Centre for Investor Education

SEARCHING FOR CREDIT ALPHA: THE AUSSIE FIXED-INCOME PUZZLE

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Executive Summary

This confidential paper considers the informational efficiency of the Australian fixed-income market and the ability of "active" managers to outperform their benchmark over time. It finds that although the Australian fixed-income asset-class is notionally as large and liquid as the Australian equities market, institutional features make it exceptionally price inefficient. While this should theoretically lend itself to active styles, a striking empirical puzzle emerges: active Australian fixed-income funds don't come close to approximating even the random distribution of returns around the benchmark that one might expect if they were genuinely seeking to outperform. Almost 90% of all Australian fixed-income funds have systematically underperformed the AusBond Composite Bond Index over the last 3 and 5 years. Curiously, this compares very poorly with the much more efficient equities asset-class, where only two-thirds of managers have underperformed their index net of fees. This reflects the static "hold-to-maturity" approach of many supposedly active fixed-income strategies, which makes it definitionally difficult for them to outperform the index they are hugging net of fees. This paper goes on to show that "top-down" quantitative asset pricing models can easily identify bonds that are trading +/-60 basis points cheap/expensive to fair value, which implies that substantial capital gains are available to active participants that are willing to invest in advanced valuation methods. By combining Coolabah Capital/Smarter Money Investments' active Australian credit returns with the risk-free interest rate duration beta embedded in the AusBond Treasury Index, it is demonstrated that investors could have outperformed the AusBond Composite Index by a margin of 1.8% pa over the last 4 years with similar volatility (3% pa), a 96% correlation to the index, low 0.9% pa tracking error and a high 1.7 times Information Ratio. This was superior to the performance of any known AusBond Composite Index benchmark manager over the same period. Most importantly, the "pure trading alpha" driving these excess returns can be produced without pulling the fixed-income managers' traditional levers of (1) duration beta, (2) credit beta and/or (3) illiquidity beta. The paper concludes with an illustration of the value of bottom-up quantitative asset pricing methods, which are used to estimate the real-time probability of the major banks' defaulting on their debts.

An Inefficient Asset-Class

The Australian fixed-income asset-class is highly price inefficient compared to more transparent markets like listed equities. There is no exchange on which to trade bonds, which are transacted over-the-counter (OTC). Price discovery is particularly opaque because the system through which all investment-grade OTC bonds are settled, called Austraclear, does not require any public reporting whatsoever on the price and/or volume of transactions. This is, therefore, an incredibly "dark" market. No volumes are publicly disseminated, and the only prices investors see are those published through YieldBroker, which discloses the "mids" of surveyed market-maker bids and offers, and Bloomberg, which does likewise.

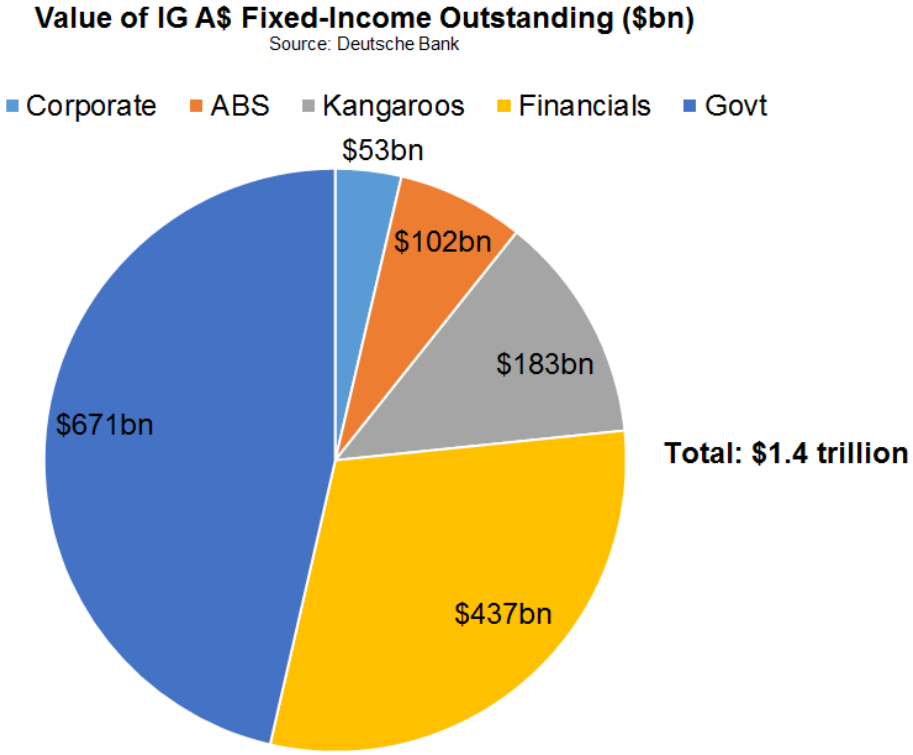
These price inefficiencies are exacerbated by the local market's stylised features. Active Australian fixed-income funds are generally remunerated as if they are passive managers, which unsurprisingly results in a preponderance of static "hold-to-maturity" portfolio construction approaches. If you are hold-to-maturity, you are, by definition, uninterested in credit risk and capital valuation distortions because you are assuming you get repaid at maturity and your only source of return is the yield on the asset (ie, not changes in capital values).

It is well known that there is a distinct paucity of active, value-based Australian fixed-income managers that are common in other asset-classes. This proliferation of passive strategies

further amplifies the inefficiency of the domestic fixed-income market. By their design, passive portfolios are valuation agnostic: they do not search for mispriced assets and seek to capitalise on valuation discrepancies. Indeed, the paradox of the passive approach is that the more successful it becomes in terms of market share, the less informationally efficient the asset-class becomes, which directly undermines the rationale and relative appeal of the strategy.

Yet Large and Liquid

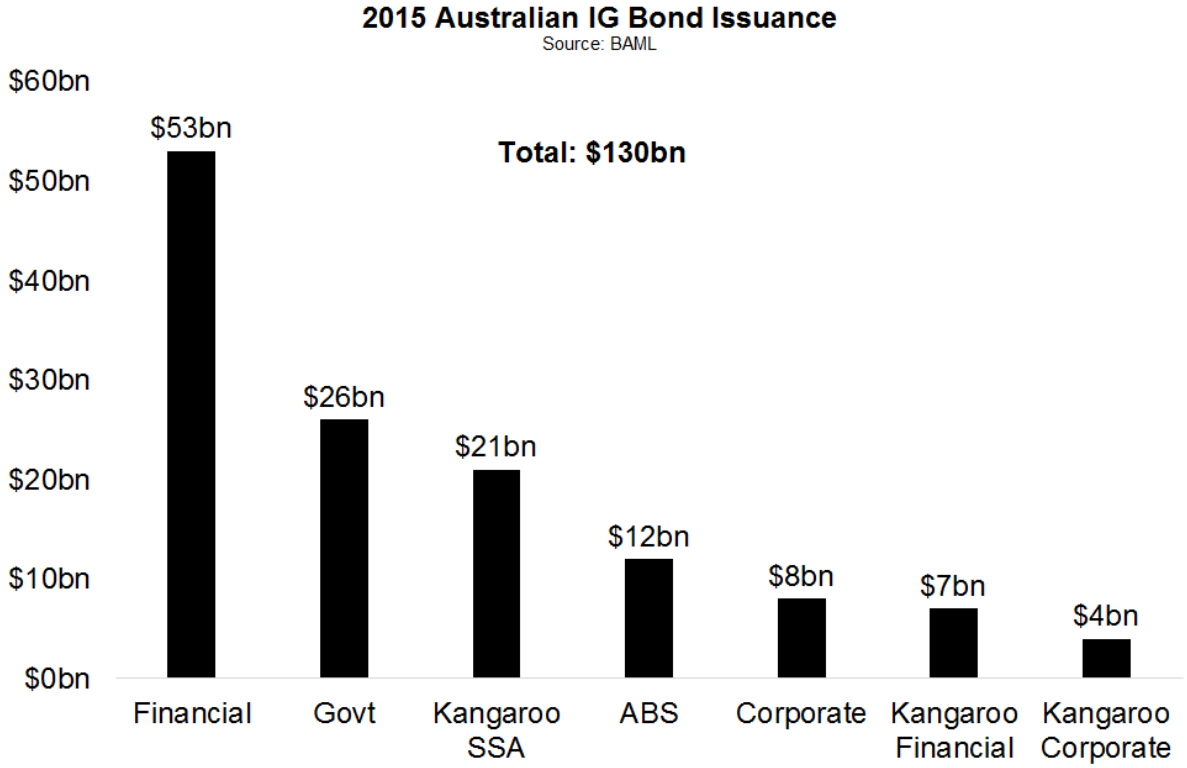
In Australia there is approximately $1.4 trillion of investment-grade fixed-income outstanding across the government, corporate, financial, kangaroo and asset-backed sectors (see first chart below). This is similar in size to the $1.6 trillion Australian equities market, although it is worthwhile noting that bonds are constantly maturing whereas shares are perpetual.



