

NSW RURAL LAND PERFORMANCE: 1990-2008

Professor Chris Eves

**Queensland University of Technology, School of Urban Development, 2 George St
Brisbane, 4000. Email: chris.eves@qut.edu.au**

Abstract

The annual income return for rural property is based on two major factors being commodity prices and production yields. Commodity prices paid to rural producers can vary depending on the agricultural policies of their respective countries. Free trade countries, such as Australia and New Zealand are subject to the volatility of the world commodity markets to a greater extent than those farmers in protected or subsidised markets.

In countries where rural production is protected or subsidised the annual income received by rural producers has been relatively stable. However, the high cost of agricultural protection is now being questioned, particularly in relation to the increasing economic costs of government services such as health, education and housing.

When combined with the agricultural production limitations of climate, topography, chemical residues and disease issues, the impact of commodity prices on rural property income is crucial in the ability of rural producers to enter into or expand their holdings in agricultural land. These problems are then reflected in the volatility of the rural land capital returns and the investment performance of this property class.

This paper will address the total and capital return performance of a major agricultural area and compare these returns on the basis of both location of land and land use. The comparison will be used to determine if location or actual land use has a greater influence on rural property capital returns. This performance analysis is based on over 35,000 rural sales transactions. These transactions cover all market based rural property transactions in New South Wales, Australia for the period January 1990 to December 2008. Correlation analysis and investment performance analysis has also been carried out to determine the possible relationships between location and land use and subsequent changes in rural land capital values.

Key words

Rural land, rural economics, rural land values, rural land use, rural land investment, investment performance, rural property prices.

Introduction

Despite the overall size of the rural property market and the continued importance of agricultural land to the Australian economy, rural property markets in Australia have received minimal attention by property researchers in comparison to the extensive research attention given to Australian commercial and residential property markets (e.g.: Newell, 1996; Newell and Higgins, 1996; Newell and MacFarlane, 1996; Newell, 1998). In particular the more recent analysis of investment property markets in Australia has been conducted in the areas of AREITS and institutional grade office, retail and industrial property (Newell 2006, Higgins, 2005; 2006). Much of the recent research in relation to property investment performance has covered the less traditional property types such as hotels and leisure property and infrastructure property (Peng and Newell, 2007) In recent years, only Eves (1998, 2004, and 2005), Eves and Painter (2008) and Eves and Nartea (2008) have critically investigated the investment performance of Australian rural property, however this investigation has been limited to New South Wales.

Similar rural property research trends are also evident in the USA, with only Kaplan (1985), Lins *et al.* (1992), Rubens and Webb (1995) and Eves and Newell (2000, 2008) and Eves and Painter (2007, 2008) investigating the performance of US farmland in an investment context. The analysis of the UK rural land market, from an investment performance perspective is also limited, with studies by Eves and Newell (2006) and the Royal Institution of Chartered Surveyors (RICS) currently providing data on rural land prices with the RICS Farmland Prices Index, however this index base date is only 1995 (RICS, 2009).

The main reasons for this lack of critical research into Australian and international rural property are arguably:

- (i) The declining significance of the rural sector, in comparison to the emergence of the resources and services sectors (USDA, 1999; ABARE, 2008).
- (ii) The low level of institutional ownership of agricultural property. In Australia this is currently less than 1% of the total institutional property portfolio. This compares with institutional exposure to the office (41.9%), retail (47.9%), industrial (7.4%) and other (2%) property sectors (PCA/IPD, 2008).
- (iii) The limited investment performance indices for rural property currently available in Australia. There are several rural land capital value indices available in the US. The NCREIF US farmland performance index (NCREIF, 2008) is the only internationally available valuation-based corporate rural property total return performance series in the major developed countries. The United States Department of Agriculture also compiles an annual capital return rural land index based on sales transactions, as do several US land based Universities such as Texas A&M University and Iowa State University. These indices are state based and account for limited areas of agricultural production. In the UK IPD provide a timberland index and RICS have commenced a farmland index, which is transaction based. In comparison, institutional-standard office, retail and industrial property performance indices are readily available for USA, UK, Canada, South Africa, Australia and New Zealand (IPD, 2009).

Reliable property investment performance indices are essential for informed investment decision-making by institutional investors. The relatively recent availability of the NSW rural property Index has overcome some of these limitations and has been used to promote and

develop a greater awareness of rural property investment potential in Australia (Eves, 2005). This problem of limited rural property investment performance data in Australia is similar to most countries, with the exception of the US where the availability of the USDA index and the NCREIF index has facilitated a greater degree of institutional ownership of rural property.

Research Purposes and Objectives

With the development and on-going update of this NSW Rural Land Investment Performance Index it is now possible to:

- Rigorously and objectively assess the capital return investment performance of NSW rural property.
- Compare the performance of rural land on both a regional location basis and on a land-use basis.
- Compare the total return performance of NSW rural property based on broad land-use categories.

Research Methodology

Rural land sales database: 1990-2008

This NSW rural property investment performance index and regional sub-indices have been constructed from data provided by the commercially available RP Data computer database. RP Data is a commercial computer database of all sales transactions and land title transfers that occur throughout NSW, with all sales recorded on an LGA basis. The computer database information is provided from completed notices of transfer which have to be provided to the Valuer Generals Department, the respective Local Government Authorities (LGAs) and Land Titles Office whenever land is transferred, sold or resumed. This computer database allows sales and transfers to be sorted on a land-use basis, area, zoning, price and date of transfer.

