PwC Treasury Broadsheet

Quarterly newsletter of snippets and stories from the world of treasury management - published by PwC Treasury Advisory

5 August 2015

Corporate credit spreads have grinded higher

In our December 2014 and March 2015 editions of Treasury Broadsheet we recommended refinancing committed term debt on the belief that credit margins had reached their sustainable floor and that pricing levels would not fall further. That view has broadly materialised with spreads on NZ 3-year BBB rated corporate debt having risen on average by 8bps since March 2015.

NZD 3-year BBB credit spreads are now around 113bps above 3-year swap rates (Chart 1). The increase was a result of a rise in global credit spreads albeit the widening in NZ spreads has been less pronounced than its major trading partners. Since December 2014 BBB corporate spreads have risen 17bps in Australia, 21bps in the United States and Europe, and a whopping 66bps in China on the back of a 20% fall in Chinese equity markets in June 2015. Although current spreads are roughly in line with fair value analysis we see limited opportunities for material improvements over the remainder of 2015.

Despite the recent rise in spreads, we are still recommending to clients to extend their weighted average maturity of debt as banks are still actively seeking to secure/ grow their balance sheets and spreads remain well below their average for the last 5-years (3-year BBB average c+140bps)

We are inclined to reiterate our March 2015 comments. "The timing is excellent to lengthen maturity, improve or renegotiate terms and conditions within your existing loan documentation in the midst of a competitive pricing environment"

Chart 1 - NZ, AUD, EUR, USA, CNY BBB spread to swap June 2011-July 2015

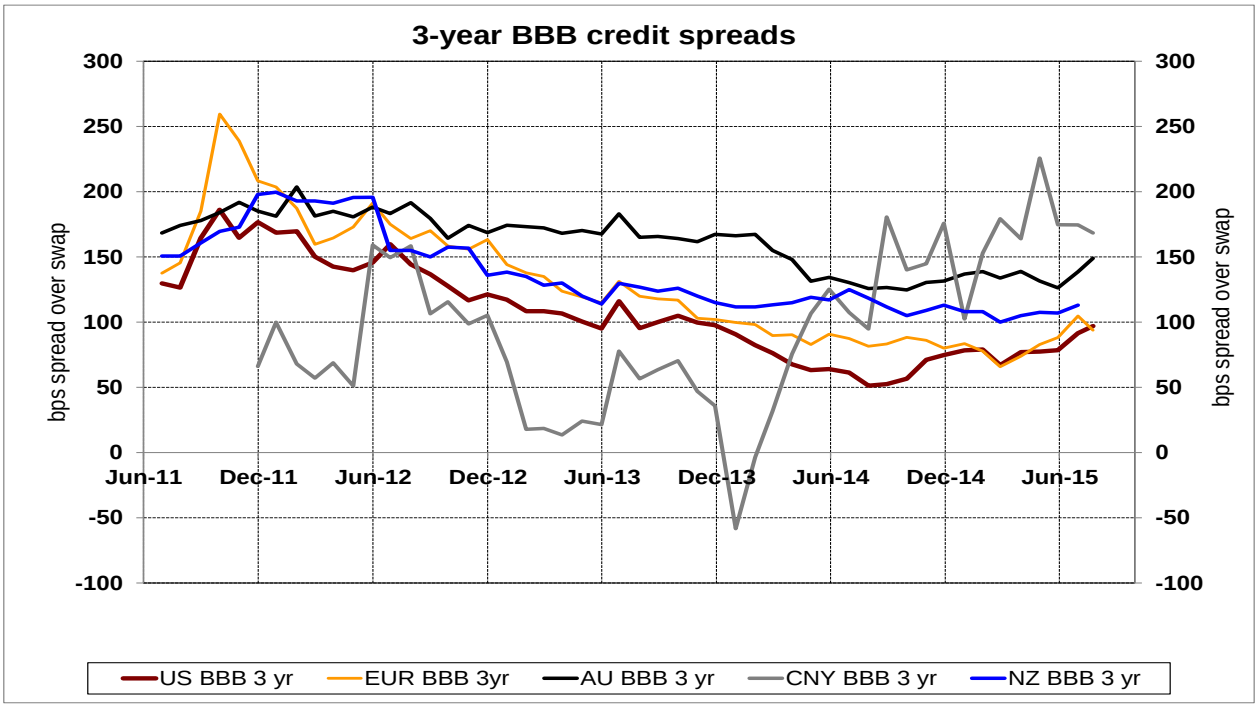


Table 1 - BBB Spreads over swap for NZ, AUD, EUR, USA, and CNY and BBB relative spreads NZ versus AUD, EUR, USA, and CNY

Date	NZD	AUD	EUR	CNY	USA	NZD v AUD	NZD v EUR	NZD v CNY	NZD v US
31/12/14	108	137	84	102	81	-29	+24	+6	+27
31/3/15	105	139	74	164	77	-34	+31	-59	+28
31/7/15	113	143	94	168	98	-30	+19	-55	+15

What are the risks to deterioration in corporate credit spread?

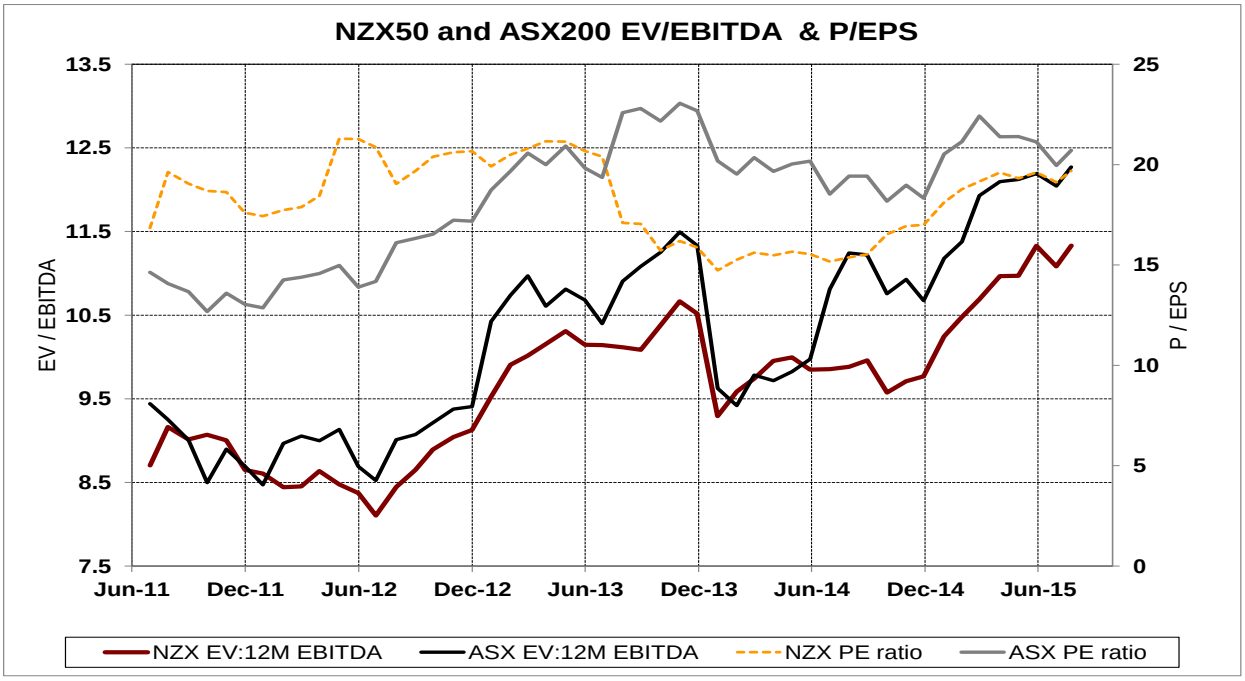
While we see no deterioration in credit spreads as imminent given the amount of excess liquidity and low global default ratios, we are mindful that risks to the downside still remain. Standard & Poor's view an intensification of the Chinese property correction and emerging market weakness on an adverse market reaction to the Fed's process of monetary policy normalisation as the key risks that might adversely impact investment, economic activity and ultimately non-performing loans. (."Navigating a Delicate Balance in Asia-Pacific: China Growth, Credit Risk and Increased Market Volatility 13 July 2015)

These events could introduce short-term funding stress due to capital outflows affecting those economies that have large external and fiscal deficits.

