PwC Treasury Broadsheet

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

3 June 2016

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A new paradigm for NZ interest rates?

New Zealand and global interest rates have been "lower for longer" for more than six years. Global interest rates have been trending lower since the 1980's impacted by the successful inflation targeting of central banks, the impact of globalisation, technology and also the integration of low cost Chinese manufacturing.

Interest rates have fallen further since the GFC impacted by overcapacity, existing high indebtedness, Quantitative Easing monetary policies, growing excess savings and more recently lower oil and commodity prices.

The following table shows the average New Zealand 90 day bank bill rate, US 10 year government bond yield and New Zealand 10 year swap rate (that largely follows the US 10 year government bond yield[1]) over the two distinct periods (pre and post GFC), as well as the current market rates.

	New Zealand 90 day bank bill rate	US 10 Year Government Bond Yield	NZ 10 Year Swap Rate
1999 – 2008	6.25%	4.70%	6.20%
2009 – 2016	2.95%	2.50%	4.40%
Current (May 2016)	2.40%	1.85%	2.95%

Additional factors that are impacting on the current low level of New Zealand 90 day bank bill rates, which are closely aligned to the Official Cash Rate, include a

[1] There is a long close correlation between US and New Zealand government bond yields because of the high level of foreign ownership of our government bonds (66.5%) and very integrated global financial/capital markets (i.e. the impact and activity of international investors).

still negative output gap (2.) Initially weaker demand and more recently stronger supply growth has maintained a small negative output gap (excess supply over demand) in New Zealand, containing domestic inflation pressures. Sharp falls in oil/petrol prices (albeit presently reversing) has also driven headline inflation rates lower.

US 10 year government bond yields have remained below a level consistent with many lead indicators that held prior to the GFC (such as non-farm payrolls employment growth, capacity utilisation and consumer inflation measures). Lower oil prices have impacted actual inflation and market implied inflation expectations, also being contributing factors behind the lower long-term interest rates in the US and elsewhere. Oil prices and inflation expectations have more recently picked up. Many other factors are currently impacting on low US (and by implication New Zealand) long-term interest rates including the massive Quantitative Easing ("QE" government bond purchase programme) from the US Federal Reserve and also substantial Chinese and Japanese investor buying and holdings of US Treasury bonds. Negative bond yields and negative monetary policy rates in Japan, Europe and many other countries has also assisted 'convergence' of the low long-term interest rates globally. Demand from pension funds and life insurance companies to match long-term liability commitments with long-term asset/securities investments is also maintaining lower bond yields.

What does the future for interest rates over the next two to five years look like?

There does appear a paradigm shift between the pre GFC period and the post GFC period, however the question is what does the new paradigm look like?

Prior to the GFC, the 'average' / 'neutral' 90 day bank bill rate was in the order of 6.50%, but has shifted lower since the GFC including as credit spreads (including domestic bank retail term deposit margins to bank bill rates) have widened. As recently as September 2015 the RBNZ confirmed the 'neutral' 90 day interest rate as 4.50%. We question whether this may be too high and more likely in the order of 4.00%.

There is greater conjecture around what a new level for long-term interest rates may be. Our base case assessment is the cyclical US economic recovery continues impacted by the success of QE, boosting equity markets, housing markets and consumer spending. However, QE is expected to unwind gradually over time (via the US Federal Reserve eventually not re-investing maturing bonds). The expectation is US services inflation remains above 3.00% impacted by ongoing rising health costs and rents. We assess US 10-year government bond yields as averaging 2.50% in the two to five year future period.

New Zealand 10 year government bond yields trade at a risk premium to US bond yields for two main reasons and are an important determinant of our domestic long-term interest rates. Our relatively narrow, small-based economy (with an agricultural focus) creates economic risk for New Zealand, and the bond market places a more conservative allowance for the very small size of the New Zealand market. The reliance on overseas capital to fund the current account deficit makes this necessary, supporting a spread of 100 basis points.

The swap spread between New Zealand 10 year government bond yields and New Zealand 10 year swap rates ("the swap spread") of 50 basis point is the final factor that drives the two to five year forward central scenario of the New Zealand 10 year swap rate averaging 4.00%. The rate is above the current 2.95%, but below the 6.20% average prior to the GFC, and also below the 4.40% average since the GFC.

More extreme possible scenarios include the following:-

<u>US 10 year government bond yields at 1.50% and New Zealand 10 year swap rates at 2.50%</u>

- No amount of super-loose monetary policy may be sufficient to stimulate economic outcomes should wider societal undercurrents (ageing population, underemployment, technological improvement, job obsolescence, income inequality) be at play - with these also arresting monetary policy as irrelevant.
- Ongoing QE programmes in Japan and Europe remain in place indefinitely (and are not successful) amidst aging populations, lack of spending, propensity for older worker wage rates to remain stable rather than increase (supplementary incomes only) thereby displacing younger workers.
- The increased regulatory environment, higher capital requirement and less credit risk associated with central clearing houses are reasons why swap spreads could narrow, credit spreads (i.e. bank cost of funds) widen further and wholesale market rates move lower from current levels.

