PwC Treasury Broadsheet

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

1 June 2018

(Click to view)

The 2025 Digital Treasurer

In March, there was a gathering in Zurich of PwC's global treasury leadership team where the future anatomy of the corporate treasurer was discussed.

For the past 20 years, treasury has largely been considered a cost centre within the corporate body, often the poor cousin in terms of receiving its share of internal budget allocation for investment in systems and processes.

We believe treasury is likely to come into its own as the 'pumping heart' of the corporate body, truly interconnecting with the business limbs and securing its own version of a turbo-charged wireless pacemaker to power internal and external relationships through embracing digital transformation.

The treasurer is and will remain the "custodian of corporate cash and financial risk".

Digital Treasury will be about the corporate body doing business differently more than about the treasurer doing the 'niche' of treasury better.

Treasury will become the fully integrated centre of the customer (internal and external) payment/ collection experience with end-to-end cash processes fully linking all stakeholders.

Fintech solutions, including block chain initiatives, will proliferate across the corporate body. This will need to be co-ordinated within treasury requiring a Fintech policy or digital treasury policy, including regulatory compliance relevant to cross border cash payments/receivables and reconciliations. Fintech solutions will reduce timing differences in cash management and significantly improve forecasting.

Treasury will need to fully capture and access corporate-wide **data** for reporting/analysis/cash flow forecasting using predictive data analytics. This will not be limited to internal data, but will embrace universal data that connects with and influences the cash flow of the corporate body.

Security will become even more important and the Treasurer, as the custodian of corporate cash, will be responsible and accountable requiring clear policies and safeguards around fraud, including digital theft and money laundering.

Where to from here for the forward-looking treasurer?

Coordinate and clarify scope/area of treasury responsibility within the corporate body to include payments and collections, develop a Fintech policy/digital treasury policy and procedures, and closely monitor the Fintech jungle for relevant solutions.

Talk to banks and trusted advisers and begin engaging with a few potential Fintech providers.

Authored by Stuart Henderson, stuart.r.henderson@nz.pwc.com

The fundamental Treasury Policy review

It is the Board's responsibility to ensure that the Treasury Policy ("Policy") continues to remain relevant and consistent with its risk tolerance and ongoing business plans. Although management will typically review the Policy at a high level (internally) on an annual basis, it is recommended that the Policy be also fundamentally reviewed at least every three years.

The fundamental review should take a deeper look at changes in the underlying business, changes in the regulatory environment and changes in the financial markets to the extent that these affect the organisation's treasury activities. Further, any comments from external and internal auditors, Board-approved policy exceptions and noted areas of tension in the implementation of the Policy should also be captured as inputs into the review.

The fundamental question is whether the Policy has performed to the agreed treasury and financial objectives set by the Board. Reviewing every three years allows for a meaningful amount of data and perspective against which to answer this question. Objectives that protect and stabilise profitability, reduce profit volatility, spread and smooth risk concentrations and eliminate unexpected surprises in financial performance are typical for an organisation that has a low or risk aware appetite. Accordingly, the policy review should be benchmarked against these important objectives.

To test the performance of the Policy's risk management parameters, good practice is for a 'rate achieved' historical or back-test to be performed. For example, over the review period, how stable has the actual foreign exchange conversion rate been and what rates were achieved? The comparative is the underlying spot exchange rate. The low variability of actual monthly rate achieved against market rates will provide comfort (or not) that the Policy is doing its job. The back-test review would also consider performance and rate achieved to budget rates and the mid-policy benchmark rate if that were included as a treasury objective.

Within the scope of the policy review, we also recommend a robust analysis of the current policy on a forward-tested basis. Satisfied that the Policy has performed and meets its objectives based on where rates have been (i.e. one historical rate scenario), the Policy should be tested against multi-forward looking rate scenarios. The forward test analysis is the best way to ensure that the Policy protects and stabilises underlying business portability, no matter what the future rate outlook.

The review typically includes other suitable candidate policies. These policies may be selected based on changes to the existing policy, peer policies or other policies. This approach robustly and objectively stress tests other policies' performance to the stated treasury objectives and existing policy.

The fundamental policy review is an important part of the Board's ongoing governance responsibilities. The health check benchmarks the Policy's consistency with protecting the organisation from underlying changes in the financial markets. Remember, the Policy is there to protect the business from external financial market risks and shocks and should not depend on the positive or negative outlook for the financial market risks it assumes.

Having a robust review process that leads to greater trust in the Policy means that ongoing risks should always be managed within the policy risk control limits. Consequently, there should be no reason for management to recommend to the Board out of policy exemptions. If the Policy is forcing the discipline of a risk management action, then the Policy is doing its job.

Authored by Brett Johanson, brett.a.johanson@nz.pwc.com

IFRS 9 vs IAS 39 - Part II: Qualifying criteria for hedge accounting

Following on from February's Treasury Broadsheet publication, this article further explores some of the key changes between accounting standard IAS 39 and IFRS 9, particularly focusing on the criteria required for hedging items to qualify for hedge accounting.

Formal designation and documentation requirements between IAS 39 and IFRS 9 are largely unchanged and continue to be required at the inception of all hedge relationships. IFRS 9 does however, require documentation to be updated from time to time where the hedge ratio is needed to be rebalanced.

Eligible hedging instruments and hedged items differ between the new and old accounting standards, despite the definition of a hedged item remaining unchanged. IFRS 9 allows for the hedging of risk components of non-financial items, the hedging of net positions, layering of cash flow and fair value hedges and, importantly, aggregated exposures are allowed as hedged items (e.g. a derivative on a derivative, which will be welcome news for fuel hedgers and corporates borrowing from offshore).

