The Use of Expert Systems in Property Portfolio Construction
- Asia Pacific Financial Markets Conference 2005 -

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Abstract

This paper examines whether a rule-based expert system is capable of outperforming the general property market, as well as randomly constructed portfolios from the market. While neural network expert systems have been used in property research there appears little in the literature on the application of rule-based expert systems. The perspective of the analysis is of an Australian investor investing in both the domestic market and the UK property market. Several interesting results ensue including: the failure of the rule-based system to significantly outperform the market or the random portfolios; the outperformance of the rule-based system over the market and random portfolios in terms of cumulative, compounded and dollar returns; and, most importantly the failure of hedging to secure a positive rate of return to the portfolio.

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Abstract

This paper examines whether a rule-based expert system is capable of outperforming the general property market, as well as randomly constructed portfolios from the market. While neural network expert systems have been used in property research there appears little in the literature on the application of rule-based expert systems. The perspective of the analysis is of an Australian investor investing in both the domestic market and the UK property market. Several interesting results ensue including: the failure of the rule-based system to significantly outperform the market or the random portfolios; the outperformance of the rule-based system over the market and random portfolios in terms of cumulative, compounded and dollar returns; and, most importantly the failure of hedging to secure a positive rate of return to the portfolio.

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1. Introduction

Previous research by the authors on the usefulness of Artificial Intelligence (AI) in selecting property stocks to enter an investment portfolio clearly identified the neural network approach as representing a potentially powerful tool available to assist the property portfolio manager (Ellis and Wilson, 2005). Neural networks are essentially a learn by example artificial intelligence system that gains knowledge from actual market outcomes and uses this information in an attempt to select property (or other) stocks based on a particular criteria so that the neural network constructed portfolio will outperform the general market. The current paper is an extension of this work in that the authors seek to (i) develop a rule-based expert system that can be used for selecting 'value' property stocks from the set of Australian and UK property stocks, and assess the ability of such a portfolio to outperform the general securitised property market in Australia; and (ii) to assess the viability of an Australian property investor receiving positive returns from either hedged or unhedged positions if investing in the UK securitized property market. Several interesting results follow from this analysis. While the expert system 'value' portfolios of Australian stocks are shown to outperform a randomly selected portfolio in most cases, they fail to outperform the Australian property market. Interestingly the expert system 'value' portfolios selected from UK property stocks outperform both the Australian property market and the randomly selected portfolio in most instances. A crucial outcome here however, is that none of these results are statistically significant. Attempts to hedge AUD/GBP exchange rate movements result in capital losses to all portfolios, leading us to question the sustainability of long-term hedging in securitised property markets.

2. Brief overview of Artificial Intelligence and Expert Systems

While the history of AI can be traced back to at least the 1950's, it is really only since the 1980's that the development and implementation of AI systems in a practical sense has expanded (Harmon and King, 1985). By 1986 there were more than two-hundred different expert systems in practical use and, in addition there were more than one-hundred different tools available to assist in building expert systems (Waterman, 1986). Initially, applied AI developed along three broad paths: natural language processing, robotics, and expert systems. Of particular interest to the current paper is the path that has been taken in the development of expert systems.

A rule-based expert system is a computer programme that is capable of using information contained in a knowledge base, along with a set of inference procedures, to solve problems that are difficult enough to require significant human expertise for their solution (Harmon and King, 1985). The set of inference procedures are provided by a human expert in the particular area of interest, while the knowledge base is an accumulation of relevant data, facts, judgments and outcomes. Such expert systems may additionally provide advice on appropriate action, in the same sense that a human expert may provide such advice. While specialized AI software languages such as LISP, PROLOG and SMALLTALK have been used in the development of expert systems, more conventional software languages such as FORTRAN and PASCAL have also been used (Kerschberg, 1986).

There have been several studies on the use of expert systems in business. Wilson (1987) presents a number of applications of expert systems in finance, investment, taxation, accounting and administration, but points to the restrictions on the broader development of expert systems in business posed by the hardware limitations of the time. In a comprehensive

bibliography of research on the application of expert systems in business Eom *et al* (1993) note the dramatic increase in publication numbers during the mid-1980's. In their survey articles on the use of expert systems in business from 1977 through 1993, Wong and Monaco (1995a,b) note that expert systems have evolved and have been implemented as practical decision making tools in many businesses, documenting an extensive use of expert systems in various areas of finance such as investment analysis, stock market trading, and financial planning. Despite this finding Ellis Johnson *et al* (1997) find very little evidence of the application of formal decision support systems such as expert systems in the real estate sector. Liao (2005) conducts a review of the use of expert systems across all areas, including finance over the period 1995 through 2004. Liao observes that expert systems provide a powerful and flexible means of obtaining solutions to a variety of problems and can be called upon as needed (when a human with expertise in the particular area may not be available). Liao categorizes expert systems into a number of classes including: rule-based expert systems, knowledge based expert systems, neural networks, fuzzy reasoning etc. (Liao, 2005).

There has been a broad examination of Neural Network (NN) based expert systems in property research. For instance Borst (1991) examines the usefulness of NNs in predicting the selling price of real estate. Tay and Ho (1991), Do and Grudnitski (1992), Worzala *et al* (1995) and McGreal *et al* (1998) all examine the effectiveness of NN systems in property appraisal. Nguyen and Cripps (2001) compare the predictive accuracy of NNs against regression in forecasting housing value, and Wilson *et al* (2002) use NNs to forecast future trends within the UK housing market. Brooks and Tsolacos (2003) suggest that analysts should exploit the potential of NNs and assess more fully their forecast performance against more traditional models, and more recently Ellis and Wilson (2005) examine the applicability of a neural network expert system in the construction of portfolios of Australian securitised property. It would appear, however that there has been little in the way of examination of the usefulness and applicability of rule-based expert systems in property market research.

3. Data and Sample

The data utilised in this study comprises nominal monthly values for real estate stocks listed on the Australian Stock Exchange (ASX) and the London Stock Exchange (LSE) from January 1997 to February 2004 inclusive, a total of 86 months. The stocks selected are those listed in the Datastream Australian Real Estate Index[1] and the Datastream UK Real Estate Index. The Datastream Australian Real Estate Index comprises the top 80% of property sector stocks in the Australian market. Stocks included in the Index own property and derive their income from rental returns. As at February 2004 the Datastream Australian Real Estate Index comprised 21 companies and the Datastream UK Real Estate Index, 30 companies. The Datastream Australian Real Estate Index is used as a proxy for the market index, against which the performance of the expert systems 'value' portfolios is compared. Market capitalisation (MV), dividend yield (DY), price-to-book-value (PTBV), price-earnings (PE), price-to-cashflow (PC), and total return (TR) data is collected for the two market indices. As for the individual stocks, the Index total return represents the cumulative points gain or loss due to changes in the share prices of stocks in the index and normal dividend payments. The total number of company observations over the sample period is 1633 for Australian real estate stocks, and 2467 for UK real estate stocks.

For each company in the sample, the following data has been collected; closing price (P), market capitalisation (MV), dividend yield (DY), price-to-book-value (PTBV), price-earnings

[1] A Datastream calculated index, the 'Real Estate' series is based on the FTSE classification and includes the following sub-sectors: Real Estate Development, Property Agencies, and Real Estate Investment Trusts.

(PE), and price-to-cashflow (PC). Closing prices and the dividend yield for each company are used to calculate the total return index for each stock as follows:

$$RI_t = RI_{t-1} \times \frac{P_t}{P_{t-1}} \times \left(1 + \frac{DY_t}{100} \times \frac{1}{12}\right) \quad (1)$$

where P_t and DY_t are the price and dividend yield at time t respectively, and RI_t is the total return index. This formulation for the total return is identical to that used by Datastream to estimate the Return Index, and adjusts the total return for the monthly frequency used in this study.[2] Total return is then calculated as the log difference of the total return index:

$$R_t = \log RI_t - \log RI_{t-1} \quad (2)$$

As not all stocks traded for the full sample period (1997 - 2004), this avoids problems associated with survivorship bias that may influence our results (see for example Brown *et al*, 1992).

