

Research into the New Issue Premium, and the Applicability of that Research to the Australian Corporate Bond Market

A submission prepared for United Energy and Multinet
Gas in response to the draft rate of return guideline of the
Australian Energy Regulator

October 2013

Prepared by:

Professor Ehud I. Ronn, University of Texas at Austin

Associate Professor Robert S. Goldberg, Adelphi University

Table of contents

1.	Executive Summary	4
1.1.	The new issue premium and the Australian corporate bond market	4
1.2.	Approach taken previously by the Australian Energy Regulator.....	6
1.3.	Institutional history in the USA.....	7
2.	Our Paper “Quantifying and Explaining the New Issue Premium in the Post Glass- Steagall Corporate Bond Market”	8
2.1.	Summary	8
2.2.	History of the New Issue Premium in the U.S.....	9
	Table 2.1: Distribution framework across different eras, from the pre-1982 period to the present..	10
2.3.	Literature Review	11
2.4.	Our Data and Methodology.....	11
2.5.	Empirical Results	12
	Figure 2.1: Average percentage of new issue daily trade volume, January 2008 to January 2012	13
	Figure 2.2: NIP Frequency Distribution, January 2008 to January 2012.....	13
	Figure 2.3: Change in monthly average values, January 2008 to January 2012	14
	Table 2.2: Variables that will putatively affect the New Issue Premium.....	14
	Figure 2.4: NIP As a Fraction of New Issue Spread	17
3.	Summary of Australian Bond Market	18
3.1.	Outstanding Issues	18
3.2.	Issuance	18
3.3.	Underwriting Process.....	19
3.4.	Trading.....	20
4.	Additional Australian Debt Market Research Review.....	20
5.	Initial Comments on the Likelihood of a New Issue Premium for Australian Issuers.....	21
5.1.	Australian Companies Issuing in Australia	21
5.2.	Australian Companies Issuing in Europe.....	22
5.3.	Australian Companies Issuing in the U.S.	23
	Table 5.1: NIP Analysis for Australian corporates raising debt capital in the USA.....	23
5.4.	Declaration.....	25
	Appendix One - References from Current Paper	26
	Appendix Two – Terms of Reference – Assessment of the New Issue Premium on Primary Issues of Corporate Bonds	30
	Appendix Three – Expert Witnesses in Proceedings in the Federal Court of Australia	35

Appendix Four – Curriculum Vitae – Robert Goldberg38

Appendix Five – Curriculum Vitae – Ehud Ronn41

1. Executive Summary

1.1. The new issue premium and the Australian corporate bond market

We have been asked to consult with United Energy Distribution Pty, Ltd (“UE”) and Multinet Gas Distribution Partnership (“Multinet Gas”) on the topic of the New Issue Premium (NIP), based on our research on the topic in the U.S. which resulted in the publication of our paper “Quantifying and Explaining the New Issue Premium in the Post Glass-Steagall Corporate Bond Market” in the *Journal of Fixed Income* (2013). Specifically, we have been asked to summarize our findings and discuss the applicability of our research to Australian borrowers -- primarily in the Australian market, but also to the extent that these borrowers access markets in the U.S. and Europe. We have also been asked to document the applicability of our research to the debt risk premium allowed by the Australian Energy Regulator (“AER”).

Using 1,487 new corporate-bond issues, our research in the U.S. bond market used the robust bond-trading information available from the TRACE reporting system and found evidence of a New Issue Premium (“NIP”) in the U.S. investment-grade corporate bond market, of the order of 10% of the credit spread in excess of Treasury rates. We showed the NIP to be related to a number of economic variables, including the bond spread and various measures of market volatility. We ventured that the NIP reflects three important economic drivers: Information uncertainty; compensation for large investors assisting in the distribution of the securities; and the Effects of oligopolistic pricing and wealth transfer.

The average value of the (NIP/Spread) ratio was 10.4%, when measured across the entire database of 1,500 bonds. For the subset of bonds issued by Australian-domiciled corporations, the average value of the (NIP/Spread) ratio was computed to be 10.3%. The latter figure thus provides the best currently available guide as to the future NIP that would be paid by a benchmark Australian utility issuing bonds in the U. S. market. We anticipate that the Australian corporate bond market will be subject to somewhat heightened information uncertainty, and this uncertainty would, in turn, justify a new issue premium. The causes of the information uncertainty would include an occasional absence of timely data on secondary trading levels, and lower levels of liquidity and transparency (see section 5.1).

The Australian bond market is well developed institutionally, though modest in size. The retail market for bonds is not well developed. As of August 2013, the face value of outstanding long-term government securities issued in Australia was reportedly \$469.9 billion. Note that the definition of government securities encompasses the debt issued by State government treasury corporations. The face value of long-term, non-government securities issued in Australia was \$452.7 billion, of which only A\$50 billion was non-finance corporate bond paper.¹ Bond issuance in Australia is fairly modest, with A\$28 billion issued in 2013Q1 across government, finance and corporate issuance.² An additional A\$22 billion was issued internationally³ by

¹ As this report deals with debt magnitudes in both the U.S. and Australian currencies, we use “\$” for the USD and “A\$” for the AUD. See Statistical Table D4, published by the Reserve Bank of Australia.

² See page 14, All Australian Debt, excluding self-funded, AJ3a A\$27.708 billion, Thomson Data 1Q2013 and Bloomberg League table reports, Bloomberg function LEAG; the selection is Debt, Australia country specific, 20131Q, \$27.6 billion.

³ For international issuance, LEAG has a category of Australia/New Zealand International Bonds. The total was \$21 billion for 20131Q and the top 10 banks represented 72.9% of issuance. Note that the issuance by New Zealand

Australian companies (Thomson Data). In general, non-finance corporate bonds make up roughly 5% of Australian dollar issuance (RBA, Debt Securities Outstanding, August 2013).

The corporate bond market in Australia is generally limited to high quality investment-grade issuers. For the period 2007-2011, AAA and AA comprised 75% of all corporate-bond issuance, and AAA through A credits comprised 94% of issuance (Black et al., 2012).

For Australian corporate bonds, investors are primarily institutional, with two-thirds coming from international accounts (Black et al., 2012). The balance of bond purchasers are largely Australian institutional accounts, including banks and managed funds, with direct retail comprising less than 1% of participation (Black et al., 2012).

Bond issuance follows the general developed-market approach of orchestrated book building without the banks taking direct capital risk on pricing and, similar to other developed markets, underwriting is concentrated within the top ten banks which control roughly 90% of Australian dollar issuance. International issuance of Australian company bonds is also concentrated, with the top ten banks managing over 65% of total bond issuance.⁴

Large local institutions are generally buy-and-hold, but offshore accounts do trade the bonds and are particularly active in the days following pricing. According to market participants, it is important for the bonds to “perform in the secondary market,” meaning that bond prices are expected to rise in the days following issuance. The expectation of a price rise is, of course, a *manifestation* of the New Issue Premium.⁵

Trading is limited and there is no centralized continuous trade reporting system such as the U.S. TRACE system. Roughly a dozen secondary market makers produce daily rate sheets with quotes for many, if not all, issues. In addition to these rate sheets, Yieldbroker is an electronic secondary trading platform that gives clients access to quotes from market makers. Government-bond turnover or trading was nearly A\$2 trillion and corporate turnover A\$80 billion over the July 2011 - June 2012 period (AFMA). In contrast, U.S. government and corporate trading was one to two orders of magnitude greater, with daily trading in 2012 averaging \$519 billion for US Treasury bonds and \$17 billion for corporate bonds, respectively (SIFMA).

Corporate risk premiums, or spreads, are of a similar order of magnitude as in the U.S., with Australian spreads for BBB and A indexes ranging from 225-275 bps. As at 24th June 2013, the Bank of America Merrill Lynch index for Australian, industrial corporate bonds had a spread of 151 bps as compared to a spread of 165 bps for U.S. companies (all categories).

We have extended our literature review to the Australian bond market and, while limited, there are a number of studies that identify a lack of liquidity as a defining characteristic of the market.⁶

corporations was NZ\$3.5B, a comparatively small fraction when considered in relation to the A\$27.7B for all Australian debt.

⁴ See Bloomberg, the same table in which the top ten banks comprised 88.3% of issuance for 1Q2013.

⁵ It is important to note the distinction between the primary and secondary markets. Whereas the primary market has a limited number of participants, the secondary market is composed of a large number of bond investors.

⁶ See references in Section IV: Whittaker (2011) and Darwin, et. al. (2012) found that liquidity is priced into the market.

Based on our research and understanding of the market, we would expect Australian companies accessing the U.S. market to incur an NIP similar to what we found in our study. We have not measured or modeled the NIP in Europe, but due to the similarity in market structure and lack of a central trade reporting system such as TRACE, we would expect companies accessing the European markets, including Australian companies, to incur an NIP at least as large as that found in the U.S. market.

Based on our market knowledge, review of publicly available data and literature, and conversations with market participants, we conclude that the Australian corporate bond market has the following characteristics:

- Smaller and less liquid than corporate bond markets in the U.S. and Europe.
- Similar to the U.S. and euro markets, banks avoid having to put their capital at risk by not pricing the offerings until they have identified investors to buy all the bonds.
- Less secondary-price transparency than in the U.S. corporate bond market.
- Significant international institutional participation. Since international institutional investors are also major participants in the U.S. markets, these investors are presumably familiar with the practice of earning a new issue premium and are therefore likely to look for similar treatment in other markets, including Australia.

To understand the institutional nature of the Australian corporate bond market, we interviewed members of the Australian financial industry, and they all confirmed the existence of a New Issue Spread in the Australian context. In addition, the practitioner literature *KangaNews* and *Credit Today* confirmed that situation in the bond market⁷.

We expect that a study of Australian corporate bond issuance would likely reveal a new issue premium similar to what we found in the U.S., with the premium related to the factors that we identified in the U.S. -- spread level, market volatility, trend of spread history and tenor.

However, the characterization of the breakdown of the expected new issue premium may be different from what we found in the U.S. For example, it is possible that the level of information uncertainty is higher in Australia than in the U.S. corporate bond market, because of the reduced liquidity in the Australian market as well as a lack of robust and timely secondary trading data.

In summary, we expect to find increased information uncertainty in the Australian market, and this uncertainty justifies a new issue premium. Whether the actual premium is beyond the amount justified by the market uncertainty, and whether any additional amount can be characterized as compensation for pseudo-underwriting and/or as excess profits orchestrated by the banks for the benefit of investors, must await further analysis of the data.

1.2. Approach taken previously by the Australian Energy Regulator

⁷ Note that *Credit Today*, a daily update on credit markets and company specific news, is a daily bulletin from the Fixed Income, Currencies & Commodities Department of the National Australia Bank.

Access arrangements approved by the Australian Energy Regulator (AER) allow for a rate of return on capital and one of the components of the rate of return is the cost of debt. The cost of debt is comprised of a risk free rate and a debt risk premium -- where the debt risk premium is based on a Bloomberg fair value curve, which itself is based on secondary bond trading levels. To the extent that UE and Multinet incur an NIP when issuing their bonds, then the calculation of adding the risk free rate and debt risk premium understates the company's true cost of debt.

The AER has rejected allowing for an NIP in at least two reports: AER, *South Australia distribution determination 2010-11 to 2014-15*, May 2010, and AER, *Final decision, NSW distribution determination 2009-10 to 2013-14*, 28 April 2009. The AER gives two reasons for disallowing an NIP allocation in the debt risk premium:

"The AER notes that extensive prior analysis of empirical evidence found that the market based methodology used to set the debt risk premium prices the cost of debt such that there is no requirement to add an under-pricing allowance" (AER, May 2010, page 381); and

"The AER considers that the use of fair yield curves represent the best estimate of the expected cost of debt. Systematic under-pricing, such as that proposed by CEG as applying to all firms irrespective of credit rating, should be readily detected and included in the fair yield curves. The AER considers that on these grounds, no allowance for under-pricing is justified ..." (AER, April 2009, page 545).

"The AER has not 'assumed away' empirical evidence. Rather, the empirical evidence presented by the NSPs and their consultants does not support the claims made. The AER considers that it has not been provided with empirical evidence of debt under-pricing for BBB+ rated bonds in any country, or evidence of debt under-pricing in Australia" (AER, April 2009, page 549).

We believe that the AER position is incorrect on both accounts. Regarding the use of fair value curves, these curves are based on secondary market levels for seasoned corporate bonds. Therefore, by definition, the new issue premium cannot be captured in that data.

Regarding the second point, the AER references research by Datta et al., (1997), and Cai et. al., (2007), on the pricing of new issue corporate bonds, but we find the research to be dated and therefore does not reflect:

1. Changes in market conditions over the past 10 or so years; and,
2. The availability of robust TRACE trading data in the U.S.

We believe that our paper clearly demonstrates and explains the presence of an NIP, and our analysis for this report supports the likely occurrence of a similar NIP for Australian issuers in the Australian market.

1.3. Institutional history in the USA

Beginning in 1999, with the Gramm-Leach-Bliley bill reversing the 1933 Glass-Steagall law barring commercial banks from underwriting, there was considerable consolidation in bank underwriting. This approach brought the end to competitive bought deals⁸, which had been

⁸ In competitive bought deals, underwriters priced and purchased the new issues prior to identifying the ultimate investors.

prevalent since the 415 Shelf Registration rules were introduced in the early 1980s, and returned underwriting to its pre-1982 form of pre-marketed transactions⁹ -- although the time span allotted for pre-marketing was measured in hours and days, rather than in days and weeks.