While it is fashionable to wax lyrical about the illiquidity of fixed-income, this is something of a fallacy. There is tremendous “primary” liquidity with around $130 billion of domestic fixed-income sold to investors in 2015 alone (see next chart). The so-called illiquidity regularly cited by media is really a reference to the significantly reduced ability of “street” market-makers to inventory bonds on their balance-sheets following the GFC as a result of new regulatory constraints.

Liquidity as measured by the volume of bonds sold to end-user investors is unquestionably healthy. It is difficult to comment objectively on secondary trading liquidity in Australia because of the absence of any public data on this subject (ie, transaction volumes) for the reasons previously explained. What one can say is that there must be a high degree of “latent” secondary liquidity should primary investors—including banks, real money managers, hedge funds and retail investors—choose to transact in the secondary domain. Indeed, as market-makers become increasingly obsolete, and more transparent trading platforms for bonds materialise, one would expect to see nimble real money managers step-

up and provide investors with opportunistic liquidity as market-makers have historically done. This trend is becoming evident in the US and one would hope that Australian managers eventually increase their sophistication in this regard.

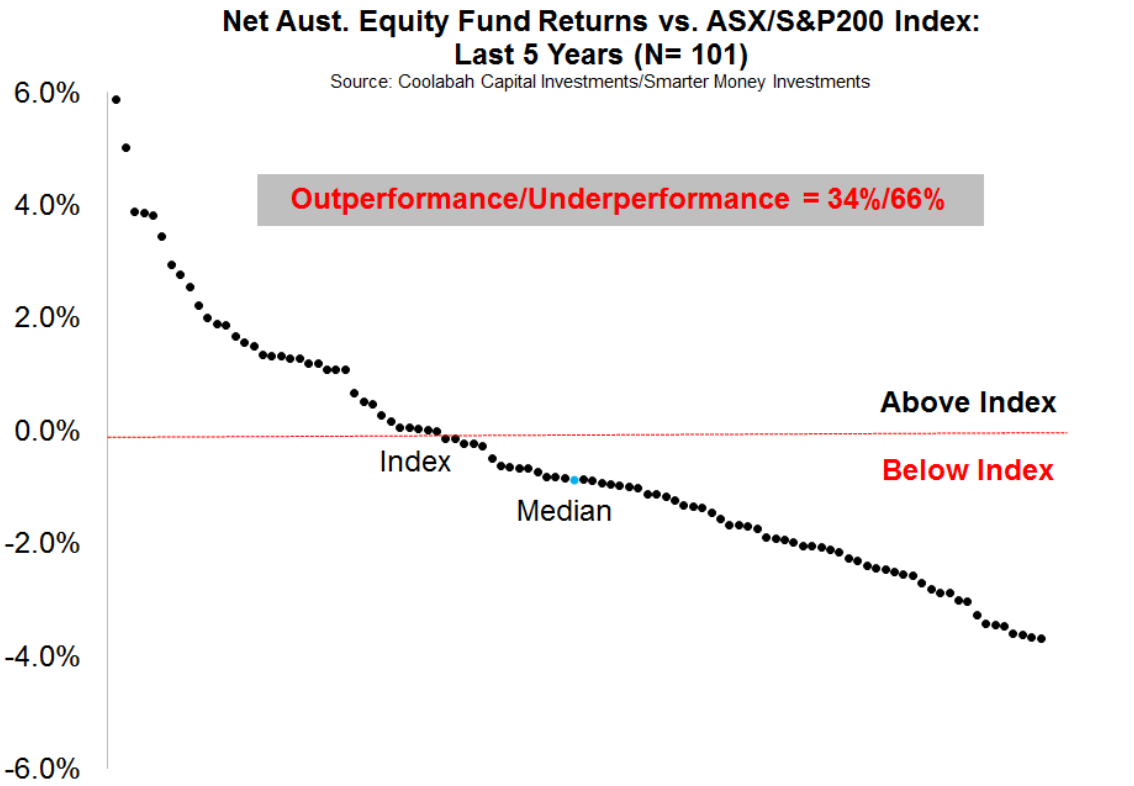


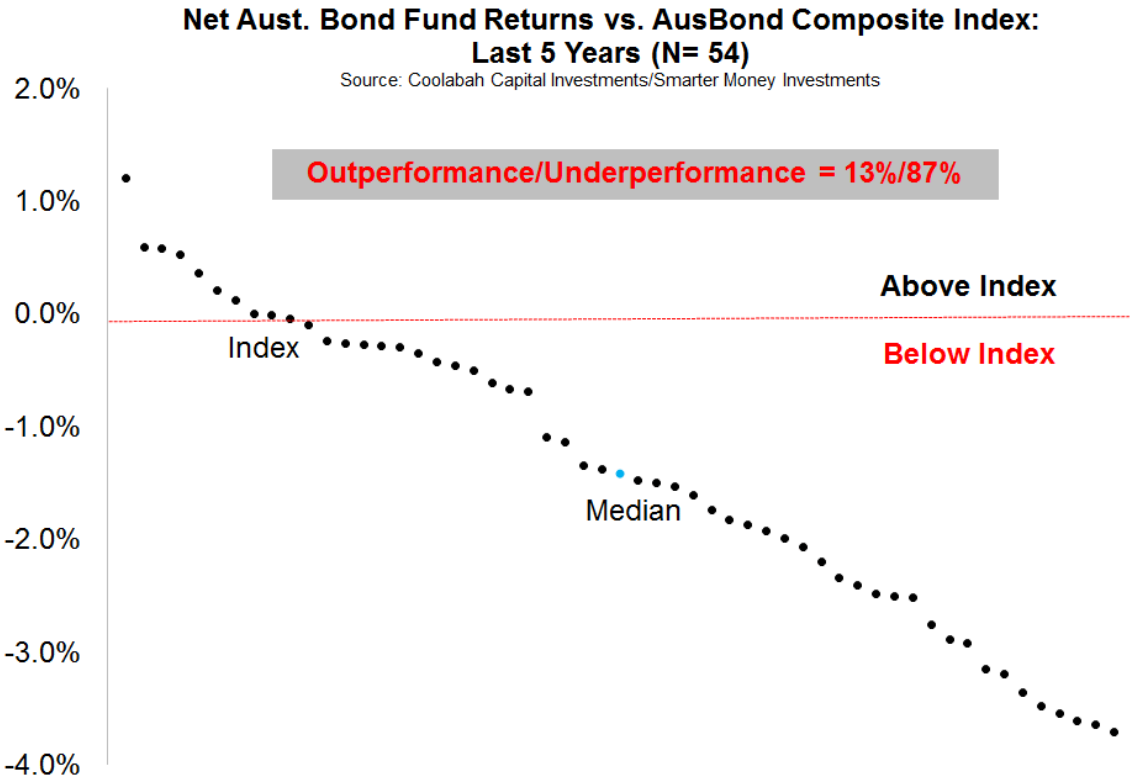
The Aussie Fixed-Income Performance Puzzle

Assuming allegedly "active" Australian fixed-income managers are genuinely trying to beat the benchmark, which in this case refers to the AusBond Composite Bond Index (0+yrs), one might anticipate a random distribution of returns around the index before fees and slightly below the index after fees.

If, on the other hand, the hypothesis that active participants are few and far between is correct—with most opting for buy-and-hold strategies with little-to-no secondary trading of assets to generate alpha—then one would expect a distribution of manager returns that systematically underperform the benchmark over time.