The NSW rural property component within the RP Data database has expanded considerably since 1990. From 1985-89, rural sales are available for 21 NSW rural LGAs; from 1990, 113 rural LGAs in NSW reported all rural sales into the RP Data computer database. With the amalgamation of many of the smaller LGAs in rural NSW, the number of LGAs has declined to 97 rural-based council areas.

For the period 1990-2008, over 35,000 NSW rural property sales are available for analysis. The integrity and quality of the RP Data database compares favourably with the equivalent US NCREIF farmland database, annually involving 1,500 US rural properties valued at US\$4 billion

Rural property database: quality control/audit

Three computer and manual sorts have been conducted to audit and improve the integrity and data quality of the RP Data database information; namely:

Rural sales within and between government departments have been removed.

Same name property transfers were examined, and eliminated if the price per hectare was significantly below the average price per hectare for that particular period.

All family sales, no value sales and transfers initiated by the Family Law Court were excluded.

All of the above quality control audits ensure the continued integrity and reliability of this rural property database.

Rural property investment performance indices: 1990-2008

Based on these 35,000 rural property sales from 97 NSW LGAs over the period 1990-2008, a rural property investment performance index for NSW has been developed. Using \$ per hectare as the benchmarking investment performance criteria and December 1990 benchmarked to an index value of 100, a semi-annual and annual rural property investment performance index has been established.

Data have been divided as follows.

Region

- North East
- South East
- North West
- Central West/Central Tablelands
- Murray/ Riverina
- South West
- Far West

Land Use

- Coastal grazing (1)
- Tableland grazing (2)
- Mixed farming (3)
- Pastoral Grazing.(4)

Total Return

- High Rainfall
- Mixed Farming
- Pastoral Grazing

Database Characteristics

This rural property database is substantial, accounting for the following percentages of total Australian agricultural production over the period 1990-2008: wheat (36%), wool (34%), coarse grains (25%), cattle (24%), milk (12%) and oilseeds (58%) (ABARE, 2008). This further reflects the overall integrity, importance and quality of this NSW rural property database.

Figure 1: NSW Rural Property Investment Index: Land Use Regions



Results and Discussion

These research results focus on the analysis of the rural land transaction data for the 8 identified regions of NSW. These regions are based on the classifications for the State of New South Wales by NSW Department of Primary Industries and Local Government Authorities. However, there are some slight deviations in boundaries, as the sales data is based on Local Government Areas. This paper focuses on the capital returns for the 7 regions and 4 land use classifications, as well as the total returns for the three (3) ABARE land use classifications for rural property in NSW (refer to Figure 1).

NSW Average Capital Returns

Table 1 shows both the annual and average annual capital returns for rural land in NSW and the weighted annual and weighted average annual capital returns for NSW rural land based on the sales volume for each of the individual regions.

From this table, it can be seen that on a simple average basis the average annual capital return for NSW rural land has been 6.18%, with volatility of 6.44%. During the period 1990-2008, there have been four years when the capital return for rural land was negative (1993, 1996, 2001 and 2006). However, on a weighted basis there has only been one year when rural land has shown a negative capital return (2001) and the average annual capital return has been higher at 6.53%, with a significantly reduced volatility of 4.70%.

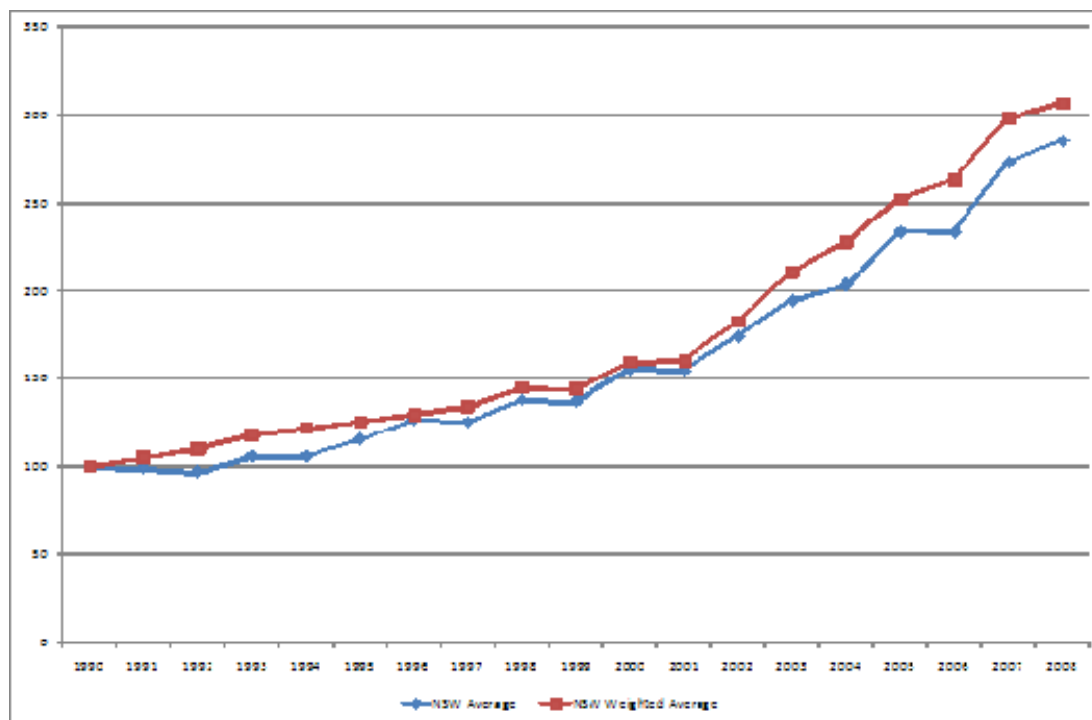
On a weighted basis the highest one year capital return was 2003 (15.4%), with the lowest positive capital return being in 1995 (0.06%).