[2] The output gap measures the degree to which real GDP growth within the economy is performing either above or below the 'potential' growth rate. Potential growth reflects the extent and speed the economy can grow without creating excess inflation pressures

US 10 year government bond yields at 3.00% and New Zealand 10 year swap rates at 4.75%

- Strong and ongoing US economic recovery a locomotive for global economic growth and recovering global inflation pressures.
- QE eventually works in Europe and along with the stimulatory impact of negative interest rates encouraging banks to lend, finally prompts consumers to borrow and spend.
- Chinese/Japanese investors ultimately scale back and sell their holdings of US Treasury bonds.

Please contact us directly should you wish to receive a copy of our more detailed report "A New Paradigm for NZ Interest Rates?" incorporating our analysis, views, and judgments of the past, present and future determinants of global and New Zealand long-term interest rate markets.

Preparing to manage milk price risk

The NZ$ denominated NZX milk futures contract, which commenced trading last week, should in time provide the opportunity for large and small dairy farmers to proactively risk manage milk price movements and volatility. The instigation of the new futures contract essentially replaces and considerably enhances the previous (and limited) Guaranteed Milk Price ("GMP") contract for fixing the milksolids payout for one season only provided to Fonterra milk suppliers. Dependent on how rapidly two-way interest and thus liquidity in the futures contract builds up will determine the viability of downstream hedging mechanisms/tools for dairy farmers.

We would hope that all those with a vested interest in an active forward price market for the largest commodity our economy produces will get behind and support the new futures contract. That list includes dairy farmer milk suppliers, local and offshore buyers of both raw milk and dairy products, milk processors, speculators, banks, brokers and agriculture service providers. In the early days the market will need support from market-makers to ensure the contract's viability. The industry players with resources available to make this commitment should be encouraged to participate. The development of a milk price forward curve out over multiple years which provides a robust price discovery mechanism will be a major step forward for more prudent and sophisticated financial management in the industry. Expectations would be that this benefits all concerned as risk, volatility and future uncertainty is reduced. If financial performance risk and volatility is reduced investment and borrowing decisions in the industry should be easier to make and thus all participants in the industry benefit.

There may never be an optimal time to start a new futures contract on a soft commodity such as milk and current milksolids payout levels below $5/kg will not see many dairy farmer suppliers racing to fix current prices for multiple years. However, the current lower price conditions may mean that the futures contract has time to build some volume and liquidity so that there is market with some depth for dairy farmers to hedge into in (say) 12 to 24 months' time when hopefully global dairy prices have recovered somewhat. Dairy farming suppliers of milk should take the opportunity to be well prepared and ready ahead of time to fix a proportion of their milk price risk when the forward pricing is more attractive. The first part of that preparation should be robust internal analysis to calculate the financial impact of volatile milk price movements over multiple years' budgets and business plans. Quantifying and measuring the risk in the context of other dairy farming risks and financial results over multiple years is an essential prerequisite exercise before transacting any milk fixed-price hedges.

The larger corporate dairy farmers may consider transacting their hedges directly on the NZX futures markets, selling milk futures in the desired volumes and time periods. Financial service providers to the dairy industry have a responsibility to ensure that dairy farmers entering such derivative financial transactions are fully aware of the implications of doing so in terms of cashflow, timing, credit risk, accounting, taxation and legal aspects. The ins and outs of futures contracts need to be well understood before committing to opening an account with a futures broker. Scenario and stress testing the cash requirements for deposits and marked-to-market margin calls along the way with the futures broker would an important first step. Companies in New Zealand already hedging foreign exchange, interest rate and other commodity price risks have generally shied away from using futures contracts directly as their method of hedging. The preference has been to hedge such price risks with "over-the-counter" (OTC) derivative products packaged up and offered by the banks. The banks in turn off-lay their market price risk through the futures markets. Time will tell whether the local Australasian banks will package up OTC "milk swaps" hedging products for larger dairy farming counterparties. The banks may be understandably gun-shy about becoming involved in milk swaps from their experiences over past years of selling interest rate swaps to less sophisticated borrowers. So far it appears that the banks may offer special debt financing facilities to cover the cash requirements of futures contracts. Again, reliable liquidity and volumes would need to be established in the futures contract over a number of years before banking/broking intermediaries will package up tailored OTC hedge products for farmers not willing to use futures directly. It would be in everyone's interest for the market to ultimately develop a standardised milk OTC derivative product that milk suppliers of all sizes can use with confidence under a formal ISDA legal arrangement i.e. no different to FX forward/options contracts and interest rate swaps. A "contract-for-difference" (CFD) style derivative may equally evolve as the solution so that milk price hedgers do not have the hassle and administrative burden of the regular cash deposits/margin calls that futures contracts entail.

