



Performance audit report

Effectiveness of the New Zealand Debt Management Office





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This is the report of a performance
audit carried out under section 16 of
the Public Audit Act 2001.

June 2007

ISBN 0-478-18184-1

Foreword

The New Zealand Debt Management Office (NZDMO) is a unit within the Treasury. It is responsible for the efficient management of the Crown's debt and associated financial assets within an appropriate risk management framework. Its broader responsibilities include providing capital market advice and financial transaction services to other agencies of the Crown. NZDMO manages gross debt of about \$40,000 million and financial assets of approximately \$18,000 million.

In carrying out a performance audit of NZDMO, my overall objective was to determine NZDMO's level of performance, under the authority of the Minister of Finance, in managing the Crown's public debt and financial asset portfolios.

Given the specialist technical functions of NZDMO, I sought expert technical assistance with the audit. I appointed KPMG under section 33(1) of the Public Audit Act 2001 to carry out the performance audit on my behalf under section 16(1) of the Act.

The material in my audit report is of a very technical nature because of the specialist functions undertaken by NZDMO. The non-technical reader can be assured that the audit did not identify any fundamental concerns with the performance of NZDMO.

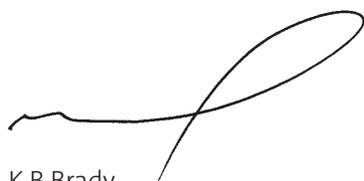
Comparison of NZDMO's internal policy framework against internationally recognised guidelines was used to assess NZDMO's effectiveness.

Within the context of its existing mandate, the achievements of NZDMO in a period of significant change are considerable. NZDMO has made appropriate adjustments to its operating framework as the Crown's fiscal position has changed. NZDMO has moved from being primarily a debt manager to an asset and liability manager.

NZDMO's continuous improvement approach has enabled it to, among other things, introduce better risk management techniques, develop and maintain its own information technology, and achieve operational efficiencies.

The audit identified areas of governance, risk management, portfolio management policy, and performance reporting where NZDMO could make some further improvements.

I would like to thank the NZDMO Treasurer and staff of NZDMO for their positive assistance with this audit.



K B Brady
Controller and Auditor-General

22 June 2007

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Glossary

Asset and liability management (ALM): In the context of this report, the management of the risk that losses may be incurred as a result of exposure to foreign exchange, interest rate, or possibly other price movements. This is the practice whereby the potential effect of foreign exchange or interest rate fluctuations is eliminated or controlled.

Backtesting: This is the process of gauging the accuracy and quality of a VaR model by comparing the model-generated VaR measures that it produces over time against actual observed gains and losses. Backtesting is typically performed by comparing 1-day profit and loss against modelled 1-day VaR to avoid the effect of changes in the portfolio within longer time periods affecting the observed profit or loss. The Bank of International Settlements Backtesting Framework ranks backtesting results into three levels:

- Green – backtesting results do not suggest a problem with the quality or accuracy of the model.
- Yellow – backtesting results do raise questions in this regard, but a conclusion is not definitive.
- Red – backtesting indicates that there is almost certainly a problem with the VaR model.

Basis point: One-hundredth of one percent – that is, 1% equals 100 basis points (bps).

Cap or floor: A cap is an interest rate option to protect against rising interest rates. In exchange for the cap premium, the buyer is protected from higher rates (above the cap strike price) for the period of time covered by the cap. At the expiry of the option, the cap seller reimburses the cap buyer if the reference rate is above the cap strike rate. If rates are below the cap rate, the option is left to expire and funding can be obtained at lower interest rates. Although the cost of the cap increases the effective cost of funds for a borrower, it also provides protection and flexibility without locking in an interest rate. A floor is similar to a cap except that it provides protection against falling rates below the floor strike rate. A floor provides the floor buyer with reimbursement if the reference rate falls below the floor strike rate.

Carry trade: A strategy in which an investor sells a certain currency with a relatively low interest rate and uses the funds to purchase a different currency yielding a higher interest rate.

Clean P&L: The validation of 1-day VaR measures can be affected by intra-day trading, fee income, and new or closed deals. The profits and losses from these are not derived from the original portfolio that VaR was calculated from. Therefore,

a hypothetical clean P&L that removes these and reflects the profit or loss that would have been earned from the portfolio as a result of market movements if it had been unchanged for the day. This clean P&L is then compared to the 1-day VaR that was calculated for this portfolio.

Collateral: Assets pledged or provided as security.

Commodity: A generic term for any item or product (including indices) that can be traded by investors on a market. More specifically, it refers to natural materials and their derived products such as metals, agricultural products and energy products.

Concentration risk: The risk of loss because of the concentration of exposure to a specific instrument, individual transaction, industry, or country.

Confirmation: A document through which a market participant notifies its counterparties of the details of a transaction and, typically, allows them time to affirm or question the transaction.

Counterparty: One of the opposing parties involved in a transaction.

Credit default swap: A contract allowing for the transfer of credit risk through a derivative instrument. The party transferring credit risk is obligated to pay a fee to the transferee.

Credit rating agencies/Rating agencies (for example, Standard & Poor's and Moody's Investor Service): Independent institutions that assess the creditworthiness or the credit risk of issuers, and provide credit ratings that are publicly available and used by investors as well as analysts as a guide for investment decisions in regard to relative credit standing or strength.

Credit risk or exposure: Credit risk refers to the risk of financial loss as a result of a credit rating downgrade or default of an institution or security issuer.

Derivative or derivative security: An instrument, such as an option, futures contract, or swap, of which the criteria and value are determined by those of an underlying asset such as a stock, currency, or commodity. Derivatives are used extensively in the hedging of financial and treasury risks.

Duration: The measure of the price sensitivity of a fixed-income security to an interest rate change of 100 basis points. Calculation is based on the weighted average of the present values for all cash flows. However, duration is measured in years, and should not be confused with the maturity of the security.

Exchange rate: The value of a particular currency denominated in terms of another currency.

Exchange traded options: Exchange traded options may have a futures contract as the underlying interest. Options on interest rates or options on interest rate futures can be used to construct an interest rate cap or floor. Options may be settled in cash or with the underlying asset or futures contract, depending on exchange rules. When the underlying interest is a futures contract, the purchase of a put option permits the option buyer to sell the futures contract at the strike price, which provides protection against falling interest rates. The purchase of a call option on a futures contract allows the option buyer to buy the futures contract at the strike price, providing protection against rising (futures) prices.

Fixed to floating interest rate debt profile (fixed/floating or fixed and floating ratio): Refers to the ratio of debt in a portfolio that is at a fixed rate and the debt that is subject to periodic interest rate repricing.

Foreign exchange contract/Foreign exchange forward contract (FEC): A contractual obligation to buy or sell a specified foreign currency amount at the exchange rate agreed on the day the contract is entered into for delivery at a specific future date. The exchange rate used is the forward rate for those two currencies at the time that the contract is entered into.

Forward rate agreement (FRA): Bilateral forward contract that fixes the interest rate on the day of the agreement for payment at a future settlement date. Typically, this can be up to two years later. FRAs are used to hedge against interest rate exposure in the sense that one of the parties pays a fixed rate and the other a variable rate.

Funding risk: Funding risk refers to the risk of loss caused by the inability to raise funds at an acceptable cost or to access markets in a timely manner.

Futures (futures contracts): Contracts stipulating the purchase or sale of currencies or securities of a specified quantity, at a specified price and on a predetermined date in the future. Futures are traded on exchanges. In contrast to forward contracts, futures contracts are not usually intended for the actual delivery of the underlying financial instruments, but for trading and hedging purposes. Also, in contrast to forward contracts, futures are not tailored contracts but are standardised in terms of quantity, price, and maturity periods.

Government curve: The equivalent of the yield curve, using the yields of various government bond maturities charted by yield and time to maturity of the bond.

Hedging: The implementation of a set of strategies and processes used by an organisation with the explicit aim of limiting or eliminating, through the use of hedging instruments, the effect of fluctuations in the price of credit, foreign exchange or commodities on an organisation's profits, corporate value, investments, or liabilities.

Hedging instruments: Types of derivative instruments or assets/liabilities the cash flows or fair market value of which can be used to fully or partially offset the changes in those of the hedged items. They include forward contracts, FRAs, swaps, futures, and options.

Historical simulation VaR: This methodology or approach involves revaluing the portfolio using the observed market data for each day over a period of time, ranking the gains and losses, and taking the desired percentile worst loss as the VaR number. This method makes no assumptions about the distribution or correlation of market price movements. The key assumption is that past market movements will be reflective of future movements.

Interest rate swap (IRS): A swap agreement where interest payments on a certain amount of principal are exchanged between two parties on a specified date. One of the payment streams involved is usually based on a fixed interest rate, while the other is based on a floating rate.

Liquidity: The ability to turn an asset into cash at short notice and/or raise cash by issuing debt or by having ready access to funding (for example, borrowing facilities). Liquidity also refers to an organisation's ability to pay its obligations when they become due.

Liquidity risk: Liquidity risk refers to the risk of loss as a result of a lack of market liquidity, preventing quick or cost-effective liquidation of products, positions, or portfolios.

Market price: The current or most recent price of a security or financial instrument in the market.

Market risk: Market risk refers to the risk of financial loss as a result of adverse market movements. NZDMO specifically measures market risk with regard to movements in interest rates and foreign exchange rates.

Mark-to-market: The practice of revaluing securities and financial instruments using current market prices.

Middle office: The basic responsibilities of this area include treasury reporting, management information, treasury accounting, and determining and monitoring the internal treasury control framework. Many organisations may not have operations sizeable enough to require a middle office or, alternatively, some of these activities may be performed by other areas.

Operational risk: Operational risk is the risk that failures in computer systems, internal supervision and control, or events such as natural disasters will impose unexpected losses on an organisation. Problems tend to arise because inadequate

attention was paid to some process or system or because personnel either fail to perform their duties or have ill-specified responsibilities or procedures. People tend to be the root cause of most operational risks, which inevitably arise from someone making a questionable decision, either by mistake or on purpose.

Options: A financial option provides the option buyer with the right, but not the obligation, to buy or sell a specified financial product at the strike or exercise price. In exchange for this right, the option buyer pays an option premium to the option seller. The writer (seller) of the option has the obligation to deliver the underlying product or pay monies, or accept delivery of the underlying product or receive monies, if the option buyer exercises it. Options trade between institutions directly and in the exchange traded market. Exchange traded or listed options are transacted through a broker and have standardised expiry dates, contract amounts, and strike prices. Interest rate options may be cash-settled contracts on interest rates, fixed-income instruments such as government bonds, or options on futures contracts.

Potential credit exposure: Potential credit exposure seeks to take account of possible future movements in the mark-to-market value of outstanding derivatives and investments from the date the analysis is undertaken to the maturity date of the transactions. As a result, even if the current mark-to-market of a particular derivative is zero, or even negative, the assessment of potential exposure will be greater than zero, reflecting the possibility of the transaction acquiring a positive value between that time and maturity.

Repurchase agreement/Repo: A sale and repurchase agreement. An arrangement by which an investor holding a security sells the security to a counterparty while simultaneously obtaining the right and obligation to repurchase it at a specific price on a future date or on demand. Government repos are issued by several central banks to help banks meet short-term shortfalls in their reserve requirements and as a means of creating liquidity in their national government debt market.

Segregation of duties: An internal control mechanism used when undertaking financial operations that prevents one person from having overall control from initiation to settlement of a financial transaction. It ensures that different people are involved in the different stages of a transaction, consisting mainly of the initiation, confirmation, recording, and settlement processes.

Settlement: The exchange of securities between buyer and seller and the corresponding transfer of money between the two contractual parties. Settlement is usually preceded by confirmations on, among other things, the date and method of exchange and payment.

Spot price: The price of a financial instrument for immediate delivery.

Spot transaction: A transaction where both parties agree to pay each other a specific amount in a foreign currency (or currencies or foreign and local currency) either on the same day or within a maximum of two days.

Stop loss: A risk management technique where thresholds are set up to trigger an automatic sale or purchase or elimination of an exposure in the event of a negative price movement.

Straight through processing: The end-to-end processing of automated data without manual intervention.

Swap: An agreement between two parties to exchange (or swap), under specified conditions, a set of cash flows (either the same or different currencies) at a future point in time.

Swap curve: The equivalent of the yield curve, using the fixed yields of various swap maturities charted by yield and time to maturity of the swap.

Swap rate: The fixed interest rate (or yield) required to be exchanged for a series of cash flow payments, based on floating interest rates, for a particular length of time (term to maturity of the swap).

Swap spread: The difference between the fixed interest rate of a swap and the interest rate of a government bond of the same maturity, expressed in basis points.

Swaptions: Swaptions are options on interest rate swaps. They give the swaption buyer the right, but not the obligation, to enter into an interest rate swap with predetermined characteristics at or before the option's expiry. Swaption premium is paid by the swaption buyer to the swaption seller, typically as a percentage of the notional amount of the swap.

Trading: The purchasing or selling of currencies, interest rate products, securities and derivatives.

Translation exposure or risk: The potential negative effects on an organisation's reported profits or balance sheet from exchange rate fluctuations.

Treasury management system (TMS): A configuration of hardware and software that is linked to internal and external information sources that allow an organisation's treasury function to collect all the necessary financial information regarding the organisation in a uniform format. The TMS allows the automation of a variety of treasury tasks from routine calculations to transaction initiation.

It also greatly facilitates analysis, forecasting of treasury results, and risk management. It facilitates straight through processing, particularly if it is linked to various front and back office applications or integrated into an “enterprise resource planning” solution.

Value at Risk (VaR): VaR is expressed as the worst case loss that could be expected to be incurred from a given portfolio as a result of movements in identified risk parameters, over a nominated time period within a specified level of probability. VaR is calculated for a specific portfolio at a specific point in time. NZDMO’s VaR measure reflects its exposure to interest rate and foreign exchange (FX) risks over 1-day, 1-month, and 1-year periods with a 95% level of confidence. That is, it would expect to incur a loss on its portfolio, from movements in interest and FX rates, greater than the calculated VaR over these periods just 1 day in 20.

Variance-covariance VaR/VCV VaR: This methodology or approach involves using observed price volatilities and correlations of price movements across a historical period to derive the market risk inherent in a portfolio. The approach assumes that volatilities are distributed normally, and takes an appropriate multiple of the standard deviation of observed volatilities as the loss at the desired confidence level for a position. Losses on individual positions are then correlated based on observations to arrive at a portfolio VaR measure. Following industry practice, NZDMO calculates the 1-month and 1-year VaR calculations by taking the 1-day VaR number and multiplying it by the square root of time (for example, 1-day VaR $\times \sqrt{365}$ = 1-year VaR).

Volatility: The level or extent of fluctuation in the rate or price of financial instruments and assets.

Yield curve: The line that results from plotting, at a certain time, the market interest rates of a financial instrument (for instance a bond) over a range of maturity dates.

Summary

The New Zealand Debt Management Office

The New Zealand Debt Management Office (NZDMO) was established in 1988 to ensure better co-ordination and management of the Crown's foreign currency and domestic debt under the authority of the Minister of Finance.

NZDMO operates as a separate unit of the Treasury, and is primarily responsible for the efficient management of the Crown's debt and associated financial assets within an appropriate risk management framework. NZDMO's broader responsibilities include:

- providing capital market advice;
- providing transaction execution services to other agencies of the Crown; and
- promoting a well-functioning, liquid domestic capital market.

NZDMO manages gross debt of about \$40,000 million and financial assets of approximately \$18,000 million.

Our audit

We engaged experts from KPMG to undertake a performance audit of NZDMO on our behalf because of the specialist and technical nature of the work of NZDMO. The audit looked at the effectiveness of NZDMO's operations, including its governance and policy framework.

We compared NZDMO's policy framework to the following internationally recognised guidelines produced by the Organisation for Economic Co-operation and Development (OECD), Bank of International Settlements and the International Monetary Fund.

We also compared NZDMO's operational activities to OECD central government debt statistics, other similar entities such as the Australian state/Commonwealth borrowing authorities (CBAs), and similar financial institutions or corporate entities that undertake financial risk management activity within Australasia.

We focused on the following areas:

- the Crown's balance sheet and the role of NZDMO;
- assurance mechanisms used for governance;
- debt management – strategic portfolio;
- debt management – tactical portfolio;
- use of derivatives;
- internal systems; and
- key personnel risk.

The Crown's balance sheet

The Government's fiscal strategy emphasises a commitment to maintaining gross debt at around 20% of Gross Domestic Product (GDP). This strategy has resulted in NZDMO reducing net foreign currency debt to zero, and maintaining a stable domestic debt portfolio. At the same time, NZDMO's asset portfolios have increased significantly due to:

- foreign currency lending to the Reserve Bank of New Zealand (RBNZ);
- a larger liquidity portfolio; and
- increased lending to government agencies.

The Crown's financial assets have grown strongly in the last ten years, from \$14,000 million to \$56,000 million. This equates to 30% growth on an annual basis.

A decentralised approach to Crown financial policy has resulted in debt and asset management responsibilities being spread over a number of departments and agencies. There is a lack of clarity in NZDMO's current policy framework in terms of translating Crown balance sheet and financial policy considerations into NZDMO's debt management strategy.

Assurance mechanisms used for governance

NZDMO's Advisory Board (the Board) provides the Secretary to the Treasury with quality assurance on NZDMO's activities, risk management framework, and business plan. Some oversight is also provided by the Treasury's Risk Management Committee.

Our review of documents and discussions with Board members indicated that the Board's role is to confirm to the Secretary to the Treasury that NZDMO is operating within an appropriate policy and risk management framework. This role is consistent with the functions of advisory boards of a number of similar sovereign debt managers internationally.

