

The NZ term structure: Going long in infrastructure

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Abstract

The NZ term structure of interest rates is long in liquidity at the short end of maturities, but entirely absent at the long end. This entails market completion and other welfare problems, notably in encouraging long term saving, retirement income support, tax non-neutralities, public sector funding, insurance support, and other exigencies. A possible issuance role for a sovereign infrastructure fund is mooted in connection with long term debt issues to support infrastructure funding. Equity in the special investment vehicle (ISFV) or fund takes the form of preference shares. The ISFV invests in primary debt securities written by state or local government to fund IFS projects and repackages these into asset backed securities issued to the public. The proposed generic structure facilitates the funding of cooperative IFS ventures involving central and local government together with private equity partnerships and can be adapted to a trans-Tasman facility. Synergistic enhancements include lifecycle derivatives and retirement funding.

Key words: Annuities, infrastructure funding, lifecycle derivatives, long term debt, preference shares, retirement finance, public-private partnerships.

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A first version of this paper was presented at the Treasury-MED-RBNZ Workshop on Financial System Development June 20 2008. The authors thank discussant Kelly Eckhold, with other contributors and participants, for some useful comments and information. A shortened version of this paper is forthcoming in *JASSA: The FINSIA Journal of Applied Finance*.

1. Introduction

The New Zealand debt markets are long on the short but short on the long. The horizontal axis of our term structure curve ends abruptly about ten years out. In this paper we make some suggestions as to how we can extend the axis; some observations about why we should want to do so; and who the issuers and holders might be.

A background review of the NZ fixed interest markets can be found in Bowden and Zhu (2005). A major development since then has been the growth of Kauri bonds, which are NZD issues by an offshore entity into the NZ market³. High grade issuers have included⁴ the World Bank, State of Queensland, Bank of America, and the European Investment Bank (their third biggest offshore source, in fact), with about NZD 5 bn worth on issue, at about 25 basis points under swap. The popularity of Kauris has been underpinned by the RBNZ's recent decision to allow them as repos for the purposes of monetary settlement. To date, however, none of these issues have been longer than 10 years and most are significantly shorter. Useful references are Ridley and Besson (2008) and Groom (2008). A further development has been the growth of capital notes and related junior securities, some of which are billed as bonds, though they are essentially floating rather than fixed, with a one year reset based on the one year swap rate at the time⁵.

These developments are interesting and of some significance for the present enquiry, but it is not our present intention to survey in any detail what is currently available, or other matters such as associated derivatives markets or regulatory supervision. Instead, the purpose of the present paper is to make some specific proposals as to how the deficiency as to the longer end could be rectified, mounting a case that we should try to do so.

Our basic proposal brings together three exigencies of current concern, one of which is the deficiency already referred to, namely the absence of a long end to the term structure. It is worth reminding ourselves that a public debt issuance program does more than just finance this or that capital project. It has also a social role in developing the country's capital market, in assisting its people to plan their own financial future, and to handle employment or asset

³ The first such issue was by Merrill Lynch in 2004, but it took a while for the idea to catch on. At the time of writing, there were 25 issues.

⁴ In addition to the sources quoted, a snapshot of the Kauri forest thus far can be found in http://www.nzx.com/nzxmarket/nzdx/bond_bank_indices/kauri_bond_indices/view

⁵ Infratil's Perpetual Infrastructure Bonds are of this character.

risk. The latter aspect has been very much to the fore in recent months with the collapse of more than 20 finance companies, resulting in an estimated⁶ 108,000 investors losing all or most of their money, about \$3.5b in all.

A second exigency is that shortly we are going to need a lot of infrastructure replenishment and development (IFS for brevity). With the export economy looking strong in the years ahead, we can afford it. To be sure, there are going to be uncomfortable short term bumps and grinds as the fallout from the subprime crisis continues, but NZ is likely to be a beneficiary from longer term reweighting of world economic influence in favour of China, in particular. Infrastructure is for the longer term, and in this context we can agree to finance it with the issue of long term debt on the user pays principle, though we leave open the matter of whether this is from tax revenue or tolls for use (on this, see Bowden (2008b, ch.10)). New Zealand has a legacy of aversion to state debt, derived from the ‘think big’ planning of the Muldoon era, which duly became known as ‘sink big’. However, even gross government debt in NZ is now down to only 6.7% relative to GDP, a striking contrast with the UK fiscal responsibility target ratio of 40%. Given the more optimistic long term prospects for the NZ economy, there is now a case for being more relaxed about asking future generations to share the burden of social infrastructure. Our proposals concern the nature of this debt, how it can be packaged and the relative roles of the central government, local government and the private sector. In extending the scope of discussion in this way, we make a connection with another topic of debate, namely the role of public private partnerships.

The third exigency concerns the availability and attractiveness of long term contractual savings schemes in the context of retirement planning. It is fair to say that personal long term or retirement saving in NZ is deficient both in magnitude and the scope of what is available. Indeed, the savings deficiency seems to have some sort of official recognition in the Retirement Commission’s booklet *Your Money In Retirement*, distributed by WINZ to every new applicant for NZ Superannuation payments. The booklet spends two pages explaining reverse equity mortgages, in terms that almost suggest an official imprimatur that this is a good thing to do. The interest rate used in their calculation is 12%. This is expensive finance, for the homeowner is in effect paying it instead of receiving it (as in our own proposals). Indeed, the implied rate would be higher if the homeowner wants a ‘no negative equity’ guarantee, which means that no residual liability exists beyond the terminal value of the

⁶ TVNZ news report concerning Dominion Finance, June 18, 2008. Recent reports are of further collapses so these figures are likely to be an underestimate of the losses involved.

house. It would be better to have a scheme that turns round the 12% to the benefit of the retiree instead of an expense, backed by a very strong credit rating, and with less in the way of overhead or margin than even traditional instruments such as insurance company annuities.

The paper is itself set in a longer run perspective. To be sure, we are facing current stresses associated with the subprime crisis, even if less so than some other OECD countries. But other difficulties such as those with the finance companies, or with the collapse of Blue Chip, are themselves indicative of a deeper underlying problem that is more secular in nature, as an endemic weakness with our system. Deficiencies of this kind are a topic of concern for the present paper.