Questions and issues that potential hedgers of milk price risk should ask themselves before considering and embarking on any form of price fixing activity should include:-

- What is the risk appetite and tolerance levels of the dairy farming entity's shareholders in respect to the volatility of profits/cashflows as a result of swings in milksolids payout amounts over multiple years?
- What is the ability to adjust milk production costs when milk prices reduce i.e. what is the mix of variable and fixed costs in the business and thus financial performance outcomes under flexed milk price scenarios?
- What is the balance sheet gearing of the entity and are interest costs fixed or floating? The need to understand the inter-relationships between NZ interest rate movements, the NZD/USD exchange value and international dairy prices will be an important consideration of the risk analysis.
- How strong is the motivation to spread milk price risk over multiple years? Reducing risk is about reducing volatility (or percentage change) of income from one period to the next. How will the percentage and term of hedging change that price risk profile? Dairy farmers invest considerable sums in herd, pasture and general farm management development to spread and reduce financial risk. A similar long-term investment approach would seem advisable for the management of the price risk on the income line.
- An acceptance and recognition that fixed price hedging to reduce income/profit volatility comes with trade-offs i.e. there will be periods of "regret factor" and "opportunity cost" when milk prices subsequently increase above fixed/hedged prices. Understanding that this may be a small price to pay for the certainty and corralling of price outcomes within acceptable bands would seem prudent.

All these variables should determine to what percentage level and for how long a dairy farming operation should fix their milk price. Robust hedging policies should include definitive minimum and maximum percentage hedged limits per time bands, not wishy-washy vague statements about "hedging when the time is right". Identical to any New Zealand importer or exporter managing their foreign exchange risk, it makes a lot of sense to have an agreed and formalised hedging policy in place rather than relying of a "seat of the pants" or "knee-jerk" decisions and price risk management approach. Exporters who have applied a longer-term and disciplined currency hedging approach against the volatility and vagaries of the NZ dollar over the last 30 years have survived and prospered. Dairy farming entities will have the opportunity to learn from those experiences and to apply similar disciplined policies and limits to their milk price risk management.

As the milk price futures market develops and expands, dairy farmers will have a direct and relevant NZD based hedging mechanism. The NZ milk futures prices will reflect and combine existing spot and forward prices in USD denominated dairy product futures contracts and the NZD/USD exchange rate. Arbitrage traders will ensure the dairy product futures and milk futures prices stay in line.

The development and implementation of formal milk price hedging policies should become as commonplace as foreign exchange, interest rate and commodity hedging policies contained with an entity's Treasury Management Policy document. Capital and debt providers alike will want to ensure that such risk policy frameworks are in place with the appropriate governance oversight, delegated authorities, hedging limits, derivative product controls, operational risk controls and reporting components documented and workable in practice. Engaging specialist and independent professional advice in formulating and implementing hedging policy frameworks is being encouraged and endorsed by industry bodies such as Federated Farmers of NZ. The banks are already assembling panels of advisors to refer their dairy farming clients to for this purpose.

Credit Default Swaps

What is a credit default swap?

A Credit Default Swap (CDS) is an insurance like product where if a "credit" event occurs, the credit protection buyer gets compensated by the credit protection seller. To obtain this coverage, the protection buyer pays the seller a premium known as the CDS spread. When a credit event occurs a buyer can be compensated in two ways, either via a cash settlement (common for indices) or from physical delivery of a reference obligation. When receiving a cash settlement protection buyers are dependent on the bond's recovery rate with a higher recovery rate leading to a lower compensation pay-out to the CDS buyer.

What forms do they come in?

Investors can either purchase a single name CDS or an index CDS. A single name CDS means the reference obligation is the fixed income security for which the CDS is written. This tends to be a senior unsecured obligation and in these instances the CDS normally pays off when the reference entity defaults on this obligation, with the default event clearly defined in the CDS documentation.

A CDS index covers multiple issuers, with each reference equally weighted. Pricing is dependent on the correlation of default among the entities in the index with higher correlations invariably leading to higher spreads.

Key drivers of CDS spreads are the probability of a default (PD) and the loss given this default (LGD). Default probabilities pertain to the likelihood of default by the entity referenced in the CDS, this probability increases over longer time periods. Assuming a credit event does occur, the loss given default relates to the expected amount of loss which is based on the expected recovery rates.

Common Users of Credit default swaps

Traders /Speculation

CDS contracts allow for synthetic long and short positions to be created against a reference entity or index without the need to physically purchase or sell the underlying securities/bonds e.g. Investors can sell CDS on a reference entity or index name and create a synthetic bond/index exposure. The equivalent principal payment would only be made if a credit event was triggered.

