July 2009
IMF Country Report No. 09/220

Democratic Republic of Timor-Leste: Selected Issues

This selected issues paper on the Democratic Republic of Timor-Leste was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on July 8, 2009. The views expressed in this document are those of the staff team and do not necessarily reflect the views of the government of the Democratic Republic of Timor-Leste or the Executive Board of the IMF.

The policy of publication of staff reports and other documents by the IMF allows for the deletion of market-sensitive information.

Copies of this report are available to the public from

International Monetary Fund • Publication Services
700 19th Street, N.W. • Washington, D.C. 20431
Telephone: (202) 623-7430 • Telefax: (202) 623-7201
E-mail: publications@imf.org Internet: http://www.imf.org

International Monetary Fund
Washington, D.C.

INTERNATIONAL MONETARY FUND

DEMOCRATIC REPUBLIC OF TIMOR-LESTE

Selected Issues

Prepared by Tobias Rasmussen (APD)

Approved by the Asia and Pacific Department

July 8, 2009

Contents Page

I. Timor-Leste's Petroleum Fund: Achievements and Challenges[1]

A. Introduction

1. **As a new but impoverished state, Timor-Leste soon faced the prospect of becoming a significant petroleum exporter.** Although modest by international standards, the country's hydrocarbon resources are vast compared to its small non-oil economy. The start of production at the off-shore Bayu-Undan field in 2004, two years after the restoration of independence, quickly made petroleum the largest source of income (Box 1). With oil prices having skyrocketed before falling back in the second half of 2008, oil and gas revenue rose to over 95 percent of government proceeds. Income from hydrocarbon extraction is likely to remain a major source of government revenue for some time and represents an opportunity to develop the economy and raise living standards.

2. **The Petroleum Fund, established in mid-2005, is the centerpiece of Timor-Leste's resource management framework.** Under the Petroleum Fund Law, all petroleum revenue goes into the Fund and is invested abroad. Withdrawals from the Fund are guided by consideration of long-term sustainability and can only be used to finance expenditure of the state budget. This helps ensure that all revenue is properly accounted for, that the government budget remains the primary vehicle for public policy, and that wealth is preserved for future generations.

3. **This chapter provides an overview of how Timor-Leste's Petroleum Fund functions and outlines key challenges going forward.** Section B considers the extent of the country's petroleum wealth and discusses the developmental challenges. Section C depicts the origins of the Fund and details its operating mechanisms. Section D assesses how the Fund has performed to date. Section E addresses the future outlook and uncertainties. Finally, Section F presents some concluding observations.

B. A New Petroleum Nation

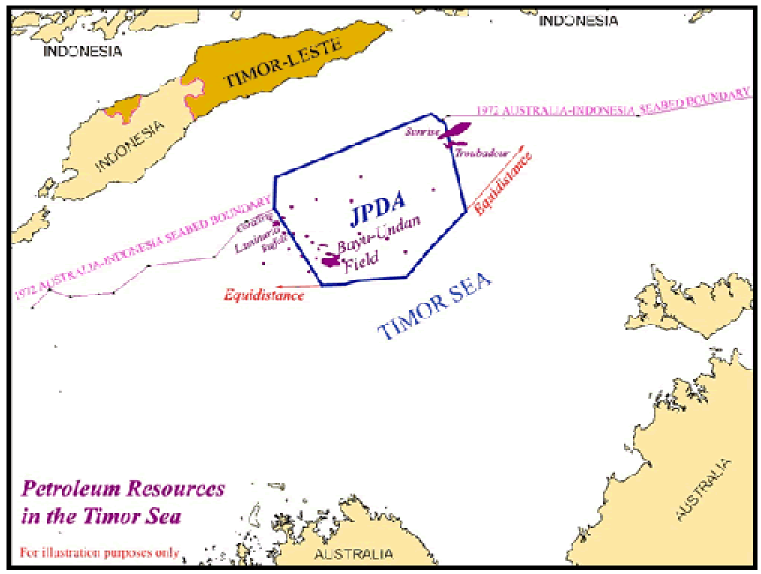
4. **Though small from a global perspective, Timor-Leste's petroleum resources are massive compared to its small and underdeveloped economy.** Based on the absolute level of output or proven reserves, Timor-Leste is far down on the list of major players (Figure 1). What stands out is the comparison to the local economy. Government revenue from oil and gas amounted to about three quarters of the country's total income in 2007. That compares to a ratio of petroleum revenue to non-oil GDP of about one in Kuwait and places Timor-Leste

[1] Prepared by Tobias Rasmussen (APD). This chapter is an abridged version of a technical background paper to a forthcoming UNDP human development report on Timor-Leste.

among the most petroleum dependent countries in the world.[2] Another way to evaluate the relative importance of petroleum is to compare the total gross value of oil and gas output (i.e., not just the net income that the government receives) to GNI. On this measure, Timor-Leste is well above any of the 60 petroleum producers covered in the BP Statistical Review.