However, in recent years, the Board has tended to provide more strategic advice as particular initiatives are considered by NZDMO and the Treasury. This has introduced some uncertainty into the Board's role. Accordingly, the Board's terms of reference should be reviewed and clarified with the Secretary to the Treasury with respect to assurance versus strategic advice.

Debt management

Policy framework

NZDMO's debt portfolios are designated as either "strategic" or "tactical". NZDMO's activities are focused more on managing the relationship between its assets and liabilities than on discretionary risk management activities. Hence "strategic" and "tactical" designations may not be the most appropriate terms within the current environment. In our view, "traded" and "non-traded" risk are better terms for NZDMO's current portfolios.

We have identified several components of NZDMO's policy and risk framework that require review. NZDMO's key policy document is its Portfolio Management Policy (PMP). While this has been regularly updated for certain operational changes, we consider that the policy requires a fundamental revision to reflect the current asset and liability management philosophy within NZDMO. NZDMO has acknowledged that the PMP requires updating and has been planning to do so when resources allow.

A high proportion of the PMP is principles-based. The document is less specific about risk settings under an asset and liability framework. Revision of the PMP would provide the opportunity for NZDMO to better reflect current practice as well as consider revised risk management practices within the PMP, particularly those associated with:

- interest rate risk;
- foreign exchange risk;
- risk measurement;
- funding risk; and
- liquidity risk.

Strategic portfolio

The strategic portfolio provides funding to core departments and agencies of the Government.

NZDMO has moved to an asset and liability framework to assess performance of parts of the strategic portfolio. It has also developed "quasi-tactical" portfolios. There is a degree of active management of these "quasi-tactical" portfolios. These steps have progressively reduced the size of the non-traded components of the strategic portfolio. This trend is expected to continue over time, as the risks associated with NZDMO's assets and liabilities are progressively matched with each other. Given these changes, NZDMO does not believe that extensive

benchmarking or cost/risk analysis is necessary under the asset and liability framework. We agree with this approach.

NZDMO expects that, for the foreseeable future, a portion of the strategic portfolio will continue to remain as net debt, with no financial assets linked to it. At the time of our audit, less risk analysis and performance reporting was undertaken for the strategic portfolio than for the tactical portfolio.

We suggest that, for monitoring and reporting purposes, NZDMO should progress the application of benchmarks that allow the matching explicitly or notionally of similar assets and liabilities. In the absence of such benchmarks being developed, it would be appropriate for NZDMO to consider setting a national “target duration” for its unmatched sub-portfolios within the strategic portfolio.

Tactical portfolio

NZDMO’s tactical activities have evolved over time. One of the first uses of the tactical portfolio was as a way for NZDMO to achieve the Government’s policy objective of a net foreign debt position of zero, without having to actually repurchase the gross debt. Since then, NZDMO’s tactical activities have expanded to include increased funding of the RBNZ’s foreign reserves as well as foreign exchange (FX) activity for the New Zealand Superannuation Fund and other Crown entities and government departments. In recent years, government surpluses have added to the investment of funds within NZDMO’s tactical activities.

NZDMO’s tactical portfolio activities involve matching assets and liabilities to offset risks (interest rate and FX), while minimising credit risk and securing a margin through this activity. At the time of our audit, NZDMO had a very low appetite for taking outright risk positions with a view to profiting from market movements.

NZDMO’s tactical activities are both necessary and valid, and have the potential to add value to the Crown within a managed risk framework. However, they are more in keeping with prudent asset and liability management and FX activity than traditional tactical trading.

Management of NZDMO’s tactical portfolio is appropriately performed within a limits framework. This framework establishes the maximum extent of risk that Portfolio Managers in NZDMO can take on from their discretionary activities. The limits framework has evolved over time. At the time of our audit, it included limits to protect against potential market losses (Value at Risk limits), as well as limits to protect against exposure to further losses once actual losses reach a certain point (stop loss limits). Credit exposure limits are also applied to limit the risk of

financial loss from a counterparty credit rating downgrade. These limits are set to reflect the level of risk acceptable to the Crown, as approved by the Minister of Finance.

NZDMO's risk management processes over the tactical portfolio are appropriate for NZDMO's current activities. The low level of risk taking and high quality of credit within the tactical portfolio minimise the risk profile for NZDMO. However, some better practices should be considered to minimise residual risks within the portfolio.

We found that NZDMO's daily reporting under its risk and performance reporting framework is timely, and provides management with high-level information on the portfolio performance, position, and compliance with the risk policies. However, we consider that the monthly reports to senior Treasury management and the Advisory Board should contain more information on key changes within portfolios to assist with comparative analysis.

We also consider that the risk-adjusted performance measure (RAPM) that NZDMO uses to report the performance on the tactical portfolio should be reviewed. We consider the key refinement needed is to more precisely report returns from risk-taken activity against one-off gains achieved by borrowing funds at the New Zealand Government rate and investing them in marketable securities that attract a higher rate.¹

Use of derivatives

Derivatives are financial instruments (such as options, futures contracts or swaps), the value of which is determined by reference to an interest rate or underlying asset (such as a stock, currency, or commodity). The derivative instruments used by NZDMO in the strategic and tactical portfolios are consistent with the exposures being managed, and the activity is well-controlled within NZDMO's risk management framework. All the derivative instruments used by NZDMO have been authorised by the Minister of Finance.

Internal systems

NZDMO's Information Technology (IT) systems meet key business requirements. This has been achieved using significant levels of in-house development. Processes exist for IT staff to regularly collaborate with other NZDMO staff to identify their strategies and needs relating to technology.

Processes to identify and manage IT risks are integrated with business processes. There is some risk with developers having access to the production environment,

¹ At the time of fieldwork for our audit, typical New Zealand Government borrowing rates were more than one percentage point lower than typical benchmark borrowing rates (New Zealand swap market interest rates). For example, NZDMO could borrow at 6.5% and then invest at 7.5%.

which is inevitable given the small size of the IT group. This access risk is largely mitigated by the level of daily review of the system-generated reports.

Key personnel risk

The skills of key NZDMO personnel typically align with their roles. NZDMO has continued to achieve operational efficiencies that have allowed staff numbers to reduce. However, if transaction volumes continue to grow, and other strategic changes introduce greater responsibilities, the relatively small team may be stretched. This is particularly the case below management level in key areas such as settlements, portfolio management, and risk analysis.

A risk that NZDMO may face in the future is that, given the existing resourcing levels, any further change in its operating environment could restrict its ability to maintain a strong control culture or respond to new operational requirements within an acceptable timeframe.

Recommendations

We have made 19 recommendations throughout our report. These identify some improvements that NZDMO could make in the following areas:

- governance;
- risk management;
- portfolio management policy; and
- performance reporting.

All of the recommendations are listed in the Appendix.

Note:

The material in the main report is of a very technical nature because of the specialist technical functions undertaken by NZDMO.

To assist the non-technical reader, a summary of expectations, findings, and conclusions is provided at the beginning of each of Parts 3 to 8 in shaded boxes. A comprehensive Glossary is also provided.

Part 1

Introduction

- 1.1 The New Zealand Debt Management Office (NZDMO) is an operating unit of the Treasury, within the Treasury's Macroeconomic Group. NZDMO is responsible for the efficient management of the Crown's debt and associated financial assets within an appropriate risk management framework. NZDMO's strategic objective is to maximise the long-term economic return on the Crown's financial assets and liabilities in the context of the Government's fiscal strategy.
- 1.2 Our audit focused on the extent to which NZDMO is carrying out its activities effectively and to confirm that NZDMO's policy parameters are consistent with its governing legislation and ministerial delegations.

Our audit objectives and performance expectations

- 1.3 Our overall objective was to determine NZDMO's level of performance, under the authority of the Minister of Finance, in managing the Crown's public debt and financial asset portfolios.
- 1.4 We compared NZDMO's policy framework to the following internationally recognised guidelines:
- Organisation for Economic Co-operation and Development (OECD) overview of advances in the risk management of government debt;
 - Bank of International Settlements (BIS) principles for interest rate and liquidity management; and
 - to a lesser extent, the relevant sections of the International Monetary Fund (IMF) guidelines for public debt management.
- 1.5 We also compared NZDMO's operational activities to:
- OECD central government debt statistics;
 - other similar entities, such as the Australian state/Commonwealth borrowing authorities (CBAs); and
 - similar financial institutions or corporate entities that undertake financial risk management activity within Australasia.

How we conducted the audit

- 1.6 We sought expert technical assistance with the audit given the specialised technical functions of NZDMO. Assistance was provided by experts from KPMG appointed by the Auditor-General under section 33(1) of the Public Audit Act 2001 to conduct a performance audit on his behalf under section 16(1) of that Act.
- 1.7 The audit was conducted by reviewing key NZDMO and Treasury documents; in particular, NZDMO's Portfolio Management Policy (PMP) and associated technical

appendices. Other key documents included both recent and historical business case requests from NZDMO to the Minister of Finance for the commencement or suspension of transactions in new instruments and new currencies and policy alterations. We also reviewed NZDMO's management reporting documents, supplemented by specific data and analytical requests to NZDMO.

1.8 Stakeholders we interviewed included:

- NZDMO management and staff;
- NZDMO's Advisory Board;
- Treasury senior management with direct responsibility for NZDMO; and
- the Reserve Bank of New Zealand (RBNZ) and selected financial market participants.

Outside the scope of the audit

1.9 We have made some observations and comments in relation to Crown financial policy in terms of the effect on NZDMO's activities. However, we have sought to avoid Crown-wide financial policy considerations not related to NZDMO.

1.10 The IMF and World Bank guidelines for Public Debt Management require sound macroeconomic and fiscal policies to support public debt management better practices. Macroeconomic and fiscal strategies are outside the scope of the audit. They are therefore referred to only by way of background and direct effect on NZDMO.

Part 2

The Crown's balance sheet and NZDMO

Background

- 2.1 NZDMO was formed in 1988 to ensure better co-ordination and management of the Crown's foreign currency and domestic debt under the authority of the Minister of Finance. NZDMO was established as a unit within the Treasury to ensure that important linkages were maintained in relation to the fiscal and macroeconomic effects of NZDMO's activities on the Crown and, ultimately, the economy.
- 2.2 Since its establishment, NZDMO has maintained an environment of continuous improvement. Over the last 10 years, NZDMO has reduced staff numbers by achieving operating efficiencies (in part from information technology improvement) and closing NZDMO's London branch. This has resulted in NZDMO's annual operational cost reducing from \$7.4 million to \$3.7 million by 2005/06.¹
- 2.3 The Treasury and NZDMO continue to consider how NZDMO should interact with other government agencies in terms of wider Crown financial risk management. In 1997, NZDMO was included within the Treasury's Asset and Liability Management Branch to provide a greater emphasis on the management of the government's aggregate balance sheet.
- 2.4 In early 2007, the Treasury undertook a change programme. The key purpose of this programme was to ensure that the Treasury as an organisation:
- ... focuses its resources more intensely on issues which are of the highest priority to the living standards of New Zealanders now or in the near future.²*
- 2.5 As part of that programme, NZDMO has become part of the Treasury's Macroeconomic Group. The intention of this change is to improve the quality of advice by linking macroeconomic and fiscal issues with Crown balance sheet management.

Structural considerations

- 2.6 The institutional arrangements for governments' borrowing activities vary globally. However, many countries have adopted a similar approach to NZDMO or a variation of it. Generally, there have been two types of arrangements, as Figure 1 shows.

1 Operational cost information has been sourced from the output reporting section of the Treasury's annual reports.

2 The Treasury 2007, *Stepping Up* change document.

Figure 1
Institutional arrangements for government borrowing activities*

Office or agency established outside the Ministry of Finance but reporting to the Minister of Finance	A debt office located within the Ministry of Finance or Treasury department
Austria, Hungary, Ireland, and Portugal	Belgium, Columbia, Canada, France, and New Zealand
As part of broader government machinery: Australia, Sweden, and the United Kingdom	

* This analysis is based on information from chapter 3, Governance Issues in Managing Government Debt, in the 2004 World Bank publication *Sound Practice in Government Debt Management*.

- 2.7 The key driver cited for maintaining the function within a country's finance ministry or treasury relates to the linkages to broader economic and fiscal management activities.

Strategy and objectives

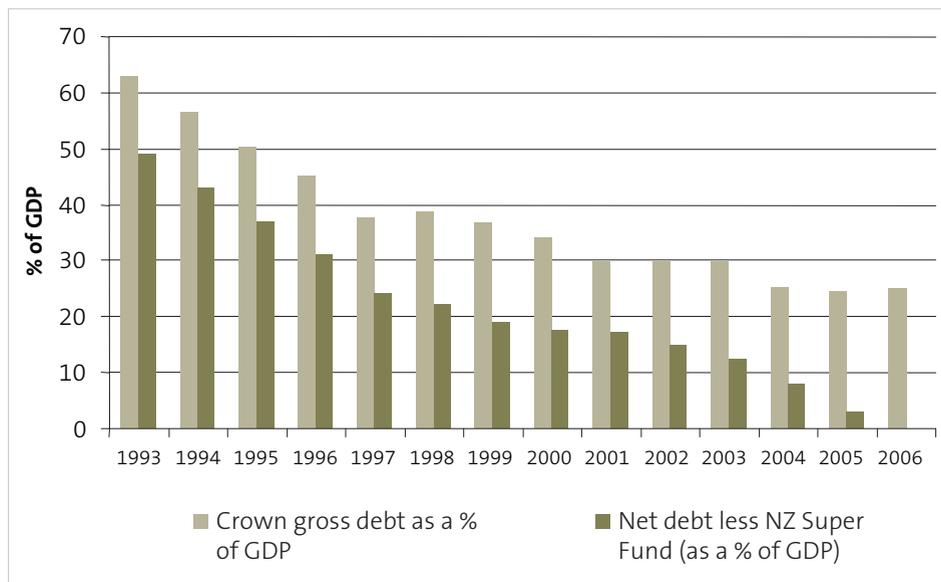
- 2.8 The main strategic objective of NZDMO is to maximise the long-term economic return on the Government's financial assets and debt in the context of the government's fiscal strategy, particularly its aversion to risk.³ This objective requires NZDMO to balance the likely risks incurred from issuing various debt instruments against minimising finance costs to the Crown. NZDMO's objectives have focused more on matching financial assets and liabilities as the Crown's fiscal position has improved and allowed the reduction of both gross and net debt.
- 2.9 To execute this strategic objective, NZDMO's core responsibility is the development and management of a portfolio framework to manage the key risks arising from the Crown's gross borrowings, such as market, credit, settlement, liquidity, and funding risks. Broader responsibilities include providing capital market advice and transaction execution services to other agencies within the Crown, and promoting a well-functioning, liquid domestic capital market.
- 2.10 The strategic objective has changed over time. Earlier policy settings placed an emphasis on risk reduction given high levels of foreign currency debt. NZDMO has increasingly adjusted its operating framework from reducing the debt portfolio to increasing the financial asset portfolio. It has migrated towards an asset and liability management framework.

³ Strategy and objectives are based on information available at www.nzdm.govt.nz and from NZDMO's Portfolio Management Policy document and its associated technical appendices.

Change in Crown fiscal position

2.11 The Crown has achieved fiscal operating surpluses over the last six years. In little more than 10 years, the Government has reduced gross debt from around 50% of GDP (the OECD average) to close to 25% of GDP as is shown in Figure 2.

Figure 2
New Zealand Government debt 1993-2006



Source: The Treasury

2.12 The Government's current fiscal strategy is committed to keeping gross debt at around 20% of GDP over the medium term. This strategy has enabled NZDMO to reduce net foreign currency debt to zero and maintain a stable domestic debt portfolio. At the same time, the NZDMO's asset portfolios have increased significantly as a result of:

- foreign currency lending to the RBNZ (this lending increased by \$1,200 million between 2001 and 2006);
- a larger liquidity portfolio (marketable securities have increased by \$3,200 million between 2001 and 2006); and
- on-lending to New Zealand government agencies (lending increased by \$2,300 million between 2001 and 2006).⁴

2.13 The Crown's financial assets have grown strongly in the last 10 years from \$14,000 million to \$56,000 million, or 30% growth on an annual basis.⁵ The fiscal improvement has enabled the Government to introduce policy initiatives with

⁴ This information is based on a comparison of the NZDMO's management accounts from 2001 to 2006.

⁵ This information is from the 2005/06 New Zealand Government financial statements.

respect to future demographic retirement needs. Other policy initiatives include the building up of foreign currency reserves by the RBNZ. At the same time, other major New Zealand public investment institutions have also grown their financial assets.

Crown financial policy and NZDMO

- 2.14 Since the 1990s, NZDMO has considered how wider macro-variables may influence its operational activities. For example, how could the risk characteristics of NZDMO's strategic portfolio offset variability in the Crown's balance sheet or minimise overall risk to the Crown?
- 2.15 As a result of identified exchange rate risk associated with its foreign currency debt, NZDMO put in place the steps necessary to achieve the Government's policy objective of a net foreign debt position of zero and extend the duration of New Zealand dollar debt. NZDMO also considered broader theoretical views on optimal debt composition and practices with respect to principles for prudent debt management and wider macroeconomic influences.
- 2.16 The Treasury has continued to review the possible relationships between government debt and broader Crown variables. Frameworks questioned have included:⁶
- economic variables – Can a government's debt portfolio be constructed to "hedge" against economic cycles as a whole, or shocks to national income/net worth?;
 - government variables – Can a government's debt portfolio be constructed to "hedge" against fluctuations specifically relating to its tax base (referred to as "tax smoothing")?; and
 - balance sheet variables – Can a government's debt portfolio be constructed to "hedge" against variability in the government's own balance sheet, or more specifically its assets?
- 2.17 NZDMO and the Treasury periodically review these frameworks when resources and priorities allow.