Hedging of counterparty credit risks

A practical example is in the methodology required to estimate the credit risk associated with having derivative exposures with a bank. International accounting standard IFRS 13 requires the reporting of credit value adjustment (CVA) when determining the fair value of OTC derivatives. The most widely used approach is to estimate default probabilities and the expected loss by utilising observable prices in the CDS market and use the adjustment generated from this calculation to discount your derivative assets or liabilities. A simple example is provided below:

CDS spread = Probability of Default * (1 – recovery rate)

Assuming the current 1-year CDS is trading at 100basis points and a 40% recovery rate on the CDS contract the probability of default is:

100bps/ (1-0.4) = 1.67%

The probability of default can then be plugged back into the Expected Loss formula to derive the derivative adjustment

Expected Loss = Probability of Default* LGD * EAD

LGD = loss given the default - is defined as a % of loss on the EAD or alternatively (1-Recovery rate)

EAD - exposure at default (value of what you are owed at default day normally the current value of the derivative + potential future exposure.

Assuming a corporate has a $10 million derivative exposure (EAD), a 45% LGD then the Expected Loss on the derivative asset or liability is

1.67% * 45% * 10,000,000 = $75,150

The $75,150 would be the CVA amount used to adjustment lower the carrying value of derivative assets. Derivative assets deteriorates by $72,150 while derivative liabilities improve by $75,150.

Under the IRB-Foundation approach, senior claims on sovereigns, corporates, and banks not secured by accepted collateral are given a LGD value of 45% and the subordinated claims are given a LGD value of 75%, but you can give whatever recovery rate you think applies to the counterparty risk you are managing.

Lead indicator of general credit worthiness of a country, index or specific security

This is highlighted in the following three charts

Chart 1 - ANZ's stock price and ANZ 5yr CDS – strong correlation between stock price and the ANZ CDS price as bank earnings and non-performing loans are strongly positively correlated.

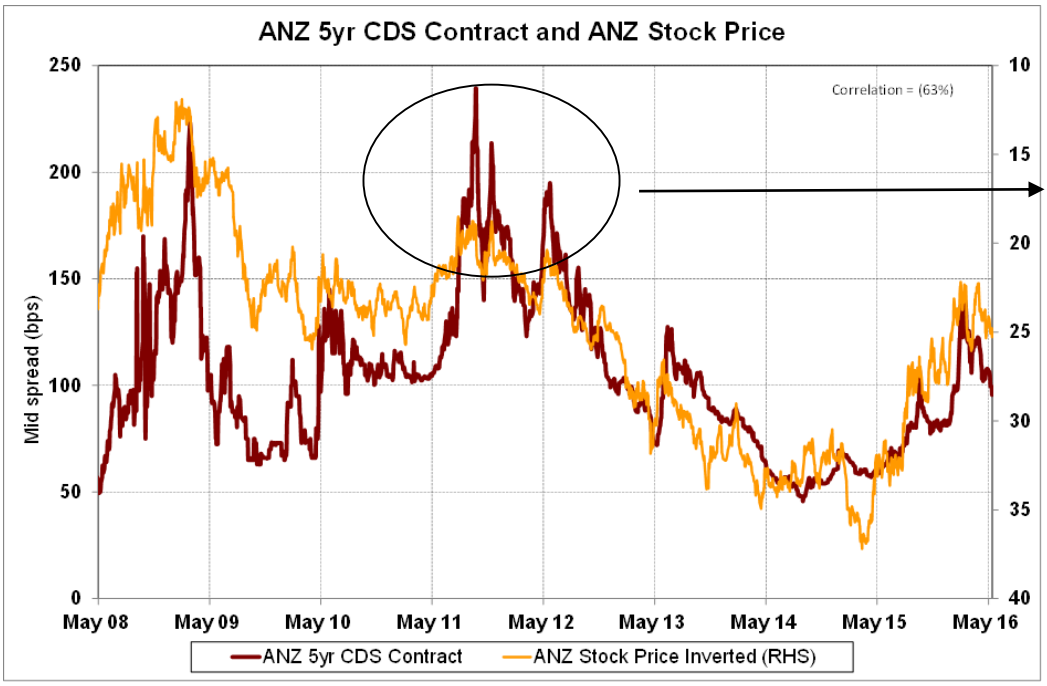


Chart 2 - CDS spreads on the S&P 100 index (lagged 2-months) versus US 5-year BBB corporate credit spreads - strong correlation as the S&P 100 index is a broad lead indicator of the health of investment grade credit in the United States.

