

*Autoridade Bancária e de Pagamentos de Timor-Leste*

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**Briefing Paper No 2007/1**

**VALUATION AND FINANCIAL REPORTING OF  
INVESTMENTS IN GOVERNMENT BONDS**

*Introduction*

The Banking and Payments Authority of Timor-Leste has noted recent discussions in the media concerning alleged “losses” suffered by the Petroleum Fund. One headline was: “Petroleum Fund loses \$5.8 million in a year”.

To date the Petroleum Fund has invested exclusively in US Government bonds, which pay a fixed rate of interest. Common sense suggests that such investments should not lose money. So did the reported “losses” arise and, if so, what is their nature?

The BPA also wishes to address the misconception that such reported “losses” arose as a result of poor management, whether by the BPA, the Minister of Planning and Finance, the Investment Advisory Board, or as a result of defects in the Operational Management Agreement.

This briefing paper describes the factors that contribute to the financial performance of a fund investing in bonds, how the income of a bond fund is measured, and why it is measured that way.

This paper is introductory in nature and discusses general principles. It is not intended to be a technical paper for bond market specialists.

*Components of Bond Market Income*

In common with all financial market instruments, bond prices change in value from day to day depending on market interest rates and other factors. The prices of bonds

traded in the market on any particular day are reported in the international financial press.

When the Petroleum Fund purchases a bond, it must pay the market price. Accordingly, its future income is the sum of two components.

First is the interest the Petroleum Fund receives from the US Government on the bonds (the “coupon rate”) each six months.

Second is the premium or discount at which the bond is bought. The premium or discount is the difference between the face value of the bond and the market price at which the bond was purchased.

The price of a bond is a function of market interest rates and the characteristics of the bond, including the bond’s coupon rate, maturity date, and the quality of its issuer, and is determined by a mathematical formula. The overall return (yield) on the bond is calculated by adding the first and second components together. The yield is always positive, otherwise the Petroleum Fund would not invest in the bond.

### ***International Accounting Standards***

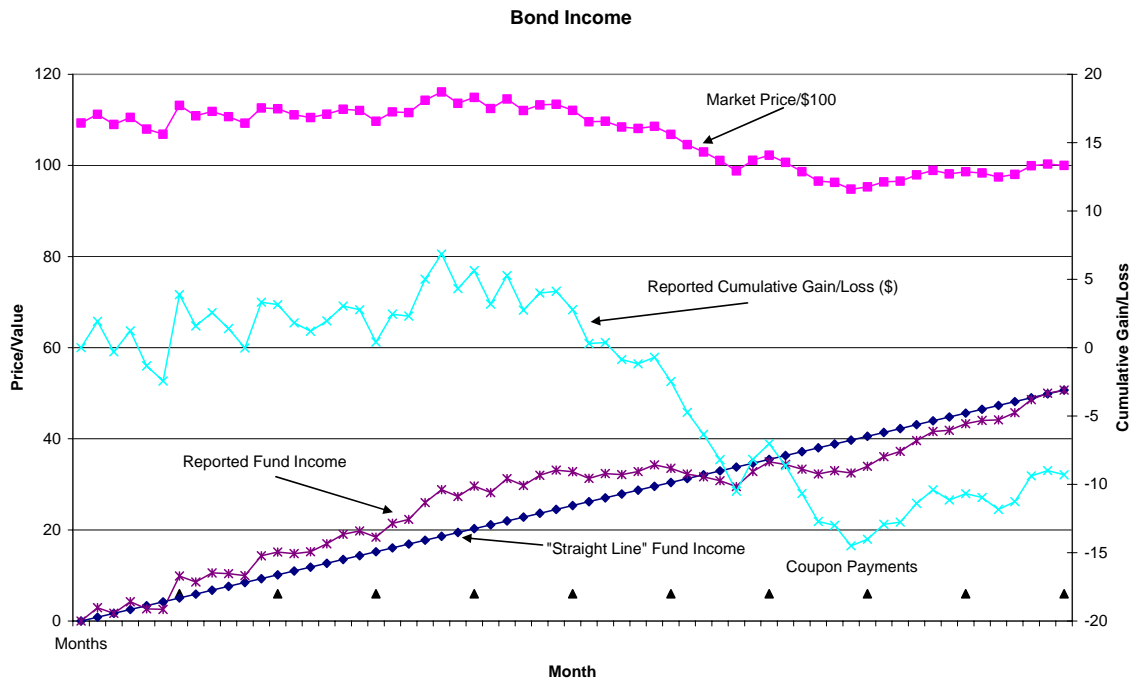
The Petroleum Fund is required by the law to measure its income according to rules contained in international accounting standards. Do international accounting standards permit the Fund to measure its income by simply measuring the yield as described in the previous paragraph? No. The accounting standards require that the value of the bond portfolio should also reflect the market prices at the balance sheet date, with any gain or loss from the original purchase price being reported as an adjustment to the premium or discount described above.

