The value of adding corporate bonds to Australian fixed-interest portfolios

Australia's growing corporate bond market presents a significant source of added return potential but also added risk. **JAMES ALEXANDER** and **JAMIE KRASOWSKI** reveal some surprising implications about investing efficiently in corporate bonds.

JAMES ALEXANDER
Director, Enhanced and Active, Australian Fixed Income, Alliance Capital Management Australia Ltd.
JAMIE KRASOWSKI
Portfolio Manager, Australian Fixed Income, Alliance Capital Management Australia Ltd.

Is an allocation to higher-yielding corporate bonds at the expense of government securities a risk-efficient means to enhance returns? To answer this question, we evaluated the performance of three yield-optimisation investment approaches with varying degrees of visibility about future credit downgrades—no foresight, late foresight and early foresight. Predictably, the early-foresight strategies proved the most successful in terms of excess return, tracking error and efficiency. But our study revealed other forces at play, as well, with implications about maturity selection—for now, shorter is better—and increased opportunities in Australia's burgeoning corporate bond market.

The rapid growth of Australia's corporate market over the past seven years has opened new roads of potential-return enhancement to investment managers. A commonly employed strategy for enhancing returns has been to increase a portfolio's allocation to corporate securities at the expense of Commonwealth and semi-government bonds, reaching for extra yield without regard to the outlook for individual credits.

As our study shows, this simplest of yield-optimisation methods has in fact been reasonably successful in enhancing return. However, replacing government bonds with corporate securities is not without risk. Such a strategy exposes the portfolio to both corporate market volatility or market and credit (or default) risk. While most investment managers agree that market risk is negligible at maturities of less than one year, it can be substantial at longer maturities.

Accordingly, we conducted a study to determine whether an allocation to corporate bonds is a risk-efficient means of enhancing return. Many investment managers employ credit research in an effort to reduce market risk, with the goal of identifying and avoiding future losers in the credit markets. In our study, we attempted to simulate such research with our early- and late-foresight strategies.

A no-foresight strategy represented the simplest yield-optimisation approach, without the benefit of credit research. Additionally, our study proposed to answer the question: Can corporate bond allocations be made at longer maturities without suffering from diminishing returns for each unit of additional market risk taken? To this end, we measured and analysed the performance and volatility of concentrated corporate bond portfolios over maturity ranges out to 10 years.[1]

One of the most interesting characteristics of the period we studied was heightened spread volatility, in spite of strong corporate fundamentals and a healthy economy. Between late 1995 and early 2002, the credit markets

were beset by numerous extraordinary events: the Asian economic crisis and bank collapses of 1997, Russia's sovereign-bond default and the implosion of Long-Term Capital Management in 1998, concerns about potential Y2K disasters in 1999, the technology wreck of 2000, and the September 11 terrorist attacks against the United States in 2001. Each of these events was followed by a flight to quality in which investors rushed to the perceived safety of developed countries' sovereign debt.

As a result, credit spreads widened sharply (Figure 1) and corporate bonds underperformed governments in the immediate aftermath of each crisis. For the purposes of our study, such volatility was useful, as it implies that the results of our research are not dependent on benign market environments and should prove meaningful in variable market conditions.

CONDUCTING THE STUDY

Our study simulated the historical monthly performance of a series of portfolios optimised on a monthly basis to include the highest-yielding securities within a given maturity range. We began by dividing the benchmark index[2] into yearly maturity cells, or sub-indexes, of 0–1 year, 1–2 years, 2–3 years and so on, up to 10 years. Next, for each sub-index, we derived optimised portfolios under three scenarios, each with a different degree of foresight into future performance. Lastly, we compared the risk and performance of each of the 30 optimised portfolios against its relevant sub-index (Table 1).