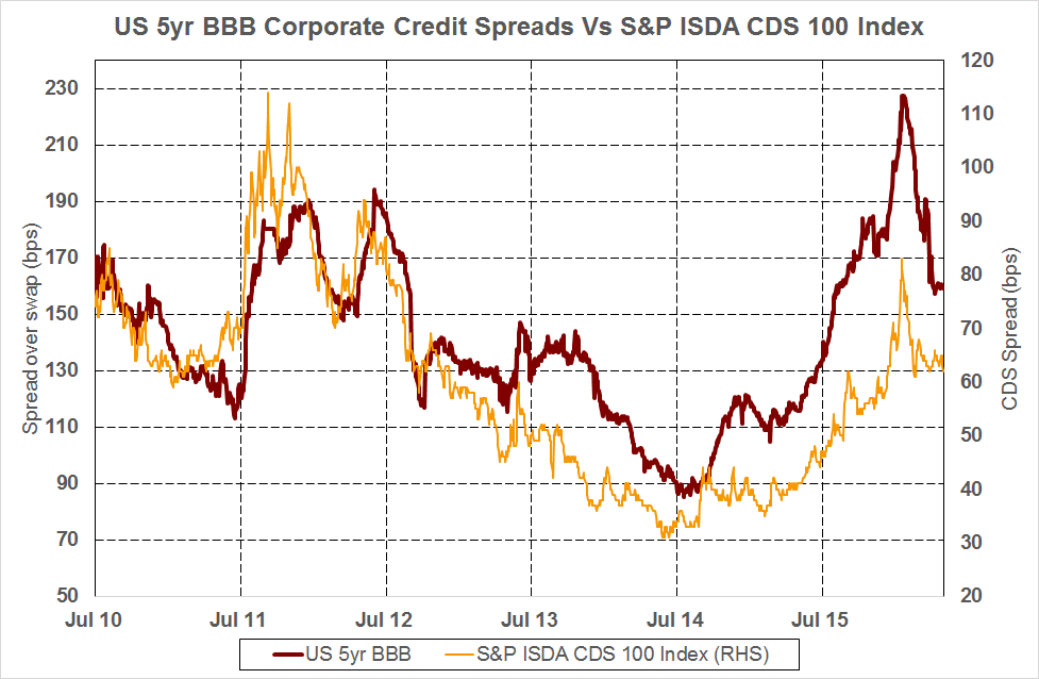
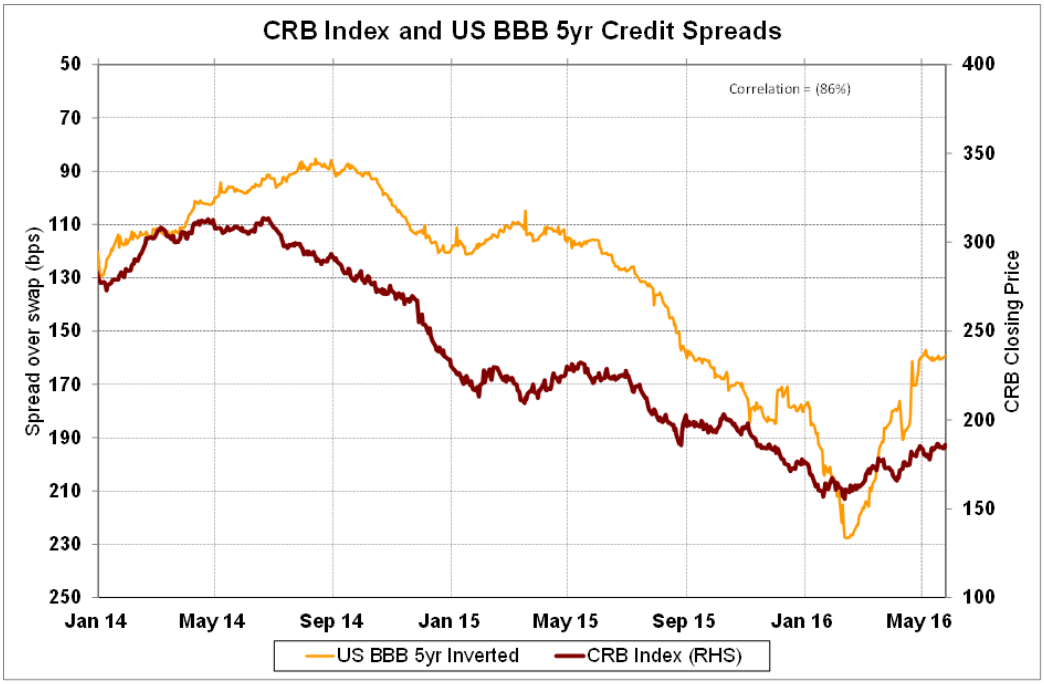


Chart 3 - US BBB corporate credit spreads against the CRB commodity index - strong correlation between commodity prices and a broad measure of credit quality across investment grade US credits. Commodity price weakness not only impacts on commodity and energy company earnings but is normally associated with lower inflation across the board which reduces corporate earnings margins.



