

# **New Zealand's Experience With Autonomous Sovereign Debt Management**

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## **Introduction**

Numerous governance and organisational structures are possible for sovereign debt management agencies. While each has its own strengths, a number of common characteristics run through many of them. This paper discusses the stylised features of well-managed sovereign debt management agencies and comments on New Zealand's experience with sovereign debt management.

Sound sovereign debt management requires the following conditions:

- a management framework which recognises the public policy and commercial interfaces in sovereign debt management
- clear objectives for the sovereign debt management agency
- a clear separation of the responsibilities and accountabilities for monetary policy and debt management policy
- a sound strategic framework for debt management policy
- well designed performance measurement and risk management systems
- management information systems integrating the front, middle and back offices.

## **A Management Framework which Recognises the Public Debt Policy and Commercial Interfaces in Sovereign Debt Management**

Regardless of the organisational structure of the debt management agency, the management framework should embody the following features:

- a clear set of objectives for the organisation. Although each organisation will have a unique set of borrowing authorities delegated from the government, there needs to be independence from government in the day-to-day management of the debt and liquidity portfolios.

- a clear separation of responsibilities for monetary policy and debt management policy. Without a clean separation the design of debt management policy is likely to be increasingly influenced by monetary policy objectives rather than sound portfolio theory.
- a well-defined set of accountabilities for the agency's performance. This could be through regular reporting to the Parliament or the Minister of Finance, or to an independent board established by the government.
- a risk management culture which fully reflects the government's risk preferences and the special set of responsibilities associated with representing the government in the financial markets. These responsibilities are considerable. The government's reputation in the financial markets is integrally affected by the interface that the debt office, as its agent, has with the markets. This requires a strong in-house code of ethics for staff as part of a strong risk management culture, and judgement in a range of transacting and relationship management situations.
- recognition that debt management is also a business which can carry large exposures to market, credit and operational risks. Debt management requires staff with a combination of portfolio related expertise and an understanding of the special risk management culture needed for a sovereign transactor.
- acceptance that debt management is a business requires budgetary arrangements that recognise that the debt agency can reduce borrowing costs (or enhance returns from investments) and risk for the government. Scrutiny of funding proposals for debt management initiatives, such as spending on information systems, need to explore the full cost and benefit implications of the investments, rather than simply the expenditures involved.

Since its inception in 1988, the NZDMO has been part of the branch structure of the New Zealand Treasury. This has obvious parallels to a corporate treasury's location and generates the following benefits:

- the NZDMO assists in providing other Treasury outputs. It provides debt servicing and interest income calculations that feed into fiscal forecasts. It has direct involvement in the preparation of the Government's financial accounts and provides capital market advice on a range of public policy issues and views on monetary conditions and financial market expectations.
- the Treasury can monitor the NZDMO's development and its effectiveness in managing the Government's asset and liability portfolios.

While the NZDMO must operate within the strategic parameters approved by the Minister, much of the discretion over day-to-day funding operations has been delegated to the Treasurer of the NZDMO.

The Treasurer is accountable to the Secretary to the Treasury. A three member Advisory Board, comprising private sector representatives, assists the Secretary to the Treasury to monitor the NZDMO's performance by providing oversight and advice across a broad range of operational and strategic risk management issues and procedural controls. This provides greater transparency in the decision-making and supervision process around the NZDMO.

### **Clear Objectives for Sovereign Debt Management**

Many countries have announced clear and orthodox objectives for monetary policy. Several countries, including Australia, Canada, Finland, New Zealand, Spain, Sweden and the United Kingdom have adopted annual inflation targets with an upper band of 3% or lower.

However, government objectives for sovereign debt management are often not well specified in terms of cost and risk. In many countries, therefore, debt management policy is undertaken with limited understanding of the government's risk preferences and its risk tolerances. Poor performance and diminished managerial accountability within the debt agency, and costly monitoring by the market as it attempts to interpret the agency's policy framework are inevitable outcomes.

Some agencies have focused on cost, and debt servicing costs in particular. But this objective is often not well defined in terms of the period under consideration or whether cash based costs or total portfolio costs marked-to-market are being targeted. Often the risk framework accompanying the focus on cost savings is not clear.

