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Is New Zealand farm land worth what it will produce?

Bob Hargreaves and Iona McCarthy*

Economics and Finance Department

Massey University

Palmerston North

New Zealand

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Abstract:

The availability of cheap credit coupled with an increased demand for agricultural commodities resulted in a recent bubble in farm land values in New Zealand. Although the market has corrected somewhat there is still an underlying structural problem with farm land values as the New Zealand taxation system presently encourages farmers to accept low capitalisation rates in return for tax free capital gains. The authors note that while some of the increases in farm land values can be justified by increased productivity the application of fundamental price earnings ratios suggests further downward adjustment in farm land values is likely.

- R.Hargreaves@massey.ac.nz

Introduction

The recent world financial crisis originated in United States as a result of permissive lending practices by bankers and other mortgage originators. The availability of low-cost credit without too much consideration of the borrower's ability to repay loans initially led to a boom in real estate prices. House prices led the boom and were followed by escalating prices for commercial and rural real estate. A similar boom was seen in the real estate markets in New Zealand. Farm land prices increased both as result of cheap credit and as a result of increased world demand for agricultural commodities. The main commodity price drivers in agriculture were the United States bio-fuel policy based on turning corn (maize) into ethanol and increased demand in developing economies in Southeast Asia for milk protein products. There was also an element of speculation with traders and hedge funds operators using complex financial derivatives to purchase agricultural commodity futures. Speculation had the initial effect of driving commodity prices up but the credit crisis resulted in reduced liquidity and increased volatility. Consequently many speculators were forced to exit in a falling market. Speculation was reduced when the world recession deepened and credit was restricted.

While the rural financiers in New Zealand did factor debt servicing ability into lending decisions there was an expectation of continued capital growth and sometimes risky lending took place. Part of the problem was that rural lending institutions were all competing for market share and their staff bonus systems were incentivised to reward staff who increased their lending volumes. Independent banking expert Tripe (2009) used strong words to criticise bank lending practices: “Where it’s been really criminal is in the farming sector.”... “They’ve had some unrealistic views of the riskiness of some of the business they’ve engaged in.”

Research by Eves and Painter (2008) compared farm land returns from Australia, Canada, United States and New Zealand. They noted that since 1990 the price of New Zealand farmland averaged 40 times earnings and expressed doubts about the sustainability of such a high price earnings ratio when compared to ratios of between 15 and 26 for the three other countries. Locke (2009) pointed out that based on the current milk payout a \$6m dairy farm with a \$2m mortgage at 9 percent interest

would make a seasonal loss of \$130,000. The Reserve Bank (2009) questioned the sustainability of agricultural debt levels, particularly for dairy farms which appeared to be at the most risk. The Reserve Bank noted total rural debt increased 30 percent in 2007 and 2008 with dairy farm debt increasing 61.5 percent.

The next section of this paper deals with the financial returns from farming, followed by a section considering past periods when the government intervened in the rural market. This is followed by a section on how participants in rural markets formulate their price expectations and then a section on the real estate cycles followed by sections about valuation methodology and the future challenges facing agriculture in New Zealand. The final section contains the conclusions.

Returns from Farming

Economics teaches us the present value of a farm is equal to its discounted future earnings. It is necessary to define earnings from farming. Farmers typically see earnings from two sides of the business. Firstly, net cash flow from the business of farming and secondly cash flow from property investment, that is land ownership.

An ongoing problem with farming in New Zealand is the business of owning land has been far more profitable than the business of farming. For example, the capital gains from owning dairy farm land prior to 2008 exceeded 10% per annum compounded. During the same period the returns from the business of dairy farming have typically returned 2%-3% per annum. This is not to say farming is inherently unprofitable but simply the high price of farmland makes it difficult for owner operators to achieve cash flows beyond 2%-3% per annum. The benchmark summaries for the 2006/2007 season from the Dairy New Zealand Dairy Base (2009) website shows the average owner operator made a 2.8% return on dairy assets while for the same period the average sharemilker made an 8.3% return on dairy assets.