Hedging instruments used for translating offshore profits to NZD

For organisations that have offshore operations and wish to protect NZD profit amounts disclosed in their New Zealand financial statements, hedging is generally through a string of purchased monthly European NZD Call options. The string of purchased options are transacted at the start of the financial period and used to set the budget foreign exchange rate for accounting purposes.

The focus of this article relates to the accounting treatment of translating monthly accounting profits as stipulated by NZ IAS 21 and the use of purchased Average Rate options as an alternative to the European option product. The Average Rate option may provide a more accurate hedged rate when aligned with the translation of monthly foreign currency profits.

Although NZ IAS 21 states that income and expenses should be translated at exchange rates on the date of the transaction during the reporting month, for practical reasons it also allows a rate that approximates the exchange rate at the date of the transaction. For example, an average spot rate for the monthly period appears to be a common and pragmatic approach.

For those organisations that use purchased European options to actively protect the monthly, New Zealand profit amounts the accounting approach is not exactly aligned with the hedged approach. The European option buyer has the right to convert an agreed monthly foreign currency exposure amount at an agreed exchange rate (the strike rate) at a future date, typically the month end reporting date.

The risk is that the actual spot exchange rate at the end of the reporting month can vary widely from its trading range during the month. Hence the average monthly accounting exchange rate can bear little resemblance to the month end hedge rate, leading to fluctuations in monthly foreign currency accounting gain and loss amounts.

A hedge instrument that would better match the accounting approach and does not appear widely used by New Zealand corporate treasury managers is the purchased Average Rate foreign currency option. The Average Rate option fixes the strike rate based on the spot exchange rate over a preceding period. The defined period could be, each business day in the stipulated monthly period. An example is as follows:

Term: 1 month

Start tenor: 1 June 2016

End tenor/expiry date: 30 June 2016

Fixing frequency – each business day over the period

Face value amount: AUD1mio

Bank buys AUD and sells NZD

Cash settled: 4 July 2016

Pricing generally is cheaper than the equivalent purchased European option as the bank's risk exposure is not all concentrated at one expiry date, but pricing will depend on the option parameters, market conditions and the bank's trading position at that time. We understand that the New Zealand banks can price these instruments which are executed under the Master ISDA documentation.

Should your organisation be hedging monthly offshore profits, and is experiencing monthly accounting variances, then the purchased Average Rate Option may be an effective instrument that can be added to your risk management toolkit.

Infrastructure funding "Nirvana"?

Central government and local government are looking for the infrastructure funding "Nirvana". They are essentially trying to solve the riddle "how do you get someone else to finance and pay for new infrastructure assets and get it off the respective government and local government balance sheets and be non-recourse".

The big issue is that even strictly private and fully off balance sheet infrastructure projects have to clearly show the investors/ lenders a creditable future cash flow stream that will not only service the debt but also repay the debt principal. It is this credit standing (credit metrics) that will dictate interest rate costs (credit margin/ fees).With many of the early Public Private Partnership (PPP) projects in the UK and Australia (toll roads as an example) the projects could only truly be non-recourse and off balance sheet if the lenders were prepared to fully take the private developer's credit risk and be comfortable with the future toll revenue streams associated with the toll roads. Many of these projects completed in the early 2000's failed and the respective governments stepped in with minimum toll guarantees.

At the end of the day most of these projects end up having future cash flows underwritten by a government or local government agency. If you look at the recent government initiated infrastructure projects such as Transmission Gully, the government may well have got away with the balance sheet implication of the project's debt, however they still provide a government backed future cash flow stream that essentially underwrites interest servicing and to some extent debt repayment.

Interestingly, if the government had funded Transmission Gully themselves and issued government bonds, the cost of debt would be significantly lower than the existing bank financed arrangements. The banks, whilst obviously happy with the government risk around the project's underwritten cash flows, cannot however risk-weight the project's debt as government risk, thus pricing accordingly reflects full corporate risk-weighting and the credit margins reflect this.

The recent media and political statements around the issuance of Auckland region "Infrastructure Bonds" supported by targeted rates confirm this basic premise. There are, however, two potential hurdles to the successful implementation of infrastructure bonds. Can the selected projects truly be off balance sheet for Auckland Council and non-recourse? If it can be assumed that they can be done from a legal and accounting perspective, the future cash flow stream supporting the infrastructure project will be high quality, being targeted rates and therefore an imposed tax. However, Auckland ratepayers will most likely still see the pig through the lipstick! Auckland may as well directly collect the targeted rate and leverage it through their revenue to net debt ratio. The real rub (benefit) will be derived if the "Special Purpose Infrastructure Vehicle" can leverage the cash flow at a higher multiple to Auckland Council's 250% governor.