Current pricing places a low probability of these events occurring with a degree of optimism already priced into corporate earnings forecasts and equity valuations for 2015-2016. Enterprise Value (EV) / EBITDA (a measure of the cost of acquiring a firm versus its current earnings) are at 7-year highs for the ASX 200 (12.3X) and 12-year highs for the NZX 50 (11.3X)

Forward P/EPS multiples are also implying healthy growth in corporate earnings despite free cash flow per share for both the ASX 200 and NZX 50 having deteriorated sharply over the last 6-months. Consensus forecast for EPS growth for 2016 is 6.7% on the NZX50 despite ANZ Business Confidence Survey being at its weakest since 2009 and global lead indicators stalling.

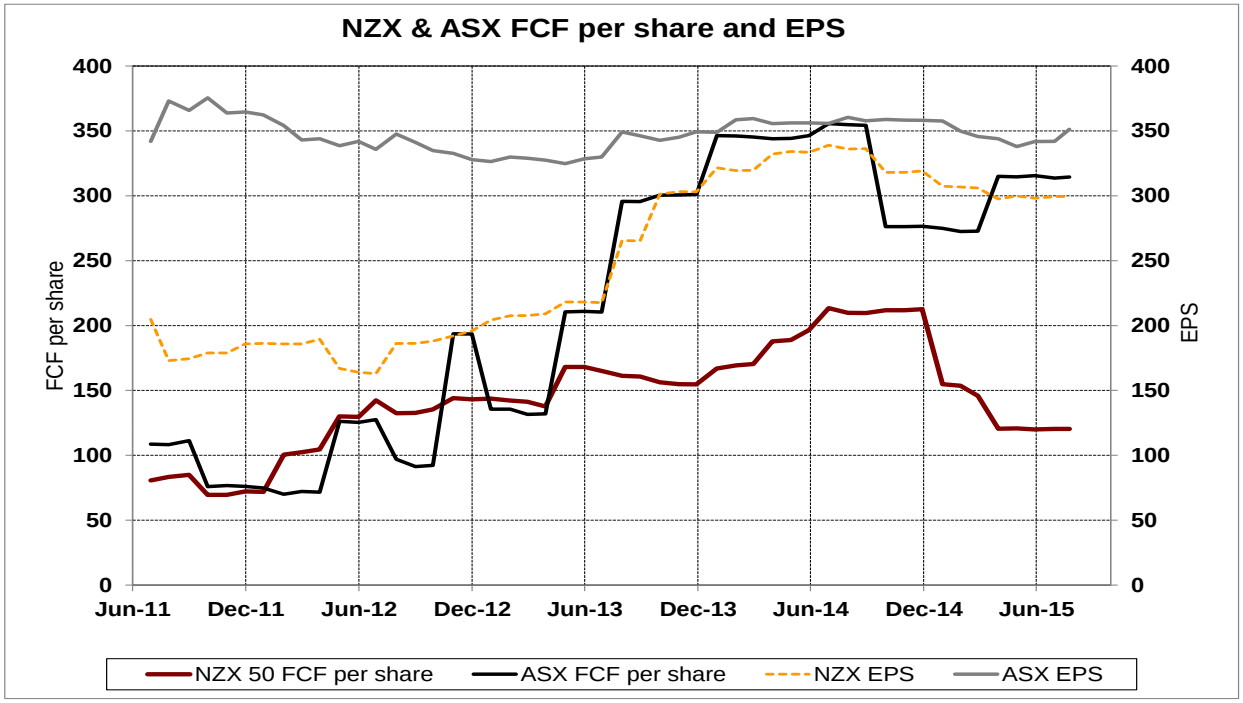
Chart 2 - NZX50 and ASX200 EV/EBIDTDA and P/EPS multiples June 2011- July 2015



ASX200	Jul-15	Dec-15	Dec-16	Dec-17
P/EPS	20.6X	16.0X	14.6X	13.0X
EV/EBITDA	12.3X	10.3X	9.3X	8.5X

NZX50	Jul-15	Dec-15	Dec-16	Dec-17
P/EPS	19.6	18.0	16.5	15.9
EV/EBITDA	11.3	10.3	9.6	9.3

Chart 3 - NZX50 and ASX200 Free cash flow per share and EPS June 2011- July 2015



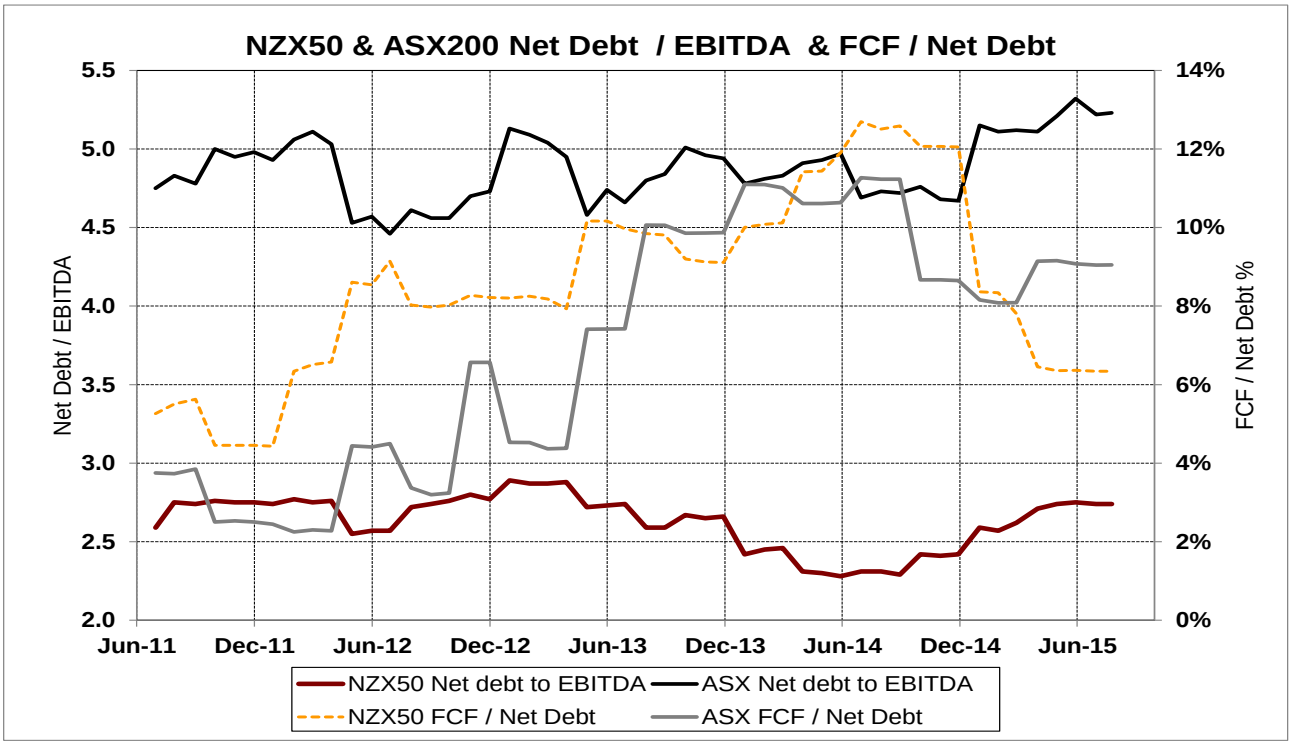
ASX200	Jul-15
EPS	$350.9
FCFPS	$314.1

NZX50	Jul-15
EPS	$318.1
FCFPS	$120.3

Should earnings growth not materialise, lending margins could feel the brunt of debt capacity constraints in NZ and Australia. The ASX 200 average Net Debt / EBITDA ratio of 5.2X is back at 5-year highs and although a Net Debt / EBITDA ratio of 2.7X for the NZX50 is not high by historic standards it has been trending higher and has been accompanied by a sharp fall in free cash which has seen the average FCF / Net Debt ratio decline by 6% over the last 6-months.