The scheme of the paper is as follows. Section 2 is a general review of the economic case for extending our limited term structure, covering issues of credit risk and system credibility that have created stress over the years.

If long bonds are to be issued, there must be a market for them. This is explored in section 3, following some preliminary definition as to just what is meant by high grade long term bonds, as distinct from other types of instrument. Section 3.3 turns to the issue of retirement saving, noting that high coupons can be generated as an enhancement from high grade long term debt. The income stream so generated can be used as a basic tranche of retirement income assurance, to supplement NZ Superannuation payments.

Section 4 turns to supply, and contains the developmental core of the paper. We propose a portmanteau structure, one that can be specialised according to the particular circumstances of the IFS project. At its most general, IFS is developed as a three way partnership between central government, local government and private equity and/or operators, one that can include structural debt/equity elements such as financing leases or capital notes. Public IFS bonds are packaged and issued to the public by a standing public infrastructure investment vehicle (IFSV), whose equity is underpinned by preference shares held by the central and local governments, and whose primary assets consist of primary debt issued by the central and local governments to finance their equity in the IFS projects. Possible enhancements to the bonds to increase demand are canvassed, including retirement derivatives and as way of structuring public private partnerships. The IFS itself can be encompassed in a number of ways: perhaps as an extension of the scope of the NZDMO, perhaps via a consortium of banks or other high grade financial institutions.

Section 5 offers some concluding remarks. It lays out some advantages of the proposed arrangement over existing mechanisms for the issuance and holding of central and local government debt, and for the financing of public infrastructure in general. Risk management aspects are also considered. Discussion extends to topics of institutional evolution, as whether the proposed structure could represent an elaboration of the role of the NZ Debt Management Office, likewise whether the scope could be extended to encompass trans-Tasman partnerships under a CER framework.

The overall purpose of this paper is to stimulate discussion on matters of public concern and economic welfare concerning the completeness of our capital markets, with special reference to long term assets and liabilities. In this spirit, the structures canvassed are put forward as suggestive rather than prescriptive. They indicate welfare improving directions; the complete map might well indicate several alternative roads for getting to the target destination.

2. The economic motivation

Why do we worry about incomplete markets? A capital markets purist might say that without very high grade long term bonds, the financial markets are manifestly incomplete, which means that investors cannot protect themselves against unforeseen adverse states of the world for an adequate horizon into the future. Moreover that they cannot rely on synthesising such instruments from among other securities such as equities⁷; in other words, no spanning instruments exist that might effectively create the long term risk free rate. Insurance companies do offer long term equity based annuities, but there are some impediments in regarding these as ersatz long term bonds. One the longevity risk for the institutions themselves: in an age of financial turmoil, venerable does not necessarily means permanent, as we have seen from the collapses of Equitable in the UK and more recently of Lehman in the US. A second is that annuities are supported by provisions such as GMWB's (guaranteed minimum withdrawal benefits) which in turn are underpinned by equity index put options, which are expensive and have to be charged up to the policyholders. In the absence of a demonstrated appetite for long term bonds, potential issuers are constrained to finance along a portion of the term structure curve that may be temporarily too expensive e.g. because of

⁷ The spanning problem in general is extensively exposted in e.g. Duffie (1992). Note that the CAPM zero beta portfolio has some superficial similarities to a risk free rate, but does not represent a solution to the problem, which has to be multiperiod in nature. In addition an empirical CAPM simply does not exist in the NZ market.

current preoccupations with inflationary expenditure in the economy and the central bank's interest rate targeting.

Macroeconomic stabilisation provides a further context. To the extent that an incomplete market discourages long term personal saving, there is a macroeconomic motivation to improve financial market efficiency. In a small country like New Zealand, we should not be too backward in arranging for the State to come forward and assist in the necessary completion. This is especially so if it ends up creating an environment in which the private sector can play a supporting role, or even in the fullness of time take up the running with similar products.

As a general observation, people need a positive incentive to save and to do so long term rather than from month to month. Taxation concessions are one way to achieve this, and this channel has to some extent been followed by the current government, with the low income tax credit, Kiwisaver and the PIE's as instances. Plenty of scope exists for further development along such lines. We do not have quite the same favourable taxation treatment for long term contractual savings as does the personalised approach of the Australians, where registered private superannuation schemes carry partial deductions of contributions together with concessional tax rates on ongoing fund earnings. But for too many NZ households, saving has been a matter of simply paying the mortgage and relying on the government for retirement income until such time as they are ready to leave the family home.

On this view, the NZ Superannuation Fund (NZSF) is an institutional embodiment of the Ricardo Effect, under which if the government saves, we do not need to do it ourselves as private personal saving. This is one possible reason why our personal savings rates are substantially negative and indeed are the worst in the OECD⁸. From the macroeconomic point of view, the NZSF has turned out to entail other problems. One is that investment losses on the Fund, which are essentially mark to market capital effects on paper, have become part of the government budget bottom line, so if the losses are substantial a government cash surplus can turn into a formal budget deficit; or vice versa for a large mark to market profit on the Fund. While all this is formally correct as an accounting convention, it might induce an approach to public finance that may prove unnecessarily cautious at the wrong time. With such a large stochastic exposure, forward budgeting and planning become more difficult,

⁸ Chapter 3 of Bowden (2008b, *ibid*), contains a graphic illustration of comparative time series of personal savings rates, and canvasses a range of different explanations for why the NZ savings graph lies so far south of the others.

hostage also to a view of the world on the part of the Fund's investment advisers that may well turn out to be wrong.

In the last analysis, market incompleteness is welfare deficient. We do need capital market instruments that encourage people to save, rather than have the government do it for them; and do so by correctly aligning the payoff profile with their lifetime portfolio planning needs. It is the failure of the latter opportunity set that has been associated with the very real distress that has been caused by financial planning gone wrong. One problem for long term financial planning has been institutional confidence. In the old days, one could be confident that taking out a forward annuity or a life insurance policy meant that you or your estate would be able to collect from the same company. Those days are passing; as earlier remarked, institutional longevity has itself become a risk. Even with more established and apparently safer financial institutions, further problems have arisen as to the manner in which mum and dad investors perceive the assurances or commitments that those names are making.

