large portion of oil revenue is shared with subnational governments, the federal and state governments have informally adopted an oil price-based rule since 2004, whereby oil revenue above a reference price is deposited in extrabudgetary accounts.[22] The resources can then be used to finance projects agreed

[22] For a discussion of fiscal federalism issues in OPCs, see Davis, Ossowski, and Fedelino (2003).

by all levels of government. This approach ensures some macro-fiscal coordination and may help contain spending pressures. There are concerns, however, with the transparency of the framework and the potential for undermining the budget as a tool to set priorities. In addition, developments in 2005 and 2006 suggest that the informal framework has not been able to contain mounting expenditure pressures.

- In Azerbaijan, a presidential decree issued in 2004 set a long-term oil revenue management strategy aimed largely at addressing a temporary increase in oil production. The basic principles are the maintenance of constant consumption out of oil wealth in real terms, limiting annual fluctuations in the non-oil deficit to ensure economic stability, and basing investment spending on a public investment plan. However, larger-than-expected revenue increases have led to growing expenditure pressures. The revised 2006 budget envisaged an almost doubling of expenditures and an increase of more than 20 percentage points in the non-oil deficit ratio.

- São Tomé and Príncipe and Timor-Leste have adopted strategies based on the permanent income approach, but with important differences. São Tomé and Príncipe, still years ahead of prospective oil production, adopted an approach based on rules that determine how much can be transferred from the oil fund to the budget. This framework does not effectively constrain the non-oil balance—as the government can borrow—and it might have implications for asset and liability management. Timor-Leste adopted relatively flexible fiscal guidelines, with an emphasis on procedures to ensure transparency and proper management of oil wealth by highlighting the non-oil deficit consistent with the estimated permanent income from oil wealth (net of government debt). The government can propose a budget with a higher non-oil deficit; however, it has to provide a rationale and information on the impact on oil wealth in future years.

- Mexico's congress approved FRL in early 2006 under which budgets are to aim at a zero overall balance. However, the numerical target does not take into account procyclicality or explicit fiscal sustainability considerations related to the oil revenue.

44. **Some of these experiences highlight the limitations of rule-based frameworks to help manage fiscal policy**. Recent large increases in oil revenue have brought about a loosening of budget constraints for OPCs. The new environment has posed a significant test for the effectiveness of rule-based fiscal frameworks. In particular, it has shown that rigid rules, based mainly on short-term considerations, can come under strong pressure and become less relevant for policy purposes. This may ultimately jeopardize the credibility of the fiscal framework. In addition, the experience highlights the need for strong political consensus for FRL or fiscal rules to be effective (Box 1).

Box 1. Botswana and Chile: Experiences with Fiscal Rules

Botswana and Chile have managed relatively successfully their dependence on natural resources. They have achieved stable macroeconomic environments and high growth rates. Given the importance of their natural resource sectors (mainly diamonds in Botswana and copper in Chile) and their use of fiscal rules, they present useful lessons for OPCs.

Botswana has implemented medium-term national development plans (NDP) closely linked to the budget process for decades. The six-year NDP sets broad fiscal objectives and associated policy actions. It has contributed to the implementation of a longer-term strategy that has helped contain spending during periods of revenue buoyancy and led to overall surpluses for most of the last two decades. The framework has incorporated goals for the overall balance and a type of "golden rule," where non-mineral revenue should at least cover noninvestment recurrent spending. This rule has been adhered in most years, except for a few years in the early 2000s, when fiscal deficits emerged. While the fiscal position has been under some strain, continued commitment to prudent fiscal policies and medium-term planning put Botswana in a strong position to face important medium-term challenges.

Chile introduced an informal fiscal rule in 2001. The rule calls for maintaining a structural central government surplus over the economic and copper price cycles. It is seen as a useful signal to financial markets, indicating a sensitivity to the risks of procyclical spending. The successful implementation of the rule is seen in large measure as due to low debt and high policy credibility, themselves the result of past prudent policies and good institutions.

While fiscal rules have been operationally useful to the conduct of sound fiscal policies in Botswana and Chile, the evidence suggests that they were not critical elements—the key has been political commitment and good institutions. Both countries' economic success mostly points to strong overall institutional quality, willingness to adopt key structural reforms, and political commitment to ensure fiscal discipline (Iimi, 2006). According to World Bank and Transparency International governance indicators, both countries have significantly higher levels of governance and institutional quality than most OPCs.

C. Budgetary Oil Price

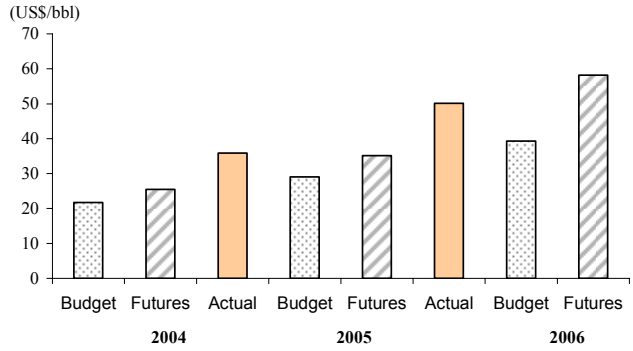
45. **Most OPCs have used a conservative oil price or revenue forecast to determine the budget's resource envelope.** As Figure 4 shows, for a sample of OPCs, the reference oil prices that were used for budget preparation over the last few years of rising prices turned out to be significantly below actual prices. The average ratio of actual prices to the budget oil price was about 1.7 in 2004 and 2005. At the time of budget formulation, oil prices in the budget were also below market expectations about future oil prices (a ratio of 1.2 in 2004 and 2005, and 1.5 in 2006). A minority of OPCs do not publish a reference price in budget documents.

46. **A variety of approaches is used to determine the reference oil price.** A few countries use an artificially low budget oil price in an attempt to contain spending pressures: in Algeria, the reference price was US$19 per barrel in past years and was raised to US$22 per barrel in 2006. The Republic of Congo and Timor-Leste have used the expected international price from the futures markets as a reference.[23] In Nigeria, the oil reference price has been negotiated between all levels of government, but in an effort to contain spending, it has remained well below market expectations, though growing rapidly. Some consideration is being given to making this arrangement formula-based, on the basis of a

[23] In the Republic of Congo, the budget price includes a prudence factor.

moving average of historical oil prices. Norway's fiscal guideline, which focuses on the structural non-oil deficit, implies that oil price forecasts have limited budget significance, although market-based projections are provided in budget documents.

Figure 4. Average Budget and Actual Oil Reference Prices for Selected OPCs



Source: Fund staff estimates. Averages for 24 OPCs. NYMEX one-year futures prices.