For the purposes of estimating the total return to an Australian investor from a position in the UK market, monthly closing prices for the Australian Dollar / British Pound (AUD/GBP) exchange rate have also been collected. As will be discussed, the total return to an Australian investor from an investment in UK assets includes both a capital gain or loss component, and an exchange rate gain (loss) component.

[2] The Datastream model for total return is based on a daily frequency and uses 260, rather than 12, in the denominator. Ellis and Wilson (2005) use price and dollar dividend in their construction of the return index, which differs from the return index in this paper.

4. Research Methodology

A rule-based system contains information obtained from a human expert and represents this information in the form of a set of IF - THEN rules such as:

IF given property stock has larger than market average capitalisation

AND/OR property stock has below market average price/earnings ratio

AND/OR property stock has below market average price/book ratio

AND/OR property stock has below market average price/cashflow ratio

AND/OR property stock has below market average price/sales ratio

AND/OR property stock has above market average dividend yield

THEN given property stock is value stock

The current paper uses as its expert knowledge inference set the outcomes from the research of Haugen (1995), O'Shaughnessy (1998), and Eakins and Stansell (2003) to select a group of fundamental financial ratios that will be used to determine sets (portfolios) of 'value' securitised property assets. These fundamental variables will form the inputs to a rule-based expert system that will have preset constraints to isolate 'value' assets. 'Value' assets are commonly defined as those whose market value is lower than their intrinsic or liquidating value (O'Shaughnessy, 1998:2). The attraction of value assets from an investor's point of view is that the (lower) market value of the asset should rise to meet the (higher) intrinsic value. This being true, portfolios comprised of value assets only, should outperform portfolios comprised of all assets. Portfolio allocation to value stocks is sometimes referred to as a 'contrarian investment strategy'. A number of studies indicate that contrarian strategies can outperform a strategy of investing in 'growth' stocks (see for example Fama and French, 1996, 1998; Haugen, 1995; Lakonishok *et al*, 1994; and Levis and Liodakis, 2001).

In a comprehensive study of the comparative performance of US equities, O'Shaughnessy (1998) identifies a number of factors as being determinants of value. These include: large stocks with low price/earnings ratios; low price/book ratios; low price/cashflow ratios; low price/sales ratios; or large stocks with high dividend yields. 'Large' stocks are defined by O'Shaughnessy as those with a higher than average market capitalization. Given the lower volatility of large stocks relative to all stocks, value portfolios comprised of large stocks are shown by O'Shaughnessy to typically outperform the market index by a sizeable margin on a risk-adjusted basis. Using neural network techniques to predict value stocks using the ratios identified by O'Shaughnessy, Eakins and Stansell (2003) demonstrate the superior performance of the neural network value portfolio versus the S&P 500 and Dow Jones Industrial Average. Following the work of Eakins and Stansell (2003), Ellis and Wilson (2005) recently investigated the performance of value portfolios comprised of Australian real estate stocks using a similar neural network methodology to identify individual value stocks.

As per O'Shaughnessy, and Ellis and Wilson, stocks with low (high) ratios are herein defined as those for which the relevant ratio is lower (higher) than the market average. For instance, a low P/E ratio stock is one with a lower than market average P/E ratio, and a high P/E ratio stock is one with a higher than market average P/E ratio. Market average ratios in this study are calculated as the average ratio for all stocks in the index each year during the sample period.

To go some way towards reducing the above mentioned deficiency in the literature on rule-based expert systems in property research the current paper develops a rule-based expert system to construct portfolios of Australian and UK listed property stocks and compare the performance of these portfolios against the Datastream Australian Real Estate Index. The primary objective of research in this study is to examine the performance of expert system value portfolios comprised of property sector value stocks versus the set of all property sector stocks. The nominal performance of each portfolio is compared to the Australian market index as well as to randomly diversified portfolios of real estate stocks. Rather than the CAPM, which has not been shown to accurately reflect investor sentiment towards risk (Eakins and Stansell, 2003) risk adjusted performance relative to the Australian market index is measured first by the Sharpe ratio (Sharpe, 1966), and second the Sortino ratio (Sortino and Forsey, 1996; Sortino *et al* 1997) for adjusting returns on a downside risk basis. Consideration is also given to the potential gain or loss from foreign exchange risk borne by Australian investors in the UK and the cost of hedging such risk and its impact on the profitability of foreign (UK) investments.

Several systems are tested in this study, including both single-variable and multiple-variable systems. Following from Ellis and Wilson (2005), the initial set of input variables employed in both the Australian and UK markets comprises market capitalisation (MV), dividend yield (DY), price-to-book-value (PTBV), price-earnings (PE), and price-to-cashflow (PC). Systems testing for UK stocks also includes the effective rate of return (EffR), with the motivation being that Australian investors in the UK will gain from an appreciation of the foreign currency (GBP) net of any capital loss on the asset. To prevent look-ahead bias associated with making investment decisions based on data which is not yet known, portfolios constructed at time *t* comprise stocks which are identified by the system as being value stocks at time *t-1*. Despite the fact that the AUD/GBP exchange rate is readily observable on a 24-hour basis, information pertaining to other variables (eg. PTBV, PC) may not be readily known (Eakins and Stansell, 2003: 88). This knowledge base is developed into an inference set that is incorporated into the rule-based expert system.

i. Single-variable systems testing

Single-variable expert systems in this study include a single input variable only. Individual systems are tested for each of the five input variables listed above for the Australian market, and six (including monthly changes in the AUD/GBP) for the UK market. The rule-set developed a binary classification system so that the output variable for the single-variable system is defined as either VALUE or NOT according to the value criteria that was previously established for each respective input (eg. low PE = VALUE versus high PE = NOT; positive EffR = VALUE versus negative EffR = NOT). Repeating the process for each of the input variables yields a total of five single-variable value portfolios for the Australian market and six single-variable value portfolios for the UK market.

ii. Multiple-variable systems testing

As opposed to the single-variable systems which classify stocks as being VALUE or NOT on the basis of a single criteria only (e.g. low PC, *or* low PTBV, *or* high DY), the multiple-variable rule-set ranks stocks in terms of the degree of value when measured against all criteria simultaneously (e.g. low PC, *and* low PTBV, *and* high DY). Stocks are given a cumulative score out of 5 in each period (score out of 6 in the UK) based on how many of the individual value criteria are satisfied. For a stock listed in the Datastream Australian Real Estate Index, a cumulative value score of 5 in any given month would indicate that the stock satisfied all of the value criteria. A value score of 0 alternatively shows that the stock satisfied none of the criteria. A cumulative score of 6 for a stock listed in the Datastream UK Real Estate Index would likewise show that the stock satisfied all of the value criteria in the UK market.

Using the multiple-variable value criteria, 'multi-value' stocks are then defined as those with a cumulative value score ≥ 4. The testing of multi-value stock portfolios in addition to value stock portfolios (based on a single-value criteria only) is to evaluate the potential value-added by imposing a stricter value criteria on stocks during each period. Given the inclusion of the effective rate of return (EffR) as a value input in the UK market, two multi-value stock portfolios are tested in the UK. The first, 'Multi 1' comprises market capitalisation (MV), dividend yield (DY), price-to-book-value (PTBV), price-earnings (PE), and price-to-cashflow (PC) only and the second, 'Multi 2' comprises these five plus the effective rate of return (EffR). Excluding the effective rate of return from the first UK multi-value portfolio allows the performance of this to be directly compared to the equivalent Australian multi-value portfolio. Its inclusion in the second UK multi-value portfolio allows the contribution of expected exchange rate changes to be measured separately.