A key element in achieving hedge accounting treatment is the proof of hedge effectiveness or the extent to which the fair value or cash flows of the hedging instrument offsets changes in the fair value or cash flows of the hedged item. IFRS 9 introduces three hedge effectiveness requirements, repealing the 80-125% bright line requirement of IAS 39:

1) *Economic relationship*: There must be an expectation that the value of the hedging instrument and the value of the hedged item would move in the opposite direction as a result of the common underlying or hedged risk.

2) *Credit risk*: Even if there is an economic relationship, a change in the credit risk of the hedging instrument or the hedged item must not be of such a magnitude that it exceeds value changes from the economic relationship.

3) *Hedge ratio*: The relationship between the quantity of the hedging instrument and the quantity of the hedged item in terms of their relative weighting. IFRS 9 requires that the hedge ratio used for hedge accounting purposes should be the same as that used for risk management purposes. There is no retrospective effectiveness testing required under IFRS 9, but there is a requirement to make an ongoing assessment of whether the hedge continues to meet the hedge effectiveness criteria, including that the hedge ratio remains appropriate.

IFRS 9 does not prescribe a specific method for assessing hedge effectiveness requirements but must ensure that the relevant characteristics of the hedging relationship, including the sources of hedge ineffectiveness that are expected over the relationship, are captured. A qualitative assessment is always necessary and a quantitative assessment is sometimes required.

A further distinction between IAS 39 and IFRS 9 is the ability to discontinue a hedge accounting relationship voluntarily. IFRS 9 allows voluntary discontinuation of a hedging relationship only where the risk management objective is no longer achieved, other qualifying criteria are no longer met or where the hedging instrument has been sold or terminated. IAS 39 had previously allowed de-designation of a hedging relationship as desired.

The changes in the criteria required to qualify for hedge accounting between IAS 39 and IFRS 9 are consistent with other changes in the standard to further link common risk management practices with hedge accounting treatments.

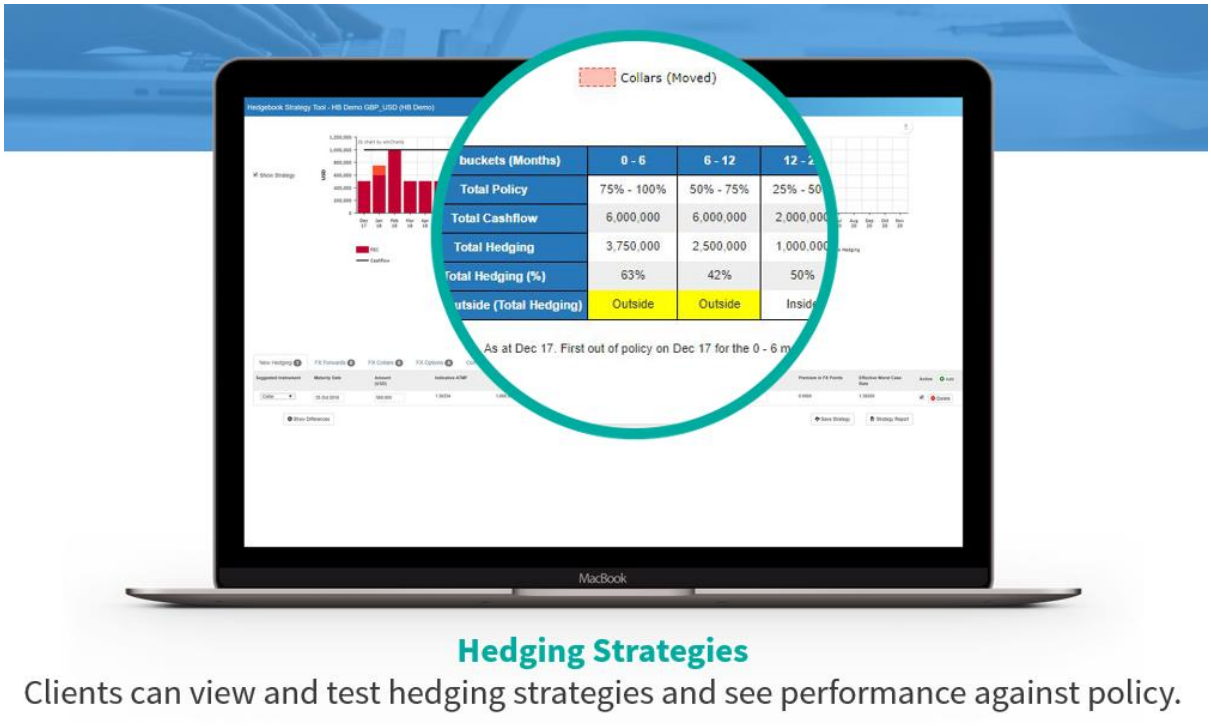
Please note that this article is not intended as formal accounting advice and does not constitute a fully comprehensive outline of changes in the IFRS 9 and IAS 39 accounting standards.

Authored by Alex Wondergem, alex.j.wondergem@nz.pwc.com

PwC New Zealand and Hedgebook team up to co-develop the FX Strategy Tool

PwC has collaborated with treasury software developer, **Hedgebook**, to create the foreign exchange hedging Strategy Tool. The Strategy Tool is an add-on module to the Hedgebook treasury management platform aimed at small-to-mid sized businesses that are exposed to foreign exchange markets.