47. **The use of conservative budget oil prices reflects prudential considerations and/or political economy factors.** Such oil price assumptions are viewed as a prudent way to reduce the risk of a large deficit or fiscal adjustment in the event of an unanticipated decline in oil revenue. Governments have also used low budget oil prices to contain spending pressures. In particular, in some cases governments have felt it politically difficult to propose budgets in which a realistic oil revenue forecast together with spending plans result in a large projected budget surplus. Low budget oil prices have also been used in an attempt to limit transfers to subnational governments (e.g., Indonesia, Venezuela).

48. **While there is a case for an element of prudence in budget oil price forecasts, the use of artificially low oil prices is likely to be challenged and may lead to spending inefficiencies.** A strategy of setting artificially low budget prices would not necessarily deliver lower spending and is unlikely to be sustainable for long, as legislatures and pressure groups will eventually see through it. In Mexico, for example, congress frequently raised the reference price suggested by the executive in the annual budget, which was well below oil futures prices—in the recently approved FRL the reference price will be set based mainly on oil future prices. In some cases, setting artificially low budget prices has also affected the quality of spending, transparency, and the unity and credibility of the budget. In particular, oil revenues in excess of budget projections have been used in some OPCs to increase budget spending or to fund extrabudgetary expenditures during the year, which may result in procyclical, poorly planned, and inefficient spending.[24]

[24] For example, Yemen has often had a supplementary budget at the end of the year to legitimize overspending when oil revenues outperformed budget projections. In Oman and Qatar additional expenditures have often been approved during the year, as oil prices and revenues exceeded conservatively budgeted levels.

Box 2. Quantitative Assessment of the Impact of Fiscal Institutions on Fiscal Outcomes in Oil-Producing Countries

This box presents a quantitative approach to assess the impact of SFIs on the broad fiscal policy responses of OPCs to the current oil boom. As discussed in Section II, the responses of countries to the oil boom have varied significantly. An attempt has been made to assess the extent to which SFIs (oil funds and fiscal rules) can explain differences in fiscal responses across countries and over time. The econometric analysis is presented in Appendix III, which provides a description of the econometric specifications and tests applied, and further discussion of the results.

The analysis focuses on the quantitative impact of SFIs on key fiscal variables, controlling for differences in the size of government net wealth and the degree of dependence on oil revenue. Many countries have introduced SFIs in an attempt to influence the level and dynamics of expenditures, and in particular to limit the response to fluctuations in oil revenue in any given year. The quantitative analysis focuses on the potential impact of SFIs on the fiscal stance (as measured by the non-oil primary balance ratio to non-oil GDP) and on expenditure dynamics, in terms of annual growth rates in real terms and the correlation with oil revenue.

The empirical results suggest that SFIs do not have a discernible impact on the fiscal position, which tends to be more dependent on the short-term volatility of oil revenue. The results indicate that the presence of SFIs has no impact on the non-oil primary deficit—even after controlling for differences in the government net wealth and the degree of dependence on oil revenue—or how the non-oil primary balance is affected by changes in government net wealth. The evidence also suggests that liquidity considerations are a key factor for fiscal policy—that is, the size of the non-oil primary balance depends mostly on the (annual) share of oil revenue in total revenue and changes in oil prices.

The evidence also indicates that SFIs have no significant impact on expenditure growth or in reducing the correlation between expenditures and oil revenue. In particular, the presence of SFIs has had no impact on the growth of spending in real terms or on reducing the sensitivity of expenditure to contemporaneous changes in oil revenue. These results are robust to controlling for differences in the level of per capita GDP and government net wealth. The analysis also fails to show that SFIs have had an impact on the correlation between expenditure and oil revenue during the oil boom.

In contrast to SFIs, broader governance institutions do seem to have an impact on the non-oil primary balance and expenditure dynamics. Higher institutional quality seems to be associated with lower non-oil deficits. There is also some evidence that countries with lower indices of corruption have lower correlations between expenditures and oil revenue. These results seem to be in line with the "voracity effect" discussed in the literature, where countries with the weakest institutions tend to spend more during revenue windfalls (Tornell and Lane, 1999), and the evidence showing that many countries with the lowest government effectiveness indices (as measured by Kaufmann, Kraay, and Mastruzzi (2005)) are among those spending the most.

IV. A Framework for Strengthening Fiscal Institutions in OPCs

49. **The experience with the recent oil boom highlights the importance of ensuring the quality of spending and the sustainability of fiscal policies.** For countries with appropriately strong fiscal positions and budget management systems capable of ensuring the quality of higher spending, increases in the non-oil deficit consistent with the preservation of macroeconomic stability may be an appropriate response to higher oil revenues.[25] At the same time, many OPCs with low indices of government effectiveness have increased

[25] See IMF (2005).

spending rapidly, and the long-term fiscal sustainability of a number of OPCs saw limited improvement or deteriorated between 2000 and 2005.

50. **Some specific challenges faced by OPCs affect the ability of SFIs to enhance fiscal management and achieve desired fiscal outcomes.** The difficulties posed by a volatile, unpredictable, and exhaustible source of fiscal revenue to fiscal management have been compounded in a number of cases by institutional weaknesses and complex political dynamics. Against this background, the evidence suggests that in many cases SFIs by themselves have not been able to overcome these constraints. SFIs have been more successful when there was broad political support for the pursued fiscal objectives.

51. **SFIs based on partial approaches and rigid rules have sometimes hindered flexible responses to changing conditions or have been modified since first established.** In particular, while in a number of cases SFIs may initially have helped achieve specific fiscal objectives, tensions have tended to surface over time between rigid SFI rules and shifting policy objectives, including in the case of oil shocks and rapidly changing economic environments. In a number of such cases, the rules were modified, bypassed, or abolished. In some cases, a focus on SFIs may also have diverted attention from a more comprehensive view of fiscal policy, including longer-term considerations.

52. **The evidence suggests that the quality of institutions matters for fiscal policy**. The findings tend to confirm the findings in the literature that broader institutions—e.g., accountability and the quality of public administration—can have a positive impact on economic policy.[26]

A. Institutions, PFM Systems, and Medium-Term Frameworks

53. **Some specific characteristics of OPCs and expenditure trends underscore the significance of developing comprehensive policy frameworks and institutions**. In particular, in many OPCs there is a need to strengthen PFM systems, enhance the links between annual budget decisions and medium- and long-term fiscal objectives, and introduce comprehensive assessments of volatility and risk as appropriate.

- In a number of OPCs, increases in spending associated with the availability of unexpected and large financial resources make the enhancement of administrative capacity and fiscal transparency particularly urgent, especially as governance indicators tend to be below other countries at similar levels of income. Rapid growth in expenditures warrants intensified scrutiny over their quality and efficiency, including in public investment procedures. Country authorities should undertake and report periodic reviews of the quality of stepped-up spending to ensure efficiency and value for money. In recent years, staff has noted in the reports for many of the countries in the sample the need to improve budget processes, fiscal transparency, and the quality of spending.