While Cai et. al., (2007), studied 2,975 corporate bonds and did not find an NIP for investment grade bonds, their paper uses data from the National Association of Insurance Commissioners (NAIC), and the time period was 1995-1999. As noted in Bessembinder et al. (2006), NAIC data only represented 12.5% of TRACE volume data during the second half of 2002. Furthermore, NAIC data applies solely to insurance companies, and these investors are typically buy and hold accounts that might not be representative of the active investors that trade bonds during the redistribution process. Also, 1995-1999 was the tail end of the competitive bid era so it would not be unreasonable to see smaller NIPs.

Similarly, Datta et al., (1997), did not have the benefit of the TRACE data, they only looked at IPOs, and their sample was only 50 bonds, compared to our sample of roughly 1,500 bonds. In addition, Datta et al., (1997), did not adjust their returns for changes in spread, only for changes in the benchmark rate. Finally, their study covered the period 1976-1992. This period included the time prior to the advent of shelf registration as well as the beginning of the 415 Era. We would expect that the first half of their study should show an information uncertainty premium required by investors, while the second half may be expected to show a lower NIP as banks became aggressive buyers of new issue securities. Ultimately, we believe that the data is the primary source of difference between our results and the results from the cited research.

2. Our Paper, “Quantifying and Explaining the New Issue Premium in the Post Glass-Steagall Corporate Bond Market”

2.1. Summary

In our *JFI* paper, we document and rationalize the premium paid by bond issuers in the U.S. corporate bond market. Institutional changes in the U.S. bond market over the past thirty years have shifted the new issue pricing risk from investors to banks and back to investors, with large institutional investors currently acting as a *de facto* adjunct underwriting group. The NIP reflects compensation for bearing the information uncertainty associated with new issue pricing and, in the U.S., compensation for the pseudo-underwriting role played by large investors. The NIP is also symptomatic of oligopolistic pricing and is a transfer of wealth that occurs at the time of issuance.

We used the superior data prevalent in trades under the TRACE system to compute the New Issue Premium and related the magnitude of that premium to predetermined economic variables such as bond spread, index spread, tenor and various measures of market volatility. We also modelled the required NIP based on compensation for information uncertainty and the bearing of unsystematic risk.

⁹ In a pre-marketed transaction, banks identified investors prior to committing to a transaction.

2.2. History of the New Issue Premium in the U.S.

As is the case with equity securities, corporate bonds often exhibit a new-issue premium, where the yield on the new issue is set at a level higher than that dictated by comparable secondary transactions or subsequent trading in the newly issued bonds. This premium has been described as a seasoning process tied to a variety of reasons ranging from compensation for information asymmetry to cartel pricing. Moreover, the corporate bond new issue market has changed dramatically over the past thirty years, and the motivation for a new issue premium has varied over time.

Prior to the 1980s, bond underwritings were orchestrated affairs played out over days, if not weeks. Investment banks put together syndicates to underwrite and seek out investors and there was significant pre-marketing of transactions. Offerings were priced based on an order book of investors. Since there was little secondary trading of corporate bonds, and even less reliable reporting of trade information, it was difficult to assess whether new issues or secondary trade levels reflected fair value, and even more difficult to assess whether the underwritten bonds reflected a new issue premium. However, to the extent that the new bonds required a concession, then that concession probably reflected the compensation due to investors for taking on the pricing uncertainty associated with the new series of bonds.

In 1982, the Securities and Exchange Commission, (SEC), introduced the Shelf Registration process that allowed the pre-registration of securities. Once registered, issuers could access the market on a moment's notice and this led to a change in the underwriting process whereby banks were increasingly asked to bid for series of bonds, either individually or in small bank groups. Without the benefit of pre-marketing to investors, banks were asked to price and purchase securities, and this process strained the capital balances of banks. Up until that point, underwriting fees were regarded as compensation for selling costs, for the provision of advice on structuring, and for incurring risks as follows:

- Underwriting the possibility of investor failure during the pricing-to-settlement period; and
- Bearing the capital risk related to selling residual positions not spoken for during the pre-marketing period.

However, with bought deals¹⁰, the pricing uncertainty risk shifted from investors to banks and, depending on the specific underwriting structure, banks earned either the full new issue premium or shared the premium with investors. Therefore, the new issue premium reflected a combination of extra payment to banks for bearing additional capital risk as well as payment to investors for taking on pricing uncertainty. While robust trading data is not available from that time period, the highly competitive nature of bond underwriting from the mid-1980s through to the mid-1990s may have resulted in a reduction in the NIP, because the underwriters often used their underwriting fees to subsidize bond pricing.

The Glass-Steagall Act of 1933 barred commercial banks from underwriting securities. However, the 1990s saw the chipping away of Glass-Steagall as Section 20 of the Glass-

¹⁰ In competitive bought deals, underwriters priced and purchased the new issues prior to identifying the ultimate investors.

Steagall Act was interpreted to allow some bond underwriting by commercial banks. Finally, in 1999, Glass-Steagall was overturned with the passage of the Gramm-Leach-Bliley Act. The implementation of the new legislation led to considerable consolidation in investment banking, and the unofficial tying of bank loans and credit lines to underwriting assignments. Since bank loans and credit lines were too large for any one bank, underwriting once again took the form of syndicates in which a handful of the client's banks jointly managed the issuance of bonds. This approach brought the end to bought deals in which underwriters priced and purchased the new issues prior to identifying the ultimate investors. Bought deals had been prevalent since the 415 Shelf Registration rules were introduced. Consequently, underwriting was returned to its pre-1982 form of pre-marketed transactions, in which banks identified investors prior to committing to a transaction. However, the time span allotted for pre-marketing was now to be measured in hours and days, rather than in days and weeks.

Bank capital and distribution systems have not kept pace with the increase in the size of issuer borrowing needs, and the current distribution system favours the rapid pricing of securities. In addition, banks have developed close working relationships with large institutional investors. The result is that banks now use these large institutional investors as a *de facto* adjunct distribution system. These investors purchase allotments of underwritings in excess of their own investment requirements, and then sell their excess positions in the secondary market in the days and weeks following the issuance. Therefore, information uncertainty as well as re-distribution risk is taken on by the large investors.

The unofficial tying of bank loans and credit facilities to underwriting assignments impedes the entrance of new players into the new issue business and the resultant bond pricing allows for the wealth transfer from issuers to investors. While the close relationships between investors and banks give the banks an advantage in subsequent secondary trading activity, there is no linkage of business activities as in the primary market. Therefore, non-bank firms are involved in the secondary trading market as well, either through the provision of trading capital and technology, or as a result of the development of their own relationship. Accordingly, bonds trade at market clearing levels.

There have been distinct phases for the distribution processes over time, and these are summarized below in Table 2.1.

Table 2.1: Distribution framework across different eras, from the pre-1982 period to the present

<u>Era</u>	<u>Time Period</u>	<u>Distribution Process</u>	<u>Bearer of Pricing Risk</u>	<u>New Issue Premium</u>
Pre-415 Shelf Registration	Prior to 1982	Investment Banks pre-marketed transactions to investors over a period of days to weeks.	All investors	Earned by all investors as compensation for information uncertainty.
415 Era	1982-Late 1990s ¹	Investment Banks often bid for transactions with little or limited investor pre-marketing.	Underwriters	Shared by investors and banks. The underwriting fees often subsidized the NIP.
Post Glass Steagall	Late 1990s-present	Commercial/Investment Banks pre-market transactions to investors over a period of hours to days, with particular emphasis on seeking pricing feedback from large institutional accounts.	Large Investors	Earned primarily by the large institutional accounts that buy the bulk of the new issue and then re-sell a portion in the secondary market.

Notes: (1) Glass-Steagall was repealed in 1999, but banks were significantly chipping away at their underwriting restrictions during the mid to late 1990s.

Corporate bonds and related credit default swaps now trade in far more liquid and transparent markets and, therefore, it is difficult to argue that new issues require as large a premium for information and valuation uncertainty. More likely, a significant proportion of the premium reflects compensation to these large investors for assisting in the underwriting process and for acting beyond their roles as end investors. The premium is thus comprised of three components:

- Compensation for bearing information uncertainty arising from the banks using the large investors to preempt the full price discovery process.
- Since the investors are taking on positions larger than their investment needs, these positions create unsystematic risk exposure that is not being compensated through the normal bond pricing channels; and
- A wealth transfer from issuers to investors resulting from the underwriting system and the synergistic relationship between banks and institutional investors.

One of the authors of this report has had conversations for over 15 years with market participants, including institutional investors, who acknowledge the existence of an NIP. The methodology usually used to calculate the NIP is based on a less rigorous method, namely comparison to the secondary trading levels of comparable securities at the time of pricing. More recently, the topic of the NIP has been mentioned in institutional investor reports (Blackstone, 2013).

2.3. Literature Review

Research on the topic of the New Issue Premium dates back to 1940, if not earlier. Wilcox (1940) showed that banks collaborated on the bidding of underwriting assignments, and he cited a 1925 written agreement on the sharing of business. Ederington (1974) and Martin (1981) attributed the NIP to differences in coupon rates, call features and tax treatment, though Sorenson (1982) found that bonds were under-priced by 10 basis points.

Following the introduction of shelf registration, Fung (1985) did not see evidence of underpricing, but Rock (1986) proposed that the premium results from the information segmentation of investors, leading to a pricing concession to satisfy uninformed investors. More recently, Green (2007) proposed that the premium reflects search costs associated with finding retail investors.

Goldstein (2007) and Edwards (2007) showed that the introduction of the TRACE reporting system has had a positive effect on liquidity and has resulted in lower transaction costs.

2.4. Our Data and Methodology

Unlike exchange-traded equities, corporate bonds trade over the counter and until recently, pricing information for secondary trades was limited, sporadic, delayed and, as reported to pricing services, often imaginary, with traders providing guesses as to where issues might trade at any given time. However, beginning in 2002, dealers began reporting trades under the

TRACE system in an effort to improve price transparency, and the system was fully phased in on a real-time basis by 2006.

Our research used the TRACE data to estimate the new issue premium for approximately 1,500 non-finance company bonds underwritten over the period from January 2008 to January 2012. The estimate was derived by calculating the relative decrease in bond spread for the issuer over the 4-8 week period following issuance as compared to the change in a comparable index of non-finance company secondary levels. In addition, the TRACE data was used to show the decline in trading activity that was recorded in the weeks following issuance. Initial significant trading activity would be consistent with a re-distribution period for new issues.

Using the TRACE bond data, weekly changes in spread were calculated for the eight weeks following issuance. To adjust for changes in the overall market, data for CFOX, which is the Merrill Lynch composite index for investment grade, non-finance companies, was collected from Bloomberg for the same time period. Subtracting the weekly change in the index from the weekly change in the transaction spread resulted in an adjusted weekly change in the transaction spread.

To determine the New Issue Premium, we calculated the average change in adjusted spread over the period 4-8 weeks after issuance.

Trading volume from TRACE was collected and used to calculate weekly average trading volume as a percentage of the size of the transaction.

2.5. Empirical Results

Using the TRACE volume data, we showed that on average, there is significant trading activity in the first week of trading and that it tails off over time. The diminished subsequent trading activity provides support for the argument that redistribution occurs during the first weeks of a bond's existence.

Figure 2.1: Average percentage of new issue daily trace volume, January 2008 to January 2012