This question is tested on a cross-asset-class basis by collecting the 3 and 5 year post-fee returns for Australian equities and fixed-income managers reported by the analytics firm Financial Express. Excess returns are then calculated by comparing each manager's performance with the total return indices for the ASX/S&P200 Index and the AusBond Composite Bond Index (0+yrs). In total there were 101 equities products and 54 fixed-income products included in our analysis. The charts below present the results.





In summary, almost 90% of all Australian fixed-income funds underperformed the AusBond Composite Index over the last 3 and 5 years. There is nothing remotely resembling a random distribution of manager returns around the index outcomes. In contrast, in the arguably more efficient and transparent listed equities market, which is also traded by an unambiguously larger number of investors, only two-thirds of active managers underperformed the ASX/S&P200 Index net of fees over the last 3 and 5 years.

Put differently, whereas 36% of active equities product have beaten their benchmark over this period, only 13% of fixed-income funds have done so even though the latter charge fees that are normally a fraction of their equities counterparts. That is to say, assuming that both manager cohorts have similar skills, one would *a priori* project a larger number of active fixed-income products to outperform their index than their equities peers given their much lower fee drag between gross and net returns.

Explained by Static Portfolios and Inferior Human Capital

The Australian fixed-income alpha puzzle is thus defined as follows: despite the availability of an ostensibly very inefficient market, almost all active managers are falling short of their benchmark in a manner that suggests:

(1) they possess substantially inferior human capital or talent than active managers in other more contested markets like equities, or

(2) they are not even attempting to outperform by adopting a hold-to-maturity style that post fees means most will always underperform.

While the explanation for the puzzle is almost certainly found in the static buy-and-hold styles of Australian fixed-income funds, and the associated absence of alpha generating secondary trading, the quality of human capital is likely another contributing factor.

As discussed, active fixed-income products typically charge fees that are a fraction of the cost of active solutions in listed equities, private equities, and the “alternatives” (ie, hedge fund) sectors. The demonstrably inferior economic incentives offered to active fixed-income managers means that they will naturally attract inferior talent compared to investors in other asset-classes that have access to superior fee structures.

This observation is empirically borne out by the number of analysts active fixed-income funds employ relative to similarly sized equities managers. Without referencing specific examples, all of the known $5 billion plus fixed-income managers in Australia have a maximum of 2-3 analysts, and often only one analyst. In contrast, Australian based equities managers with more than $5 billion in FUM will ordinarily have teams comprising 10 to 20 analysts.

Investigations of the base salaries paid to analysts in Australian equities and fixed-income also indicates that the former receive materially higher base compensation and bonuses. One is left to conclude that the quality of the human capital in equities will tend to be better than that which is found in fixed-income, *ceteris paribus*.

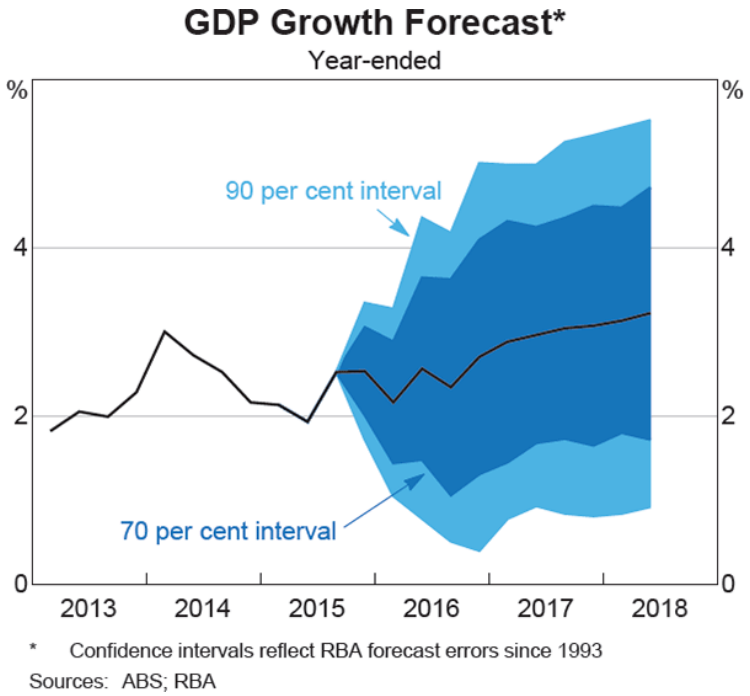
Beta Parading as Alpha

So how do fixed-income managers pretend to produce alpha? This paper argues that alpha is commonly confused with beta. In particular, fixed-income strategies almost always pull on three key levers to generate higher raw returns, which are, however, simply loading investors up with commensurately greater risk. These include:

- Interest rate duration beta;
- Credit beta; and
- Illiquidity beta.

What managers are generally failing to do is deliver alpha that is unrelated to these three factors, which are now considered in more detail:

- **Interest rate duration beta:** Conventional fixed-income funds often claim they can add-value through active bets on interest rate duration risk. Yet empirical research shows that economists, the futures market, and even the RBA itself cannot forecast interest rate movements accurately beyond 6-12 months. With 260 internal analysts the RBA's 90% confidence intervals around its GDP forecasts 1 to 2 years ahead are between 1% and 5.5% (see chart below) based on 20 plus years of forecasting history. This shows that the RBA's models have little if any predictive capacity more than a year out. If the RBA has scant idea where GDP will be in 12 months' time, then it is near-impossible to accurately forecast interest rate movements beyond this horizon. The interest rate derivatives/futures markets are also among the most efficient and actively traded in the world, and contested by every global macro hedge fund manager, which makes it hard for an Aussie fixed-income participant to extract risk-adjusted excess returns by second-guessing this market pricing.



- **Credit beta:** Another lever that is used to inflate returns is loading investors up with credit risk through "high-yield" solutions encompassing sub-investment grade and/or unrated assets, including the increasingly popular "direct loan" space. There is not necessarily any unique manager skill required to create a portfolio along these lines. These assets are also often highly illiquid, which then makes them difficult to mark-to-market. Indeed, one perversity that is sometimes observed is high-yield funds not even bothering to mark-to-market their portfolios using public prices. Instead, they simply report their yield-to-maturity with scant volatility in portfolio values and/or unit prices (despite the fact that these assets actually have very high risk). In a similar manner, there are Australian credit funds that are more than 50% invested in sub-investment grade and unrated bonds that do mark-to-market their portfolios yet because of the lack of traded prices for high-yield assets are likewise reporting very low volatility when they should be displaying far higher probabilities of loss.

- **Illiquidity beta:** In the search for yield institutions have tried to capture higher returns through assuming significant illiquidity beta in the form of unrated “direct loans” — commonly acquired off bank balance-sheets—that offer little or no possibility of any secondary liquidity. Like other high-yield assets, direct loans appear to be low risk insofar as portfolios are either not marked-to-market or done so using extremely stale secondary prices. Since there is no bona fide ability to exit these positions, it is impossible for managers to produce alpha when a cheap asset converges towards fair value.