Even if Auckland can get through the politics of a "hands-off targeted rate" and the project can be packaged as an off balance sheet/non-recourse vehicle issuing debt with a specific charge over targeted rates, the debt will be significantly more expensive than Auckland Council's own direct issued debt. The higher interest cost comes about as it is unlikely that the vehicle's debt will achieve the 20% risk-weighting that NZ Local Authorities and the LGFA enjoy. Herein is one very critical reason why AA rated Councils fund at cheaper margins than AA rated Banks.

Accordingly, the infrastructure bond described in recent media reports would need to get the RBNZ behind it and achieve a comparable risk-weighting to make economic sense from a funding perspective. Such a risk-weighting will be very difficult to achieve if the vehicle succeeds in leveraging the targeted rates cash flow higher than 250%.

The other hurdle faced by an off balance sheet, non-recourse, rates secured bond issuing vehicle is that we would very much doubt that existing lenders and bond investors to Auckland Council would separate the separate infrastructure bond risk from Auckland Council debt risk in terms of credit consolidation, as the vehicle would essentially be diverting rates revenue from Auckland Council. The underlying cashflows are still coming from the same ratepayer's base that make up Auckland's existing credit risk metrics.

It might be a tough bow to bend convincing lenders/investors that they are truly diversifying their risk. There is still a great deal of water to go under the bridge, however, the two main objectives of utilising fully privatised infrastructure initiatives will be that they will be built sooner and may be able to leverage the underlying cash flows to a higher extent (albeit at higher interest costs).

Borrower swaptions: Update to last year's strategy

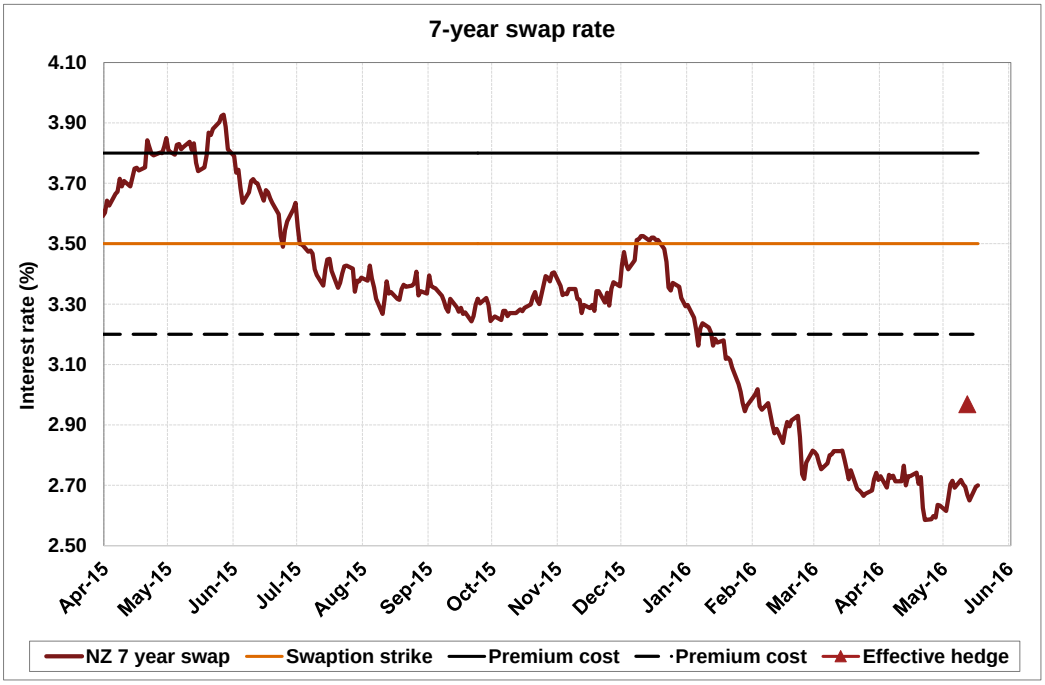
For those readers familiar with the Treasury Broadsheet, last May we produced an article on using purchased interest rate swaptions. Recall, swaptions are a hedging instrument that provides the borrower the right, but not the obligation to enter into a fixed interest rate swap at a future date. The hedge enables a borrower to buy future protection against rising interest rates by locking in a known 'worst case' scenario today. Its application is both prudent and effective when there is uncertainty to future debt forecasts, uncertainty to future interest rate movements, however interest rate protection/certainty is required.

Last year when we considered the use of a swaption (a 12 month option period to enter into a 7-year swap), the strike rate of the swap was 3.50%. The 3.50% at-the-money rate represented the markets forward view on the 7-year swap in 12 month time (an expectation of rising interest rates!). As the buyer of the swaption, this allowed us to observe market rates knowing the worst case scenario would be to enter a swap today at 3.50%. Factoring in the 30bps pa premium cost of the strategy, the all-in worst case effective rate would be 3.80% over the next seven years.