The objective of our optimisation process was to maximise the yield-to-maturity of each of the portfolios, subject to three constraints. First, each optimised portfolio must have a market value equal to the market value of all the securities constituting the relevant sub-index. Second, each portfolio must have a duration equal to that of the relevant sub-index. And third, no single security may account for more than 20% of the portfolio, on a market-value basis, thereby ensuring that each optimised portfolio contained at least five securities. In practice, these constraints resulted in portfolios that contained mostly non-government bonds.

How much visibility?

While an investment strategy involving an increased allocation to corporate bonds is likely to add return, it also increases credit risk—that is, the risk that the issuer may be unable to fulfil its obligations with respect to principal or interest payments, or the risk that the issuer may experience a credit-rating downgrade, causing a decline in the market value of the security.

The yield spread of a corporate bond relative to a credit-free instrument such as government debt reflects the market's estimate of the corporate bond's credit risk. The larger the yield spread, the greater the perceived credit risk. Because market participants try to anticipate rating downgrades, a bond's spread typically widens prior to such a downgrade. Thus, credit spreads reflect not only an issuer's current ability to meet its debt obligations but also the market's expectations of future changes to that ability. Accordingly, to protect a portfolio against loss due to downgrade, it is necessary to sell a security well before the downgrade occurs.

In our study, we focused on credit-rating downgrades that resulted in a bond being removed from the index. When a security falls below the index's minimum rating restriction of A–/A3 and is consequently removed from the index, its spread generally widens meaningfully both prior to and at the time of the downgrade.

This is particularly the case in the Australian corporate market, due to

TABLE 1 **CONSTRUCTING OPTIMISED PORTFOLIOS: OUR METHODOLOGY**

Index

Corporates, Semi-governments and Goverments of All Maturities from 0 to 10 Years

0–1 year Corps, Semis and Govt	0–1 year Corporates
0–2 year Corps, Semis and Govt	0–2 year Corporates
2–3 year Corps, Semis and Govt	2–3 year Corporates
3–4 year Corps, Semis and Govt	3–4 year Corporates
4–5 year Corps, Semis and Govt	4–5 year Corporates
5–6 year Corps, Semis and Govt	5–6 year Corporates
6–7 year Corps, Semis and Govt	6–7 year Corporates
7–8 year Corps, Semis and Govt	7–8 year Corporates
8–9 year Corps, Semis and Govt	8–9 year Corporates
9–10 year Corps, Semis and Govt	9–10 year Corporates

FIGURE 1 **HIGHER THAN NORMAL SPREAD VOLATILITY**

Source: Bloomberg L.P.