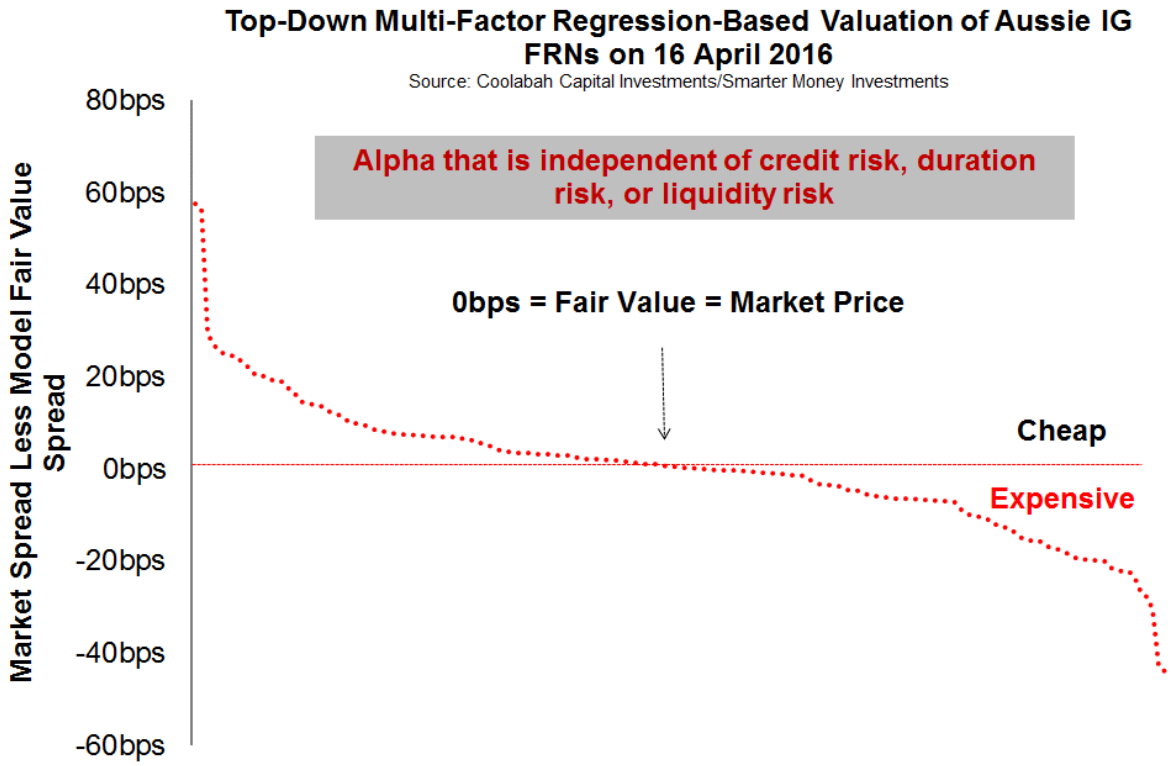
Quantifying Alpha Generation Opportunities

Alpha can be defined as an improvement in risk-adjusted excess returns after one has stripped out the various beta factors (typically through a Fama-French like multi-factor regression model). One can then further define “active” strategies as those that seek to identify assets that are cheap relative to rigorous quantitative assessments of fair value and which have a high likelihood of converging back to fair value and thus furnishing capital gains over and above the interest rates paid on the assets.

In this context, it is instructive to think about two different “top-down” and “bottom-up” approaches to asset pricing. This paper characterises a top-down model as a "market-efficient" multi-factor regression that assumes current bond prices are correct and estimates the fair value of any given fixed or floating-rate asset based on observed prices and their relation to maturities, credit ratings, capital structure positions, industry sectors, liquidity and other factors.

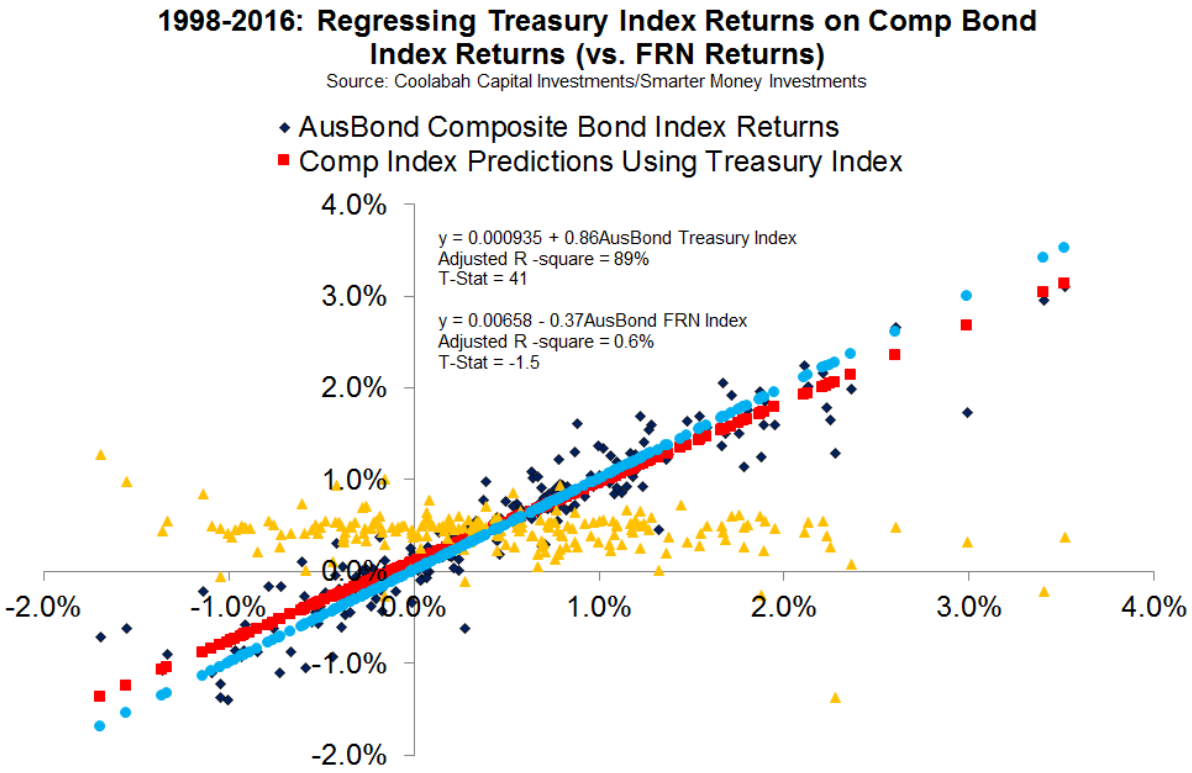
This method addresses the question: if market prices are generally correct (ie, efficient), where exactly should the asset in question trade right now after accounting for all of its features/factors. Top-down models are useful for exploiting real-time trading anomalies where asset prices temporarily deviate from their true market levels. The chart below shows the results of one such top-down method for all investment-grade floating-rate notes in Australia. Each dot represents an FRN’s market spread less the model’s fair value spread. If this number is positive (negative) the FRN is cheap (expensive).

Importantly, this analysis shows that there are clearly assets that are mispriced by between 40 basis points and 60 basis points at any given point in time. If these spreads converge back to fair value the assets would present investors with attractive capital gains. An 11 basis point movement in, say, a 5 year senior major bank FRN results in a circa 50 basis point change in the capital value of that asset. Accordingly, identifying *ex ante* movements of this magnitude 4 times a year can deliver ~200 basis points per annum in gross alpha independent of credit risk, interest rate duration risk, or liquidity risk.



Unbundling Alpha and Beta

The most popular Australian fixed-income benchmark, the AusBond Composite Bond Index (0+yrs), has two key risk factors: risk-free interest rate duration beta and credit beta. This section decomposes these factors and evaluates their significance in determining the overall index returns. Specifically, the AusBond Treasury Index, which represents a portfolio of AAA rated Australian government bonds, and, separately, the AusBond Floating-Rate Note Index, which comprises corporate and financial FRNs, are regressed on the AusBond Composite Bond Index over the period 31 December 1998 (when the FRN index started) to 31 March 2016. The chart below summarises the results.