[26] See Manasse (2006). Also, Mehlum, Moene, and Torvik (2006) provides empirical evidence suggesting that the quality of institutions matters for the growth performance of countries rich in natural resources.

- With liquidity constraints lifted in a number of OPCs, capital markets may play less of a disciplining role than in countries that need to access markets to finance fiscal deficits.

- The development of institutions that promote a long-term perspective is warranted given the inability of future generations to voice preferences on the use of oil, a nonrenewable resource.

54. **The analysis also suggests the importance in OPCs of appropriate longer perspectives and risk analysis in fiscal planning.** In many OPCs, short-term horizons in annual budgets may not give adequate weight to oil price volatility and uncertainty. This may give rise to procyclical expenditure patterns, as spending adjusts to revenue availability, and increases the risk of large and costly expenditure adjustments. Rather than providing greater flexibility to cope with oil revenue and other shocks, annual budgets that do not provide a clear link to longer-term policies and plans, including the recurrent cost of capital projects or for entitlement programs, may create multi-year spending commitments that entrench rigidities and undermine fiscal discipline.[27]

55. **Priority should be given to enhancing PFM systems where appropriate.** The budget systems in many OPCs suffer from PFM weaknesses, including in the capacity to manage the planning, allocation, and effective control of budgetary resources. The increase in spending associated with higher oil revenues is likely to place additional pressures on PFM systems. Depending on their particular circumstances, OPCs should consider undertaking reforms in PFM areas such as budget planning, accounting and classification, internal control, audit, and reporting.

56. **Adopting a medium-term framework (MTF) for fiscal policy can help connect the annual budget to longer-term policies and sustainability objectives, and enhance risk analysis in OPCs.** MTFs can provide a framework to set fiscal policy objectives and the policies to achieve them. Establishing a sustainable long-term fiscal framework is particularly important for OPCs with volatile and exhaustible resource revenues. However, such long-term planning is subject to considerable uncertainty: measures of sustainable spending may vary over time, and budgets often respond to short-term policy considerations. Therefore, a well-designed, rolling MTF should help clarify fiscal policy choices, considering both immediate and longer-term objectives, and their likely consequences.[28] [29]

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[27] For OPC examples, see Bartsch et al (2004), Eifert, Gelb, and Tallroth (2003), and Askari, Nowshirvani, and Jaber (1997).

[28] Spackman (2002) provides an overview of the rationale for adopting a medium-term framework for budgeting. See also Schick (1998), World Bank (1998 and 2005), OPM (2000), and Diamond (2006).

[29] Public investment planning should be fully integrated into the MTFs. Some OPCs retain separate fiscal institutions that plan or execute certain types of capital or development expenditures. While separate arrangements do not necessarily undermine integrated fiscal planning, they may result in "dual budgeting" practices. See World Bank (1998), and Sarraf (2005).

57. **The design and implementation of an MTF needs to be consistent with institutional capacity, particularly the PFM systems.** There are several stages in the evolution of an MTF, requiring varying degrees of institutional capacity and PFM systems (Appendix IV). While often MTFs must be supported by improvements in PFM systems, they can also spur such improvements.

58. **The simplest form of MTF is a medium-term fiscal framework (MTFF)**. It entails a comprehensive statement of fiscal policy objectives (against which fiscal performance can be assessed), integrated medium-term macroeconomic projections, and (aggregate) fiscal targets based on macroeconomic stabilization and fiscal sustainability considerations (a top-down approach). Even a simple MTFF can help incorporate longer-term perspectives into budget planning processes and promote predictability, fiscal discipline, transparency, and accountability. It may also help bolster support for prudent fiscal policies among policy makers and the public, and get the political debate to span longer horizons.

59. **Further MTF stages involve medium-term budget frameworks (MTBFs) and medium-term expenditure frameworks (MTEFs).** The introduction of these frameworks entails more fundamental changes in the way budgets are put together. Different models could be considered by countries at varying stages of development.

60. **The implementation of the more advanced MTF modalities should be consistent with administrative capacity.** It may require the prior adoption of more basic PFM reforms, such as improving budget and accounting classification. While existing PFM systems in some OPCs are likely to be sufficient to support the gradual introduction of advanced MTF forms, the track record of implementing them in low-income countries with significant PFM weaknesses has been mixed. This suggests that countries should start cautiously with the more basic forms (World Bank, 2005). Each stage in this process should build on the preceding one and be in line with the capabilities of the budget system.[30]

61. **MTFs in OPCs can be specifically designed to help address the fiscal risks posed by reliance on volatile and uncertain oil revenues.** They should incorporate explicit risk management strategies to help offset shocks and facilitate less disruptive adjustment processes, thereby contributing to the smoothing of spending over the medium term.

- The introduction of budgetary contingencies or other self-insurance mechanisms is important. Traditional MTFs include technical and prudential contingencies for dealing with changes in key macroeconomic assumptions or unexpected expenditures. OPCs should give appropriate weight to the risk of oil shocks and their potential fiscal impact in determining the appropriate size of contingency reserves and non-oil deficits from a vulnerability and sustainability perspective, especially in light of the asymmetric costs of adjustment.

[30] See forthcoming IMF papers on fiscal issues related to the scaling up of aid for further discussion.

- Scenario or stress tests to the MTF and long-term fiscal position in relation to potential oil and other shocks should be regularly conducted to calibrate country specific target levels for contingency reserves and non-oil deficits.[31] This approach, which can be conducted at various levels of complexity, should help internalize the risks in fiscal policy formulation in OPCs.[32]

62. **The experience with MTFs among OPCs varies widely**. Many OPCs are moving toward adopting at least basic forms of MTF for managing fiscal policy (see Appendix IV for country examples).

- **Most sub-Saharan African OPCs are in the early stages.** In many of these countries the link between policies and the annual budget remains weak, and PFM systems require substantial upgrading. Nonetheless, reforms in Cameroon, Chad, Gabon, and Nigeria include a move toward a basic MTF to help implement their poverty-reduction strategies. The initial focus tends to be on developing a top-down MTFF with more detailed sector strategies for priority ministries, along with complementary PFM reform plans to help improve budget planning and execution.

- **Some emerging OPCs are adopting MTFs**. Azerbaijan, Kazakhstan, and Timor-Leste have introduced rolling MTFFs, ranging from three to five years. However, more comprehensive and detailed medium-term planning is often hampered by the fragmented nature of the budget and the need for complementary PFM reforms.

- **More mature OPCs are also beginning to embrace MTFs**. Iran's fourth Five Year Development Plan, which outlined basic policy objectives and set out a wide range of macroeconomic targets, also recommended that fiscal policy be anchored within a medium-term framework to help reduce pro-cyclicality of expenditure and improve policy coordination. Algeria, Libya, and the United Arab Emirates have also indicated their intention to develop MTFs in conjunction with other PFM reforms.