FIGURE 2 **ANALYSIS OF THE NO-FORESIGHT STRATEGY—EXCESS RETURNS**

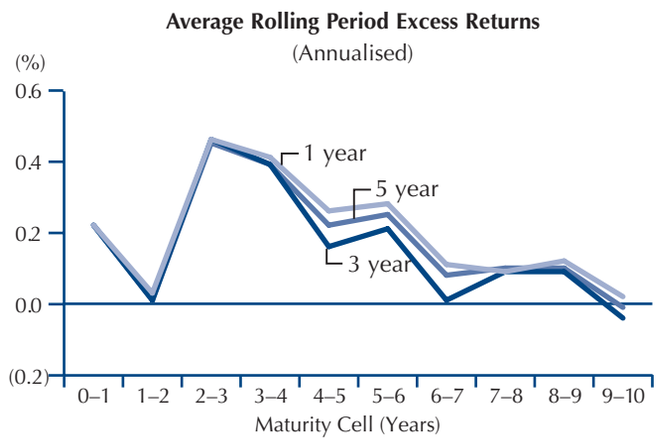


FIGURE 3 **ANALYSIS OF THE NO-FORESIGHT STATEGY—TRACKING ERROR**

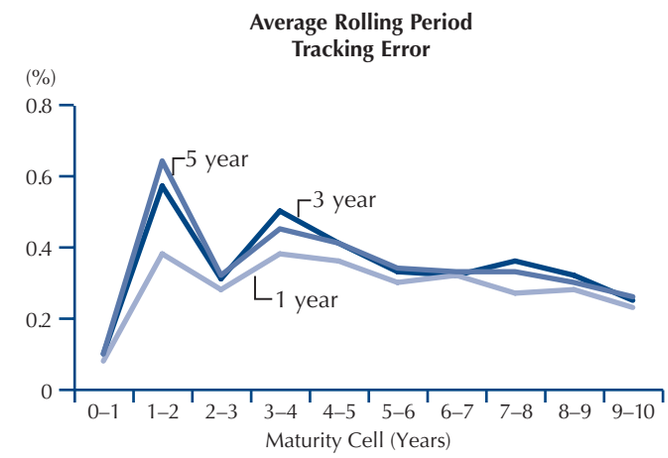
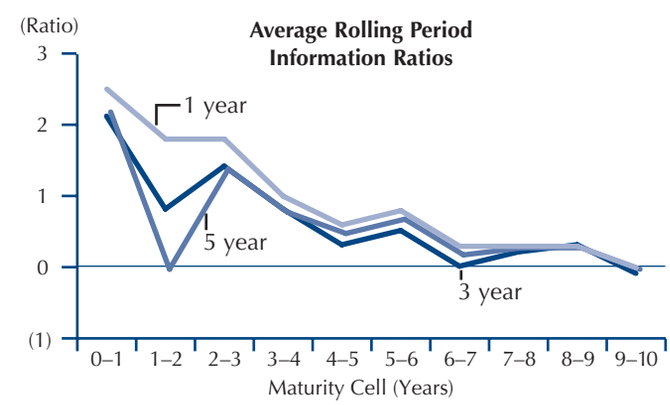


FIGURE 4 **ANALYSIS OF THE NO-FORESIGHT STATEGY—INFORMATION RATIOS**



Source: UBS Warburg Australia and Alliance Capital

many investors' mandates that restrict eligible investments to securities rated A–/A3 or better. Effectively, such investors become forced sellers to a small group of potential buyers. This phenomenon contributes further to the bond's spread widening.

In order to quantify the impact of a manager's ability to avoid bonds that are removed from the index, we created three scenarios in which our hypothetical portfolio managers had varying degrees of credit-ratings foresight when making security selections.[3] (In practice, investment managers strive to replicate the late and early foresight strategies by employing credit research in their investment processes.)

No Foresight. First, we simulated a scenario in which a manager has zero visibility and therefore makes buy decisions solely on the basis of the highest yield, or widest credit spread offered, at the time of purchase. This strategy is fully exposed to the risk that a security may fall out of the index due to downgrade as well as to the decline in bond price that occurs prior to and at the time of such a downgrade. We called this scenario "no foresight".

Late Foresight. Next, we created a scenario in which a manager is able to identify bonds that are destined to be downgraded below A–/A3, but only shortly before the event. In this case, the manager is able to avoid securities on the path to downgrade in the month in which such a downgrade is effected. This limited-visibility strategy allows the manager to avoid the price deterioration that occurs at the time of downgrade, but only some—not all—of the underperformance that occurs prior to downgrade. We labelled this the "late foresight" scenario.

Early Foresight. Lastly, we simulated a scenario in which a manager is able to identify bonds destined to be downgraded below A–/A3 well in advance. In this full-visibility scenario, the manager is able to avoid all of the underperformance that precedes such a downgrade for three months prior to the event. We called this scenario "early foresight".

Using information ratios to evaluate results

Beating the "market", as described by a chosen benchmark, is the foremost objective of any investment manager. Yet, because the amount of risk taken is also critical, investors frequently evaluate a manager's performance by adjusting the portfolio returns for risk. Thus, the most successful strategy is often considered to be the one that earns the highest return per unit of risk taken—that is, the portfolio that has the greatest "efficiency".

We used information ratios, which measure portfolios' efficiency, to evaluate the results of our study. The information ratio is the ratio of the excess return (benefit received) to the tracking error (risk taken). Excess return is defined as the difference between the portfolio's monthly returns and the index's monthly returns, compounded monthly and annualised. Tracking error is defined as the annualised standard deviation of the monthly excess returns versus the index. We examined these ratios on a rolling one-year, three-year and five-year basis in order to view the changing dynamics of performance and volatility.