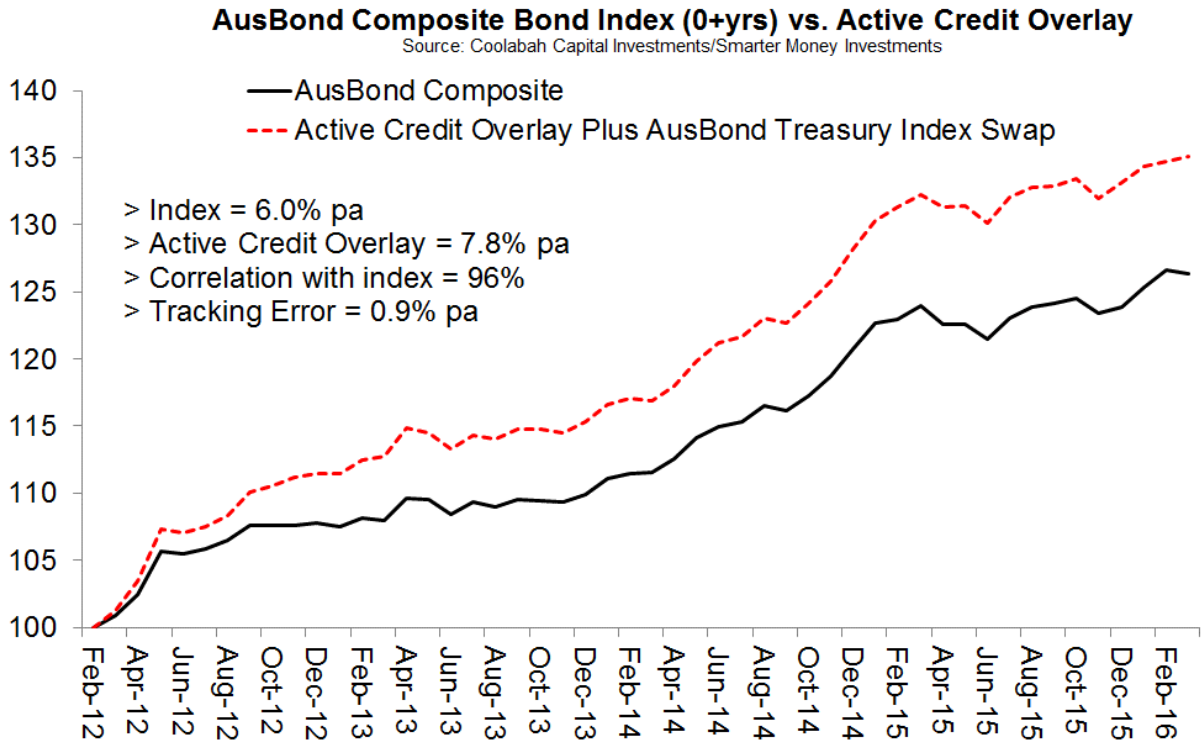


In short, the AusBond Treasury Index (light blue dots) accounts for almost 90% of the AusBond Composite Bond Index's (dark dots) returns while the FRN index, or no-duration credit beta, returns (yellow dots) have little explanatory power in respect of, or are uncorrelated with, the AusBond Composite Bond Index.

As discussed earlier, it is extremely difficult to add-value through active interest rate duration management given the inherent efficiency of the interest rate derivatives markets, which are traded every second of every day by global fixed-income and macro hedge fund participants as a proxy for, among other things, macroeconomic event risk.

For Australian fixed-income benchmark mandates, a superior solution might, therefore, be to accept risk-free duration beta given the high efficiency of this sector and target extracting alpha from credit markets, which are less informationally efficient.

This proposition is tested by combing Coolabah Capital/Smarter Money Investments' historic active credit returns, which have had less than 3 months of interest rate duration risk, over the last 4 years with a total return swap on the AusBond Treasury Index (see next chart). The findings suggest that after netting out the swap costs this solution would have produced approximately 1.8% pa of gross excess returns above the AusBond Composite Bond Index with a 96% correlation to the index, similar volatility (around 3% pa), 0.9% pa tracking error and an Information Ratio of 1.7 times. That is to say, a simple overlay combining Coolabah Capital/Smarter Money Investments' low duration active credit track-record with the risk-free interest rate duration risk in the AusBond Treasury Index would have delivered excess returns that are better than all known competitors included in our analysis of the performance of Australian fixed-income funds relative to the AusBond Composite Bond Index earlier.



Most importantly, the “pure trading alpha” driving these excess returns can be produced without pulling the fixed-income managers’ traditional levers of (1) duration beta, (2) credit beta and/or (3) illiquidity beta.

Bottom-Up Valuation Methods

Another approach to finding alpha is through bottom-up methods or "market-inefficient" techniques that ignore current asset prices as proxies for fair value and build a first-principles approach to pricing bonds based on the underlying characteristics of both the issuer (eg, equity, assets, liabilities, leverage, volatility, etc) and the debt security (eg, maturity, capital structure position, etc).

All these models attempt to accurately estimate any given asset's expected probability of default and the overall expected loss from which fair value credit spreads can thereafter be derived. They are thus more "value-orientated", or fundamentals-based, valuation techniques that are informative for both short-term and long-term investment opportunities.

To illustrate these techniques, this section utilises a suite of advanced "Merton" models—originally developed by the Nobel laureate Robert C. Merton—to estimate the real-time probability of Australian banks going into default and changes in their implied credit ratings based on objective empirical data. Assessing probabilities of default, and then losses in default, are self-evidently condition precedents to estimating fair value spreads.

The risk of bank failure is a topical subject at the present time given sustained media coverage on hedge funds seeking to short major bank equities on the basis of concerns around the valuation of the Australian residential property market.[1]

[1] See this AFR analysis

Since 2013 we have argued that the major banks' equity was expensive[2]—trading as much as 3 times book value—given our contrarian forecasts for a significant increase in tier one (T1) capital and consequent balance-sheet deleveraging that would force returns on equity lower.[3]

Concurrently, we posited that heightened competition from regional rivals becoming approved by APRA as advanced internal-ratings based (IRB) banks, which would put them on a similar capital, leverage and return on equity playing field to the majors, combined with a mean-reversion in the majors' cyclically low bad debt levels to more normal thresholds, would conspire over the medium term to compel their returns on equity towards their 10% to 11% cost of equity.[4]

This analysis has ramifications for every part of the majors' capital structure, including their T1 hybrids, tier two (T2) subordinated bonds, senior bonds and deposits. If the majors' non-risk-weighted T1 capital ratio has to rise significantly by another circa 0.50-1.0 percentage points to hit our projected target for APRA's new minimum leverage ratio of 5%—with a practical APRA expectation closer to 6%—then the majors will likely have to source another ~$40 billion in common equity tier one (CET1) and additional tier one (AT1) capital. They can comfortably do this through discounted dividend reinvestment plans, asset sales, and a tapering in dividend payout ratios over the next ~3 years.

Since June 2014 the majors have already boosted total T1 capital by more than $40 billion in what has been the biggest deleveraging of their balance-sheets in modern history. This is "credit positive" and could see the majors' S&P stand-alone credit profiles (SACPs) lifted from single "a" currently to "a+" in the future, which S&P has repeatedly flagged as a possibility.[5]

As the T1 capital raising process continues in the years ahead, one would expect the risk premia associated with the majors' bonds to decline, all else being equal.[6] While AT1 capital instruments with a 5.125% equity conversion trigger in principle benefit from higher CET1, they will suffer in the near to medium term from greater issuance (supply) as the majors seek to meet their T1 capital shortfalls with the cheapest possible securities. Even at ~520 basis points above the bank bill swap rate (BBSW), AT1 capital is much cheaper than the majors' cost of equity, which is some ~800 basis points above BBSW.

The Reserve Bank of Australia recently announced that it had adopted[7] the "Classic" Merton Model (CMM) to monitor changes in default risks across all publicly-traded companies. Under this framework a company is assumed to go into default when its assets are worth less than its liabilities. This is a reasonable albeit imperfect test given that default (and insolvency) is determined by the ability of a company to repay its debts as and when they fall due, not by its net worth.

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[2] See this AFR analysis

[3] See this AFR analysis

[4] This in turn implies the majors should trade close to book value, which at the time of writing ANZ and NAB were doing. CBA and Westpac remain the expensive stand-outs at circa 2 times book value

[5] S&P argues this would only impact T2 bond credit ratings, which would increase from BBB+ to A-

[6] There is an argument that senior bonds will become more explicitly loss-absorbing in due course as APRA develops its TLAC regime, which could result in a 1-2 notch downgrade in senior ratings that would be partly offset by the increase in the majors' SACPs to a+

[7] See this September 2015 RBA Bulletin paper

To emphasise this distinction, Australian banks have unique access to an emergency line of credit from the RBA called the "Committed Liquidity Facility" (CLF).[8] This allows Commonwealth Bank of Australia, for example, to instantaneously draw down on ~$66 billion of cash for a minimum 12 month term at a cost of just 2.4% annually. The CLF makes it practically impossible for an Australian bank to suffer liquidity-induced insolvency, which is the single biggest threat to leveraged banks that borrow short and lend long.

Following a public debate with us,[9] the RBA varied the CLF's terms to make the condition for accessing it a "positive net worth" rather than a "solvency" test. This means Merton-style models, which equate default with negative net worth, are especially attractive for assessing bank credit risk.