Box 1. Timor-Leste's Petroleum Resources

With oil and gas seeping out of the ground in many places throughout the country, Timor-Leste's hydrocarbon potential has long been surmised. Major production only commenced recently, however, and much of the territory is still unexplored.



To date, commercial hydrocarbon extraction has been limited to the so-called Joint Petroleum Development Area (JPDA) in the Timor Sea, which is shared with Australia. The largest field there and the only one currently in production is Bayu-Undan, which became operational in early 2004. Based on conservative estimates, projections in the government budget have another almost 700 million barrels of oil equivalent still to be extracted with production levels gradually tapering off before coming to an end in 2022.

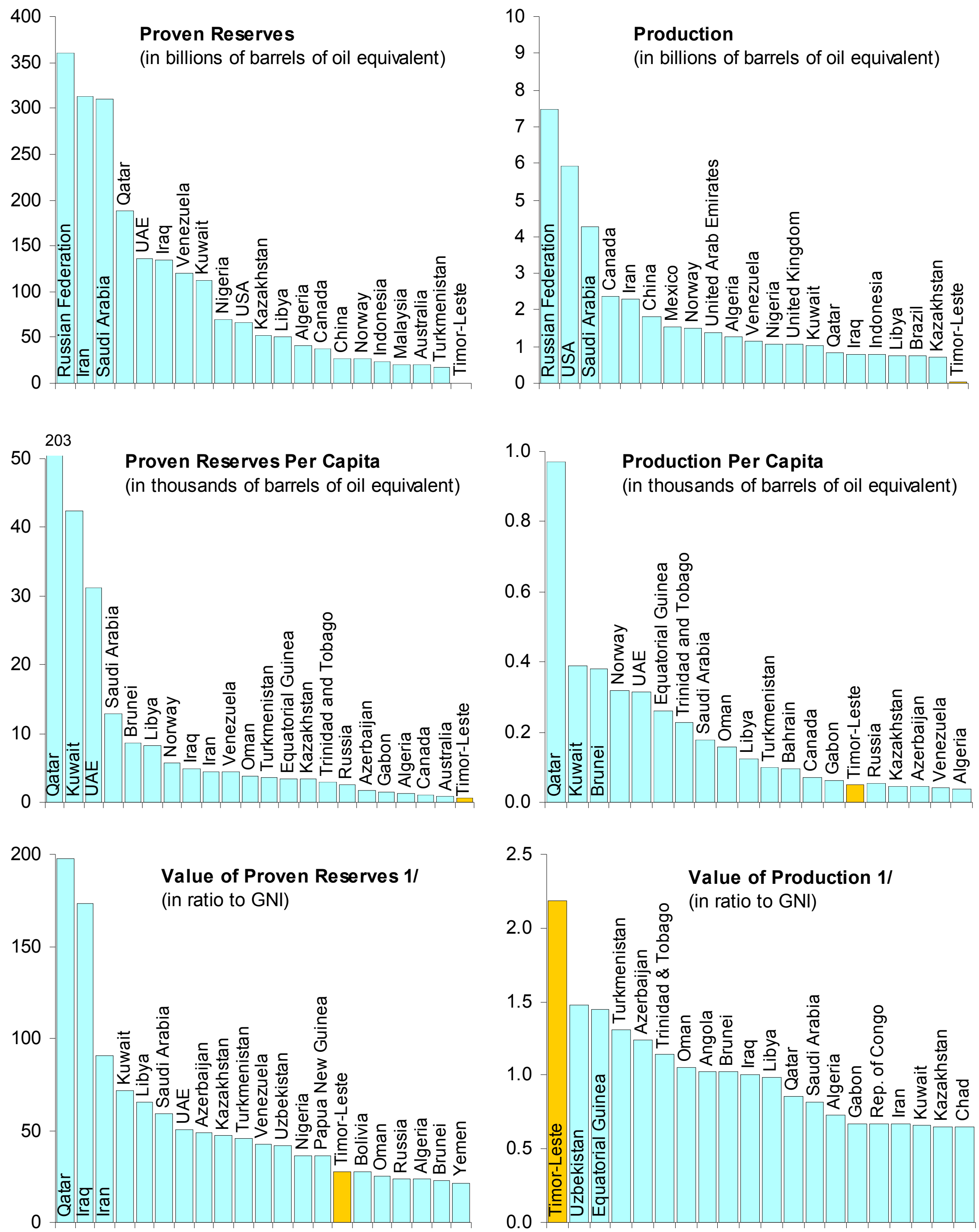
Revenue from the JDPA is shared with a 90/10 split between Timor-Leste and Australia according to the Timor-Sea Treaty, ratified in April 2003. According to the latest budget documents for 2009, based only on Bayu-Undan, total projected revenue for the lifetime of the project is $11 billion. The next field to be developed is likely to be Kitan, a recent discovery in the JDPA that is estimated to contain 30–40 million barrels of extractable oil and could come into production in 2010–11.