For all of our portfolios, we sought a high information ratio, which signifies that a manager has added value while incurring a small amount of risk. For different markets and management styles, the characteristic ranges of the information ratio can be very different. In their text on portfolio theory, Richard Grinold and Ronald Kahn asserted that, when evaluating institutional money managers, an information ratio of 0.5 is considered "good", 0.75 "very good" and 1.0 "exceptional".[4] These criteria may be too demanding for many management styles. InTech reports that for Australian bond funds benchmarked to the UBS Warburg Australia Composite Index—the index we used in our study—over the three-year period ending August 31, 2001, the average manager achieved an information ratio of 0.7, with an upper-quartile manager scoring 1.2, the median manager 0.6 and a lower-quartile manager 0.1. Over a five-year period, the average manager achieved an information ratio of just 0.4, with upper-quartile results at 0.9, median at 0.5 and lower-quartile at (0.1).[5]

For all of our portfolios, we sought a high information ratio, which signifies that a manager has added value while incurring a small amount of risk.

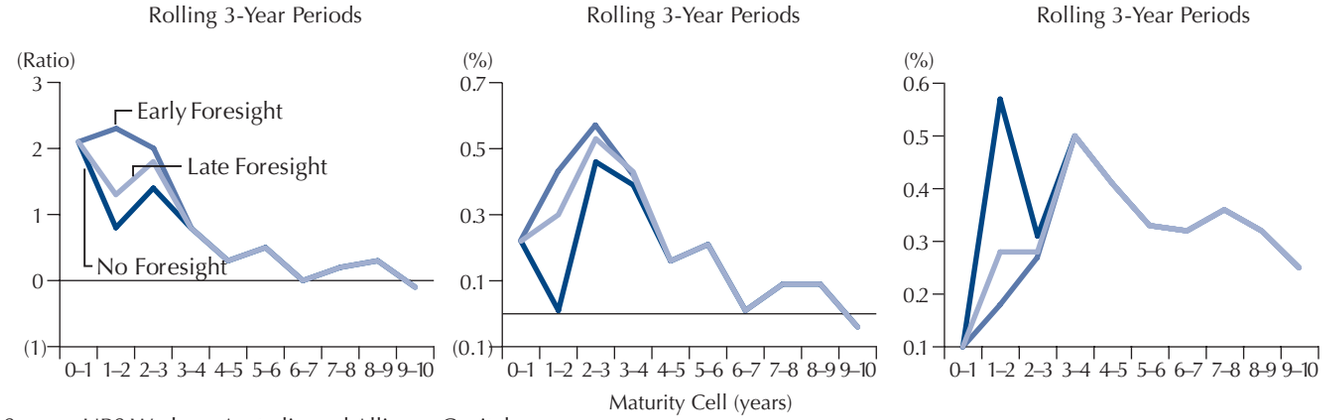
INTERPRETING THE RESULTS

The no-foresight approach: reach for yield

As shown in Figure 2, portfolios constructed using a no-foresight approach generally outperformed their sub-indexes over one-, three- and five-year periods, while experiencing tracking error of between roughly 10 and 60 basis points, depending on the maturity cell (Figure 3). Putting these statistics together in an information ratio (Figure 4), we find that the longer the maturity cell, the less successful the strategy of concentrating portfolios in corporate bonds. Interestingly, we found this to be the case regardless of which visibility scenario—early, late or no foresight— our hypothetical investment managers employed. The shortest maturity cell consistently showed the best results. The average information ratio for rolling one-year periods in our no-foresight portfolios can be considered exceptionally good for the first three maturity cells, good for intermediate maturities (3–6 years) and poor for long maturity cells.