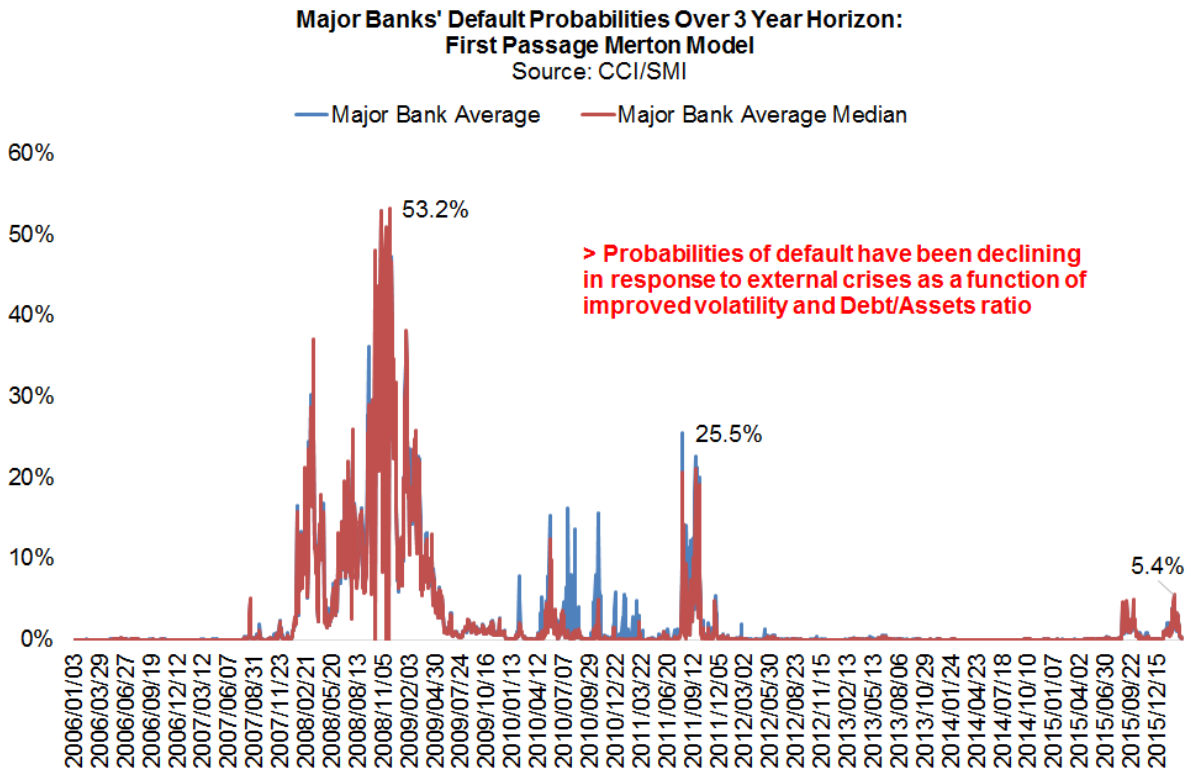
For any listed entity one knows its market capitalisation (ie, publicly traded equity), the value of its debts, and thus the overall value of its assets, which is equal to debt plus equity. This is the same as saying the value of a house is made up of the owner's equity plus the amount they borrowed from the bank. One can also accurately measure the volatility of a listed company's equity, which is traded each day.

Merton created a method that allows one to use data on a firm's equity volatility and capital structure to estimate the probability distribution of its asset values over any given future period (eg, one, two or three years).

While the RBA's CMM only allows default to occur at the end of a pre-specified time horizon (specifically the maturity date of an assumed bond), we prefer a more flexible “First Passage” Merton Model (FPMM) that permits assets to fall below liabilities, and therefore default, to occur at any time over the modelled maturity horizon. We also publish the results of a “Jump Diffusion” variant of the classic Merton model (JDMM) that embeds asset volatility distributions with higher probabilities of extreme negative values.

While one can apply these techniques to all listed companies, the charts below highlight the results of the FPMM and the JDMM for the major banks. In particular, the charts show the Merton-estimated default probabilities over a future three-year horizon, which are recalculated every day. One can then map these default probabilities onto implied credit ratings based on global historical defaults within different Standard & Poor's ratings since 1920.

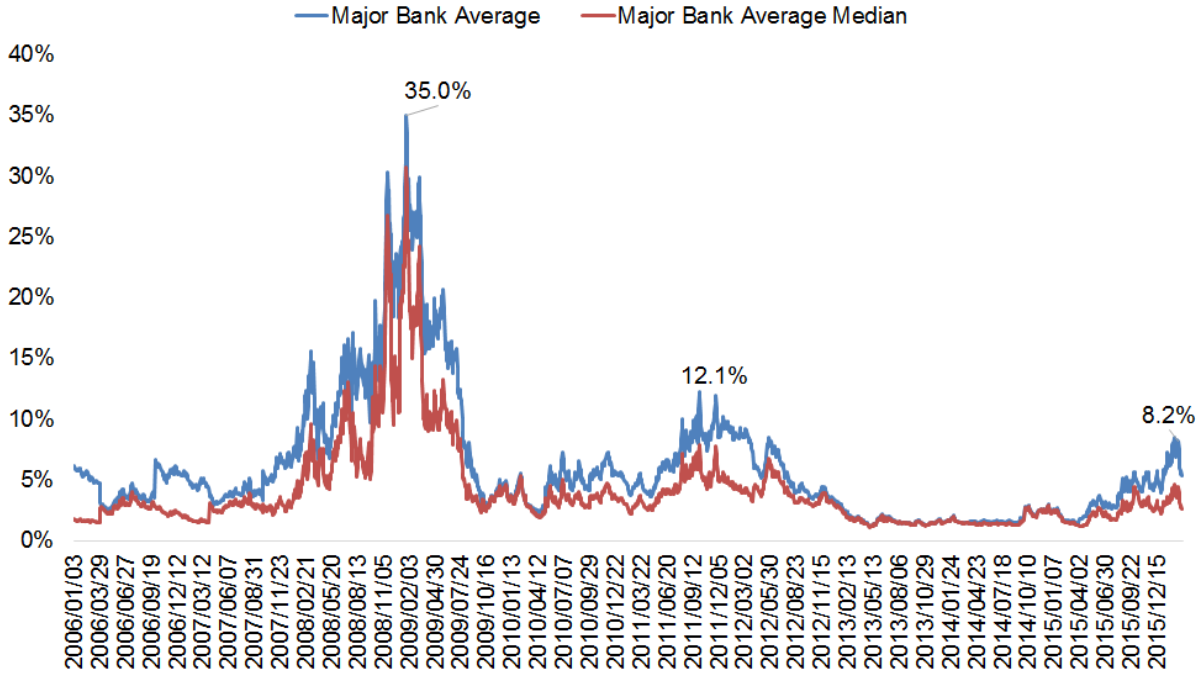
[8] See this AFR analysis
[9] See this AFR analysis



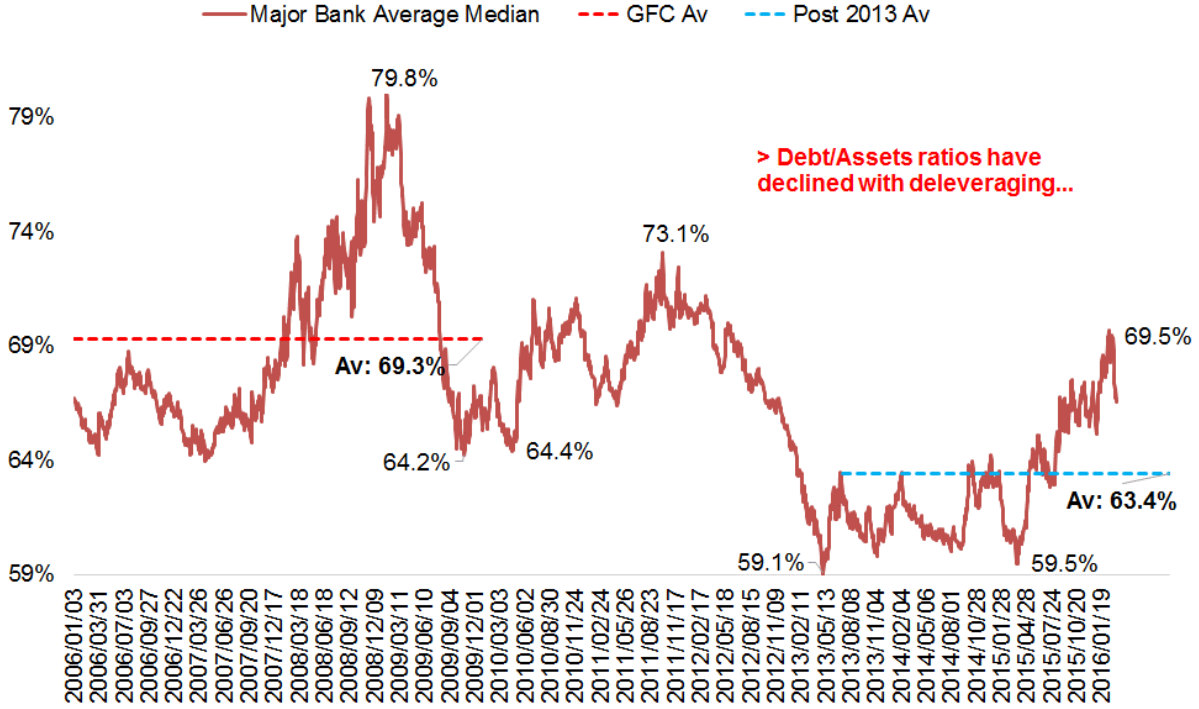
During the worst days of the global financial crisis and, to a lesser extent, during the ructions in bank capital markets triggered by the 2010 and 2011 European sovereign debt crises, investors were pricing Aussie banks as if there was a very real chance they would go bust. Three year default probabilities rose to between ~35% (JDMM) and ~50% (FPMM) in the GFC and to ~12% (JDMM) and ~25% (FPMM) in 2010 and 2011.