Table 1: NSW Rural Land Capital Returns: 1990-2008

Year	NSW (Average)	NSW (Weighted Average)
1991	12.0	5.0
1992	3.8	4.8
1993	-1.4	7.4
1994	6.8	2.8
1995	0.5	3.1
1996	-1.2	3.3
1997	5.3	3.5
1998	0.8	8.1
1999	2.4	-0.6
2000	8.9	10.8
2001	-4.9	0.5
2002	15.3	13.9
2003	9.6	15.4
2004	10.2	8.2
2005	12.9	10.8
2006	-0.16	4.4
2007	17.1	13.3
2008	4.5	2.9
Average Annual Return (%)	6.18	6.53
Risk (%)	6.44	4.70

Figure 2 represents the investment performance of NSW rural land on an index basis and also shows the variation in average annual capital returns based on the NSW average and weighted average analysis. The variation in the capital returns has been greater in the period 2001-2008, compared to the results for the period 1990-2000.

Figure 2: NSW Rural Land Capital Return Index: 1990-2008



New South Wales Geographic Rural Land Performance

Table 2 shows the average annual returns for rural land in each of the major geographic areas of NSW for the period 1990-2008. From this table it can be seen that there is considerable variation in the capital return for rural land based on geographic location. This variation in change in rural land prices from year to year in the 7 rural regions can be attributed to prevailing seasonal conditions, major commodity prices and the demand for rural land by alternate property markets such as the rural lifestyle and Tree Change markets (Eves, 1998). Based on the 18 year period, the region with the highest average annual capital return was the North West region (8.42%) and then followed by the Riverina/Murray regions at 8.36%. However, the volatility for the Riverina/Murray region was considerably higher at 12.49% compare to 7.11% for North West. The far West region had a very low average annual return of only 4.10%, with a volatility of 23.61%. The geographic and land quality aspects of this region can show considerable variation depending on the location of annual sales.

Table 2: NSW Rural Regions: Annual Capital Returns: 1990-2008

	North East	North West	Central West	South East	Riverina/Murray	Far West	South West
1991	14.18	26.08	-19.29	15.92	24.17	-28.07	-11.89
1992	-1.76	-0.47	26.55	12.73	12.67	-26.83	-6.64
1993	1.36	6.00	0.70	-4.46	17.84	25.56	8.86
1994	9.67	4.90	16.67	10.15	-9.91	-21.24	6.32
1995	-5.11	4.66	-6.65	13.12	0.13	31.46	9.47
1996	-0.14	-2.02	11.26	-3.27	-1.53	41.03	-3.50
1997	2.70	5.96	2.77	4.90	12.05	-20.61	4.96
1998	0.12	1.53	10.69	6.33	12.00	22.90	8.72
1999	2.43	8.47	-13.27	-3.65	2.64	3.11	-1.84
2000	3.79	12.23	14.13	15.11	6.04	24.70	10.21
2001	-10.61	9.50	1.27	12.99	-1.94	-10.14	2.08
2002	23.98	9.99	23.70	4.21	9.61	8.60	20.95
2003	5.33	2.74	15.37	15.71	34.29	4.46	17.20
2004	18.15	16.56	21.89	5.21	-5.85	-14.22	18.09
2005	14.02	11.84	5.63	8.26	8.23	29.28	11.21
2006	10.69	20.03	-15.22	15.89	32.19	-32.05	-1.58
2007	11.04	8.24	0.43	17.52	-1.53	17.61	3.63
	5.93	8.42	5.87	7.89	8.36	4.10	5.27
	8.56	7.11	13.34	7.74	12.49	23.61	8.82

An analysis of the average annual capital returns based on the last 12 months, last three, five, ten and 15 years is shown in Table 3. Again, this table shows the significant variation in rural land capital returns for the geographic areas at various time periods since 1990. The North West region has the highest average annual capital return for the study period of 8.42%. This region also, apart from the last twelve months, has had the highest sub-period capital returns. Average annual returns for all regions have been reasonably consistent over the 15 year period, with the greatest variation in average annual capital returns occurring over the past 5 and 10 year periods. There has also been significant variation in returns over the past 12 months, with negative returns for all regions located in the south of NSW.