According to Meat and Wool New Zealand (2009) the situation for hill country sheep and beef farmers in New Zealand was worse than their dairy farming counterparts. The average rate of return on total farm capital employed in hill country farms over the period 1999 - 2008 ranged from -0.03% to 4.6%, with an average of 2%.

In times of low commodity prices the problem with highly leveraged farmers being asset rich and cash poor is accentuated since farm disposable incomes may be below debt servicing requirements. During these periods it is common for farmers to say: 'land should be worth what it will produce' and 'land is overpriced'.

In the current situation of low commodity returns it is inevitable that farm land prices have come under downward pressure. Federated Farmers spokesperson Bruce Wills (2009) predicted some New Zealand farms could lose 30 percent of their value. McLeod (2009) took a less pessimistic view noting from Real Estate Institute statistics a 7½ percent reduction in the 3 months to May 2009. The most reliable indicator of movements in farm land values is the Quotable Value (2009) farm price index. Due to delays in recording sales data and low rural sales volumes the farm price index lags the market by up to 6 months, but declines in the index started to show up early in 2009. For example, the average price per hectare of dairy farms decreased by 10.6% in the half year ending June 2009.

At the time of writing dairy farms sales volume has decreased significantly with the Real Estate Institute (2009) reporting nil dairy farm sales in New Zealand during the month of August, down from 20 in the same period in 2008 and 19 in 2007. Decreased sales volume is an important leading indicator in real estate cycles, signalling downward pressure on prices due to the mismatch between higher vendor expectations and lower bids by purchasers.

Historical Perspective

So what happens when it all gets out of hand? Can farming for capital gains continue indefinitely? Perhaps history can provide some guidance? Should the government intervene as it has in the past?

Under 1935 State Advances Act the government-owned State Advances Corporation was instructed to value farm land on the basis of its productivity. Similarly under the 1936 Mortgagees and Lessee's Rehabilitation Act the income approach to valuation was used to assess the debt servicing capacity of farmers. In some cases mortgagees

had to write down the principal owing under the mortgage to meet the farmer's debt servicing ability. Of course this legislation was very unpopular with lenders and was soon repealed. The 1943 Servicemen Settlement and Land Sales Act fixed the price of farm land at 1942 values until 1951. The rationale for the legislation was so the soldiers going away to World War 2 would not be disadvantaged by increases in land prices. Farm land transactions during this period had to be approved by the Land Sales Court on the basis of productive valuations using a capitalisation rate of 4.5% and an agreed system of costs and pricing.

One of the problems with intervening in the market and controlling the price of land was that eventually the legislation had to be repealed and the market allowed to operate. Vendors were well aware that the price of land was likely to go up once the land sales era finished and so there were a number of circumstances where “dodgy transactions” were alleged to have occurred. Thus there was the official price, as specified by the Land Sales Court, but sometimes an additional illegal payment made to actually secure the vendors signature.

The most dramatic reduction in rural land prices over the last 50 years occurred during the so-called ‘Rogernomics’ restructuring during the 1980s. At this time almost all farming subsidies were removed and price of remote hill country farms fell by up to 60% in nominal terms during the downturn. Dairy farms were less affected because they were not subsidised to the same degree as sheep and beef farms. However, when inflation is taken into account the drop in the dairy farm index from 1984 -1987 was 45% in real terms.

Formulating Price Expectations

Johnson (1969) identified the difficulty farm buyers have when trying to estimate Future agricultural commodity price trends and the effect of these on farm land prices. His research found periods of reduced volatility in farm incomes led to increased farmer confidence and lower capitalisation rates increased land prices. The research period of 1954-1969 was characterised by various industry and government schemes aimed at smoothing payouts to farmers. Johnson found when formulating their bid prices farm buyers appeared to place most emphasis on income in the year just past. Currently some dairy farmers are facing major difficulties because they purchased

farms when the milk payout was \$7.90 per 1 kg of milk solids in 2007/2008 and a year later the forecast payout was \$5.20. The forecast payout has since recovering somewhat to \$6.05 for the 2009/2010 season but debt servicing difficulties remain. Leathers & Gough (1984) also investigated the pricing of farm land in New Zealand. They rejected the hypothesis farm land was overpriced. However, they noted the emphasis on deferred earnings (capital gain) created a distortionary effect leading to the same sort of liquidity and debt servicing problems evident in 2009.