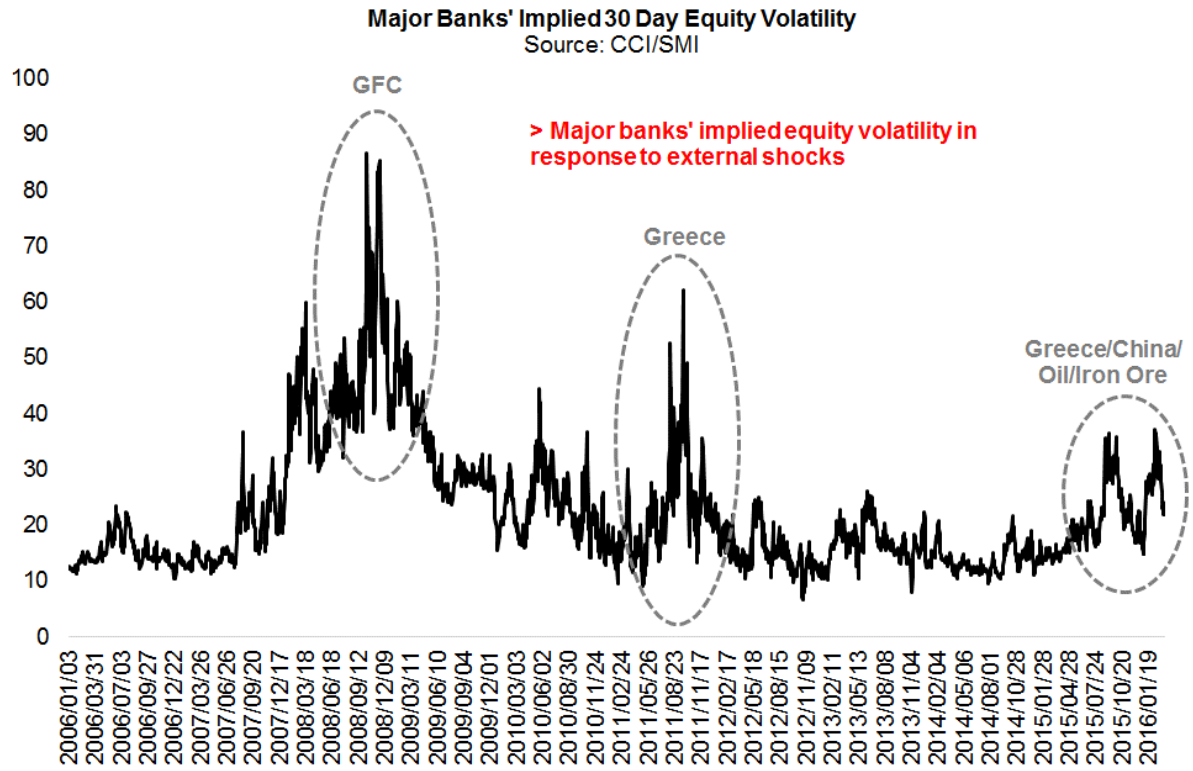
It would appear that this was fuelled by a huge increase in asset volatility coupled with a disconcerting rise in the banks' debt-to-assets ratios as the value of their equity plummeted. During normal conditions, our models' default probabilities imply the major banks are effectively AAA rated credit risks. Yet during the GFC and European sovereign crises investors were treating the banks like they were "junk", which was matched by a commensurate blow-out in credit spreads.

Major Banks' Default Probabilities Over 3 Year Horizon: Jump Diffusion Variant of Classic Merton Model
Source: CCI/SMI