As the newspaper article reproduced in Appendix A graphically illustrates, a long established and regrettable truism of NZ financial life is that it is the older people who suffer when finance companies and credit unions fall in a heap. The financial pressure arises because they need the additional interest income to make ends meet, with much of their capital locked up in the family home they are understandably reluctant to leave. In this respect, things look set to become worse and not better, for with rising food prices and electricity prices, the single person's state pension is hardly sufficient⁹. To be sure, part of the problem is a lack of financial sophistication¹⁰, and a misplaced reliance upon financial advisers who may have their own agendas.

Unfortunately, one of the lessons of history is that there are no lessons from history – some people never learn. But one way of preventing such things happening in the future is to make sure that older people do have recourse to something that is a lot safer, yet is more attractive in terms of the income it can yield. In effect, we should be seeking to shift the apparent risk-expected reward locus to the right¹¹, even if in reality the laws of efficient markets tell us that something or other will have to be given up. The trick is to correctly align

⁹ The current NZ Superannuation rate single person living alone benefit is \$18,084 p.a. before tax, or after tax is extracted at the minimum rate, \$1,239 per month.

¹⁰ As matter of casual observation, there are failures of both information and precaution (failure to completely understand the trade off between risk and expected reward). Older people have in the past even gone for unrated deposits in the 'sevens when triple A rated deposits were available in the 'eights.

¹¹ For any given apparent risk, higher expected reward.

what has been gained and what has been lost with the individual's lifetime consumption and savings preferences.

3. The market for long term bonds

3.1 Definitions

1. The remarks in this paper will concern fixed interest securities, not floating rate notes and the like, which could in principle simply be reproduced by a rolling over of short term bills. Similarly, capital notes typically have an annual interest rate reset, and have junior ranking among the firm's obligations, so on either of these grounds do not come within the current scope. Thus the canonical instrument has a fixed rate coupon payable at regular intervals, say 6 months or annually and will have a principal value payable at some designated maturity date. However, this does not rule out extensions to instruments constructed out of such securities, e.g. zero coupon bonds or coupon strips, which have only a notional principal. Nor would it rule out perpetuities, which have no fixed redemption date.

2. A number of instruments have features either similar to fixed interest bonds or else can be regarded as hybrids of bonds and equity. As noted in section 1, some of these are assuming importance in the NZ capital markets. As another instance, banks are now using special investment vehicles to which they issue preference shares, which carry a fixed nominal yield. The SIV's are in turn funded by bonds issued to the downstream retail fund, i.e. the target investors. The driver in this case is the portfolio investment entity (PIE) taxation regime which allows the retail holder of the downstream fund to cap his or her tax liability at 30%. However, closer examination reveals that these have callable features and/or carry the option on the bank's part to reset the rate at some point down the track. Moreover, the preference shares are in fact part of the bank's capital, and because they are not cumulative, carry a junior ranking in the event of financial trouble. As such, they are best treated as equity and will certainly appear as such to the retail holder of the downstream fund (hence the tax advantage). Similar remarks apply to straight capital notes issued by e.g. Rabobank.

Holding feasibility is also of relevance. Most Kauri bonds are issued under Australian securities law and with less stringent disclosure requirements do not qualify for small scale retail issue in NZ. NZ Banks and corporate investors or funds, are the target market, so that private investor access must in most cases be second hand via one of those intermediaries.

3. As to whether bonds are short or long, this will naturally depend both upon the nominal maturity at the time of issue and the time still left to run if the bonds are to be valued or

transacted at some time prior to nominal maturity. The categorisations used in the London gilt (government bond) markets are a good basis for deciding just what is ‘long’ or merely intermediate:

Shorts -- 0-7 years left to run

Mediums -- more than 7 and less than 15 years to run

Longs -- 15 or more years to run

Undated -- pay a fixed coupon but have no financial maturity date.

On this classification, NZ does not have (to our knowledge) any long dated fixed interest instruments of investment grade. Our government bonds typically do not extend beyond 12 years even at issue, so these are medium term instruments. In this respect the instruments currently denoted as ‘infrastructure bonds’ appear to have little to distinguish them, beyond a statement as to purpose. Kauri bonds also tend to be very high grade, but 10 years has been the effective horizon for these as well, with most around the 3-5 year maturity band; so ‘short’ by the above classification. Local authority stock does not extend much beyond 5 years, for a variety of reasons: funding profiles, perceived liquidity, and the difficulty in obtaining an adequate credit rating for longer dated instruments. Thus NZ local authority stock is no more than ‘short’. As a general observation, local authority stock has been fragmented and expensive in term of both issue costs and necessary yields. Most good quality corporate debentures are also short term. Recent bank bonds are likewise in this maturity band¹². Some Finance companies debentures have in the past been medium term, but in the light of recent events, it would seem unlikely to have many more of these.

3.2 The market for very long dated bonds

In the 1890’s, two thirds of bonds issued in the London capital market bore either 50 or 100-year maturities. But over most of the last century, the issuance of very long bonds diminished and indeed virtually vanished. More recent times, however, have seen a revival, driven by an appetite that certainly exists for long term bonds in major world capital markets. Among the OECD governments, the French, UK and German governments have recently floated 50-year issues. The US government was forced to back down on its 2001 plan to discontinue its longer 30 year issues, with a well subscribed issue in November 2006. The problem in this case was not only investor displeasure, but the fact that the 30 year bond provided the

¹² 2007-8 issuers are ASB with 2011 maturity; BNZ 2013; Westpac 2011; ANZ 2010. As earlier noted, some banks e.g. ANZ-National have issued ‘perpetual’ debt securities but these are in fact subordinated and callable.

physical underpinning to bond futures on the CBOT, which had become extremely popular as an interest rate play. The two graphs in Appendix B show just why, with considerable volatility in the futures price because of the high duration leverage involved.

Some high rated international agencies issue very long dated debt, notably the World Bank and the Asian Development Bank (ADB). The former issues out to 50 years and the ADB to 30 years. In the international corporate sector, maturities of 20-30 year maturities are reasonably common, but in recent years there have been some issues even longer. IBM and Apache both issued 100 year bonds (century bonds) in 1996, while Walt Disney's 100-year issue in 1993 quickly became part of financial folklore as 'sleeping beauty' bonds, taking the fizz out of Coca Cola's 100-year issue in the same year.