Consensus forecast for both the ASX 200 and NZX 50 over the remainder of 2015 and into 2016 is for an improving Net Debt / EBITDA ratio- in part -underpinned by a constructive view on earnings growth. Any shocks to earnings and especially cash flow generation could lead to ongoing weakness in these ratios which would eventually work its way into higher lending margins.

Chart 4– NZX50 and ASX200 Net Debt / EBITDA and FCF / Net Debt June 2011- July 2015



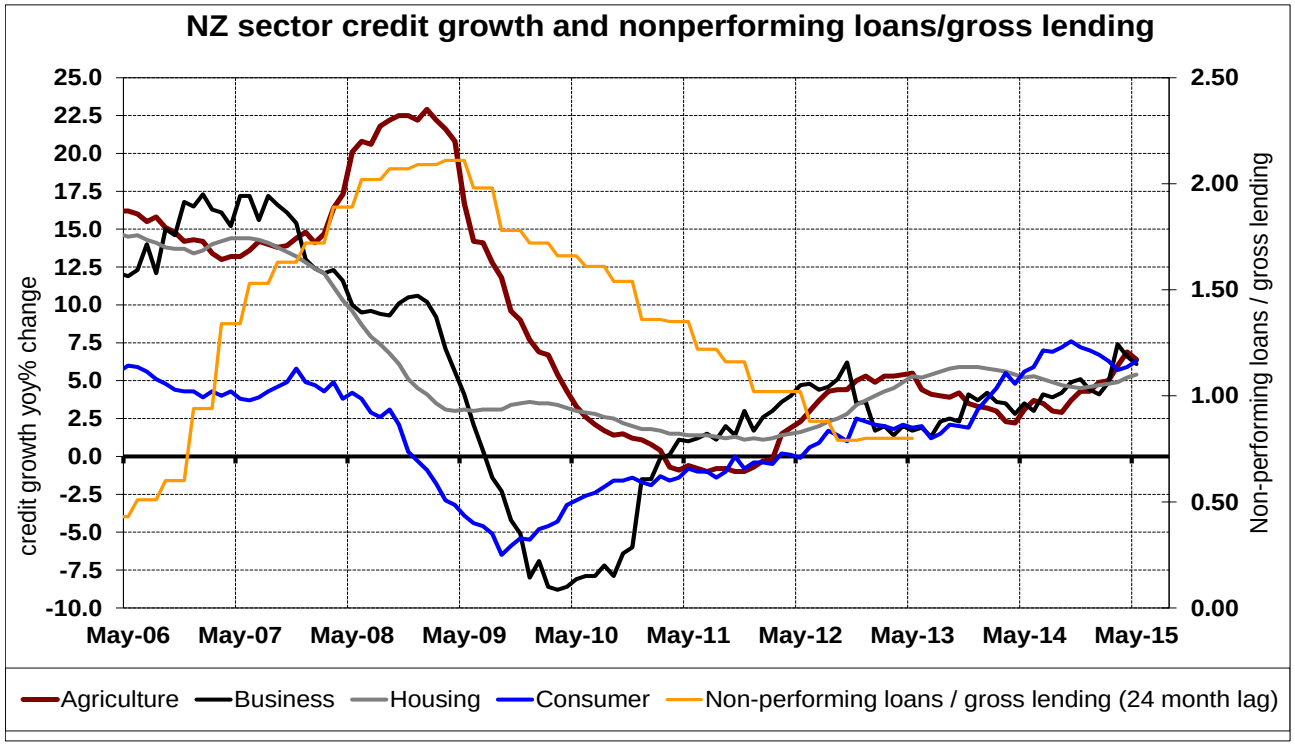
ASX200	Jul-15	Dec-15	Dec-16	Dec-17
Net Debt / EBITDA	5.2X	4.6X	4.3X	3.9X
FCF / Net Debt	9.0%			

NZX50	Jul-15	Dec-15	Dec-16	Dec-17
Net Debt / EBITDA	2.7X	2.4X	2.3X	2.3X
FCF / Net Debt	6.3%			

Issuers on negative outlook or CreditWatch negative for S&P as at June 2015 still outnumbered positive ones on aggregate, resulting in a net negative bias of 8% of total issuers. The strength of the negative bias varies by sector with the telecommunication sector improving, while weakness was seen across cyclical industries (transportation, real estate developer, diversified, chemicals, gaming media, entertainment oil and gas metals and capital goods (6%) industries.

An economic slowdown in China continues to be a key risk with any material property adjustments likely to have significant flow on effects for the heavily indebted property sectors in Australia, New Zealand. Although this is not our base case scenario we would expect to see non-performing loans start to rise in line with recent weakness in dairy and the historic lag to growth in credit aggregates in recent quarters.

Chart 5 –Non performing loans to gross lending (lagged 24 months) versus credit growth aggregates



Summary

As such the balance of risks still lean toward unanticipated rises in credit spreads rather than material falls over the remainder of 2015.

This supports the view that timing is excellent to lengthen maturity, improve pricing and to renegotiate security and covenant terms with your banking partners.

Long-term Foreign Exchange Hedging – Rules of Engagement

Over the years, as specialist foreign exchange advisors, we have seen many exporting companies in New Zealand "shy-away" completely from any form of long-term foreign exchange hedging on the NZ dollar i.e. forward hedging beyond two years and out to five years forward.

The reasons cited by both company management and Board Directors for their reluctance to enter such long-term hedging contracts are many and varied:

- "We use up too much credit limit with our bankers with such long-term derivative contracts" or "The banks do not allow us to hedge beyond 12 months!"
- "We do not have a budget or a business forecast with future foreign currency receipts going that far out, how could we contemplate hedging a risk we do not yet have!"
- "We manage our financial affairs from one financial year to the next and have no motivation or incentive to commit ourselves to derivative contracts that bind the company for multiple years".
- "Hedging exchange rates is too risky and some economists are forecasting the NZ dollar to depreciate a lot further. If that occurs we would have locked-into rates above the market".
- "We are uncomfortable with the potential negative marked-to-market revaluation loss on the hedge contracts if the NZ dollar subsequently depreciates further, below our hedged rate".

Credit limit constraints from the bank are a valid reason for being unable to hedge currencies beyond two years. However, it is the exporting company's responsibility to bring their bank lenders with them in understanding the sensitivity and materiality of FX movements on the company's financial performance. If the Board Directors (representing the shareholder's long-term interests) deem it prudent to hedge a percentage of future three to five year export sales forward and approve a FX Risk Management Policy accordingly, then the onus is on the company management to have the banking dealing limits in place to transact the hedges. Some banks have blanket credit policies that limit the term of currency hedges, which indicates that the bank lender is not as closely aligned with the financial risks/performance and the interests of the of the company as they should be.

Treasury Policies that include "conditional" FX hedging limits that allow hedging out to three and five years forward are typically only for a maximum amount of 25% to 50% of each year's forecast foreign currency receipts. Therefore, the argument that there is no forecast that far forward (thus imprudent to hedge) does not wash, as 25% of 50% of the last year's actual flows will suffice as an estimate of the future exposure. The risk of over-hedging, even when foreign currency sales may decrease in the future is still low.