Prominence has been given to risk considerations rather than minimising cost in the New Zealand Debt Management Office's (NZDMO's) objective. The NZDMO's objective is:

*'to identify a low risk portfolio of net liabilities consistent with the Government's aversion to risk, having regard for the expected costs of reducing risk, and to transact in an efficient manner to achieve and maintain that portfolio'*

Three main considerations underlie the Government's preference for low risk in its portfolio management:

- evidence suggests that individuals or, more relevant in a public choice context, 'median voters', tend to be risk averse in their decision-making and expect the Government to reflect this preference in managing its interests.
- losses incurred in the Government's portfolio impose costs which most taxpayers are unable to avoid. Taxpayers have limited practical scope to foresee and undo the consequences of poor financial decisions by the Government. Risk-averse policies reduce the risk of surprises, providing greater certainty for planning.
- the Government does not have any competitive advantage over other market participants in attempting to derive excess returns from its portfolio management, except for its privilege as a tax and regulation-exempt institution and internal information on the fiscal situation or government policy objectives. However, the NZDMO does not consider it is ethical for these exemptions to be exploited.

The NZDMO's objective requires it to consider the expected costs of risk reduction. Minimum risk strategies are not prescribed because additional risk reduction can have high expected costs, making such strategies sub-optimal. Information difficulties also mean that it is often not possible to be confident that a portfolio is in its least-risk configuration.

### **Separating Debt Management Policy and Monetary Policy**

Separation is critical. Few things undermine the professionalism of debt management operations more than the failure to have a clear separation of responsibilities for monetary policy and debt management policy. Without this clear separation, debt management policy will almost inevitably become subservient to monetary policy as the monetary authorities attempt to use debt management policy as a means of strengthening monetary policy signals and enhancing the credibility of the central bank.

In some situations, debt management policy can support monetary policy, but often issues such as those listed below can create tensions between the central bank and the debt agency. In such circumstances, it is less likely that debt management decisions will be based upon sound portfolio theory. Accordingly, the risk management framework of the debt management agency, and its overall reputation, is compromised.

## *Tensions Between Monetary Policy and Debt Management Policy*

Examples<sup>1</sup> of this potential tension between monetary policy and debt management policy include:

- the central bank may, for instance, argue that the government should issue foreign-currency denominated debt, in the hope that such a move would enhance its own credibility by making it more costly for the government to inflate away the principal value of its obligations, thereby helping to reduce the inflation risk premium in the yield curve.

The debt management office on the other hand might believe that foreign-currency debt increases the overall riskiness of the government's balance sheet if the government's asset portfolio does not have any significant foreign-currency exposure.

- similarly, the central bank might argue for the issuance of inflation-indexed bonds as a means of enhancing its credibility. This can bring it into conflict with the debt management agency if the agency considers that the market is not ready for such an instrument and that a failed issuance programme would reduce the market's view of the professionalism of the debt management office.
- the central bank may wish to use pricing decisions in daily open market operations to change monetary policy or signal a desired change in monetary conditions. The debt management office may wish such pricing decisions to be made on commercial grounds only. For example, a daily liquidity management operation involving the purchase of Treasury Bills to inject liquidity into the banking system might result in bids which are acceptable to the debt office. The central bank may wish to reject them to signal a tightening of monetary policy.
- differences in view can also occur in making pricing decisions on inflation-indexed bond tenders. Here the central bank and the debt office might have differing views about fair value if they have different views on the size of the inflation risk premium and/or the liquidity premium. The central bank may be willing to see tenders underbid (ie, very high real returns accepted relative to conventional bonds) as an indication that few people are concerned about inflation and that inflation expectations are low. The debt office would like lower yields to reduce the government's cost of borrowing.

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<sup>1</sup> It is assumed that, as in most OECD countries, the central bank is committed to achieving price stability, (I shall put aside the issue of defining this) or low and stable rates of inflation. It is also assumed that the government has not set clear objectives (in terms of cost and risk) for sovereign debt management, or clearly defined policy advisory responsibilities.

- the central bank may have a preference for a debt portfolio with a relatively short duration, as a long duration portfolio may be perceived by the market as increasing the incentive of the government to inflate, thereby weakening the central bank's mandate and credibility. The debt management office may consider that issuance will reduce refinancing risks for the government, stabilise costs, attract new investors and increase the depth of the bond market.