Although markets usually get prices right in the end, in the short and medium term markets sometimes get things very wrong. An extreme example was reported by Hutchison et al (1997). In Japan in 1988 at peak values the Emperor's Palace in central Tokyo was worth more than all of the land and developed property in California. The land and gardens comprising the Emperor's palace consists of around 2.37 square kilometres (237 ha.), the State of California in the United States is 423,790 square kilometres (42.37 million ha) and in 1988 had a population of 25m. At the same time the total market capitalisation of Japanese shares exceeded the value of all Wall Street by ratio of 5 to 3 at a time when Japanese economic output was only one third of that of the US. With the benefit of hindsight it is obvious the market got it badly wrong.

More recently behavioural school economists led by academics such as Akerlof and Shiller (2009) challenged the efficient market hypothesis. They argued markets can sometimes appear to act quite irrationally, due to psychological factors (animal instincts) resulting in large swings in consumer confidence. Shiller (2005) showed very high price earnings ratio in relationship to long term averages led to market corrections. He accurately forecast “irrational exuberance” leading to both the dot-com share market bust and the 2007 correction to the US housing bubble. Akerlof and Shiller went on to argue a case for “the steady hand of government” being used to provide an improved framework for markets to operate under.

Farmer incomes are determined by both the price of agricultural commodities and the volume of commodities produced. The traditional income approach to valuation assumes the net operating income is capitalised in a ‘typical year’ but does not account for increasing productivity over time, the economies of scale a farmer adding

more land may be hoping to achieve, “excess demand” from city based investors seeking a tax shelter and changes in the highest and best use of the land to a more urban usage.

The reality is that in New Zealand pastoral farms have continued to get larger and more productive on a per hectare basis. Hall and Scobie (2006) estimated farming productivity increases of around 3 percent per annum compared with productivity increases in the rest of the economy of less than 1 percent per annum. Some of these productivity gains have resulted from improvements in plant and animal genetics and better management systems. Other improvements have relied on intensification by increased use of nitrogen fertiliser and supplementary feed.

Farm Real Estate Cycles

Figure 1 shows a stylised matrix developed by Hargreaves and McCarthy (1995) describing the six-stage rural real estate market and the various drivers of this market.