The demand for such issues arises in several types of use pattern. Long term bonds are used to underpin the pricing and offering of annuities by insurance companies, and as part of the general portfolio of all types of general insurance companies. In a fund management context, long term bonds are an important asset class as an element of a conservative balanced portfolio, in addition to specialist fixed interest funds. Because of their high duration they are also attractive to active portfolio managers seeking to take a position on interest rates. In the latter respect, it will be noted that duration is an inverse function of interest rates, so very long term bonds acquire extra speculative appeal at such times. NZ long term interest rates remain higher than those of major comparators, even if the margin is not as wide as at the short end, and there is currently plenty of scope for further reductions. So both on coupon income and on duration plays, one might have anticipated that an appetite for very long dated high grade NZ issues might exist among general investors and hedge funds offshore. If it were the case that a futures market became established, this would provide further pricing continuity to the underlying bond itself.

In the meantime, there is considerable evidence of a strong appetite even among NZ investors for longer term debt securities. The April 2008 issue of perpetual subordinated callable securities by ANZ-National was over-subscribed by \$435 m, more than the original base issue. The demand might have been even greater without the callable feature, though of course the interest rate would have been set a little lower.

3.3 Personal finance: Underpinning retirement income

As life tables continue to lengthen, longevity and longevity risk have posed new problems for retirement financing. To be sure, some people are also working longer, but on the other hand

the corporate uncertainties or recent years have also seen more unemployment among the older¹³. Rising old age health costs have imposed their own burden on the expenditure side. The net result is a need for retirement financing that lasts longer than ever before, and caters for longevity risk as well as the expected time to death.

As earlier mentioned, personal retirement income provision for many NZ residents has proved both problematic and expensive in recent times. Ideally, one would want a high grade product with a attractive coupon that can serve as an assured basic tranche to underpin a possibly more adventurous stance on the remaining assets. But one of the problems with high grade long term bonds is that the low coupon is unattractive to retail investors. This is especially the case in NZ where the yield curve has been inverted in recent times, with very attractive shorter term rates available even at call from high grade institutions.

However, in a recent paper, Bowden (2008a) has argued that very long term bonds can be enhanced with embedded derivatives into much more attractive long term savings instruments that might have special appeal to retirees and the baby boomer generation. Annuity structures are an obvious instance, alternatively delayed start coupons. Even with delays of only 5 years, the coupon enhancement can become very attractive (of the order of 10-12% depending on the price structure). If in addition the holder is prepared to sacrifice some of the terminal value then the enhancement become even more attractive. Bequest sacrifice is in fact quite a reasonable proposition for many older people whose children are, or will be better off, than their parents. If the holder can be classified as a cash-based investor, then under NZ tax conventions, the accrual component escapes tax until such time as the delayed coupons begin, making the instrument even more attractive¹⁴. This would constitute a powerful long term savings incentive, whose benefit for the economy as a whole would outweigh a relatively minor loss of tax revenue.

In addition, the volatility inherent in long term bond prices can itself be exploited. Lifetime options can be written so that the holder of the bond, or more correctly his or her estate, gives up a designated proportion of the face value upon death. This amounts to the holder having written a call option on the price of the bond. The option premium notionally received can be built back into a higher coupon while still alive, via a multiplier process in

¹³ It may also be that abolishing the compulsory retirement age has discriminated against rehiring older workers.

¹⁴ There may be more of a tax burden on the other side, as accrual might not be allowed as a tax credit to the issuer of the enhanced bond. This is a potential argument for having the enhancement as a state rather than a private sector role. Note also that for the holder there is a limit of \$100,000 for a cash based investments of this kind.

which options premiums at each round are ploughed back into further units of the bond, upon which further options are written. Even if the implied strike is set at the current price or face value of the bond, the volatility of the bond price can be exploited. The pricing depends upon the age at which the option is written and the relevant life tables as to the ensuing life expectancy. For a 75 year old, with a modal life table conditional expectancy¹⁵ of 10 years, a coupon of 6.6% can be enhanced with zero sacrifice of the nominal principal into one of 7.36%; with 50% sacrifice into 9.14%; and with 100% sacrifice into 14.24%, even without any delayed start feature. To be sure, the holder's estate has lost out if the price at death is greater than the face value. But the reality is that for many older people, their children have achieved financial independence and the need for a bequest is correspondingly diminished. Even for retirees better placed with their finances, the availability of an underpinning facility of this kind will enable a tiered approach to portfolio planning: once the basics are in place, then by all means get more adventurous with the surplus. Bowden (2008a) has examples of both option and delayed annuity enhancements.

Enhancements of this kind have to be credible; which in turn requires that the underlying instruments exist, that they have reasonable liquidity, and that both the bond issuer and the enhancing institution will still be around in twenty years time. The next section takes up this aspect.

4. Infrastructure financing

As earlier indicated, the infrastructure funding vehicle (IFSV) is a special purpose vehicle that takes in primary securities on a wholesale level and repackages these into retail form, with maturities, enhancements, and other terms, directed towards both marketability and the special needs of retail holders. Figure 1 is a summary overview of the fund itself; more detail is provided in what follows.

¹⁵ Calibrated off the official 2002 NZ Life Tables. The entire conditional life density is used, not just the modal peak, which is quoted just to illustrate that 75 year olds still have some way to go before they can expect to shuffle off this mortal coil.