Hedgebook provides its users with an easy-to-use, cost effective treasury management system to record, report and value foreign exchange derivatives such as forwards and options. The development of the Strategy Tool module gives users additional visibility over the impact of proposed or hypothetical hedging transactions on their hedging position (including on a forward basis). For example, a common practice among companies managing FX hedging risk is to leave orders with their bank or FX broker at target FX exchange rates. By adding these orders into the Strategy Tool, businesses will clearly understand the impact these orders will have on the hedging position if/when they are filled. The Strategy Tool can also scenario test the impact of a new forward FX contract or changing the terms of an existing FX contract.



A key part of PwC's treasury advisory role is to provide strategic and tactical foreign exchange hedging advice within a company's approved risk management framework. Implicit within our role is to monitor clients' financial market risk positions and provide specific and tailored hedging advice. In order to do this effectively, PwC relies on timely and accurate client risk positions and exposure information. The Hedgebook 'what-if' solution assists in designing FX hedging strategies, considering the impact of new or re-structuring of hedges.

The Strategy Tool combines the existing hedges with projected foreign currency cash flows and enables users to add, remove, restructure, extend or shorten any hedges in order for these to line up with the timing and amounts of forecast FX cash flows. Users can now have access to the Tool, enabling you to project and understand the impact on your hedge position when making strategic decisions around foreign exchange hedging.

The Strategy Tool module is now available to all New Zealand Hedgebook users when advised by PwC Treasury Advisory or not (certain conditions apply). Follow this link to arrange a demo: https://www.hedgebookpro.com/contact/.

Authored by Tom Lawson, tom.f.lawson@nz.pwc.com

Payments: a standardised API from Payments NZ?

The importance of payment-related Application Programming Interfaces (APIs) has increased significantly in recent years as organisations seek Fintech-enabled solutions to interface with financial institutions. APIs are a set of clearly defined communication methods between software components (i.e. allowing one system to connect and transact with another). Given the increasingly automated nature of our payments landscape, the industry's governing body, Payments NZ, is facilitating an API pilot to create a standardised framework for the New Zealand payments industry.

Payments NZ quotes "simplification and improving efficiency through standardisation" as the key drivers for conducting the pilot with the goal of improving "system efficiency by reducing fragmentation, duplication of effort and deployment delays."

The pilot is scheduled to conclude at the end of 2018 with an appropriate standardised framework slated for release to the wider market in early 2019. Alongside the API, the following initiatives are being investigated:

- Transaction settlement 365 days a year.
- Proxy banking identifiers, such as cell phones.
- Requests to pay that can be sent to cell phones with a 'pay now' button.
- Incorporating the messaging standard ISO20022 allowing standardised information to be sent alongside payments.

PwC's 2017 Fintech survey highlighted the commitment that NZ Financial Services leaders have made to developing new technologies with 85% of respondents reporting that they have partnered with Fintech start-ups.

It is time that corporate treasury departments begin making similar commitments to streamline their transition in the Fintech revolution. We will be conducting a Transactional Banking Survey over the coming months that will dive further into payment solutions in the context of Corporate Treasury.

Source: https://www.paymentsnz.co.nz/about-us/payments-direction/api-framework/

Authored by James Butler, james.p.butler@nz.pwc.com

Approaches to determining your optimal debt duration

An often lightly reviewed area of treasury and debt management relates to the way in which an organisation determines its debt maturity profile or debt maturity structure (DMS). While it is well understood and commonplace to spread debt maturities across time (or time 'buckets') to avoid the concentration of refinancing risk, questions relating to *how long* these maturities should be spread out for and what weighted average debt maturity (WADM) a firm should target often receives significantly less attention.

Table 1 – Debt Maturity Risk Parameters - Generic Corporate Borrower, source: PwC

Bank Debt	1-year	2-year	3-year	4-year	5-year	7-year	10-year
Spread to BKBM	1.20%	1.35%	1.50%	1.65%	1.80%	2.10%	2.55%
Spread to 1-year		0.15%	0.30%	0.45%	0.60%	0.90%	1.35%

Table 1 above provides a simple example by presenting credit margins (by tenor) for a generic corporate borrower. As one can see, these margins increase by 0.15% per annum for each additional year a borrower seeks to fund itself, (i.e. the 'term premium' a borrower must pay for the additional funding certainty). In this respect, there is consensus that longer dated-funding is less risky. However, there is less conversation around what the optimal borrowing period should be. In other words, should this hypothetical firm be borrowing for 2 years or 5 years? In order to make an objective assessment we need to ask – "Is the additional 0.45% cost p.a. commensurate with the reduced risk?"

Addressing this question forms the basis of this article. Namely, is there an optimal DMS for a firm given the funding markets it has available and its idiosyncratic risk profile and, if so, how can this be measured? It is our observation that corporate treasurers struggle to answer these questions definitively. For example, after considering its industry classification and the behaviour of its peers, the ultimate assessment is a qualitative 'this feels right' rather than any objective quantification of the costs and benefits. So how can a firm better estimate its optimal DMS?

Optimising the Debt Maturity structure

A firm's Treasury Policy provides a useful starting point for framing up a DMS by reviewing the defined minimum and maximum debt funding limits. By considering these, one is able to 'back solve' for an organisation's implied minimum and maximum WADM (refer to the example below). As demonstrated in Table 2, even for a relatively 'normal' policy framework, the WADM variance between maximum and minimum bounds can be quite large (2.75 years and at 0.15% p.a.). Clear guidelines around when and how to move towards either boundaries remains relatively subjective, providing management with discretion as funding market dynamics change, but without strong guidance as to which decisions make strong economic sense.