Greater Sunrise straddles the eastern boundary of the JPDA. A development plan has yet to be agreed upon, including the location of the required processing plant, but production could start around 2013. According to a separate treaty, government proceeds from Greater Sunrise will be split 50/50 between Timor-Leste and Australia. Timor-Leste's total take could be of about the same magnitude as receipts from Bayu-Undan.

In Timor-Leste's exclusive jurisdiction, exploration in off-shore acreage is ongoing and could lead to a major find. Finally, there is potential for onshore production although that has still to be explored.

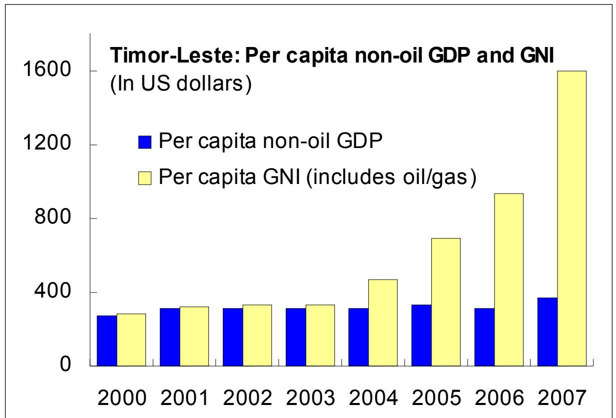
[2] Data are not universally available but the ratio of petroleum revenue to non-oil GDP can sometimes be inferred from figures published in IMF Article IV reports. According to this source, with ratios of about 2.5 in 2006, Equatorial Guinea and Libya come close to Timor-Leste. Other highly oil dependent countries have much lower ratios, including Angola (1.0 in 2005) and Brunei (0.6 in 2005).

Figure 1: Oil and Gas Reserves and Production, 2007



Sources: BP Statistical Review of World Energy, June 2008, for data on oil and gas production and reserves. World Bank World Development Indicators database, July 2008, and CIA World Factbook for figures on GNI and population. Timor-Leste reserves refer to projected production from the Bayu-Undan field from the 2009 budget.
1/ Oil and gas valued at $71 per barrel, the average spot price in 2007.

5. **Petroleum is now by far Timor-Leste's largest source of income.** In 2002, the year independence was restored; GDP per-capita was less than $350. From that small base, the government received a flood of petroleum receipts. Total income, as measured by GNI, rocketed to over $1,600 per capita in 2007. As prices and volumes grew, the Petroleum Fund reached $4.75 billion in March 2009. Invested entirely in U.S. government bonds it has produced an average annual return of 5.2 percent. Concurrently, the estimated sustainable income from the country's petroleum wealth quadrupled from the first estimate in the FY2005/06 budget to about $400 million for 2008. This translated into a greatly expanded scope for increasing government expenditure. At the same time, however, there were capacity constraints in budget execution and little growth in the non-oil economy.



Source: IMF (2008)

6. **If well harnessed, Timor-Leste's petroleum wealth offers the potential for a more prosperous future.** Living standards remain among the lowest in the world and there is pressure to achieve better and more immediate results. However, the petroleum sector provides almost no jobs and income generation in the rest of the economy remained stagnant. With non-oil GDP broadly flat up until 2007, the onset of oil and gas production had little impact on the wider population and poverty remained pervasive. The overarching economic challenge remains to translate the petroleum wealth into a broad-based and sustainable increase in living standards.[3]

C. The Petroleum Fund

7. **The Petroleum Fund is the centerpiece of Timor-Leste's resource management framework.** After thorough public consultations, parliament approved the Petroleum Fund Law unanimously in June 2005. The Petroleum Fund (PF) is based on the Norwegian model and was established with technical assistance provided by the IMF.[4] It aims at (i) limiting the risk of Dutch Disease, i.e., the tendency for the real exchange rate to become overly appreciated, thereby causing a contraction of the non-oil tradable sector; (ii) sheltering the budget from unstable commodity prices and associated swings in government spending; and (iii) avoiding that rent seeking leads to economic and social divisions and weakened institutions. Three important aspects are discussed in more detail below: savings policy,

---

[3] Cordon and Neary (1982), Sachs and Warner (1995), Sala-i-Martin and Subramanian (2003), Isham and others (2005), and Ploeg and Poelhekke (2007) discuss pitfalls of natural resource management.

[4] For early discussion, see Alkatiri (2003), MOPF (2004), IMF (2004), and IMF (2005).

responsibilities and oversight arrangements, and investment strategy. Key Fund principles are outlined in Box 2.