### *New Zealand Experience*

Not surprisingly, in many countries the relationship between the central bank and the debt management agency can be tense. Fortunately, a very good relationship exists between the Reserve Bank of New Zealand (RBNZ) and the NZDMO. Several factors, including considerable dialogue and a clear understanding of roles, has assisted this. Two developments have been particularly important:

- the roles, responsibilities and accountabilities for the conduct of both monetary policy and debt management policy have been carefully defined.

Under the Reserve Bank of New Zealand Act 1989, the implementation of monetary policy, with the objective of maintaining price stability, was identified as the RBNZ's primary role. Price stability is defined in a policy targets agreement between the Minister of Finance and the Governor of the RBNZ as maintaining underlying inflation within a range of 0-3% per annum.

Although its responsibilities are not legislated, the NZDMO is responsible for ensuring that the Government's net debt portfolio is managed consistent with the Government's risk preferences. Under the Fiscal Responsibility Act 1994, New Zealand Governments are required to follow a legislated set of principles of responsible fiscal management, and publicly assess their fiscal policies against these principles. Regular reporting requirements are specified to ensure full disclosure of the Government's fiscal position.

Agency agreements between the NZDMO and the RBNZ clarify the principal/agent role in those areas where the RBNZ provides services for the NZDMO. The RBNZ acts as the NZDMO's issuing agent, registrar and paying agent in the domestic market, and conducts daily liquidity management operations and Treasury bill and bond tenders on the NZDMO's behalf. An important provision in the agency agreement on cash and wholesale debt management is that all functions carried out by the RBNZ as agent for the NZDMO are conducted without reference to monetary policy considerations.

This agreement also makes clear that the NZDMO is responsible for making all pricing decisions on Treasury bills and government bonds, and for advising the Minister of Finance on the size and structure of the domestic borrowing programme, which is announced on Budget day.

- both the RBNZ and the NZDMO are committed to the principles of transparency, neutrality and even-handedness in conducting their business. (The application of these concepts to the NZDMO's domestic debt management is discussed later in the paper). Implementing a clearly defined policy framework in a consistent manner reduces monitoring costs by investors and assists their decision making.

### **Establishing a Sound Strategic Framework for Sovereign Debt Management**

As with several other sovereign debt agencies, the NZDMO used mean-variance modelling to help it find a low-risk portfolio for the Government's foreign-currency debt. This modelling used a one-year duration New Zealand-dollar liability as a low-risk benchmark in order to determine the riskiness of alternative portfolio structures.

While this technique provided useful information on currency composition, the NZDMO was uncomfortable with the modelling work in respect of interest-rate risk for two main reasons:

- portfolio compositions suggested by the modelling were unstable, depending upon the period under review. Successive New Zealand Governments had embarked on comprehensive structural reform which also generated large movements in interest rates and the exchange rate. This limited the predictive power of the modelling.
- questions arose as to whether the benchmark was appropriate given that there was only limited information available at the time on the asset side of the Government's balance sheet.

#### *Balance Sheet Approach*

This situation began to change in the early 1990s. Information increasingly became available on the structure of the Government's assets. Accrual based accounting systems were replacing cash accounting systems in government agencies. From December 1991, on a six monthly basis, the Government was required to produce consolidated financial statements based on generally accepted accounting practices.

This opened the way to the possibility that the Government's risk might be reduced by matching the risk characteristics of the Government's liabilities with those of its assets. If such matching were possible, liability structures would provide natural hedges against shocks to the Government's balance sheet, reducing the effect on the Government's net worth.

With this principle in mind, in 1993 the NZDMO commissioned three leading North American specialists in duration theory to quantify as far as possible the risk characteristics of the assets in the Government's balance sheet. The objective was to gain better insight into the Government's overall balance sheet risk and to develop a stronger conceptual framework for strategic debt management. This framework would explore whether it was feasible to match the structure of the Government's assets with its liability portfolio in order to dampen the impact of interest-rate and currency movements on the Government's net worth.

Sizeable challenges needed to be confronted, particularly given that many of the Government's balance sheets assets were physical assets in the nature of public goods which did not generate cash flows.