During the period 1990-2000, the average price per hectare for rural land in the North West of NSW increased from \$673 to \$1,099; however the average price per hectare for rural land in this region to the end of 2008 was \$2401, reflecting an increase in the average annual capital return for the last eight years compared to the period 1990-2000. The ten year period from 1990-2000 saw strong interest in this region due to the ability of farmers to purchase irrigation blocks and grow high-value irrigated crops such as cotton. However, with the prolonged droughts in some areas of NSW and the reduced water allocations for irrigation, the demand for rural land has been strongest in areas such as the North West and Murray/Riverina regions.

Table 3: NSW Geographic Region: Capital Returns: 1990-2008

Return %	Last 12 Months	Last 3 Years	Last 5 Years	Last 10 Years	Last 15 Years
North East	6.92	9.55	12.17	8.57	6.20
North West	5.31	11.19	12.40	10.49	7.99
Central West	9.05	-1.92	4.36	6.30	6.52
Far West	18.18	1.25	3.76	4.95	6.87
Murray/Riverina	-0.61	10.02	6.49	8.31	6.39
South West	-1.31	0.24	6.01	7.86	6.97
South East	-4.72	9.56	8.43	8.65	7.85

During the period 2001 to 2005, the two regions showing the highest average annual capital returns were the Central West and South West regions of NSW being 13.9% and 13.6% respectively. However, both these regions have shown one of the lowest capital returns for the last three years (-1.92% and 0.24% respectively). Both these regions suffered significantly during the drought periods in the mid 2000s.

Over the past ten years there has been an increasing trend for people to move from the major cities of NSW to coastal and inland locations, particularly for retirement and lifestyle change (ABS, 2006). This trend is also being represented in the change in price and subsequent increases in capital returns for rural land in the coastal areas of NSW. The North East and South East of NSW have seen significant increases in average annual capital returns over the past 5 to 10 years compared to average annual capital returns for the past 15 years, with the North East region showing a 15 year average annual capital return of 6.2%, but the average annual capital returns for the past three and five years being 9.55% and 12.17% respectively.

Correlation Analysis: NSW Geographic Regions

A correlation analysis has been carried out to analyse the association between the changes in rural land capital returns from one rural region in NSW to another. This analysis was carried out to determine if the rate of decline or increase in rural land prices was general throughout the State or influenced by factors other than location.

The results of the correlation analysis are presented in Table 4 show that there are limited significant positive correlations across the rural regions of NSW. When compared to the previous study of NSW rural land prices by Eves (2002, 2007) for the periods 1990-2000 and 1990-2005, the number of significant correlations across these regions has decreased. The current analysis shows the following significant positive and negative correlations:

Table 4 also shows that there are a number of negative correlations across the region, with some of these results being marked but not as statistically significant (Central West and Murray/Riverina $r = -0.28$; Far West and Murray/Riverina $r = -0.27$ and Far West and South East $r = -0.37$). This table also shows that the Far West region has a positive correlation with the South West region, due to the reliance in these regions on wool production and limited opportunities to alter rural production due to low commodity prices and the reliance on above average seasons.

Table 4: Correlation Matrix: NSW Rural Regions: 1990-2008

	<i>North East</i>	<i>North West</i>	<i>Central West</i>	<i>Far West</i>	<i>Riverina/Murray</i>	<i>South West</i>	<i>South East</i>
North East	1.00						
North West	0.53*	1.00					
Central West	0.15	-0.50*	1.00				
Far West	-0.18	-0.45*	0.11	1.00			
Riverina/Murray	0.10	0.27	-0.28	-0.27	1.00		
South West	0.33	-0.11	0.51	0.31	-0.07	1.00	
South East	0.03	0.35	-0.10	-0.37	0.29	0.00	1.00

Significant at 5% Level

The significant positive correlation is between North West and North East ($r = 0.53$). The significant negative correlations are between North West and Central West ($r = -0.50$) and North West and Far West ($r = -0.45$).

Land Use Analysis

The above analysis has been based on the geographic location of the various regions of NSW. This analysis has shown that there is often no significant correlation between the changes in land price from one location to another. Limited correlation could be linked to the economic factors influencing the rural land market.

To test this scenario the various regions in the study have been grouped as either grazing regions or farming regions.

The grazing regions have then been divided into:

- Coastal grazing
- Tableland grazing
- Mixed farming
- Pastoral Grazing

Table 5 shows that the annual capital returns and the average annual capital returns for rural land in NSW has also varied based on land use, as well as geographic location. This table shows that the annual return, based on rural land use, with each individual land use showing years of negative capital returns (Coastal Grazing 1993, 1996, 2001 and 2008; Tableland Grazing 1996, 1999 and 2008; Mixed Farming 1995, and 2001). In the Pastoral Grazing land use areas there have been 7 years of negative capital returns. This land use has also had the highest capital return in any given year (41% in 1996) and the highest negative return of -28.1% in 1991. The Mixed Farming land use and Tableland Grazing had an annual capital return in excess of 20% (2003 and 2007 respectively) during the period 1990-2008.