B. The Role for SFIs Within Broader Institutional Reforms

63. **The design of SFIs and the underlying fiscal institutions are crucial if they are to be effective**. While SFIs are not a panacea for managing oil revenues, under an appropriate institutional framework, well-designed SFIs may help support sound fiscal policies. In particular, more flexible SFIs such as financing funds and procedural FRL aimed at transparency and accountability, may hold more promise for helping fiscal management.

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[31] Aizenman and Lee (2005) and Rodrik (2006) look at the rationale for holding large precautionary international reserves, which can be extended to OPCs facing potential large shocks. See forthcoming IMF papers on fiscal issues related to the scaling up of aid for further discussion.

[32] Bartsch (2006) applies a probabilistic approach to examine the optimal size of financial assets to stabilize spending in Nigeria. Celasun, Debrun, and Ostry (2006) use a probabilistic (fan-chart) approach to analyze debt sustainability. Specific oil-shock scenarios in debt sustainability analysis exercises are also examples of this approach.

Successful SFIs require strong institutions and political commitment. The development of SFIs should not detract from undertaking other more fundamental PFM and governance reforms, which should be given priority as appropriate. In addition, international experience suggests more specific principles for the design and implementation of effective SFIs.

Oil funds

64. **Some basic principles for the design of effective oil funds are the following:**

- Oil funds should be well integrated with the budget to enhance both the coordination of fiscal policy—including integrated asset and liability management—and the efficiency of public spending. This is best achieved by ensuring that the fund operates as a government account rather than a separate institution. Rigid operational rules (such as those seen in contingent and revenue-share funds) are best avoided.
- Funds should ideally not have the authority to spend, to avoid dual budgets and preserve the integrity of the budget.
- Financing funds should be preferred. These funds devolve the focus of fiscal policy design and implementation to the budget and highlight the importance of the non-oil balance for fiscal programming. Expenditure decisions are reflected in non-oil fiscal indicators and in the net accumulation of assets in the oil fund, which in some cases may make fiscal policy more transparent.
- Stringent mechanisms to ensure transparency, good governance, and accountability and prevent the misuse of resources should be in place to provide assurance that government assets are properly and prudently managed.

65. **Oil funds can play a useful role in asset management, provided they are properly integrated with other government financing operations.** The resources in the oil fund should be managed to support the government's overall asset and liability management strategy with a medium- to long-term horizon, taking account of the major risks. This requires the development of a clear, comprehensive, and transparent investment and risk management framework. Macroeconomic stabilization, competitiveness, and liquidity considerations suggest the advisability of placing oil fund resources abroad.

Fiscal rules and FRL

66. **The implementation of quantitative fiscal rules in OPCs has proved very challenging.** This has been mainly due to the characteristics of oil revenue and political economy factors. Country experience suggests that rigid numerical rules have been prone to design and implementation difficulties given the substantial volatility of oil revenue. Compliance with the rules in periods of abundant liquidity has also been challenging and inflexibility has often meant that they are reviewed or abandoned during oil shocks. Less rigid guidelines may work better to sustain the credibility of the fiscal framework while maintaining a longer-term perspective.

67. **The success of procedural FRL in strengthening fiscal management hinges on appropriate design, consistency with PFM capacity, and enforcement of their**

provisions. This, in turn, depends on the extent of political commitment to fiscal discipline and a willingness to adopt key structural reforms. However, improved transparency and better management of oil revenues by itself can act as an important factor in strengthening overall institutional quality and fiscal management. The experience of some OPCs and subnational regions suggests that FRL, with comprehensive procedural and transparency requirements, can contribute to improving transparency and accountability. The formulation and implementation of FRL can also help identify and address specific PFM weaknesses, and improve intergovernmental coordination.

Oil reference prices

68. **While there is a case for an element of prudence in budget oil price forecasts, the use of artificially low reference oil prices for budgeting purposes would best be avoided.** As indicated previously, an artificial oil reference price assumption risks undermining the transparency, unity, and credibility of the budget, particularly if it is associated with frequent expenditure revisions during the fiscal year, extrabudgetary activity, and reduced expenditure controls which may affect the quality of spending.

69. **Fiscal prudence should be expressed through spending plans.** Oil revenue projections used for budgeting purposes may involve an element of prudence to take risk into account, but they should also be credible. Budgeting within a realistic MTF which uses the best estimates of oil revenues and accounts for fiscal risk, and setting expenditures at prudent levels, based on medium- and long-term perspectives and risk analysis, may help countries cope better with oil price volatility and unpredictability. In addition, a greater focus on the non-oil balance in budget documents as an indicator of the direction and sustainability of fiscal policy, may help foster an informed debate of fiscal policy choices.

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APPENDIX I. Expenditure Patterns in OPCs During the Recent Oil Boom

Between 1999 and 2005 average primary government spending increased by 13 percentage points of non-oil GDP. Yet, this average masks large differences across countries. For instance, increases in spending as a share of non-oil GDP exceeded the increase in oil revenues in Indonesia, Sudan, and Syria. In contrast, expenditure as a share of non-oil GDP declined in Cameroon, the Republic of Congo, Gabon, Kuwait, and the United Arab Emirates.

In most countries, additional expenditures were concentrated in capital spending. On average, higher capital outlays accounted for 60 percent of the additional spending. In a subset of countries (Appendix I, Table 1), about half of the higher primary spending was concentrated in subsidies and transfers, reflecting to some extent higher domestic fuel subsidies (in most countries these subsidies might have been netted out from oil revenues and would not be recorded as spending). Using a functional classification of expenditures, countries have generally shifted away from military spending and towards education and health spending, but these results should be treated with caution due to the small size of the sample.

Spending stepped up in the last few years, with over 50 percent of the additional spending in 2000–05 occurring during 2004–05. This follows the large increase in oil revenue over the last two years and may be due in part to growing perceptions of a long-lasting increase in oil prices. It also suggests that it may have taken time to design and begin the execution of new capital projects.

Spending patterns varied significantly between lower- and higher-income OPCs. Whereas on average the increase in total spending accounted for 27 percent of the increase in oil-revenue in higher-income countries, this increase was as high as 40 percent in lower-income countries. Lower-income countries show a particularly pronounced increase in spending on subsidies and transfers and wages. By contrast, the increase in capital spending was marked in higher-income countries. Increases in education and health spending are also noticeable in lower-income countries, but this may reflect increases in wages. The observed lack of higher spending on health and education in higher-income countries suggests that much of their additional capital spending was allocated to other areas, such as transport or infrastructure.