Table 2 – Debt maturity risk parameters, source PwC

Maturity Buckets	0-3 years	3-5 years	5-10 years
Minimum	25%	25%	0
Maximum	60%	60%	50%
Max WADM	5.25 years[1]		
Min WADM	2.50 years		

Academic literature on the topic provides snippets into how firms may construct a more robust DMS. DMS is typically measured by either (1) a firm's WADM or (2) via a ratio of its short-term debt[2] to long-term debt. Once the key determinants have been established, an econometric model is used to estimate a DMS based on those chosen drivers. In other words, the firm's optimal DMS (expressed as either a WADM or the percentage of short-term debt), is a function of a firm's specific financial

[1] Based on midpoints.

[2] The measure of short-term debt varies throughout the academic research with short-term debt varying between 1 and 3 years.

characteristics. An example of one of these models is provided below and comes from Pavel Korner's 2007 paper *The determinants of Corporate Debt Maturity Structure: Evidence from Czech Firms*.

$$DMS = \alpha + \beta_1(Growth\_options) + \beta_2(Company\_size) +$$
$$\beta_3(Collateralizable\_assets) + \beta_4(Leverage) + \beta_5(Asset\_maturity) +$$
$$+ \beta_6(Corporate\_tax\_rate) + \beta_7(Company\_level\_volatility) + \varepsilon_i$$

Determining the drivers of the Debt Maturity Structure

The following section explores in detail some of the key determinants that might be used in a DMS forecast model (not too dissimilar to the one above).

Asset maturity

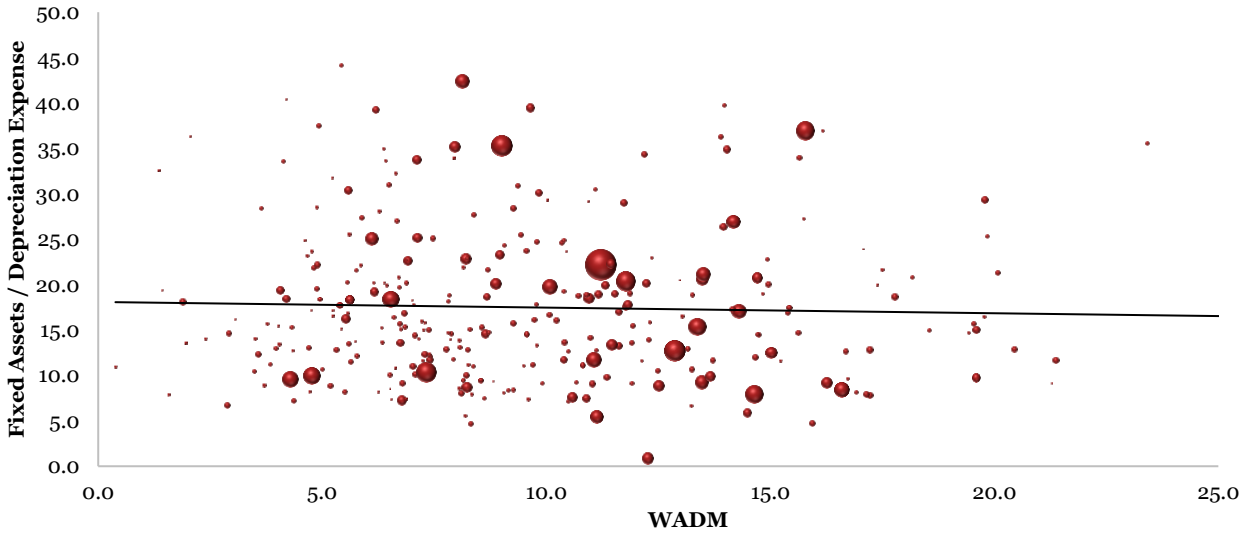
Asset maturity[3] is one of the most commonly cited determinants when assessing DMS. Irrespective of whether it's the 'accounting' or 'financing' approach, most practitioners are happy to accept that (temporary) current assets are typically best funded by short term liabilities and (permanent) fixed assets by long term liabilities (debt and equity). Such an approach implies organisations with longer dated assets (such as utilities) look to fund themselves with longer dated debt; the converse would be true for those with shorter dated assets (such as retailers).

The underlying rationale is that such an approach best enables an organisation to match the cash flows generated by its assets against those from its debt financing obligations. In addition, Myers (1977) notes that such an approach also helps to mitigate asset underinvestment problems given the expectation that debt would decline at a similar rate to an asset's value.

Deriving the WADM of these assets generally involves ratios of fixed assets to depreciation expense or looking at the operating cash cycle (Current Assets/COGS). Other (more subjective) measures, such as the 'Average Time to Realise Firm Value', may also be considered. These more subjective measures can better represent the 'true duration' of assets – given that they capture a firm's ability to restructure or sell assets – yet they are significantly harder to measure across a larger sample.

While asset maturity has generally been positively and significantly related to a firm's DMS in the models considered in the academic, research on its own it is a much weaker correlation as Chart 1 indicates. In other words, asset duration should be used as one of many inputs into the derivation of a firms DMS.