Box 2. Main Features of Timor-Leste's Petroleum Fund

Timor-Leste's Petroleum Fund is essentially a government account with the Banking and Payments Authority (BPA) to which the country's petroleum receipts are credited and from which debits can be made to finance the state budget. It was established with the Petroleum Fund Law and operates according to the following key principles:

- **Management.** The fund is to be managed prudently in accordance with the principle of good governance for the benefit of current and future generations. The government is responsible for the overall management and the BPA is responsible for the operational management.
- **Income.** All Timor-Leste's revenue from petroleum operations is paid into the fund and the fund also retains all investment income (net of management expenses).
- **Investment.** All assets are invested abroad in established financial markets, with at least 90 percent in U.S. dollar-denominated fixed income instruments. Initially, according to the management agreement between the Ministry of Finance and the BPA, the Fund was restricted to holding U.S. government securities in order to track the benchmark Merrill Lynch 0–5 year bond index.
- **Withdrawals.** Transfers from the fund can only be made to the single state budget account. The amount transferred in any fiscal year can only take place after the publication of the budget law and cannot exceed the appropriation specified therein. Transfers are also contingent on the government providing parliament with a report specifying the *estimated sustainable income* (ESI) and a certification of that amount by an independent auditor.
- **Savings policy.** To preserve the real value of the country's petroleum wealth, withdrawals from the fund are guided by the concept of sustainable income. For each year, ESI is calculated as 3 percent of the sum of the fund balance and the present value of expected future petroleum receipts. Withdrawing more than ESI requires the government to provide parliament with a detailed explanation of why it is in the long-term interests of the country, and also a report certified by the independent auditor estimating the impact on future ESI.
- **Reporting.** The BPA publishes quarterly reports on the performance and activities of the fund. The government submits an annual report with an audited financial statement. Details on revenue and composition of the investment portfolio are fully disclosed.
- **Oversight.** An Investment Advisory Board advises the Minister of Finance on the overall investment strategy and management of the fund. An independent Consultative Council advises parliament on the performance and operation of the fund and also on budget appropriations and whether these are being used effectively to the benefit of current and future generations.
- **Transparency.** Fund management is to be carried out with the highest standard of transparency. Quarterly and annual reports are made public, as is the advice of the Consultative Council (within 30 days of having been provided to parliament). Minutes of Investment Advisory Board meetings have routinely been posted on the BPA website.

Source: Ministry of Planning and Finance (2004) and formulations in the Petroleum Fund Law (Law No. 9/2005 of August 3).

Savings Policy

8. **With the Petroleum Fund Law of August 2005, Timor-Leste opted for a savings policy based on the principle of maintaining the total value of its oil and gas resources.** To that end, withdrawals from the fund should be guided by the real rate of return on the total petroleum wealth, the so-called *estimated sustainable income* (ESI). The approach had the benefit of being intuitively simple, appealing from the point of view of intergenerational equity, and offering a reasonably stable source of income to the budget (Box 3).[5] The ESI is a benchmark to guide the level of saving rather than a legal obligation. Transferring more is admissible, but requires that the Government provides Parliament with a detailed explanation of why this is in the long-term interest of the country and also documents the resulting future reduction in ESI.

Box 3. Calculation of Estimated Sustainable Income

The estimated sustainable income (ESI) for a given fiscal year is defined as the maximum amount that can be appropriated and transferred from the Petroleum Fund to the budget while retaining sufficient resources to appropriate an equal amount in all subsequent years.

ESI for a given fiscal year is calculated according to the following formula:

$$ESI = r\left[V + \sum_{t=0}^{n} \frac{R_t}{(1+i)^t}\right],$$

where r = 3 percent is the specified real rate of return, V is the balance of the fund at the start of the fiscal year, R_t is the budget projection for petroleum revenue in year t, n is the last year of projected receipts, and i is the discount factor specified as the nominal yield on U.S. government securities averaged over years 0 to n.

The Petroleum Fund Law states that all assumptions upon which this calculation is based shall be prudent, reflect international best practice, and be based on internationally recognized standards. Moreover, the resulting calculation shall be certified by an independent auditor.

Source: Petroleum Fund Law, Schedule I.

[5] In practice, the calculation is more complicated than it might appear. It depends on uncertain forecasts for oil prices and volumes, is highly sensitive to the discount factor, and there is no assurance that investments will earn a 3 percent real rate of return. If all assumptions entering into the calculations prove correct then ESI will remain constant in real terms from one year to the next. However, if actual values differ, as invariably happens, then ESI will fluctuate from year to year. This volatility is likely to gradually diminish as financial assets grow relative to remaining future petroleum revenue.

Responsibilities and Oversight Arrangements

9. **Responsibility for the Petroleum Fund is divided among several institutions to provide checks and balances.** Decision making, administrative issues, and portfolio management are divided between different stakeholders: parliament, via the Petroleum Fund Law, defines the investment universe; the Ministry of Finance is responsible for formulating the precise investment mandate; and the BPA is responsible for carrying out that mandate and reporting on results.

10. **Separate bodies provide oversight.** They provide additional checks and help ensure broad understanding of the Fund's role and operations.