Long-term hedging is not appropriate where a company is exporting a commodity that has its USD price correlated to the NZD/USD exchange rate. It is more appropriate for exported manufactured products where it is difficult to achieve product price increases in the marketplace when the NZD appreciates. It is always interesting to observe that our exporters invest long-term in marketing, product development , distribution logistics, manufacturing process and people into the markets they are selling into and then often do not match that financial investment with appropriate long-term currency hedging policies and practices to corral the financial risk.

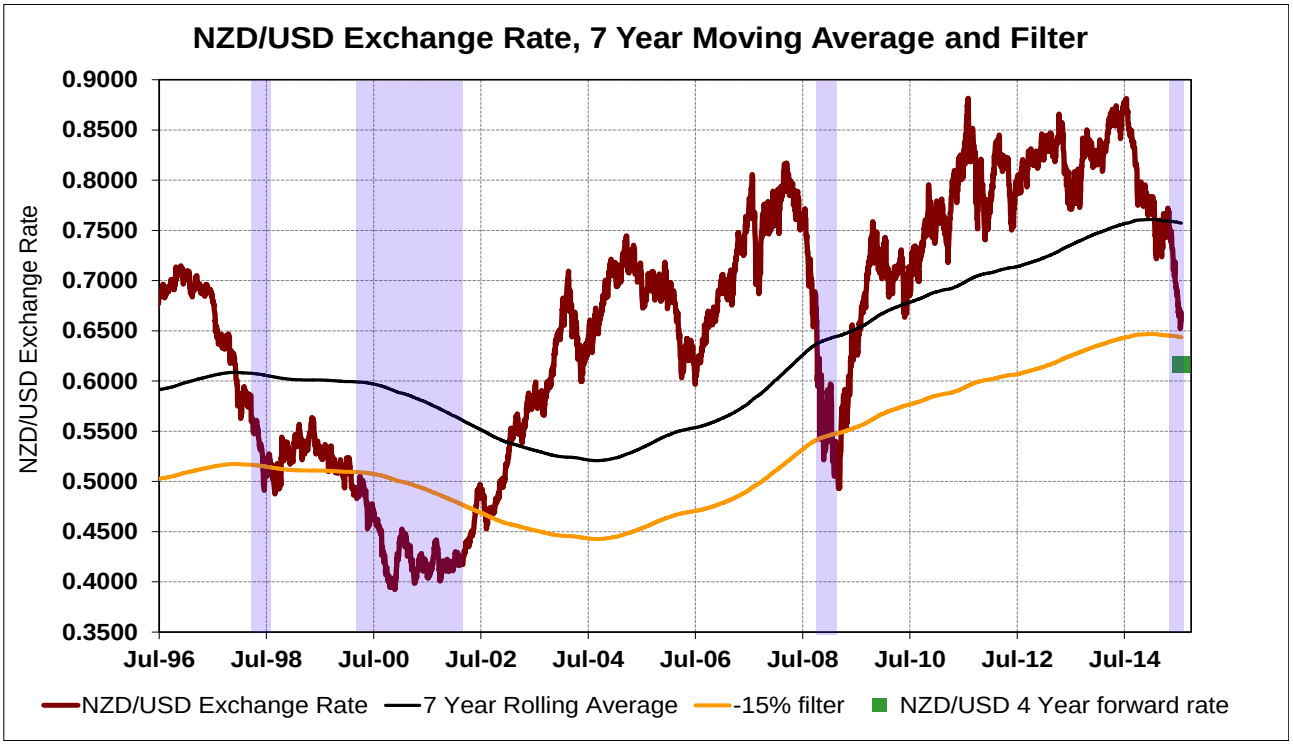
Fear of unrealised "marked-to-market" revaluation losses with the company's bankers is not a valid reason not to hedge longer term. If exporters reject long-term FX risk management on this basis they would never hedge anything and expose the business and shareholder returns to unnecessary volatility through the gyrations of the market spot rate.

Reliance on someone else's FX rate forecasts (which are invariably very changeable!) is not prudent financial risk management either. Including conditional filter-tests as part of the hedging limits that trigger the opportunity to hedge long-term when the NZ dollar is at a cyclical low (based on historical average FX rates) is a more proven and pragmatic approach (in the absence of anything superior). Successful foreign exchange risk management requires strategic discipline that has to be distanced from short-term emotion and sentiment.

The chart below applies a "15% below the 7-year average" filter-test to the NZD/USD exchange rate movements over the last 20 years. The conditional hedging is triggered when the 4-year forward rate is more than 15% below the 7-year rolling average. Strict application of the long-term hedging trigger mechanism would have protected USD export receipts very well against the subsequent NZD appreciation in 1999, 2002 to 2004 and 2009 to 2012

Exporters, who do have long-term currency hedging policies, normally restrict the amount that can be hedged with forward exchange contracts and collar option contracts, however allow higher percentages with purchased NZD call options (often entered for shorter terms than the underlying exposure and "earmarked" to the exposure dates). Entry tactics are also important for such hedging; averaging-in to the desired amount of hedging is advisable. No-one can pick the bottom of any currency down-cycle, however entering such long-term hedges on the way down is usually easier than waiting to have the bottom confirmed and hedging on the way back up.

Like any multiple-year financial commitment, analysis and advice is needed on the cashflow, accounting, taxation and credit limit implications.



NZ Wholesale Investors to Re-orientate the Compass

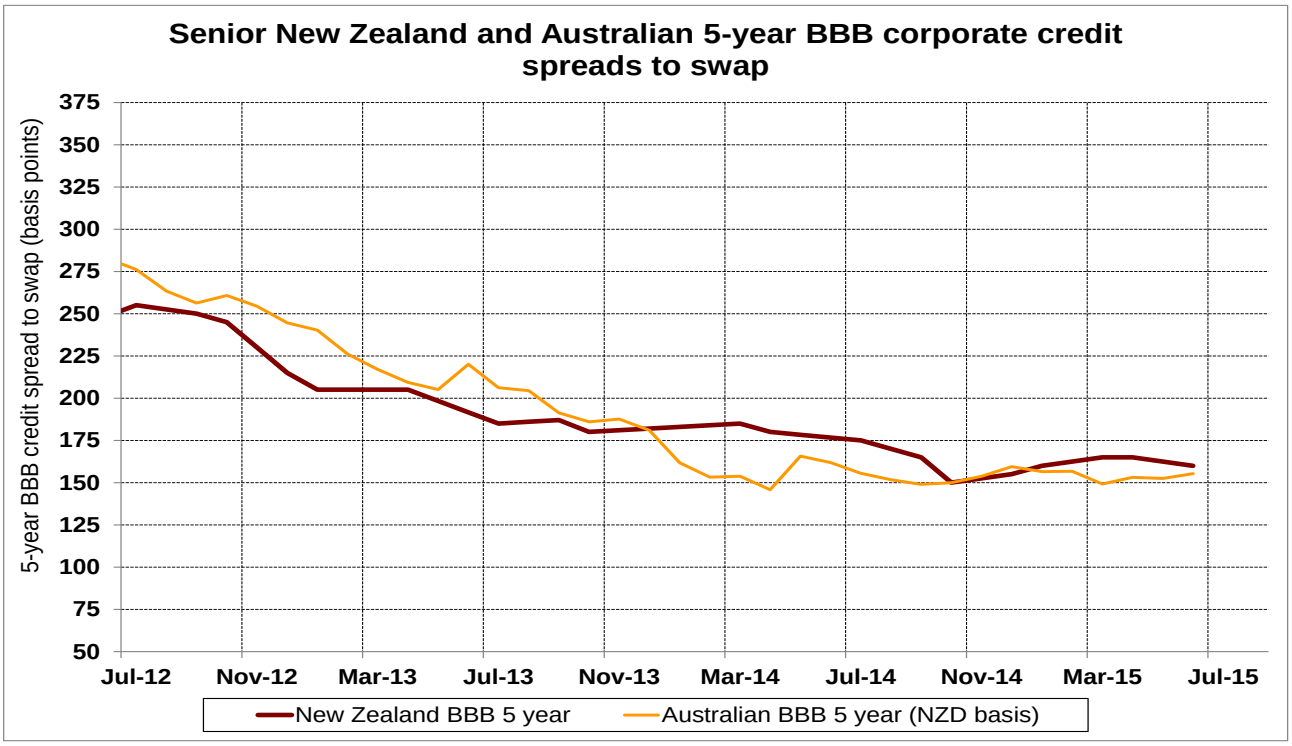
The lack of New Zealand corporate bond issuance has meant that wholesale investors including Kiwisaver funds have had to widen their investment horizon and re-orientate the compass towards non-NZD corporate bond markets if they are to achieve their desired portfolio diversification objectives. In the New Zealand market, failing to diversify will likely mean sector, issuer and counterparty credit rating concentrations. Moreover, the lack of corporate debt issuance and attractive term deposit rates are reasons why investment portfolios have become increasingly exposed to the New Zealand banking sector, again requiring greater investment diversification.