Chart 1 – S&P 500 firms' Weighted Average Debt Maturity (WADM) versus Asset Maturity (Fixed Assets/Depreciation expense) scaled by revenue. Source S&P, Bloomberg

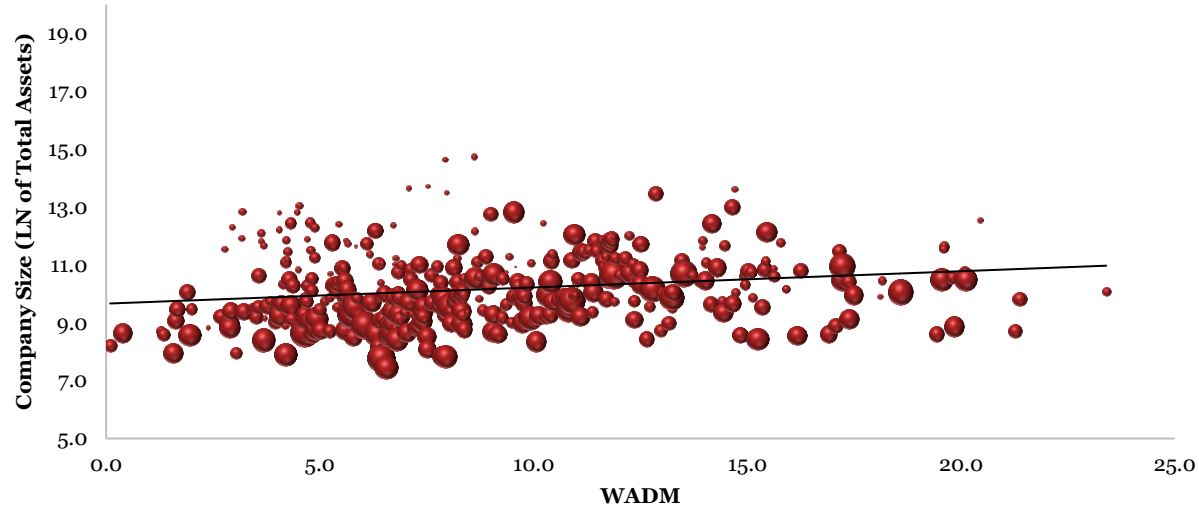


[3] Asset maturity is commonly measured by the following: Fixed Assets/Depreciation, (Fixed Assets – Equity)/Total Assets, Currents Assets/COGS, Property, Plant and Equipment/Depreciation.

Size[4]

Larger organisations are likely to have greater access to a wider variety of financing means, such as the debt capital markets. Unsurprisingly then, larger firms are able to achieve a longer WADM than those confined to borrowing in the bank debt market. As Chart 2 below shows, there is a positive relationship between these two factors, but again, size alone cannot determine a firm's DMS.

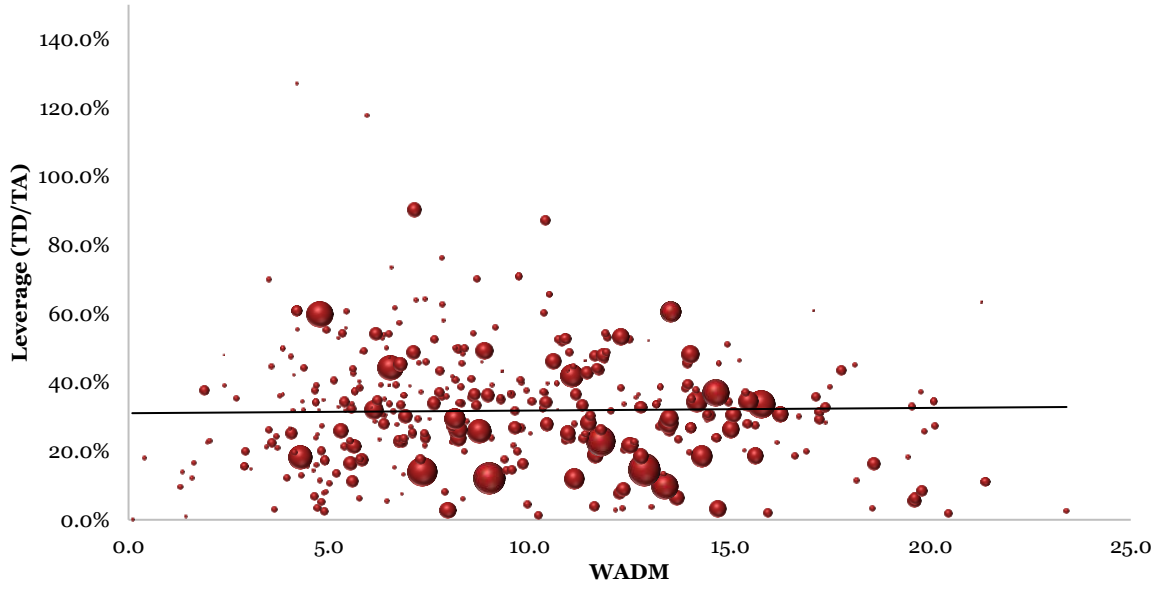
Chart 2 – S&P 500 firms' Weighted Average Debt Maturity (WADM) versus Size (LN of Total Assets) scaled by Quality (Net Income/Total Assets). Source S&P, Bloomberg



Leverage[5]

In theory, firms with greater leverage are more likely to borrow for a longer time in order to reduce any immediate bankruptcy risk. By contrast, lenders are incentivised to lend for shorter periods in order to help mitigate any moral hazard issues that may arise. This is done by making a firm more continually dependent on the lender for funds. The relationship between WADM and leverage is displayed below in Chart 3.