Table 5: NSW Rural Land Capital Returns: Rural Land Use: 1990-2008

	Coastal Grazing	Tableland Grazing	Mixed Farming	Pastoral Grazing
1991	12.0	5.5	6.8	-28.1
1992	3.8	3.0	11.2	-26.8
1993	-1.4	1.0	11.2	25.6
1994	6.8	13.8	0.5	-21.2
1995	0.5	4.8	-0.9	31.5
1996	-1.2	-1.2	1.1	41.0
1997	5.3	5.1	5.9	-20.6
1998	0.8	4.0	10.9	22.9
1999	2.4	-7.8	0.2	3.1
2000	8.9	12.6	8.7	24.7
2001	-4.9	14.2	-0.5	-10.1
2002	15.3	8.9	16.0	8.6
2003	9.6	11.5	21.5	4.5
2004	10.2	14.9	8.3	-14.2
2005	12.9	10.3	6.9	29.3
2006	15.93	14.78	0.69	-32.1
2007	18.48	27.98	4.27	17.6
2008	-4.06	-1.69	5.68	18.2
Average Annual Capital Return (%)	6.19	7.9	6.57	4.1
Volatility (%)	7.14	8.21	6.12	23.61

Table 6 breaks down the annual returns into the last, three-, five- and ten-year periods, to show the trend in capital return performance for each of the rural lands uses.

Table 6: Rural Land Use Capital Returns: 1996-2008

	Coastal Grazing	Tablelands Grazing	Mixed Farming	Pastoral
Last 10 years	8.5	10.6	7.2	5.0
Last 5 years	10.7	13.2	5.2	3.8
Last 3 Years	10.1	13.7	3.5	1.2

This table shows that Tableland and Coastal Grazing has had consistently high returns in excess of 10% for the last three- and last five-year periods. However, Mixed Farming areas of NSW have had a declining trend in average annual capital returns over the same period. This coincides with the significant drought periods in NSW from 2002 to 2008. The average annual capital return for the pastoral grazing areas has been significantly lower for the past 3 and 5 years (1.2% and 3.8% respectively), again due to the low wool prices and sustained drought periods

Figures 3 and 4 compares the capital return investment performance of the seven regions and the four rural land uses on an index basis since 1990.

From Figure 3, it can be seen that over the 18 year period, rural land in the North West, Riverina/Murray and South East have outperformed the other rural regions, with these regions showing a similar trend in the capital return index. The figure also shows that the capital return performance for the South West, Central West and North East tended to follow a similar pattern from 1990 to 2005; however, since 2005 the North East region has outperformed the South West and Central West regions. The figure also reveals the volatile land prices in the Far West region.

Figure 3: NSW Rural Land Capital Return Index: Geographic Regions: 1990-2008

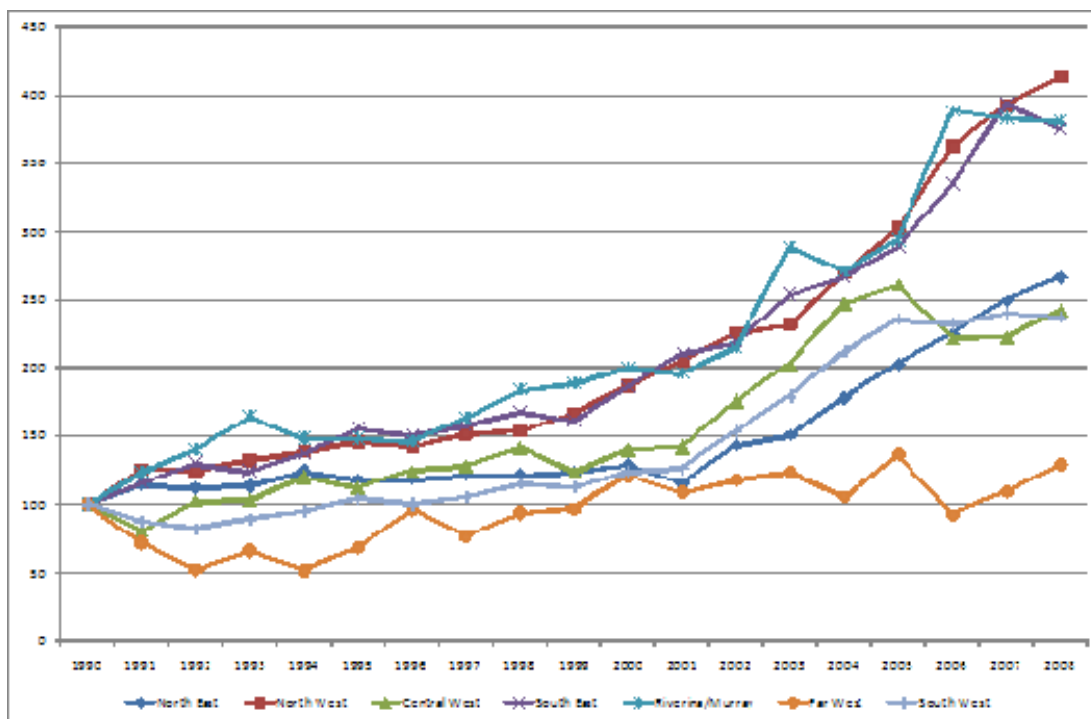
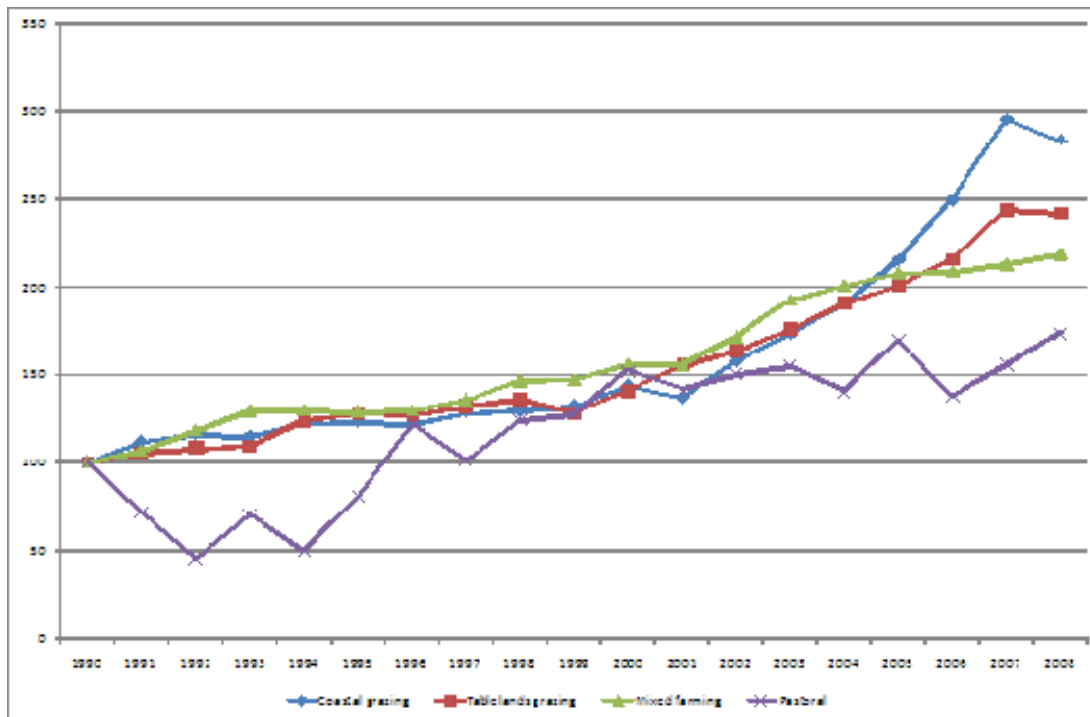