Six corporates have issued a total of $925m in the New Zealand debt market over the last six months; these being Transpower, Spark, Port of Tauranga, Fonterra, The Warehouse and Goodmans. Of these issuers The Warehouse is not credit rated and other than Transpower, the remaining issuers were in the A/BBB credit rating category. Although there may be a spread of sectors encompassing utilities, telecommunications, infrastructure, food, property and retail there remains a limited number of issuers within these sectors and a concentration of credit ratings. Furthermore, issuers within the energy sector did not enter the domestic debt markets in the last six months as these and other corporates prefer the longer funding terms of the US private placement market, again limiting the size of the domestic debt market.

Local Kauri and LGFA bond issuance has meet some of this diversification requirement but wholesale investors continue to look beyond the New Zealand corporate debt and bank term deposit market to satisfy their ongoing and growing investment requirements.

To illustrate the size and diversity of the Australian debt capital markets we have identified around AUD2.8 billion of corporate debt capital market issuance over the last six months. Of these corporates, AUD1.8 billion were A credit rated and AUD0.83 billion were BBB credit rated issuers. A spread of sectors were represented; manufacturing (AUD0.95 billion), energy (AUD0.23 billion), retail (AUD0.5 billion), property (AUD0.35 billion), telecommunications (AUD0.2 billion), utilities (AUD0.35 billion), insurance (AUD0.2 billion).

When comparing the indicative credit spreads of the BBB, 5-year corporate bond market in New Zealand and Australia (after NZ/AUD basis swap adjustment only) we observe spreads since July 2012 being closely aligned.



Wholesale investors as part of their ongoing investment strategy and instrument selection process should continue to monitor and benchmark market pricing of both markets thereby identifying any price-effective opportunities to diversify corporate debt investment portfolios across the NZD and AUD corporate debt markets.

Use of Foreign Exchange Options in New Zealand Corporate Treasury Management

Background

The 2015 PwC New Zealand treasury management survey provided some pertinent snippets on the use of foreign exchange options in treasury management by New Zealand companies:

- 20% of the 152 respondents with material foreign exchange risks use purchased foreign exchange options, i.e. "vanilla" options such as NZD calls or NZD puts, and 26% use "collar" options. 34% of these respondents in total use some form or foreign exchange options, down from 39% in the 2011 survey.
- Usage of foreign exchange options is more prevalent for "active" managers of foreign exchange risk (used by 47% of active managers, 16% of passive managers). Note that "passive" managers refer to those managers who typically hedge on a mechanical basis to specific hedging percentages each month with little discretion. Active managers increase or decrease the hedging percentage and term, based on factors such as macro-economic events and company risks and are more likely to vary the type of hedge instrument.
- Exporter use of foreign exchange options is approximately twice as prevalent as that for importers.

Rationale for foreign exchange options in Treasury Management

In the design of Treasury / Foreign Exchange Policies, the use of options is an important component of the hedging policy including where there is a low level of certainty in exposures, or there is a poor track record in the accuracy of forecasts for actual exposures. In practice, the use of options are an important tool to be used within a portfolio of hedge contracts, allowing a component of flexibility in the rate achieved and being used across the continuum of minimum and maximum hedge limits (and potentially term).

Purchased foreign exchange options (i.e. an NZD "call" exporter or NZD "put" importer option)

Purchased options may reduce the potential for being over-hedged with an instrument that enforces a market obligation on the organisation, whilst also providing commercial flexibility to the business. Purchased options also allow hedging percentages to be 'topped-up' at favourable extremes of the currency cycle or conversely can also be used to maintain minimums of policy at unfavourable currency extremes. Maintaining minimums of policy with purchased options provides worst case insurance/protection against unfavourable future currency movements whilst minimising the opportunity cost / potential for regret if the opposite movement occurs and the entity is otherwise locked-in.

The premium cost of a purchased option is often cited as a major reason of why not to transact a purchased option, however it does need to be considered in the context of the related scope for volatility and movement in the exchange rate; e.g. whilst a premium cost equivalent to 200 foreign exchange points (2 cents) may *appear* expensive, this needs to be viewed in the context of the potential for the NZD/USD exchange rate to move by up to two cents within one or two days! Outright purchased options support active management whereby target spot rates can be set whereby the option is revisited to achieve the desired *economic* outcome (for example being re-set as a forward exchange contract) or can be kept in the "bottom drawer" until maturity. In many respects purchased options can be viewed as "buying time" by protecting an exchange rate until it is observed that the NZ dollar has bottomed or not (exporter).