- A **Consultative Council** advises parliament on Petroleum Fund matters. It comprises former senior office holders from the public sector and also includes representatives of civil society, private business, and religious organizations. Aside from general advice in the context of the budgetary process, the Council is mandated to present an opinion on whether appropriations from the fund are being used effectively to the benefit of current and future generations.

- An **Investment Advisory Board** advises the Minister of Finance on the investment strategy and makes recommendations for change. Its members have technical expertise and it is responsible for developing performance benchmarks and instructions that the minister provides to investment managers.

- An **Independent Auditor** reports on payments made and any accounting discrepancy identified. The auditor is required to be an internationally recognized firm.

11. **Reporting is subject to stringent standards of transparency.** Quarterly reports on the Petroleum Fund's performance are made public. The audited annual reports are also published and contain substantial detail, including all advice provided by the Investment Advisory Board. In addition, parliament is required to publish advice of the Consultative Council and the Investment Advisory Board's meeting minutes have routinely been posted on the BPA website.

Investment Strategy

12. **This initial investment mandate was simple and quite conservative but it is now evolving.** The starting investment universe (Box 3) reflected the need to gain experience and build local capacity before venturing into higher yielding but also riskier and more complicated instruments. It was not intended to be permanent. The Petroleum Fund Law notes that the range of qualifying instruments should be reviewed after the first five years, having regard to the size of the fund and the level of institutional capacity. In early 2007 the Investment Advisory Board recommended entering into contract negotiations with

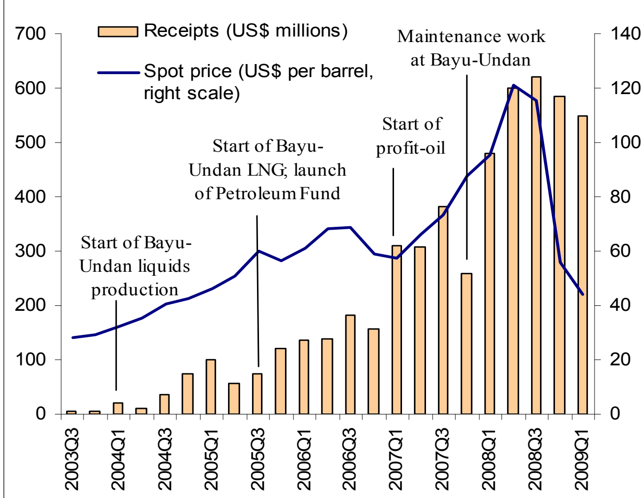
noncommercial external managers as a first step toward broadening the investment universe. Moreover, in the 2008 budget, the government announced its intention to explore possibilities for diversification and to start the process of revising the list of qualifying instruments in the Petroleum Fund Law. This was followed by the BPA's appointment, in June 2008, of J.P. Morgan as the fund's new custodian, replacing the Federal Reserve Bank of New York and enabling transactions in other instruments besides U.S. government securities. In June 2009, the Bank of International Settlements became the fund's first external manager, with a mandate to manage a US$1 billion portfolio of sovereign and supranational bonds, including some denominated in foreign currencies.

13. **As the investment strategy is reviewed, the challenge will be to strike a balance between risk and return and to ensure good implementation.** A more diversified portfolio can improve the trade-off up to a point by spreading risks and exploiting the low or negative correlation between stocks and bonds. For example, based on historical performance, placing 10 percent of the current portfolio in a broad basket of equities could be expected to slightly increase the return while roughly maintaining the overall level of volatility (IMF *Selected Issues and Statistical Appendix*, 2007, Chapter 3). However, increasing the expected return eventually means accepting more volatile outcomes. In this context, the large size of the fund merits special attention, as a 15 percent loss (less than what happened for major stock indices in 2008) would be equivalent in value to current non-oil GDP. The tolerance for the possibility of such losses would need to be held against the benefits of a higher expected return. Equally important would be to ensure that the fund is effectively managed according to the new targets.