Appendix I. Table 1. Government Expenditure in Selected Oil-Producing Countries
(As a share of non-oil GDP, unless otherwise noted)

	All Countries 1/					Lower Income 2/		Higher Income 2/	
	Average			Change		Change	Average Annual Increase in Real Terms	Change	Average Annual Increase in Real Terms
	1999 3/	2003	2005	1999-2005 4/	2003-05				1999-2005 4/
							(In percent)		(In percent)
Total expenditure and net lending	42.0	45.5	51.4	10.8	5.9	8.7	12.5	13.1	10.0
of which primary expenditure	37.6	42.7	49.0	12.6	6.3	10.3	13.8	14.9	11.7
Current expenditure	33.6	35.2	36.9	4.1	1.6	5.3	11.9	2.9	8.4
Interest	4.4	2.8	2.4	-1.8	-0.3	-1.7	...	-1.9	...
Wages and salaries	12.2	11.5	12.1	0.6	0.5	1.4	12.0	-0.3	6.2
Capital expenditure and net lending 5/	8.4	10.3	14.6	6.7	4.3	3.4	18.8	10.2	20.5
Memorandum items:									
Subsidies and transfers (in percent of the change in primary expenditure) 6/	…	…	…	45.1	74.4	45.3	...	43.8	...
Oil revenue	20.0	30.4	53.4	34.9	23.0	21.8		49.0	

Sources: Fund staff reports and staff estimates.

1/ Excluding two large outliers (Angola and Equatorial Guinea).
2/ Lower-income countries are those defined by the World Bank as low income or lower middle income countries. Higher-income countries are those defined by the World Bank as high income or upper middle income countries (i.e., 2005 GNI per capita above $3,465).
3/ Excludes Kazakhstan, Russia, and Timor Leste for which 1999 data are not available.
4/ For Kazakhstan, Russia, and Timor Leste the base year is 2000.
5/ Includes extrabudgetary funds when information is available.
6/ Based on 12 countries with available data: Algeria, Azerbaijan, Cameroon, Chad, the Republic of Congo, Gabon, Indonesia, Nigeria, Saudi Arabia, Sudan, United Arab Emirates, and Yemen.

APPENDIX II. Sustainable Fiscal Benchmark—Key Assumptions and Further Considerations

Key assumptions

The sustainable fiscal benchmark is based on a standard theoretical approach linked to the permanent income hypothesis (PIH) used to determine a sustainable fiscal policy for OPCs. It is defined as the (permanent) annual non-oil primary deficit derived from government net wealth, which is the present value of projected future oil revenues plus the value of net government financial assets.[33] Fund teams have increasingly applied similar analytical tools to OPCs, with various intertemporal welfare criteria and country-specific assumptions. In this paper, a standardized and simple approach to estimate the sustainable benchmark has been applied to the whole sample to facilitate comparability.

The construction of the sustainability benchmark for OPCs inclusive of estimated oil wealth depends on key assumptions in a similar way to the debt-sustainability analysis (DSA) for other countries. In OPCs, the analysis makes explicit a number of sensitive intertemporal welfare issues. Similar judgments about intertemporal welfare choices are made in the DSA for other countries, but are usually not made explicit.

The following key assumptions were made:

- Estimates of proven oil reserves were taken from British Petroleum (2005). This report includes annual series of estimated proven reserves dating back to at least 1980, which can be taken as "real-time" information available for each year. In addition to the discovery or incorporation of new oil reserves and their depletion, changes in reserves also reflect updated estimates.

- Oil production during the projection period was assumed to remain constant at the level of the year for which the sustainability exercise was done (i.e., 2000 and 2005) until depletion.

- Oil prices during the projection period were assumed to remain constant in real terms at the level observed in each particular year for which the analysis was carried out.

- The government take from oil production used in the exercise was the average of the latest three-four years, to smooth out the effect of one-off oil revenue sources.

- An interest rate of 3 percent in real terms (the historical average of long-dated U.S. Treasury bonds) was used to discount future oil revenue flows.

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[33] Barnett and Ossowski (2003) offer a formal derivation of this approach. A simplified formulation, which can be modified to account for GDP or population growth (as discussed below), is the following:

*Sustainable non-oil primary deficit = r/(1+r) * government wealth = r/(1+r) * (present value of oil revenue + financial assets–debt)*, where r is the real interest rate.

- A lower interest rate in real terms (2 percent) was applied to the estimated net government wealth in 2000 and 2005 to estimate a "sustainable" level of consumption for each of those years ("sustainable" non-oil primary deficits). The 2 percent rate was set as a "middle of the road" scenario between (i) a constant non-oil primary deficit in real terms but declining over time in terms of non-oil GDP (using a real interest rate of 3 percent, i.e., the return on financial risk-free assets); and (ii) a constant non-oil primary deficit relative to non-oil GDP (using a real interest rate equivalent to 3 percent minus the long-term growth rate of the non-oil economy). The former approach would imply a more lax fiscal policy in the short run but a tighter one in the future, while the latter would require a tighter fiscal policy in the short run relative to option (i). Hence, using a 2 percent rate implies a more gradual adjustment of the non-oil primary deficit relative to non-oil GDP than in (i), but allows a higher deficit in the short run than in (ii).[34]

Other approaches or assumptions could give different results, and therefore this exercise should be seen as a reference scenario for the analysis. There is substantial uncertainty about the appropriate parameters for the oil sector in the short run and more so in the long run. More conservative oil price assumptions would lead to lower estimated sustainable non-oil primary deficits. The opposite would be the case if probable reserves were included in the calculations. In addition, multiple dynamic paths could be designed to be equivalent to the (constant) sustainable benchmark.

Further considerations

The sustainability analysis used in this paper has a "static" dimension in that it focuses on the fiscal position of one specific year at a time. A sustainability gap can be closed in future years in various ways, including increased non-oil revenue, reductions in spending, or changes in the fiscal regime of the oil sector. These factors can only be captured explicitly in a dynamic setting.

The quality of government spending, in particular public investment, can influence growth, future government revenue, and thus fiscal sustainability. Public investment could yield higher returns to the government than investments in financial assets. As shown in Takizawa, Gardner, and Ueda (2004), government spending could exceed the level prescribed by standard PIH-based models in the short term if the economy starts with a capital stock that is below the "steady-state level," and if the impact of government investment on growth exceeds a threshold level. At the same time, spending with significant positive impact on economic growth will improve fiscal sustainability, provided that governments are able to realize the fiscal dividends of growth. Additional revenue that may be required to cover significant depreciation and maintenance costs of the new public capital stock also needs to be taken into account. The financial returns may need to be quite high for

[34] The 2 percent rate can also be justified to reduce vulnerabilities to negative shocks or relatively low real returns on financial assets in most countries.

the additional spending to have a neutral or positive impact on the government's cash flow, and therefore on sustainability.[35]

Sound expenditure management practices, including project design and implementation, are needed to ensure that additional public spending is of high quality, productive, and cost-effective. Research has shown that the quality of policies and institutions has a large influence on the ex post rate of return of public investment and on the rate of growth. In this regard, existing institutional capacity and indices of government effectiveness need to be considered when assessing the potential impact of higher public spending on private investment, growth, and fiscal sustainability. In addition, public investment should be adequately financed to ensure that the projects initiated can be completed and then properly maintained.