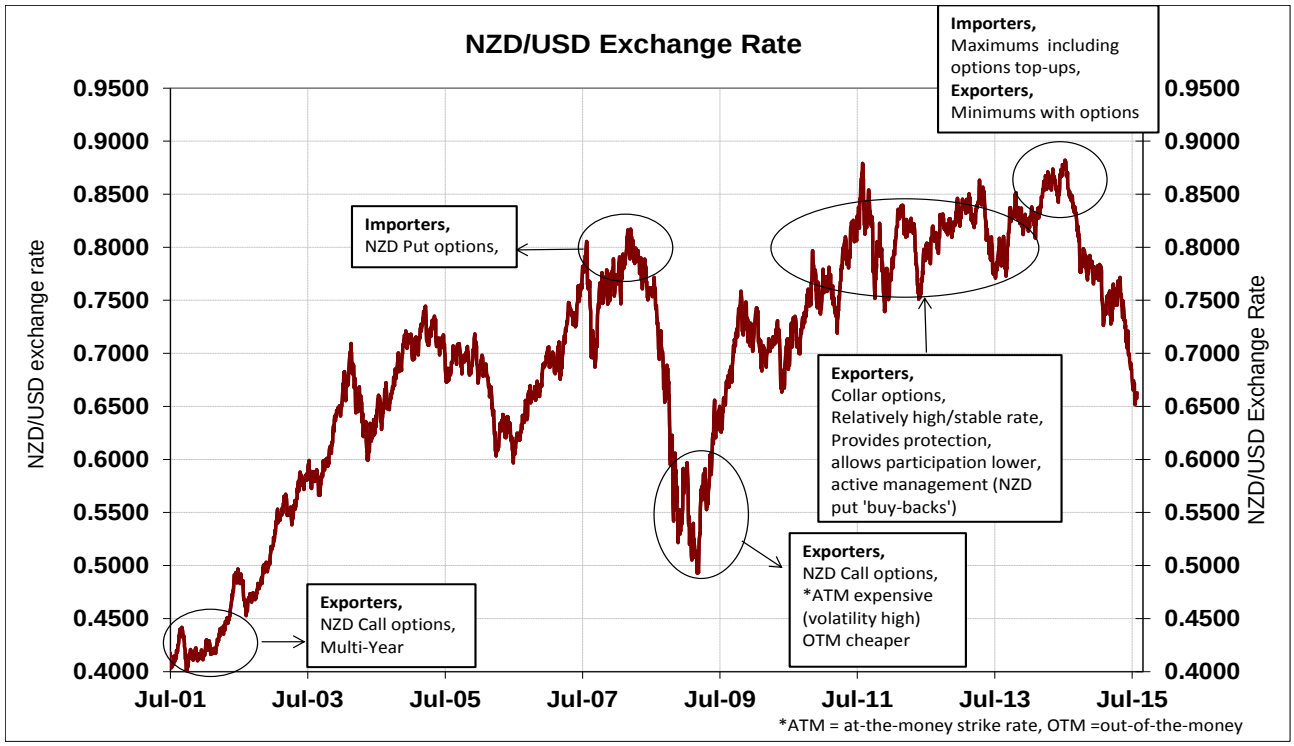
Foreign exchange collar options

A foreign exchange collar option for a New Zealand exporter involves the simultaneous purchase of an NZD call option and the selling of an NZD put option, in the same currency, amount and maturity, but at different strike rates thereby creating predetermined high and low boundaries. A zero net premium cost collar option is a specific collar option structure whereby the respective strike rates are set such that the premium received exactly offsets the premium paid. Collar options are categorised in the same context as forward exchange contract in Treasury Policies as there is an obligation (i.e. market position) 'enforced' through the sold option leg of the collar. For this main reason collar options are not as flexible as purchased options, however they do provide a degree of 'participation' relative to a forward exchange contract.

Collar options also allow for active use in a sustained "choppy" trading environment in managing the economic outcome of the hedge contract. For example, if the exchange rate was to subsequently sharply appreciate after a collar was entered, the exporter could purchase back the sold NZD put option leg very cheaply; i.e. being left with a very cheaply purchased NZD call option, being protected at a certain level but with all the rights to participate lower in future exchange rate movements.

Application of foreign exchange options in Treasury Management

The following chart depicts some of the occasions over the last 10 to 15 years where New Zealand exporters and importers have used foreign exchange options as part of a portfolio of hedge instruments. It should be recognised one is never going to accurately pick the peaks and troughs of currency cycles, however a greater weighting towards the extent of optionality within the hedge portfolio will eventuate in certain environs.



Potential reasons for not using foreign exchange options in Treasury management

Whilst the use of foreign exchange options is an integral part of risk management techniques for many New Zealand exporters and importers, the results of the PwC Treasury Survey indicated the majority of respondents (i.e. 66%) *do not* use foreign exchange options. Potential reasons for this non-use may include:-

- A lack of understanding/education around the use of options. The best purchased option is one you do not ultimately use, as it means that subsequent exchange rate movements have gone your way and that is positive for the business' overall profitability.
- Foreign exchange options may be seen as speculative. This may be true for some "exotic" option structures, however it is not true for purchased NZD call options, purchased NZD put options, and simple collar options incorporated within Treasury / Foreign Exchange Policies used within an environment of control and compliance.
- A possible perception that pricing is not seen as transparent, and that bank counterparties automatically take large margins / profits on option premia. In reality, risk managing the sold option by the counterparty can be complex due to its component parts, and pricing may also be influenced by the way the bank's own options book is positioned. Option pricings can be requested from multiple bank counterparties to ensure/assist competitive quotes.

Interest Rate Insurance – Using borrower Swaptions

A borrower swaption is an interest rate hedging instrument that provides a borrower the right, but not the obligation to enter into a fixed-rate interest rate swap at a future date. The swaption provides the 'option' to enter into a predetermined swap at today's market interest rates.

A swaption has the following benefits:-

- It allows a borrower to take advantage of today's market interest rates.
- It provides flexibility in circumstances where there is some uncertainty to the projected debt forecast, if the debt does not materialise the swaption can expire unused.

Given the flexibility of this hedging instrument, there is an upfront cost associated with purchasing a swaption, this is known as the 'premium'; and should be considered insurance against the risks to both higher interest rates and uncertain debt forecasts.

Worked example:

A borrower expects an additional $5 million increase in debt levels in 12 months' time. Interest rates are low and present value when considering the businesses historic cost of debt and WACC. However, there is some uncertainty as to whether the future capital expenditure (thus increased debt) will happen. Furthermore, should interest rates remain low/or move lower, the business wants the ability to participate in a lower hedged rate. The business wants to protect against higher interest rates occurring over the next seven years as annual profits are sensitive to interest rate movements.

The business decides to buy a swaption today. The swaption gives the business the right to enter into 7-year swap in 12 months' time at a known premium cost. 3.50% is the current 7-year swap rate staring in 12 months' time.

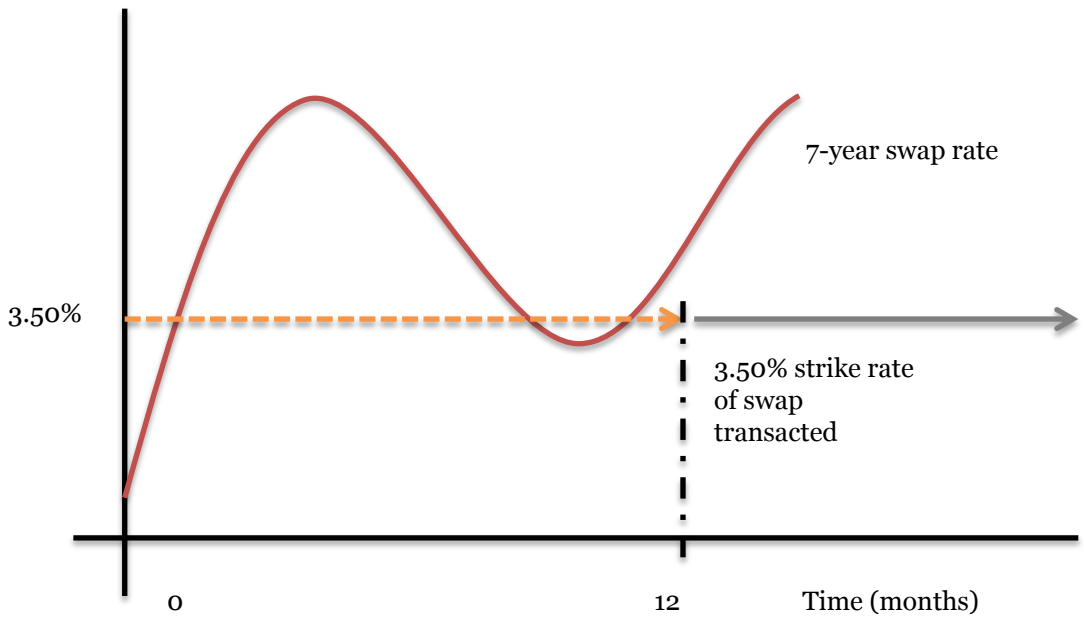
The cost of the swaption today is $90,000 (based on hedging $5 million). In terms of basis point cost this is 30bps pa. As an effective rate (including the premium cost) this is 3.50% + 0.30% = 3.80% pa.

Outcome 1: Interest rates have increased

12 months forward. The business requires an additional $5 million of debt. Wholesale market interest rates have increased above the strike rate of the swap, the business transacts the swap.

Having purchased the option a year earlier (when rates were more favourable) the business enters into a swap at 3.50%. The swaption allowed for certainty of wholesale market interest rate costs ahead of debt becoming certain i.e. provides insurance.