The consultants were asked to derive a methodology for calculating the risk characteristics (real duration and sensitivity to exchange-rate movements) of the three largest real assets in the Government's balance sheet: highways, equity in the government-owned electricity system and land and buildings.

Duration of the physical assets was based on calculations of the cash flows or benefits guaranteed by the assets, the discount rate and the remaining asset life. Asset duration is able to be calculated if the cash flow or benefits are assumed to be the same in each future period, and the discount rate and maturity of the asset is known. A benefit of this approach was that it was not necessary to specify the absolute level of benefits flowing from the assets. It was sufficient to forecast the likely growth rate of benefits.

To estimate the duration of the national highway system, for example, technical data was gathered on the economic life of the asset. Scenarios were developed based on different growth rates in services and the real discount rate. These scenarios were combined to produce an overall weighted duration of around 15 years.

It was decided, however, not to complete the work for a range of reasons:

- the poor quality of the data on the Government's assets resulted in large standard errors around the estimates of the interest-rate sensitivity of the assets.

- there was insufficient information on the extent to which the assets were nominal or real in nature. This is important because changes in nominal interest rates caused by changes in inflation expectations will change the value of nominal assets but not real assets.
- there were concerns about the legitimacy of the assumption used that cash flows or benefit streams were insensitive to interest-rate changes. While this assumption made the estimation problem more tractable, it was difficult to know how strong an assumption this was.

Nevertheless, some important conclusions did emerge from this work:

- the duration of the assets tended to be quite long, implying that the debt portfolio should also have a long duration.
- some of the Government's assets were real assets (ie, these generated cash flows which were indexed to movements in inflation), the value of which was sensitive to changes in real interest rates, implying there was a strong case for issuing real, or inflation-indexed, debt.
- the asset prices were not significantly sensitive to exchange-rate movements, implying that holding foreign-currency debt in the Government's debt portfolio introduced significant variability to the Government's net worth.

This study suggested that the NZDMO should reconfigure its debt portfolio over time to remove foreign-currency exposures and achieve a longer duration of New Zealand-dollar debt, including inflation-indexed securities.

### *Foreign-Currency Debt Management*

These developments came later. In the meantime the Government was gradually paying down its net foreign-currency debt, (which totalled NZ\$15 billion at June 1991) by using the cash proceeds from state asset sales, and some additional domestic borrowing.

However, a large stock of foreign-currency debt remained to be managed. The strategic benchmark for managing the foreign-currency debt portfolio drew insights from the mean-variance modelling and an efficient market approach of 'selling the market'. This approach reflected the NZDMO's view that it was unable to systematically predict the cheapest forms of borrowing and that diversifying its foreign-currency exposures across currency blocs was a low-risk portfolio management approach.

The NZDMO's mean-variance analysis had consistently shown that the US dollar represented the dominant currency (from a NZ-dollar base) when attempting to reduce risk. However, the mix between Yen and European currencies was unstable and the NZDMO was unwilling to contemplate the large rebalancing costs which would result from a strategy which called for strict adherence to the output of the model. In addition, as the input to the model included an historic variance/co-variance matrix, there was an assumption that these relationships would hold in the future.

Given these factors, a portfolio was constructed where the net liability centred around 50% US dollars, 25% Yen and 25% European currencies. However, the benchmark was allowed to fluctuate by 5 percentage points either side of these levels, reflecting the approximations in the process. It is difficult to argue conclusively that a portfolio with 46% US dollars is more risky than one with 50% US dollars. A second reason for the 50/25/25 percentage split was that these ratios corresponded approximately to relative gdp weights of the currency blocs and were therefore consistent with a 'sell the market' strategy.

As noted earlier, mean-variance analysis provided little useful information on interest-rate risk in the portfolio. A low-risk portfolio tended to reflect the horizon period of the analysis. Given that the foreign-currency liabilities were not funding identifiable assets, the NZDMO was in a similar situation to a mutual fund or unit trust manager with an asset portfolio which is not funding a specific liability. A valid, risk-adverse strategy is to 'buy the market' in order to diversity risk.

Therefore, the NZDMO adopted the duration of the government bond market in each currency as the target duration for that currency portfolio. This strategy meant that the NZDMO tended to issue into the most liquid segments of the relevant markets.