[35] Domestic fuel subsidies and population aging are examples of other medium- and long-term fiscal issues that should be considered in assessing fiscal sustainability in a dynamic setting.

APPENDIX III. Econometric Analysis of the Impact of Fiscal Institutions on Fiscal Outcomes

This section provides a more detailed description of the econometric analysis presented in Section IV on the impact of SFIs on the policy response of OPCs to the current oil boom. It describes the methodology and data and presents the main results.[36]

Methodology and data

The econometric analysis focuses on the impact of SFIs on key fiscal variables, after controlling for the country-specific size of the additional oil revenues and government net wealth. It would be expected that on average countries with SFIs would have a more restrained fiscal response to the oil boom, particularly as *ex-ante* it was not known how much of the oil price increase would be long-lasting.[37] Nevertheless, when measuring the impact of SFIs it is necessary to take into account country-specific factors. As such, the econometric analysis is structured in the following manner:

- Regressions were run to assess the impact of SFIs on key fiscal variables, namely: the change in the non-oil primary balance ratio to non-oil GDP; the average growth of government expenditures in real terms; and the correlation between expenditure and oil revenue.
- The analysis focuses on assessing whether the presence of SFIs changes a country's fiscal response. The regressions control for key economic variables in OPCs, in particular the size of government net wealth and the degree of dependence on oil revenue. The objective is to assess whether different fiscal outcomes are observed in a country with SFIs compared to a similar country without SFIs. Other control variables that may influence the fiscal response (such as per capita GDP) are also included.
- The quantitative assessment also looks at the more direct effect of SFIs in affecting the response to changes in oil revenue and the size of government net wealth.

The econometric analysis uses panel data to ensure more robust estimates of the impact of SFIs on fiscal outcomes.[38] To measure the impact of SFIs on key fiscal variables, a

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[36] In addition, a forthcoming working paper will provide further discussion of the econometric analysis and results.

[37] In most cases, countries have introduced SFIs (oil funds or fiscal rules) in an attempt to affect, directly or indirectly, the behavior of expenditures and/or the non-oil balance (particularly the contemporaneous response to fluctuations in oil revenue). This tends to reflect short-term considerations (such as preventing volatile spending and enhancing macro-fiscal management), and/or longer-term objectives (such as promoting sustainability and intergenerational equity).

[38] The econometric analysis is based on a common specification for panel data (Baltagi, 2005):
$y_{it} = \alpha+\beta x_{it}+\mu_i+\nu_{it}$

with *i* denoting countries and *t* denoting time; μ_i denotes the unobservable country-specific effect, and ν_{it} denotes the more common disturbance factor. See discussion below on how to address the presence of μ_i in the panel data regressions. The proxy for SFIs is a dummy variable, which takes value 1 if a country has an oil fund and/or fiscal rules, and value zero otherwise.

dummy variable is used, which takes the value 1 if a country has an oil fund and/or fiscal rules and zero otherwise. Both the current oil boom and a longer period (1992-2005) are looked at. The longer period is particularly relevant to assess the impact of the new SFIs, as a number of oil funds and fiscal rules were introduced in the late 1990s or early 2000s.

The methodologies applied in this paper are directed at estimating a robust relation between fiscal outcomes and fiscal institutions taking into account some standard econometric problems. The key challenges for the econometric analysis are the following:

- Countries with relatively large non-oil deficits or difficulties in containing spending may be the ones more likely to introduce SFIs. This could lead to biased estimates, as the SFI would "appear" to cause higher deficits or expenditure growth—that are explained by time-invariant country specific-factors ("fixed effects") not captured in the standard regressions. One methodology used to address the possible estimation bias is to run regressions that correct for fixed effects. The basic intuition is that by looking at the *changes* in the fiscal variables (instead of levels) the regressions will better capture the impact of the introduction of the (or changes in the) institutional variable. In this particular case, the fixed effects regressions will be capturing the impact of introducing an oil fund and/or fiscal rule in a country.[39] Nevertheless, by focusing on within-country variation, some information could be lost. As such, a specification which incorporates a linear combination of cross-country and within-country variation (random effects regressions) was also tested.[40]

- SFIs could be influenced by the dependent variables (e.g., the fiscal outcomes could lead to changes in the institutions). In general, earlier studies have assumed that variations in economic variables are unlikely to have immediate feedback on institutions—which tend to change slowly over time. Nevertheless, in this study the SFI variable only measures whether an SFI is present or not, which should minimize the endogeneity problem.[41] Nevertheless, an econometric tool that attempts to correct for the possibility of feedback from the dependent variable, developed by Arellano and Bond (1991), is used.

- It may be difficult to distinguish the impact of the introduction of SFIs in countries where this overlapped with the beginning of the oil boom. If the "state of the world" changed (with perceived long-lasting increases in oil prices), regressions could show that the SFIs are "causing" increases in the non-oil deficit, while this may be mainly a response to higher oil revenue. However, the regressions compare the impact of SFIs,

[39] This is similar to the usual "omitted variables" problem. The fixed effects regressions focus on the within-country variation, correcting for possible bias from unobserved country-specific effects. See Baltagi (2005) for a more technical discussion.

[40] Baltagi (2005) discusses the use of fixed or random effects regressions. Another possibility would be to use event-studies techniques. However, this is not feasible due to data constraints and difficulties in distinguishing the impact of introducing the institutions from the oil boom using this technique.

[41] This problem is likely to be more relevant if the SFI variable measured "qualitative" aspects of the institution, which could potentially be dependent on fiscal outcomes. See also Fabrizio and Mody (2006).

not only over time, but also across countries—while controlling for changes in net wealth and oil revenue (which would capture the impact of the oil boom). Furthermore, ex-ante, governments did not know to what extent the oil shock was likely to be long lasting and a gradual adjustment would be expected.

Most of the fiscal and national accounts data were provided by country teams or taken from past staff reports. In addition, a measure of net government wealth was estimated for every year as described in Section II. The analysis uses the International Country Risk Guide (ICRG) indices as proxies for the quality of overall institutions. The econometric analysis uses the index of political risk (PR), a composite index of 12 variables, and some of the individual indices that are included in the PR, including: government stability, corruption, law and order, democratic accountability, and bureaucratic quality. These indices are commonly used in the literature, particularly as annual data are available.

Results

The empirical results suggest that SFIs do not have a significant impact on the fiscal stance, as measured by the ratio of the non-oil primary balance to non-oil GDP. As Appendix III, Table 1 shows, the results indicate that the introduction of SFIs does not affect the non-oil primary deficit, even after controlling for government net wealth and the degree of dependence on oil revenue (the ratio of oil revenue to total revenue).[42] The impact of SFIs is negative under all alternative specifications during the oil boom period, suggesting that the presence of SFIs is associated with a lower non-oil primary balance—however, the coefficients do not tend to be statistically significant.[43] These findings are also confirmed for the longer sample (Appendix III, Table 1, columns 4–7).[44] In general, however, the estimates are not statistically significant.[45] The results do indicate that the size of the non-oil primary balance depends mostly on the (annual) relative size of oil revenue (Appendix III, Table 1) and changes in oil prices. In general, government net wealth does not appear to be influencing fiscal policy.