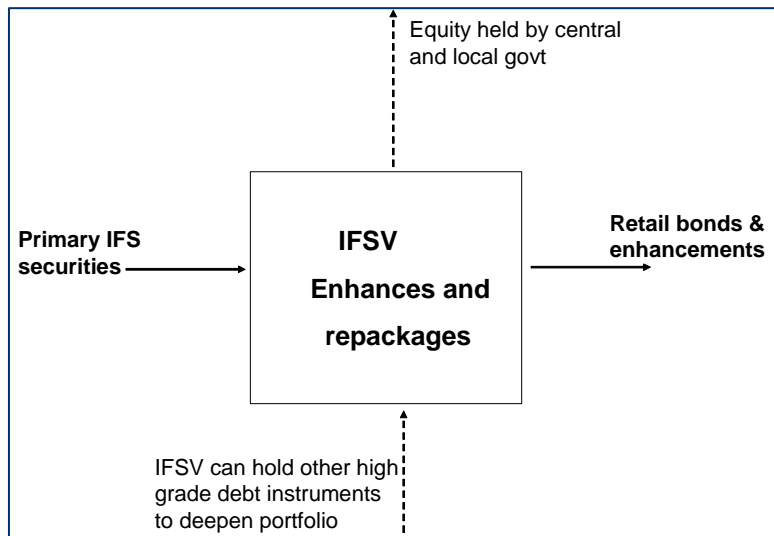


Figure 1: IFSV – summary overview

The IFSV is itself embedded within a more embracing financial structure that encompasses the way that the IFS projects are themselves financed. What follows is a description of the capital structure, funding, and income flows of a proposed special purpose entity established for the purpose of facilitating IFS development and of ancillary structures concerned with IFS financing. Comments concerning how the IFSV might be established and its relationship with existing government financial institutions appear in section 5. The discussion that follows is supported by two diagrams. Figure (2a) depicts the capital structure and the different agents, and figure (2b) the flow of dividends and interest.

4.1. Funding flows and capital structure

Special IFS funding vehicle

An Infrastructure Special Investment Fund Vehicle (IFSV) is established to assist the debt funding of larger NZ infrastructure projects (such as the projected Auckland Harbour tunnels), reaching in the process a wide range of investors. To initiate funding for a specific project, the NZ Government and participating Local Government Authorities (e.g. Auckland Regional Council and Auckland City Council) would contribute capital backing to the IFSV through the purchase of non-cumulative perpetual preference shares in the IFSV.

Debt Funding

Debt funding for infrastructure projects is provided through Public Infrastructure Bonds. Very long-dated bonds would be issued by the NZ Government; ideally 30 - 50 years, though

one could make a start at 20 year. Participating local authorities would issue medium dated infrastructure debt (6 -12 years). Such bonds could be purchased directly by wholesale market participants, but many would become assets of the special infrastructure investment vehicle (henceforth IFSV). Alternatively, the government-local bodies might issue a series of shorter dated bonds, which would be repackaged by the IFSV into a mix that includes longer dated debt instruments for onward sale to the public, as below. This does raise risk management issues for the IFSV that are considered in the next section.

The IFSV would in turn fund its assets through the offer of debt instruments, which may in turn be backed by specific assets or asset classes, in a range of credit tranches and maturities attractive to a targeted variety of market participants. Credit ranking for the IFSV would generally be high, given the strong asset quality together with the above capital backing from central and local government.

Infrastructure Equity funding

Equity funding for the specific infrastructure projects would come from three sources:

1. NZ Government
2. Participating local authorities
3. Private partners.

The equity funding from NZ Government and the local authorities would be ‘permanent’ shares, while that of the private partners would be in the form of long-to-medium term structured capital notes (say, 20 years), with amortising principal. For a project such as the Auckland Harbour Tunnel, the private partners would progressively be paid out with replacement capital contributed largely by the participating local authorities, although additional capital could be provided by the NZ Government. This could be structured via amortising capital notes, or else as a financial lease. In the first arrangement, the specific IFS holding company (e.g. Auckland Harbour Tunnels Ltd) would issue amortising capital notes to the private partner. In the second, the private partner would be the lessor for a block of equity and would again be progressively paid out by the public partners.

4.2 Income and financing flows

Central government

The NZ Government would receive dividends on its holding of preference shares in the IFSV (from asset cash flows) and on its equity in the specific infrastructure asset holding company

(funded by tolls or ‘rent’). In turn, the NZ Government would pay interest on its outstanding infrastructure bonds, funded by current tax receipts.

Local Authorities

The participating local authority would receive dividends on its holding of preference shares in the IFSV (from asset cash flows) and on its equity in the infrastructure asset holding company (funded by tolls or ‘rent’). In turn, the local authority would pay interest on its outstanding infrastructure bonds, funded by this together with current council tax receipts.

The local authority could increase its equity holding in specific infrastructure assets over time by a funding arrangement such as a financing lease, or as an end result of the amortising capital notes issued to a private partner by the specific asset holding company, effectively buying out the private partner as the capital notes progressively amortise.

Infrastructure IFSV

The IFSV would receive interest payments from the issuers of its bond holdings (i.e. NZ Government and local authorities). It would pay dividends to its preference share holders and interest to its own (IFSV) debt holders.

To summarise, the IFSV is set up as a holding and repackaging centre for the primary long term debt issued by central and local government to finance its equity in specific infrastructure projects. It finances this by issuing its own asset backed securities to the general public. The IFSV debt may in turn be enhanced in targeted ways, such as coupon strips, zero coupon or delayed start coupon bonds, or lifecycle derivatives for retirement income. The IFSV would derive enough margin income from such activities to finance its repacking of its source government/local authority bonds at no yield penalty to the latter originators.