All refinancing transactions were required to maintain the currency composition of the portfolio within its bands and move its duration closer to the duration of the government bond market for that currency bloc. This meant that, over time, the foreign-currency portfolio would move closer to the strategic benchmark portfolio.

### *Debt Reduction*

In 1994, the New Zealand Government achieved a fiscal surplus. With the Treasury's economic projections suggesting sizeable fiscal surpluses for the foreseeable future, the Government set an objective of reducing its net public debt to gdp ratio as rapidly as possible from 43% of gdp in June 1994 to below 30% of gdp, followed by a more gradual reduction to below 20% of gdp.

Several reasons lay behind the Government's decision to reduce its indebtedness. Important among them has been a desire to:

- reduce the economy's vulnerability to economic and financial market shocks
- reduce debt servicing obligations
- lower the risk premium in the term structure of interest rates, reducing the cost of capital to all firms in the economy
- increase the Government's and the country's creditworthiness, with the subsequent rating implications also feeding through into interest rates
- provide the Government with a buffer against the future spending implications of an ageing population
- provide greater scope for reducing the variability of future tax rates, and therefore reduce the deadweight losses associated with this
- provide greater certainty for individuals with regards to their investment and consumption decisions.

Within the overall debt objective, the Government gave priority to reducing its foreign-currency debt exposure. In mid-1994, when the Government's net foreign-currency debt totalled NZ\$10.2 billion, an objective of obtaining zero net foreign-currency debt in three years time was set. This objective was achieved in September 1996 and financed by a combination of cash receipts from the Government's operating or fiscal surplus, the sale of state-owned assets, and some additional borrowing in the domestic market. By June 1996 net public debt had declined to 32% of gdp.

Repaying foreign-currency debt rather than domestic debt was desired because:

- the NZDMO's research indicated that the value of the Government's assets were much more sensitive to movements in domestic interest rates than to movements in the exchange rate
- exchange-rate risk cannot be hedged cost-effectively given the magnitude of the external debt portfolio and the capacity of the New Zealand-dollar foreign-exchange market
- rating agencies are concerned about external debt levels, particularly in relation to total export earnings

- repatriation of foreign-currency debt helped to develop the diversification and liquidity of the New Zealand domestic bond market

Extensive modelling work was undertaken in an attempt to find a low-risk approach to paying down the Government's net foreign-currency debt. In particular, the NZDMO was concerned to find a cost-effective profile for the reduction of net foreign-currency debt which had little foreign-currency and interest-rate risk for the Government. Currency and interest-rate risks arose because the Government's projected cash flows (from fiscal surpluses and privatisation receipts) were in New Zealand dollars and its repayment obligations fell in various maturities across various foreign currencies. A low-risk approach required the Government to progressively eliminate the debt in the currencies that were least correlated with the New Zealand dollar and to hedge the long-dated interest-rate exposures before hedging the short-dated liabilities.

Paydown of the Government's net foreign-currency debt was achieved by using available cash to retire maturing debt, acquire hedges in the form of cash flow matching swaps, and repurchase some long-dated Yankee and Bulldog debt. Repurchasing debt was desirable because it reduced the size of the Government's balance sheet, reducing both credit risk (of the offsetting hedges) and the ongoing need to manage the debt.

### *Domestic Debt Management*

With the objective being to reduce net public debt levels, it was no longer appropriate to increase the duration of the domestic debt portfolio in the manner the asset/liability study implied. Instead, the NZDMO manages the composition of the domestic debt portfolio so as to diversify risk, reduce cost, and meet a range of public policy objectives.

Refinancing and interest-rate risk is reduced by ensuring that the maturity profile is relatively smooth and issuance is spread across the term structure. The longest nominal benchmark bond has a 10-year maturity. Inflation-adjusted bonds, which have recently been introduced, have a 20-year maturity.

Price (rate) risk is diversified by sampling interest rates over the fiscal year and issuing a mix (approximately 3:1) of fixed and floating-rate debt.

In its debt management, the NZDMO is strongly committed to the principles of transparency, neutrality and even-handedness. It believes that adherence to these principles will lower the Government's borrowing costs by reducing price uncertainty and encouraging competitive bidding, and that these gains should outweigh any short-term gains available through opportunistic borrowing in the domestic market.