The binary classification in the multi-value context operates in much the same way as for the single-variable models: stocks scoring a cumulative value score ≥ 4 are classified as VALUE, stocks with a cumulative score < 4, NOT.

5. Results

i. Descriptive statistics

Summary statistics pertaining to monthly returns for Datastream Australian Real Estate Index and the Datastream UK Real Estate Index are provided in Table 1. The Datastream Australian Real Estate Price Index started the period (January 1997) at 716.84 and finished on February 2004 at 1109.1. The Datastream UK Real Estate Price Index started at 2211.07 and finished at 2864.05. The mean return to the Australian market index is approximately 0.92%, and for the UK market index is 0.60%. The AUD/GBP started at 2.1534 AUD per 1 GBP and finished at

2.3952 implying Australian investors with a long position in GBP denominated assets would realize an exchange gain of about 0.2418 AUD per 1 GBP invested.

**** insert Table 1 about here ****

To establish the degree of randomness in monthly returns for the Australian and UK indices, a non-parametric runs test is conducted. The runs test p-value is recorded where, for α levels > p-value, the data is not random. This test accepts randomness for both series at the 10% level. The Anderson-Darling test for the normality of returns fails to reject the null hypothesis that Australian market index returns follow a Normal distribution, but rejects the Normal null for the UK market index. The Ryan-Joiner p-value similarly rejects the Normal null at the 10% level.

ii. Expert system value portfolios

The performance of each of the expert system value portfolios relative to the Australian market index is shown in a series of tables. Table 2 describes the performance of expert system value portfolios comprised of Australian real estate stocks, and Table 3 the performance of expert system value portfolios comprised of UK real estate stocks. Portfolios in both tables are compared to the Australian market index as proxied by the Datastream Australian Real Estate Index and to mean statistics for 100 randomly diversified portfolios - the bootstrap mean - of all Australian (Table 2) and UK (Table 3) real estate stocks.

**** insert Table 2 about here ****

Nominal monthly mean returns for each of the expert system value portfolios in Table 2 are less than the mean return to the Australian market index (0.930%). The highest mean return is for the multi-value portfolio *Multi 1* (0.640%) and the lowest is for the price-to-book-value portfolio (0.415%). An analysis of z scores and p-values for the difference between mean returns to the market portfolios and the expert systems value portfolios however reveals that the level of underperformance is not significant at the 0.10 level. All portfolios except the price-to-book-value portfolio outperform the bootstrap mean, though the difference is again insignificant at the 0.10 level. Compared to mean returns for each of the single-value portfolios, p-values for the difference between the multi-value portfolio *Multi 1* mean return and single-variable mean returns is likewise insignificant.[3]

Cumulative mean returns for all portfolios over the sample period are lower than the cumulative mean market return (79.064%), yet are higher than the bootstrap mean cumulative return (37.188%) except for the price-to-book-value portfolio which returns 35.276% for the 86-months. Cumulative mean returns in this study are calculated as the sum of monthly portfolio returns and do not include the effects of monthly compound interest. Compound returns - the percentage return to $1 invested at the beginning of the sample period and subsequently reinvested at each period's monthly rate of return - are also calculated. Consistent with the cumulative returns, none of the expert system value portfolios in Table 2 were able to beat-the-market, nor the bootstrap mean on a compound returns basis.

Risk-adjusted returns in this study are calculated using the Sharpe ratio and the Sortino ratio. The Sharpe ratio measures the difference between the portfolio return and the risk-free rate, and is standardised by the standard deviation of portfolio returns. The Sortino ratio is

[3] z scores and p-values for the difference between the Multi-Value portfolio mean return and single-variable mean returns, not reported in this study, are available from the authors by request.

calculated as the difference between the mean portfolio return R_p, and a minimum acceptable return *MAR*, divided by the downside deviation *DD*, of the portfolio return versus the minimum acceptable return, DD_{MAR}. Downside deviation is similar to loss standard deviation with the exception that the *DD* only includes portfolio returns below the *MAR*, rather than portfolio returns below the mean. The basis of the Sortino ratio is that investors are more concerned with the risk of loss (downside risk), than the risk of gains (upside risk). Standard deviation, as used by the Sharpe ratio, considers both upside and downside risk. The calculation of the Sortino ratio is given in the Appendix in Equation (A1). For consistency, the Sortino ratio *MAR* is set equal to the mean monthly risk-free rate of 0.49%, this being the mean of the monthly Australian 10-year Commonwealth Bond rate for the sample period.[4] Consistent with findings already discussed, the difference between expert system value portfolio Sharpe ratios and Sortino ratios versus the market portfolio or the bootstrap mean Sharpe and Sortino ratios is not significant.

Results pertaining to the performance of UK expert system value portfolios are presented in Table 3. Relative to the performance of the Australian market index, results in Table 3 are for the effective rate of return to an Australian investor from a position in UK (GBP denominated) assets. Calculated as

$$R_{AUD} = [(1 + R_{GBP}) + (1 + \Delta S_{AUD/GBP})] - 1 \qquad (3)$$

[4] Source, OECD Main Economic Indicators. Annual average equals 5.9%

where R_{AUD} and R_{GBP} are the Australian Dollar and British Pound denominated returns respectively and $\Delta S_{AUD/GBP}$ is the change in the spot Australian Dollar/British Pound exchange rate, returns in Table 3 include both a capital gain and exchange gain component.

*** *insert Table 3 about here* ***

Inclusive of a mean monthly exchange rate gain of approximately 0.186%, mean returns to the dividend yield, price-to-cashflow, price-earnings, price-to-book-value single-value portfolios exceed both the Australian market index return and the bootstrap mean return. Both multi-variable models *Multi 1* and *Multi 2* also outperform both the market and the bootstrap mean. The price-to-book-value portfolio earns the highest mean monthly return (1.464%) and the market capitalisation portfolio the lowest (0.186%). Consistent with findings attributable to Australian real estate stocks, expert system value portfolio mean monthly returns are not significantly different to either the mean monthly market return or the bootstrap mean return. Cumulative mean and compound returns to the above listed portfolios also exceed the market portfolio and bootstrap mean returns, though suffice to say, the statistical significance of the difference in cumulative mean returns cannot be ascertained. Consistent also with prior described findings there are no significant differences between the Sharpe and Sortino ratios for any of the portfolios in Table 3.

For Australian investors with open positions in foreign currency denominated assets, two questions arise: namely what is the contribution of exchange gains or losses to overall portfolio performance and whether the underlying exchange rate risk should be actively managed. Appreciation of the foreign currency will increase the domestic currency value of foreign currency denominated assets and depreciation, decrease the value of foreign currency

denominated assets. As previously discussed, results presented in Table 3 comprise both a capital gain (loss) component and an exchange rate gain (loss) component, ie. the effective rate of return to an Australian investor. To consider the impact of currency variability on portfolio returns in Table 3, Table 4 provides comparative returns for the cases where (i) the AUD/GBP exchange rate is fixed, and (ii) the exchange risk is fully hedged.

*** *insert Table 4 about here* ***

While portfolio mean returns net of GBP appreciation may be inferred from Table 3 via subtraction of the mean monthly forex gain from the mean monthly return, Table 4 provides exact mean returns for the UK value portfolios exclusive of exchange rate gains or losses. Assuming that the AUD/GBP exchange rate is at par for the entire sample period such that 1 AUD = 1 GBP, the change in the AUD/GBP in Equation (3) is therefore zero. In terms of cumulative returns, appreciation of the GBP over the sample period can be seen to add from 9.25% (price-earnings) to 10.65% (*Multi 1*). Compound returns are approximately 10.50% (market capitalisation) to 32.17% (price-to-book-value) higher. Despite the fact that mean returns in Table 3 are not statistically different to those given a fixed exchange rate in Table 4, the difference in compound returns illustrates the value of foreign currency appreciation to Australian investors.