6 Analysis undertaken by KPMG using NZDMO papers.

Part 3

Assurance mechanisms used for governance

Our expectations and overall findings

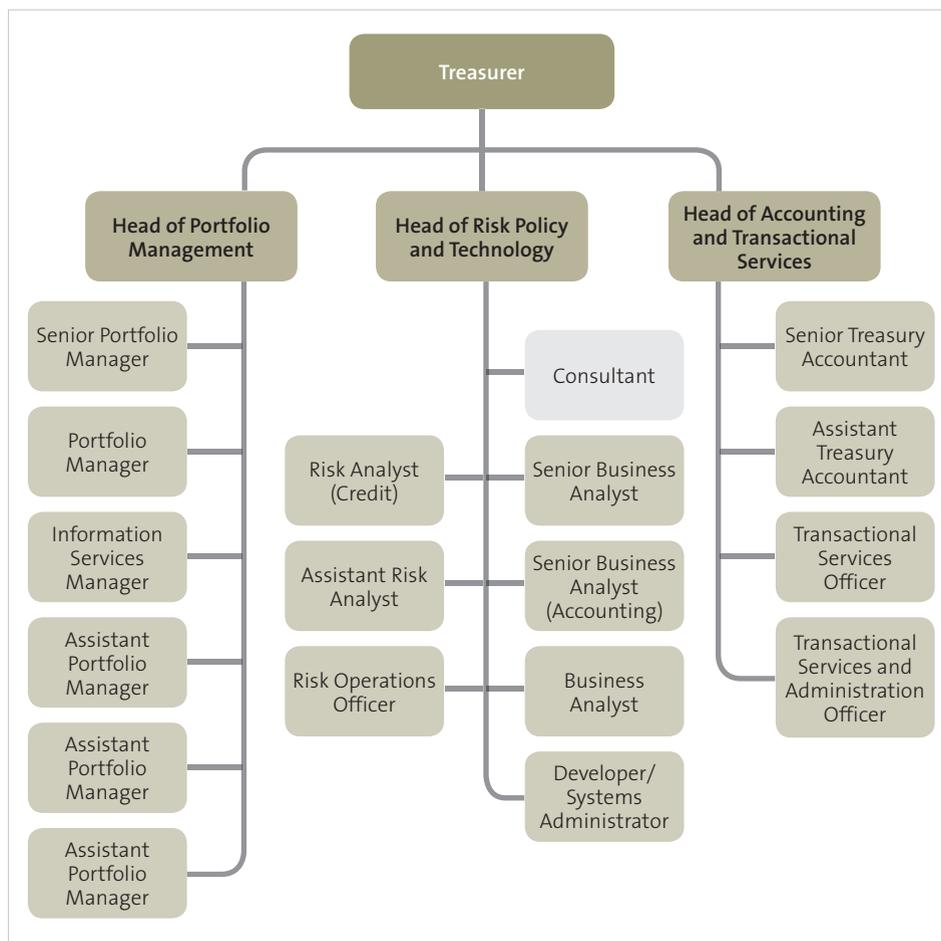
- 3.1 We expected that NZDMO's governance structure would include:
- a. a legal framework to facilitate its management of the Government's debt, cash, and marketable securities/assets;
 - b. a clear and concise policy framework that ensures implementation of its strategy and risk management objectives;
 - c. an institutional framework that ensures clear roles and accountabilities to carry out its activities;
 - d. a reporting framework that provides its management, the Treasury's senior management, and NZDMO's Advisory Board with adequate information and assurance that NZDMO's activities comply with its policy framework; and
 - e. quality assurance practices specific to NZDMO.
- 3.2 We found that NZDMO's governance structure included:
- a. a legislative framework that allows it to borrow, invest, and hedge financial risk (using derivatives), through delegation arrangements from the Minister of Finance, within an acceptable operating framework;
 - b. a policy framework that addresses all key financial risk management issues but requires some updating to reflect current practice;
 - c. an appropriate structure to enable it to be held accountable for its current activities, but with a lack of clarity about its role in wider Crown financial policy;
 - d. an adequate reporting framework with respect to governance, but the need for some improvement of its performance and strategy reporting; and
 - e. assurance practices consistent with similar entities, with the exception of an internal audit function within NZDMO.
- 3.3 We concluded the assurance mechanisms used for governance were adequate and effective for managing NZDMO's key risks and activities.

Background

- 3.4 The head of NZDMO is its Treasurer. The NZDMO Treasurer reports to the Treasury's Deputy Secretary responsible for the Macroeconomic Group, who in turn reports to the Secretary to the Treasury who is accountable to the Minister of Finance.
- 3.5 The Treasurer has three direct reports within NZDMO – the Head of Portfolio

Management, Head of Risk Policy and Technology, and Head of Accounting and Transactional Services. The organisational structure of NZDMO is shown in Figure 3.

Figure 3
Organisational structure of the New Zealand Debt Management Office



Source: The Treasury

- 3.6 NZDMO's organisational structure has defined responsibilities and accountabilities that ensure segregation of key duties, notably with separation of deal execution activities (Portfolio Management), an independent middle office risk analysis function (Risk Policy and Technology), and settlements/accounting (Accounting and Transactional Services). There is an established risk management culture within the management team that is supported by a body of policies, including ethical guidelines, codes of conduct, and dealing limits for the Portfolio Management Group.

Legal framework

- 3.7 Most of the functions of NZDMO are fulfilled through the exercise of statutory powers contained in the Public Finance Act 1989 (the Act). The Act establishes the legal framework for the use of public financial resources, and includes authorities and controls for:
- the operation of bank accounts;
 - the investment of public money;
 - the raising, repayment, and conversion of loans and the issuing of securities;
 - the giving of guarantees and indemnities; and
 - entering into derivative transactions (or “contracts”).
- 3.8 While these authorities and controls are generally vested in the Minister of Finance, many have been delegated to the Secretary to the Treasury, with a chain of further sub-delegations to the NZDMO Treasurer and then to specified positions within NZDMO depending on the function.
- 3.9 In addition to the formal delegations, NZDMO’s risk framework is reinforced with further sub-allocation of responsibilities by the Head of Portfolio Management to staff based on their seniority and experience. This limits the transactions that staff may enter into with respect to borrowing, investing, and executing derivative transactions.
- 3.10 The Act defines derivative transactions very widely, including a number of products that NZDMO has never traded in (such as options, commodities, and credit default swaps). This wide mandate is narrowed by NZDMO’s Portfolio Management Policy (PMP). The PMP contains a list of financial instruments and currencies in which NZDMO is approved to transact by its Treasurer. Any changes to the PMP are communicated to NZDMO’s Advisory Board, the appropriate Treasury Deputy Secretary, and the Secretary to the Treasury through NZDMO’s monthly report.
- 3.11 While NZDMO is authorised to enter into practically any type of derivative transaction, Ministerial approval is sought before new currencies or instruments are added to the list of authorised instruments or currencies in the PMP. If NZDMO wishes to transact in a new currency or instrument, it prepares a business case for doing so and seeks the approval of the Minister of Finance. Before seeking this permission, NZDMO prepares a risk control document that identifies the risks associated with the product and the processes that will be put in place to manage those risks.

- 3.12 The Act gives the Minister of Finance the power to borrow in the name of the Crown. While this power cannot be delegated, the Minister of Finance has appointed Borrowing Agents to act on his behalf to borrow funds within the parameters of his borrowing programmes. Senior NZDMO staff are among the appointed Borrowing Agents.
- 3.13 The Act contains a permanent appropriation for the payment of all principal and interest in respect of any loan to the Crown. It also contains a permanent appropriation for the payment of expenses associated with the raising and management of loans and the issuing and management of securities.
- 3.14 The PMP lists options only as “approved in principle”. Forward Rate Agreements have not been recently transacted, and the current Treasury Management System (TMS) does not support them.
-

Recommendation 1

We recommend that NZDMO include as authorised in its Portfolio Management Policy only instruments or currencies which NZDMO has full and final approval, functional capacity, and current skills to transact.

Ownership of Crown financial policy

- 3.15 In Part 2 of this report, we describe NZDMO within the broader context of Crown Financial Policy.
- 3.16 The current decentralised, multi-responsibility approach to Crown financial policy has direct effects on NZDMO. It means that NZDMO does not have the mandate or capacity to further lead the implementation of an operationally co-ordinated Crown financial policy given NZDMO’s institutional and governance structure. It also means that there is ambiguity in NZDMO’s PMP about NZDMO’s role in translating Crown balance sheet and financial policy considerations into its debt management strategy. We noted reference to wider Crown balance sheet considerations within the financial risk technical appendix of NZDMO’s PMP.
-

Recommendation 2

We recommend that NZDMO be explicit that Crown financial policy considerations have either been incorporated into NZDMO’s Portfolio Management Policy or completely removed from the policy to clarify NZDMO’s role in Crown financial policy.

- 3.17 If Crown financial policy considerations are incorporated into the operational policy parameters, then those parameters should be monitored.

Governance oversight and independent review

- 3.18 NZDMO's Advisory Board provides the Secretary to the Treasury with quality assurance on NZDMO's activities, risk management framework, and business plan. The current Advisory Board contains skills gained as a senior partner in a major accounting firm, an adviser from a treasury and risk management firm, and a former Deputy Governor of the RBNZ. The other broader oversight function is provided by the Treasury's Risk Management Committee, whose focus is Treasury-wide organisational risks such as human resources. A review of the role of the Risk Management Committee is planned for June 2007.

Role of the Advisory Board

- 3.19 Our review of documents and discussions with Advisory Board members confirmed that its role is primarily assurance oriented. Its key role is to confirm to the Secretary to the Treasury that NZDMO is operating within an appropriate policy and risk management framework. This role is consistent with those advisory boards of a number of similar sovereign debt managers internationally. The only observed variances are that some boards report or interact directly with the Minister of Finance.
- 3.20 The Advisory Board does not fulfil the function of a private sector board that, in addition to reviewing an entity's risk management framework, may challenge or formulate the entity's strategy and sometimes interact with management on operational decisions.
- 3.21 Any operational changes and strategic decisions made by NZDMO are reported to the Advisory Board for information purposes rather than for approval. International evidence suggests this approach is better practice as it avoids potential conflicts of interest for advisory board members with respect to transactional activity.
- 3.22 The high-level balance sheet and portfolio analysis provided by management to the Advisory Board is limited. Our discussions with the Advisory Board indicated that this may limit the review and analysis able to be undertaken by the Advisory Board of the information provided by management.
- 3.23 In recent years, the Advisory Board has not only been providing advice to the Secretary to the Treasury that NZDMO is operating within an appropriate policy and risk management framework, but has also been providing strategic advice as particular initiatives are considered by NZDMO and the Treasury.

Recommendation 3

We recommend that NZDMO review and clarify the NZDMO Advisory Board's terms of reference with the Secretary to the Treasury with respect to assurance versus strategic advice, and clarify the role of the Treasury's Risk Management Committee and its relationship to NZDMO's Advisory Board.

Internal audit function

- 3.24 NZDMO does not have an internal audit function. In terms of peer review, NZDMO is reliant on external audit, including periodic reviews that give more frequent reporting of control related issues.
- 3.25 It is considered good practice for treasury functions to receive regular internal audits, and we note that all central borrowing authorities in Australia have internal audit functions (although these are outsourced because of the level of expertise required).
- 3.26 There are potentially many advantages to having an internal audit function for an organisation such as NZDMO. For example, an internal audit function provides regular, systematic, and in-depth reviews of a range of issues, including determining compliance with policies and procedures. It also provides a conduit of information for senior management and the board. Internal audit can provide a source of ideas and another perspective for management, as well as creating momentum for change when it is required.
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Recommendation 4

We recommend that NZDMO review the degree of assurance provided by the current scope of the external audit, and determine what additional assurance could be obtained from a suitably qualified internal audit resource.

Part 4

Strategic portfolio

Our expectations and overall findings

- 4.1 We expected that NZDMO would have:
- a. an adequate strategy and policy framework to carry out borrowing and investment;
 - b. processes and controls to identify and mitigate errors or fraud while executing its strategy (investment, borrowing, and deal intermediation);
 - c. processes in place for identifying and analysing financial risks for portfolio management;
 - d. a control environment supporting portfolio management; and
 - e. a reporting framework which provides assurance to management that NZDMO is managing the risks and performing satisfactorily against its policy framework.
- 4.2 We found that NZDMO has:
- a. a strategy and policy framework in place for the strategic portfolio but aspects of the policy were out of step with the current asset and liability framework;
 - b. adequate processes and controls for executing the strategic portfolio activities (investment, borrowing, and deal intermediation);
 - c. fewer processes in place for identifying and analysing financial risks for strategic portfolio management compared to the tactical portfolio;
 - d. an adequate control environment supporting portfolio management; and
 - e. a reporting framework that requires some further development as a result of the change in portfolio management approach to match the level of analysis and reporting of the tactical portfolio.
- 4.3 We concluded that NZDMO's policy, processes, and controls provide effective and efficient management of the strategic portfolio. Some refinements could further strengthen the risk and reporting management framework.
- 4.4 We have assessed NZDMO against five key criteria for ensuring a robust risk management framework within Parts 4 and 5 of this report. Identification and management of operational risk (assessment of the control framework) is not normally considered separately. However, given the technical nature of the review, we have chosen to assess financial risk and operational risk in separate sections.

Background

Portfolio structure

- 4.5 NZDMO currently has two main portfolio groups – a strategic portfolio and a tactical portfolio.
- 4.6 The strategic portfolio provides funding to agencies of the Government. Financial assets will not always match the financial liabilities within this portfolio. The Government bears zero net interest cost for NZDMO’s “matched liabilities” (non-market bonds) issued to other major New Zealand public investment institutions. However, there are also unmatched financial liabilities (New Zealand dollar debt). These are, in effect, a debt pool. The Government will continue to bear the long-term costs of funds from this pool.
- 4.7 To the extent that a New Zealand bond issue has not been allocated to a tactical or quasi-tactical portfolio, the debt will be typically allocated to the strategic portfolio. If funds are not immediately required, the funds are left in the Crown Settlement Account earning the Overnight Cash Rate. The composition of the portfolio is therefore an outcome of not being able to allocate any residual portions of debt issues to corresponding financial assets.
- 4.8 Once debt (and any associated derivatives) has been allocated to the strategic portfolio, these financial instruments will normally be held to maturity. Financial instruments in this portfolio are currently accounted for on an accruals basis under New Zealand generally accepted accounting practice (GAAP). The intention of NZDMO is that a significant portion of this portfolio will be accounted for on a mark-to-market basis under New Zealand equivalents to International Financial Reporting Standards (NZ IFRS). This accounting policy is based on management and reporting of the portfolio on a fair value basis.
- 4.9 The strategic portfolio also incorporates a quasi-tactical portfolio associated with on-lending to New Zealand government agencies. The quasi-tactical portfolio has a degree of active management.
- 4.10 Risk metrics are calculated for the two recently developed quasi-tactical portfolios within the strategic portfolio. However, the level of risk analytics undertaken within the tactical portfolio is not applied to the rest of the strategic portfolio.
- 4.11 The strategic portfolio does not have a target duration or duration benchmark. While not policy, the Technical Appendix to the PMP document indicates that the duration of NZDMO debt should, historically, have been relatively long. In principle, NZDMO now looks to match its debt to the duration of selected financial assets on the Crown balance sheet.

- 4.12 NZDMO does not currently set a fixed/floating mix target for the domestic debt portfolio. Our analysis suggests that the domestic portfolio is currently close to 30% floating interest rate exposure – with 10% from treasury bills and 15% from interest rate swaps.
- 4.13 The quasi-tactical portfolio is reported upon in terms of Value added Risk (VaR), but does not have a risk limit. If circumstances are appropriate, NZDMO may move this sub-portfolio to the tactical portfolio.

Designation of portfolios

- 4.14 In our opinion, the current designation of portfolios as strategic and tactical is somewhat ambiguous for parties that are not fully acquainted with NZDMO's current mode of operations. Many risk management practitioners would consider tactical risk management akin to proprietary trading or at least active management. The description of the tactical portfolio in the PMP is consistent with this latter interpretation.
- 4.15 Since the last significant rewrite of the PMP in 2003, NZDMO's trading philosophy has shifted from outright proprietary trading to a more transaction flow or balance sheet driven style. In discussions with NZDMO staff, they referred to "traded" and "non-traded" risk. Such a description provides a better insight into the nature of the current portfolios and is consistent with financial institutions' differentiation between asset and liability management activities (non-traded) and markets activities (traded).
- 4.16 We suggest that NZDMO consider redesignating portfolios/sub-portfolios in terms of traded (tactical portfolio) and non-traded risk (strategic portfolio). This could assist parties outside NZDMO to understand NZDMO's portfolio structure, the purpose of portfolios, and the rationale for the current portfolio structure.