Transparency surrounding the Government's domestic borrowing intentions is enhanced by publishing the auction calendar for the forthcoming year with the Budget. The details provided include the overall size of the annual borrowing requirement, and the dates and the size of the auctions.

Auction predicability allows market participants to plan with confidence, and helps the market absorb sizeable amounts of government securities. It has also helped encourage substantial foreign portfolio investment. As at September 1996, foreigners held 53% of the government securities in the market.

Neutrality and even-handedness are promoted through the auction process. Conventional bonds and bills are sold through a multiple price auction system. Inflation-indexed bonds are sold through a uniform price auction in order to reduce the potential "winners curse" problem, which is accentuated with the introduction of a new security<sup>2</sup>.

### **Well-Designed Performance Measurement and Risk Management Systems**

Performance measurement needs to be applied to both tactical and strategic trades and measures need to be developed in respect of cost and risk objectives.

Well-designed performance measurement systems are critical because they provide:

- management information regarding the magnitude and nature of discretionary decisions and assist thinking on alternative financing or investment strategies
- information to assist portfolio managers in managing the controllable risks for which they are responsible and provide feedback on the quality of their decisions
- information necessary to generate incentive structures which ensure staff incentives are aligned with those of the debt agency.

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<sup>2</sup> Under a uniform price auction, all successful bidders pay the lowest successful bid. As a result, a high bid not only increases the probability of being successful, but also increases the probability of reduced profit or subsequent loss for that bidder. This auction pricing technique could induce a significant risk premium into bidding when a new instrument is difficult to price.

Sound risk management policies are needed for managing market risk, funding risk, liquidity risk, settlement risk, credit risk and operational risk. For the sovereign debt management agency the management of liquidity risk and credit risk is particularly important. Risk averse sovereigns with well designed strategic frameworks and sound tactical trading policies are unlikely to be exposed to substantial market risk in terms of position taking. A government's reputation would, however, be seriously damaged if it defaulted as a result of a poorly designed liquidity policy, or if it incurred substantial costs through inappropriate credit policies for its liquid assets and swaps portfolios.

### *Performance Measurement and Risk Management in the NZDMO*

Performance measurement within the NZDMO is currently based around cost rather than risk considerations.

When the Government had a large amount of net foreign-currency debt, the actual portfolio was closely monitored to ensure that it was moving towards the low-risk strategic benchmarks (based on the currency mix and interest-rate sensitivities described earlier). Currently the Government's foreign-currency debt and asset portfolios are fully immunised so that there is no currency or interest-rate risk around the Government's gross foreign-currency debt portfolio.

Cost performance is measured on two types of NZDMO transactions:

- liquidity management or investment transactions. The NZDMO is required to manage a considerable amount of foreign-currency liquidity in order to meet upcoming principal repayments or debt servicing payments on the floating-rate swaps used to hedge the fixed-rate foreign-currency debt.
- foreign-exchange purchases, when the NZDMO funds debt servicing payments out of domestic currency.

In each case, a shadow or benchmark portfolio has been established and value added is defined as the difference in value between the actual and the shadow portfolio. None of the value added is risk-adjusted at this stage.

Rules were established for the shadow foreign-currency transactions. Portfolio managers have discretion to lead or lag the shadow portfolio trades.

The benchmark portfolio for the liquidity book (foreign-currency investments) is based on prescribed asset allocations and expected returns on the assets. The liquidity manager is free to vary the asset allocation within limits and expected returns are adjusted regularly.

Tactical trading within conservative limits is also undertaken and the performance of such trades is measured daily.

Credit risk arising from the management of the portfolio is carefully managed.

- Since 1988, the NZDMO has consolidated credit risk reporting across all financial instruments, including assets and off-balance-sheet exposures arising from foreign-exchange transactions and swaps. Credit limits are based on a time-weighted combination of mark-to-market exposures plus a margin for market volatility. The time weighting increases the amount of credit limit utilised as the maturity of the transaction increases.
- All credit exposures are monitored daily and situations where credit quality falls below a minimum threshold are addressed immediately.
- A Credit Support Annex has been appended to the NZDMO's swap documentation to cap the exposure to individual counterparties. It outlines arrangements for the posting of collateral once exposures reach specified levels. Credit support, through the posting of collateral, is one-way for those institutions rated below New Zealand's sovereign rating by either of the two major rating agencies. It is also unilateral if New Zealand is assigned a triple A foreign-currency rating by both rating agencies.
- The NZDMO is developing a credit pricing model to ration scarce credit limits, based on the value-added from incurring credit risk. Up until now the NZDMO has used rules-of-thumb to price credit risk on structured transactions.