CAPITAL STRUCTURE AND INITIAL FUNDING

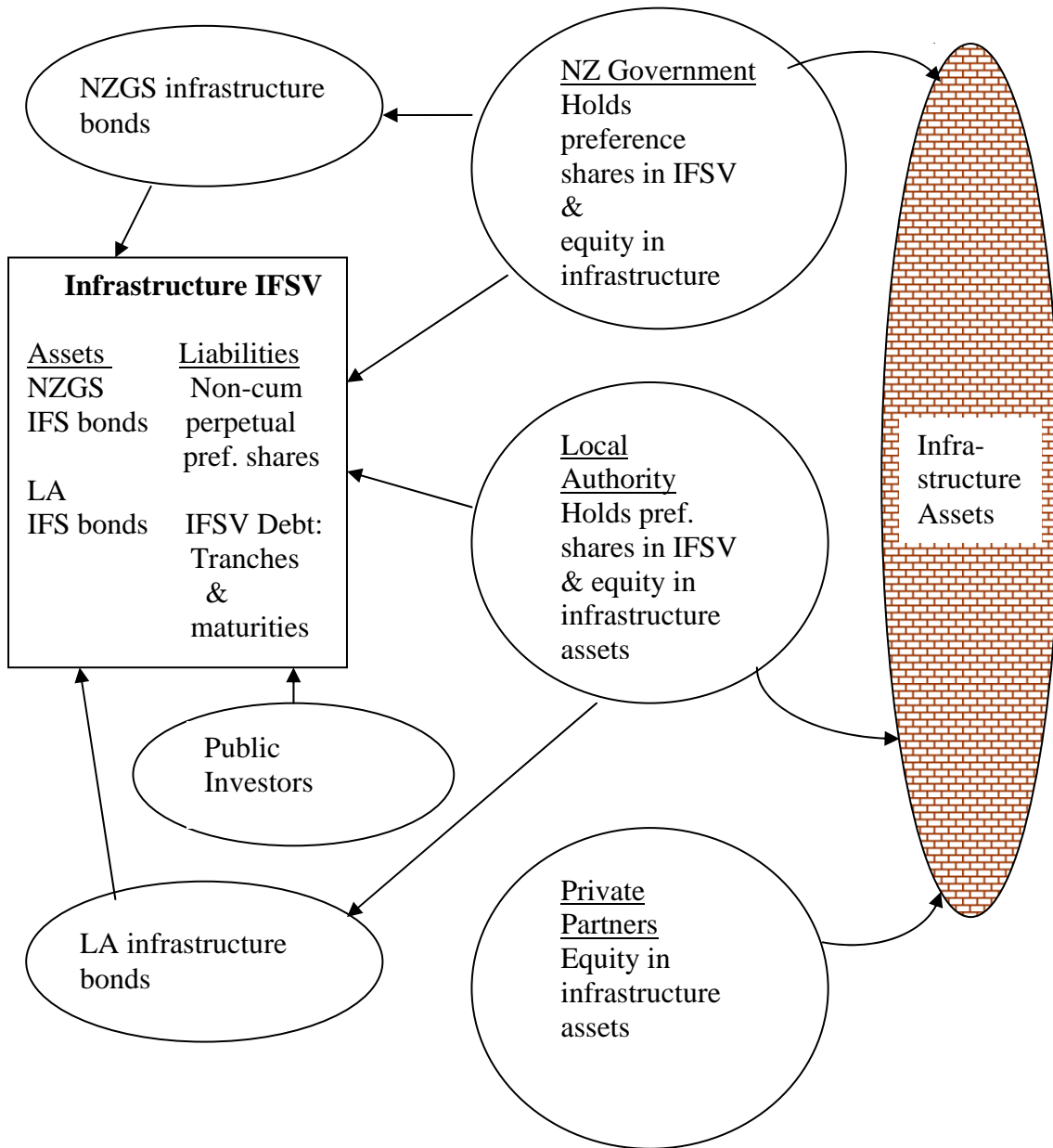


Figure 2a: Capital structure and funding flows

DIVIDENDS & INTEREST

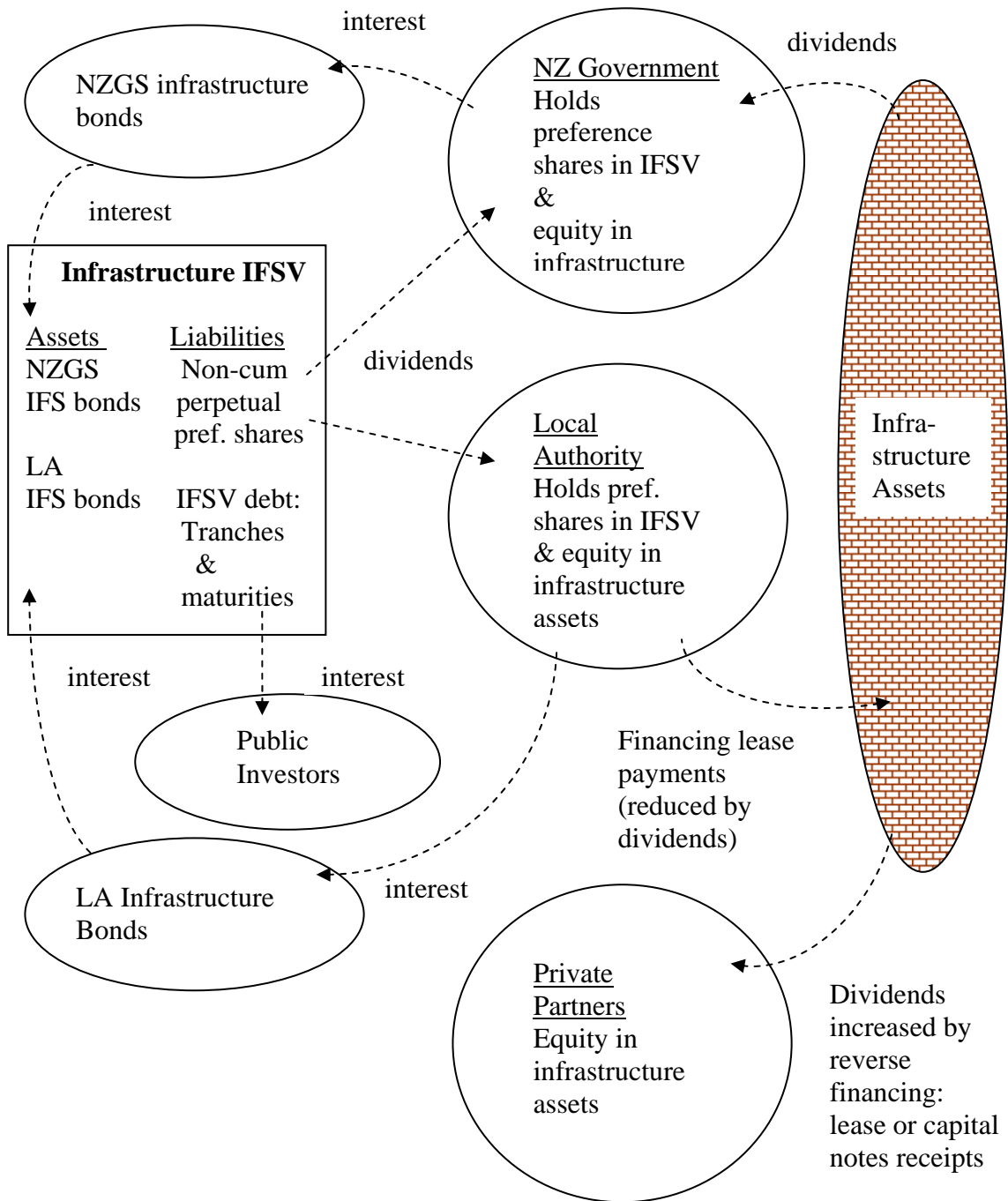


Figure 2b: The flow of dividends and interest

5. Concluding remarks

As every scrumhalf knows, being small is not such a disadvantage if you recognise that there is a problem and even take advantage of it. A small country can rise above the limitation of market size by devising structures more directed along desired dimensions of economic and financial system development. The financing structures of section 4 have been designed with this in mind. The proposed IFSV vehicle is a gathering and repackaging point that:

- (i) Is underpinned with equity capital from both local and central governments;
- (ii) is incentive compatible (default means that the equity shareholders themselves lose);
and
- (iii) enjoys a high credit rating as a consequence.