It will be recalled from prior discussion that expert systems value portfolios purchased at time t use all pertinent available information up to the previous period, *t-1*. By avoiding look-ahead bias the investor now bears the risk that the values of input variables, such as the AUD/GBP exchange rate, will change between time *t-1* when the decision is made and time *t*, when the underlying stock is purchased. To manage exchange rate risk between time *t-1* and *t* the hedge in Table 4 is constructed along the following lines: at time *t-1* the investor purchases an AUD/GBP foreign exchange option with an exercise value equal to the then current spot exchange rate. The option maturity is the next period, time *t*. If the GBP depreciates between time *t-1* and *t*, the option is exercised and the portfolio effective rate of return is calculated on the change in the AUD/GBP to time *t-1*. Else if the GBP appreciates between time *t-1* and *t* then the option expires worthless and the portfolio effective rate of return is calculated on the change in the AUD/GBP to time *t*.

Under the initial assumption that the above described hedge is costless, ie. the option premium is zero, results for the *Costless Hedging* expert systems value portfolios in Table 4 show a significant degree of outperformance relative to the Datastream Australian Real Estate Index with cumulative returns as high as 306.11%, and compound returns as high as 1767.80% for the price-to-book-value portfolio. Furthermore mean returns given costless hedging in Table 4 are also significantly greater than their respective unhedged values in Table 3 at the 0.05 level, and returns to all except the market capitalisation value portfolio are significantly greater at the 0.01 level. Relative to mean monthly returns presented in Table 3, the additional mean monthly portfolio return of approximately 2.11% to 2.14% implies a potentially substantial benefit from hedging foreign exchange risk.

Examining the real gains to hedging foreign investments with currency options, Ziobrowski and Ziobrowski (1993) estimated the benefits to US investors of hedging long-term positions in British Pound and Japanese Yen denominated real estate stocks. Despite the short-term gains from exchange rate risk with currency options, the authors concluded that 'as a long-term strategy, the currency option offers no real protection against foreign asset devaluation caused by currency devaluation' (Ziobrowski and Ziobrowski, 1993: 46).

Under the assumption of costless hedging with currency options, fully hedged returns in Table 4 have already been shown to be significantly greater than their unhedged values. To determine the impact of the cost of the option premium on portfolio returns, Table 5 provides the return to an initial $1 investment, reinvested each period over the full sample, for each of the UK expert system value portfolios given the cases where (i) exchange rate risk is unhedged, (ii) exchange risk is costlessly hedged (*Hedged Gross*), (iii) the real cost of the option premium is deducted from each period's reinvested value (*Hedged Net*)[5]. Real option premiums each period are calculated using the Garman and Kohlhagen (1983) modified Black-Scholes model for valuing foreign currency options:

$$C = Se^{-r_f t}N(d_1) - Xe^{-rt}N(d_2)$$

$$d_1 = \frac{\ln\left(\frac{S}{X}\right) + \left(r - r_f + \frac{1}{2}\sigma^2\right)t}{\sigma\sqrt{t}} \qquad (4)$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

where C is the call option premium, $S = X$ are the spot AUD/GBP exchange rate at time *t-1* and option exercise respectively, r is the mean of the monthly Australian 10-year Commonwealth Bond rate, r_f is the mean of the monthly UK 10-year Commonwealth Bond rate, and σ is the annualized standard deviation of AUD/GBP monthly returns from January 1990 to December 1996. The average call option premium over the sample period is 0.0419AUD and the total premium paid is 3.6009AUD.

[5] The *UK - Hedged Net* beginning of period value of $0.97 is calculated as the $1 initial investment less the initial option premium.

**** insert Table 5 about here ****

Relative to their unhedged and hedged gross end-of-period values, end-of-period values to the hedged net expert system value portfolios are all lower. Indeed except for the price-to-book-value portfolio, end-of-period hedged net values are negative. As illustrated by Figure 1, this result can be seen to be due to the cumulative impact of the premium on the future value of reinvested returns.

**** insert Figure 1 about here ****

Despite the fact that hedged gross end-of-period values minus the nominal total premium exceeds unhedged end-of-period values for all portfolios and the Australian market Index end-of-period value, the subtraction of a premium each period reduces the value reinvested in the next period. This effect is cumulative over time resulting in much lower future values (compound returns) for the portfolios. Based on the average monthly call option premium of 0.0419AUD, estimation of the average monthly required rate of return in Table 5 shows that Australian investors would have to earn approximately 4.375% compounded monthly for the end-of-period hedged net portfolio value to equal the initial $1 invested. This result is consistent with the earlier findings of Ziobrowski and Ziobrowski (1993) for US investors.

6. Conclusions

There are a number of interesting conclusions to flow from this study. First we note that the use of a rule-based expert system is capable of beating the general property market and randomly selected portfolios, although the outperformance is not statistically significant. This is in contrast to the outcomes from Ellis and Wilson (2005) who use a neural network system to develop portfolios that consistently outperformed the market. A possible explanation for

this may be due to the fact that a neural network system is capable of picking up non-linear relationships that are unable to be identified by the rule-based system. Despite the statistical insignificance of the comparative performance the cumulative, compound, and dollar returns are generally greater than the broad market Index or the randomly selected portfolios, but there is no way of calculating the statistical significance of this outcome. Perhaps the crucial finding in the paper is there appears to be no long term benefit to the Australian investor through hedging exposure to fluctuations in the AUD/GBP exchange rate, which is in broad agreement with the findings of Ziobrowski and Ziobrowski (1993) in relation to hedging US real estate. Further to Ziobrowski and Ziobrowski, however, we show this result is not due to the total cost of the premium, but rather is due to the continuous impact of the premium on compounded returns.

References

Borst, R.A. 1991. Artificial Neural Networks: The Next Modeling/Calibration Technlogy for the Assessment Community? Property Tax Journal. 10 (1). 69-94.

Brooks, C. and Tsolacos, S. 2003. International Evidence on the Predictability of Returns to Securitised Real Estate Assets: Econometric Models vs Neural Networks. Journal of Property Research. 20 (2). 133-156.

Brown, S.J., Goetzmann, W., Ibbotson, R.G. and Ross, S.A. 1992. Survivorship Bias in Performance Studies. Review of Financial Studies. 5 (4). 553-580.

Do, A.Q. and Grudnitski, G. 1992. A Neural Network Approach to Residential Property Appraisal. The Real Estate Appraiser. December. 38-45.

Eakins, S.G. and Stansell, S.R. 2003. Can Value-based Stock Selection Criteria Yield Superior Risk-adjusted Returns: An Application of Neural Networks. International Review of Financial Analysis. 12. 83-97.

Ellis, C. and Wilson, P. 2005. Can a Neural Network Property Portfolio Selection Process Outperform the Property Market? Journal of Real Estate Portfolio Management. 11 (2).105-121.

Ellis Johnson, L., Redman, A.L., and Tanner, J.R. 1997. Utilization and Applications of Business Computing Systems in Corporate Real Estate. Journal of Real Estate Research. 13 (2). 211-230.

Eom, S.B., Lee, S.M., and Ayaz, A. 1993. Expert Systems Applications Development Research in Business: A Selected Bibliography (1975-1989). Euroepean Journal of Operational Research. 68. 278-290.

Fama, E.F. and French, K.R. 1996. Size and Book-to-Market Factors in Earnings Returns. Journal of Finance. 51 (1). 131-155.

Fama, E.F and French, K.R. 1998. Value versus Growth: The International Evidence. Journal of Finance. 53 (6). 1975-1999.

