

Farm Price Research

By Dr Steve Joynes AIF[®], Trust Asset Manager, Fletcher Law, Hamilton

Introduction

This work was undertaken to examine the historical capital gains of dairy farms throughout New Zealand. During a meeting with a Waikato chartered accountant I was informed that he had read that farmland capital gains historically have been 11% so this must be a good investment, considering what the bank rate of return yields. On querying his source I received a copy of a paper presented at the Hawke's Bay Large Herds Conference 2004 titled "Financial Measures of Business Success". It was authored by Nicola Shadbolt of Massey University. The thrust of her paper was comparing the different types of ownership structures in terms of profitability and return on assets. As far as I can ascertain she used 15 years of data. She states on page 69 that "historically dairy farm land in New Zealand has increased in value by 11% per annum (Nartea and Basanta 1998). I followed this reference to the author and received a copy from Gilbert Nartea who is an academic at Lincoln University. Basanta was a Masters student at the time. Nartea and Basanta stated on Table 1 of their paper that the mean rate of capital gain was 12.90% for dairy farms and 11.84% for farm real estate. The period was 1966 to 1996. Dairy farm production had a mean rate of return of 1.49%. It should be noted that over a reasonable timeframe (10 years plus) the mean return is always higher than the compound return. The compound return is what the investor really receives. I emailed Nartea to confirm whether the figures included inflation but received no reply. I am confident that the returns quoted are nominal. This paper researches this information.

The compound inflation rate from 1966 to 1996 was 8.8% and therefore the real capital gain on dairy farms was approximately 4.1%. Interestingly this ties in very closely with Shadbolt's analysis that farm land owners have to make a 3.82% increase in land values to have the same equity/profitability

benefits as a sharemilker. This may be irrelevant but it demonstrates the equitability within a sharemilking agreement.

In short, what is the historical increase in farmland values? Although data was not easy to find the following work demonstrates a reasonable snapshot of dairy land capital gains.

Methodology

It was hard to source good historical data for farm prices. However Livestock Improvement Corporation (LIC) reports quoted farm sales and mean prices and therefore data could be extracted from 1978 to 2004.

The data available was:

- Number of farm sales
- Average farm sale price (\$)
- Average farm size (hectares)
- Average cost per hectare (\$/ha)
- Average milk-fat payout.

The data was adjusted, as considered by LIC, to account for the rate of inflation based on the 2004 year. The inflation figures were based on using the Reserve Bank of New Zealand (RBNZ) inflation calculator and were always calculated on the quarter 4 figures.

Results

Table 1 shows the details of the land values and milk-fat calculations. Tables 2 and 3 show the results of *before* inflation and *after* inflation compound returns for the 26 years in consideration.

In Table 1 it can be seen that the average farm sold in 1978 for \$95,743. If we allow for the effect of inflation over the next 26 years (6.1% per annum) then the farm would be worth \$447,148 in 2004.

To calculate the real capital growth the adjusted price was then compounded by X% until the 2004 value was reached. For this example the compound rate is 4.96% to get from \$447,148 to \$1,575,882.

This methodology was applied to all years. Using 1978 until 2004 as the example we find that if a farm was purchased in 1978 then:

- Annual increase in sale price was 4.75%
- Average farm size increased by 82%
- Annual real increase per hectare is 2.54%
- Annual return of milk-fat price was 0.92%.

However this will only apply for a minority of farmers who purchased in 1978 and sold in 2004.

If it is assumed that farmers purchase dairy land for the medium to long-term of at least 10 years how do we examine the results? Tables 2 and 3 now show a matrix of compounding returns for actual farm prices and inflation adjusted returns on a hectare-age basis respectively. The left column is the year the farm was purchased. The columns show the year the farm was sold. For example, in Table 2, if the farm was bought in 1982 and sold in 2000 the compound nominal return would be 1.56%. For the same years, for the inflation-adjusted return, the result would be -0.84%.

It is assumed that milk-fat payout will service debt, cover maintenance and wages and pay the farmer a living wage. If the farm were bought in 1994 the real return per hectare would be 6.27% gross or 2.88% inflation adjusted. The best returns would have been by purchasing in 1991 where the full returns today would be in excess of 6.69%. Long-term (20 years plus) full returns are 0-3% depending when the purchase was made.