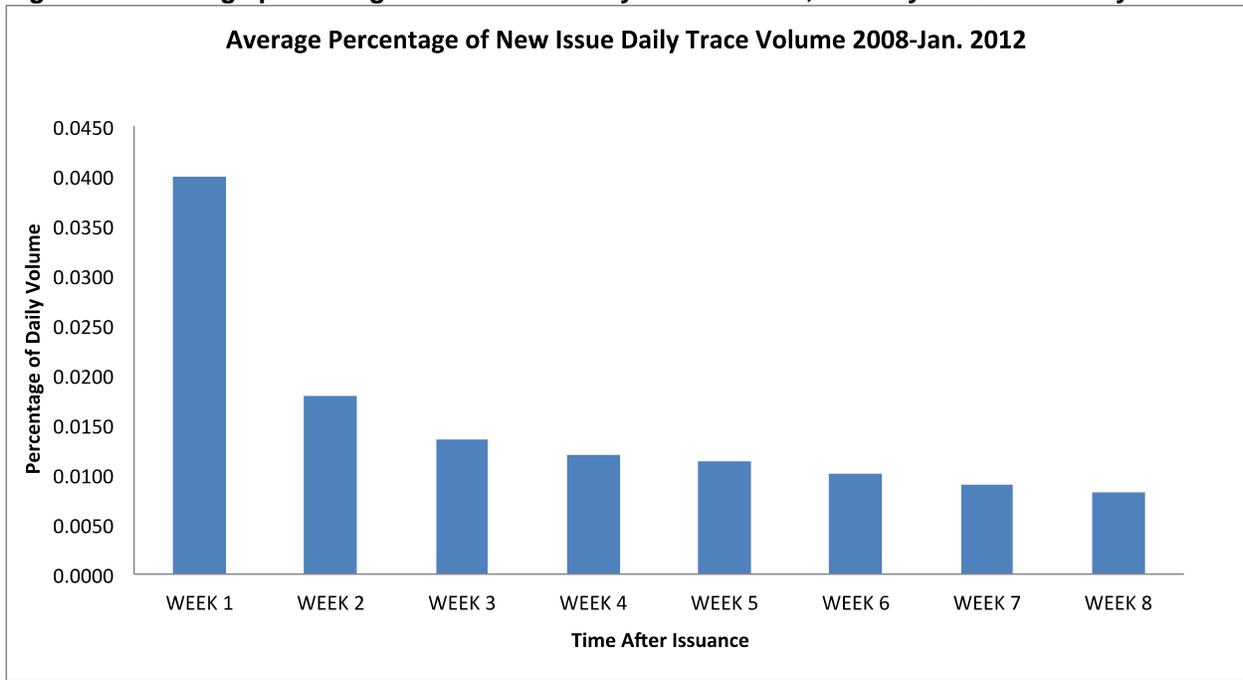


Figure 2.2: NIP Frequency Distribution, January 2008 to January 2012

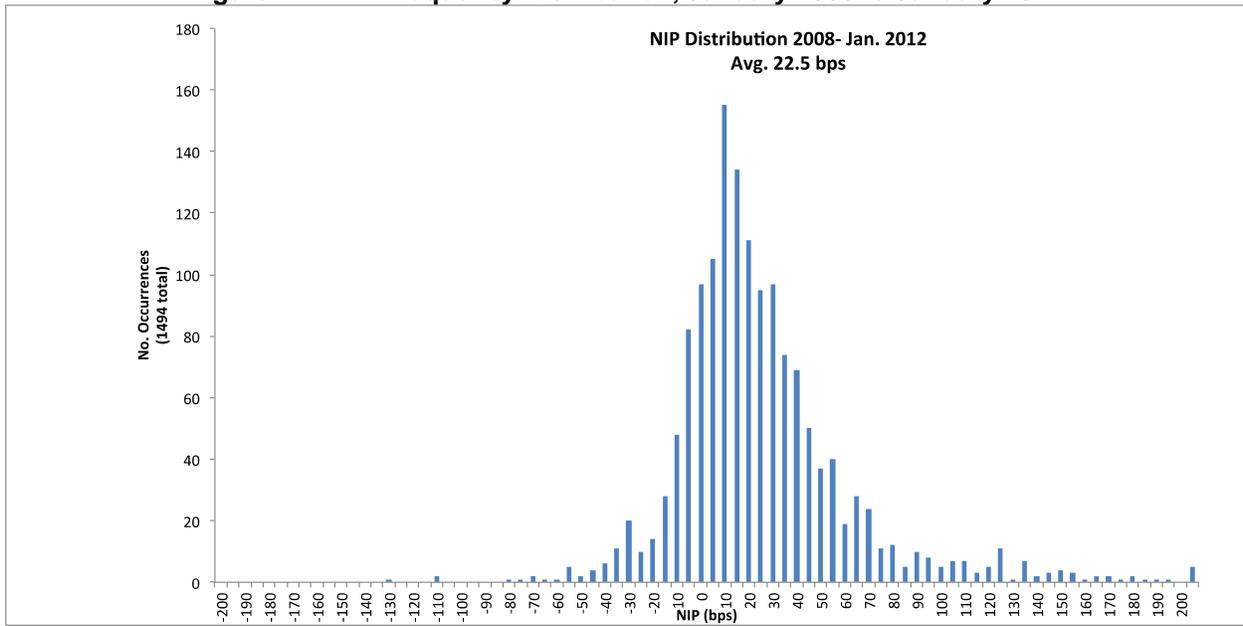
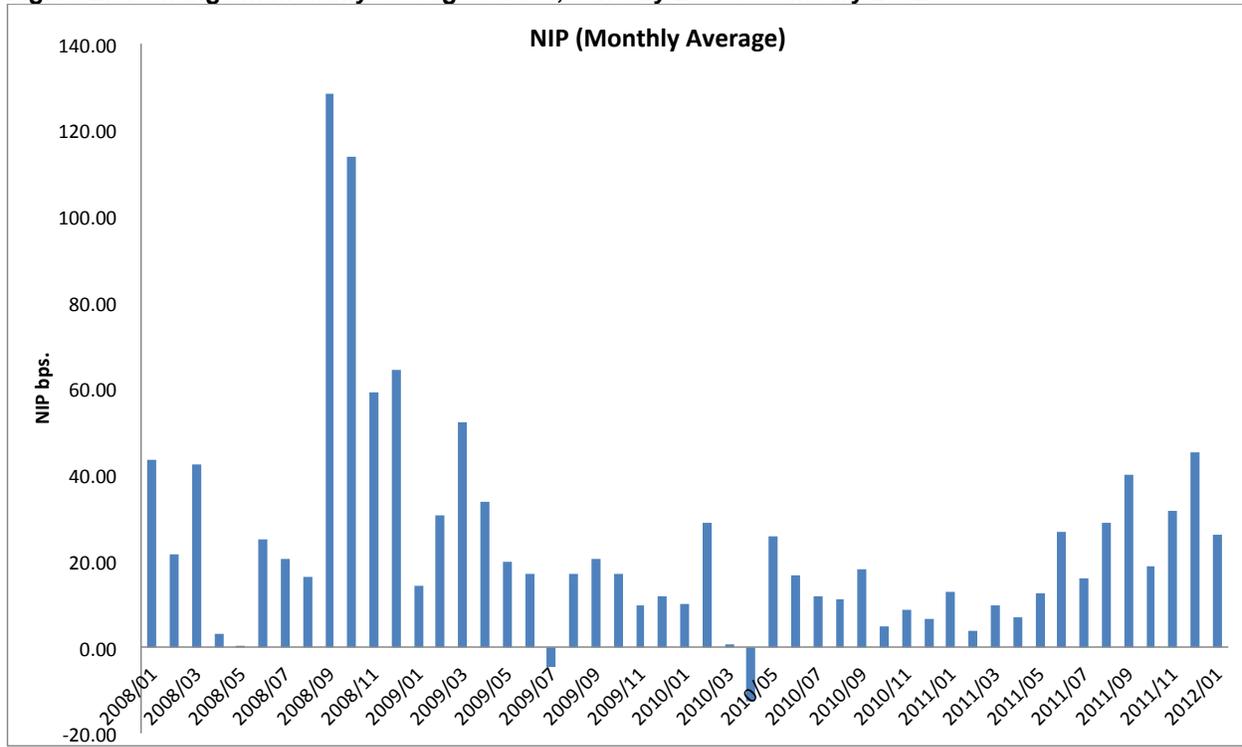


Figure 2:3: Change in monthly average values, January 2008 to January 2012



We also calculated the NIP by credit rating band, with the following results:

AAA/AA: 16.0 bps.
 A: 24.8 bps.
 BBB: 21.9 bps.

One should not of course read too much into the point estimate for the BBB NIP being less than its counterpart for A rated bonds: In addition to random variation, that could be due to smaller issuance by BBB companies during stress periods, as well as differences in maturities of the debt.

We considered the relationship between NIP and a set of observable factors that we deemed determinative of NIP magnitude, including issue size, credit spread, index level, trend in index, volatility, and tenor. These factors are described below along with the regression results.

Table 2.2: Variables that will putatively affect the New Issue Premium

No.	Definition	Intuition for Postulated Sign
1.	Amount issued, in USD \$M	Possibly non-monotonic: For very small and/or very large issues, the magnitude of the NIP may be larger as small issues are less attractive to own due to a lack of liquidity, and very large issues may require extra compensation to search out incremental investors.
2.	Value of CFOX, the corporate spread over Treasuries (bps)	Probably negative. An environment of stable, high spreads could present an attractive asset opportunity for investors and they may be willing to suffer a negative new issue

		premium in order to acquire blocks of bonds not available in the secondary market.
3.	Ten-day trend in CFOX (bps)	This variable is less traditional, as finance studies typically call for a snapshot of a variable at a point in time to constitute the latest measure of the market's views. In this case, we incorporated this variable since market sentiment expressed as an improvement or deterioration in credit spreads would affect NIP in ways not captured by our other variables. We postulate a positive sign, in that deteriorating credit conditions would, all else constant, cause lead investors to require a higher risk premium for bearing information uncertainty and pseudo underwriting risk.
4.	Swap Spread volatility, (percentage points)	A higher forward-looking volatility implies a requirement of greater compensation for bearing risk.
5.	The Unsystematic Risk (percentage points)	The greater the unsystematic risk, the greater the required compensation for risk not willingly borne.
6.	Spread to the Treasury rate at issuance (bps)	Greater risk commands greater coupon rate.
7.	Tenor (years)	Since the compensation is spread out over a longer period of time, greater tenor should imply a lower NIP.

Note: Since the Swap Spread is the difference between the Swap rate and the rate on the corresponding-maturity Treasury security, then:

$$\text{Delta Swap Rate} = \text{Delta}(\text{Swap Rate}) - \text{Delta}(\text{Treasury Rate})$$

where Delta represents “the change in.” Applying the variance operator to both sides, we obtain:

$$\text{Var}(\text{Delta Swap Rate}) = \text{Var}[\text{Delta}(\text{Swap Rate})] + \text{Var}[\text{Delta}(\text{Treasury Rate})] - 2 \text{Cov}[\text{Delta}(\text{Swap Rate}), \text{Delta}(\text{Treasury Rate})]$$

where $\text{Cov}[\text{Delta}(\text{Swap Rate}), \text{Delta}(\text{Treasury Rate})] = \text{Corr}[\text{Delta}(\text{Swap Rate}), \text{Delta}(\text{Treasury Rate})] \text{StdDev}(\text{Delta Swap Rate}) \text{StdDev}(\text{Delta Treasury Rate})$. The volatility is of course the square-root of $\text{Var}(\text{Delta Swap Rate})$.

The MOVE and SMOVE indices provide the forward-looking volatilities of the Treasury Rate and Swap Rate, respectively, and the $\text{Corr}[\text{Delta}(\text{Swap Rate}), \text{Delta}(\text{Treasury Rate})]$ is obtained from a rolling 30-day correlation of changes in the Swap and Treasury Rates.

We ran a regression of NIP on the above seven right-hand side variables, taking into account the clustering of the data around calendar dates and found the following results:

Table 2.3: Results from the econometric estimation of the new issue premium

Regression Results for NIP		
R-Squared: 35.8%; Number of Observations: 1487		
	Clustering Estimation	OLS Estimation

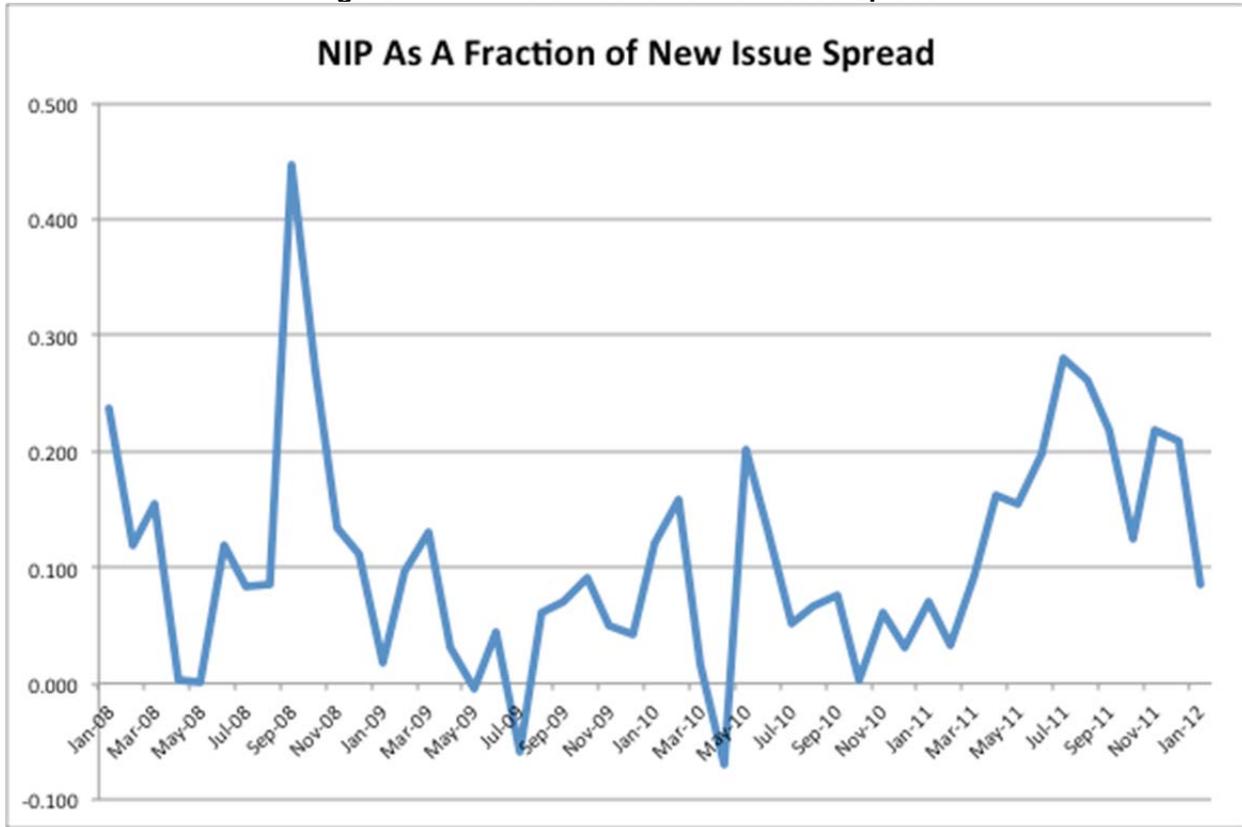
	Coefficient	<i>t Stat</i>	<i>Coefficients</i>	<i>t Stat</i>
Intercept	-15.134	-2.98	-15.135	-3.75
Amount Issued	0.892	1.22	0.892	1.98
Amount Issued^2	-0.025	-0.73	-0.025	-1.45
CFOX	-0.080	-3.53	-0.080	-5.79
CFOX trend 10 day	4.834	6.14	4.834	11.13
Swap Spread Volatility	0.174	4.10	0.174	6.02
Unsystematic Risk	0.140	1.90	0.140	2.35
Treasury Spread at Issue	0.135	9.80	0.135	17.14
Tenor	-0.652	-8.73	-0.652	-7.85

We investigated the relationship solely between the NIP and the new issuance spread over the 1,500 bond sample. The average value of the ratio $\left(\frac{NIP}{Spread}\right)$ is 10.4%, while the ratio of the (average NIP) over the (average spread) is 10.1%. When looking for the most basic indicator of a future NIP, we believe that the former ratio will provide a better guide than the historical NIP.