In this example, the swap is transacted at 3.50%. The effective rate of borrowing including cost is 3.80% pa.

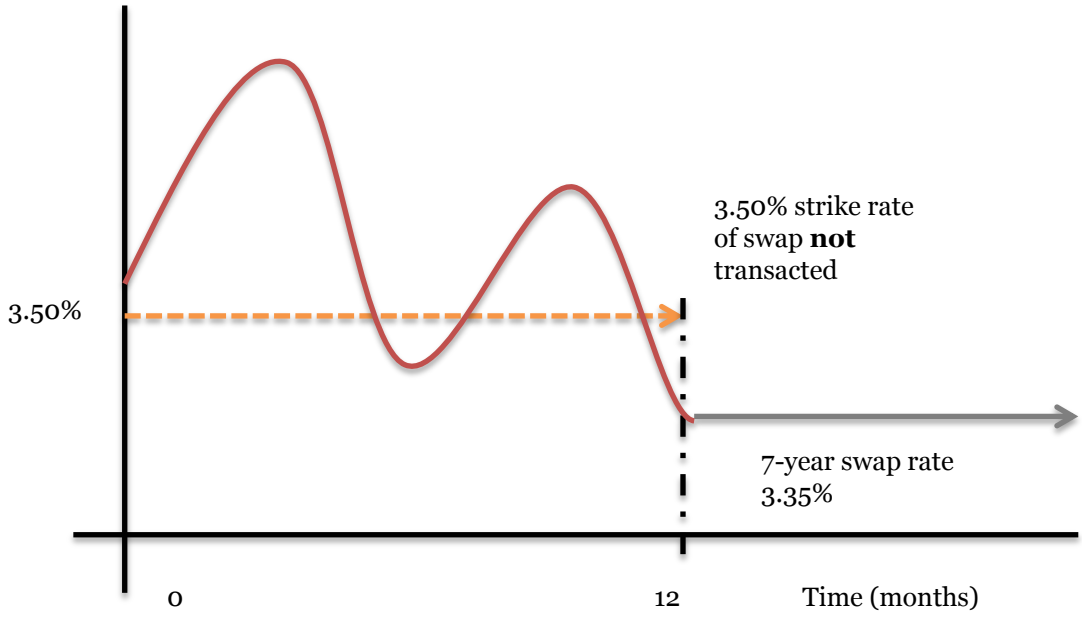


Outcome 2: Interest rates decline

Wholesale market interest rates have fallen and are below the 3.50% strike rate. The business requires an additional $5 million of debt.

The business chooses not to exercise the swaption (walks away) and enters a new swap at lower market rates. The only cost has been the $90,000 premium (30bp). This cost can be added to the new swap being transacted at market rates.

In this example, the swap is transacted at 3.35%. The effective rate of borrowing including cost is 3.35% + 0.30% = 3.65% pa. Although the effective rate is above the market rate, the swaption provided an interest cost benefit of 0.15% pa, from 3.80% to 3.65%.



Outcome 3: The business does not require additional debt

In the event there is no debt, the swaption will either be in-the-money (market rates are above the strike rate of the swaption) or have no value (market rates are below the strike rate).

In the instance where the swaption has intrinsic value (in-the-money), the swaption can be closed out and the cash benefit applied to the existing swap portfolio. Alternatively, should market rates fall below the strike rate the business would let the swaption expire (and the business is not compromised in being over hedged).

Summary

A borrower swaption allows a borrower to take advantage of favourable conditions today by having the option to enter into a swap at a future date. The swaption allows a borrower to have certainty of wholesale market interest rates (swaptions provide insurance) at a premium cost when there is some uncertainty to debt, and outlook for interest rates.

The cost of the option premium can be reduced if the strike rate is set out-of-the money (i.e. higher)

With current wholesale market interest rates at/near historical lows, securing future interest cost certainty is compelling when using this type of hedge instrument but where flexibility is required, and/or when there is a 'view' being taken on the future direction of interest rates. A swaption caters for full participation in a multiple of outcomes.

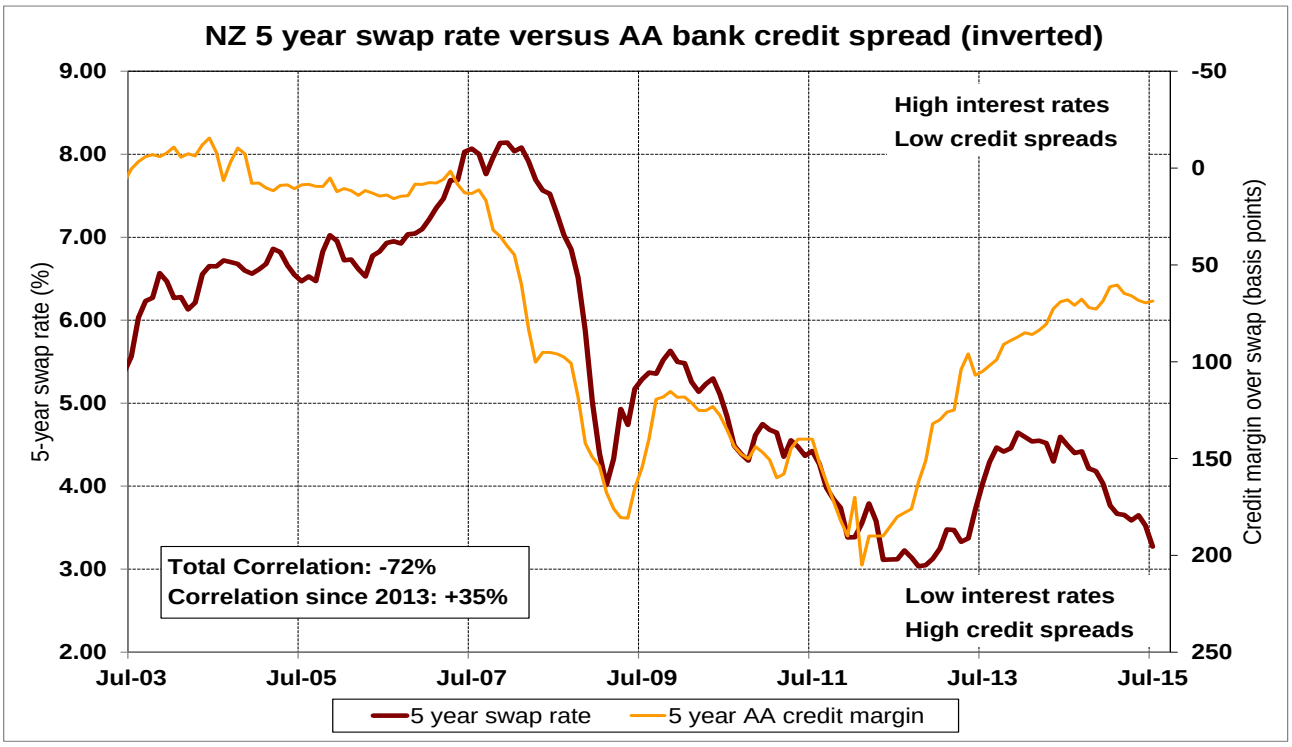
A summary of outcomes is illustrated as follows:

	Require Debt	**Do Not Require Debt**
Rates Rise	Execute swaption for swap at 3.50% + premium	Sell swaption for intrinsic value, offsets the premium cost
Rates Fall	Let swaption expire, enter new swap at lower rates + premium	Let swaption expire Sunk cost

Has the negative relationship between credit spreads and wholesale interest rates broken down? And what does it mean for corporate borrowers?

There is a long-held view that credit spreads (i.e. the funding cost that banks charge above wholesale interest rates) are negatively correlated with underlying interest rates. The relationship is based on the expectation that when underlying interest rates are increasing, it is a sign that the economy is performing well, financial markets are (more) stable and they compete aggressively for new lending (pushing down credit spreads).