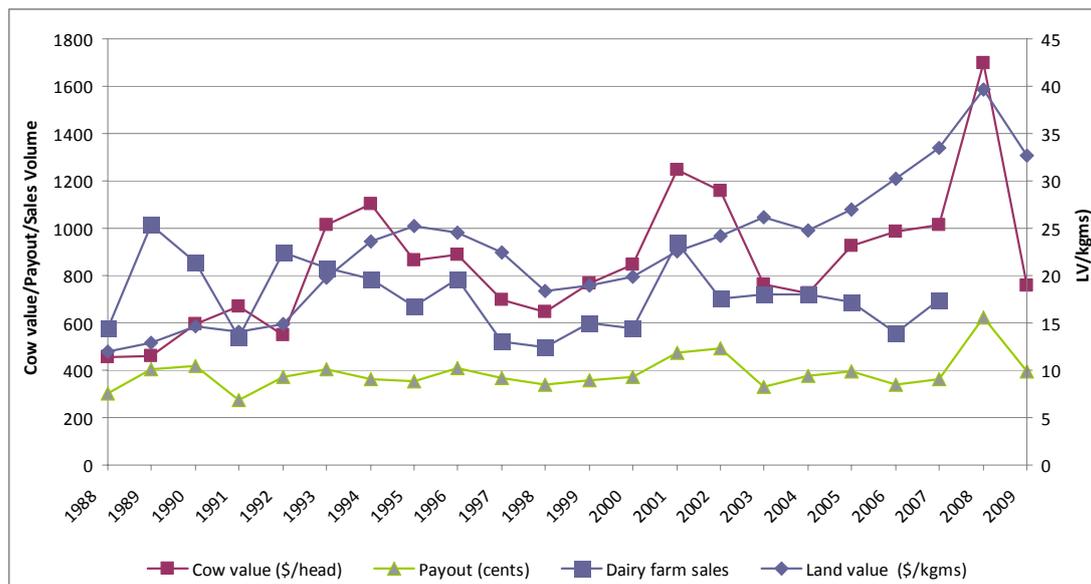
Figure 1

Farm Real Estate Cycles						
Factor	Stage 1 Trough	Stage 2 Upturn	Stage 3 Boom	Stage 4 Peak	Stage 5 Downturn	Stage 6 Recession
Farm Profitability	Weak, some losses	Improved overseas product prices	Continued improvement	Decline	Continued Decline	Losses are common
Sales Volume	Static, slow turnover	Increasing	Peaks	Decline	Continued decline	Volume low
Listing Time	Long listing time	Time to sell decreases	Listing time short	Longer listing time	Farms hard to sell	Long listing time
Farm Prices	Static	Increase	Rapid Increase	Vendors offer attractive financing to keep prices up	Decreasing	Continue to decrease
Lending Criteria	Finance hard to obtain	Relaxed slightly but relatively expensive	Easy credit at favourable rates	Credit tightens, interest rates increase	Credit continues to tighten	Credit difficult to obtain and expensive
Buyers Attitudes	Farms not seen as a good investment	Existing farmers can afford to expand	Rapid capital gains encourage more buyers into the market	High prices for farms and poor outlook reduce returns and buyer interest	Why purchase in a falling market?	Some bargains available for existing farmers
Sellers Attitudes	Most sellers still under financial pressure	Backlog of unsold farms decreases. New sellers have higher expectations	An excellent time to sell	Still a good time to sell	Strong vendors withdraw from the market	Financial pressure to sell on many vendors

Farm profitability and sales volume consistently provide leading indications of changes in the real estate market. For dairy farms the most obvious indication that farm values are going to change are forecast changes in the payout. An expectation of an increase or decrease in payout is reflected in dairy farm sale prices and also reflected in the price paid for capital dairy stock. Volume of farm sales also provide an indication of change in price in the dairy farm market.

The length and magnitude of dairy farm real estate cycles is hard to predict but Figure 2 shows that the average length has been more than 10 years over the period from 1988 to 2009. Figure 2 shows the relationship between the real Quotable Value Dairy Farm sale price, payout, cow sale prices and annual dairy farm sales volumes. The key points that can be ascertained from Figure 2 are that payout, cow prices and farm turnover lead real estate prices both on the upside and downside of the real estate cycle. Farms are getting bigger and thus over time the number of dairy units and volume of dairy farm sales is declining but within this there are still cyclical turnover patterns. Increases in the dairy farm payout quickly get capitalised on to the price of land but decreases in payout take much longer to affect the land prices.