The average three- and five-year information ratios follow a similar trend using the no-foresight approach, but with a distinct and seemingly anomalous trough in the 1–2 year maturity cell. This trough was the result of the significant underperformance of a single security, Korea Development Bank 7.5% due August 1999. Korea Development Bank (KDB) was downgraded by Standard & Poor's from A– to BBB– on 11 December 1997, and was therefore eliminated from the index on 31 December 1997. Between 32 August and 31 December 1997, this bond's spread widened an astonishing 737 basis points. To put this in context, other corporate bond spreads widened

FIGURE 5 **COMPARISON OF STRATEGIES**



Source: UBS Warburg Australia and Alliance Capital

an average of five basis points during this period. The resulting underperformance was so great that it completely distorted the trend of all three rolling periods for its maturity cell.

This example serves as a sobering footnote to the simplest yield-optimisation strategy. Indeed, such a strategy is at even greater risk of choosing credits that will severely underperform. Because market participants are forward-looking when determining credit spreads, securities with wider than average spreads are more likely to include potential disasters, such as KDB. And securities with wider than average spreads are precisely the ones favored by the no-foresight yield-optimisation approach.

Late- and early-foresight strategies: eliminate the negative

As expected, our late- and early-foresight strategies improve on the results of the no-foresight approach, with the early-foresight strategy turning in the best results—at least among the shorter maturity cells (Figure 5, left).

For example, for the 1–2 year maturity cell, the average three-year information ratio is an exceptionally strong 2.3 for the early-foresight approach, 1.3 for late foresight and 0.8 for no foresight; for the 2–3 year cell, the ratio is 2.0 for early foresight, 1.8 for late foresight and 1.4 for no foresight. The higher information ratios of the early- and late-foresight strategies stem from both improved excess returns and decreased tracking error (Figure 5, centre and right).

Performance trends across the maturity spectrum are smoother for late- and early-foresight strategies than for the no-foresight strategy. In particular, we find that the anomaly in the 1–2 year maturity cell of the no-foresight strategy is greatly reduced in the late-foresight strategy and absent from the early-foresight strategy. The security causing the distortion, KDB, was constrained or removed in the portfolio construction processes of the latter strategies. All security exclusions for late- and early-foresight strategies are listed in Table 2.

The benefits of shorter maturities—for now

We also note that the late- and early-foresight approaches show a clear performance advantage over the no-foresight strategy only in the short maturity ranges—not at longer maturities. Clearly, extending the credit allocation to longer maturities affects performance measures. If we divide all maturity cells into three categories—short at 0–3 years, intermediate between 4 and 6 years, and long at seven years and beyond—we find the best results in the short category for all performance statistics: excess return, tracking error and information ratio. The intermediate range appears relatively less attractive, and the long range represents the worst case. Information ratios trend down from "exceptionally good" to "good" to "poor".

There are two related factors at play here. First, all the security exclusions took place in the shorter maturity cells. Second, the Australian corporate market consists mostly of securities maturing in under five years. Therefore, this study's yield-optimisation strategy relied more heavily on semi-government bonds at longer maturity cells, due to the dearth of longer-maturity corporates. Traditionally, semi-government bond spreads relative to Commonwealth Treasuries are narrower, thereby offering less potential return, and less volatile than corporate bond spreads. We would expect to see this dynamic change if the composition of the Australian corporate market grew to include proportionally more long-term bonds.

We see this again from yet another angle. Examining the three-year rolling information ratios across the maturity spectrum for the early-foresight strategy (Figure 6), we found that the lowest recorded information ratio was negative for cells 4–5 and beyond. In fact, the 4–5 year cell showed the greatest variation in information ratios, with a range of (1.0) to 2.2. We believe the explanation for this stems from the composition of the Australian corporate market and its heavy concentration in bonds maturing in less than five years. It is generally the case that negative credit events have a greater impact on longer-maturity bonds, because of long bonds' greater price sensitivity to changes in yield. Because the highest concentration of longer-maturity bonds in Australia is in the (relatively short-term) 4–5 year cell, it appears that that cell felt the brunt of Australia's negative credit events during the period covered by our study.