First and foremost, on the basis of economic intuition, it is compelling that the appropriate measure be *normalized* by an appropriate statistic. In that regard, adjusting for the spread permits sensitizing the measure to current credit-market conditions (rather than using the average NIP realized over the 2008-2012 period).

Second, in terms of our paper's page-14 regression analysis, the spread displayed a high *t*-statistic and is the most intuitive predictor of the NIP based on our economic model that links NIP to information uncertainty and unsystematic risk (see below). In addition to the time-series sensitivity of the NIP (in relation to prevailing credit market conditions), in a cross-sectional dimension we believe that the NIP of a high-spread company would be higher than the NIP of a low spread company.

Figure 2.4: NIP As a Fraction of New Issue Spread



We also modelled the NIP as a payment for information uncertainty and the bearing of pseudo underwriting risk with the following terms:

$$\text{Unsystematic Pseudo Underwriting Risk Premium} = \text{Bond Spread} / [\text{Duration} * 8]$$

$$\text{Information Uncertainty} = [\text{Bond Spread} / \text{Bond Index Volatility}] * \text{Standard Deviation (NIP)}$$

Compensation for unsystematic risk is justified for the investors since they are playing the role of pseudo-underwriter, and are bearing non-diversifiable risk. To model the pricing of this risk, we assume that the bond is held in inventory for 6 weeks, or 1/8 of a year. Since we argue that the unsystematic risk is approximately equal to the systematic risk, the investor will want to earn an additional spread, equal to the new issue spread, for the length of time held in inventory, or 1/8 * spread. For example, if the bond spread was 160 bps, and this represents systematic compensation, the investor will want to earn an additional 160 bps across the 6 weeks, or 20 bps of upfront underwriting compensation. Since the investor captures this compensation via capital appreciation, the bond only needs to be priced with enough extra spread such that the capital appreciation generates these 20 bps. Because price moves by the rate change times duration, the necessary new issue premium is just $\text{Spread} * 1/8 / D$. For the above example, assuming a duration of 10, you would only need a new issue premium of 2 bps to create a 20 bp price move, which is the totality of the additional compensation required. Thus, the portion of the NIP allocated to the unsystematic risk is merely 2 bps.

The total required New Issue Premium can be expressed as:

$$\text{NIP} = \text{Bond Spread} / [\text{Duration} * 8] + [\text{Bond Spread} / \text{Bond Index Volatility}] * \text{Standard Deviation (NIP)}$$

Using this formulation, we found a *required* New Issue Premium of 12.9 bps versus the *observed* 22.5 bps, with a correlation coefficient between the required and observed values equal to 0.42. The required premium is a little more than one half of the observed premium and, interestingly, is in line with traditional underwriting fees. However, banks continue to charge a completely separate fee for underwriting and selling the bonds. Therefore, not only do issuers appear to be paying twice for the underwriting of bonds, but also the fee being paid to the large investors is roughly 10 bps higher than the compensation required to make up for the unsystematic and information risks incurred.

3. Summary of Australian Bond Market

Before discussing the applicability of our current study to Australian issuers, we need to frame that market and the sectors relevant to our analysis. Australian companies access the capital markets locally as well as internationally, both in Europe and the United States. Bonds issued outside Australia are generally issued in U.S. dollars and euros, with the proceeds swapped back into Australian dollars using currency and interest rate swaps. In addition, there is some Australian dollar issuance in Europe. Also, foreign companies access the local market to issue Australian dollar bonds, referred to as Kangaroo bonds, generally swapped into the issuer's desired currency.

3.1. Outstanding Issues

As previously noted, the Australian bond market is well developed institutionally, though modest in size. The retail market for bonds is not well developed. Based on Reserve Bank of Australia (RBA) data, long-term government debt outstanding totals A\$469.9 billion, while domestic non-government debt totals A\$452.7 billion, of which only A\$50 billion is non-finance corporate bond paper¹¹.

Non-finance corporate bond paper issued internationally by Australian companies totals A\$164 billion. In contrast, U.S. Treasury debt outstanding is approximately \$11 trillion and corporate securities approximately \$9 trillion, (*Securities Industry and Financial Markets Association*, "SIFMA" data). Per the European Central Bank (ECB), all euro-denominated debt totals \$15 trillion with approximately \$3.5 trillion of non-government paper.

3.2. Issuance

Australian bond issuance consisted of A\$28 billion issued in 2013Q1, comprised of government, finance and corporate issues. An additional A\$22 billion was issued internationally by Australian companies. Of the A\$28 billion, A\$8 billion were Kangaroo bonds issued by non-Australian entities (as reported by Thomson, the RBA and Bloomberg). In general, non-finance corporate bonds make up roughly 5% of Australian dollar issuance.

¹¹ As this report deals with debt magnitudes in both the U.S. and Australian currencies, we use "\$" for the USD and "A\$" for the AUD. See Statistical Table D4 published by the Reserve Bank of Australia. The figures are as at August 2013.

Specifically, Australian non-finance corporates borrow funds domestically, as well as in Europe and the United States. A review of Bloomberg data for the January 2012 to June 2013 period shows 79 transactions totalling \$36 billion in issuance. Approximately 19% of the volume was issued domestically, 56% in Europe, and 25% in the U.S., including global transactions.

The average size of each transaction is approximately A\$400 million, though corporate transactions tend to average between A\$250 million and A\$300 million. Kangaroo bonds averaged A\$300 million in the 2013Q1 (Bloomberg and Industry Sources).

The corporate bond market in Australia generally is limited to high quality investment grade issuers. For the period 2007-2011, AAA and AA comprised 75% of all corporate bond issuance, and AAA through A credits comprised 94% of issuance (Black et al., 2012).

Australian bond issuance is heavily reliant on international sources of funds, with 80% of government debt now held by offshore investors (Australian Financial Markets Association, AFMA). For Australian corporate bonds, investors are primarily institutional with two-thirds coming from international accounts (RBA, 2013). The balance of bond purchasers are primarily Australian institutional accounts, including banks and managed funds (RBA, 2013). Direct retail comprises less than 1% of participation, though there are continued efforts by the government to increase direct participation through the easing of documentation requirements (Black et al., 2012).

3.3. Underwriting Process

Bond issuance follows the general developed market approach of orchestrated book building without the banks taking direct capital risk on pricing.

Similar to other developed markets, underwriting is concentrated with the top ten banks controlling roughly 90% of Australian dollar issuance. International issuance of Australian company bonds is also concentrated, with the top ten banks managing over 65% of total bond issuance (Thomson Reuters).

To allow for international participation and different time zones, the order period generally lasts at least 24 hours. It is fairly common for the order book to be in excess of the size of the offering. However, this over-subscription may not always be indicative of the true demand for the bond offering as investors have become trained to place larger orders than they want as they know they will be cut back during the allocation process, a process managed by the underwriters. Based on our industry contacts, and similar to the U.S. and Europe, deals are over-subscribed, but generally with less “order inflation” which cuts down on the allocation process. Our contacts have suggested that this reduced order inflation may reflect less hedge-fund participation, a class of investors that typically get greater “haircuts” to their requested allocations.

Large local institutions are generally buy and hold, but offshore accounts do trade the bonds and are particularly active in the days following pricing. According to market participants, it is important for the bonds to “perform in the secondary market,” meaning that bond prices are expected to rise in the days following issuance.

For international bonds for Australian issuers, the underwriting process is similar to other Eurobond offerings and indeed similar to the U.S. bond market.

Based on our discussions with an Australian banker, bonds are generally priced as a spread to swaps rather than to government bonds, due to the latter's comparatively lower liquidity.

An interesting quote that speaks to the status of the new issue market comes from Guy Debelle, RBA Assistant Governor (Financial Markets), when he was speaking at the KangaNews DCM Summit, Sydney conference earlier this year:

"In many of the recent discussions about the state of the local market, I have been in the room with both issuers and investors. The issuers say there is not enough demand for their paper. The investors say there is not enough supply. But what actually seems to be going on here is that the bid-ask is too wide. It is basically an issue of price. Ironically, those very same discussions are often chaired by investment banks, whose mandate, I would have thought, would be to intermediate between the issuers and the investors."

3.4. Trading

Bond liquidity fell during the global financial crisis, as it did in the U.S. In general, worldwide bank capital devoted to bond trading has not kept up with outstanding balances over the past ten years.

The Australian market does not possess a centralized, continuous-trade reporting system such as TRACE. Roughly a dozen secondary market makers produce daily rate sheets with quotes for many, if not all, issues. In addition to these rate sheets, Yieldbroker is an electronic secondary trading platform that gives clients access to quotes from market makers. However, Yieldbroker is primarily a domestic market system and does not reflect trades of international investors.

Government turnover or trading was nearly A\$2 trillion and corporate turnover was A\$80 billion over the July 2011-June 2012 period (AFMA survey 2012). By comparison, U.S. government and corporate *daily* trading in 2012 averaged \$519 billion and \$17 billion (SIFMA).

Corporate credit spreads are of a similar order of magnitude as in the U.S. On 6/24/13, the A\$ Bloomberg BBB fair-value 7-year curve was 6.32% compared to a Government rate of 3.69%, a difference of 263 bps, while the Bloomberg A BVAL 9-year index was 5.98%, a spread of 229 bps. Alternatively, the Bank of America Merrill Lynch BBB Australia Corporate Index had a spread of 272 bps and the AA curve was 5.63%, for a spread of 194 bps. The Bank of America Merrill Lynch Australia Index for industrial corporate bonds had a spread of 151 bps, not substantively different from the US overall corporate index spread of 165 bps¹².

4. Additional Australian Debt Market Research Review

Research specific to the Australian bond market is relatively scarce and little new work is available purely on the corporate bond market. As a reference, a recent survey of SSRN found 28 papers on the topic of the Australian Bond Market, with the majority dealing with government securities. For comparison, there were 374 papers found on the topic of the U.S. Bond Market.

Whittaker (2011) developed a multifactor model and found that liquidity is priced into the Australian dollar market with less liquid issues having higher yields. Since the lack of liquidity

¹² Please note that the yields reported in this paragraph have been quoted on a semi-annual basis, and have not been transformed into the annual equivalent rates that are used in regulatory calculations.

leads to information uncertainty, this finding is consistent with the concept of a new issue premium.

Similarly, Darwin, et. al. (2012) investigated CDS spreads and found that, as is the case in the U.S., default risk and liquidity are priced into credit spreads. They also found that the Australian bond market is predominantly illiquid.

In contrast, Lepone and Wong (2009) did not find a relationship between credit spread and liquidity, and attributed the lack of an association to their use of low-precision monthly data.

Batten, Hogan and Szilagyi (2011) found that the corporate bond market is still limited to higher-quality issues, and that the development of the Kangaroo market has been helped by a demand for high-quality issuers. Liquid foreign exchange and derivatives markets allow foreign issuers to issue in Australian dollars and then convert their securities into the currency of their choice.

5. Initial Comments on the Likelihood of a New Issue Premium for Australian Issuers

In the U.S., our research found a significant new issue premium, approximately equal to 10% of the issuance credit spread across all issuance maturities. We modelled this premium as consisting of three components:

- Compensation for information uncertainty
- Compensation for acting as a pseudo underwriter and taking on non-diversifiable risk
- An extra payment orchestrated by the banks and transferred from the issuer to the investor, ultimately benefiting the bank-investor relationship.

5.1. Australian Companies Issuing in Australia

Based on our market knowledge, a review of publicly available data and literature, and conversations with market participants, we conclude that the Australian corporate bond market has the following characteristics:

- Smaller and less liquid than corporate bond markets in the U.S. and Europe.
- Similar to the U.S. and euro markets, in that banks do not position new issue offerings.
- Less secondary price transparency than in the U.S. corporate bond market.
- Significant international institutional participation, with investors undoubtedly aware of the new issue premiums available in the U.S. market.

As noted, we expect that a study of Australian corporate bond issuance would be likely to reveal a new issue premium similar to what we found in the U.S., with the premium related to the factors that we identified in the U.S. -- spread level, market volatility, trend of spread history and tenor. Empirical results based on Australian data could be subject to higher standard errors than empirical results obtained using U.S. data, because the sample sizes for Australian dollar bonds are smaller.

In addition, the characterization of the breakdown of the expected new issue premium would probably be different from what we found in the U.S. It is likely that the level of information uncertainty would be higher in Australia than in the U.S. corporate bond market, because secondary trading data may not always be available in a timely manner, and there may also be lower levels of liquidity.

Before pricing a new issue, banks and investors need to be certain of current benchmark levels for the same and/or similar credits. To the extent that this data is unavailable or unreliable, the uncertainty surrounding the current state of the market is heightened.

Even with available benchmark secondary trading information, market participants need to gauge the *depth* of the new issue market in terms of investor appetite for new securities. A lack of transparency in the new issue market is, in itself, a source of information uncertainty.

Therefore, we suspect that the amount of information uncertainty is greater in the Australian market than in the U.S., and that this heightened uncertainty may play a larger role in the new issue premium than in the U.S.

We do not know whether “pseudo underwriting” and redistribution play as large a role in the Australian market as in the U.S. market. The lack of centralized trading data may impede the ability to fully understand the level of redistribution, though a survey of individual daily bank pricing sheets may yield data to analyze this question. We do know that international institutional accounts play a significant role in the primary distribution of corporate bonds, and it is reasonable to assume that some portion of these initial purchases are for trading purposes.

Finally, as in the U.S., there is a close relationship between the international banking community and institutional investors. Therefore, it is likely that the NIP reflects the effects of oligopolistic pricing and wealth transfer from issuers to investors.