This means that the balance sheet of the Petroleum Fund will show the investment portfolio at its market value, not at the purchase cost, nor at the value at which the bonds will mature, nor at some calculated number in between. The value of the portfolio on the balance sheet is the value if the bonds were sold at the date of the financial report. Of course, the Petroleum Fund does not intend to sell its investment portfolio at the reporting date, but rather hold it until the bonds mature with the guaranteed positive return described above.

The total value of the interim market gains and losses reported over the life of the bond will therefore cancel out over time, so that an apparent market loss in one period (in the case of the headline quoted above, the \$5.8 million) will result in compensatory gains being reported in subsequent quarters.

### ***Two Illustrative Examples***

In the first case, suppose the Petroleum Fund purchases a 5-year bond with a face value of \$100 paying 12% per year. Because market interest rates are less than 12%, say 9.7%, the price of the bond will be higher than its face value, in this case \$109. The Fund holds the bond until it matures five years later, at which time the Fund will receive \$100. Meantime, the Fund receives \$12 per year in interest (the “coupon”).



The following notes help explain this graph:

The **market price** at the date of purchase is \$109, and subsequently will vary according to market conditions. Whatever happens in the meantime, the price of the bond always ends up at \$100, being the face value at maturity date. This means that over the life of the bond, the Fund needs to account for the \$9 premium paid as “negative income”. The \$9 is not a trading loss nor an indication of mismanagement of the Fund, but simply a reflection that the bond is paying a higher rate of interest (12%) than the market rate (9.65%) at the date of purchase.

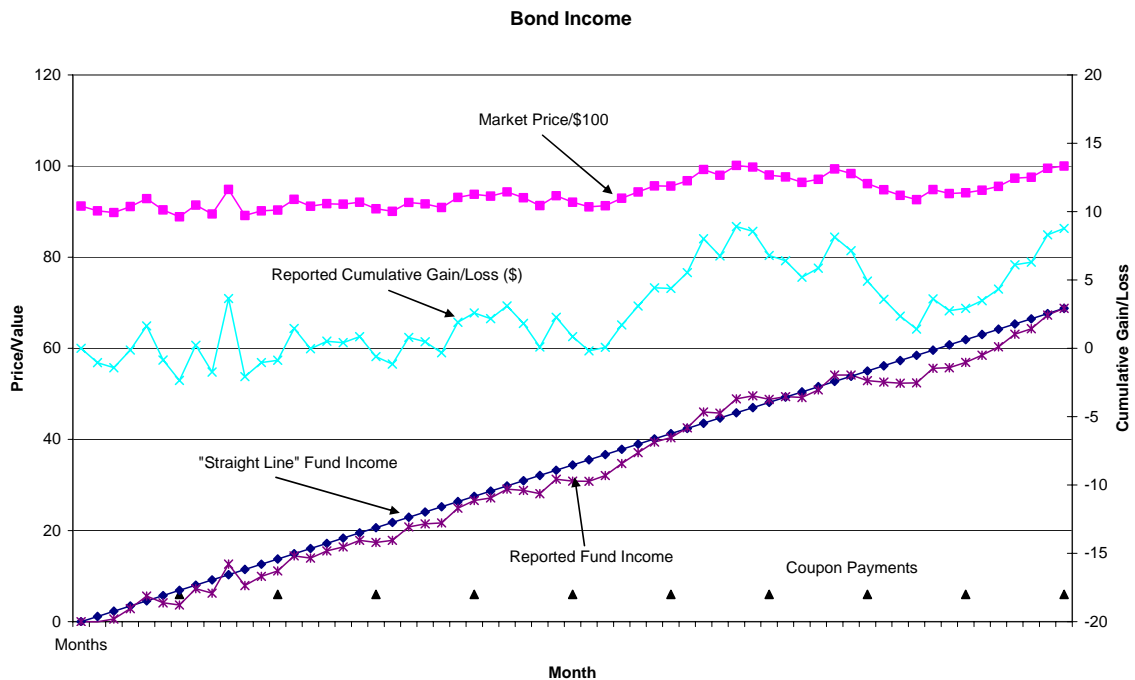
The **coupon payments** are the six-monthly interest payments paid to the Fund by the issuer of the bond. In this case the total coupon payments received over 5 years are \$60 (12% of \$100 for five years).

The **“straight line” Fund income** is the accumulated income, including both the coupon payments (on a monthly accruals basis) less the accumulated share of the \$9 premium paid spread evenly over the life of the bond. The value of the straight line income is always positive, and on the maturity date the accumulated income (\$54) equals the sum of the coupon payments received (\$60) less the premium paid at date of purchase (\$9). The \$54 of income received on the original investment of \$109 (9.9% per year) is called the yield. The “straight line” Fund income is the theoretical measure of income if subsequent market interest rates are ignored, and reflects the “true” income of the Fund over longer periods of time.

The **reported cumulative gain/loss** (measured on the right-hand axis) shows the change in market value over the life of the bond. It is zero on the date of purchase, and on maturity date is equal to the value of the original premium/discount (-\$9) because the bond is repaid at \$100 and the market premium (\$9) has gone away (been amortised, in technical language) over the life of the bond. The market gain/loss may move quite considerably according to market conditions while the bond is held by the Fund.