Chart 3 – S&P 500 firms Weighted average Debt Maturity(WADM) versus Leverage (LN of Total Assets) scaled by revenue. Source S&P, Bloomberg



[4] Size is commonly measured by: Revenue, Total Assets, Market Value, Average time to realise Firm value.
[5] Leverage is commonly measured by: Total Debt/Total Assets, Total Debt/Market Value

Whilst there is a slight positive relationship between these two factors, it should be noted that as with all other variables, size by itself couldn't determine a borrower's WADM. This is because other factors, such as industry and growth, are vital in determining leverage.

Growth options[6]

Borrowers with strong projected growth or who believe their credit metrics in the longer term will be significantly stronger than they are currently, are incentivised to borrow for shorter periods. This is on the basis that they will be in a better position to realise lower funding margins in the future once their performance/growth option has been realised. As such, these borrowers will seek to reduce future borrowing costs by locking in a shorter-term debt margin.

As noted by Flannery (1986), from a lender's perspective, this may be a more optimal strategy too given the role of signalling through refinancing. In other words, lenders are able to infer the credit quality of organisations based on their choice of debt maturity when information asymmetries are present.

Other factors

In addition to the DMS determinants discussed above, other factors that also require attention relate to security quality[7], earnings quality[8] and earnings volatility[9].

Conclusion

As you read this paper, it likely dawned on you that no single factor is the strongest and most accurate determinant of your firm's optimal DMS, which is made harder in New Zealand where access to longer dated borrowing is often restricted due to size. Thankfully, much stronger and smarter analytics, combined with more accessible financial market data are beginning to provide much needed transparency and objectivity to this field that has often been seen as qualitative 'gut feel' without the strong analysis often applied to interest rate and foreign exchange risk management decisions.

While the derivation of an optimal DMS will continue to have subjective elements, we encourage corporate treasurers and CFOs to take a more objective look at their funding options considering some of the key drivers mentioned in this paper. If the results are widely disparate to your current DMS, within the context of your organisation's risk framework, then you may well have found an opportunity to facilitate interest expense savings, reduce your refinancing risk or, with a bit of luck, both.

If you would like to explore in detail some of the key drivers that might influence your firm or industry's DMS, feel free to contact James and Ollie in PwC Debt Advisory.

Authored by James McHardy (james.c.mchardy@nz.pwc.com) and Ollie McDowell (ollie.a.mcdowell@nz.pwc.com)

Global interest rate books becoming 'less out of the money'

A statistical release on the Over-the-Counter (OTC) derivatives market from the Bank for International Settlements (BIS) provides some interesting comparatives on the global financial derivatives markets.

The report shows that the total notional amount of outstanding OTC derivatives contracts as at the end of 2017 was USD532 trillion, with this total amount having been reasonably stable between USD480 trillion and USD550 trillion over the last three years. Interest rate derivatives make up 80% of this amount at USD427 trillion. Foreign exchange contracts make up most of the balance at USD87 trillion (16% of the total).

[6] Growth options are commonly measured by: Market Value/Book Value, Depreciation/Total Assets, (Marketing + R&D expenses)/Total Assets, Capex/Depreciation
[7] Security quality is commonly measured by: Collateralisable Assets, Secured Debt/Total Debt, Tangible Fixed Assets/Total Assets
[8] Earnings quality is commonly measured by: Annualised change in EBITDA, NPAT/Total Assets
[9] Earnings volatility is commonly measured by: EBITDA Margin, EBIT Margin, NPAT Margin

The breakdown of maturities for interest rate contracts indicates that fixing terms are typically quite short. Of the USD 427 trillion of total interest rate contracts, USD191 trillion is in terms of less than one year (45% of total interest rate contracts), USD140 trillion is in terms of between one and five years (33% of total interest rate contracts) and USD95 trillion is in terms greater than five years (22% of total interest rate contracts). Another way of slicing the data is that USD319 trillion of the USD 427 trillion total is in swaps (75%), USD68 trillion is in forward rate agreements or FRAs (16% of total) and USD39 trillion is in interest rate options (9% of total). FRA maturity terms are typically no longer than one year; hence there is some bias lower in the overall weighting of contracts less than one year. The composition of instrument use and hedging terms has not materially changed over the last two years.

Total notional amounts as at December 2017 (USD trillion), source BIS	
Total	530
Foreign exchange	**87**
Interest rates (by instrument)	**426**
- Swaps	318 *(75%)*
- Forward Rate Agreements	68 *(16%)*
- Options	39 *(9%)*
Interest rates (by term)	
- Less than 1 year	191 *(45%)*
- Between 1 and 5 years	140 *(33%)*
- Greater than 5 years	94 *(22%)*

What has changed is, while the overall size of the global derivatives market has been reasonably constant, collective gross market values (a way to value market and counterparty credit risk) have 'improved'. The BIS shows the gross market value of OTC derivatives reduced from USD13 trillion as at June 2017 to USD11 trillion at the end of 2017, its lowest level for 10 years. Unsurprisingly, interest rate derivatives make up the majority of this amount at USD7.6 trillion – which in itself is also the lowest level since 2007. BIS notes that the decrease is likely to have reflected 'increases in long-term interest rate, which reduced the gap between market interest rates on the reporting date and those prevailing at contract inception', (i.e. the extent of interest rate hedging contracts being 'out of the money' has reduced). Case in point, US 10-year government bond yields were trading at 1.45% in June 2016, 2.45% in December 2016, 2.30% in June 2017 and 2.40% in December 2017. In recent weeks, they have traded in a 2.75% to 3.15% range. Should US long-term interest rates remain around current levels, we would infer that the global marked-to-market position (i.e. unrealised financial revaluation 'losses') for the holders of long-term pay fixed swaps will have reduced further. Indeed, there will now be a number of entities who will be "in the money" on their swaps portfolios, likely for the first time in close to a decade.