In summary, we expect to find increased information uncertainty in the Australian market, and this uncertainty justifies a new issue premium. Whether the actual premium is beyond the amount justified by the market uncertainty, and whether any additional amount can be characterized as compensation for pseudo underwriting and/or as excess profits orchestrated by the banks for the benefit of investors, must await further analysis of the data.

5.2. Australian Companies Issuing in Europe

The Eurobond market is similar in size and scope to the U.S. corporate bond market, with over €360 billion worth of investment grade bonds issued in the first quarter of 2013. Similar to the U.S., underwriters (many of which are the same banks that operate in the U.S. market) do not take capital positions in unsold bonds and instead orchestrate transactions where they find buyers for all the offered securities.

Since the markets are dominated by institutional accounts, many of which participate in U.S. bond offerings, and there is a highly liquid and well-functioning derivatives market, it is reasonable to conclude that significant differences in pricing between the U.S. and euro market would be arbitrated away, and there is no evidence of a systematic cost advantage to issuing in Europe.

In addition, the euro market lacks the secondary trading transparency provided by the U.S. TRACE reporting system. Therefore, we believe that it is reasonable to assume that a formal study of the Eurobond new issue market would find evidence of a new issue premium which is at least as large as that found in the U.S.

5.3. Australian Companies Issuing in the U.S.

For Australian companies issuing in the U.S., we would expect their bonds to be subject to the same market forces that were discussed previously. It is possible that the new issue premiums may be slightly larger than the premiums for the average U.S. company, due to greater information uncertainty.

To examine the NIP for Australian companies issuing in the U.S. market, we conducted a search of the Bloomberg database for the period January 2005-June 2013. There were 99 U.S. \$ issues over that period, for Australian domiciled companies, but only 32 bonds were recorded as having TRACE secondary bond data. The 67 other listings were either duplicate transactions, where a company issued the same security in both the Euro-market and the U.S. market, or else the transactions were solely in the Euro-market or private placement market in the U.S. and thus did not have TRACE data. Of the 32 bonds with TRACE data:

- There were 18 companies in our research paper’s database for the period January 2008 - January 2012.
- Four companies were not part of our 2008-2012 database.
- 10 companies were outside the 2008-2012 time period.
- Rio Tinto Finance and BHP Finance accounted for 14 and 11 bonds of the 32 bonds, respectively.

For bonds not already part of our database, we calculated the NIP using the same process as outlined in section 2.4 of this report. There were 25 out of 32 bonds which exhibited an NIP, and the average NIP across all 32 bonds was 27 bps, reflecting 10.3% of the new issue spread.

These results are shown in Table 5.1 below.

Table 5.1: NIP Analysis for Australian corporates raising debt capital in the USA

NIP ANALYSIS FOR AUSTRALIAN COMPANIES ISSUING US\$ BONDS IN THE U.S. AND/OR GLOBAL MARKETS, JANUARY 2005 TO JUNE 2013										
CUSIP	Issuer	Announced Date	Coupon	Amount	Rating	Maturity	Issue Yield	Issue Spread	NIP	NIP/Spread
			%	\$ million			%	bps	bps	ratio
EJ3915810	APT Pipelines	3/10/2012	3.875	750	BBB	11/10/2022	3.988	238	9	4%
055451AH1	BHP Finance	18/03/2009	6.5	1,750,000	A	1/04/2019	6.544	400	85	21%
055451AL2	BHP Finance	16/11/2011	3.25	1,250,000	A	21/11/2021	3.357	135	41	30%
055451AK4	BHP Finance	16/11/2011	1.875	750,000	A	21/11/2016	1.987	110	36	33%

NIP ANALYSIS FOR AUSTRALIAN COMPANIES ISSUING US\$ BONDS IN THE U.S. AND/OR GLOBAL MARKETS, JANUARY 2005 TO JUNE 2013

CUSIP	Issuer	Announced Date	Coupon	Amount	Rating	Maturity	Issue Yield	Issue Spread	NIP	NIP/Spread
			%	\$ million			%	bps	bps	ratio
055451AJ7	BHP Finance	16/11/2011	1.125	1,000,000	A	21/11/2014	1.246	85	27	32%
055451AG3	BHP Finance	18/03/2009	5.5	1,500,000	A	1/04/2014	5.577	400	100	25%
055451AQ1	BHP Finance	21/02/2012	2.875	1,000	A+	24/02/2022	2.984	92	-10	-11%
055451AP3	BHP Finance	21/02/2012	1.625	1,250	A+	24/02/2017	1.682	77	3	4%
055451AN8	BHP Finance	21/02/2012	1.00	1,000	A+	24/02/2015	1.071	62	7	11%
055451AR9	BHP Finance	21/02/2012	4.125	1,000	A+	24/02/2042	4.228	102	-20	-20%
055451AF5	BHP Finance	26/03/2007	5.4	750,000	A+	29/03/2017	5.441	85	5	6%
055451AB4	BHP Finance	5/12/2005	5.25	750,000	A+	15/12/2015	5.351	78	-11	-14%
EJ3791534	Newcrest Finance	24/09/2012	4.2	750	BBB-	1/10/2022	4.272	255	31	12%
767201AQ9	Rio Tinto Finance	14/09/2011	3.75	1,150,000	A	20/09/2021	3.781	178	42	24%
767201AK2	Rio Tinto Finance	28/10/2010	3.5	1,000,000	A	2/11/2020	3.593	93	-6	-6%
767201AM8	Rio Tinto Finance	17/05/2011	2.5	700,000	A	20/05/2016	2.606	83	13	16%
767201AF3	Rio Tinto Finance	14/04/2009	8.95	2,000,000	BBB	1/05/2014	9.25	752	156	21%
767201AH9	Rio Tinto Finance	14/04/2009	9	1,500,000	BBB	1/05/2019	9.375	658	100	15%
767201AL0	Rio Tinto Finance	28/10/2010	5.2	500	A	2/11/2040	5.2	115	-3	-3%
767201AL0	Rio Tinto Finance	14/09/2011	5.2	350	A	2/11/2040	5.05	178	38	21%
767201AC0	Rio Tinto Finance	24/06/2008	6.5	1,750	A	15/07/2018	6.619	250	32	13%
767201AJ5	Rio Tinto Finance	28/10/2010	1.875	500	A	2/11/2015	1.892	68	-19	-28%
767201AP1	Rio Tinto Finance	14/09/2011	2.25	500	A	20/09/2016	2.378	148	38	26%
767201AN6	Rio Tinto Finance	17/05/2011	4.125	1,000	A	20/05/2021	4.133	103	9	9%
767201AL0	Rio Tinto Finance	17/05/2011	5.2	300	A	2/11/2040	5.36	113	15	13%
767201AE6	Rio Tinto Finance	24/06/2008	5.875	2,500	A	15/07/2013	6.021	240	29	12%
767201AD8	Rio Tinto Finance	24/06/2008	7.125	750,000	A	15/07/2028	7.189	252	33	13%
EJ4077529	Sydney Airport	16/10/2012	3.9	825	BBB	22/03/2023	3.922	220	29	13%
EI6391656	Telstra	7/04/2011	4.8	1,000,000	A	12/10/2021	4.892	133	-11	-8%
EJ5938992	Wesfarmers	13/03/2013	1.874	750	A-	20/03/2018	1.874	100	14	14%
EI4063828	Woolworths	14/09/2010	4	750,000	A-	22/09/2020	4.015	135	21	16%

NIP ANALYSIS FOR AUSTRALIAN COMPANIES ISSUING US\$ BONDS IN THE U.S. AND/OR GLOBAL MARKETS, JANUARY 2005 TO JUNE 2013										
CUSIP	Issuer	Announced Date	Coupon	Amount	Rating	Maturity	Issue Yield	Issue Spread	NIP	NIP/Spread
			%	\$ million			%	bps	bps	ratio
EI4063901	Woolworths	14/09/2010	2.55	500,000	A-	22/09/2015	2.575	115	20	17%
								Average	27	10.3%

Notes: For the new issue yield, some bonds on Bloomberg have the yield quoted on the "Description Page". For the other bonds, with the exception of the Rio Tinto 5.2% bond due in 2040, the new issue price quoted on the description page is converted to a yield using the Yield Analysis function on Bloomberg. The Rio Tinto 5.2% bond due in 2040 was issued in October 2010, and then reopened in both May and September of 2011. For all three tranches, the new issue yield was calculated by taking the new issue spread as announced at the time of issuance and adding the spread to the benchmark treasury recorded by Bloomberg under the Generic 30 year treasury screen on the day of announcement.

The NIP has a standard error of 6.7, calculated as the standard deviation of the NIP series divided by the square root of the number of observations. The t statistic is 3.97, calculated as the arithmetic average of the distribution divided by the standard error. The t statistic shows that the NIP is statistically significantly at the 1% level of significance.

Based on our research and analysis, we believe that Australian issuers are subject to the same NIP market forces as have been revealed through our study. Furthermore, our research is based on the U.S. investment grade market that has an average rating of A- and an average maturity of 10 years. These parameters are similar to the AER benchmark of 10-year BBB+ for regulated utilities. The results of our additional analysis of Australian companies issuing in the U.S. are consistent with our research. Therefore, subject to an extension of our research to both the Australian and European markets, the application of a fixed proportion of 10.3% of the new issue spread provides the best current estimate of the expected NIP. The ratio of 10.3% would be expected to apply in Australian dollar terms.

5.4. Declaration

In preparing this report, the joint authors (herein after referred to as 'we' or 'our' or 'us') confirm that we have made all the inquiries that we believe are desirable and appropriate and that no matters of significance that we regard as relevant have, to our knowledge, been withheld from this report. We acknowledge that we have read, understood and complied with the Federal Court of Australia's Practice Note CM 7, Expert Witnesses in Proceedings in the Federal Court of Australia. We have been provided with a copy of the Federal Court of Australia's Practice Note CM 7, *Expert Witnesses in Proceedings in the Federal Court of Australia*, dated 4th June 2013, and our report has been prepared in accordance with those guidelines.

Appendix One - References from Current Paper

Pre-existing references

Cai, Nianyun (Kelly), Jean Helwege and Arthur Warga, 2007, "Underpricing in the Corporate Bond Market," *Review of Financial Studies* 20, No. 6, 2021-2046

Crabbe, Leland E. and Christopher M. Turner, 1995, "Does the Liquidity of a Debt Issue Increase with its Size? Evidence from the Corporate Bond and Medium Term Note Markets," *Journal of Finance* 50, 1719-1734

Doran, James, Ehud I. Ronn and Robert S. Goldberg, "A Simple Model for Time-Varying Expected Returns on the S&P 500 Index," *Journal of Investment Management*, Vol. 7, Number 2, 2nd Quarter 2009.

Ederington, Louis H., 1974, "The Yield Spread on New Issues of Corporate Bonds," *Journal of Finance* 29, 1531-1543

Edwards, Amy K., Lawrence E. Harris, and Michael S. Piwowar, 2007, "Corporate Bond Market Transaction Costs and Transparency," *Journal of Finance* 62, 1421-1451

Fang, Lily H., 2005, "Investment Bank Reputation and the Price and Quality of Underwriting Securities," *Journal of Finance* 60, 2729-2761

Fridson, Martin S., and Yan Gao, 1996, "Primary versus Secondary Pricing of High-Yield Bonds," *Financial Analysts Journal* 52, No 3, 20-27

Fung, W. K. H., and Andrew Rudd, 1986, "Pricing New Corporate Bond Issues: An Analysis of Issue Cost and Seasoning Effects," *Journal of Finance* 41, 633-643

Goldstein, Michael A., Edith S. Hotchkiss and Erik R. Sirri, 2007, "Transparency and Liquidity: A Controlled Experiment on Corporate Bonds," *Review of Financial Studies* 20, No. 2, 235-273

Green, Richard C., 2007, "Presidential Address: Issuers, Underwriter Syndicates, and Aftermarket Transparency," *Journal of Finance* 62, 1529-1550

Martin, John D., and R. Malcolm Richards, 1981, "The Seasoning Process for Corporate Bonds," *Financial Management* 10, No. 3, 41-48

Rock, Kevin, 1986, "Why New Issues Are Underpriced," *Journal of Financial Economics* 15, 187-212

Song, Wei-Ling, 2004, "Competition and Coalition among Underwriters: The Decision to Join a Syndicate," *Journal of Finance* 59, 2421-2444

Sorenson, Eric H., 1982, "On the Seasoning Process of New Bonds: Some are More Seasoned than Others," *Journal of Financial and Quantitative Analysis* 17, No. 2, 195-208

Wasserfallen, Walter, and Daniel Wydler, 1988, "Underpricing of Newly Issued Bonds: Evidence from the Swiss Capital Market," *Journal of Finance* 43, 1177-1191

West, Richard, 1965, "New Issue Concessions on Municipal Bonds: A Case of Monopsony Pricing," *Journal of Business*, 38, No. 2, 135-148

Wilcox, Clair, 1940, "Competition in Our Economy," *Investigation of Concentration of Economic Power (Monograph No. 21, Temporary Economic Committee, 76th Congress)*, 177-179

Yasuda, Ayako, 2005, "Do Bank Relationships Affect the Firm's Underwriter Choice in the Corporate-Bond Underwriting Market," *Journal of Finance* 60, 1259-1292

New References

AER, *Final decision, NSW distribution determination 2009–10 to 2013–14*, Australian Energy Regulator, 28 April 2009.

AER, *South Australia distribution determination 2010-11 to 2014-15*, Australian Energy Regulator, May 2010.

AFMA, 2012 Australian Financial Markets Report, Australian Financial Markets Association

Batten, J. and Hogan W., 2003. 'Time variation in the credit spreads on Australian Eurobonds, Pacific-Basin Finance Journal, 11, 81-99

Batten, J. A., Hogan, W. P., and Szilagy, P. G., 2011, "The Role of Foreign Bond Issuance: The Case of Australia", *Australian Economic Review*, Vol. 44, Issue 1, pp. 36-50

Bessembinder, H., W. Maxwell, and K. Venkataraman. 2006. 'Market Transparency, liquidity externalities, and institutional trading costs in corporate bonds', *Journal of Financial Economics*, Vol. 82, 2, 251-288.