Strategic debt portfolio

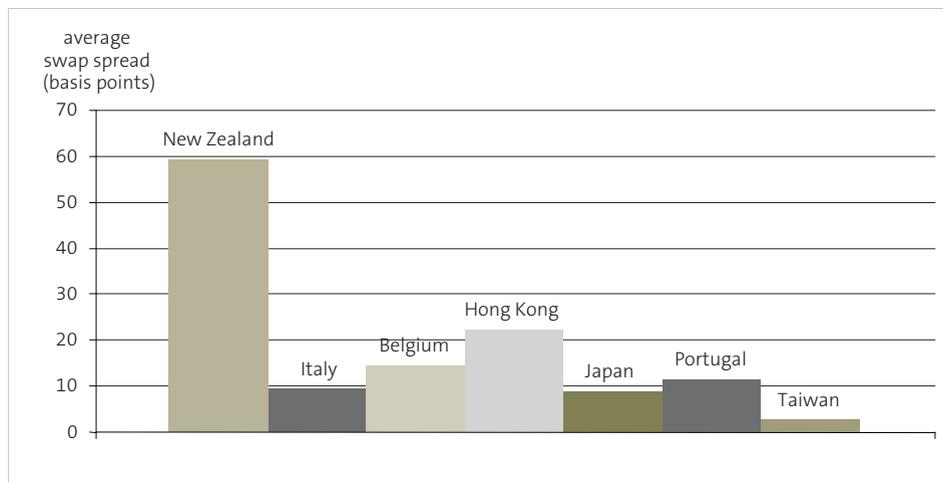
- 4.17 The Crown has reduced gross debt from around 50% of GDP (the OECD average) to close to 25% of GDP in little more than 10 years. While aspects of the strategic portfolio have been driven by fiscal surpluses, NZDMO's performance has further enhanced improvements with respect to minimising finance costs and volatility (or risk).
- 4.18 In the early 1990s, the dollar value of gross debt was close to \$50,000 million and the cost of borrowing was more than \$4,400 million a year or 9%. More recently, gross debt has reduced to just over \$30,000 million and overall financing costs to around \$2,500 million per year or less than 7%. Key decisions supporting

performance in recent years have included reducing net foreign currency debt to zero, discontinuing the issue of inflation bonds, and introducing interest rate swap hedging. The latter has assisted in reducing the cost of funds for NZDMO in six out of the last seven years by between 2 and 20 basis points.

- 4.19 The improved fiscal position of the New Zealand Government, combined with the financial market environment, has ensured that the relative cost of borrowing for New Zealand is quite favourable on an international basis.
- 4.20 By way of comparison, we compared the swap spread of New Zealand to that of like-rated sovereign borrowers (“AA+”) and also “AAA” rated countries. Our analysis is shown in Figure 4.

Figure 4

Average 5-year swap spreads for New Zealand and like-rated sovereign countries (for 2000-06)



Source: Bloomberg

- 4.21 This analysis highlights the ability of the New Zealand Government to achieve financing costs substantially below the swap interest rate (the wholesale market reference interest rate) when compared to similar rated countries. This analysis suggests that “AA+” type sovereign borrowers could borrow at about 10-20 basis points below the reference market rate.
- 4.22 When comparing New Zealand to the highest credit rating, “AAA”, which includes many of the Western European countries, the New Zealand Government still has greater borrowing advantage (in terms of swap spread) than most “AAA” rated countries. It is only countries such as the United States of America, the United Kingdom, and Norway that achieve similar swap spread margins.

Portfolio Management Policy

General observations

- 4.23 Aside from several updates for operational changes, NZDMO's Portfolio Management Policy (PMP) has not had a fundamental rewrite since 2003. Since then, both the activities and market environment in which NZDMO operates have continued to change substantially. NZDMO's activities have moved away from significant discretionary risk management activities. NZDMO is now operating in an environment where it has significant excess liquidity and where the yield curve of New Zealand Government debt trades at 80 to 100 basis points below the interest rate swap curve.
- 4.24 NZDMO recognises that the PMP needs revision. It has acknowledged that the policy should reflect current practice rather than theoretical best practice. NZDMO plans to update the policy when resources allow.
- 4.25 The PMP contains a high proportion of guidance around contextual issues, but less guidance on operational application of the asset and liability framework/philosophy. For example, within the section on funding, the PMP says that "NZDMO will establish a relatively even maturity profile for terms of debt". This is consistent with good practice, but it is unclear what this means in actual practice. It is stated in another section of the PMP that the NZDMO has the right to use options. However, the PMP is silent about whether options can only be bought, or whether they can also be sold. In practice, NZDMO does not use options, and has indicated that further Ministerial approval would be required before using them. This is inconsistent with what the PMP currently states.
- 4.26 Several reasons are provided within the PMP as to why NZDMO should undertake tactical trading, including "tactical trading brings with it knowledge of how various markets operate under a variety of circumstances, which improves NZDMO's understanding in managing the overall portfolio". The discretion to actively manage risk is provided through a VaR limit and the asset and liability framework or philosophy.
- 4.27 The PMP needs to be revised to reflect current philosophies. Better practice is to review treasury policies on an annual basis. The revision of the PMP document will provide the opportunity to better reflect actual practice as well as consider revised risk management practices within the PMP, particularly those associated with:
- interest rate risk;
 - foreign exchange risk;
 - risk measurement;
 - funding risk; and
 - liquidity risk.

Recommendation 5

We recommend that NZDMO update its Portfolio Management Policy to synchronise the policy's principles and management strategies with current business practices and goals. In particular, consideration should be given to expanding the Portfolio Management Policy by including the policies used to support the principles and limits in the document while retaining a Portfolio Management Policy that is clear and understandable.

- 4.28 We suggest that NZDMO gives attention to making the PMP document more concise and specific.

Funding risk

- 4.29 Funding risk is currently considered to be low given the demand for New Zealand government bonds and the significant liquidity reserves that NZDMO holds. NZDMO is also targeting an issuance programme of up to \$2,500 million a year to maintain liquidity in its benchmark stocks.
- 4.30 In effect, NZDMO is managing funding risk by continuing to maintain its domestic bond programme and through the general objective of maintaining a relatively even maturity profile for benchmark stock issues.
- 4.31 Other relevant issues that could be considered by NZDMO include a policy of facilitating secondary market activities through stock lending and repurchase ("repo") activities.
- 4.32 Currently, the PMP has portfolio maturity profile limits of \$3,500 million a year (or implicitly between 2% and 3% of GDP) for domestic debt and \$1,500 million a year for foreign currency debt. We consider that there is little value in specifying maximum maturities for each period, the average term of debt, or other parameters in the policy, given that the NZDMO's:
- current liquidity holdings are significant;
 - entire foreign currency debt portfolio is close to \$1,500 million; and
 - debt maturity profile is relatively balanced and spread over 10 years.

Liquidity risk

- 4.33 NZDMO told us that the current PMP is geared around maintaining adequate liquidity to ensure that NZDMO can meet its foreign currency obligations. NZDMO believes it is no longer appropriate to have the policy focused on foreign currency obligations. We agree that NZDMO's liquidity policy should consider NZDMO's overall obligations.

- 4.34 The policy could consider crisis liquidity and normal liquidity requirements for NZDMO. However, in the current circumstances (of excess liquidity and high demand for New Zealand Government debt), this may not add significant value. It may be sufficient for the next policy revision to specify a minimum liquidity holding with an associated trigger for action. This may entail NZDMO ensuring that it has sufficient liquid assets to meet all near term liabilities if the liquidity portfolio falls below a minimum level.
- 4.35 A minimalist approach, as described above, would require at least a statement of intention for managing liquidity risk as well as any rules that would trigger action. In general, we consider that the approach and framework taken is in line with industry practice.
- 4.36 We agree with recent proposed changes to the policy regarding inconsistencies in methodology. These changes represent better practice. In particular, the shift in treating derivative transactions on an individual rather than aggregated basis is a notable improvement.

Market risks

- 4.37 While foreign exchange and interest risk exposures fall within the VaR policy limits, it is often useful to present additional foreign exchange risk and interest rate risk analysis. This enables management to review risk exposures at a more detailed level than is possible using the VaR limit alone, but without overlaying additional policy parameters on the portfolio managers.

Reputation risk

- 4.38 It is becoming more common for business organisations to state explicitly in policy what they consider to be the largest threats to their reputation and how they intend to manage such threats. Sources of such risks may be political, environmental, public liability, or economic, depending on the industries involved.
- 4.39 It may be instructive for NZDMO to consider defining such risks and including clauses relevant to reputational risk events and scenarios in its policy.

Processes and controls on instrument choice and deal execution

- 4.40 Debt managers typically prefer to concentrate borrowing activities on issuing longer-maturity fixed-rate domestic debt instruments to:
- minimise refinancing risks;
 - stabilise debt-servicing costs;

- increase the investor base;
- increase the depth of the domestic bond market; and
- establish a pricing benchmark to help the market in pricing the credit of other domestic fixed-income issuers.¹

- 4.41 Sovereign borrowers generally prefer domestic fixed-interest debt over foreign currency debt and short-dated instruments. Unhedged foreign currency debt will typically increase the riskiness of the debt portfolio (through exchange rate risk) and potentially undermine the debt management framework. In this context, we assessed NZDMO's choice of instruments within the strategic portfolio with respect to its influence on the debt portfolio.
- 4.42 International evidence indicates that OECD government borrowers typically use certain types of instruments. During the last 10 years, these borrowers have typically aimed to increase their debt portfolio duration, as shown in Figure 5.

Figure 5

Use of financial instruments by OECD government borrowers and by NZDMO (1995-2005)*

Instrument	Level of use within a range of OECD countries (% of total debt portfolio)	Level of use within NZDMO (% of total debt portfolio)
Short-term securities, mainly treasury bills	Minimum close to 0% and maximum around 63%. Average moved down from around 20% to 10%.	NZDMO portfolio has historically been around 15%, but reduced to closer to 10% recently.
Medium- or long-term fixed rate securities or notes	Minimum around 20% and maximum around 90%. Average moved up from low 40% to 60%.	NZDMO portfolio has historically been around 80%.
Foreign currency debt	Minimum 0% and maximum around 50%. Average 15%.	NZDMO portfolio has historically been around 15%, but reduced to closer to 5% recently.

* Information was sourced from the 2006 *OECD Statistical Yearbook*.

- 4.43 The types of instruments used by NZDMO are broadly consistent with international practice. Furthermore, the composition is similar to international public debt portfolio composition. The bulk of borrowing undertaken uses medium to long-term fixed rate securities (government bonds) and the residual instruments are a mix of short-term instruments and foreign currency debt.

1 Based on information in chapter 2 of the 2004 World Bank publication *Sound Practice in Government Debt Management*.

- 4.44 In the 1990s, New Zealand issued \$1,800 million of inflation bonds for a number of macroeconomic reasons. Ultimately, however, investor appetite and market pricing resulted in the suspension of inflation bond issuance.
- 4.45 International evidence shows that only a few countries continue an active issuance program in price-index debt (Australia, Canada, Italy, Sweden, and the United Kingdom). Overall, inflation bonds appear to have provided mixed results for debt managers. NZDMO's suspension of their use is therefore consistent with the lack of clear advantages or disadvantages for maintaining a small amount of issuance (as a percentage of total debt).
- 4.46 Overall, the debt composition of NZDMO is consistent with similar developed countries within the OECD, and does not include instruments that would be inappropriate for NZDMO to use when balancing risk and cost dynamics.

Identifying and measuring risk

Applying benchmarks to the strategic portfolio

- 4.47 NZDMO has recently moved to an asset and liability framework to assess performance of parts of the strategic portfolio (that is, monitoring the interest margin between related assets and liabilities within the strategic portfolio) along with developing quasi-tactical portfolios for assets and liabilities that have a degree of active management. These steps have progressively reduced the size of the residual strategic portfolio. Furthermore, the strategic portfolio is expected to continue reducing over time as various assets and liabilities are aligned. Given these changes, NZDMO does not believe that extensive benchmarking or cost/risk analysis is necessary under the asset and liability framework.
- 4.48 However, it is expected that a significant portion of the portfolio will remain as net debt for some time, with no financial assets linked to it. As a result, limited risk analysis or performance reporting is undertaken with respect to this part of the strategic portfolio. We understand that NZDMO's intention is that eventually the residual portfolio may be notionally allocated or attributed to financial assets potentially residing outside of NZDMO.
- 4.49 International comparisons indicate that government borrowers, in the absence of risk measures (such as VaR), often assess performance of their core debt portfolio using benchmarks. Benchmarks can help guide debt managers' decision-making with respect to trade-offs between expected costs and risks. They can also provide a framework for assessing portfolio performance and policy-setting.²

² Based on information in chapter 7 of the 2004 World Bank publication *Sound Practice in Government Debt Management*.

- 4.50 However, benchmarks that are not properly formulated or implemented will provide limited support to policy setting and performance measurement. For benchmarks to be successfully applied, they need to be incorporated into the Government's debt management and overall macroeconomic philosophy, incorporate the constraints within their own market, and be robust enough to withstand a normal range of economic scenarios or cycles.

Non-benchmarking of the strategic portfolio

- 4.51 NZDMO currently considers that there is no need to benchmark two out of the seven sub-portfolios within the strategic portfolio where matching of asset and liability duration has not occurred. The rationale for not having a benchmark portfolio, which is often usual practice for matched portfolios, is not stated within the current policy framework. It would be useful for the PMP to elaborate that NZDMO has decided not to follow benchmarking given its asset and liability approach.
- 4.52 Applying benchmarks to the portfolio has been the subject of recommendations from previous reviews of NZDMO's practices and is alluded to in the PMP. There are a number of arguments that could support the rationale for not having a benchmark portfolio. They include, for example, that it is difficult for NZDMO to determine the appropriate duration benchmark for the residual debt pool. It could also be argued that NZDMO needs to maintain liquidity in benchmark bond issues that will influence the construction of its strategic portfolio. A further argument could be made that the risk management and administrative effort involved in measuring and managing activities against a benchmark are not justified in terms of adding value.

Parameters and monitoring of the strategic portfolio

- 4.53 Leaving aside the rationale for not setting a duration benchmark, it would be useful to at least set broad parameters in the PMP that are associated with the management and monitoring of the residual sub-portfolios within the strategic portfolio where matching has not occurred. Discussions with NZDMO staff indicated that the current duration of the strategic portfolio is not explicitly measured or monitored.
- 4.54 While not policy, the Technical Appendix of the PMP states that the duration of the portfolio was about 3.2 years in 2000, and that the strategic portfolio should have had a relatively long duration given the duration of the Government's physical assets.
- 4.55 This stance is consistent with the debt portfolios of other governments (which typically have durations of close to five years³). Government entities also tend to

have portfolios with relatively long durations because they prefer a stable cost of funds (for budgeting purposes) as well as the fact that government physical assets tend to have relatively long economic lives.

- 4.56 Where actual duration starts to move away from the notional target, then this could provide a trigger for reconsideration of debt issuance and risk management activities.
- 4.57 At the time of our audit, positions within the quasi-tactical portfolio were excluded from the formal market risk reporting and limits framework as applied within the tactical portfolio. Unacceptable daily volatility would arise in value-added and VaR measures within the existing portfolio. NZDMO therefore intends to undertake further refinements before considering transferring the quasi-tactical portfolio into the tactical portfolio.
- 4.58 We consider that the activities conducted within NZDMO's quasi-tactical advances desks are consistent with NZDMO's overall tactical activity (asset and liability mismatch management). This should be recognised in the PMP.

Recommendation 6

We recommend that NZDMO progress the application of benchmarks that allow the matching explicitly or notionally of similar assets and liabilities.

- 4.59 In the absence of such benchmarks being developed, it would be appropriate for NZDMO to consider setting a national "target duration" for its unmatched sub-portfolios within the strategic portfolio.

Warehousing of funds

- 4.60 Excess funds from bond issues are sometimes effectively warehoused in the strategic portfolio until applied to funding requirements. Typically, any interest rate mismatch (funds that are borrowed on a term basis but invested overnight) is synthetically eliminated by interest rate or foreign currency derivatives.
- 4.61 Some funds that remain within the strategic portfolio are periodically assessed for their ultimate purpose in terms of short-term needs (for example, liquidity management versus longer-term requirements). While these funds are managed within the strategic portfolio, a possible alternative to warehousing the funds would be to transfer the excess funds into the tactical portfolio. The tactical portfolio has the VaR and associated performance measurement frameworks applied to it. This would therefore facilitate the risk capture, identification, and management of the surplus funds in a manner consistent with other liquid assets in the tactical portfolio.

A well-functioning domestic financial market

Background

4.62 The principles for managing the New Zealand dollar debt portfolio include the following:⁴

- **Minimise refinancing risk.** NZDMO maintains a relatively even maturity profile for term debt across the yield curve to reduce pressure on the domestic bond market when supply increases unexpectedly and to provide the Government with greater flexibility in an environment of fiscal surpluses.
- **Promote bond liquidity and minimise the Government's cost of borrowing.** NZDMO builds benchmark bonds of around \$3,000 million. When deciding which benchmarks to build up in the current financial year, NZDMO trades off the size and number of benchmarks to be offered. When issuing debt, NZDMO samples interest rates throughout the year by conducting around 12 auctions of government bonds and weekly auctions of treasury bills.
- **Manage interest rate risk to minimise financing costs.** NZDMO maintains a mix of fixed rate and floating rate debt and uses interest rate swaps. Inflation-indexed debt makes up a component of the portfolio and is issued when it is cost-effective to do so. NZDMO seeks to reduce price uncertainty and encourage competitive bidding through an efficient auction programme.
- **Transparency.** Transparency surrounding the Government's domestic borrowing intentions is enhanced by the publication of the details of the borrowing programme when the annual budget and half-year fiscal updates are released. NZDMO sets out its intended government bond and treasury bill programme and will indicate whether it intends to undertake New Zealand-dollar interest-rate swap transactions. Similarly, NZDMO consults the market before introducing new policies and practices. This reduces uncertainty around the process of policy change.

4.63 Although these principles limit NZDMO's ability to borrow opportunistically or engage in secondary-market intervention, the possible opportunistic gains are outweighed by the benefits of being transparent.

Promotion of a well-functioning capital market

4.64 Secondary to NZDMO's debt management objectives are the maintenance and development of an efficient domestic capital market that reduces the cost of capital for private sector borrowers by improving New Zealand's sovereign creditworthiness.