Garman, M.B. and Kohlhagen, S.W. 1983. Foreign Currency Option Values. Journal of International Money and Finance. 2. 231-237.

Harmon, P. King, D. 1985. Artificial Intelligence in Business Expert Systems. John Wiley and Sons: New York.

Haugen, R.A. 1995. The New Finance: The Case Against Efficient Markets. Prentice-Hall: New Jersey.

Kantzrdzic, M. 2003. Data Mining – Concepts, Models, Methods and Algorithms. John Wiley and Sons: New Jersey.

Kerschberg, L. 1986. Expert Database Systems - Proceedings from the First International Workshop. The Benjamin/Cummings Publishing Co.: Reading.

Lakonishok, J., Shleifer, A. and Vishny, R. 1994. Contrarian Investment, Extrapolation and Risk. Journal of Finance. 49 (5). 1541-1578.

Levis, M. and Liodakis, M. 2001. Contrarian Strategies and Investor Expectations. Financial Analysts Journal. 57 (2). 43-56.

Liao, S. 2005. Expert System Methodologies and Applications – A Decade Review from 1995 to 2004. Expert Systems with Applications. 28. 93-103.

McGreal, S., Adair, A., McBurney, D., and Patterson, D. 1988. Neural Networks: The Prediction of Residential Values. Journal of Property Valuation and Investment. 16 (1). 57-67.

Nguyen, N. and Cripps, A. 2001. Predicting Housing Value: A Comparison of Multiple Regression Analysis and Artificial Neural Networks. Journal of Real Estate Research. 22 (3). 313-336.

O'Shaughnessy, J.P. 1998. What Works on Wall Street. Revised Edition. McGraw-Hill: New York.

Sharpe, W.F. 1966. Mutual Fund Performance. Journal of Business. January. 119-138.

Sortino, F.A. and Forsey, H.J. 1996. On the Use and Misuse of Downside Risk. Journal of Portfolio Management. 22(2). 35-42.

Sortino, F.A., Miller, G.A., and Messina, J.M. 1997. Short-Term Risk-Adjusted Performance: A Style-Based Analysis. Journal of Investing. 6(2). 19-28.

Tay, D.P.H. and Ho, D.K.K. 1992. Artificial Intelligence and the Mass Appraisal of Residential Apartment. Journal of Property Valuation & Investment. 10. 525-540.

Waterman, D. 1986. A Guide to Expert Systems. Addison-Wesley: Reading.

Wilson, I.D., Paris, S.D., Ware, J.A., and Jenkins, D.H. 2002. Residential Property Time Series Forecasting with Neural Networks. Journal of Knowledge-Based Systems. 15. 335-341.

Wilson, P.J. 1987. Expert Systems in Business, Vols. 1 and 2. MTE: Sydney.

Wong, B.K. and Monaco, J.A. 1995a. A Bibliography of Expert System Applications in Business (1984-1992). European Journal of Operational Research. 85. 416-432.

Wong, B.K. and Monaco, J.A. 1995b. Expert System Applications in Business: A Review and Analysis of the Literature (1977 - 1993). Information Management. 29. 141-152.

Worzala, E., Lenk, M. and Silva, A. 1995. An Exploration of Neural Networks and its Application to Real Estate Valuation. Journal of Real Estate Research. 10 (2). 185-201.

Ziobrowski, A.J. and Ziobrowski, B.J. 1993. Hedging Foreign Investments in U.S. Real Estate with Currency Options. Journal of Real Estate Research. 8 (1). 27-54.

Appendix

Calculation of the Sortino ratio

The Sortino ratio is calculated as the difference between the portfolio return R_p and the minimum acceptable return MAR, divided by the downside deviation DD of the portfolio return versus the minimum acceptable return DD_{MAR}. Downside deviation is similar to the loss standard deviation with the exception that it (DD) only includes portfolio returns below the MAR, rather than portfolio returns below the mean. The basis of the Sortino ratio is that investors are more concerned with the risk of loss (downside risk), than the risk of gains (upside risk). Standard deviation as used by the Sharpe ratio, considers both upside and downside risk.

$$Sortino\ ratio = \frac{R_p - R_{MAR}}{DD_{MAR}}$$

$$DD_{MAR} = \sqrt{\frac{\sum_{i=1}^{N} (L_i)^2}{N}} \qquad \text{(A1)}$$

$$L_i = (R_i - R_{MAR}) \quad if\ (R_i - R_{MAR}) < 0$$
$$or$$
$$L_i = 0 \quad if\ (R_i - R_{MAR}) > 0$$

Table 1.
Descriptive Statistics of Australian and UK Real Estate Index Returns, and AUD/GBP Exchange Rate, 1/01/1997 - 1/02/2004.

	Australia DS Real Estate	***UK DS Real Estate***	***AUD/GBP***	***UK DS Real Estate Effective Return***
Count	86	86	86	86
Mean	0.0092	0.0060	0.0023	0.0076
Standard Deviation	0.0358	0.0486	0.0352	0.0472
Excess Kurtosis	0.4775	0.1563	-0.0152	-0.2009
Skewness	0.1911	-0.4152	0.2274	-0.1728
Minimum	-0.0765	-0.1195	-0.0804	-0.1149
Maximum	0.1219	0.1340	0.0971	0.1122
Sum of *ln* returns	0.7917	0.5127	0.2016	0.6559
Value: start of period	716.84	2211.07	2.1534	-
end of period	1109.1	2864.05	2.3952	-
Gain (loss)	392.26	652.98	0.2418	-
Runs test (*p*-value)	0.2756	0.3311	0.2756	0.5429
Anderson-Darling (*p*-value)	0.8800	0.0400	0.6640	0.5980
Ryan-Joiner (*p*-value)	> 0.1000	0.0975	> 0.1000	> 0.1000

Table 2.
Performance of Australian Expert System Value Portfolios, 1997 - 2004.

	MV	***DY***	***PC***	***PE***	***PTBV***	***Multi 1***	***Market***	***Random***
Mean Monthly Return	0.64%	0.49%	0.59%	0.48%	0.42%	0.64%	0.93%	0.44%
Standard Deviation	0.0394	0.0281	0.0246	0.0262	0.0258	0.0274	0.0358	0.0284
Downside Deviation	0.0262	0.0198	0.0172	0.0190	0.0190	0.0183	0.0225	0.0207
Max Monthly Gain	14.39%	9.04%	7.47%	7.80%	7.63%	10.08%	12.19%	8.23%
Max Monthly Loss	-9.93%	-6.97%	-6.98%	-7.33%	-5.37%	-5.79%	-7.65%	-7.21%
Cumulative Mean Return	54.10%	41.74%	50.11%	40.90%	35.28%	54.43%	79.06%	37.19%
Compound Return	60.72%	46.70%	60.67%	46.07%	38.26%	66.71%	108.27%	67.59%
Average # Companies	5	12	13	15	16	10	19	9
Max # Companies	7	18	18	19	19	17	21	15
Min # Companies	4	7	7	10	12	5	17	4
Sharpe Ratio	0.0368	-0.0002	0.0398	-0.0040	-0.0297	0.0542	0.1225	-0.0191
Sortino Ratio	0.0552	-0.0003	0.0571	-0.0055	-0.0404	0.0813	0.1949	-0.0247

Table 3.
Performance of UK Expert System Value Portfolios, 1997 - 2004.