A growing market spells increasing opportunity

It is interesting to view the progression of various maturity cells' information ratios over time, as shown in Figure 7

TABLE 2 **SECURITY EXCLUSIONS FOR LATE- AND EARLY-FORESIGHT STRATEGIES* (S&P LONG-TERM RATINGS UNLESS OTHERWISE NOTED)**

Issue		Date	From	To
Korea Development Bank	7.5% Aug-99	11-Dec-97	A–	BBB-
Korea Exchange Bank	6.75% Dec-99	2-Oct-97**	A–2	A-3**
Case Credit Corp.	5.75% Jul-01	4-Aug-99	A–	BBB+
Santos	6.4% Oct-02	22-Sep-99	A–	BBB+
Boral	6.5% Aug-03	24-Feb-00	A–	BBB+
Orica	6.25% Feb-02	17-Dec-00	A–	BBB+
Coles Myer	5.75% Nov-01	28-Oct-01	A–	BBB+
Coles Myer	6% Sep-03	28-Oct-01	A–	BBB+
Coles Myer	6.75% Jul-05	28-Oct-01	A–	BBB+
Ford Credit	6.5% Jun-02	15-Oct-01	A	BBB+
Ford Credit	6.75% Aug-03	15-Oct-01	A	BBB+
Ford Credit	5.75% Mar-04	15-Oct-01	A	BBB+
GMAC	6.25% Nov-01	15-Oct-01	A	BBB+

* Bonds dropped from index due to downgrade: 31 October, 1995 to 31 March, 2002
** Short-term
Source: Standard & Poor's and UBS Warburg Australia

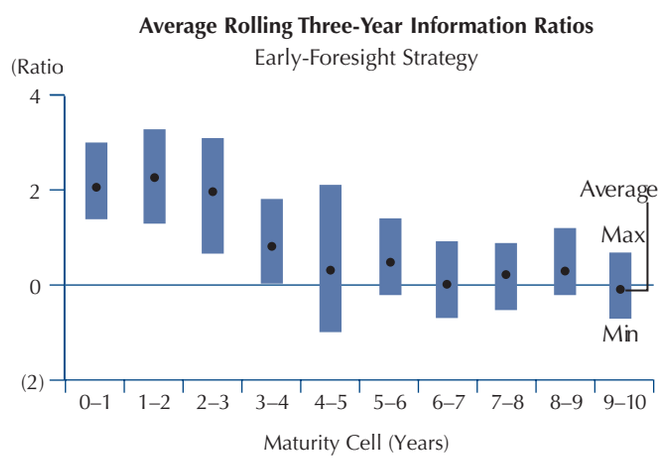
for the early-foresight strategy. In September 1998, at about the midpoint of our study, the information ratio of the 2–3 year maturity cell was below 1.0. This number climbed steadily to more than 3.0 in March 2002. The same improvement appears for longer maturity cells, though to a lesser degree. The 5–6 year and 8–9 year cells rose from close to 0.0 to more than 1.0 and 0.5, respectively.

Given that the percentage of corporate bonds in the Australian market (as represented by the UBS Warburg Australia Composite Index) grew from just 4% in October 1995 to 29% in March 2002, we have concluded that the growth of Australia's corporate market provides an important source of risk-adjusted excess return opportunities for investment managers.