D. Fund Performance to Date

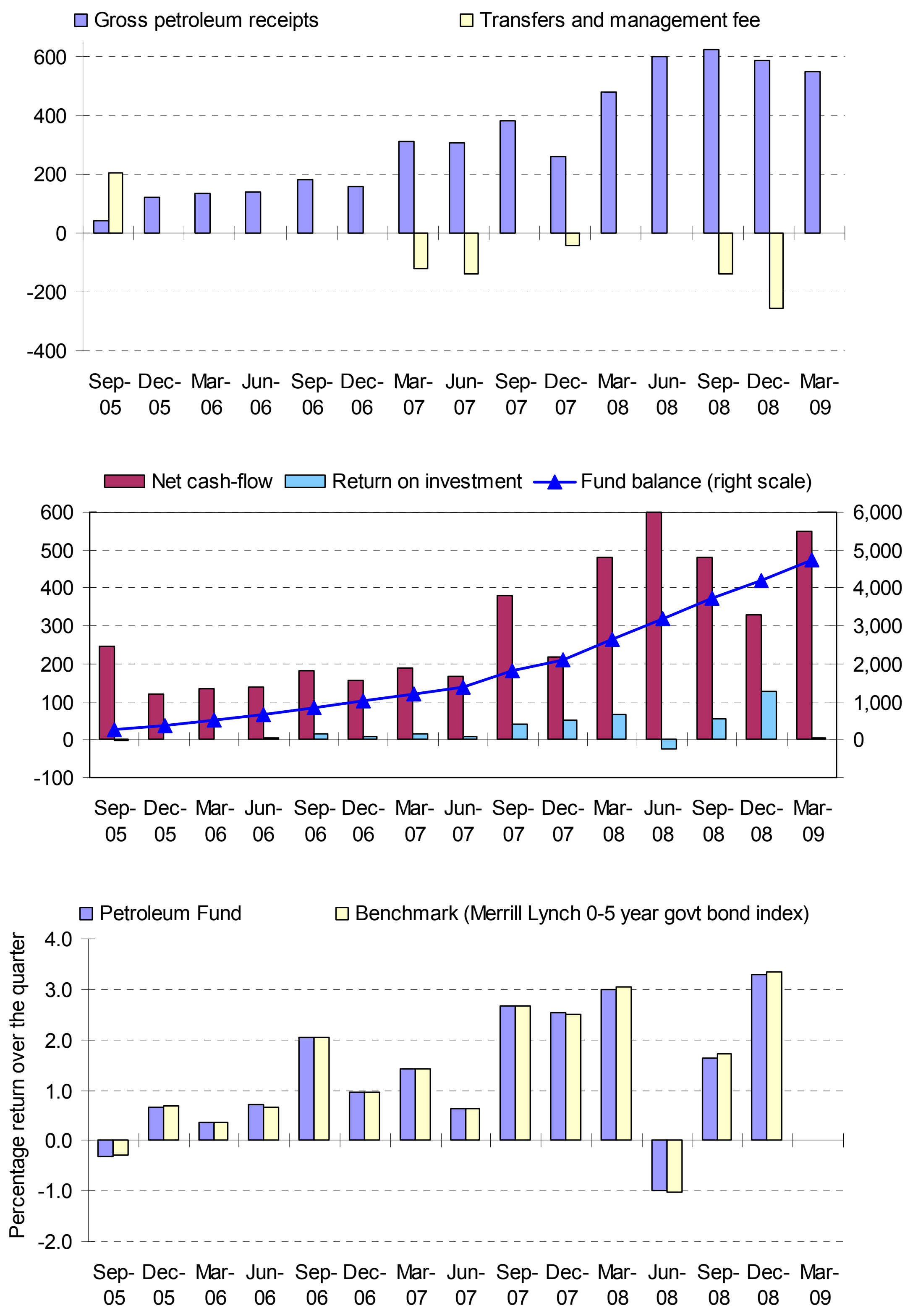
14. **The Petroleum Fund has grown quickly.** Between its inception in September to mid-2008 receipts increased from $50 million a month to over $200 million, and the Fund's assets reached $4,197 million in December 2008—some eight times annual non-oil GDP (Figure 2). The higher revenue was largely the result of soaring oil prices to almost $150 per barrel at one point in mid-2008, with a progressive tax regime, and somewhat higher-than-expected production also contributing. Prices subsequently dropped sharply to below $40 in early 2009 and that will eventually feed through to lower Petroleum Fund receipts.

Crude Oil Price and Timor-Leste Petroleum Receipts



Source: IMF commodity price statistics; Timor-Leste Government Finance Reports.

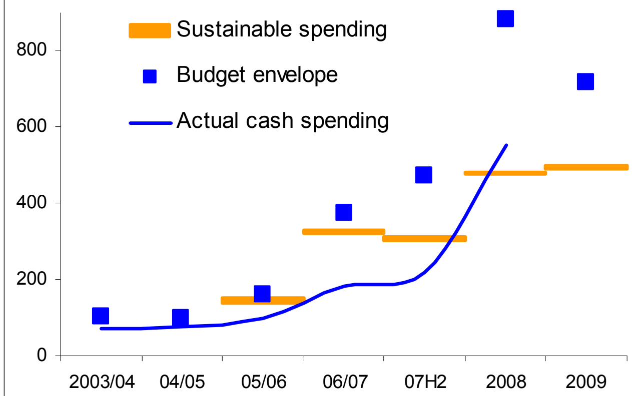
Figure 2 : Timor-Leste Petroleum Fund Quarterly Results, 2005 - 2009Q1
(In millions of U.S. dollars, unless otherwise indicated)



Source: Banking and Payments Authority, Petroleum Fund of Timor-Leste Quarterly Reports.