### **Management Systems which Integrate the Front, Middle and Back Office**

There is a rapidly growing global demand for front, middle and back office technology with user-friendly functionality. Such growth has been stimulated by the well-published risk management failures in major corporates and financial intermediaries over the past five years, the development of G.A.R.P. and the value at risk methodology and database. Risk management software suppliers are competing to provide integrated front, middle and back office systems based on open data bases. Others, specialising in middle office risk management systems, are seeking to develop their products to include measurement of credit risk as well as market risk.

A sovereign debt agency is faced with several difficult challenges:

- defining its current and future user needs in the light of future business process re-engineering possibilities
- deciding whether to develop an in-house, highly customised management information system or whether to purchase an 'off the shelf' standard risk management system and undertake additional customisation
- deciding which standardised risk management system to purchase
- ensuring that the project is well managed, runs to budget, is completed on schedule and that the product is widely accepted within the organisation and staff are trained fully in its functionality

#### *NZDMO's Experience*

The NZDMO developed its current management information system in-house over a nine-year period (work commenced before the NZDMO was established). It was primarily a middle and back office system with deal capture facilities. It provided the NZDMO with daily mark-to-market valuations for the portfolio.

Over time, several problems began to emerge with this system:

- the hardware platform became outdated
- the database was closed
- the system was unable to interface easily with new work applications. A range of spreadsheet applications were developed to provide information unable to be produced by the existing management information system.

In addition, the NZDMO faced substantial key person risk in developing its information systems.

After sending out requests for proposal to 26 systems vendors and completing considerable in-house testing, the NZDMO purchased the Infinity Derivatives System in December 1995. The NZDMO is the only Infinity client currently attempting to introduce the integrated front to back office Infinity system across the full range of financial instruments it deals in.

Deal capture has been completed for all existing transactions and the front office system has been introduced to the portfolio managers and cash managers, in parallel with the existing system. Implementation of the middle

office system is currently underway and the primary goal is to complete installation of the front, middle and back office systems by December 1997.

Key benefits from the system are expected to include:

- the new system will run on a state of the art technology platform
- greater flexibility for users due to the open database and the ease of interfacing with other work applications
- new modules can be added on as they are developed by Infinity or other third parties
- the operating costs should be lower with the new system
- the risks of key person dependency are reduced

A number of key management insights have emerged on the project:

- installation is almost invariably more complex than early specification suggests
- developing a well-skilled project team with knowledge of the software and the NZDMO's operations can take considerable time
- there is an on-going need to undertake business process re-engineering reviews to improve efficiencies and maximise the use of the system
- it is important to build the information technology skill levels throughout the organisation so that all staff recognise and can access the benefits of the new software
- it is also important to manage expectations of the project. Because it was custom built, the existing management information system meets many of the users' needs whereas the new system cannot deliver all that users want without significant customisation
- maintaining good communication and relationships with Infinity and other possible software suppliers is important in order to influence software development in line with the NZDMO's requirements.

## **Conclusion**

Establishing competencies in the stylised features of sovereign debt management identified in this paper involves substantial management challenges. Sovereign debt management is not a simple, straightforward operation. It is a complex and specialist business which requires expert

portfolio and risk management skills and a very sound understanding of public policy objectives.

Looking ahead at the NZDMO's work programme, several strategic issues will continue to be explored in managing the Government's net debt. These include the optimal level and structure of the domestic debt portfolio and the role of foreign-currency reserves and foreign-currency debt in the Government's balance sheet. Key operational issues are the continued implementation of flexible and integrated information systems and the ongoing development of risk-adjusted performance measures. While these are challenging and complex issues, the degree of complexity is reduced markedly by having established clear strategic and operational objectives for the Government's debt management.