The **reported Fund income** is the income of the Fund as reported under the rules contained in International Accounting Standards. These rules require the Fund to take account of the reported cumulative gain/loss. Despite some ups and downs during the life of the bond, the accumulated reported income at the date the bond matures (\$54) will exactly equal the accumulated straight line income. Over time the market-driven “gains” and “losses” have cancelled out.

In the second example, suppose that the Petroleum Fund purchases a bond at less than the \$100 face value.



This graph shows an alternative scenario for the Fund buying the same 12% bond, but on the assumption that market interest rates were not 9.9%, but 14.7% at the time of purchase. This means the Fund would only pay \$91 for a \$100 bond, because its coupon rate is less than other market investments are paying. Instead of paying a premium of \$9 in the previous example, the Fund now buys the bond at a discount of \$9. The overall income over the five years is \$69, being the coupon of \$60 (as before) plus the gain of \$9 (\$100 less \$91) recognised as income over the five-year period. The \$69 of income on the \$91 investment over five years reflects the market interest rate of 14.7%.

Again, note how the market price of the bond at maturity date is exactly \$100, how the “straight line” and the “reported” income both total \$69 over the life of the bond, and how the reported gains rise from zero to \$9, with quite substantial variations in the interim. Also note that the reported “gain” of \$9 over time is not a reflection of excellent management, but simply reflects the mathematics of bond market investments.

***Bond Market Performance Measurement***

So why does the Petroleum Fund use this more complicated way of measuring its income, and not use the straight line method, which would be much easier to understand, and which would report a steady stream of income over time?

The answer is because although the above examples may look straightforward enough for a single bond, accountability for a multi-billion dollar portfolio containing a range of different investments all having different characteristics and maturing at different times becomes opaque if such simplistic reporting is adopted.

Investment managers, including the BPA, are held accountable for the quality of their fund management decisions by comparing the portfolio income with the income achieved by other market participants over the same period.

The Minister and others use industry benchmarks to determine whether the Petroleum Fund's returns are good or bad compared to the market, and the Petroleum Fund reports its financial results in a manner that makes this analysis transparent. This is the purpose of the Petroleum Fund's quarterly reports. Accountability is measured by comparing how closely the return on the Petroleum Fund investments – including market variations – matches a market benchmark that reflects the average income being achieved by all market participants.

### ***The BPA's Management of the Petroleum Fund***

A review of the Petroleum Fund's quarterly reports shows that the BPA has managed the investments from the outset to produce results almost exactly the same as the market benchmark nominated by the Minister of Planning and Finance.

The international financial agencies that periodically visit Dili to review the operational management of the Fund have commented favourably on progress to date. For example, the International Monetary Fund has written: "The BPA has successfully positioned itself to handle the Petroleum Fund management", while a World Bank mission reported "The [Petroleum Fund] portfolio has shown extremely impressive results of essentially zero tracking error." The zero tracking error refers to the difference between the Petroleum Fund portfolio income and that of the benchmark selected by the Minister. A zero difference is a significant achievement, even for a fund manager in a developed country.

In practical terms, this means the BPA aimed to achieve the average bond market returns for the year. It did not try and outperform the market by trading and speculating which would result in taking higher risks and facing potential losses. In doing so, the BPA complied precisely with the mandate agreed with the Minister of Planning and Finance.

### ***Portfolio Management Approaches***

The mandate given to the BPA is designed to achieve a positive income over the longer term, because the Minister and her advisors, including the Investment Advisory Board, are aware that the underlying "straight line" income will always be positive over the five-year horizon of the current investment mandate. It is the yield that matters, and not whether the portfolio bonds were purchased at a premium or a discount (which gives rise to the gain/loss number reported in the financial statements).

This management approach is known as "passive management". Passive management can be contrasted with "active management", which involves buying and selling bonds every day to try and take advantage of movements in market interest rates. An active strategy may produce higher returns, but also risks suffering large losses. Some of the smartest traders in the world are active investors in the bond markets, and considerable skill is needed to outperform the market using active management. The passive management approach means that the income of

the Petroleum Fund is guaranteed to be better than half of all bond market investors, though not as good as the other half.

### ***Conclusion***

The alleged “losses” of \$5.8 million are not the result of stock market trading, nor a lack of guidance from the Investment Advisory Board. The reported “loss” is the recognition in the financial statements of the Petroleum Fund that certain bonds were purchased at above their face value, reflecting that the coupon rates were higher than the market yields on the date of purchase. This is perfectly normal in bond markets.

To the extent that the “losses” reported by the media include adverse changes in market prices over and above the amortisation of the original purchase premiums or discounts, these will be cancelled out by compensating “gains” in future years. The overall income of the Petroleum Fund over the longer term is not affected by short-term changes in market prices, but is guaranteed at market yields given the passive investment management approach agreed between the BPA and the Minister.

The overall performance of the Petroleum Fund in the period measured by the international accounting standards exactly equalled the industry benchmark, indicating that the management of the Petroleum Fund had been carried out exactly in accordance with the mandate agreed between the Minister of Planning and Finance and the BPA.

Dili, 5 September 2007