CONCLUSIONS

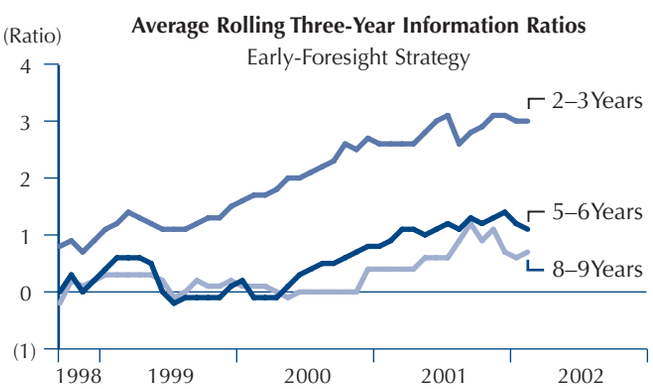
- A simple yield-optimisation strategy, represented by the no-foresight scenario, added value over the period we studied. However, excess returns were somewhat volatile, as a small number of deteriorating corporate bonds negatively affected performance in some years.
- The improved results of our late- and early-foresight approaches underscore the importance of avoiding corporate bonds that are downgraded below A–/A3. The most noteworthy difference was visible in the 1–2 year maturity cell, where the average rolling five-year information ratio was an extremely poor 0.0 for the no-foresight scenario, but a much stronger 1.0 and 2.4, respectively, for the late- and early-foresight scenarios.
- Shorter maturity cells experienced the best results for all performance statistics: excess return, tracking error and information ratio. Specifically, the information ratio deteriorated from "exceptionally good" in the 0–3 year maturity cells to "good" in the 4–6 year cells to "poor" for longer maturities.
- The least consistent performance, as measured by the variability of rolling period information ratios, was found in the 4–5 year maturity cell. Longer maturity cells showed greater consistency in performance but lower information ratios than shorter cells. We believe the structure of the Australian corporate market, with its concentration in corporate bonds with less than five years to maturity, explains these results.
- Information ratios steadily improved as the corporate bond market grew. Specifically, the 2–3 year maturity cell had a three-year information ratio below 1.0 in September 1998; the ratio climbed to more than 3.0 by March 2002. Longer-maturity cells' information ratios also improved. Between October 1995 and March 2002, the weighting of corporate bonds in the index grew from 4% to 29%. We conclude that the growth of the Australian corporate market provides an important source of risk-adjusted excess return opportunities for investment managers.
- Care should be exercised when generalising these results to future time periods. Our study dealt with a steadily growing corporate asset

FIGURE 6 **RANGE OF INFORMATION RATIOS WITHIN EACH MATURITY CELL**



Source: UBS Warburg Australia and Alliance Capital

FIGURE 7 **INFORMATION RATIOS IMPROVED OVER TIME**



September 1998, through February 2002
Source: UBS Warburg Australia and Alliance Capital