15. **Contributing to the Fund's growth, only in 2008 did spending catch up with the sustainable level.** As projected receipts grew so did ESI, from $103 million (30 percent of non-oil GDP) in the FY2005/06 budget to $396 million (about 80 percent of non-oil GDP) in the 2008 mid-year budget update. Government expenditure also increased sharply but with some lag and displaying low rates of budget execution. Consequently, prior to 2008, transfers to finance the non-oil budget deficit were smaller than what was available. In 2008, the budget appropriated more than ESI but the final level of withdrawal was equal to the estimated sustainable amount.[6] The 2009 budget also appropriates more than ESI and that looks more likely to be used based on the upward trajectory of actual expenditure.

Timor-Leste: Actual and Sustainable Spending
(In US$ millions)



Source: Timor-Leste Government Finance Reports and Budgets.
Note: Sustainable spending is *Estimated Sustainable Income* from petroleum plus budgeted non-oil revenue. Figures for the second half of 2007 (transition budget) have been annualized.

16. **To date, Petroleum Fund investments have mirrored the target set out in the management agreement.** The portfolio has tracked the Merrill Lynch index within the specified tolerance limits and the return on the fund has been virtually the same as the benchmark. From inception to December 2008, the Fund earned an average annual rate of return of 5.6 percent.[7] That was a remarkably strong performance considering that global financial markets have suffered losses of historic proportions, with the S&P 500 producing a negative 6.8 percent total annualized return during the same period. In a very turbulent 2008, the Fund benefited enormously from being invested in one of the few asset classes that increased in value. Reflecting the conservative mandate, results have also been fairly consistent, with just two quarters of negative returns.

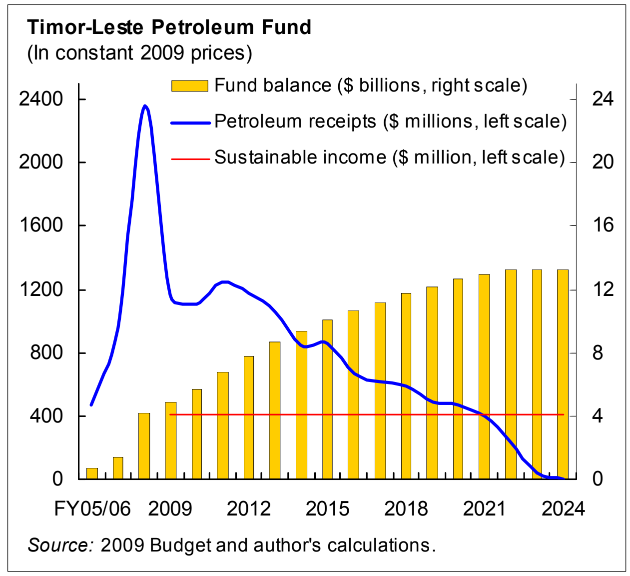
---

[6] Total cash spending in 2008 was about 15 percent higher than the estimated sustainable level but a drawdown on other cash balances allowed Petroleum Fund withdrawals to stay within ESI.

[7] Based on U.S. consumer prices, which rose at an average annual rate of 2.1 percent between August 2005 and December 2008, that implies a real rate of return of 3.5 percent, more than the 3 percent assumed in the calculation of ESI. Timor-Leste's own consumer prices rose at a higher 6.3 percent rate, however, suggesting that the fund failed to earn enough to maintain its purchasing power when measured in domestic goods. In addition, almost half of the fund's return in 2008 was the result of market revaluation due to the decline in U.S. Treasury rates, pointing to a lower return going forward given the current portfolio composition.

E. Outlook

17. **The 2009 budget projects continued large increases in the Petroleum Fund.** Assuming post-2009 withdrawals based on ESI, the budget has the fund growing rapidly before finally leveling off at about $13 billion (in today's prices) when forecasted petroleum receipts come to an end in 2023. Even if the economy grows at a strong 8 percent rate, the ratio of the fund's balance to non-oil GDP would increase to 11 in 2014 before starting a gradual decline. The budget projection is, however, highly sensitive to the underlying assumptions. Projected petroleum receipts ($9.4 billion in net present value) are for Bayu-Undan only and based on conservative assumptions regarding volume and prices ($60 per barrel through 2013 and then declining slightly). Revenue could be larger if new fields enter production or if oil prices are higher. At the same time, there is also considerable downside risk from even lower prices or production disruptions at Bayu-Undan.[8]



18. **Possibly the biggest uncertainty regarding the future of the fund is the pace of withdrawals.** In 2009, for the first time, withdrawals are likely to be above ESI. From an abstract welfare perspective, withdrawing more makes sense if the spending generates a social rate of return that is greater than what is earned on keeping money in the fund. However, that may not always be easy to achieve. Oil rich countries have a poor record on securing productive public investment, with some cases of vast amounts wasted on failed projects (Sala-i-Martin and Subramanian, 2003). Moreover, even where high-return projects are identified, channeling too many resources into the domestic economy may create inflationary pressures and erode competitiveness more broadly (Corden and Neary, 1982).