It should be noted that between 1978 and 2004 the compound rate of inflation was 6.1%.

Table 3 shows that for investments greater than 10 years the real return is in the range -3.98% to 6.53%. For greater than 20 years the real return is 0.51% to 2.90%. Although there is no overall regression to a mean for any period of time, probably due to the data set being too small, the longer a dairy farm is held as a land investment the less return it gives.

Summary

The following is a summary of some of the results for inflation-adjusted data.

- Table 1 shows that the nominal farm price compound return from 1978 to 2004 was 4.96%, the annual mean was 5.81% and the standard deviation was 13.39%
- Table 1 shows that the real farm price per hectare compound return from 1978 to 2004 was 2.54%, the annual mean was 3.38% and the standard deviation was 13.63%
- Table 1 shows that the real milk-fat compound return from 1978 to 2004 was 0.92%, the annual mean was 1.76% and the standard deviation was 13.54%.
- There was a period of negative returns if farms were bought between 1978 and 1985 and then sold between 1986 and 1992.
- Double-digit returns occurred 46 times out of 288 possibilities if farms were bought and sold. 13 times there was a negative double-digit loss.
- The cheapest year for purchasing farms was in 1988. The real compound return in 2004 for this purchase is 6.08%.
- If a farm were held for 10 years or more then the best return would be 6.53% and the worst -3.98%.

Asset Class Comparisons

For the period 1978 to 2004 and adjusted for inflation.

- US Micro Cap Stocks made 11.20%
- S & P 500 Index made 8.90%
- US Government Bonds made 5.30%
- Dairy land per hectare 2.54%
- *US Inflation was 4.3% compared to NZ inflation of 6.1%*

In this case New Zealand return had a 1.8% hurdle rate and even long-term government bonds exceeded dairy land returns.

For the period 1989 to 2004 and adjusted for inflation the:

- US Micro Cap Stocks made 11.10%
- S & P 500 Index made 9.00%
- US Government Bonds made 6.90%
- Dairy land per hectare 6.24%
- Fully diversified with 95% in equities 9.67%
- Fully diversified with 35% in equities made 8.72%
- *US Inflation was 2.9% compared to NZ inflation of 2.1%*

For this period the US return had a 0.8% hurdle rate to compare with New Zealand. However all asset classes exceeded Dairy farm returns. The global 35 portfolio had a return of 8.72% with a volatility of 8.88%. Likewise dairy land had a return of 6.08% with a volatility of 11.86%. Hence the fully diversified portfolio with 35% in equities had a superior return and less risk.

Key Points

- It is often quoted that actual farm prices have risen rapidly but the mean farm size has increased by 82% since 1978. The farm sale price is misleading and the hectare rate is more significant for a returns basis.
- For a farm bought in 1978 the compound return has been 2.54% with a standard deviation of 13.63%, inflation adjusted.
- For farms owned for greater than 20 years the nominal return on farm prices ranges from 2.16% to 4.24% while the real hectare return ranges from 0.51% to 1.41%. Therefore the assertion by Shadbolt of an 11% historical return cannot be substantiated.
- For the period from 1989 to 2004 dairy land underperformed the following asset classes by the following percentages. The differential for inflation has not been included because money is still expected to be spent in New Zealand. Growth of \$100,000 in dairy land grew to \$247,000.

US Micro Cap Stocks	4.86% (\$485,000)
S & P 500 index	2.76% (\$364,000)
US Government Bonds	0.66% (\$272,000)
Fully diversified with 95% in equities	3.43% (\$399,000)
Fully diversified with 35% in equities	2.48% (\$350,000)

Conclusion

The limited amount of data available has allowed for an analysis of farm prices against the assertion that they grow in value at 11% per annum long term. This is clearly not the case.

As an investment fiduciary my responsibility is to consider all asset classes to assist trustees create a diversified portfolio to meet the needs of their beneficiaries. Clearly dairy farms are part of the economic base for private families as well as New Zealand but it is important not to read too much into simple statements without looking at long term statistics.

Overall dairy land has done poorly over the past 20 years compared to a basket of other asset classes. How we use this information for the next 20 or so years is a challenge for us all.