A government-backed IFSV is in a stronger position to offer the long dated bonds that our system needs, not least to underpin savings and the private provision of retirement income. The same IFSV could itself enhance its long term debt with retirement products such as annuities or lifecycle options. Alternatively, the enhancement can be carried out by banks or insurance companies which have credit status high enough to provide some assurance that they will be around for quite some time to come.

The IFSV arrangement has a number of advantages over the direct issue of central or local body debt, which may be summarised as follows.

- (a) It underpins both by acting as a true intermediary, funnelling the savings of many small investors that would not otherwise go directly into the government or semi-government securities or to the same degree.
- (b) It enhances the credit of participating local authorities improving the cost at which the latter can issue their own debt. Because the IFSV would be a significant holder, this constitutes a source of review and discipline on debt programmes of the local authorities.
- (c) By the same token, the local authorities might now be able to mount longer term debt, knowing that a market base would exist in the form of the IFSV.
- (d) It can restructure its own asset - backed securities into more marketable maturity and credit tranches that need not precisely mirror the primary debt that underpins them.

- (e) The IFSV can offer enhancements to its debt that increase the market appeal to targeted audiences, such as retirees (via lifecycle derivatives), insurance companies (coupon strips) and hedge funds (the residual zero coupon bonds).
- (f) The IFSV is a more visible ‘one stop, one shop’ point of contact and marketing to local and offshore investors.
- (g) The IFSV is part of a more embracing structure that represents a more efficient way to finance and own infrastructure assets. Structures such as financing leases or amortising capital notes represent ways that local authorities can, if they so desire, gradually increase their holdings of the IFS asset; while the private partners, if they wish, can gradually divest themselves in the pursuit of further opportunities.
- (h) A NZ based IFSV would be a suitable cooperative vehicle for a Trans-Tasman IFSV (see below).

Risk management

With long dated bonds, risk management is going to be an issue. A drawback to very long dated bonds is that the issuer ends up with expensive finance or mark to market losses if interest rates subsequently drop. One or two buffers do exist. If the long dated bonds are issued by the owner of the IFS, then lower interest rates would increase the economic value of the infrastructure concerned. Likewise, the equity component of the IFSV, which has very long duration, would also serve to buffer mark to market losses on its debt. Discussions with the NZDMO suggest that the government recognises the asset-matching duration argument.

Nonetheless, an exposure would continue to exist for the IFSV itself, even if its precise magnitude is debatable. To be sure, it will be holding long dated assets (the underlying government stock) to offset long dated liabilities to its investors. But because liquidity in NZ will not be all that high in this maturity band, the IFSV will have to supplement with shorter dated stock. A common recourse is to swap long dated liabilities into floating, which in the present context would entail a chicken and egg problem, because swaps of this kind are predicated on the existence of long term physical debt to underpin the market. Alternatively, the IFSV could buy ten year futures with appropriate delta or vega hedging. The difficulty here is that NZ does not have an active bond futures market of any maturity. A possible recourse is to access the Australian ten year futures market with an OTC currency swap added to protect the currency exposure. Basis risk would become a problem, with the effective use of Australian interest rates to hedge NZ interest rates. The most obvious solution in this

aspects is a common currency, which automatically also means a common interest rate policy. The common financial market aspect is considered further below. Another way to ensure that the IFSV has adequate depth and liquidity in its asset portfolio is to allow it to hold high quality long term offshore bonds. Hedging back to NZ dollars via forwards or swaps will ensure that the yield remains comparable with NZD denominated debt.

Institutional arrangements

The present paper does not consider institutional arrangements in any detail. In particular, one should not rule out the IFSV as being evolutionary from current arrangements, rather than a completely *de novo* incorporation. In this respect, the NZ Debt Management Office might be a natural institutional departure point. There would be some saving in transactions costs relative a *de novo* quango. The NZDMO could in the meantime test the waters with an initial 20 year issue carrying enhancements along the lines earlier suggested. The National Superannuation Fund is potentially another channel, though conflicts of interest might arise in this role.

Australasian perspectives

Issuing a special class of bonds to finance infrastructure has also been discussed from time to time in Australia. The 2006 Allan Inquiry report into the Financial Sustainability of Local Government in New South Wales flagged a \$6.3 billion shortfall in regional infrastructure funding, projected to grow to \$14.6 billion by 2021. In early 2007 the Wollongong City Council, faced with its own financing pressures, proposed federal tax incentives for investors in designated infrastructure bonds, and floated also the idea of a cooperative issuance vehicle.

A more embracing possibility is to extend the scope of the IFSV to Australasia via a regional arrangement with the Australian federal and state governments, perhaps within the CER framework. To fully take advantage of economies of scale and of market, a common currency would be ideal. Indeed as earlier noted, the common interest rate derived from a common currency would make hedging easier for even a wholly NZ based IFSV. Indeed the common financial market is a powerful argument for a common Tasman currency, in addition to those canvassed in Grimes et al (2000). In the meantime, however, there would be nothing to stop such a supranational entity from issuing in either or both AUD and NZD.

The present paper has the nature of a scoping proposal; a proposition cast as a suggestion. Plenty of points of detail remain and it may well be that alternative structures can be devised to the same general purpose. But whatever its shape, and whichever way it is to be

kicked, it is important that some one at least makes the effort to get the ball into play for the long term.

Appendix A

The imperative for yield enhancement -- and the all too common outcomes

The newspaper article reproduced below is unfortunately not all that atypical, even if rather bizarre in the circumstances. To be sure, there is, in the last analysis, no recourse against bad judgment or misinformation. The point is that in country as small and closely knit as NZ, the investment opportunity set and information flows should be better. By the same token, it is possible to argue that there is an enhanced duty of care to make sure that large numbers of people are preserved from having to make errors of this kind.