So how did this interest rate hedging strategy fare?

Since last year the 7-year swap rate subsequently moved lower to 2.70% from 3.84%, representing a decline of 1.14% over the 12 month period.

Consider the following chart. The premium cost is represented by two black lines (+/-30bps above the swaption strike rate). In terms of cost recovery, a market rate above or below the two lines indicate levels where the option premium can be perceived as having paid for itself, i.e. markets had moved in a range to fully compensate for the cost of the swaption.



In a scenario where market rates had moved higher (above 3.80%) the premium cost would have been considered well spent. A borrower would have secured an all-up effective rate below the prevailing market. Conversely, where we are today at 2.70% (the current 7-year swap), when considering the effective rate of 3.00% (plus premium), the 1.14% fall not only shows the forward market is not necessarily an accurate predictor of future interest rate movements, it also represents the strategy having fully paid for itself (and then some).

As this real example shows, the use of swaptions should be considered as a viable hedging tool for any corporate borrower where cost certainty is required. Option premiums are often misunderstood as "costs" when they are actually invested capital, and can be considered a form of insurance. Rather than focusing on the cost, premiums are best visualised as annualised basis points and considered within the whole context of the "worst case hedge rate achieved" relative to the borrower's debt cost of capital budget rate.

Businesses are prepared to insure against disaster (that generally does not derive an economic value), therefore paying for interest rate insurance should be a no-brainer particularly when the pay-back is financially measurable. In this example, the 0.80% annual difference in effective rates (3.80% vs 3.0%) over seven years would equate to at least a $500,000 saving on $10 million. In context of the current interest rate environment, when including the premium cost of swaptions the all-up effective rate of this type of strategy would reside well below many corporate borrower's debt WACC levels. Finally, as the Europeans and Japanese have shown, interest rates can indeed be negative, therefore it is not fait accompli that next movement will necessarily be higher from here!

Blockchain and opportunities for corporate treasurers

The blockchain (sometimes called 'distributed ledger technology') is a public ledger which is built and maintained by individual nodes and secured by mathematical algorithms. New blocks are added following each transaction providing a full history of every transaction in the chain.

When something is required to be sent to another user through the blockchain, the data required to complete the transaction will be sent out to the system (in disseminated form) and the nodes which maintain the network will then collate all these transactions into a single block. Following this, the block will be confirmed and attached to the chain as the newest transaction block including both the latest transactions and all transactions that have gone before it.

In order for this to happen however, the block must be confirmed by all the nodes (through algorithms) to create a mathematical proof. Once the number is created, it is sent through the network which will recognise and confirm this number as being unique and the transaction will be confirmed.

Essentially, the blockchain can only be updated through the agreement of the majority of participants in the system (at this stage more than 50%).

The current use of the blockchain is primarily to allow crypto currency transactions (i.e. Bitcoin), however the blockchain can facilitate the transfer of value of anything digital which will be wholly accurate, confirmed and fully visible.

The blockchain will make payments with banks faster, more accurate, in more currencies/markets and at a lower cost and risk than currently possible. Blockchain will also provide straight through reconciliation and a full audit trail automatically created.

In addition to efficiencies in payments, the ability to transact anything digitally on the blockchain could allow contracts to be exchanged with a fully secure and visible record of the transaction and all the data that is associated with it.

Applications of the blockchain technology will provide the ability to securely, efficiently exchange data and messages without intermediaries with payments via blockchain direct to the party you are paying, and secure as the distributed ledgers that support blockchain. So far transactions have proven to be impenetrable.

Through blockchain, money can move more easily, lowering the costs and complexity of cash pooling. Idle cash in one region can be cheaply mobilised to where it is needed most or where it yields a higher return.

Blockchain enabled payment apps in conjunction with crypto currencies will remove expensive intermediaries leading to reduced foreign exchange costs (cost of currency conversion), however also more conversion currencies, reducing currency risks a Treasurer must manage. There are many other opportunities for blockchain in trade finance and remittance services as well.

Banks are taking notice of the potential of the blockchain with the R3 initiative announced in September last year agreeing a partnership between a number of banks (including a number of Australasian banks) to develop commercial applications for this emerging technology in the global financial services industry. Banks are exploring opportunities for real-time gross settlement systems (RTGS), currency exchange and remittance through the blockchain with companies such as Ripple, currently advertised as the world's "first open-standard, Internet Protocol (IP)-based technology for banks to clear and settle transactions in real-time via a distributed network."

The opportunities and potential of blockchain technology is seemingly unlimited, not only for re-defining how payments are made, but also how all electronic data is managed and shared. Watch this space.

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