Figure 4 compares the capital return investment performance of rural land based on the four main land use classifications for the period 1990-2005.

From this figure, it can be seen that rural land in the Mixed Farming areas of NSW outperformed all other land use classification for the period 1990-2005. However, since 2005, both Coastal Grazing and Tableland Grazing have shown higher capital return performance compared to Mixed Farming. During the period from 2002 to 2008 the average price per hectare for rural land in the coastal grazing areas has increased from \$3,512 to \$6,312

Figure 4: NSW Rural Land Capital Return Index: Rural Land Use: 1990-2008



The pastoral grazing areas of NSW showed negative capital returns for 7 of the 18 years in the study; however, the region also experienced significant annual increases in capital returns over the same period, especially from 1994 to 1996 and 2006 to 2008. Despite these significant periods of price increases, the overall performance of this land use continues to lag the other rural land use classifications.

Correlation Analysis

Table 7 shows significant correlation between the Coastal Grazing and Tableland Grazing ($r = 0.64$). The low and negative correlations between the other rural land uses indicates portfolio diversification benefits from rural land based on both geographic and land use classifications. The variation in rural land price movements across geographic and land use regions suggest that a rural property investment portfolio based on properties across a range of land uses and geographic locations will smooth and lower the risk of the portfolio due to variations in land prices due to factors such as seasonal conditions, commodity prices and input costs that are specific to particular agricultural regions or commodities, even at an Australian State level, More significant portfolio benefits could be achieved if the rural property portfolio is diversified across all Australian locations or internationally..

Table 7: Correlation Analysis: Rural Land Use: 1990-2008

	<i>Coastal Grazing</i>	<i>Tableland Grazing</i>	<i>Mixed Farming</i>	<i>Pastoral Grazing</i>	<i>NSW Weighted</i>
Coastal Grazing	1.00				
Tableland Grazing	0.64*	1.00			
Mixed Farming	0.26	0.04	1.00		
Pastoral Grazing	-0.27	-0.20	0.06	1.00	
NSW Weighted	0.63*	0.51*	0.77*	0.27	1.00

* Significant at the 5% level

The insignificant positive correlation between the NSW weighted average and Pastoral Grazing is due to the relatively low weight (7.2%) that Pastoral adds to the overall weighting of the index.

It is important to note that there was some less significant negative correlation in the analysis, again showing the limited relationship between the various rural land uses in NSW. This was particularly the case with Pastoral grazing that had a negative correlation with Coastal and Tableland grazing and a very small positive correlation ($r = 0.06$) with Mixed Farming.