TABLE 3 **PERFORMANCE SUMMARY FOR VARIOUS STRATEGIES**

Maturity	Excess Return (annualised averages)			Tracking Error (averages)			Information Ratio (averages)		
Cell	1 year	3 year	5 year	1 year	3 year	5 year	1 year	3 year	5 year
No Foresight									
0–1 yr	0.22%	0.22%	0.22%	0.08%	0.10%	0.10%	2.5	2.1	2.2
1–2 yr	0.03%	0.01%	0.01%	0.38%	0.57%	0.64%	1.8	0.8	0.0
2–3 yr	0.46%	0.46%	0.45%	0.28%	0.31%	0.32%	1.8	1.4	1.4
3–4 yr	0.41%	0.39%	0.39%	0.38%	0.50%	0.45%	1.0	0.8	0.8
4–5 yr	0.26%	0.16%	0.22%	0.36%	0.41%	0.41%	0.6	0.3	0.5
5–6 yr	0.28%	0.21%	0.25%	0.30%	0.33%	0.34%	0.8	0.5	0.7
6–7 yr	0.11%	0.01%	0.08%	0.32%	0.32%	0.33%	0.3	0.0	0.2
7–8 yr	0.09%	0.09%	0.10%	0.27%	0.36%	0.33%	0.3	0.2	0.3
8–9 yr	0.12%	0.09%	0.10%	0.28%	0.32%	0.30%	0.4	0.3	0.3
9–10 yr	0.02%	–0.04%	–0.01%	0.23%	0.25%	0.26%	0.2	–0.1	0.0
Late Foresight									
0–1 yr	0.22%	0.22%	0.23%	0.08%	0.10%	0.10%	2.6	2.1	2.2
1–2 yr	0.30%	0.30%	0.30%	0.22%	0.28%	0.29%	2.1	1.3	1.0
2–3 yr	0.53%	0.53%	0.52%	0.25%	0.28%	0.29%	2.0	1.8	1.8
3–4 yr	0.44%	0.43%	0.42%	0.38%	0.50%	0.46%	1.0	0.8	0.9
4–5 yr	0.26%	0.16%	0.22%	0.36%	0.41%	0.41%	0.6	0.3	0.5
5–6 yr	0.28%	0.21%	0.25%	0.30%	0.33%	0.34%	0.8	0.5	0.7
6–7 yr	0.11%	0.01%	0.08%	0.32%	0.32%	0.33%	0.3	0.0	0.2
7–8 yr	0.09%	0.09%	0.10%	0.27%	0.36%	0.33%	0.3	0.2	0.3
8–9 yr	0.12%	0.09%	0.10%	0.28%	0.32%	0.30%	0.4	0.3	0.3
9–10 yr	0.02%	–0.04%	–0.01%	0.23%	0.25%	0.26%	0.2	–0.1	0.0
Early Foresight									
0–1 yr	0.22%	0.22%	0.23%	0.08%	0.10%	0.10%	2.6	2.1	2.2
1–2 yr	0.43%	0.43%	0.44%	0.15%	0.18%	0.18%	2.8	2.3	2.4
2–3 yr	0.57%	0.57%	0.57%	0.25%	0.27%	0.28%	2.2	2.0	2.0
3–4 yr	0.44%	0.42%	0.41%	0.38%	0.50%	0.45%	1.1	0.8	0.9
4–5 yr	0.26%	0.16%	0.22%	0.36%	0.41%	0.41%	0.6	0.3	0.5
5–6 yr	0.28%	0.21%	0.25%	0.30%	0.33%	0.34%	0.8	0.5	0.7
6–7 yr	0.11%	0.01%	0.08%	0.32%	0.32%	0.33%	0.3	0.0	0.2
7–8 yr	0.09%	0.09%	0.10%	0.27%	0.36%	0.33%	0.3	0.2	0.3
8–9 yr	0.12%	0.09%	0.10%	0.28%	0.32%	0.30%	0.4	0.3	0.3
9–10 yr	0.02%	–0.04%	–0.01%	0.23%	0.25%	0.26%	0.2	–0.1	0.0

Source: UBS Warburg Australia and Alliance Capital

class in a liquid and efficiently functioning Australian fixed-income market. In drawing our conclusions, we have explicitly assumed the continuing robust supply of Commonwealth government debt, which serves as the "risk-free" pricing and hedging benchmark for the market. We have no way of knowing whether our conclusions would hold if structural changes to the supply of Commonwealth debt were to affect the efficiency and liquidity of the local fixed-income market.

NOTES

1 Because the focus of our study was the measurement of market risk, as opposed to default risk, we did not attempt to determine whether investors are compensated appropriately for taking on higher default risk at longer maturities.

2 Our study was conducted using historical data for the UBS Warburg Australia Composite Index All Maturities between 31 October 1995 and 31 March 2002. This index consists of Australian government, semi-government, supranational and investment-grade corporate bonds rated A– or better by Standard & Poor's or A3 or better by Moody's and with an issue size of at least A$100 million. During the period surveyed, 13 bond issues from 9 different issuers were dropped from the index because of downgrade below the minimum credit rating. The number of bonds in the index ranged from 72 to 190. Data drawn from the index included percentage weightings and yields-to-maturity at the end of each month for all bonds included in the index.

3 None of our investment scenarios considered transaction costs. As a result, all three scenarios describe best-case outcomes.

4 Richard C. Grinold and Ronald N. Kahn, Active portfolio management: A quantitative approach for producing superior returns and controlling risk, (Chicago: Probus Publishing, 1995).

5 InTech Pty. Ltd., Sector Funds Performance Survey (31 August 2001). J