[42] The SFI variable takes a value of 1 if the country has an oil fund or a fiscal rule/FRL, and zero otherwise. The analysis does not look separately at different SFIs due to data limitations. In addition, introducing variables that include a more qualitative assessment of SFIs (for example, differentiating SFIs by quality of design or actual specific objectives) could bias the estimates. The preceding section presents a more qualitative discussion of the SFIs.

[43] To test whether the presence of SFIs would constrain the impact of changes in government net wealth, column 3 included the interaction between the SFI variable and government net wealth, which is also not significant.

[44] The main results are robust to controls for possible endogeneity of the SFI variable. The coefficients of the SFI are small and still not statistically significant at the 10 percent level (Appendix III, Table 1, columns 6–7).

[45] The regressions, except for column 1, exclude Equatorial Guinea, as the very large increase in oil production and revenue in the late 1990s would tend to dominate the results. If included, the regressions would tend to show a more negative impact of fiscal institutions.

Appendix III. Table 1. Dependent Variable: Non-Oil Primary Balance

	Sample: 2000-05			Sample: 1992-2005			
	OLS	Fixed Effects		Fixed Effects		Arellano-Bond	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log (GDP per capita in USD, lagged)	-0.24	23.8**	22.8**	-	-	-3.27	-
	(-0.19)	(2.11)	(2.13)			(-0.91)	
Net government wealth (as a share of non-oil GDP)	-0.001	-0.01	0.01	0.002***	0.002***	-0.001	0.0
	(-1.18)	(-1.26)	(0.84)	(2.92)	(3.00)	(-0.74)	(0.47)
SFIs dummy	-4.69	-2.26	-	-0.8	-0.5	-0.2	-1.5
	(-1.00)	(-0.84)	-	(-0.73)	(-0.45)	(-0.14)	(-0.99)
Oil revenue (as a share of total revenue)	-1.1***	-0.56***	-0.59***	-.30***	-.31***	-.41***	-0.33***
	(-7.50)	(-3.19)	(-3.12)	(-5.46)	(-5.62)	(-5.71)	(-5.31)
Oil price (lagged)	0.1	-0.68**	-0.68**	0.0	0.04	-.16	-.17**
	(0.30)	(-2.28)	(-2.28)	(-0.55)	(0.50)	(-1.35)	(-2.12)
Inflation (lagged)	-.12**	-0.01	-0.01				
	(-2.49)	(-0.13)	(-0.15)				
FI dummy* net wealth			-.015				
			(-1.17)				
Non-oil primary balance (as a share of non-oil GDP, lagged)				-	-	0.60***	0.28***
						(3.43)	(6.48)
Composite index of institutional quality (ICRG)				0.3***	-	-	-
				(2.68)	-		
Democratic accountability				-	-1.65***	-	-1.5**
					(-3.33)		(-2.21)
Bureaucratic quality				-	1.45	-	2.06*
					(1.15)		(1.73)
Government stability				-	.60**	-	-
					(2.34)		
Law and order				-	2.2***	-	1.77*
					(2.76)		(1.84)
Number of observations	172	166	166	284	284	268	255

Source: Fund staff calculations.

T-statistic is in parenthesis, with *** significant at 1%; ** at 5%; * at 10%. The regressions use robust standard errors. The constant term is not shown. Column 1 is based on standard OLS, while columns 2-5 correct for fixed effects. Based on the Hausman specification test, fixed effects are preferred to random effects regressions (not shown). Columns 6 and 7 used a dynamic specification developed by Arellano and Bond (1991) to correct for possible endogeneity of the independent variables.

In contrast to SFIs, broader governance institutions do seem to have an impact on the non-oil primary balance (Appendix III, Table 1, columns 4, 5, and 7). Once broader indicators of institutional quality are introduced, the SFIs coefficients tend to zero and become highly insignificant, while higher institutional quality seems to be associated with lower non-oil deficits. A composite indicator of the overall quality of institutions (column 4), suggests that the higher the quality of institutions, the higher the non-oil primary balances.[46] Concerning individual indices included in the composite indicator (column 5), the main contributors for the higher non-oil primary balance are government stability, law and order, and bureaucratic quality. Democratic accountability has a negative impact on the non-oil

[46] The indicator of institutional quality is proxied by ICRG's political risk index. GDP per capita is omitted from the regressions that include some of the institutional variables to avoid multicollinearity.

primary balance.[47] The results are robust to controlling for possible dynamic effects (columns 6 and 7).

The empirical evidence also does not show that the presence of SFIs influences expenditure growth or helps constrain the expenditure response to changes in oil revenue. The econometric results (Appendix III, Table 2), using various specifications, show that the impact of SFIs on expenditure tends to have the "wrong" sign (positive), but the coefficients are not statistically significant after controlling for fixed effects (columns 2 and 5).[48] When testing for the interaction between the SFI variable and oil revenue growth (columns 3 and 6)—to better assess the ability of SFIs to affect the expenditures sensitivity to contemporaneous changes in oil revenue—the results are mixed.[49] During the boom period, SFIs appear to strengthen the response of spending to rising oil revenue. In the longer sample this relationship is not statistically significant. These results suggest that SFIs have not moderated spending responses to oil revenue volatility, particularly in periods of large changes. In addition, the data show that government net wealth is not significant as expenditures tended to react more strongly to changes in oil revenue.[50]

The empirical analysis also fails to show that SFIs have had an impact on the correlation between expenditure and oil revenue during the oil boom (Appendix III, Table 3). The latter is proxied by the ratio between changes in expenditures and changes in oil revenue, where the strongest impact from fiscal institutions would be expected to be found.[51] When the corruption index is introduced, the coefficient of the SFI variable becomes close to zero and highly insignificant. The coefficient for the (lack of) corruption index, however, is significant and suggests that countries with lower levels of corruption have lower correlations between expenditures and oil revenue.[52]

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[47] As discussed in the literature, the channels through which the different indicators of institutional quality affect fiscal policy can be complex and difficult to capture in regressions. In particular, some studies have suggested that countries that move toward more democratic regimes may spend more in the first years of the transition; the regression may be capturing this phenomenon. See Fabrizio and Mody (2006), and Manasse (2006).

[48] The coefficient of the SFIs is positive and significant when using standard OLS regressions.

[49] The interaction between SFIs and government net wealth was also tested, but was not statistically significant.

[50] Columns 4–6 exclude Angola, as the period of high inflation distorted the estimation of real variables and the econometric results.