Figure 2

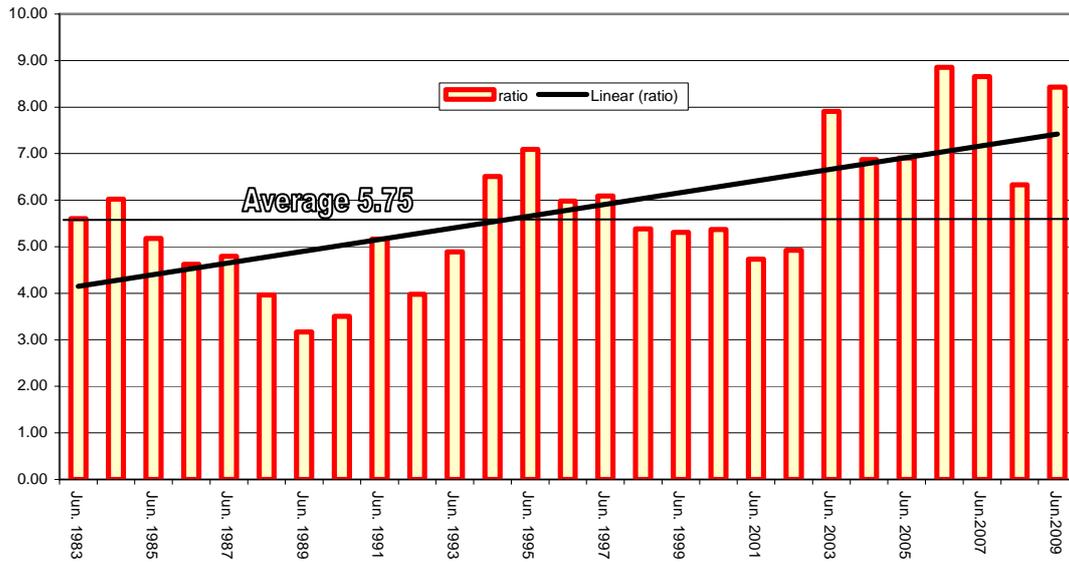


Government intervention in the form of light handed regulation could result in more sensible loan to value ratios and greater emphasis on debt servicing ability, thereby helping to avoid future farm price bubbles. However, the rural market will continue to demonstrate cyclical effects just so long as New Zealand farmers are subjected to the ebbs and flows of international commodity prices, currency fluctuations and some farmers continuing to use last years' price as a proxy for future prices.

The bar graph in Figure 3 shows the annual ratio of the price farmers pay per kg of milksolids to purchase dairy farms and the milk solids payout per kg. Over the period June 1983 to June 2009 the ratio averaged 5.75. Periods when the ratio was lower than 5.75 represented good buying. The upwards sloping trend line shows the annual income from the business of farming steadily decreasing in relation to the price paid for dairy farms.

Figure 3

Ratio of Price Paid per kg ms to Payout



Valuation Methodology

Inevitably, valuation methodology has come under scrutiny and questions have been raised about the most appropriate basis for the valuation of farm land. Currently there are three standard approaches to the valuation of farmland; (Murray 1969, Frizzell 1979, American Society of Farm Managers and Rural Appraisers and The Appraisal Institute 2000). These are the comparable sales approach, the replacement cost less depreciation approach and the income approach. Normally valuers use at least two of the three approaches when compiling a rural valuation. The comparable sales approach is where like is compared with like and operates across many markets including farms, housing, the sharemarket, animal sales and plant and equipment sales. This approach works particularly well when there is plenty of recent sales information. The main difficulty with applying comparable sales to the valuation of farmland comes down to the heterogeneous nature of farms. No two farms are exactly alike and the rural market often has relatively few recent transactions. The skill of the rural valuer is in being able to make adjustments for the differences between sale properties and relate this back to the property being valued. Although valuation is an inexact science rural valuers do have the experience and judgement to make these adjustments.

The second approach is the replacement cost less depreciation method. This method involves calculating the added value of the improvements and adding this to the land value. The added value is estimated by calculating the replacement cost of each improvement and then deducting an amount for depreciation. There are strong market elements contained in the replacement cost less depreciation method because the historical cost of land is usually irrelevant and the current value has to be estimated from comparable sales of land exclusive of improvements. Similarly there are no textbooks available to assist a valuer with estimating how much depreciation to deduct as the rate of depreciation is driven by the market and keeps changing.

The third approach is the income or productive approach. This approach requires the valuer to do a productive budget. The surplus brought from the budget is capitalised to arrive at the productive valuation. The linkage between the income from an asset and its value is the capitalisation rate, or yield. After capitalising the income stream the valuer needs to adjust the valuation for the quality of both the locality and improvements. Farms closer to town typically sell for more than farms that are further away. Furthermore, improvements which may not add to the productivity of the farm can have an impact on the value. For example two farms may be identical in all respects except that one has a million-dollar house and the other one a house worth \$100,000. The income approach also has some strong market elements. Unless the capitalisation rate used in the income approach is market related then the valuation may not relate to what is actually happening in the market place.