'A widow who thought she had bought a central Auckland apartment through Blue Chip has discovered she actually invested in a carpark next door. She also found she does not have title to the carpark.

The 70-year-old Bay of Plenty woman, who does not want to be identified, said she and her family went to visit unit 404 at 22 Emily Place before investing in May 2006. Her son owned an apartment in the same street, so she was familiar with the area. The apartment was to be refurbished and rented out for short stays, she said, and was empty at the time she viewed it.

Despite her lawyer being against the idea, she followed the advice of a Blue Chip adviser friend and took out a \$181,000 mortgage on her family trust-owned home to invest in a Blue Chip joint venture. She received a \$400 monthly "procurement fee", and Blue Chip covered the \$1300-a-month mortgage. "It was going along nicely, and I thought, 'Oh well, I'm set for retirement'," she said.

Last October, the procurement fees stopped. By February, Blue Chip had stopped paying the mortgage. The woman has since been forced to cover it. When the payments stopped, the family looked into taking over the apartment and renting it out themselves. The woman's son went to see the building manager and discovered that the apartment had been owned by a man on Waiheke Island for the past two years. The Waiheke owner confirmed he had refurbished the apartment and had had tenants in it for 18 months.

The son then checked the certificate of title on the sale-and-purchase agreement for unit 404 which his mother held, and found it referred to a carpark on the next-door property. Quotable Value records show that site is owned by Ile My Ltd, a company associated with Blue Chip co-founder Mark Bryers.

The woman said there was no mention on the title of the family trust that owns her home, or of the trustee company she was required to set up to make the Emily Place investment. "I don't own anything. What I've got I've earned and worked for, and now it's going down Blue Chip's drain."

Blue Chip was to develop a 149-unit apartment building in Emily Place, and the future apartments were being sold through a company called Becroft, which is now one of the 22 Blue Chip companies in liquidation. Liquidators Meltzer Mason Heath have said the development is not proceeding, and any claims for funds owed need to be made against Becroft.

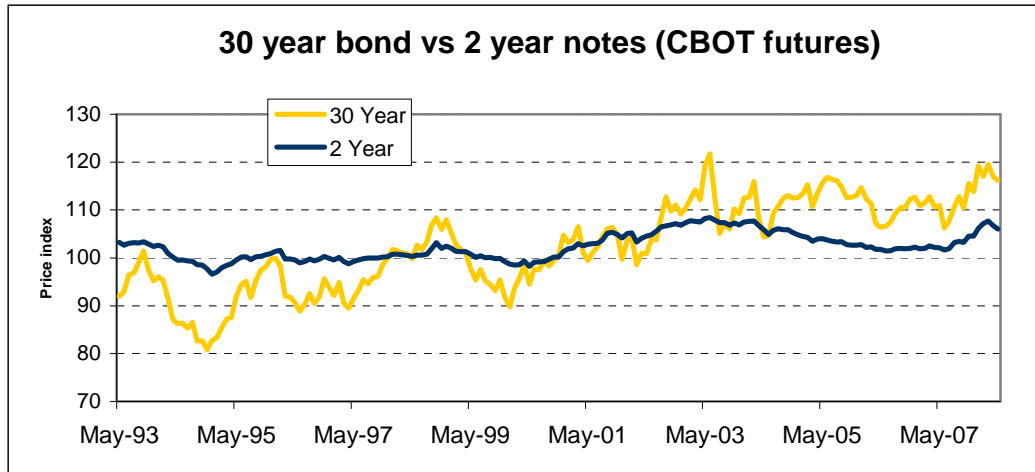
The woman's Blue Chip adviser friend referred her to Auckland property lawyer Zeljan Unkovich, who acted for her on the investment. Mr Unkovich said yesterday that he did not know how the mix-up could have occurred, and believed the woman was mistaken in thinking she had invested in an existing apartment.'

NZ Herald, 13 May 2008

Appendix B

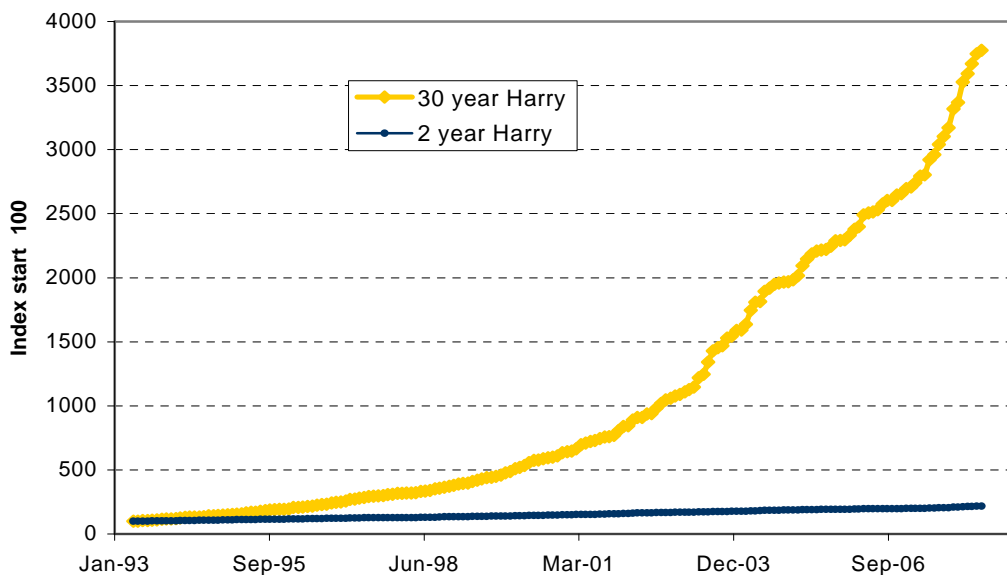
Illustrating the volatility of long term bond futures

The first graph shows the price history of 2 and 30 year CBOT bond futures.



The second graph shows how the long term contract multiplies up the potential for capital gains, by imagining that each month Harry Foresight makes the correct call as to direction (up or down) and goes long or short appropriately.

The fortunes of Harry Foresight



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