Black, S., Kirkwood, J., Rai, A., and Willians, T., 2012, "A History of Australian Corporate Bonds", Reserve Bank of Australia, RDP 2012-09

Creighton, A., Gower, L., and Richards, A., 2007, "The Impact of Rating Changes in Australian Financial Markets", *Pacific-Basin Finance Journal*, 15, 1-17.

Darwin, T., Treepongkaruna, S. and Faff, R.W., 2012, "Determinants of Bond Spreads: Evidence from Credit Derivatives of Australian Firms" *Australian Journal of Management*, Vol. 37, No. 1

Datta, S., Iskandar-Datta, M., and Patel, A., 1997, "The Pricing of Initial Public Offers of Corporate Straight Debt", *The Journal of Finance*, 52, 1, 379-396

Debelle, Guy, 2013, "Some Recent (and not so recent) Trends in Australian Debt Markets", Address to the KangaNews DCM Summit, Sydney

ECB, *Debt Securites Outstanding*, European Central Bank, 2013

Lepone, A. and Wong, B., 2009. Determinants of Credit Spread Changes: Evidence from the Australian Bond Market, *Australasian Accounting Business and Finance Journal*, 3(2)

NabPrivateWealth, "A Short Guide to Investing in Australia's Bond Market", National Australia Bank

Prager, R., Riaz, K., Vedbrat, S., and Watt, E. C., 2013 "Setting New Standards, The Liquidity Challenge II", BlackRock Investment Institute, BlackRock, page 6.

RBA, Table D4, Debt Securities Outstanding, Reserve Bank of Australia, 2013

SIFMA, US Bond Markets Trading Volume and Outstandings, 2013

Thomson Reuters, Capital Markets Review, Managing Underwriters, First Quarter 2013, Thomson Reuters

Whittaker, Timothy, 2011, "Systematic Liquidity Risk in the Australian Bond Market", Working Paper, Griffith University

Appendix Two – Terms of Reference – Assessment of the New Issue Premium on Primary Issues of Corporate Bonds

Background

On 30th August 2013, the Australian Energy Regulator (AER) published its draft rate of return guideline that will form the basis of the regulated rate of return to be applied in energy network decisions made from 2014 onwards. Previously the AER published an Issues Paper on 18th December 2012 and a Consultation Paper on 10th May 2013.

Under the new Rules, promulgated by the Australian Energy Market Commission, (AEMC), in December 2012, fundamental changes have been made to the way in which the allowance for the return of debt can be determined. Clause 6.5.2(j) of the National Electricity Rules (NER) provides that, at each determination, the allowance for the return of debt can be computed in one of three different ways:

- The return that would be required by debt investors in a benchmark efficient entity if the investors raised debt at the time or shortly before the making of the distribution determination for the regulatory control period.
- The average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period; or
- Some combination of the returns referred to in subparagraphs (1) and (2). Implicit in these considerations is that the regulatory framework should encourage efficient financing practices that the former approach did not explicitly consider.

Implicit in these considerations is that the regulatory framework should encourage efficient financing practices that the previous approach did not explicitly consider.

The calculation of the spot cost of debt, or the market cost of debt at a particular point in time remains an essential component of all three of the aforementioned approaches. Option one, which is known as the rate-on-the-day approach, uses an estimate of the cost of debt that is determined over a limited number of days in advance of the commencement of a new regulatory period. Option two calculates a form of historical average total cost of debt, using historical information on spot rates. Under option three, the base cost of debt may be estimated separately from the debt risk premium.

The current assignment is focussed on the spot cost of debt. United Energy and Multinet Gas are seeking a suitably qualified consultant to investigate whether a new issue concession, or new issue premium, is available to be earned on primary bond transactions. In regulatory determinations made by the AER, the cost of debt is generally determined with reference to bond yields in the secondary market. The AER has also made use of observations on the Bloomberg BBB fair value curve, which is constructed from secondary market yields.

The consultant will be provided with a report from the Competition Economists Group, (CEG), which presents the results of analysis of the regulatory debt risk premium (DRP)¹³. The recently completed submission by CEG will contain yield curves that have been estimated

¹³ CEG (2013), Estimating the debt risk premium, a report for the Energy Networks Association prepared by the Competition Economists Group,, (CEG), June 2013.

according to the methods of Nelson and Siegel (1987)¹⁴. The report will also contain an assessment of the performance of the Bloomberg fair value curve for BBB+ corporate debt.

Scope of work

The consultant is required to provide expert commentary and analysis about the pricing of new corporate bond issues. The emphasis should be on investment grade bonds, and, in particular, debt securities with a credit rating of BBB+ from Standard and Poor's. The AER identifies BBB+ as being the benchmark credit rating for a reference entity. The consultant should focus on the corporate bond market in Australia, however expert analyses that are oriented around other financial markets in which Australian corporate borrowers have a presence will also be considered. Australian corporations are known to access global debt markets, including European wholesale, the Canadian market, United States Private Placement (USPP), US high yield, US registered and the US 144A market.

The questions to be addressed can be set out as follows:

- 1) Define the new issue premium (or new issue concession) and explain whether it can be identified and measured.
- 2) Review and discuss any pre-existing literature on the under-pricing of corporate debt, including published academic articles.
- 3) Consider the circumstances in financial markets that might give rise to a yield premium on primary bond issuance, including legislation, institutional arrangements, compliance requirements, and competitive practices.
- 4) Investigate potential variables that might affect the pricing of bonds at issuance. The factors that should be tentatively considered include: Market volatility; overall liquidity; the transaction volume being sought by the issuer; specific credit factors related to the borrower; market familiarity with the borrower; the diversification benefit of an issuer entering the market; the overall volume currently in the market; and, expectations for supply going forward.
- 5) If feasible, derive (and apply) a quantitative framework for analysing the extent of underpricing, and report on the performance of the explanatory variables. Provide details of data sources.
- 6) Assess whether current methods applied by the AER for determining the spot cost of debt take proper account of the new issue premium or new issue concession.
- 7) Determine the best estimate of the size of the new issue (yield) premium that might be paid by an Australian corporate borrower, such as the benchmark efficient entity that is regarded as the model entity under an incentive-based regulatory regime.

¹⁴ Nelson, C.R. and Siegel, A.F. (1987). "Parsimonious Modeling of Yield Curves," *The Journal of Business*, 60, pages 473-489.

Timeframe

The consultant is to provide a draft report which discusses the results of the analysis by Monday 23rd September 2013. A final report should be provided by no later than Monday 7th October.

Reporting

Jeremy Rothfield will serve as the primary contact for the period of the engagement. The consultant will prepare reports showing the work-in-progress on a regular basis. The consultant will make periodic presentations on analysis and advice when appropriate.

The consultant is likely to be called upon to present analysis and advice to the ENA Cost of Capital Subgroup.

Conflicts

The consultant is to identify any current or potential future conflicts.

Compliance with the Code of Conduct for Expert Witnesses

Attached is a copy of the Federal Court's Practice Note CM 7, entitled "Expert Witnesses in Proceedings in the Federal Court of Australia", which comprises the guidelines for expert witnesses in the Federal Court of Australia (Expert Witness Guidelines).

Please read and familiarise yourself with the Expert Witness Guidelines, and comply with them at all times in the course of your engagement with United Energy and Multinet Gas.

In particular, your report prepared for United Energy and Multinet Gas should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Expert Witness Guidelines.

Your report must also:

1. Contain particulars of the training, study or experience by which the expert has acquired specialised knowledge.
2. Identify the questions that the expert has been asked to address.
3. Set out separately each of the factual findings or assumptions on which the expert's opinion is based.
4. Set out each of the expert's opinions separately from the factual findings or assumptions.
5. Set out the reasons for each of the expert's opinions; and
6. Otherwise comply with the Expert Witness Guidelines.

The expert is also required to state that each of the expert's opinions is wholly or substantially based on the expert's specialised knowledge.

The declaration contained within the report should be that “[the expert] has made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the report”.

Please also attach a copy of these terms of reference to the report.

Fees

The consultant is requested to submit:

- A fixed total fee for the project and hourly rates for the proposed project team should additional work be required; and
- Details of the individuals who will provide the strategic analysis and advice.

Contacts

Any questions regarding this terms of reference should be directed to:

Jeremy Rothfield, telephone (03) 8846 9854, or via email at Jeremy.Rothfield@ue.com.au

Appendix Three – Expert Witnesses in Proceedings in the Federal Court of Australia

FEDERAL COURT OF AUSTRALIA
Practice Note CM 7
EXPERT WITNESSES IN PROCEEDINGS IN THE
FEDERAL COURT OF AUSTRALIA

Practice Note CM 7 issued on 1 August 2011 is revoked with effect from midnight on 3 June 2013 and the following Practice Note is substituted.

Commencement

1. This Practice Note commences on 4 June 2013.

Introduction

2. Rule 23.12 of the Federal Court Rules 2011 requires a party to give a copy of the following guidelines to any witness they propose to retain for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based on the specialised knowledge of the witness (see **Part 3.3 - Opinion** of the *Evidence Act 1995* (Cth)).
3. The guidelines are not intended to address all aspects of an expert witness's duties, but are intended to facilitate the admission of opinion evidence¹⁵, and to assist experts to understand in general terms what the Court expects of them. Additionally, it is hoped that the guidelines will assist individual expert witnesses to avoid the criticism that is sometimes made (whether rightly or wrongly) that expert witnesses lack objectivity, or have coloured their evidence in favour of the party calling them.

Guidelines

1. General Duty to the Court¹⁶

- 1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.
- 1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential.
- 1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.

2. The Form of the Expert's Report¹⁷

- 2.1 An expert's written report must comply with Rule 23.13 and therefore must
 - (a) be signed by the expert who prepared the report; and
 - (b) contain an acknowledgement at the beginning of the report that the expert has read, understood and complied with the Practice Note; and
 - (c) contain particulars of the training, study or experience by which the expert has acquired specialised knowledge; and
 - (d) identify the questions that the expert was asked to address; and

¹⁵ As to the distinction between expert opinion evidence and expert assistance see *Evans Deakin Pty Ltd v Sebel Furniture Ltd* [2003] FCA 171 per Allsop J at [676].

¹⁶ The "*Ikarian Reefer*" (1993) 20 FSR 563 at 565-566.

¹⁷ Rule 23.13.

- (e) set out separately each of the factual findings or assumptions on which the expert's opinion is based; and
 - (f) set out separately from the factual findings or assumptions each of the expert's opinions; and
 - (g) set out the reasons for each of the expert's opinions; and
 - (ga) contain an acknowledgment that the expert's opinions are based wholly or substantially on the specialised knowledge mentioned in paragraph (c) above¹⁸; and
 - (h) comply with the Practice Note.
- 2.2 At the end of the report the expert should declare that "[the expert] has *made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the Court.*"
- 2.3 There should be included in or attached to the report the documents and other materials that the expert has been instructed to consider.
- 2.4 If, after exchange of reports or at any other stage, an expert witness changes the expert's opinion, having read another expert's report or for any other reason, the change should be communicated as soon as practicable (through the party's lawyers) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court¹⁹.
- 2.5 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report.
- 2.6 The expert should make it clear if a particular question or issue falls outside the relevant field of expertise.
- 2.7 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports²⁰.

3. Experts' Conference

- 3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

J L B ALLSOP
Chief Justice
4 June 2013

¹⁸ See also *Dasreef Pty Limited v Nawaf Hawchar* [2011] HCA 21.