	MV	*DY*	*PC*	*PE*	*PTBV*	*EffR*	*Multi 1*	*Multi2*	*Market*	*Random*
Mean Monthly Return	0.19%	0.99%	1.18%	1.03%	1.46%	0.38%	1.25%	1.27%	0.93%	0.87%
Standard Deviation	0.0527	0.0442	0.0429	0.0412	0.0428	0.0488	0.0445	0.0399	0.0358	0.0454
Downside Deviation	0.0401	0.0298	0.0275	0.0269	0.0251	0.0388	0.0265	0.0251	0.0225	0.0313
Max Monthly Gain	10.19%	11.67%	10.72%	10.90%	10.99%	10.55%	12.36%	9.97%	12.19%	11.13%
Max Monthly Loss	-14.46%	-13.54%	-8.87%	-9.51%	-9.00%	-22.51%	-8.65%	-9.11%	-7.65%	-11.96%
Mean Monthly Forex Gain (Loss)	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%
Cumulative Mean Return	15.84%	83.78%	100.68%	87.61%	124.41%	32.30%	106.28%	107.66%	79.06%	74.22%
Compound Return	3.97%	111.95%	151.86%	122.66%	218.66%	24.19%	164.89%	172.70%	108.27%	105.20%
Mean # Companies	7	13	20	21	19	16	10	14	28	14
Max # Companies	9	17	26	25	26	28	15	20	30	21
Min # Companies	6	9	12	12	7	1	4	6	26	8
Sharpe Ratio	-0.0579	0.1118	0.1614	0.1309	0.2269	-0.0229	0.1706	0.1941	0.1225	0.0844
Sortino Ratio	-0.0760	0.1658	0.2520	0.2002	0.3874	-0.0288	0.2860	0.3093	0.1949	0.1243

Table 4.
AUD/GBP Exchange Rate Variability and the Performance of UK Expert System Value Portfolios, 1997 - 2004.

	MV	*DY*	*PC*	*PE*	*PTBV*	*EffR*	*Multi 1*	*Multi2*
				Fixed Exchange Rate				
Mean Monthly Return	0.07%	0.87%	1.07%	0.92%	1.35%	-	1.13%	-
Standard Deviation	0.0541	0.0466	0.0456	0.0448	0.0455	-	0.0445	-
Downside Deviation	0.0434	0.0347	0.0332	0.0333	0.0312	-	0.0300	-
Max Monthly Gain	12.72%	10.63%	11.32%	10.10%	13.98%	-	15.00%	-
Max Monthly Loss	-15.36%	-15.67%	-11.14%	-12.06%	-10.34%	-	-8.65%	-
Mean Monthly Forex Gain (Loss)	-	-	-	-	-	-		-
Cumulative Mean Return	5.98%	74.15%	91.09%	78.36%	114.74%	-	95.63%	-
Compound Return	-6.53%	90.55%	126.43%	100.18%	186.49%		138.15%	
Sharpe Ratio	-0.0778	0.0817	0.1272	0.0960	0.1888	-	0.1424	-
Sortino Ratio	-0.0971	0.1097	0.1749	0.1290	0.2747	-	0.2109	-
				Costless Hedging				
Mean Monthly Return	2.30%	3.11%*†	3.32%*†	3.16%*†	3.60%*†	2.49%*†	3.38%*†	3.40%*†
Standard Deviation	0.0552	0.0452	0.0448	0.0432	0.0447	0.0495	0.0445	0.0421
Downside Deviation	0.0322	0.0218	0.0200	0.0195	0.0179	0.0301	0.0176	0.0172
Max Monthly Gain	13.49%	12.31%	13.65%	13.44%	13.06%	11.46%	15.00%	12.95%
Max Monthly Loss	-14.46%	-12.67%	-8.84%	-9.51%	-9.00%	-17.71%	-8.65%	-9.11%
Mean Monthly Forex Gain (Loss)	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%
Cumulative Mean Return	195.58%	264.31%	281.88%	268.60%	306.11%	211.40%	286.91%	289.08%
Compound Return	509.42%	1142.29%	1376.23%	1205.10%	1767.80%	627.93%	1452.63%	1498.41%
Sharpe Ratio	0.3276	0.5790	0.6306	0.6172	0.6955	0.4032	0.6476	0.6909
Sortino Ratio	0.5622	1.1981	1.4097	1.3696	1.7358	0.6636	1.6399	1.6882

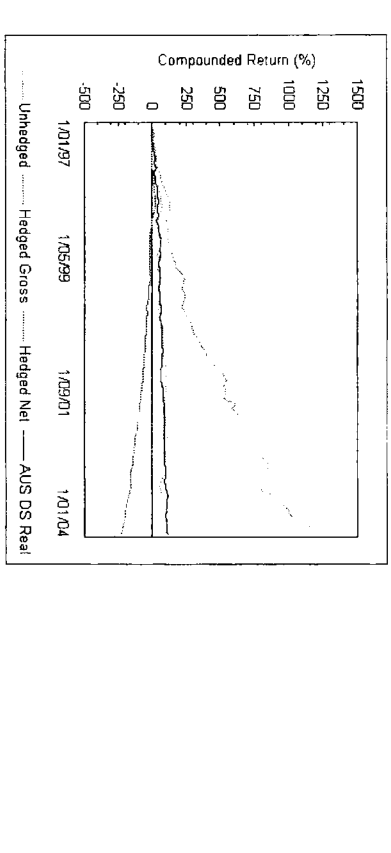
* significantly different to the Datastream Australian Real Estate Index at the 0.05 level
† significantly different to the mean randomly diversified portfolio at the 0.05 level

Table 5.
Returns from $1 Invested in Different UK Expert System Value Portfolios, 1997 - 2004.

	MV	DY	PC	PE	PTBV	Multi 1	EffR	Multi2	MARKET	Average Premium	Total Premium
	UK - Unhedged										
Beginning-of-period value	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00		
End-of-period value	$ 1.04	$ 2.12	$ 2.52	$ 2.23	$ 3.19	$ 2.65	$ 1.24	$ 2.73	$ 2.08		
	UK - Hedged Gross										
Beginning-of-period value	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$0.0419	$3.6009
End-of-period value	$ 6.09	$ 12.42	$ 14.76	$ 13.05	$ 18.68	$ 15.53	$ 7.28	$ 15.98	$ 2.08		
	UK - Hedged Net										
Beginning-of-period value	$ 0.97	$ 0.97	$ 0.97	$ 0.97	$ 0.97	$ 0.97	$ 0.97	$ 0.97	$ 1.00	$0.0419	$3.6009
End-of-period value	-$ 1.98	-$ 1.60	-$ 0.66	-$ 1.45	$ 0.75	-$ 0.41	-$ 1.88	-$ 0.16	$ 2.08		
Unhedged Req'd Monthly Return [1]	4.38%	4.50%	4.54%	4.51%	4.61%	4.56%	4.40%	4.56%	-		
Hedged Gross Req'd Monthly Return [2]	4.84%	5.21%	5.32%	5.24%	5.47%	5.35%	4.93%	5.37%	-		
Breakeven Req'd Monthly Return [3]	4.38%										

[1] Average monthly required rate of return for which the *Hedged Net* end-of-period value equals the *Unhedged* end-of-period value
[2] Average monthly required rate of return for which the *Hedged Net* end-of-period value equals the *Hedged Gross* end-of-period value
[3] Average monthly required rate of return for which the *Hedged Net* end-of-period value equals $1.00

Figure 1.
Mean of Compound Percentage Returns for UK Expert System Value Portfolios, 1997 - 2004.



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19 September 2005

Dr. Craig Ellis
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AUSTRALIA

Dear Conference Participant,

This letter is to confirm the status of the review process for papers submitted to the Financial Markets Asia-Pacific Conference 2005, Sydney 26-27 May. Specifically we would like to confirm that all papers submitted to the Conference were double blind peer reviewed in full by members of the Conference Scientific Committee, the membership of which comprised senior academics from both Australia and overseas.

Full versions of papers accepted by the Conference Scientific Committee for publication in the Conference proceedings, and that were presented at the Conference were issued on the Conference proceedings CD, ISBN: 1 74108 096 7. Additional copies of the Conference proceedings CD are available from the University of Western Sydney by contacting the Chair of the Scientific Committee, Dr. Craig Ellis at the address provided above.