Total Returns

ABARE conducts an annual survey of Australian farmers and produces a summary of income and expenditure for a range of agricultural production types across all States of Australia. This ABARE data has been analysed to determine an income per hectare for the three land use classifications of High rainfall, Mixed farming and pastoral grazing in NSW. This \$ rate per hectare allows an income return for the average NSW farmer to be determined. The combined income and capital returns for the land classifications are shown in Table 8.

Table 8 shows that over the 18 year period, although the high rainfall areas (coastal and tableland grazing) have generated high capital returns, the mixed farming areas have achieved higher income returns, resulting in a significantly higher average annual total return of 9.6% compared to the 7.7% for the high rainfall classification. However, over the past three years the total return from the average farmer in the high rainfall areas of NSW has been significantly greater than the total return obtained by the average mixed farming property owner. Table 8 also shows that the poor income from wool and sheep over the past 10 years has had a very minimal impact on the total return from this land classification. The addition of income returns over the period has only resulted in the average annual total return being 0.2% higher than the average annual capital return for this land use in NSW.

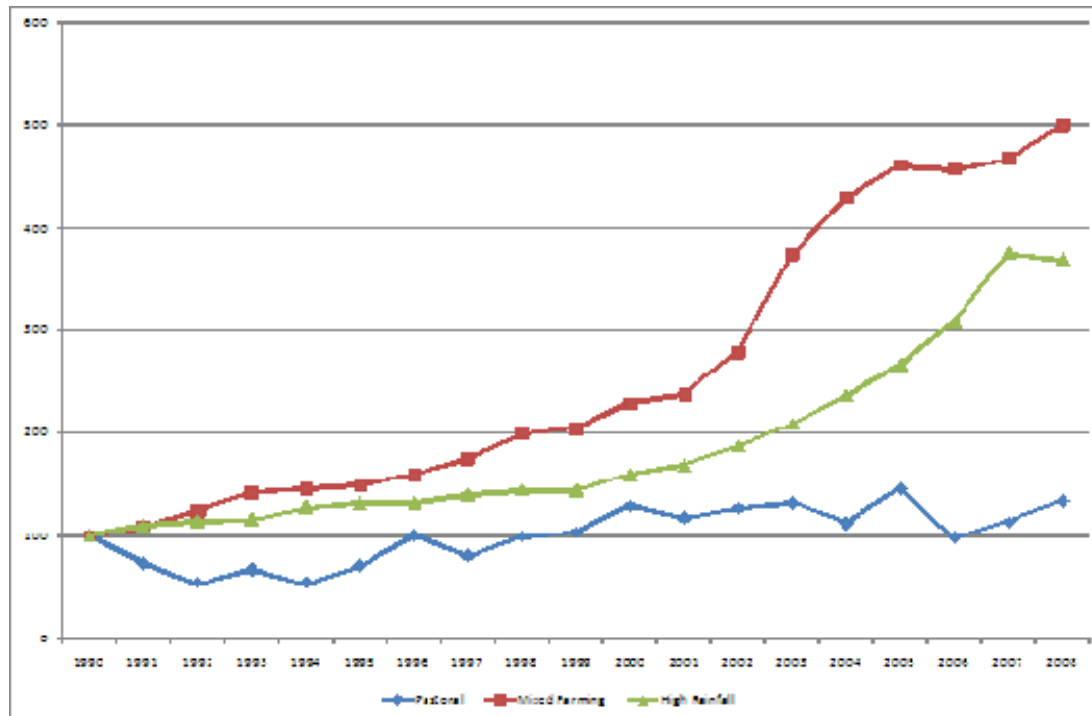
The difference in average annual total return is further highlighted in Figure 5.

Table 8: Rural Property total returns; Land Use: 1990-2008

Year	High Rainfall	Mixed Farming	Pastoral
1991	9.55	8.75	-27.5
1992	4.66	15.04	-26.3
1993	0.75	13.89	25.8
1994	10.41	2.24	-20.6
1995	3.20	2.69	32.0
1996	0.34	6.82	41.5
1997	5.83	9.57	-19.8
1998	2.94	14.24	23.7
1999	-0.12	2.53	4.1
2000	11.15	11.68	25.4
2001	5.60	3.88	-9.0
2002	11.48	17.13	8.1
2003	10.90	34.16	4.1
2004	13.19	14.87	-14.6
2005	12.96	7.37	29.2
2006	15.50	-0.91	-32.8
2007	22.08	2.47	16.0
2008	-1.71	6.68	18.0
Average	7.7	9.6	4.3
Volatility	6.3	8.1	23.6

Figure 5 shows that from 1990 to 1996 the trend in total returns for high rainfall and mixed farming land use in NSW was relatively similar; however, high grain, beef and wool prices during the period 1997 to 2005 had a greater impact on the income returns for mixed farming compared to both high rainfall and pastoral grazing. This is the main difference for the difference in total returns rather than a sustained increase in capital values.

Figure 5: NSW Rural Land Total Return Index: Rural Land Use: 1990-2008



Conclusions

Since 1990 the average annual capital return for all rural land in NSW has been 6.18% (6.53% weighted). Although this return appears modest it is from a historically low base following the significant fall in rural land prices in 1989-1990. This period of rural recession followed record rural land prices set in the period 1985-1988.