[51] Coefficients for the SFI dummy tend to have the expected sign—the existence or introduction of SFIs reduces the correlation between expenditures and oil revenue. The estimates, however, are not significant.

[52] The presence of democratic accountability also appears to help contain the correlation between expenditures and growth. The impact of the institutional variables is robust to excluding potential outliers (e.g., Norway).

Appendix III. Table 2. Dependent Variable: Expenditures (Annual real growth rate)

	Sample: 2000-05			Sample: 1992-2005		
	OLS	Fixed Effects (FE)		OLS	Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)
Log of expenditures (as a share of GDP, lagged)	-13.7**	-49.3***	-53.6***	-17.8***	-35.2***	-35.4***
	(-2.30)	(-3.59)	(-3.97)	(-4.65)	(-5.37)	(-5.50)
Log (GDP per capita in USD, lagged)	-1.63*	-4.55	-3.04	-0.58	-8.8**	-7.7**
	(-1.78)	(-0.70)	(-0.49)	(-0.71)	(-2.2)	(-1.99)
Net government wealth (as a share of non-oil GDP)	0.0001	-0.003***	-0.004***	0.00	0.00	0.00
	(0.45)	(-2.75)	(-3.49)	(-0.53)	(-0.05)	(-0.2)
Oil revenue growth (percentage change)	0.06***	0.07**	0.05	0.08***	0.08***	0.073***
	(2.83)	(2.24)	(2.04)	(3.55)	(3.20)	(2.68)
SFIs dummy	5.58**	8.01	-	4.32**	3.13	-
	(2.40)	(1.13)		(2.36)	(1.08)	
Inflation (lagged)	-0.016	0.04	0.08	-0.23***	-0.28***	-0.29***
	(-0.30)	(0.64)	(1.06)	(-2.63)	(-2.67)	(-2.86)
Oil revenue (as a share of total revenue, lagged)	.2***	0.6***	0.71***	0.18***	0.43***	0.45***
	(3.2)	(2.95)	(3.44)	(3.81)	(3.58)	(3.80)
FI dummy* oil revenue growth			0.07**			0.02
			(2.25)			(0.62)
Number of observations	171	171	171	297	297	297

Source: Fund staff calculations.

T-statistic is in parenthesis, with *** significant at 1%; ** at 5%; * at 10%. The regressions use robust standard errors. The constant term is not shown. Based on the Hausman specification test, fixed effects are used instead of random effects regressions (not shown).

Appendix III. Table 3. Dependent Variable: Ratio of the Change in Expenditure to the Change in Oil Revenue

	Sample: 2000-05		
	OLS	Fixed Effects (FE)	
	(1)	(2)	(3)
Log (GDP per capita, lagged)	-0.21	3.0	4.6
	(-0.73)	(0.87)	(1.17)
Net wealth as a share of non-oil GDP (lagged)	0.00	0.0	0.0
	(-1.14)	(-1.05)	(-0.38)
Oil revenue as a share of total revenue	-0.034	-0.2	-.25*
	(-1.00)	(-1.42)	(-1.75)
SFIs dummy	-1.11	-4.4	-3.7
	(-0.67)	(-0.99)	(-0.84)
Corruption index			-3.96**
			(-2.08)
Democratic accountability			-2.26*
			(-1.77)
Number of observations	170	170	156

Source: Fund staff calculations.

T-statistic is in parenthesis, with *** significant at 1%; ** at 5%; * at 10%. The regressions use robust standard errors. The constant term is not shown. Based on the Hausman specification test, fixed effects are used instead of random effects regressions (not shown).

APPENDIX IV. Using Multi-Year Fiscal Policy and Planning Frameworks

In a number of countries, budget processes have been re-oriented to lengthen the period covered by fiscal frameworks. While the specific forms vary, these reforms generally do not mean extending the budget, in terms of the legal appropriations, beyond one year. Most include: a clear fiscal policy statement establishing a medium- to long-term path for expenditure aggregates; medium-term macroeconomic forecasts; requirements for ministries to maintain budget estimates beyond the budget year and to explicitly cost new measures; and hard cash budget constraints for ministries. MTFs also generally emphasize fiscal discipline and play a central role in guiding PFM reform and micro-level performance management.

MTFs have tended to evolve gradually through three basic stages of institutional development:[53]

- **A medium-term fiscal framework (MTFF)** provides a top-down statement of fiscal policy objectives and sector strategies (not necessarily disaggregated to spending agencies), and a set of integrated medium-term macroeconomic and fiscal targets and projections. The MTFF is designed to augment the compliance requirements of the traditional budget to meet a government's stabilization objectives, including the identification of fiscal risks, such as the vulnerability to shocks in OPCs, and the need to control fiscal aggregates and coordinate with monetary policy.

- **A medium-term budget framework (MTBF)** incorporates realistic projections of spending by individual agencies (e.g., line ministries) that allocate resources in line with strategic priorities and consistent with overall fiscal objectives of the MTFF. Information on the distribution of resources within the budget seeks to bolster the stabilization objective with harder medium-term spending constraints for line ministries, and also the productivity of public expenditure, as spending agents can be held accountable for their share of resources.

- **A medium-term expenditure framework (MTEF)** extends the analysis further with more detailed costing within sectors and performance measures. This stage also seeks to identify and promote incentives for better public sector performance, often through the increased delegation of authority to line ministries or agencies and increased flexibility in the mode of service delivery. This stage is predicated on reasonably sound, well-established PFM systems, and a commitment to fiscal discipline and stabilization objectives.

[53] OPM (2000). World Bank (1998) provides a detailed description of the development of an MTEF.

Specific examples of MTFs in OPCs at various stages of institutional development include the following:

- **Mexico's FRL**, approved in March 2006, requires the annual budget to be presented to congress with quantitative projections for the next five years and explicit costing for new fiscal measures. It includes other measures designed to smooth expenditures, strengthen expenditure management, ensure greater transparency, and steps toward performance-based budgeting.

- **Russia** embarked on an ambitious budget system reform program in 2004. A rolling three-year federal budget will be introduced from 2007, approved by parliament, with a detailed breakdown of revenue projections and expenditures. A legal upper limit to the federal deficit of 2 percent of GDP will be set when the oil price is lower than a threshold price. When the oil price is higher than the threshold, the budget should be balanced or in surplus. The non-oil fiscal balance may also be used as an additional fiscal indicator. These reforms are accompanied by wide-ranging PFM reforms and performance budgeting methods (Diamond, 2006).

- **Timor-Leste** adopted a long-term fiscal sustainability policy, similar to Norway's (Section II). Annual budget documents roll forward three-year projections based on sector investment programs with detailed plans to guide expenditures and against which performance can be measured. Considerable technical assistance is being targeted to try to overcome the severe administrative capacity limitations and weak PFM systems that constrain budget execution.