CA Ellis

Dr. Craig Ellis
Co-Chair, Financial Markets Asia-Pacific Conference 2005

Financial Markets Asia-Pacific Conference

26th- 27th May 2005

Sebel Pier One Hotel Sydney Australia

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Alejandro Díaz-Bautista	NAFTA Integration and Economic Growth in Mexico (Diaz).doc
Ali Salman Saleh, Rami Zeitun	Islamic banking in Lebanon: Prospects and Future Challenges
Anil Mishra	International Investment Patterns: Evidence Using A New Dataset
Anil Mishra, Kevin Daly	Multi-country Empirical Investigation into International Financial Integration
Antonie Biard	Regulation of Guru Analysts' Conflict of Interest
AR.Kerbasi, B. Hassani Shirvanshahi	The Relationship between Exports And Credit Risk
Brian Phillips, Chris Wright, Carmen Mihai	Emerging Issues in Retirement Quality, Savings, and Security
Byung Chun Kim, Seung Oh Nam, SeungYoung Oh, Hyun Kyung Kim	The Microstructure of the KOSPI 200 Stock Index Derivatives Markets
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Craig Ellis, Patrick Wilson	The Use of Expert Systems in Property Portfolio Construction
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Elaine Loh	Technical Trading Rules and Market Efficiency: Australian Evidence 1980 - 2002
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Maike Sundmacher	**The Influence of Survival Thresholds and Aspiration Levels on Bank Trading Activities**
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Xuan Vinh Vo	Determinants of International Financial Integration
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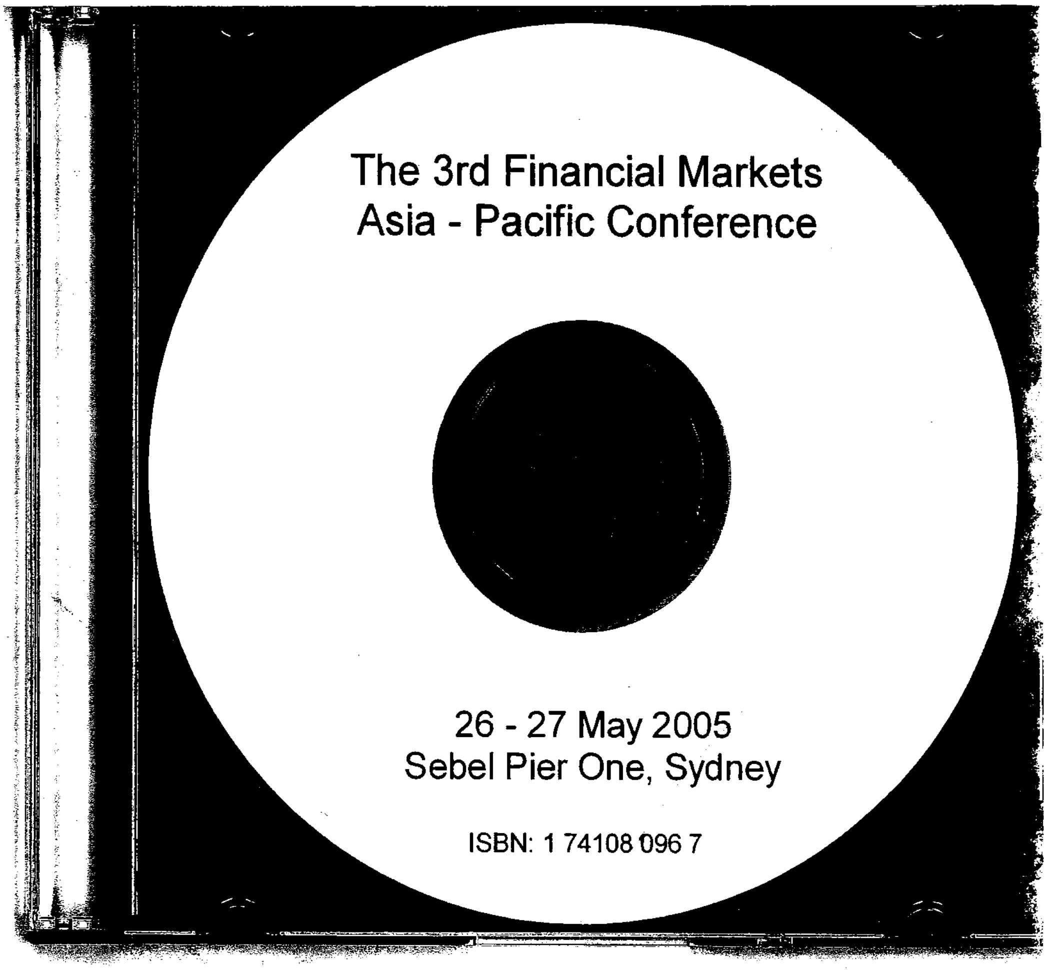
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Asia - Pacific Conference
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The 3rd Financial Markets Asia-Pacific Conference
May 26th – 27th 2005, Sebel Pier One, Sydney

Welcoming Remarks

Welcome to Sydney for the 2005 Financial Markets Asia-Pacific Conference. The conference is seen as providing a unique opportunity for academics and practitioners to present and share research findings on topics of practical and theoretical importance involving finance in the Asia-Pacific region. The Australasian Finance Group at the University of Western Sydney as hosts of the conference has become the focal point in the School of Economics for fostering research, education and advanced standards in the field of finance in the Australasian region. The Group focuses on facilitating the exchange of information and ideas between researchers, educators and business. To this end the Australasian Finance Research Group organizes an annual finance conference specifically addressing the Asia Pacific Region, which encourages theoretical and empirical research activities that advance knowledge of finance in the region. The Research Group also contributes to the available body of research in finance via publications such as 'Finance in Asia' (Elgar 2005). The Group's Working Paper Series disseminates early findings and helps promoting the discussion of research in progress.

This year, over 100 papers were submitted to the selection committee and 55 were accepted. The final program appearing below is organised into 12 sessions. This year's Conference features include the publication in the Journal of the Asia Pacific Economy (Routledge) of the best papers in a special edited Conference edition of the Journal. Keynote speakers at this years Conference include Dr John Laker Chairman of Australia Prudential Regulatory Authority (APRA). Geoff Peck, Head of Product, BT Financial Group who will lead discussions on the latest developments in Superannuation at the Superannuation Symposium.

I am especially thankful to Dr Craig Ellis Conference Program Chair for his most effective effort in organising the program of submissions. I would like to acknowledge a debt of gratitude to Professor Tom Valentine for Chairing the Superannuation Symposium and his encouragement in helping with organising the conference. I also wish to extend an expression of thanks to Prof Anis Chowdhury Managing Editor of the Journal of the Asia Pacific Economy (Routledge) for inviting Prof Jonathan Batten (Macquarie Graduate School of Management) and myself to jointly edit a special Conference edition of the Journal, which will include the publication of best papers presented at this years Conference. I am especially thankful to Professor Roger Juchau, Dean of the College of Law and Business for giving his Welcoming Address and acknowledge support from Ass/Prof. Brian Pinkstone, Head of the School of Economics and Finance for his ongoing support in encouraging the Conference organising committee.

I also wish to thank our Conference Secretary Ms Jo Roger who has performed an outstanding job as Conference Secretary. I would also like to thank Mr Xuan Vinh Vo for compiling and organising the production of CD Rom of the Conference Proceedings. Finally I am also grateful to our Sponsors: Blackwell Publishers, McGraw-Hill Australia, Pearson Education, Australia.