¹⁹ The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565

²⁰ The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565-566. See also Ormrod *"Scientific Evidence in Court"* [1968] Crim LR 240

Appendix Four – Curriculum Vitae – Robert Goldberg

Robert Goldberg
 17 Victorian Lane
 Brookville, NY 11545
 516-626-1323
 rgoldberg17@mac.com

Academic Experience:

Visiting Associate Professor, Adelphi University	Fall 2011-
Present	
Adjunct, Adelphi University	2004-2011
Investments, Financial Markets, Seminar in Finance, Freshman Seminar, Financial Theory and Practice, Corporate Finance	
Adjunct, Hofstra University	2004
Money and Capital Markets	

Professional Experience:

Managing Partner, Maratan Partners, an asset management advisory firm	2007-Present
Consultant, MarketAxess, an electronic bond trading firm	2012-Present
Consultant, EA Markets, a corporate finance advisory firm	2011-Present
Consultant, Barclays Capital, WR Hambrecht and Howland Securities	2004-2009
Managing Director and Head of Corporate Finance Advisory, Barclays Capital	2002-2003
Co-head of Debt Markets, WR Hambrecht + Co	1999-2002

Managing Director, Investment Banking:

Chairman, Equity Commitment Committee, Merrill Lynch & Co., Inc.	1998-1999
Managing Director, CFO Staff, Merrill Lynch & Co., Inc.	1997-1998
Managing Director and Head of US Capital Markets Desk, Merrill Lynch & Co., Inc.	1995-1997
Managing Director, Capital Markets Desk and Liability Management, Merrill Lynch & Co., Inc.	1985-1995

Manager of Funding, Treasurer's Office, Merrill Lynch & Co., Inc. 1983-1985

Financial Analyst, Exxon Corporation 1979-1983

Analyst, Arthur D. Little SM Stoller Nuclear Division 1979

Education:

Columbia University

MBA, Finance 1979

MS, Nuclear Science and Engineering 1978

BS, Nuclear Science and Engineering 1977

Scholarly Activities:

"Quantifying and Explaining the New Issue Premium in the Post Glass-Steagall Corporate Bond Market" by Goldberg and Ronn, Journal of Fixed Income, June 2013

"A Methodology for Computing and Comparing Implied Equity and Corporate Debt Sharpe Ratios" by Goldberg, Adelphi University Working Paper Series, 2011

"A Simple Model for Time-Varying Expected Returns on the S&P 500 Index" by Doran, Ronn and Goldberg, Journal of Investment Management, 2Q 2009, and also presented at the 16th Annual Derivatives Securities and Risk Management Conference, April, 2006

"System and method for pricing and allocation of commodities or securities" Patent 7,644,034 Jan. 5, 2010 issued to Evelyn, Goldberg, Hayes, Gerrish, Hansson, Ocheret

Professional licenses:

NASD Series 7, 24, 63 and 65te

Appendix Five – Curriculum Vitae – Ehud Ronn

EHUD I. RONN

Address: Department of Finance 6508 Ladera Norte
McCombs School of Business Austin, TX 78731-2629
1 University Station, B6600
University of Texas at Austin
Austin, TX 78712-1179

Tel.: (512) 471-5853 (512) 800-5752
FAX: (512) 471-5073
E-Mail: eronn@mail.utexas.edu

EDUCATION

Stanford University	Finance*	1978-82	Ph.D.	1983
Technion (Israel)	Economics**	1976-78	M.Sc.	1978
Technion (Israel)	Economics/Management***	1972-76	B.Sc.	1976

* GSB Merit Fellowships, 1980-81, 1981-82
** Gutwirth Foundation Scholarship
*** Graduated with honors

EXPERIENCE

University of Texas at Austin	Professor of Finance	1996-present
Dartmouth College	Visiting Professor of Finance	Fall 2011
Fordham University	Visiting Professor of Finance	Fall 2011
University of Texas at Austin	Jack S. Josey Professor in Energy Studies	2000-2002
University of Texas at Austin	Associate Professor of Finance	1988-1996
European Business School	Permanent Visiting Professor of Finance	2001-2006
	Adjunct Professor of Finance	2006-2010
Helsinki School of Economics and Business Administration	Visiting Associate Professor of Finance	May 1991
University of Chicago	Visiting Assistant and Visiting Associate Professor of Finance	1987-88
University of California, Berkeley	Assistant Professor of Finance	1982-88
Morgan Stanley & Co.	Executive Director, Commodity Market Modeling	2010-2011
University of Texas at Austin	Director, Center for Energy Finance Education and Research	1998-2009
Merrill Lynch & Co.	Vice President, Trading Research Group	1991-93

DISSERTATION

“Utility-Based Valuation of Capital Assets,” Stanford University, May 1983.

PUBLISHED ARTICLES

1. “The Substitution of Capital, Labor and Energy in the Israeli Economy” (with A. Melnik), *Resources and Energy*, 3 (November 1981), pp. 247-258.
2. “A Utility-Based Model of Common Stock Price Movements” (with R. Litzenberger), *Journal of Finance*, XLI:1(March 1986), pp. 67-92.
3. “Pricing Risk-Adjusted Deposit Insurance: An Option-Based Model” (with A. Verma), *Journal of Finance*, XL1:4 (September 1986), pp. 871-895.
4. “On the Rationality of Common Stock Return Volatility,” *Financial Review*, Vol. 21, No. 4, November 1986, pp. 355-381.
5. “A New Linear Programming Approach to Bond Portfolio Management,” *Journal of Financial and Quantitative Analysis*, Vol. 22, No. 4, December 1987, pp. 439-466.
6. “A Multi-Attribute Comparative Evaluation of Relative Risk for a Sample of Banks” (with A. Verma), *Journal of Banking and Finance*, Vol. 11, 1987, pp. 499-523.
7. “Non-Additive Preferences and the Marginal Propensity to Consume,” *American Economic Review*, Vol. 78, No. 1, March 1988, pp. 216-223.
8. “Capital Adequacy Standards for a Sample of 43 Major Banks” (with A. Verma), *Journal of Banking and Finance*, Vol. 13, No. 1, 1989, pp. 21-29 (Also published in *Proceedings, Bank Structure and Competition*, Federal Reserve Bank of Chicago, May 1988).
9. “Inflation Futures and a Riskless Real Interest Rate” (with B. Flesaker), *Review of Futures Markets*, Vol. 7, No. 1, May 1988, pp. 36-67.
10. “The Box Spread Arbitrage Condition: Theory, Tests and Investment Strategies” (with A. Gerbarg Ronn), *Review of Financial Studies*, Issue I, Volume II, 1989 (Also published in the *Proceedings, Seminar on the Analysis of Security Prices*, Center for Research in Security Prices, November 1987).
11. “Arbitrage-Based Estimation of Non-Stationary Shifts in the Term Structure of Interest Rates” (with R. Bliss), *Journal of Finance*, Vol. 44, No. 3, July 1989, pp. 591-610 (Preliminary draft published in *Proceedings, Seminar on the Analysis of Security Prices*, Center for Research in Security Prices, May 1988).
12. “A Simple Time-Varying Binomial Model for the Valuation of Interest Rate-Contingent Claims” (with R. Sias) (previously entitled “The Valuation of Options on the Short-Term Interest Rate”), **Advances in Futures and Options Research**, Vol. 5, 1991, pp. 89-111.

13. “The Valuation of Options on Eurodollar Futures Contracts using Non-Stationary Arbitrage-Free Models” (with H. Han), *Journal of Fixed Income*, Vol. 1, No. 3, December 1991, pp. 60-73.
14. “The Pricing of FIREARMS (‘Falling Interest Rate Adjustable Rate Mortgage’)” (with B. Flesaker), *Journal of Real Estate Finance and Economics*, Vol. 6, pp. 251-275, May 1993.
15. “A Non-Stationary Trinomial Model for the Valuation of Options on Treasury Bond Futures Contracts” (with R. Bliss), *Journal of Futures Markets*, Vol. 14, No. 5, August 1994, pp. 597-617 (Published in monograph form as **A New Method for Valuing Treasury Bond Futures Options**, Association for Investment Management and Research, Financial Analysts Federation, 1992).
16. “A Characterization of the Daily and Intra-Day Behavior of Returns on Options” (with A. Sheikh), *Journal of Finance*, Vol. 94, No. 2, June 1994, pp. 557-580.
17. “Debt and Market Incompleteness” (with L. Senbet), *Journal of Banking and Finance*, Vol. 19, No. 6, 1995.
18. “An Empirical Estimate of the Prepayment Option Value in Fixed-Rate GNMA Mortgage-Backed Securities” (with P. Rubinstein and F.-S. Pan), *Journal of the American Real Estate and Urban Economics Association*, Spring 1995, Vol. 23, 1, pp. 1-20.
19. “The Valuation of Default Risk in Corporate Bonds and Interest Rate Swaps” (with S. Nielsen), **Advances in Futures and Options Research**, Volume 9, 1997, pp. 175-196.
20. “Callable U. S. Treasury Bonds: Optimal Calls, Anomalies, and Implied Volatilities” (with R. Bliss), *Journal of Business*, Vol. 71, No. 2, April 1998, pp. 211-252.
21. “On the Relationship between Expected Returns and Implied Volatility of Interest Rate-Dependent Securities” (with P. Wadhwa), *Journal of Portfolio Management*, Vol. 24, No. 3, Spring 1998, pp. 93-109.
22. “Analyzing the Risks Inherent in the Procter & Gamble – Bankers Trust Levered Swap Contract” (with C. Dincerler and J. Martin), **Advances in Financial Planning and Forecasting**, edited by Cheng-Few Lee, Elsevier Science, 2001, Vol. 10, pp. 243-256.
23. “Valuation of Commodity-Based ‘Swing’ Options” (with P. Jaillet and S. Tompaidis), *Management Science*, 2004 (Preliminary draft of part I published in *Energy & Power Risk Management*, Vol. 3, No. 3, June 1998, pp. 14-16 and part II in July 1998 issue, pp. 28-29).
24. “The Bias in Black-Scholes/Black Implied Volatility: An Analysis of Equity and Energy Markets” (with J. Doran), *Review of Derivatives Research*, Volume 8, Issue 3, 2005 (Publication year: 2006).
25. “Estimating the Commodity Market Price of Risk for Energy Prices” (with S. Kolos), *Energy Economics*, Vol. 30, Issue 2, March 2008, pp. 621-641.

26. “Computing the Market Price of Volatility Risk in the Energy Commodity Markets” (with J. Doran), Special Issue on Commodities, *Journal of Banking and Finance*, Vol. 32, Issue 12, Dec. 2008, pp. 2541-2552.
27. “The Impact of Large Changes in Asset Prices on Intra-Market Correlations in the Domestic and International Markets” (with A. Sayrak and S. Tompaidis), *Financial Review*, Vol. 44, Issue 3, Aug. 2009, pp. 405-436.
28. “A Simple Model for Time-Varying Expected Returns on the S&P 500 Index” (with J. Doran and R. Goldberg), *Journal of Investment Management*, Vol. 7, Number 2, 2nd Quarter 2009.
29. “Valuation of a Natural Gas Storage Facility” (with M. Kjaer), *Journal of Energy Markets*, Vol. 1, Number 4, Winter 2008/09.
30. “Intra-Day Risk Premia in European Electricity Forward Markets” (with J. Wimschulte), *Journal of Energy Markets*, Vol. 2, Number 4, Winter 2009/10.
31. “Pricing Credit-Rated Defaultable Coupon Bonds” (with R. Jagannathan and W. Chen), *International Review of Applied Financial Issues and Economics*, Vol. 3, No. 3, 2011, pp. 574-593.
32. “Quantifying and Explaining the New Issue Premium in the Post Glass-Steagall Corporate Bond Market” (with R. Goldberg), forthcoming, *Journal of Fixed Income*, 2013.

BOOK EDITOR

Real Options and Energy Management: Using Options Methodology to Enhance Capital Budgeting Decisions, 2002, Risk Books, London

CHAPTERS IN BOOKS

1. “Testing the Causality of Policy Variables in Israel” (with U. Ben-Zion), in Nadav Halevy and Jacob Kop (eds.), **Studies in the Israel Economy**, Maurice Falk Institute for Economic Research in Israel, Jerusalem, 1977, pp. 149-61.
2. “Changes of Asset Composition and the Performance of Mutual Funds” (with U. Ben-Zion and D. Rotem), in Zvi Zussman and Moshe Felber (eds.), **Studies in the Israel Economy 1981**, Jerusalem, 1983, pp. 187-208.
3. “A Model for the Valuation of Callable Bonds,” in Frank J. Fabozzi (ed.), Ch. 10, **Handbook of Fixed Income Options: Strategies, Pricing and Applications**, pp. 245-259, 1996.
4. “Options on Treasury Bond Futures Contracts” (with K. Toft), in Frank J. Fabozzi (ed.), Ch. 11, **Handbook of Fixed Income Options: Strategies, Pricing and Applications**, pp. 261-281, 1996.
5. “Tax Effects in U. S. Government Bond Markets” (with Y. Shin), in Frank J. Fabozzi (ed.), **Advances in Fixed-Income Valuation Modeling and Risk Management**, New Hope, PA., 1997, pp. 233-250.

6. “A Two-Factor Model for the Valuation of the T-Bond Futures Contract’s Embedded Options” (with S. Nielsen), in Frank J. Fabozzi (ed.), **Advances in Fixed-Income Valuation Modeling and Risk Management**, New Hope, PA., 1997, pp. 135-152.
7. “Valuation of Oil Fields as Optimal Exercise of the Extraction Option,” in Vincent J. Kaminski (ed.), **Managing Energy Price Risk** (3rd. Edition), Risk Books, London, 2004.
8. “Was Enron’s Business Model Fundamentally Flawed?,” in Michael Frenkel, Ulrich Hommel and Markus Rudolf (eds.), **Risk Management: Challenge and Opportunity** (2nd. edition), 2004.

PRACTITIONER PUBLICATIONS

1. “Vega-Hedging: An Antidote for Model Misspecification” (with C. Xuan), *The MFA Reporter*, 1996, and *Derivatives Week*, Aug. 18, 1997.
2. “Hedging Long-Dated Oil Futures Contracts: An Empirical Investigation” (with C. Xuan), *Energy & Power Risk Management*, Vol. 3, No. 2, May 1998, pp. 26-29).
3. “Modeling the Correlation Matrix of Natural Gas Futures Returns” (with M. Kjaer), *Energy Risk*, Nov. 2006, pp. 60 – 66.
4. “Modeling the Correlation Function in the Crude-Oil Futures Market,” *Energy Risk*, 2009.