The current reality is that the valuers employed by lending institutions tend to rely on the comparable sales approach, use the cost less depreciation method as a backup method and for the most part ignore the traditional income approach to valuation. However, it is true that various gross income estimates are widely used by buyers and sellers as well as valuers. For sheep and beef farms the price paid per stock unit is the typical gross income metric. The equivalent metric for dairy farms is the price paid per kilogram of milk solids. Like many rules of thumb, gross income estimates present some real dangers when too much reliance is placed on this approach. For example, consider two dairy farms with identical per hectare production but the first dairy farm may achieve this without the use of supplementary feeds and wintering off and make minimal use of nitrogen fertiliser. Clearly, if the second farm makes use of

wintering off and supplementary feed then the first farm would be expected to sell for more on a per hectare basis.

Part of the reason the traditional income approach to valuation has not been used very much over the last 20 years relates to the fact it is time consuming. However, the advent of modern computers and computer spreadsheets now makes it possible to speed up the computational aspects. On line farm data bases for the main farming types and regions also provide essential industry cost and price information.

It is worthwhile reviewing the theoretical concepts underlying the income approach. The income approach budget for valuation purposes puts the farm in a static or status quo budget position. This means the fertility of the farm remains constant as do the numbers and genetic merit of the animals, improvements are maintained in their present state of repair, and the costs and prices used in the budget will not necessarily be current market prices if it appears that these are out of line with long run prices. This budget also uses the concept of the average efficient farmer. The average efficient farmer is not easy to define, but usually thought of as the average of the top 50% of farmers. The reason for this is that the less successful operators are more likely to be exiting the industry. Conversely, if the valuer is valuing a farm where the current operator is achieving production of 10% beyond what anyone else could achieve then clearly this level of management could not be used in the budget because once this very efficient manager sells the extra production would be lost. The productive budget is not a cash forecast budget because it provides for depreciation in order to maintain improvements and plant and machinery in a steady state. According to Heady (1952) the economic concept behind this approach is to reward all of factors of production according to their marginal value product, or market value. In the case of the reward for management this will not be the nominal amount that might be used by lending institution to calculate farmer's drawings but would be the amount it would cost to hire an outside manager. If the management factor was under awarded and the surplus inflated by this amount, this would be capitalised into the value of the land and the result in over valuation. Similarly the contribution of the stock and plant is assessed by valuing these items and then charging interest, at a rate that reflects the higher risk, on this value against the budget.

A derivative of the traditional productive approach is the bid price method as described by Klemme and Schoney (1984) and Leathers and Gough (1984). The bid price considers the valuation from the point of view of a potential purchaser. The bid price equals the productive value plus investment value. One of the strengths of this method is that it is forward looking and forces potential buyers to consider the value of a farm on the basis of productivity. When entering a period when there is little capital gain (and possible capital losses) ahead this seems like a prudent approach.

Thus the first part of the bid price method is to ascertain the productive valuation using the budgetary concepts discussed above. In this case the capitalisation rate used is the real after tax of cost of capital weighted for the influence of equity and borrowing. For example, with a 50% debt/equity, current debt funding at 7% and an after tax return to equity of 3% then the capitalisation rate is 5%. The investment value is calculated by discounting the likely selling price at the end of the holding period back to present values. In this case the discount rate will be the same as the capitalisation rate. In the current market care would have to be taken on assessing the likely selling price, historically there has been a 10% annual growth but values have decreased in the past in real terms when farm returns dropped.

A significant difficulty with the capitalisation approach occurs with valuing land uses with fluctuating income streams as might be found in horticulture and viticulture. In these enterprises there are usually negative income streams for several years during the development and establishment phases. As the trees or vines mature yield increases cash flow becomes positive and then gradually decreases as the trees/vines age, and newer varieties are preferred in the market. In this type of situation the discounted cash flow method is the most theoretically correct valuation technique to use.