By currency denomination, BIS notes the gross market value of both USD and EUR denominated interest rate contracts were similar at around USD8.4 trillion equivalent each in 2011. By the end of 2017, out of the total of USD7.6 trillion interest rate contracts gross market value, EUR denominated had fallen to USD3.6 trillion equivalent, whereas USD were sharply lower at USD1.4 trillion.

Gross market values of interest rate contracts (USD trillion), source BIS		
	As at End 2008	**As at End 2017**
Total	22.5	7.6
USD denominated	11.4	1.4
EUR denominated	6.4	3.6

Central clearing has remained relatively stable for OTC interest rate derivatives; as at the end of 2017, USD320 trillion of the USD427 trillion interest rate contracts (approximately 75%) were cleared with central counterparties. This also means that actual gross credit exposures are significantly less than the gross market value amount of USD11 trillion reported above. Gross credit exposures, which adjust gross market values for legally enforceable bilateral netting agreements, were at USD2.7 trillion at the end of 2017 – their lowest level since 2007 and highlighting the impact that low volatility market conditions have had on the aggregate marked-to-market position of organisations.

In contrast to the high degree of central counterparty (clearing) in interest rate derivative markets, only 2% of OTC FX derivative market contracts (by notional amount) were centrally cleared as at the end of 2017. We continue to expect that this highly decentralised trend will remain in FX markets given the limited usefulness of centrally-cleared Futures-style products to effectively manage FX risks.

Source – Bank of International Settlements

Authored by Chris Hedley, chris.m.hedley@nz.pwc.com

Corporate treasury and cybersecurity

It is now common knowledge that cyber criminals have turned their scopes to target corporate treasury functions and it is very easy to see why they are such attractive targets. Once inside the system, hackers are able to move vast amounts of cash quickly and harvest valuable client data to be sold/distributed on the black market.

Currently, cybercrime is estimated to cost the global economy in excess of US$400 billion a year and is expected to increase to over US$2 trillion within the next two years[10]. Many businesses have been aggressive in expanding their defenses by implementing technologies such as two-factor authentication and many countries have begun pooling resources to share expertise and coordinate across borders (e.g. the recent signing of the European Memorandum of Understanding).

Cybersecurity is an ever-present challenge that sees no sign of realistic abatement and, accordingly, organisations are recommended to take a holistic approach that encompasses the following areas:

- **Technology**: The technological landscape is changing rapidly, so it is important to be up to speed with the latest security features and encryption software to minimise the risk of exposure. Furthermore, all systems should be continuously updated and it should be ensured that the systems and vendors have robust/audited security and risk management processes.

- **Governance**: Global policies are required to establish corporate governance, which is key in laying the groundwork for alleviating cyber fraud. The Board of Directors need a strong mandate, which provides a framework to manage risk.

- **Training**: Basic training for all employees should be mandatory along with specific training for key teams is essential. Human error is a major factor in breaches and trusted but unwitting insiders are typically to blame.

- **Culture**: Emphasis needs to be placed by businesses on the importance of shared responsibility when it comes to mitigating or preventing cybercrime. Employees need to be consulted and ensure that their cybersecurity concerns are considered by senior management. The objective is to empower employees to act like a human firewall.

- **Process**: Strict adherence to processes are needed to prevent both internal and external fraud along with segregation of duties. Processes that attract the most attention from cyber

[10] Source: Forbes

criminals need to be regularly reviewed and that technology control points are embedded in new automated processes.

Given where cyber-security is heading, it is not a topic that treasurers can afford to ignore. Indeed, it was the highest rated external concern raised in the latest ACT 2018 Treasurer's Survey[11], with 94% of global corporate treasurers being 'concerned', higher than financial market volatility, tax, regulatory changes and Brexit. Whether this area is regarded as a necessary evil or a business enabler may vary from case to case, but as the threats evolve, the topic will only become more critical.

Authored by Matt Stewart, matt.j.stewart@nz.pwc.com

Four interesting things you may not know about oil markets

1) There is a new futures market in town

Oil has traditionally traded via three main futures exchanges – the most well-known benchmarks being Brent and WTI (which have been trading since the late 1980s and 1970s respectively). Details of the new exchange are as follows:

- Known as the Shanghai International Energy Exchange (INE) Crude oil futures.
- Denominated in Chinese Yuan.
- Measured by the barrel.
- Trading since end of March 2018.

Why this is interesting: The most interesting fact is that the settlement currency is Yuan. This could create a conduit to trade oil avoiding contact with the US dollar. Other futures exchanges (Brent/Dubai/WTI) are all settled in USD.

The new contract has traded well since its introduction and could potentially provide Iran with a way to continue exporting oil at its current pace despite US sanctions. One of the key factors of the previous sanctions was that Iran was denied access to US financial markets. Iran could channel more oil to China, the largest importer of oil in the world (it overtook the US as the largest importer of crude oil in 2017) without using USD as the transaction currency.

2) US production constraints (helping restrict the supply of oil)

The Permian Basin (which straddles the border between Texas and New Mexico) is the largest oil producing area in the US, producing over 3 million barrels of oil per day. However, there are a number of constraints currently impacting the supply out of this large basin including the following:

- Take away capacity - There is currently limited ability to move product from the basin to the Gulf of Mexico (where the oil can be exported via ship). This is traditionally done via pipeline. There are currently infrastructure projects in train; however, this capacity is not likely to come on line until 2019 at the earliest.