WORK IN PROGRESS

- “Managing Long and Short Price-and-Quantity Exposure at the Corporate Level” (with S. Kolos), Working Paper, University of Texas at Austin, Dec. 2007
- “Valuation of Credit Derivatives, and Credit Value-at-Risk, for the Energy Industry,” Working Paper, University of Texas at Austin, April 2007
- “Valuation of a New Class of Commodity-Linked Bonds with Partial Indexation Adjustments” (with T. Kirschenmann), Working Paper, University of Texas at Austin, Jan. 2009
- “The Valuation and Informational Content of Options on Crude-Oil Futures Contracts” (with F. Murphy), Working Paper, University of Texas at Austin, Dec. 2012
- “Fine-Tuning a Corporate Hedging Portfolio — The Case of an Airline Company” (with M. Gerner), Working Paper, University of Texas at Austin, July 2012
- “Using Equity Options to Obtain Forward-Looking Equity Betas — with Application to the Commodity Markets,” Working Paper, University of Texas at Austin, Aug. 2012
- “Modeling Natgas Intra-Month Spot (Daily or ‘Cash’) Price Movements,” Working Paper, University of Texas at Austin, July 2012
- “The Correlation Functions in the Crude-Oil and Natural-Gas Futures Markets,” Working Paper, University of Texas at Austin, June 2012

SEMINAR PRESENTATIONS (2003 –)

“On the Market Price of Volatility Risk”:

- Federal Reserve Bank of Chicago, March 2003
- Southern Methodist University, April 2003
- Thirteenth Annual Derivatives Securities Conference, April 2003
- Financial Management Association Annual Meetings, October 2003
- Texas Christian University, October 2003
- Bachelier Finance Society Third World Congress, July 2004

“Was Enron’s Business Model Fundamentally Flawed?” LBJ School of Public Affairs Conference on “Corporate Governance and Control Fraud,” April 2003

“Desirable Attributes of a Successful Electricity Forward Market”: Public Utility Commission of Texas Public Workshop on Forward Market Structure for the ERCOT Market, June 2003

“Estimating the Commodity Market Price of Risk for Energy Prices”:

- Fourteenth Annual Derivatives Securities Conference, April 2004
- Bachelier Finance Society Third World Congress, July 2004
- European Business School, September 2005

“Managing Long and Short Price-and-Quantity Exposure at the Corporate Level”: Cornell University, February 2005

“A Simple Model for Time-Varying Expected Returns on the S&P 500 Index”:

- Sixteenth Annual Derivatives Securities Conference, April 2006
- Western Economic Association, July 2007
- University of Twente, October 2007
- Annual Symposium of the Financial Services Institute, St. John’s University, September 2008

“Computing the Market Price of Volatility Risk in the Energy Commodity Markets”: CfC Commodities 2007 Academic Conference, Birbeck College University of London, January 2007

“Valuation of Credit Derivatives, and Credit Value-at-Risk, for the Energy Industry”:

- CEMAF/ISCTE – NOVA 12th Anniversary Finance Conference, ISCTE Business School, Lisbon, March 2007
- Third International Conference on Credit and Operational Risks, HEC Montréal, April 2007

“Energy Derivatives after . . . Dec. 2, 2001”: New York University Stern School of Business Conference “Derivatives 2007: New Ideas, New Instruments, New Markets,” May 2007

“The Crude-Oil/NatGas Markets: The Message from Markets”:

- Fuqua School of Business MBA International Retreat, July 2006
- Invited keynote address to Canadian Applied and Industrial Mathematics Society — CAIMS * SCMAI 2007, May 2007

“Fine-Tuning a Corporate Hedging Portfolio — The Case of an Airline Company”:

- 22nd Annual Derivatives Securities and Risk Management Conference, March 2012
- Case Western Reserve University, April 2012
- Tulane University, Dec. 2012

– University of Alberta, Jan. 2013

“Intra-Day Risk Premia in European Electricity Forward Markets”: Eighteenth Annual Derivatives Securities & Risk Management Conference, April 2008

“The Valuation and Informational Content of Options on Crude-Oil Futures Contracts”:

– Vienna Graduate School of Finance, June 2009

– European Business School, June 2009

– Center for Advanced Research in Finance, Tokyo University, June 2009

– Madrid Finance Workshop, Oct. 2009

– Twentieth Financial Economics and Accounting Conference, Nov. 2009

– Centre de Recherche Mathématique, McGill University, March 2010

– Industrial-Academic Forum on Commodities, Energy Markets, and Emissions Trading, Fields Institute, April 2010

– University of Hong Kong, June 2011

– HEC Montréal, Oct. 2011

– Fordham University, Nov. 2011

“Challenges in Energy Risk Management”: Keynote Address, Texas Quantitative Finance Festival, Nov. 2010

“Using Equity Options to Obtain Forward-Looking Equity Betas — with Application to the Commodity Markets”:

– Global Derivatives USA, International Center for Business Information, Nov. 2012

– Financial Research Association, “Early Ideas” Session, Dec. 2012

– Nanyang Business School, March 2013

AWARDS

1986 Earl F. Cheit Excellence in Teaching Award, University of California at Berkeley, San Francisco MBA Program. Award presented at 1986 Spring Banquet, San Francisco, April 1986.

1986 American Association of Individual Investor Award for Best Paper in Investments at June 1986 Western Finance Association Meetings: “A New Linear Programming Approach to Bond Portfolio Management.” Award presented at 1986 Annual Meeting of the Western Finance Association, Colorado Springs, June 1986

1997 Texas Finance Symposium Best Paper Award: “Ex-Ante Inferences on Rates of Return to Capital Assets Implied in Their Market-Value Weights.” Award presented at 1997 Symposium, Denton, TX, October 1997

European Business School Teaching Excellence Award (Winter Term 2001/02), Silver

European Business School Teaching Excellence Award (Summer 2002), Gold

European Business School Teaching Excellence Award (Summer 2006)

Selected by *Energy Risk* Magazine to “Energy Risk Hall of Fame,” Nov. 2004

Annual Symposium of St. John’s University Financial Services Institute Best Paper Award: “A Simple Model for Time-Varying Expected Returns on the S&P 500 Index.” Award presented at 2008 Symposium, New York City, September 2008

GRANTS

“A New Linear Programming Approach to Bond Portfolio Management”: Institute for Quantitative Research in Finance Grant, September 1985

“Arbitrage-Based Estimation of Non-Stationary Shifts in the Term Structure of Interest Rates”:

– Institute for Quantitative Research in Finance Grant, May 1988

– Research Foundation of the Institute of Chartered Financial Analysts Grant, July 1988

“The Pricing of FIREARMS (‘Falling Interest Rate Adjustable Rate Mortgage’)”: Prochnow Educational Foundation, February 1989

PROFESSIONAL SERVICE

Associate Editor, *Review of Quantitative Finance and Accounting*, 2001 –

Associate Editor, *Energy Economics*, 2001 –

Associate Editor, *Journal of Energy Markets*, 2007 –

Associate Editor, *International Journal of Theoretical and Applied Finance*, 2008 –

Associate Editor, *Journal of Financial Services Research*, 1999 – 2003

Associate Editor, *Journal of Portfolio Management*, 1996 – 2002

Member, Advisory Board, **Handbook of Quantitative Finance & Risk Management**, forthcoming 2009.

Director, Center for Energy Finance Education and Research (CEFER), McCombs School of Business, University of Texas at Austin, 1998 – 2009

Member, Program Committees, 1987 – 1993, 1995 and 2006 – 2013 Annual Meetings of the Western Finance Association.

Member, Program Committees, 1992, 1994, 1996, 2002, 2003, 2005, 2008 and 2009 Annual Meetings of the Financial Management Association.

Member, Program Committee, 10th Global Finance Conference 2003, European Business School

Member, Program Committee, 2002 Annual Meeting of the European Finance Association.

Member, Program Committee, 2007 – 2010 Annual Meetings of the European Financial Management Association.

Member, Program Committee, 2010 – 2011 FMA Asian Conference

Seminar Coordinator, 1989 Texas Finance Symposium

Co-Chair, 1999 Tenth Annual Conference on Financial Economics and Accounting.

Secretary-Treasurer, Research Consortium on Financial Economics and Accounting, 2001 –

United Energy Distribution Pty Limited
ABN 70 064 651 029

Multinet Gas Distribution Partnership
ABN 53 634 214 009



United Energy and Multinet Gas
6 Nexus Court
Mulgrave VIC3170
PO Box 449
Mt Waverley VIC 3149
T 03 8846 9900
F 03 8846 9999
www.uemg.com.au

TERMS OF REFERENCE – ASSESSMENT OF THE NEW ISSUE PREMIUM ON PRIMARY ISSUES OF CORPORATE BONDS

Background

On 30th August 2013, the Australian Energy Regulator (AER) published its draft rate of return guideline that will form the basis of the regulated rate of return to be applied in energy network decisions made from 2014 onwards. Previously the AER published an Issues Paper on 18th December 2012 and a Consultation Paper on 10th May 2013.

Under the new Rules, promulgated by the Australian Energy Market Commission, (AEMC), in December 2012, fundamental changes have been made to the way in which the allowance for the return of debt can be determined. Clause 6.5.2(j) of the National Electricity Rules (NER) provides that, at each determination, the allowance for the return of debt can be computed in one of three different ways:

- a) The return that would be required by debt investors in a benchmark efficient entity if the investors raised debt at the time or shortly before the making of the distribution determination for the regulatory control period.
- b) The average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period; or
- c) Some combination of the returns referred to in subparagraphs (1) and (2). Implicit in these considerations is that the regulatory framework should encourage efficient financing practices that the former approach did not explicitly consider.

Implicit in these considerations is that the regulatory framework should encourage efficient financing practices that the previous approach did not explicitly consider.

The calculation of the spot cost of debt, or the market cost of debt at a particular point in time remains an essential component of all three of the aforementioned approaches. Option one, which is known as the rate-on-the day approach, uses an estimate of the cost of debt that is determined over a limited number of days in advance of the commencement of a new regulatory period. Option two calculates a form of historical average total cost of debt, using historical information on spot rates. Under option three, the base cost of debt may be estimated separately from the debt risk premium.

The current assignment is focussed on the spot cost of debt. United Energy and Multinet Gas are seeking a suitably qualified consultant to investigate whether a new issue concession, or new issue premium, is available to be earned on primary bond transactions. In regulatory determinations made by the AER, the cost of debt is generally determined with reference to bond yields in the secondary market. The AER has also made use of observations on the Bloomberg BBB fair value curve, which is constructed from secondary market yields.

The consultant will be provided with a report from the Competition Economists Group, (CEG), which presents the results of analysis of the regulatory debt risk premium (DRP) ¹. The recently completed submission by CEG will contain yield curves that have been estimated according to the methods of Nelson and Siegel (1987)². The report will also contain an assessment of the performance of the Bloomberg fair value curve for BBB+ corporate debt.

Scope of work

The consultant is required to provide expert commentary and analysis about the pricing of new corporate bond issues. The emphasis should be on investment grade bonds, and, in particular, debt securities with a credit rating of BBB+ from Standard and Poor's. The AER identifies BBB+ as being the benchmark credit rating for a reference entity. The consultant should focus on the corporate bond market in Australia, however expert analyses that are oriented around other financial markets in which Australian corporate borrowers have a presence will also be considered. Australian corporations are known to access global debt markets, including European wholesale, the Canadian market, United States Private Placement (USPP), US high yield, US registered and the US 144A market.

The questions to be addressed can be set out as follows:

- (1) Define the new issue premium (or new issue concession) and explain whether it can be identified and measured.
- (2) Review and discuss any pre-existing literature on the under-pricing of corporate debt, including published academic articles.
- (3) Consider the circumstances in financial markets that might give rise to a yield premium on primary bond issuance, including legislation, institutional arrangements, compliance requirements, and competitive practices.
- (4) Investigate potential variables that might affect the pricing of bonds at issuance. The factors that should be tentatively considered include: Market volatility; overall liquidity; the transaction volume being sought by the issuer; specific credit factors related to the borrower; market familiarity with the borrower; the diversification benefit of an issuer entering the market; the overall volume currently in the market; and, expectations for supply going forward.
- (5) If feasible, derive (and apply) a quantitative framework for analysing the extent of under-pricing, and report on the performance of the explanatory variables. Provide details of data sources.
- (6) Assess whether current methods applied by the AER for determining the spot cost of debt take proper account of the new issue premium or new issue concession.

¹ CEG (2013), Estimating the debt risk premium, a report for the Energy Networks Association prepared by the Competition Economists Group,, (CEG), June 2013.

² Nelson, C.R. and Siegel, A.F. (1987). "Parsimonious Modeling of Yield Curves," The Journal of Business, 60, pages 473-489.

- (7) Determine the best estimate of the size of the new issue (yield) premium that might be paid by an Australian corporate borrower, such as the benchmark efficient entity that is regarded as the model entity under an incentive-based regulatory regime.

Timeframe

The consultant is to provide a draft report which discusses the results of the analysis by Monday 23rd September 2013. A final report should be provided by no later than Monday 7th October.

Reporting

Jeremy Rothfield will serve as the primary contact for the period of the engagement. The consultant will prepare reports showing the work-in-progress on a regular basis. The consultant will make periodic presentations on analysis and advice when appropriate.

The consultant is likely to be called upon to present analysis and advice to the ENA Cost of Capital Subgroup.

Conflicts

The consultant is to identify any current or potential future conflicts.

Compliance with the Code of Conduct for Expert Witnesses

Attached is a copy of the Federal Court's Practice Note CM 7, entitled "Expert Witnesses in Proceedings in the Federal Court of Australia", which comprises the guidelines for expert witnesses in the Federal Court of Australia (Expert Witness Guidelines).

Please read and familiarise yourself with the Expert Witness Guidelines, and comply with them at all times in the course of your engagement with United Energy and Multinet Gas.

In particular, your report prepared for United Energy and Multinet Gas should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Expert Witness Guidelines.

Your report must also:

1. Contain particulars of the training, study or experience by which the expert has acquired specialised knowledge.
2. Identify the questions that the expert has been asked to address.
3. Set out separately each of the factual findings or assumptions on which the expert's opinion is based.
4. Set out each of the expert's opinions separately from the factual findings or assumptions.
5. Set out the reasons for each of the expert's opinions; and
6. Otherwise comply with the Expert Witness Guidelines.

The expert is also required to state that each of the expert's opinions is wholly or substantially based on the expert's specialised knowledge.

The declaration contained within the report should be that "[the expert] has made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the report".



Please also attach a copy of these terms of reference to the report.

Fees

The consultant is requested to submit:

- A fixed total fee for the project and hourly rates for the proposed project team should additional work be required; and
- Details of the individuals who will provide the strategic analysis and advice.

Contacts

Any questions regarding this terms of reference should be directed to:

Jeremy Rothfield, telephone (03) 8846 9854, or via email at Jeremy.Rothfield@ue.com.au