F. Discussion and Conclusions

19. **Timor-Leste has had a remarkable start as a petroleum producer.** Oil and gas revenue has grown far beyond expectations and has fundamentally changed the economic outlook for what was one of the poorest places in the world. Few countries have undergone income booms of a magnitude that compares to what Timor-Leste has experienced. In an

---

[8] Analysis presented in the 2009 budget shows that a permanent $10 per barrel reduction in the price of crude reduces ESI by $85 million (21 percent). This high degree of sensitivity reflects a regime in which the average effective tax rate for Bayu-Undan rises with intrinsic profitability.

example of astute planning, a comprehensive resource management framework was established to help oversee this windfall gain. The Petroleum Fund is a central component.

20. **The fund addresses the basic challenge of transforming petroleum wealth into higher living standards for current and future generations.** Success depends on many factors. But one important prerequisite is to avoid the pitfalls that have led many other oil-rich countries to be associated with deepening poverty and sharpening social divisions. The fund facilitates this objective. It provides transparency and accountability where oil revenue has been notoriously prone to governance problems. It gives stability in the face of income volatility that could otherwise damage the economy. And, while making funds available for current generations, it also emphasizes savings to protect the interests of future generations where governments are often myopic. As a result, the fund significantly increases the likelihood that Timor-Leste's petroleum resources will turn out to be a blessing rather than a curse.

21. **The fact that the fund accumulates financial assets abroad does not imply a disregard for domestic investment.** Given the amounts involved, it would be impossible to convert all petroleum receipts into domestic assets. Accumulating foreign assets is unavoidable in the current environment and the fund helps ensure that this capital is properly managed. That task is separated from the management of domestic assets due to differing requirements and objectives, with investments in the local economy naturally involving considerations regarding the social and not just the financial rate of return. The separation reinforces the ideal of transparently financing domestic investments via the budget and is a standard recommendation in the resource management literature (Bell and Faria, 2007).

22. **Overall, the fund has worked well and has been a considerable achievement.** The fact that all petroleum receipts have been properly accounted for and managed within a coherent framework is more than many other countries have accomplished. Aside from being a source of financial stability, the Fund has also helped cement the public's trust in how the all-important petroleum resources are being administered.

23. **The Fund does not solve all problems, however.** Even if withdrawals are held within ESI, the large increase in government spending that has been made possible could still cause cost pressures and crowd out activity in other sectors of the economy. Moreover, with most of the petroleum wealth yet to be extracted, changes in oil prices can still lead to substantial fluctuations in ESI, which could translate into macroeconomic instability and undermine economic growth. Finally, transparency helps but easy access to petroleum revenue still alters the balance between governments and tax payers and reduces the pressure for accountability.

References

Alkatiri, M., 2003, "Statement on the Occasion of the Extractive Industries Transparency Initiative Multi-stakeholder Conference in London." Available at http://www.pm.gov.tp/extractive.htm

Bell, J. C., and T. M. Faria, 2007, "Critical Issues for a Revenue Management Law," in Humphreys M., J. D. Sachs, and J. E. Stiglitz (Eds.), *Escaping the Resource Curse* (New York: Columbia University Press).

Corden W. M., and J. P. Neary, 1982, "Booming Sector and De-industrialisation in a Small Open Economy," *The Economic Journal*, Vol. 92, pp 829-831.

International Monetary Fund, 2008, *Democratic Republic of Timor-Leste: Staff Report* (Washington DC: International Monetary Fund).

———, 2007, *Democratic Republic of Timor-Leste: Selected Issues and Statistical Appendix* (Washington DC: International Monetary Fund).

———, 2004, *Democratic Republic of Timor-Leste: Staff Report* (Washington DC: International Monetary Fund).

———, 2005, *Democratic Republic of Timor-Leste: Staff Report* (Washington DC: International Monetary Fund).

Isham, J., M. Woolcock, L. Pritchett, and G. Busby, 2005, "The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth," *The World Bank Economic Review*, Vol. 19, pp 141-171.

Ministry of Planning and Finance (MOPF), 2004, "Establishing a Petroleum Fund For Timor-Leste," Public Consultation Discussion Paper (Dili: Ministry of Planning and Finance). Available at http://www.mof.gov.tl/en/MacroEconomicTaxPolicy/download/en/PF-DiscPaper-Final.pdf

Ploeg F. V. D., and S. Poelhekke, 2007, "Volatility, Financial Development and the Natural Resource Curse," *European University Institute Working Paper No. 2007/36* (Fiesole: European University Institute).

Sachs, J. D., and A. M. Warner, 1995, "Natural Resource Abundance and Economic Growth," *NBER Working Paper No. 5398* (Cambridge, MA: National Bureau of Economic Research).

Sala-i-Martin, X., and A. Subramanian, 2003, "Addressing the Natural Resource Curse: An Illustration from Nigeria," *IMF Working Paper No. 03/139* (Washington DC: International Monetary Fund).