- Crews/labour – Labour is in very short supply and the industry is having to advertise wider and wider to try to attract workers.

- Hydraulic Fracturing liquid availability – The main ingredient is water, which is a very scarce resource in the area (Hydraulic Fracturing or 'Fracking' is the process of blasting a mixture of

[11] Source: Association of Corporate Treasurers

mainly water and sand down pipelines in order for them to release the gas and oil locked within the rock structures).

- Gas - Gas is not required to extract oil. Gas is extracted at the same time as oil and there is no way to have one without the other. Gas, however, has very different uses to oil (e.g. heating) and is not in as high demand at the moment due to mild temperatures. The problem is getting rid of the gas. Gas can be flared (burnt in to the air), but there are environmental restrictions on how much gas can be emitted in this way. Due to the inability to get the oil without the gas, this is causing oil companies to limit their oil production.

Why this is interesting? The reserves under the Permian area are immense and if these constraints were relieved, supply could accelerate exponentially causing (another?) step change in the oil market. The last time we saw this was in 2014 when oil prices fell dramatically. A number of factors contributed to this, including the US being allowed to export oil, but a large part of it was the acceleration in the use of fracking to access previously inaccessible deposits.

3) The difference between shale oil and 'traditional oil'

A rather high level/low tech explanation of how conventional oil is extracted is as follows:

A hole is drilled straight down into the earth, a pipe is inserted into the hole past the deposit of oil and the oil is then extracted by being pumped back to the surface.

Typically, the breakeven for this type of extraction varies between US$30-$40 per barrel. Saudi Arabia can produce the cheapest in the world at around US$10 per barrel.

Shale oil production (again at a high level) is different in two main ways:

- The hole is not just drilled straight down, but down and then at a 90 degree angle and runs horizontally (sometimes for kilometres)

- Once the (perforated) pipe is in place, the surrounding formation of rock is 'stimulated'. This is where Hydraulic Fracturing Fluid is pushed into the pipe under high pressure to force the hydrocarbons back into the pipe and oil and gas is then pumped back up to the surface.

With additional pipe/drilling materials and labour costs, shale oil is more expensive to produce. Break evens are estimated based on the level at which producers enter/re-enter the market when the price of oil rises. This is monitored using the 'rig count'. As the price of oil increases, there is more incentive for further drillers to enter the market. The latest count was last week and there had been a year on year increase of 151 rigs from this time last year[12].

Why this is interesting? The market is helped to balance as more producers deem it feasible to enter the market and add more supply to meet demand. The US has been touted as the new swing producer since these new exploration techniques have taken off with break-evens above and below current oil prices. The likelihood of seeing large increases in oil prices due to a lack of supply may be kept in check as participants enter the market and keep the market balanced. However, there may be another shift coming, which is described in the next section.

4) Sulphur restrictions are coming… (this has the potential to be a game changer, at least on a temporary basis)

The U.N. International Maritime Organization set a target in 2008 to reduce sulphur content in fuel to 0.5% by 2020. The current limit is 3.5%. All ships need to comply with this measure by 1 January 2020.

The problem is refineries are not currently equipped to produce enough low sulphur fuel to meet global demand. The lead-time to build or update infrastructure to accommodate the changes is long

[12] Source: Baker Hughes GE

and, with only 18 months until the deadline, it is likely that there will be shortages in supply of low sulphur fuel to meet market demand, at least temporarily.

A recent opinion piece published by Bloomberg estimates that the spike in oil prices that will be caused by this move towards cleaner burning fuel could have a large enough impact to threaten a global recession[13].

An irony of this situation is that Venezuela, whose oil infrastructure is falling into disrepair due to political instability, is sitting on one of the best-known sources of extra heavy, low sulphur oil reserves in the world. It is this grade of crude that provides the best input for the low sulphur products required.

Why is this interesting*?* How is it not? This could be a game changer for oil prices, or at the least a large swing factor, and the changes are already flowing into different derivative product pricing.

Authored by Sarah Houston-Eastergaard, sarah.j.houston.eastergaard@nz.pwc.com

[13] Source: Bloomberg

Get in touch

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

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

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

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

Alex Wondergem
Associate Director
M: +64 21 041 2127
E: alex.j.wondergem@nz.pwc.com

Tom Lawson
Associate Director
M: +64 27 421 0733
E: tom.f.lawson@nz.pwc.com

James Butler
Treasury Advisor
T: +64 9 355 8265
E: james.p.butler@nz.pwc.com

Tom North
Treasury Advisor
T: +64 9 355 8497
E: tom.o.north@nz.pwc.com

Sarah Houston-Eastergaard
Manager
T: +64 4 462 7310
E: sarah.j.houston.eastergaard@nz.pwc.com

Matt Stewart
Treasury Analyst
T: +64 5 462 7037
E: matt.j.stewart@nz.pwc.com

Ollie McDowell
Treasury Advisor
T: +64 9 355 8702
E: ollie.a.mcdowell@nz.pwc.com

Rajeev Verma
Treasury Analyst
T: +64 9 355 8648
E: rajeev.c.verma@nz.pwc.com

Georgia Bowers
Treasury Analyst
T: +64 9 355 8760
E: georgia.r.bowers@nz.pwc.com

www.pwc.co.nz/treasury-and-debt-advisory