The Future Outlook for Farm Land Values

Based on price earnings ratios farm land in New Zealand currently appears to be overpriced. A market correction is underway but this may not be as severe as some commentators are suggesting because of the inescapable population pressures that Malthus identified and the demand for bio-fuel crops accentuating the shortage of

arable land used for food production. For example, during the period 1960-2000 on a world wide basis, the amount of arable land per person reduced by 44% to 2500m². Couple this with looming water shortages in countries where agriculture is affected by changing weather patterns and reduced snow melt caused by global warming. In addition, the increased demand for water by industry and cities means farmers are consistently outbid for water rights. The net result provides competitive advantage to high rainfall countries such as New Zealand where agriculture is largely based on pastoral agriculture. Also, the world demand for the protein products (milk, meat and fish) New Zealand is good at producing is increasing due to rising middle class wealth, particularly in India and China. Furthermore concerns about the pollution to the environment resulting from factory farming operations favour less intensive pastoral farming systems.

Of course scientists may use genetic engineering to come up with another “green revolution” by producing high yielding ‘miracle’ crops. However history shows that increased crop yields from improved crop varieties come at the cost of higher inputs of artificial fertilisers.

Future improvements in productivity are likely to become more difficult due to concerns about the environment damage to the rivers and streams resulting from the waste water discharges produced by intensive farming systems. There is also the question who pays for mitigating global warming and the contribution to greenhouse gases from farm animals.

Logically the need to mitigate emissions from agriculture is likely to have negative influence on future farm land prices. Currently just under 50 percent of New Zealand’s total greenhouse gas emissions are derived from agriculture. When agriculture is phased into the proposed emissions trading scheme in 2015 farmers will have to start paying for greenhouse gas emissions and this will reduce their cash flows. Certainly scientific developments in a farm carbon sequestration and the use of nitrogen inhibitors will reduce the present level of emissions but there will still be a cost to be borne by farmers.

Conclusions

As a result of tighter credit for farmers bank managers are likely to pay much more attention to cash flow. The old sayings that “cash flow is King” and “near cash flow is worth more than future cash flow” will become particularly relevant. Budgets where bankers stretch the rules and factor in interest only loans and capital gain are likely to be a thing of the past. However, it is not all doom and gloom for investors, history shows that the rural property market is surprisingly resilient in periods of downturn. Smart farmers can influence supply by delaying retirement and minimising the number of farms on the market during tough times. Such actions help to underpin the price of land. In addition, there is only a certain amount of land and strong operators continue to enlarge their operations and compete among themselves for land.

The rural market is also influenced by the urban market. The ongoing demand for lifestyle blocks within commuting distance of towns and cities gives farmers the option of either selling their farm to another farmer, or subdividing and selling lifestyle blocks. There is also a ripple effect when the farmer close to town sells and buys another farm outside the commuting zone thus injecting more capital into this market. Then there is the question of highest and best use to other farm and horticultural endeavours. While dairy farming is currently the highest and best use of much of the better land in New Zealand this will not always be the case. With water shortages looming in the drier parts of the country it seems likely the most efficient use of this resource will be for sustainable horticultural and arable activities.

The reduction in farm prices during 2009 supports the contention that farm land has been over priced in relationship to its earning capacity. Continuation of the normal ups and downs of rural property cycles seems inevitable given New Zealand farmers exposure to the volatility of world markets. However, lending institutions do have the power to avoid fuelling property bubbles if they adopt more prudent lending criteria. History shows most banks are unlikely to act prudently in times of easy credit because they are all competing for market share. Fortunately moves are under way in New Zealand for the Reserve Bank to require trading banks to increase their reserve asset ratios thereby reducing the amount of available credit.

While the market approach to the valuation of farmland has stood the test of time and is upheld in the Courts it is essentially a backward looking approach. Valuers are sometimes accused of driving forward while looking in the rear vision mirror. In volatile property markets it is also important to look ahead at future cash flows and likely changes in property values. The income approach to valuation, the bid price method, and discounted cash flows are forward-looking approaches. The authors recommend these approaches be incorporated into buyer calculations and valuation reports.

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