Major Banks' Debt/Asset Value Ratios
Source: CCI/SMI

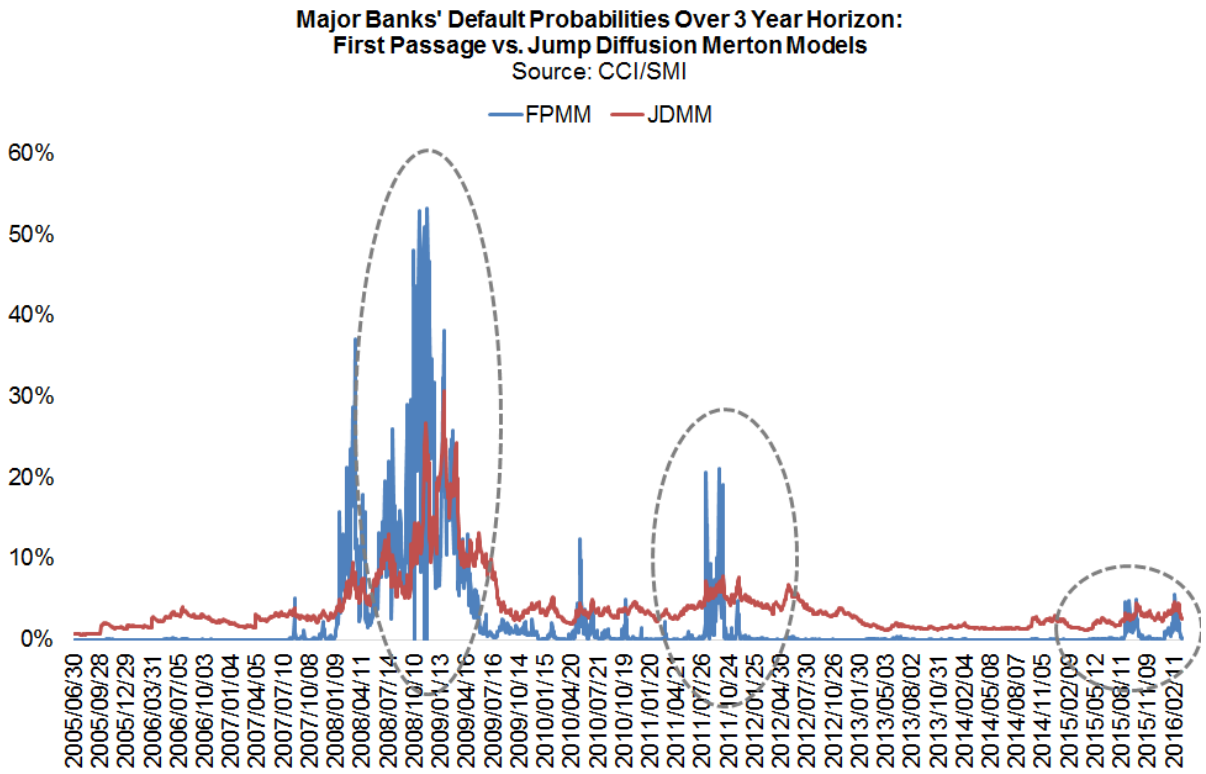


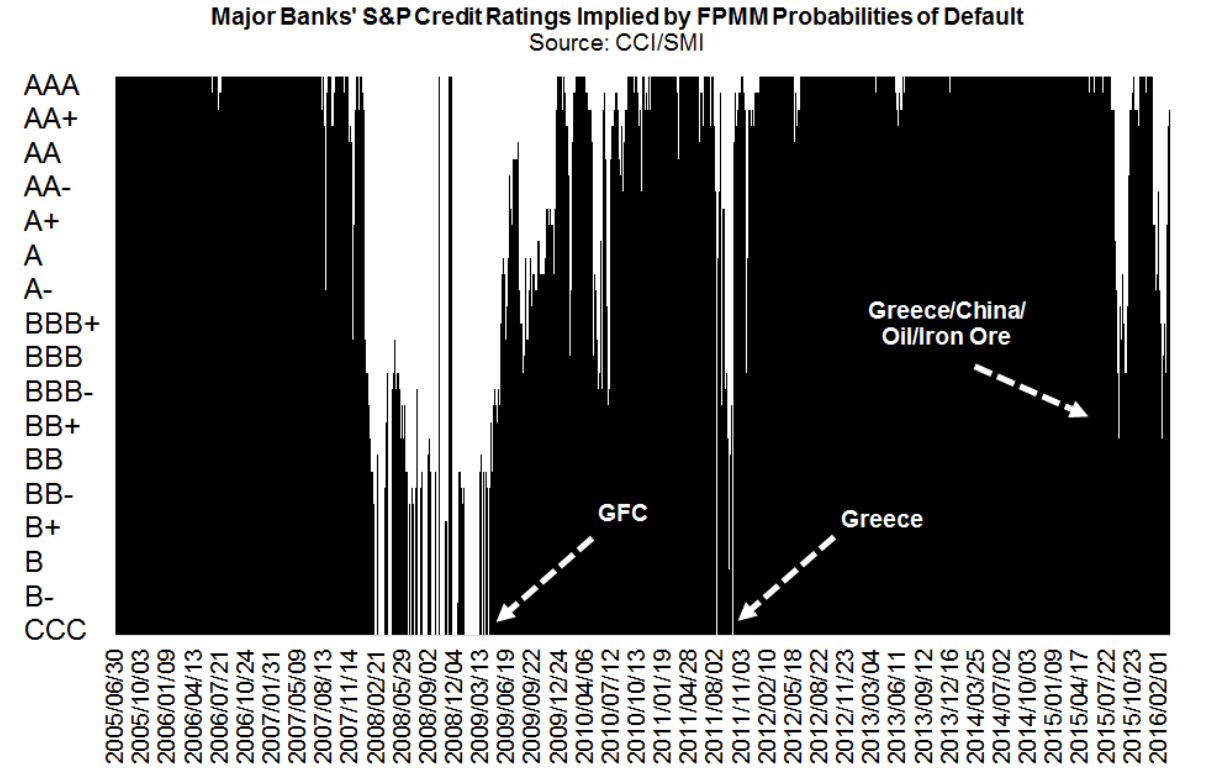


The majors' default probabilities are, however, materially different during the sequence of two standard deviation plus shocks experienced over 2015 and 2016. These include the Greek dramas in June 2015, the first Chinese equities crash in August, plummeting energy and iron ore prices in the final quarter of 2015 and the first quarter of 2016, further Chinese equities turmoil in January, and European bank perturbations in February.

Despite 30%-40% declines in the majors' share prices and significant increases in credit spreads, the charts above show that their default probabilities have remained generally contained to peaks of between ~5% (FPMM) and ~8% (JDMM) over 2015 and 2016. This has in turn translated into significantly improved dynamic credit ratings within the "BBB" to "AAA" bands. (The final chart below illustrates the dynamic credit ratings implied by the majors' default probabilities over time.)

There is further support for the "improved resilience case" in major bank credit default swap (CDS) spreads: in the GFC, CBA's 5 year senior CDS spreads peaked at ~180 basis points; during the 2011 European sovereign debt crisis they went as wide as ~220 basis points; yet in 2015 and 2016 the worst prints were around a more modest ~136 basis points.





The more durable performance of Australia's major banks in the 2015/16 shocks is likely a function of several related factors. First, the significant balance sheet deleveraging forced by APRA's capital raising requirements has materially de-risked the banks' debt-to-asset ratios from their GFC levels. Second, implied equity and asset volatility have been lower, possibly as a result of the bolstered balance-sheet strength. In its latest financial results for the period

to December 2015, CBA claimed that its CET1 capital ratio is now the third highest in the world.

Finally, since its original media release on the introduction of macro-prudential constraints on credit creation in late 2014,[10] APRA has become increasingly aggressive in its efforts to dampen speculative investment lending against housing given concerns about the emergence of an asset price bubble (forecast by us in 2013).[11] The ensuing housing boom coincided with a deterioration in credit assessment standards, which we brought to APRA's attention in early 2015.[12]

APRA has been successful in both dramatically slowing housing investment credit growth to below its 10 per cent per annum acceptable ceiling and significantly boosting the conservatism of the major banks' historically robust lending standards through: increases in minimum deposit requirements; the application of a minimum 7% interest repayment test (versus prevailing 4 per cent variable rates); tougher living cost and rental expense assumptions; and more prudent principal and interest amortisation schedules. A full list of APRA's focus areas is explained in this May 2015 speech by APRA's chairman, Wayne Byres.

It is possible that APRA's reforms combined with a de-risking in the major banks' commercial strategies—with ANZ partially withdrawing from Asia (a source of heightened impairments), NAB disposing of its troubled UK banking business, and CBA mitigating compliance problems in its financial planning and insurance operations—have assisted in ameliorating overall credit risk.

Notwithstanding rising impairments in the major banks' mining and energy books, which represent less than 2%-3% of their total credit exposures, overall non-performing loans have been in trend decline since 2011 and at sub 1% are a fraction of US (2%), UK (4%) and European (6%) bank levels.

The sharply declining petrol price and lower-than-expected consumer price inflation, which banks calculate have been equivalent to a full RBA rate cut, have also helped improve consumer arrears with CBA reporting recent declines across home loans, personal loans and credit cards in the second half of CY2015.

Curiously, however, the major banks are still forced to pay higher risk premia on funding instruments like their T2 bonds. Global analysts CreditSights says that the majors' subordinated-to-senior-debt cost ratios are 43% more expensive than US bank ratios. Analysis of these ratios across US, UK and Australian banks arrives at similar conclusions (see table below) despite the fact that the majors carry higher issuer credit ratings. CreditSights also notes that while the majors T2 securities trade at similar spreads to Canadian banks, the majors have much higher CET1 ratios that are about 3-4 percentage points above comparable Canadian ratios.

[10] See here
[11] See this AFR analysis
[12] See this AFR analysis

US Banks

Issuer	Security Code	Security Rating	Senior Rating	Call/Maturity Date	T2/Senior Ratio
Wells Fargo & Co	EJ547824 Corp	A	A+	02/28/23	1.12
Wells Fargo & Co	EJ786410 Corp	A	A+	08/15/23	1.21
Wells Fargo & Co	EK012345 Corp	A	A+	01/16/24	1.26
Wells Fargo & Co	EK300188 Corp	A	A+	06/03/26	1.34
Wells Fargo & Co	AF284534 Corp	A	A+	07/22/27	1.35
				Average	**1.25**

UK Banks

Issuer	Security Code	Security Rating	Senior Rating	Call/Maturity Date	T2/Senior Ratio
Royal Bank of Scotland	EJ458578 Corp	BB	BBB-	15/12/2022	1.27
Royal Bank of Scotland	EJ705137 Corp	BB	BBB-	10/06/2023	1.33
Royal Bank of Scotland	EJ992332 Corp	BB	BBB-	19/12/2023	1.28
Royal Bank of Scotland	EK290912 Corp	BB	BBB-	28/05/2024	1.24
				Average	**1.28**

Australian Banks (27 October 2015)

Issuer	Security Code	Security Rating	Senior Rating	Call/Maturity Date	T2/Senior Ratio
Westpac	AU000WBCHBD1	BBB+	AA-	14-Mar-19	2.96
ANZ	AU3FN0023859	BBB+	AA-	25-Jun-19	2.97
CBA	AU3FN0025367	BBB+	AA-	05-Nov-19	2.70
NAB	AU3FN0026928	BBB+	AA-	26-Mar-20	2.39
ANZ	AU3FN0029575	BBB+	AA-	17-May-21	2.35
				Average	**2.67**