However, in the past 18 months this relationship has broken down. Over this period the New Zealand economy has grown strongly and banks have been competing very aggressively for new lending. Separately, falling global interest rates (particularly in Europe, US, and subsequently NZ) has caused wholesale interest rates to fall back toward post-GFC lows. Coincidentally, New Zealand borrowers have enjoyed a period of both lower funding margins and historically low credit spreads. The decrease in credit spreads has been caused by strong investor demand, relatively low new debt issuance and globally low interest rates and inflation. These unique conditions have made it one of the cheapest times in New Zealand to borrow debt.



Looking ahead –as other articles in this publication point towards – storm clouds appear to be brewing over credit markets. Accordingly, the negative relationship between interest rates and credit spreads is likely to re-emerge in coming months and quarters.

For corporate borrowers, these storm clouds suggest funding margins are likely to have bottomed out over the first half of 2015. Fortunately, many have used the recent period of favourable credit markets to re-finance existing or new debt. For those who have not, there is still a realistic opportunity to do so. Irrespective of your current funding requirements, the fragility of the relationship we have described above highlights the reason why corporates should manage funding and interest rate risks independently and proactively. Although the movements in the past 18 months have been favourable for both interest rate and funding risk management (from a borrower's perspective), there is no reason why the opposite might occur to create unwanted financial pressure. Only by having the flexibility to selectively manage both components of risk can a corporate borrower make the most effective use of current market conditions.

Behavioural Finance - something we should all be aware of

Only in the last half century have we seen the development of academic research in the area known as behavioural finance. Put simply, behavioural finance is the combination of economics, psychology and finance. Since its inception in 1974 by Nobel laureate Daniel Kahneham and his colleague Amos Tversky, it has dictated most of the finance and economics literature. The literature has shown that despite our reluctance to believe we are in fact rational decision makers, in reality we are not. Humans are subject to many biases which can lead to irrational decisions. Whilst the research pertaining to behavioural finance is large, we have endeavoured to highlight some of the most prevalent and relevant biases. These can be grouped into three key areas:

1. Heuristics

A heuristic is essentially a rule an individual may use to help simplify a complex problem in order to form judgements or make decisions. They have been likened to mental shortcuts and work well under most circumstances. However, they can lead to ill-informed decisions if used incorrectly. There are many types but perhaps the most important in behavioural finance are the following:

- Anchoring – we tend to attach an anchor to our thoughts to use as a reference point, even though the anchor may be irrelevant have no logical relevance to the decision at hand. For example, in a 1974 paper Kahneman and Tversky conducted a study in which a wheel containing the numbers 1 through 100 was spun. Then, subjects were asked whether the percentage of U.N. membership accounted for by African countries was higher or lower than the number on the wheel. Afterward, the subjects were asked to give an actual estimate. Tversky and Kahneman found that the seemingly random anchoring value of the number on which the wheel landed had a pronounced effect on the answer that the subjects gave. For example, when the wheel landed on 10, the average estimate given by the subjects was 25%, whereas when the wheel landed on 60, the average estimate was 45%. As you can see, the random number had an anchoring effect on the subjects' responses, pulling their estimates closer to the number they were just shown - even though the number had absolutely no correlation at all to the question.

- Conjunction fallacy – People can fall into an error which breaks fundamental law of probability when people rely on repetitiveness. In a similar experiment, Tversky and Kahneman gave subjects a short character sketch of a woman called Linda, describing her as, "31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations". People reading this description then ranked the likelihood of different statements about Linda. Amongst others, these included "Linda is a bank teller", and, "Linda is a bank teller and is active in the feminist movement". People showed a strong tendency to rate the latter, more specific statement as more likely, even though a conjunction of the form "Linda is both X and Y" can never be more probable than the more general statement "Linda is X". The explanation in terms of heuristics is that the judgment was distorted because, for the readers, the character sketch was representative of the sort of person who might be an active feminist but not of someone who works in a bank.

2. Framing

How a problem is asked, or “framed”, can influence the outcome of our decisions. For example, Tversky and Kahneman (1981) demonstrated systematic reversals of preference when the same problem is presented in different ways, for example in the Asian disease problem. Participants were asked to imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume the exact scientific estimate of the consequences of the programs are as follows. The first group of participants was presented with a choice between programs (in a group of 600 people):

- Program A: "200 people will be saved"
- Program B: "there is a 1/3 probability that 600 people will be saved, and a 2/3 probability that no people will be saved"

72 percent of participants preferred program A (the remainder, 28%, opting for program B).The second group of participants was presented with the choice between the following (in a group of 600 people):

- Program C: "400 people will die"
- Program D: "there is a 1/3 probability that nobody will die, and a 2/3 probability that 600 people will die"

In this decision frame, 78% preferred program D, with the remaining 22% opting for program C.

Programs A and C are identical, as are programs B and D. The change in the decision frame between the two groups of participants produced a preference reversal: when the programs were presented in terms of lives saved, the participants preferred the secure program, A (= C). When the programs were presented in terms of expected deaths, participants chose the gamble D (= B).

3. Cognitive biases

Humans are also vulnerable to making irrational decisions based on several biases. There are many biases however, the following are especially important:

- Confirmation bias – confirmation bias is very common in business. When we form an opinion we subconsciously look for evidence to help support this view.
- Loss aversion bias – holding on to a poor performing stock, currency, bond etc because you try and avoid the loss in hopes the asset will recover. This is very common as we often let our egos dictate our views.
- Overconfidence bias – another very prevalent bias in business is the over confident bias. A classic example is a study by Svenson in 1981. Svenson surveyed 161 students in Sweden and the United States, asking them to compare their driving skills and safety to other people. For driving skills, 93% of the U.S. sample and 69% of the Swedish sample put themselves in the top 50%; for safety, 88% of the U.S. and 77% of the Swedish put themselves in the top 50%.

To conclude, whilst we can argue that we are well-informed, rational creatures, in reality we are not. There are many biases to be aware of. It is not until we learn/accept that we are susceptible to biases that we can put in place actions to prevent ill-informed decisions.

Get in touch

Stuart Henderson
Partner
T: +64 9 425 0158
M:+64 21 343 423
E:stuart.r.henderson@nz.pwc.com

Roger Kerr
Partner
T: +64 9 355 8181
M:+64 21 935 288
E: roger.j.kerr@nz.pwc.com

Brett Johanson
Partner
T: +64 4 462 7234
M:+64 21 771 574
E: brett.a.johanson@nz.pwc.com

Chris Hedley
Director
T: +64 9 355 8183
M: +64 21 479 680
E: chris.m.hedley@nz.pwc.com

James McHardy
Director
T: +64 9 355 8342
M: +64 21 263 4282
E: james.c.mchardy@nz.pwc.com

Jason Bligh
Associate Director
T: +64 4 462 7265
M: +64 21 386 863
E: jason.p.bligh@nz.pwc.com

Alex Wondergem
Manager
T: +64 9 355 8252
M: +64 21 041 2127
E: alex.j.wondergem@nz.pwc.com

Tom Lawson
Manager
T: +64 9 355 8284
M: +64 27 421 0733
E: tom.f.lawson@nz.pwc.com

Mahesh Chhagan
Treasury Advisor
T: +64 9 355 8301
E:mahesh.b.chhagan@nz.pwc.com

Freddy Greenslade
Treasury Analyst
T: + 64 9 355 8723
E: frederick.m.greenslade@nz.pwc.com

Daniel Sharp
Treasury Analyst
T: +64 9 355 8865
E: daniel.j.sharp@nz.pwc.com

Dylan Queen
Treasury Analyst
T: + 64 4 462 7209
E: dylan.t.queen@nz.pwc.com

pwc.co.nz/corporate-treasury-advisory-services/

pwc