4 These principles are based on domestic debt management information from www.nzdmo.govt.nz.

- 4.65 An efficient, or deep and liquid, government bond market is characterised by low transaction costs (narrow bids and offers), competitive market processes, a sound market infrastructure, a large investor base, and high substitutability between financial instruments.⁵
- 4.66 Other evidence of a well-functioning market would be multiple banks and broker entities offering price making in government bonds, along with the Crown achieving a stable cost of funds, consistent with borrowers similar to New Zealand (“AA+” rated borrowers).

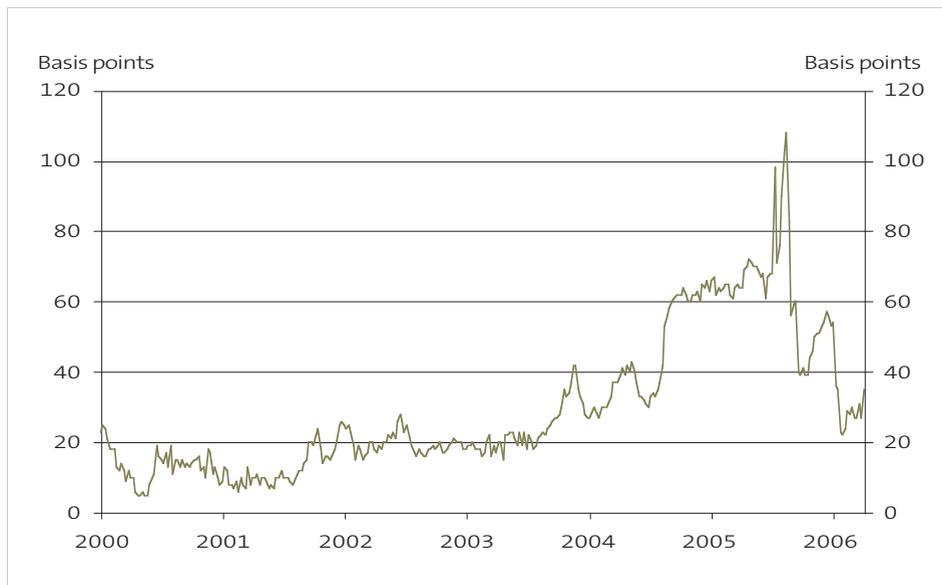
Performance of the government treasury bill and bond market

- 4.67 In recent years, the New Zealand financial markets have experienced some challenges, in part arising from the continued growth in financial institutions’ balance sheets. As a result, a comparable level of liquidity to be held has also increased. Therefore, New Zealand financial institutions’ demand for holdings of government securities has remained strong, and has meant competing with the strong offshore demand for government securities as part of the carry trade.
- 4.68 Pressure appeared in the short-term money market in 2005 and 2006, with unusually high and volatile interest rates. The RBNZ identified that both speculative positioning and a shortage of the level of government collateral available to the banks for secured lending purposes resulted in significant supply/demand imbalances.⁶ These factors, combined with increased offshore holdings, resulted in a shrinking supply of government securities. Government securities became very expensive to hold.
- 4.69 The RBNZ implemented its new Liquidity Management Operation framework in early 2006. This resulted in the RBNZ initially increasing the Settlement Cash Level from \$20 million to \$2,000 million and discontinuing the auto-repo facility, along with acceptance of bank bills and other non-government securities as security as part of the RBNZ’s normal market operations. These changes helped ease short-term cash rates, and resulted in the treasury bill spread substantially narrowing. The effect of these changes was highlighted by the changes in the spread between 3-month treasury bills and bank bills, as shown in Figure 6.

5 Based on information in chapter 9 of the 2004 World Bank publication *Sound Practice in Government Debt Management*.

6 RBNZ (May 2006), *Financial Stability Report*.

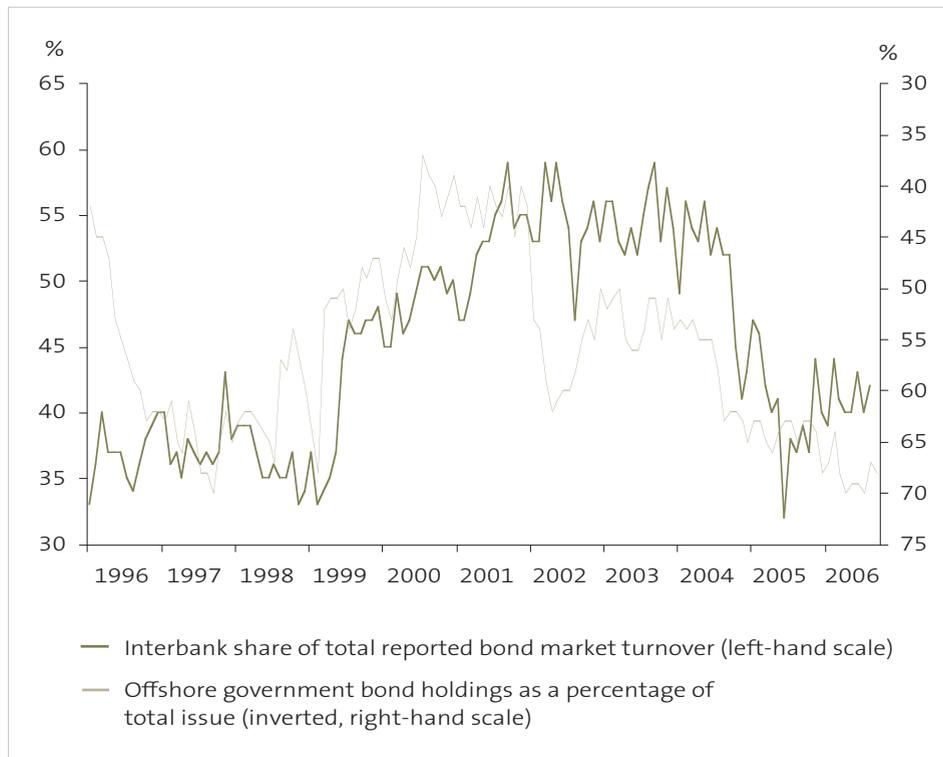
Figure 6
Spread between 3-month treasury bills and bank bills 2000-06



Source: RBNZ November 2006 Financial Stability Report

- 4.70 The measures implemented by the RBNZ to ease short-term interest rate pressure have had an operational effect on NZDMO. The level of treasury bills issued by NZDMO has reduced significantly, and the level of credit advantage (value added) in terms of performance has narrowed.
- 4.71 However, the offshore demand for government securities remains a challenge, and the shortage of supply is reflected in the statistics gathered by the RBNZ, specifically the domestic inter-bank government bond turnover and offshore government bond holdings. These are shown in Figure 7. The statistics show the effect of foreign investors' strategy of buy and hold, rather than active turnover of government securities by local investors.

Figure 7
Domestic inter-bank government bond turnover and offshore government bond holdings 1996-2006



Source: RBNZ November 2006 Financial Stability Report

- 4.72 Figure 7 shows a strong relationship of reduced domestic turnover of government bonds when foreign ownership of bonds increases (and vice-versa). The analysis also suggests that increased foreign demand tends to correlate with strength in the New Zealand dollar, as the last period of high foreign ownership of government bonds occurred during 1997/98 when the New Zealand dollar was above 65 cents against the US dollar (during 2006/07, the average exchange rate was about 65 cents).

Maintenance of the primary and secondary markets for New Zealand dollar government bonds

- 4.73 NZDMO relies on a number of mechanisms to maintain liquidity in the government stock it issues. These mechanisms include maintaining specific concentrated debt issuance tranches (when the cash position does not always require issuance) and maintaining dialogue with the RBNZ and market

participants around potential liquidity issues. It is critical that NZDMO nurtures investor appetite for its bonds to promote a liquid secondary market with low transaction costs.

- 4.74 This issue has been addressed by some Australian Commonwealth Borrowing Authorities, that appoint and incentivise a dealer panel (typically 5-6 market makers) and offer bonus schemes based on turnover of the issuer's stock. This arrangement is intended to facilitate the liquidity of the secondary government bond market. Also, quarterly reviews are held to assess dealer performance and include demotion from the panel for ongoing underperformance.
- 4.75 Other mechanisms that can be used include formal customer surveys to learn whether key financial markets stakeholders have any concerns or issues on which they wish to provide feedback. This type of engagement can assist in understanding customer needs concerning financial transaction execution. A survey would normally encompass all elements where the centralised treasury interfaces with the customer (for example, Operations and middle office, as well as front office functions). Often the trend of the scoring of performance across two or more surveys is more illuminating than an absolute measure. Anonymous comments from customers can have a more immediate effect upon assistance provided.

Recommendation 7

We recommend that NZDMO review the mechanisms available to actively engage financial market participants in order to promote a well-functioning government debt market.

Part 5

Tactical portfolio

Our expectations and overall findings

- 5.1 We expected that NZDMO would have:
- a coherent strategy and policy framework with respect to tactical portfolio management;
 - processes and controls to identify and mitigate errors or fraud while executing its strategy (investment, borrowing, and deal intermediation);
 - processes in place for identifying and analysing financial risks for portfolio management;
 - a control environment supporting tactical portfolio management; and
 - a reporting framework to provide assurance to management that NZDMO is managing the risks and performing satisfactorily against its policy framework.
- 5.2 We found that NZDMO has:
- an existing strategy and policy framework in need of updating to reflect NZDMO's current operational activities and conservative philosophy relating to risk taking;
 - sufficient processes and controls to identify and mitigate errors or fraud relating to key risks within the tactical portfolio;
 - processes in place to identify and analyse key financial risks for portfolio management, with some methodology improvements to be considered in relation to market and credit risk;
 - a strong control-conscious environment supporting portfolio management; and
 - a reporting framework that requires some improvement to the analysis of NZDMO's risk management and performance against its policy framework. In particular, improvements should be considered for the risk-adjusted performance measure (RAPM), to create more granularity with respect to sources of value-added performance.
- 5.3 We concluded that NZDMO's policy, processes, and controls provide effective and efficient management of the tactical portfolio. Some refinements could further strengthen NZDMO's risk and reporting management framework.
- 5.4 Consistent with Part 4 of this report, we have assessed NZDMO against five key criteria for ensuring a robust risk management framework with respect to the tactical portfolio. Given the technical nature of the review, we have chosen to assess financial risks and operational risk in separate sections.

Background

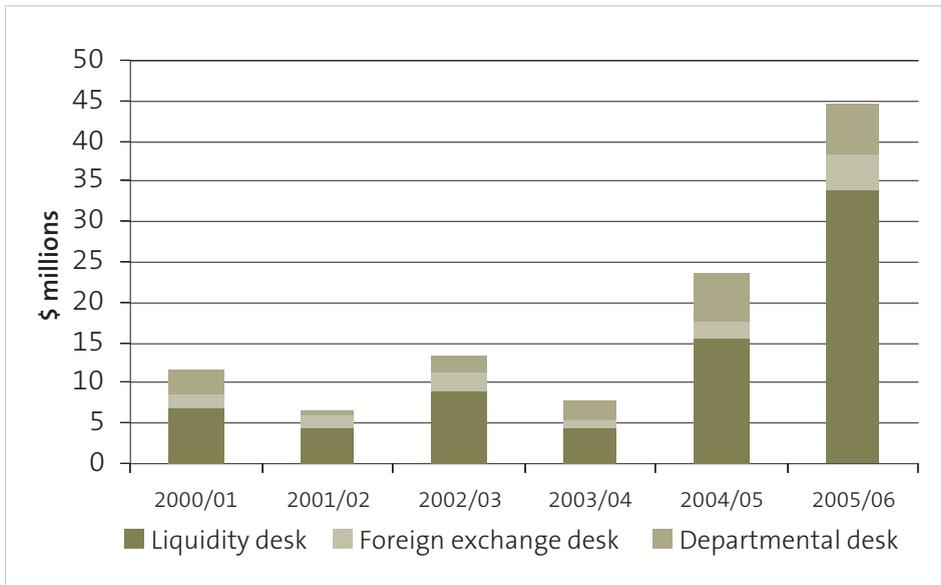
Tactical activities

- 5.5 The PMP describes tactical management activities as being the discretionary management of the net debt portfolio within established limits around the strategic portfolio. Within those limits (designed to mitigate market and credit risk), NZDMO's Portfolio Managers have discretion as to the use of instruments and timing of transactions to effect movements in the portfolio.
- 5.6 NZDMO's tactical activities have evolved over time. One of the first uses of the tactical portfolio was as a way for NZDMO to achieve the Government's policy objective of a net foreign debt position of zero, without having to actually repurchase the gross debt. Since then, the NZDMO's tactical activities have expanded to include funding the RBNZ's foreign reserves, as well as intermediating foreign exchange (FX) activity for Crown entities and government departments. In recent years, government surpluses have added to the investment of funds within NZDMO's tactical activities.
- 5.7 Operationally, NZDMO has established sub-portfolios within its tactical portfolio to reflect the nature of the assets and liabilities managed and to allow attribution of value added for management reporting purposes.

Tactical portfolio performance

- 5.8 NZDMO measures the performance of its tactical activity through both an absolute value-added figure and a risk-adjusted performance measure (RAPM) to reflect the amount of risk taken on to generate that value added.
- 5.9 The performance of the tactical portfolio under both these measures has shown substantial and sustained improvements during the last six years. This has been driven largely by the liquidity desk, as Figures 8 and 9 show. The majority of the value added created by NZDMO in the 2006 financial year related to cash management of \$4,000 million of assets. Incremental value of \$30 million was achieved primarily as a result of the unusually high treasury bill spread of more than 60 basis points (treasury bills being the key funding instrument for the cash assets).

Figure 8
Value added by tactical portfolios (2000/01 to 2005/06)



Source: NZDMO

Figure 9
Tactical portfolios risk-adjusted performance (2004/05 and 2005/06)



Source: NZDMO

- 5.10 The key driver of NZDMO's value-added performance is its investment of surplus funds raised from the issue of government securities (New Zealand Government Stock and treasury bills) into higher yielding securities issued by institutions.

NZDMO's tactical policy framework

- 5.11 We expected that:
- NZDMO's PMP would describe the nature and rationale for its tactical activities;
 - there would be a clear benefit to the Crown from NZDMO undertaking what it has identified as tactical activities; and
 - clear limits would exist as to the extent of the tactical activities that can be undertaken in terms of the financial risks identified.
- 5.12 We found that:
- there is a clear benefit to the Crown from the tactical activities that NZDMO is currently undertaking;
 - clear limits exist restricting the extent of the tactical activities undertaken (these have been approved by the Minister of Finance);
 - the nature of NZDMO's tactical activities was not explicitly stated in the PMP; and
 - the rationale given in the PMP for undertaking tactical trading is now less relevant to NZDMO's current tactical activities (which are typically not of a trading nature).

Tactical activity

- 5.13 The Minister of Finance approved NZDMO to conduct tactical trading in 1993. The stated arguments for undertaking tactical trading were that:
- temporary pricing imperfections sometimes occur, making it possible to generate profit from tactical decision-making;
 - tactical trading builds knowledge of how various markets operate under a variety of circumstances. This improves NZDMO's understanding in managing the overall portfolio. It is important, for instance, to maintain high-quality information flows about markets or sectors where intermediation transactions occur but are infrequent (intermediation transactions are where a substantial proportion of the value of tactical management is realised); and
 - tactical trading enables NZDMO to build and maintain skills in analysis, decision-making under uncertainty, negotiations, and deal closure. The immediate benefit is a reduced risk of mistakes when transacting and the projection of a more professional image.

- 5.14 In terms of managing its tactical portfolios, the bulk of NZDMO's activities are involved in the matching of assets and liabilities to offset interest rate and FX risks while minimising credit risk, and securing a margin through doing so. At the time of our audit, NZDMO was reluctant to take outright risk positions with a view to profiting from market movements.
- 5.15 In the context of undertaking this activity, the arguments advanced in the PMP for undertaking tactical management or trading appear less relevant. A lack of significant position-taking removes much of the opportunity to profit from temporary market pricing imperfections, other than in credit markets.
- 5.16 The tactical activities that NZDMO undertakes are both necessary and valid and have the potential to add value to the Crown within a managed risk framework. However, they are more in keeping with prudent asset and liability management and FX intermediation activity than traditional tactical trading.
-

Recommendation 8

We recommend that NZDMO update its Portfolio Management Policy to reflect that the tactical activity currently being undertaken is asset and liability management activity and foreign exchange intermediation, rather than primarily outright tactical trading.

Benefit to the Crown

- 5.17 The matching of financial assets and liabilities and the use of derivatives to manage the cash flow mismatches in a portfolio is standard asset and liability management practice. There is a clear benefit to the Crown from this. It allows for the minimisation of market risks while also focusing NZDMO Portfolio Managers on adding value.
- 5.18 A fairly recent and strongly growing part of NZDMO's tactical business is FX intermediation for other parts of the Crown. NZDMO is able to provide these entities with forward exchange contract (FEC) pricing that is superior to that which they would otherwise be able to get from banks. This FX business currently involves turnover of about \$50,000 million each year.
- 5.19 These arrangements provide a clear benefit for the Crown. In each case, the entity involved is able to access FX rates at prices that are better than those that they would receive from banks on their own. We note that entities retain the ability to trade with banks instead of NZDMO if there is an advantage to them in doing so. This acts to ensure the competitiveness of NZDMO's pricing.

- 5.20 In all the above cases, after entering into a trade with a counterparty, the Portfolio Managers have discretion as to whether they immediately extinguish the risk (and the opportunity for profit or loss) on the deal by entering into a reverse trade with the market, or whether they leave the position open and seek to close it out later with the market at a more advantageous rate. This is subject to the risk of their trading positions remaining within their delegated limits.