Although the average price of rural land in NSW has been 6.18%, there have been rural regions of the State that have performed significantly better than the State average. Areas such as the North West, Southern East and Riverina/Murray have returned average annual increases in rural land values significantly higher than the State average but often at higher levels of risk. The exception to this has been the North West region that has shown the highest average annual capital return but at the lowest volatility of 7.11%. The region with the second lowest risk (South East at 7.74%) showed an average annual capital return of 8.36% compared to North West at 8.42%.

There is some significant correlation between the increase and decrease in rural land prices in adjoining regions and regions where agricultural production is very similar. There is also significant negative correlation in changing rural land prices in areas of differing and opposing rural land use. This result is expected on the basis that, when the income levels in one specific rural land use are high compared to another rural land use that is in a low-income regime, the change in rural land prices should be opposite.

The return for higher value agricultural land uses such as mixed farming exceed the traditional high rainfall grazing enterprises but with a higher risk. Land returns for the pastoral grazing regions are the most volatile, which is due to both the scarcity of sales across a large geographical area and the reliance of this land use on a single commodity (wool). All other rural regions and land uses have some alternatives to maximise income returns in periods of low commodity prices for specific commodities.

The importance of alternative income sources is reflected in the total return for the average NSW farmer. The farmers in the mixed farming areas have on average achieved a total average annual return 3.03% higher than the average annual capital return, whereas the increase due to income return was only 1.1% and 0.2% higher for high rainfall and pastoral grazing farmers respectively.

Although these results show that the average farmer has achieved a positive average annual total return over the period 1990-2008, it should be noted that the returns from the above average farmer would be significantly greater than those shown in this paper. The top 20% of farmers would not only achieve significantly greater income returns, but their capital returns would be higher due to the higher prices they can achieve for their well-managed properties.

References

Australian Bureau of Statistics (2006) National Regional Profile, Selected Characteristics NSW. <http://www.abs.gov.au/AUSSTATS/abs>

Australian Bureau of Agricultural and Resource Economics. 1998. Australian Commodity Statistics. ABARE: Canberra.

Australian Bureau of Agricultural and Resource Economics 1991, 1993, 1995, 1997, 1999, 2001, 2002, 2004, 2006, 2008. Farm Survey ABARE Canberra

Collins, H. 1958. Movement in rural land values. *The Valuer* 15:156.

Eves, C and Natea G. 2008. Diversification Benefits from New Zealand Real Estate. *Pacific Rim Property Research Journal*. Vol 14, No. 1, pp 27-40.

Eves, C and Painter, M 2008. The financial gains from adding farmland to an international investment portfolio. *Journal of Real Estate Portfolio Management*. Vol 14, No. 1, pp 63-74

Eves, C and Newell, G 2007. The role of US farmland in real estate portfolios. *Journal of Real Estate Portfolio Management*. Vol 13, No. 4, pp 317-327

Eves, C. 1997. Analysis of NSW rural land performance: 1985-1995. *The Valuer and Land Economist* 34(6):551.

Eves, C. 1998. Influence of commodity prices and farm profit on rural land markets and valuation practice. *New Zealand Valuers Journal* (Sept):30.

Eves, C. 2005 Developing a NSW rural property investment performance index. *Australian Property Journal* Vol 38, No. 6, pp 427-432.

Higgins D 2005 Modelling The Australian Property Investment Universe: A Preliminary Study. *Pacific Rim Property Research Journal* Vol 11, No. 3, pp 269-281.

Higgins D 2006 Positioning Commercial Property In The Australian Investment Market. Pacific Rim Real Estate Society Conference. Auckland New Zealand January 2006.

- Kaplan, H. 1985. Farmland as a portfolio investment. *Journal of Portfolio Management* 12:73.
- Lins, D. *et al.* 1992. Institutional portfolios: diversification through farmland investment. *AREUEA Journal* 20:549.
- MacPhillamy, C. 1972. Rural land prices: current situation and prospects. *The Valuer* 17:702.
- NCREIF. 1998. Farmland index performance report: 2nd quarter 1998. NCREIF: Chicago.
- Newell G. 2007. The Significance And Performance Of Industrial Investment Property In Australia. *Pacific Rim Property Research Journal* Vol 13, No. 3 pp 361-388.
- Newell, G. 1996. The inflation-hedging characteristics of Australian commercial property. *Journal of Property Finance* 7:6.
- Newell, G. and Higgins, D. 1996. Impact of leading economic indicators on commercial property performance. *The Valuer and Land Economist* 34:138.
- Newell, G. and MacFarlane, J. 1996. What does property trust performance tell us about commercial property returns? *Australian Land Economics Review* 2:10.
- Newell, G. 1998. The distributional characteristics of Australian commercial property returns. *Australian Land Economics Review* 4:23.
- Peng H & Newell G. 2007 The Significance Of Infrastructure In Australian Investment Portfolios. *Pacific Rim Property Research Journal* Vol 13, No. 4, pp 423-450.
- Property Council of Australia/IPD. 2008. Australian Property Index December 2008. IPD Melbourne.
- Royal Institution of Chartered Surveyors. 2009. RICS rural land market survey. RICS June 2009
- Rubens, J. and Webb, J. 1995. Farmland as an inflation hedge. *Real Estate Research Issues* 2:129.