Enjoy your Conference

Dr Kevin Daly,

Co-Chair 3rd Financial Markets Asia-Pacific

ACKNOWLEDGEMENTS

It is with certain gratitude that we acknowledge the many people who worked so hard to make our 3rd Financial Markets Asia-Pacific Conference such a success. Our scientific committee played a central role in the academic conduct of the conference, and so we thank the following:

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CONFERENCE PROGRAM IN DETAILS

Thursday 26 May 2005
09:30 - 11:00

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Share Markets
Harbour Watch

Session Chair
Tom Valentine

Presentations

Uncovered Share Return Parity for Australian Shares
Tom Valentine

Risk-Return Relationship from the Asia Pacific Perspective
Noor Azuddin Yakob, Diana Beal, Sarath Delpachitra

The Information Content of Cross-sectional Volatility for Future Market Volatility: Evidence from Australian Equity Returns
Md. Arifur Rahman

The Analysis of Major Shareholders Occupying Fund in China's Stock Market
Yang Songling, Chen Fang

Thursday 26 May 2005
09:30 - 11:00

Session 2
Markets and Institutions
Dawes Point

Session Chair
Guy Ford

Presentations

Integrating Governance and Risk-Preference in Banking Institutions
Guy Ford, Maike Sundmacher

Equity Market vs. Capital Account Liberalization: A Comparison of Growth Effects of Different Liberalizations In Developing Countries
Sonal Dhingra

Understanding the Rules of Financial Innovations
Abdelhafid Benamraoui

Characteristics and Underpricing of Australian Mining and Energy IPOs from 1994 to 2001
William Dimovski, Robert Brooks

Thursday 26 May 2005
11:15 - 12:45

Session 3
International Investments
Harbour Watch

Session Chair
Anil Mishra

Presentations

International Investment Patterns: Evidence Using A New Dataset
Anil Mishra

High Capital Mobility and Precautionary Demand for International Reserves
M Ramachandran

The Multi-Motives Study: Evidence for the Australian Companies Raise Foreign Currency Denominated Debt
Lim Mei, Wong Hung Kun (Ken)

Demand for Foreign Exchange Reserves: Some Evidence from India
Prabheesh. K.P, Malathy Duraisamy, R. Madhumathi

Thursday 26 May 2005
11:15 – 12:45

Session 4
Share Market Relations
Dawes Point

Session Chair
Gary Tian

Presentations

The Empirical Relationship between Intraday Volatility and Trading Volume: Evidence from Chinese Stocks
Gary Tian

Stock Returns and Macroeconomic Variables: Evidence from Asian-Pacific Countries
Maria Psillaki, Christis Hassapis

A New Set of Measures on International Financial Integration
Xuan Vinh Vo

Bank Health and Investment: An Analysis of Unlisted Companies in Japan
Shin-ichi Fukuda, Munehisa Kasuya, Jouchi Nakajima

Thursday 26 May 2005
14:00 – 15:30

Session 5
Market Efficiency
Harbour Watch

Session Chair
Craig Ellis

Presentations

Technical Trading Rules and Market Efficiency: Australian Evidence 1980 – 2002
Elaine Loh

Portfolio Optimisation based on Wavelet Decomposition
You You Luo, Tsun Yue Ho

The Use of Expert Systems in Property Portfolio Construction
Craig Ellis, Patrick Wilson

The Microstructure of the KOSPI 200 Stock Index Derivatives Markets
Byung Chun Kim, Seung Oh Nam, SeungYoung Oh, Hyun Kyung Kim

Thursday 26 May 2005
14:00 – 15:30

Session 6
International Financial Relations
Dawes Point

Session Chair
Kevin Daly

Presentations

Multi-country Empirical Investigation into International Financial Integration
Anil Mishra, Kevin Daly

The Relationship Between Exports and Credit Risk
A.R.Kerbasi, B. Hassani Shirvanshahi

Determinants of International Financial Integration
Xuan Vinh Vo

EVT Enhanced Dynamic VaR – A Rule Based Margin System
Malay Bhattacharyya, Gopal Ritolia

Thursday 26 May 2005
15:45 – 17:15

Session 7
Islamic Banking
Harbour Watch

Session Chair
Rami Zeitun

Presentations

Islamic Banking in Lebanon: Prospects and Future Challenges
Ali Salman Saleh, Rami Zeitun

The Determinants of Salespersons' Performance in Islamic Insurance Industry in Malaysia
Fauzilah Salleh, Abdul Razak Kamaruddin, Izah Mohd Tahir

Effects of Interest Rate Reduction on the Reallocation of Financial Resources in Islamic Banking: Evidence from Iranian Agricultural Bank
Habibollah Salami, Farshid Eshraghi

Universal Banking and its Implications for Developing Economies
Paritosh Kumar Srivastava

Thursday 26 May 2005
15:45 – 17:15

Session 8
International Economies
Dawes Point

Session Chair
Md. Arifur Rahman

Presentations

The Impact of Open Market Operations and Monetary Policy in a Small Open Economy
Xinsheng Lu, Francis In

Efficiency of Delhi International Airport Using Data Envelopment Analysis: A Case of Privatization and Deregulation
Somesh K.Mathur

NAFTA Integration and Economic Growth in Mexico
Alejandro Díaz-Bautista

Absolute and Conditional Convergence: Its Speed for Selected Countries for 1961-2001
Somesh K.Mathur

Friday 27 May 2005
09:00 – 10:30

Session 9
Retail and Commercial Banking
Harbour Watch

Session Chair
Maike Sundmacher

Presentations
The Influence of Survival Thresholds and Aspiration Levels on Bank Trading Activities
Maike Sundmacher

Service Quality in the Commercial Banking Industry in Malaysia: A Perspective from Customers and Bank Employees
Izah Mohd Tahir, Wan Zulqurnain Wan Ismail

Determinants of Australian Bank Interest Rate Margins
Mohammad Elian, Tom Valentine

Customers Switching Barrier Determinants in Retail Banking Services: Malaysian Case
Hanim Misbah, Nor Haziah Hashim, Muhamad Muda

Friday 27 May 2005
09:00 – 10:30

Session 10
Issues in Behavioural Finance
Dawes Point

Session Chair
Xuan Vinh Vo

Presentations
Japanese Fund Managers' Risk-taking Behaviors
Chia-Ching Lin

Edogenous Cross Correlations
J-H Steffi Yang, Steven Satchel

Why Should Women Be Less Financially Literate Than Men? A critical Review of the Literature and Some surprising Conclusions
Suzanne Wagland, Ingrid Schraner

Risk Identification in the Stock Market by Differentiating Entrepreneurial Decision Making
Roberta Powell

Friday 27 May 2005
10:45 – 12:15

Session 11
Retail and Commercial Banking II
Harbour Watch

Session Chair
Xuan Vinh Vo

Presentations
Market Discipline in Indian Banking: A Quantity Based Approach to Depositors' Behavior
A. Sarkar, L. M. Bhole

Bank-dependence, Financial Constraints, and Investment: Evidence from Korea
Jaewoon Koo, Kyunghee Maeng

The Impact of Risk on Bank Loan Portfolio Management in the First Bank of Nigeria PLC
Oladejo Biodun

Growth and Performance of Primary Agricultural Financing Cooperative Institutions: An Appraisal
Dharmpal Malik

Friday 27 May 2005
10:45 – 12:15

Session 12
Agency
Dawes Point

Session Chair
Rami Zaiton

Presentations
Regulation of Guru Analysts' Conflict of Interest
Antonie Biard

Does Ownership Structure Affect Firm's Performance and Default Risk in Developing countries? Jordanian Case Study
Rami Zaiton

Corporate Disclosure in Annual Reports of Chinese Listed Companies with Domestic and Foreign Shares
Jinghui Liu, Ian Eddie

Emerging Issues in Retirement Quality, Savings, and Security
Brian Phillips, Chris Wright, Carmen Mihai