Limits framework

- 5.21 Management of NZDMO's tactical desks is performed within a limits framework to establish the maximum extent of risk that Portfolio Managers can take on from their discretionary activities. The limits framework has evolved over time and currently consists of both VaR limits to protect against potential market losses, as well as stop loss limits to protect against exposure to further losses once actual losses reach a certain point. Credit exposure limits are also applied to limit the risk of financial loss from a counterparty credit rating downgrade. These limits are set to reflect the Crown's risk appetite and were approved by the Minister of Finance.

Deal execution processes and controls

- 5.22 Appropriate formal and informal management controls and practices are in place around the activities of the Portfolio Managers within the tactical portfolio. Formal controls include:
- granting of written delegated authority by the Head of Portfolio Management to transact certain types of instruments;
 - approval by the Treasurer or Head of Portfolio Management to transact interest rate and currency swaps;
 - strict constraints applying to NZDMO staff in relation to accepting entertainment and gifts;
 - a requirement for the immediate entry of transactions into NZDMO's treasury management system, and timeliness and sign-off of written confirmations; and
 - a prohibition on historical rate rollovers of foreign exchange transactions.
- 5.23 Informal controls include:
- Portfolio Managers undertake transactions dependent upon their dealing competency as reviewed by the Head of Portfolio Management;
 - Portfolio Managers are expected to estimate the profit and loss derived from their dealing activities, and are challenged on the rationale for any exposures not hedged;

- the Head of Portfolio Management undertakes minimal transactions, which lends itself to effective oversight of the actions of the Portfolio Managers;
- weekly Portfolio Manager meetings are held where topical matters and approaches are outlined act as a valuable control and oversight mechanism;
- distribution and management review of portfolio position reports are produced daily at 4.30 p.m., which includes reporting of profit and loss and adherence to approved VaR limits; and
- a procedures manual that comprises key operational information (for example, funding margins for advances) is used.

5.24 In terms of processes:

- responsibilities for issuing government bonds and treasury bills to the financial market are detailed in the agency agreement between the RBNZ and the Treasury – associated procedures are well-honed, given the number of tenders entered into;
- funding advances to entities are dictated by the formal lending arrangements in place; and
- for foreign exchange, NZDMO has made available comprehensive guidelines for the management of Crown and departmental foreign exchange exposure. This document sets out a standard operating process that helps ensure compliance with NZDMO dealing and settlement practices.

Financial risk identification and analytical techniques

5.25 We expected that:

- all trading positions giving rise to the financial risks identified would be recorded within the risk modelling and reporting framework;
- appropriate tools to model exposure to market risk would be in place and limits based on the modelled outcomes would be applied;
- credit risk exposures would be accurately calculated and managed within an appropriate limits structure; and
- risks around exposure concentrations (by instrument, counterparty type, country) would be managed.

5.26 We found that:

- trading positions within the tactical portfolios are recorded for risk modelling and reporting purposes;
- appropriate tools are in place to model market risk using a VaR methodology and stress testing. Limits to tactical risk taking are set using the VaR model outputs. While the VaR model's output is not consistent with the stated 95%

confidence level, the risk of a loss greater than the VaR limit is remote because of low levels of risk taking;

- current counterparty credit exposures are adequately modelled and exposures are maintained within an appropriate credit limit structure. Breaches of exposure limits are infrequent, are escalated and reported appropriately as they occur, and are resolved satisfactorily;
- NZDMO is aware of a number of errors in its potential credit exposure calculation methodology. A new credit risk methodology to correct current shortcomings is being created, though its implementation is dependent on development resources becoming available; and
- NZDMO manages some aspects of portfolio exposure concentration risk (counterparty, credit rating, and instrument limits). The residual concentration risk is relatively immaterial when compared to other financial risks.

Recording risk positions

- 5.27 NZDMO includes only positions within its tactical portfolio when calculating and reporting market risk against its overall portfolio limit. The risks arising from the mismatch of funding and lending (made through the quasi-tactical advances desks), are excluded, despite NZDMO actively managing these. This is because the quasi-tactical portfolio forms part of the strategic portfolio described in Part 4.
- 5.28 For management information purposes, NZDMO currently calculates VaR and value-added for this advances activity.

Recommendation 9

We recommend that NZDMO manage risks in its quasi-tactical advances desks within NZDMO's risk limits for overall tactical activity (asset and liability mismatch management).

Market risk measurement and management

- 5.29 NZDMO measures its exposure to potential losses of value in its tactical portfolio from adverse market movements in two ways – VaR and stress testing.

VaR methodology

- 5.30 NZDMO uses a variance-covariance approach to measuring its VaR usage, and calculates VaR on a daily basis with a 95% confidence level for 1-day, 1-month, and 1-year periods. The VaR model uses an exponential weighting methodology (EWMA) to give greater emphasis to the most recently observed market price

volatilities in the 120 calendar day set of market movement observations modelled. The database set of market movements from which the VaR model draws its volatilities and correlations is updated on a weekly basis.

- 5.31 The covariance approach to measuring VaR is well-established, and is widely used by a large cross-section of treasury operations. Furthermore, the employment of appropriate swap and sovereign debt curves for valuing positions is better practice. It ensures that the risk of fluctuations between government and swap curves are measured accurately. This is considered very important in the context of NZDMO's business objectives and portfolio composition.
- 5.32 There are different schools of thought on the benefits of using EWMA. The determining factors for using it are usually the speed by which market fundamentals change, and the responsiveness required of the VaR number to these changes. In the former case, EWMA is often used for rapidly changing markets in which historically observed properties are no longer relevant. In the latter case, traders and Portfolio Managers usually prefer a VaR that responds quickly to changing market conditions. In contrast, a stable VaR would be preferred for determining capital adequacy or risk appetite for market risk.
- 5.33 In this context, EWMA is not considered inappropriate for NZDMO's purposes. However, given the results observed from backtesting over a sustained period, EWMA may be responsible for dampening the volatility of the market movements used to generate the distribution of returns. This is because it dilutes the value of longer-dated historical data. As a result, only the most recent observations really count, and longer-dated historical stress events are strongly suppressed. In turn, this may have the effect of underestimating volatilities, correlations, and VaR.
- 5.34 Another issue is the length of data history to be used. More conservative and stable models use longer data histories and higher confidence levels. As a rule of thumb, histories of 500-750 trading days are typically observed in the market. This history is rolled forward on a daily basis. The use of EWMA is not compatible with enlarging the 120 calendar day dataset used by NZDMO, because of the methodology's weighting of longer-dated historical movements.
- 5.35 Daily, monthly, and annual VaR limits for NZDMO's tactical activity have been agreed by the Minister of Finance. The VaR limits have been set in terms of the degree of risk acceptable to NZDMO. The limits allow for increases in market volatility and short-term bulk intermediary transactions. Stop loss limits are also used to complement use of VaR and to protect NZDMO from further losses on its portfolio once they reach a certain point.

VaR Limits

- 5.36 Daily, monthly, and annual VaR limits for NZDMO's tactical activity have been agreed by the Minister of Finance. NZDMO's Treasurer has delegated authority to the Head of Portfolio Management to manage the tactical portfolios so that the calculated VaR does not exceed 50% of the authorised limit. From our observations, the VaR limit usage is typically 5-10% of the limit. This represents the low outright position-taking by NZDMO, with its tactical activities typically being asset and liability mismatch management and FX intermediation. As a result, there have been no VaR limit breaches or instances where actual losses have exceeded the VaR limit. There have also been no instances where incurred losses have reached the stop loss limits.

Backtesting

- 5.37 Validation of the calculated VaR numbers is performed through backtesting to gain comfort that losses do not exceed the calculated VaR more than 5% of the time. The model's performance has improved substantially in recent years – from red to amber on the backtest scale of the Bank for International Settlements (BIS) – as a result of improvements to the model, as well as moving to a BIS-compliant clean profit and loss backtesting approach. Results have stabilised in recent rounds of backtesting, but the model consistently underestimates the observed confidence level of market risk losses (that is, modelled losses exceed VaR more than 5% of the time).
- 5.38 The sustained amber performance of the VaR model observed in backtesting points to an underlying systemic issue. This refers to an ongoing error that is inherent in the methodology or application of the model. The most likely sources of such errors tend to be:
- lack of data integrity;
 - a shortcoming in the assumptions of the model; and
 - errors in the implementation or function of the model.
- 5.39 There has been considerable work done by NZDMO, and there are ample indications, that suggest the data used to determine model parameters has a high level of integrity. A more viable source of error is indicated by the backtesting results. In particular, variance tests and non-normality analysis show that the VaR distribution is considerably “non-normal”. The covariance method enforces and relies on a normal distribution in estimating VaR. It is feasible that this causes an underestimation of VaR.

- 5.40 Accuracy can be confirmed only by a comprehensive validation of the VaR model. This highlights a process and control issue in NZDMO regarding the VaR model. Better practice would require an independent validation of the model engine and outputs. Furthermore, this function would need to be undertaken on a periodic basis (at least annually). Some elements of such validation are already being covered by backtesting. However, validation also includes data maintenance, implementation, and functional accuracy, and the security and control framework of the operational models. A best practice validation framework entails adequate independence and a formal approval process.
- 5.41 We do not consider the systemic error revealed by backtesting to materially affect NZDMO's business and risk objectives, as a result of the current low level of VaR usage. The fact that VaR limit use is typically 5-10% of the overall NZDMO limit means that the likelihood of the NZDMO incurring a loss from its tactical activities greater than the VaR limit is remote. However, this issue may become material in future if NZDMO undertakes a greater level of risk-taking activities. In terms of better practice, the VaR model performance should be addressed.
- 5.42 At the time of our audit, NZDMO management informed us that they were also trialling VaR calculation using a historical simulation approach for VaR. This is a positive development. NZDMO reports that its backtesting validation of this model (revalued using 500-1000 days of historical prices) through backtesting has produced promising results.
- 5.43 We consider that using such an alternate approach for VaR may address the systemic errors. Historical simulation does not assume or enforce statistical relationships in the underlying market dynamics. Rather, market relationships are preserved by using the precise historical market data. This is one reason why the industry is moving toward using historical simulation for VaR. The downside is the increased effort, time, and cost relative to the covariance approach. This may mean a greater drain on resources, systems (for data), and operational run times. As NZDMO is some way toward addressing such factors, implementation of such a model would appear to be a viable proposition.

Recommendation 10

We recommend that NZDMO continue to seek improvements to its market risk modelling by considering implementation of the historical simulation methodology, and by producing periodic reports showing graphical time series of daily Value at Risk versus actual profit and loss.

- 5.44 Implementation of historical simulation methodology would be consistent with better practice. It removes the assumptions inherent in the NZDMO's variance-covariance model of normally distributed market volatilities.

Stress testing

- 5.45 Stress testing is performed to overlay the daily VaR utilisation results. These tests provide an extra level of comfort that outlier events or unlikely losses are not being underestimated. Three particular stress tests are run that incorporate parallel and steepening/flattening yield curve shifts as well as stressing spread movements between swap and interest rate curves. These are typical scenarios used in the market. Several market participants use a broader array of shifts including combinations of curve shifts. This is more appropriate for portfolios that allow latitude for discretionary trading and are likely to contain considerable curve risk. This would not appear to be the case for NZDMO's current tactical portfolios.
- 5.46 NZDMO is also creating stress tests of FX spot rates. The FX tests had not been implemented at the time of our audit, but will operate in a modular style in which a series of FX spot rate shifts may be entered in the model.
- 5.47 It may be instructive for NZDMO to introduce a fourth test representing an inverse curve scenario. This would be a stressed shift (50-100 basis points) at the long end of the curve, with the short end remaining unchanged. Two reasons for such a test are that:
- the current "steepening/flattening" test pivots at two years and does not stress the part of the curve that is close to the portfolio's duration (at about three years); and
 - the domestic curve is currently inverse.

Credit risk

- 5.48 The PMP does not allow NZDMO to transact or maintain an exposure to any counterparty (as either a security issuer or counterparty in a transaction) with a credit rating of less than "A-", unless required to do so by government policy. Because of the resulting high credit quality of its counterparties, NZDMO assumes the probability of default by a counterparty to be zero (noting that any positions with a counterparty whose credit rating fell below "A-" would be closed out as soon as possible). Credit risk management is therefore concerned with the likelihood of incurring a financial loss as a result of a counterparty's credit rating being downgraded.
- 5.49 NZDMO calculates credit risk using credit spreads and the probability of downgrade. The method incorporates credit spread losses that are expected to be

incurred as a result of credit downgrades and break costs if NZDMO has to close out the position because the credit rating falls below “A-”.

- 5.50 Given the high quality of NZDMO’s credit counterparties and the composition of its portfolios, we consider the current methodology adequate for the portfolio and particularly in its treatment of probability of downgrade and default probability.
- 5.51 Maximum allowable mark-to-market credit exposure limits are set at the counterparty level with the approval of the Minister of Finance. These are based on the institution’s long-term debt credit rating, as assigned by the credit rating agencies Standard & Poor’s or Moody’s, and its type (sovereign, financial institution, or corporate). Where necessary, credit exposure limits for non-rated institutions are based on appropriation or Ministerial direction. Limits on sub-entities are approved individually, and the aggregated limit for the group is the highest credit limit of the entities that make up the group. Credit exposure reports are produced daily that show current exposure against limits by entity and group. Actual usage is generally low in comparison to approved limits.
- 5.52 If NZDMO has not had an exposure to an institution for two years, then that institution is normally removed from the list of approved institutions and must go through formal approval procedures again before it can be added to the approved institutions list.
- 5.53 If an institution is downgraded below “A-/A3”, NZDMO’s credit exposure for all outstanding transactions with that institution must be eliminated as soon as practicable, even if the net credit exposure to the institution is zero.
- 5.54 Credit exposures for an institution must not exceed the policy limit that is allocated to that institution, be it an institution or group limit. The Head of Risk Policy and Technology (RPT) is responsible for monitoring and reporting breaches of credit exposure limits to the NZDMO Treasurer. If a breach occurs, the Head of Portfolio Management is responsible for proposing a plan to the Treasurer for resolving the breach. The Treasurer is responsible for approving the planned resolution, or may authorise the maintenance of an exposure above limits for up to two months (after this, the permission of the Minister of Finance is required). Any breaches, how they occurred, and the steps taken to resolve them are reported in the next monthly report.
- 5.55 Breaches of credit limits seldom occur. There were two breaches in the 2006 year, and these were resolved within two to five days. Explanations of the causes and resolutions of these breaches were included in monthly reporting.
- 5.56 A further enhancement to existing practice would be to model potential exposure scenarios where the value of the instruments that give rise to the exposure

has increased. This would demonstrate the effectiveness of exposure control procedures such as collateral calling and payment netting arrangements.

- 5.57 NZDMO models potential exposures under a market scenario where the value of the investments that produce the exposure have increased at the 99% confidence level.¹ While this information is calculated daily and reported in the monthly report, it is used for management information purposes only, and no maximum potential exposure limits are applied.
- 5.58 NZDMO is aware that there are a number of errors in the calculation methodology. Potential exposures are not calculated for contracts that are presently out of the money. The current information produced is therefore not reliable. Additionally, the methodology does not apply the benefits of netting arrangements or the effects of collateral calls. As a result, the credit exposures calculated are likely to be overstated (that is, conservative).
- 5.59 NZDMO recognises the shortcomings of its current methodology and that market practice has improved significantly since its methodology was introduced in 1996. At the time of our audit, work was being done to calculate credit risk using simulation techniques. It is intended that this new system will, when implemented, provide a portfolio-wide potential loss measure by simulating potential market parameters into the future and revaluing the current portfolio exposures under these scenarios to arrive at potential exposure and loss measures. These include the effects of collateral and netting arrangements.

Recommendation 11

We recommend that NZDMO implement an up-to-date credit risk methodology, particularly with regard to potential exposure management to address the inherent conservatism in the current methodology. Potential credit exposure for each counterparty should be calculated for all outstanding transactions and incorporated into a credit limits framework.

Concentration risk

- 5.60 In a credit exposure context, concentration risk refers to losses from deterioration of the credit quality of a class of exposures (for example, exposures to an industry or geographical area).
- 5.61 Quarterly, NZDMO includes, in its monthly report, an analysis of its exposures by counterparty type, credit rating, and country level as a percentage of its overall portfolio exposure. However, no specific limits exist at these levels.

¹ This is effectively the converse of VaR. The potential exposure methodology measures a profit scenario at the 99% confidence level, while VaR measures a loss scenario at the 95% confidence level.

- 5.62 Better practice entails the management of the risk of portfolio credit concentrations through setting explicit portfolio limits by relevant concentration category. Such limits might theoretically be set as high as 100% of the overall portfolio exposure for exposure categories where credit concentration is not a concern.

Recommendation 12

We recommend that NZDMO manage concentration risk in its portfolio exposures by implementing a limits framework of maximum exposures (as a percentage of total portfolio exposure) by counterparty type, credit rating, and country.

Portfolio management control environment

Delegated authority framework

- 5.63 We found that the delegation chains were up to date and covered all of NZDMO's activities. We found the control environment under which NZDMO operates to be effective both in terms of policy and procedures. In practice, NZDMO's management takes a keen interest in all operational aspects of the function, and have instilled a risk-averse culture.
- 5.64 When transacting for a new government entity, NZDMO gains comfort around that entity's authority to enter into the transaction through enquiry with the relevant Treasury Vote Analyst for that entity. Procedures for undertaking advances to entities are formalised through official debt arrangements. At the time of our audit there had been no cases of transactions being disowned or mismanaged by entities. Therefore, the risk of the Crown incurring financial loss through unauthorised activity is low. Suggested improvements to NZDMO's control environment are detailed below.

Derivative instrument approval

- 5.65 NZDMO's authority to transact in options was approved in principle by the Minister of Finance in 1994. They are listed as "approved in principle" instruments for transaction purposes in Schedule B: Approved Instruments of the Portfolio Management Policy (the Schedule). Final approval is based on the NZDMO Treasurer formally advising the Minister that the risk and controls surrounding transacting in options are sufficient. But this final approval has not been sought and options have not been transacted. The options that have been considered for use are exchange traded options on approved futures contracts, interest rate caps and floors, swaptions, and currency options.

- 5.66 Any derivative product for which the NZDMO Treasurer does not have authority to transact should not be stated in the PMP as a permitted product.
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Recommendation 13

We recommend that NZDMO immediately remove options from the approved instrument schedule of its Portfolio Management Policy, and periodically review the lists of approved financial instruments (that is, Schedules B, C, and D of the Portfolio Management Policy) and update as required.

Product control

- 5.67 There are strong controls in NZDMO to ensure that only currencies and instruments approved in the PMP are transacted. The deal entry interface into NZDMO's Treasury Management System (TMS) is limited to approved currencies and products with any required systems changes for new products or currencies overseen by Risk Policy and Technology staff. This limits the ability of Portfolio Managers entering trades in unauthorised products or currencies. If a deal is entered into outside of the TMS (for example, verbally), or a trade in an unauthorised currency or instrument is mis-booked as an authorised one, it would be detected by the Accounting and Transactional Services staff when the confirmation from the counterparty is received and no booked deal is found in the TMS or the confirmation details are found to not match those in the TMS.
- 5.68 While Forward Rate Agreements (FRAs) are listed as an approved instrument for transaction purposes in Schedule B: Approved Instruments, Portfolio Management Policy, FRAs have not recently been transacted by the Portfolio Managers, and the TMS no longer supports this derivative product.
- 5.69 Better practice suggests that any derivative product that is not supported by the in-house TMS, in terms of reporting and/or valuation and/or settlement and/or credit assessment, should not be transacted. The product should be removed from the list of approved instruments to help ensure compliance. Failure to do so could lead to undesirable consequences, such as monetary loss.
- 5.70 The addition of new financial instruments to the PMP is infrequent, the most recent being Mortgage Backed Securities in June 2004. The number of currencies in which NZDMO transacts has grown in recent years, to accommodate the foreign exchange hedging needs of NZDMO clients. This has seen the addition of Mexican pesos, Polish zloty, Thai baht, and Russian roubles to the list of authorised currencies.

- 5.71 The application of derivative instruments can change over time for legitimate business reasons – for instance, as a result of changes in customer requirements or in the approach to hedging or trading. As a result, it is important to ensure that the parameters surrounding the use of derivatives remain suitable for the organisation in terms of risk.

Recommendation 14

We recommend that NZDMO update its list of approved instruments to reflect only those instruments that NZDMO has the functional capability to process and that have been recently traded (for example, within the last two years)

- 5.72 Implementing recommendation 14 would ensure that NZDMO has the information technology capability to correctly identify the risk and record the profit or loss on instruments. It would also act as a check to ensure that NZDMO's skills in transacting in the instrument are current and that the business case remains valid.

Consistency of delegated authority

- 5.73 Of the derivatives approved for use by the Minister of Finance, only asset swaps and interest rate swaps have a formal restriction on the transaction term for which the Portfolio Managers (in this case, the Head of Portfolio Management) are able to transact up to 10 years' maturity.
- 5.74 There is a formal term limit on the authority to transact some financial transactions but not others, which make up a substantial portion, of approved financial instruments (for example, security investments, futures, and currency swaps). This limit is inconsistently applied.

Recommendation 15

We recommend that NZDMO review the term limitation formal authority across all the financial products that the NZDMO Treasurer can transact, and seek to apply a term limit that is based upon Portfolio Manager seniority and potential economic outcome.

Risk and performance reporting

- 5.75 NZDMO's reporting of its tactical activities against its policy framework serves two key purposes:
- ensuring compliance with the risk policies within the PMP; and
 - reporting NZDMO's performance in managing the tactical portfolio.

- 5.76 We expected that:
- effective daily reporting procedures would be in place to provide management with information on the tactical portfolio's financial performance, risk position, and compliance with the PMP limits framework;
 - sufficient information would be reported to senior Treasury management and the Advisory Board to enable them to gain an accurate appreciation of NZDMO's performance in managing the tactical portfolio, the structure and risks of the portfolio, and its compliance with the PMP limits framework; and
 - NZDMO's management of the tactical portfolio would be measured and reported using an appropriate performance measurement framework.
- 5.77 We found that:
- NZDMO's daily reporting is performed in a timely manner and provides management with high level information on the portfolio performance, position, and compliance with the risk policies;
 - monthly reports to senior Treasury management and the Advisory Board, while containing appropriate summaries of risk limit usage and compliance with the PMP, did not provide information on portfolio composition; and
 - the risk-adjusted performance measure (RAPM) that NZDMO uses to report the performance of its management of the tactical portfolio has limited information content for measuring NZDMO's risk management activities.

Daily management reporting

- 5.78 A range of end-of-day reports are normally available to NZDMO's Risk Policy and Technology staff and the front office from 4.00p.m. each afternoon. The reports include reporting against the risks identified in the PMP framework, as well as daily profit and loss measures.
- 5.79 This reporting process is the way any limit breaches are detected and escalated for resolution by front office staff. The reports are also the mechanism through which the Head of Portfolio Management and the NZDMO Treasurer maintain oversight that the changes to the portfolio each day are consistent with their expectations.
- 5.80 We found that the reports contained high level analysis of the portfolios, showing current net position value and VaR by currency. However, they did not readily provide different views of the portfolios, such as analysis of exposures by maturity or risk sensitivity. While we understand that such reports are able to be run as required, we consider that they should be produced for management as part of the daily reporting to provide further insight into the drivers of the reported VaR measure.

Recommendation 16

We recommend that NZDMO consider expanding the suite of daily management reports to include portfolio composition views. These could include an analysis of portfolio assets and liabilities by maturity, stated in dollars and/or risk sensitivities.

- 5.81 Expanding the suite of daily management reports would provide readily accessible information to Portfolio Managers, risk managers, and executives on the risk construction of the portfolio. This would provide greater insight into the drivers of the high level VaR measure than is currently provided.

Monthly external reporting

- 5.82 Monthly reports are prepared for the Secretary to the Treasury and senior management within the Treasury. These monthly reports are also included in papers that go to NZDMO's Advisory Board ahead of its quarterly meetings. The reports contain information regarding performance metrics (RAPM), value added (refer to comments below on the meaning of this in NZDMO's context), and VaR, as well as commentary on the NZDMO's activities and its compliance with its PMP.
- 5.83 The monthly reports contain very little detail regarding balance sheet composition and portfolio characteristics.
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Recommendation 17

We recommend that NZDMO include an overview of the current balance sheet composition of the tactical portfolio in monthly reports to senior management and NZDMO's Advisory Board to better convey the extent of matching of assets and liabilities (and the associated residual risks) within this portfolio.

Risk-adjusted performance measure

- 5.84 NZDMO measures the performance of its management of the tactical portfolios using a risk-adjusted performance measure (RAPM). This measure is designed to report the value added from the NZDMO's funding and risk management of its tactical activities compared to the amount of notional capital that is required to underpin these activities.
- 5.85 It makes sense that there should be correlation between the performance of the risk management activities and the amount of risk being taken.
- 5.86 One of the contributors to the relatively high reported returns by RAPM is that the value-added calculation includes one-off gains that are achieved from issuing

New Zealand Government Stock and treasury bills (in recent times, 100 basis points below the New Zealand swap curve) and swapping the proceeds into floating rate funds. For daily management reporting purposes (not external financial reporting), NZDMO values both its bonds and swaps off a single valuation curve that is equivalent to the swap curve less 12.5 basis points. As a result, a one-off gain is recognised when debt is revalued (because of a reduction in its value) using a higher swap-based interest rate than it was issued for.

- 5.87 However, swapping of a low fixed rate coupon on debt for a floating rate coupon at swap rates less a margin does not (excluding interest rate movements) give rise to a profit in the traditional sense. The gain that is being included in the RAPM measure is representative of the Crown's ability to issue debt at a lower cost than swap rates.
- 5.88 In our view, it is inappropriate to describe this gain as value added in the same way as other components of the value added by NZDMO in its management of the tactical portfolio. This is because it is an inherent advantage of NZDMO's funding activities rather than a result of its explicit risk management activities. It is also because there are a number of other wider macroeconomic and financial market drivers, outside of NZDMO's control, that also influence the swap spread.
- 5.89 In NZDMO's view, it is appropriate to describe the gain primarily as value-added because NZDMO explicitly manages the risk in terms of the spread between its sub-100 basis point funding cost and the comparative investing curve. We accept that there are aspects of the spread that are explicitly managed by NZDMO, for example:
- maintaining the liquidity premium for the New Zealand Government bond market;
 - managing key relationships to maintain a strong government credit rating; and
 - managing the credit risk associated with assets invested against the funding instruments.
- 5.90 Under NZ IFRS, no one-off gain would be recorded from NZDMO's funding advantage, as the bond would be valued off the New Zealand Government curve and the swap off the swap curve would be adjusted for the margin received. However, for management reporting purposes (under the RAPM model), NZDMO will record a one-off benefit from the higher yields it is able to invest in compared to its funding cost.
- 5.91 RAPM can increase rapidly if notional risk capital is reduced while simultaneously the margin between funding costs and investment returns is maintained or increased. NZDMO has acknowledged that aspects of the RAPM model could be improved.

- 5.92 We have discussed with NZDMO one method that could be employed to measure risk adjusted performance, which is basically an Economic Value Added (EVA) approach.
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Recommendation 18

We recommend that NZDMO refine its value-added performance measure (RAPM) to better report the different components of market risk taking returns and the one-off gains achieved by borrowing funds at the New Zealand Government rate and reinvesting them in marketable securities (which attract a higher rate). NZDMO should also mark-to-market all assets, liabilities, and derivatives at the appropriate yield curves that include the credit spread for each issuer.

- 5.93 Implementing this recommendation would remove the effect of reporting one-off gains of the Crown's funding advantage. Instead, the margin gained would be then recognised over the life of the transaction. This would ensure that the performance measure provides NZDMO's treasury management analysis of returns associated underlying market risk positions only, and would be consistent with reporting under NZ IFRS.
- 5.94 From this performance analysis, the cost of capital could be deducted providing a net income after capital calculation. To calculate the cost of capital, NZDMO should determine the notional risk capital required for the tactical portfolio, which would then be multiplied by the cost of capital (which should be an appropriate New Zealand Government bond rate). NZDMO should still be able to monitor and report mark-to-market gains or losses on government and swap curve-related instruments as a separate item within its management reporting if this information is considered to be useful.
- 5.95 We note that NZDMO's move to financial reporting under NZ IFRS has provided it with an appropriate valuation methodology that could be extended to its management reporting and performance analysis.
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Recommendation 19

We recommend that NZDMO use, where appropriate, the valuation methodologies developed for external reporting under New Zealand equivalents to International Financial Reporting Standards for its management reporting.

Part 6

Use of derivatives

Our expectations and overall findings

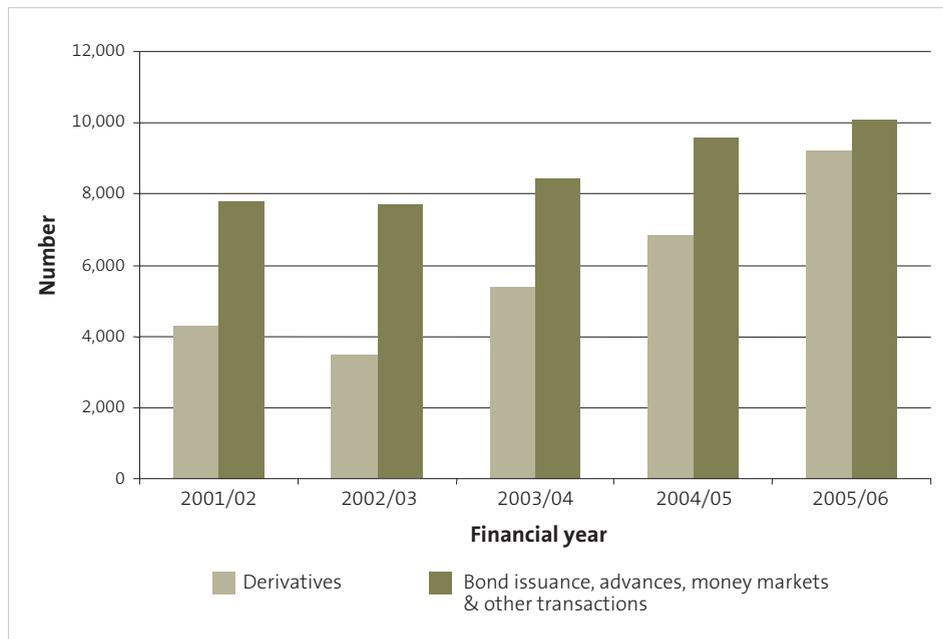
- 6.1 We expected that:
- the derivatives used by NZDMO would be those most appropriate for hedging or managing the relevant financial exposure;
 - a robust and standard procedure would be in place for seeking approval from the Minister of Finance to transact in new derivatives; and
 - Minister of Finance approval and the delegated authority chain from the NZDMO Treasurer to the Head of Portfolio Management and from the Head of Portfolio Management to the Portfolio Managers would be complete.
- 6.2 We found that:
- the derivatives transacted by NZDMO were generally appropriate given both the exposure and risk-averse management approach;
 - most derivative instruments have been approved for use by NZDMO for a number of years;
 - the authority to transact derivatives was sound; and
 - while a formal limit (as to the term) exists for the Portfolio Managers to transact swaps, there was no limit for other approved derivatives. We consider this treatment inconsistent.
- 6.3 We concluded that the use and types of derivatives used by NZDMO are appropriate and consistent with its policy and risk management framework.

Background

- 6.4 NZDMO splits its management activities between the strategic and tactical portfolios. Within each of these portfolios are a number of sub-portfolios that are structured to monitor and report upon the various activities undertaken.
- 6.5 The strategic portfolio mainly contains domestic New Zealand dollar debt and assets. In terms of derivative activities, interest rate swaps are transacted with banks to ensure compliance with NZDMO's debt management principles. Interest rate swaps are also undertaken in order to hedge borrowing arrangements with some NZDMO clients. Such borrowers also enter into fixed (floating) to floating (fixed) interest rate swaps to manage the duration of their own portfolios. These exposures are then hedged with banks.

- 6.6 Currency and foreign exchange swaps are transacted in the market to obtain foreign currency cash. They thereby create foreign currency liabilities, for investment purposes (for example, into mortgage-backed securities), and to extend foreign currency advances to the IMF.
- 6.7 Unlike the strategic portfolio, the tactical portfolio mainly contains foreign currency liabilities and assets. Liabilities are matched to the assets such that the market value of the portfolio is immunised against changes in both interest and exchange rates within predetermined risk tolerances (for example, the VaR limit). NZDMO books the spot and forward foreign currency transactions with Crown entities and departments to this portfolio.
- 6.8 Foreign currency spot transactions are used to exchange one currency for another, generally New Zealand dollars into a foreign currency, where foreign currency obligations are due or forecast. Foreign currency swaps are used to manage timing changes in foreign currency obligations. These transactions are hedged with similar but offsetting transactions, together with foreign currency investments and interest rate futures contracts as required.
- 6.9 Foreign currency loans advanced to the RBNZ, for foreign currency reserve purposes, are booked to this portfolio. This requires the conversion of New Zealand dollar proceeds to foreign currency through currency and foreign exchange swaps in order to fund and create foreign currency loans. The alternative course of action would be to fund reserves from foreign currency borrowing. This was not as cost-effective at the time of our audit. Foreign currency swaps are also used to hedge the translation hedge requirement of the New Zealand Superannuation Fund (NZSF). Currency and asset swaps are used to manage, in an asset and liability management sense, the prevailing foreign currency debt portfolio and associated assets and thereby add value to the Crown.
- 6.10 The total number of derivative transactions (foreign exchange spot and forwards, currency swaps, interest rate swaps, and futures contracts) increased in each of the three years to the point in the 2006 year where it almost equalled all other transactions combined. This is shown in Figure 10. This is primarily because of an increase in the number of foreign exchange transactions, which reflects both an increase in the number of Crown entities and departments serviced by NZDMO and the nature of their requirements (the NZSF in particular).

Figure 10
NZDMO transaction volumes (2001/02 to 2005/06)



Source: KPMG

Appropriateness

- 6.11 NZDMO's 2005/06 Annual Performance Report states that foreign exchange derivative transactions have practically doubled over the course of that year largely because of transactions undertaken with the NZSF. A substantial proportion of these transactions are foreign exchange swaps (FX swaps). For the year up to and including October 2006, the notional value of the FX swap business transacted with the NZSF averaged \$3,700 million a month and increased by \$83 million a month.

Valuations

- 6.12 NZDMO values all its positions (both strategic and tactical portfolios) on a daily basis. However, it currently does this using three different valuation methodologies depending on the type of reporting the valuations are being incorporated into.

End-of-day reporting

- 6.13 For daily reporting purposes, NZDMO values the interest rate component of its derivatives using a valuation curve that is derived as the swap curve less 12.5

basis points. NZDMO selected the 12.5 basis point margin adjustment because it considers it provides a fair representation of both NZDMO's borrowing costs and the credit standing of its pool of assets. This curve is used to value both derivatives as well as physical securities (such as bonds). The use of this adjusted swap curve may give rise to a valuation error on individual positions. We have not sought to quantify the effect of this on a portfolio-wide basis.

- 6.14 For the end-of-day reporting, the foreign currency component of derivatives is valued using FX mid rates taken at 3.00p.m., and financial futures are valued at closing market prices.

External financial reporting under New Zealand generally accepted accounting practice

- 6.15 NZDMO uses derivatives for hedging purposes rather than trading. Therefore, it is not required to include them on its Statement of Financial Position at fair value under GAAP.¹ Instead, the financial effect of the derivatives is currently recorded in the financial statements as the underlying transactions occur. Information as to the fair value of derivatives is disclosed by NZDMO in schedules in the Treasury's Annual Report.
- 6.16 For external financial reporting, NZDMO values the interest rate component of its derivatives using the swap curve adjusted for the contractual spread of the deal. Futures and the foreign currency component of derivatives are valued as for end-of-day reporting.
- 6.17 The external financial audits of NZDMO's financial statements have found the financial instrument valuations to be not materially misstated.
- 6.18 The Government is currently in transition to reporting under NZ IFRS. Accordingly, the financial year ending 30 June 2007 will be last set of financial statements prepared under GAAP.

External reporting under New Zealand equivalents to International Financial Reporting Standards

- 6.19 As part of the transition to NZ IFRS, NZDMO will first prepare financial statements under NZ IFRS principles for the financial year ending 30 June 2007 (for comparative purposes).

1 What is included in the financial statements is any initial premium paid for the derivative, amortised across the life of the contract, contractual cash flows incurred (such as accrued interest or exchanges of principal cash flows), and any FX revaluation gains or losses on foreign currency balances. Futures settle daily and so are recorded at fair value. The valuation of a cross-currency swap is affected by both FX and interest rates. Therefore, NZDMO's financial statements include the initial principal cash flows that were exchanged by the counterparties and accrued interest. Additionally, changes in value relating to FX rate movements affecting the value of foreign currency principal balances payable and receivable are also recorded. However, the financial statements do not include value changes related to movements in interest rates.

- 6.20 Under NZ IFRS, NZDMO will be required to include the fair value of all derivative instruments, in its Statement of Financial Position. Changes in the fair values will be reported through the Statement of Financial Performance. For non-derivative instruments, the accounting treatment (fair value or modified historical cost) will depend on whether the position is part of a portfolio that is managed on a fair value basis (for example, the tactical portfolio).
- 6.21 Under NZ IFRS, the valuation methodologies used for derivatives do not change. The key valuation change is in the valuation of physical securities. Where these were previously valued off the swap curve, the swap curve used in each valuation will be adjusted for the credit spread attaching to that instrument.
- 6.22 NZDMO's derivative valuations prepared under NZ IFRS principles have been assessed as part of the 2006/07 financial audit of NZDMO. The financial auditor has concluded that these valuations were not materially misstated.
- 6.23 Best practice is that all positions should be marked-to-market daily, based on the appropriate yield curves and credit spreads. This practice also assists in maintaining the control environment. For example, it helps to ensure that transactions are dealt at market rates, and that profits and losses are calculated accurately.
- 6.24 We understand that NZDMO proposes to use the valuation methodologies developed for NZ IFRS for its management reporting. We endorse this approach, as it would represent better practice and should ensure consistency between the results reported in management reports and reporting in the financial statements.

Part 7

Internal systems

Our expectations and overall findings

- 7.1 We expected NZDMO's Information Technology (IT) function to deliver:
- system functionality that meets NZDMO's business needs and enables the business to operate efficiently;
 - plans, processes, and IT capability to maintain and support IT systems in the longer term;
 - processes to identify, evaluate, and monitor risks posed by technology; and
 - testing of the functionality of changes before implementation.
- 7.2 We found:
- NZDMO's IT systems are an in-house developed solution that meets business needs. Processes exist for IT staff to regularly collaborate with other NZDMO staff to identify their strategies and needs relating to technology;
 - NZDMO's IT section has plans to create a new Information Systems (IS) Strategic Plan, update its Business Continuity Plan, and reduce key personnel risk through cross-training;
 - processes to identify and manage IT risks are integrated with business processes; and
 - before implementing changes, NZDMO tests the functionality of the changes and verifies that the changes meet its business needs. Because of the small size of the IT group, developers have access to the IT production environment. However, mitigating controls exist to prevent and detect any errors or unauthorised changes to the production environment.
- 7.3 We concluded that NZDMO's systems provide the functionality to meet its business requirements with sound control procedures around change management.

Background

- 7.4 NZDMO's Information Technology (IT) systems, including Matriach and SWIFT, currently meet key business needs. For example, Matriach has the functionality and reporting capability needed for NZDMO's business to operate efficiently. Business staff interviewed were unable to identify any significant gaps in the IT system's functionality.

- 7.5 Processes are also in place for the IT function to continue to identify and address business needs as they change in the future. Two main factors that contribute to high levels of business alignment are:
- NZDMO's IT systems being an in-house developed solution; and
 - processes for IT staff to regularly collaborate with other NZDMO staff to identify their strategies and needs relating to technology.
- 7.6 Having an in-house developed system, rather than a packaged solution, enables the IT function to effectively and efficiently build technology solutions to meet the business needs. Two examples are:
- Matriarch's core functionality and reports were tailored and built to meet NZDMO's specific needs and business.
 - It is easier to build new functionality and reports in Matriarch than to fit the business needs into the constraints of a packaged system. For example, the IT function has been able to create new functionality and reports for new instruments such as mortgage-backed securities, build new models including credit models, create new reports needed for clients, and build an interface between Matriarch and SWIFT to automate manual processes and allow for straight through processing.

Ability to maintain and support systems

- 7.7 NZDMO's IT function has effective processes in place to address future system maintenance and support needs. For example, IT has plans to create a new Information Systems Strategic Plan (ISSP), update its Business Continuity Plan (BCP), and address key personnel risk.
- 7.8 Over the next 6-12 months, NZDMO IT will develop an ISSP, and will align it to meet the business strategies and will consider applicable Treasury strategies. The most recent ISSP was created in 2002 and outlined a solution to replace Infinity with Matriarch, which has now happened.
- 7.9 While NZDMO met the 2002 ISSP's objectives and delivered the Matriarch system to address the stated business needs, the next ISSP will explore technology options to best meet NZDMO's future maintenance and support needs. Existing technology may become obsolete, and the business will need a system that is appropriately future-proofed. The ISSP will consider the advantages and disadvantages of the current in-house solution against other technology options.
- 7.10 Although the current BCP is comprehensive, it is several years old and needs to be updated and tested. A full scale BCP test was performed at NZDMO's Auckland site in 2002. The 2002 test was considered successful, because NZDMO was able

to transmit payment messages and manually process payments through all three payment systems. According to NZDMO, if a disaster occurred today, it would be able to follow the BCP. However, NZDMO has not performed another full scale BCP test since 2002.

- 7.11 Since NZDMO's systems sit on the Treasury's IT platform, NZDMO's BCP needs to be aligned with the Treasury's BCP. NZDMO is working with the Treasury's Knowledge Infrastructure Services (KIS) to implement a new remote access solution. The implementation is due to be complete around June 2007. After this, NZDMO will be able to begin planning the timeline to update its BCP. NZDMO IT staff and business representatives will be involved in this.

IT risk management

- 7.12 NZDMO IT has processes in place to identify, evaluate, and monitor IT risks, and these processes are integrated with business processes.
- 7.13 Common risks posed by technology are presented by:
- software changes requested by the business;
 - the Treasury's patches to hardware, operating system, or Microsoft® Access database;
 - system problems; and
 - the Treasury's infrastructure, processes, and people.
- 7.14 NZDMO IT identifies, evaluates, and monitors IT risks through:
- reviewing the Matriarch enhancement log and problem log;
 - weekly IT staff meetings;
 - fortnightly enhancement team meetings;
 - quarterly IT strategy meetings; and
 - regular contact with the Treasury about upcoming patches and NZDMO's pre-testing of Access patches before implementation.

Acceptance test procedures

- 7.15 Before implementing changes, NZDMO IT has processes in place to test the functionality of the change and to verify that the change meets the business needs. While segregation of duties issues exist because developers have access to production, such risks are mitigated by:
- a review of system-generated reports on a periodic basis;
 - an audit to identify unauthorised or inappropriate changes to the system; and
 - the ability to revert to backup versions of the system where serious errors occur.

Backup controls

7.16 NZDMO IT system backup capabilities include:

- Every 15 minutes, the Search Query Language (SQL) server logs are electronically transmitted from the Wellington server to the Auckland server. Each morning, NZDMO IT reviews the database customisation report to verify that there are no exceptions between the servers (for example, no difference in the number of records between servers).
- Each morning, nine of the key Access databases are automatically backed up on a separate server. About five days of backups are kept on the server. Whenever a file has become corrupt, IT has been able to restore the file with the backup copy. NZDMO IT periodically copies production SQL database backup information into the test database – this was most recently performed in January 2007.
- The Treasury's KIS group also backs up the SQL server database each night. Whenever NZDMO IT has needed to retrieve backup tapes from KIS, it has been able to restore the database from the backup tapes.
- SWIFT database and certificates are backed up to the BCP site, and these backups are performed automatically every day.

Part 8

Key personnel risk

Our expectations and overall findings

- 8.1 We expected that:
- a. NZDMO would have a process for determining the appropriate level of human resources required to deliver on its objectives;
 - b. the skill sets of NZDMO's employees would be aligned to their designated roles; and
 - c. processes would be in place to ensure that institutional knowledge is captured and is maintained.
- 8.2 We found that:
- a. NZDMO has a process for determining the appropriate level of resources, but at times has found it difficult to find suitable candidates to fill specific roles;
 - b. the skill sets of NZDMO's employees are aligned to their roles, although there is limited risk management and portfolio management experience available to handle further growth in NZDMO's activities; and
 - c. processes are in place to ensure that institutional knowledge is captured and maintained.
- 8.3 We concluded that NZDMO's level of resourcing is appropriate and employees have the relevant skills for their roles.

Management of key personnel risk

- 8.4 There is a consensus of opinion among NZDMO management that maintaining a sufficient number of professionals with the appropriate level of experience and skill is a primary concern. NZDMO has experienced some staff turnover in each of its three functions. However, this issue is not inconsistent with many other New Zealand organisations that require highly specialised and skilled resources from an extremely tight labour market.
- 8.5 NZDMO's management team has strategies in place to manage this ongoing issue. Staffing of the Portfolio Management Group (PMG) has been maintained by recruitment from a combination of sources – from within NZDMO and externally from the financial markets. By comparison, resourcing requirements of the RPT and the Accounting and Transactional Services team are solely externally focused.

- 8.6 During the last three years, NZDMO staff positions have reduced by approximately two full-time equivalents (FTEs) at a time when the number of transactions has increased by around 50%, mainly because of increases in foreign exchange, derivative, and cash management activity.
- 8.7 NZDMO's management team has remained stable, and the appetite for taking financial risk has diminished under the incumbent Treasurer.
- 8.8 The RPT area operates with a small head count and would be considered thinly staffed in comparison to Australian state Borrowing Authorities (although many are generally larger organisations compared to NZDMO). The potential to quickly deliver on new project initiatives is therefore restricted. In addition, there is key personnel risk regarding retention of intellectual property and organisational capability.
- 8.9 A peer comparison shows that the RPT group performs a wide range of functions, including technical support, strategic, research and development, risk support, compliance, and systems functions. While we recognise that there is a fine balance between resourcing and cost effectiveness, additional staff would aid in expanding such activities and would decrease key personnel risk. Further, it may allow a more strategic view of issues to be taken as well as allowing more strategic advice to clients.
- 8.10 NZDMO's 2006/07 business plan details five primary projects for which the estimated human resource required ranges from 2.2 to 5.5 FTEs annually. Given that the nature of these projects is largely debt management focused, this dictates that a fair proportion of this resourcing would need to be provided from the Portfolio Management Team, which comprised 7 FTE positions at the time of our audit.
- 8.11 This is an environment where transaction activity is expected to growth further (for instance, from the introduction of an NZDMO bond repurchase and sale facility). Growth is also expected in accordance with NZDMO's strategy, which is to undertake more of the foreign exchange business of government departments and Crown entities. New business is expected to arise from both existing clientele and from transacting with new organisations.
- 8.12 With the loss of a senior portfolio manager and the need to train junior staff in Portfolio Management, we consider that NZDMO will be challenged to complete all the initiatives detailed in its business plan. The team's overall level of senior financial market experience (more than five years) is limited to several individuals in terms of discharging NZDMO's strategic planning responsibilities across a broad scope of financial instruments (futures contracts on six exchanges, 18 currencies,

active domestic borrowings programmes, interest and currency swaps, and various investment products).

IT key personnel risk

- 8.13 To maintain and support IT systems in the future, the NZDMO IT team needs staff who can resolve system problems and develop requested enhancements. Also, the IT team needs to maintain complete documentation of processes and system design.
- 8.14 Key personnel risk exists at NZDMO, because the IT systems were developed by a small core team that includes an individual who has worked with NZDMO for more than 20 years. To reduce key personnel risk, NZDMO IT expanded its team to five people (four permanent staff and one consultant) and cross-trains its staff. NZDMO recognises that IT staff need to understand its business and how the IT functions should work, and be able to communicate to staff in other parts of the NZDMO using their language. To facilitate cross-training, comprehensive system documentation is available to explain the Matriarch system, Infinity tables used in Microsoft[®] Access, development standards, configuration procedures, and troubleshooting.

Appendix

Our recommendations

Recommendation 1

We recommend that NZDMO include as authorised in its Portfolio Management Policy, only instruments or currencies which NZDMO has full and final approval, functional capacity, and current skills to transact.

Recommendation 2

We recommend that NZDMO be explicit that Crown financial policy considerations have either been incorporated into NZDMO's Portfolio Management Policy or completely removed from the policy, to clarify NZDMO's role in relation to Crown financial policy.

Recommendation 3

We recommend that NZDMO review and clarify the NZDMO Advisory Board's terms of reference with the Secretary to the Treasury with respect to assurance versus strategic advice, and clarify the role of the Treasury's Risk Management Committee and its relationship to NZDMO's Advisory Board.

Recommendation 4

We recommend that NZDMO review the degree of assurance provided by the current scope of the external audit, and determine what additional assurance could be obtained from a suitably qualified internal audit resource.

Recommendation 5

We recommend that NZDMO update its Portfolio Management Policy to synchronise the policy's principles and management strategies with current business practices and goals. In particular, consideration should be given to expanding the Portfolio Management Policy by including the policies used to support the principles and limits in the document while retaining a Portfolio Management Policy which is clear and understandable.

Recommendation 6

We recommend that NZDMO progress the application of benchmarks that allow the matching explicitly or notionally of similar assets and liabilities.

Recommendation 7

We recommend that NZDMO review the mechanisms available to actively engage financial market participants in order to promote a well-functioning government debt market.

Recommendation 8

We recommend that NZDMO update its Portfolio Management Policy to reflect that the tactical activity currently being undertaken is asset and liability management activity and foreign exchange intermediation, rather than primarily outright tactical trading.

Recommendation 9

We recommend that NZDMO manage risks in its quasi-tactical advances desks within NZDMO's risk limits for overall tactical activity (asset and liability mismatch management).

Recommendation 10

We recommend that NZDMO continue to seek improvements to its market risk modelling by considering implementation of the historical simulation methodology, and by producing periodic reports showing graphical time series of daily Value at Risk versus actual profit and loss.

Recommendation 11

We recommend that NZDMO implement an up-to-date credit risk methodology, particularly with regard to potential exposure management to address the inherent conservatism in the current methodology. Potential credit exposure for each counterparty should be calculated for all outstanding transactions and incorporated into a credit limits framework.

Recommendation 12

We recommend that NZDMO manage concentration risk in its portfolio exposures by implementing a limits framework of maximum exposures (as a percentage of total portfolio exposure) by counterparty type, credit rating, and country.

Recommendation 13

We recommend that NZDMO immediately remove options from the approved instrument schedule of its Portfolio Management Policy, and periodically review the lists of approved financial instruments (that is, schedules B, C and D of the Portfolio Management Policy) and update as required.

Recommendation 14

We recommend that NZDMO update its list of approved instruments to reflect only those instruments which NZDMO has the functional capability to process and which have been recently traded (for example, within the last two years).

Recommendation 15

We recommend that NZDMO review the term limitation formal authority across all the financial products that the NZDMO Treasurer can transact, and seek to apply a term limit that is based upon Portfolio Manager seniority and potential economic outcome.

Recommendation 16

We recommend that NZDMO consider expanding the suite of daily management reports to include portfolio composition views. These could include an analysis of portfolio assets and liabilities by maturity, stated in dollars and/or risk sensitivities.

Recommendation 17

We recommend that NZDMO include an overview of the current balance sheet composition of the tactical portfolio in monthly reports to senior management and NZDMO's Advisory Board to better convey the extent of matching of assets and liabilities (and the associated residual risks) within this portfolio.

Recommendation 18

We recommend that NZDMO refine its value added performance measure (RAPM) to better report the different components of market risk taking returns and the one off gains achieved by borrowing funds at the New Zealand Government rate and reinvesting them in marketable securities (which attract a higher rate). NZDMO should also mark-to-market all assets, liabilities, and derivatives at the appropriate yield curves which include the credit spread for each issuer.

Recommendation 19

We recommend that NZDMO use, where appropriate, the valuation methodologies developed for external reporting under New Zealand equivalents to International Financial Reporting Standards for its management reporting.

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