Financial viability – a long-term view

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Abstract

Farm profitability is under pressure, with depressed product prices and a rising exchange rate combining to reduce farmer incomes. While exchange rate movements do affect short-term profitability, long-term trends have a much greater effect upon farm profits. While commodity prices are cyclical, over time they fail to keep up with inflation. An analysis of international commodity prices from 1949 to the present day demonstrates a reduction in real terms for all agricultural commodities. An analysis of prices received by New Zealand farmers since the 1950s shows a similar trend. The efficiency of sheep production, measured as lambing percentage and wool weights, has not demonstrated the improvements achieved by other sectors. Milkfat production per cow has doubled over the past 80 years, broiler chicken feed conversion efficiency has doubled over the past 20 years, wheat yields are two and a half times greater now than 70 years ago, while lambing percentage and wool weights have not significantly improved since 1950. Sheep and beef farms maintained profitability by increasing stocking rate and stock numbers per labour unit, and diversifying into more profitable stock, such as deer. The pressures facing farmers in the mid 1990s are being faced by other farmers elsewhere in the world, and have existed since intensive farming began in New Zealand. To farm profitability today, as in the past, farmers need to continue to capitalise on technology, and modify farm outputs to match market demand, at a greater rate than competitors.

Keywords: agricultural profitability, agricultural production, commodity prices, New Zealand

Introduction

Many family farms in New Zealand are facing long-term sustainability problems. Fluctuating nominal but declining real product prices mean many farmers have insufficient income to fully maintain their properties, meet debt servicing and capital requirements, and meet personal drawing needs. The current high interest rates, and the upward pressure that they put on the exchange

rate, contribute to the problem, but the issue is more fundamental and long term.

This paper demonstrates that while a high exchange rate and the cyclic nature of product prices are important to short-term profitability, they disguise more significant long-term trends.

Exchange rate

Over the long term, the key drivers of the New Zealand exchange rate are our inflation rate relative to that of trading partners, and our productivity growth relative to that of our trading partners (Brash 1992; Davison 1995). For example, over the period 1975–1986, our annual inflation exceeded that of our trading partners, and our exchange rate followed accordingly (Figure 1). Davison reported that 94% of the variation in exchange rate for the period July 7.5 to March 96 can be attributed to New Zealand's inflation rate, relative to that of our trading partners.

Figure 1 Relative CPI and nominal TWI, quarterly averages, March 1970 base. (Source: Reserve Bank)

However, there are cycles within that long-term trend, and when the exchange rate is moving downward relative to the inflation rate, such as the period 1988–1991, this does provide improving returns for exporters, while pushing up the price of imports. However, the counter-cycle of an increasing exchange rate has the opposite effect, such as the period 1992 to the present.

In addition, the proportion of individual commodities sold in various countries can vary from the overall basket which makes up the trade weighted index. For

example, because beef is predominantly sold in \$US, if the \$NZ appreciates against the \$US dollar at a faster rate than against the TWI basket, then the price received in \$NZ will fall, even if the TWI exchange rate, and New Zealand inflation, are stable. Figure 2 illustrates the impact for lambs, mutton, beef and wool, and is the basis for farmers' legitimate concern for the effect on their net returns of the appreciation of the \$NZ against other currencies.

International price trends

The prices for agricultural products, like all commodities, are cyclical. Factors such as climate effects, world stocks, international trade policies, and economic recessions, combine to push product prices up and down. All farmers are acutely aware of these cycles and their impact on farm profitability. However, all too often, cycles and trends are viewed over a short time period (6 months to 5 years). Figure 3 and Table 1 show the international market price for 12 common agricultural commodities.

Figure 3 clearly demonstrates the cyclic nature of all commodity prices. It also demonstrates the failure of international prices to keep pace with inflation.

The same trends occur in non-agricultural commodities, for example, steel, coal, and computer chips.

As technology allows one to produce greater quantities, and at cheaper prices, so it does for one's competitors, who are providing similar products, or substitution productions. Changing lifestyles and customs, political and trading relationships, and inelasticity of supply also contribute. For example, factors influencing the price received for New Zealand wool include: reduced price and improved quality of synthetics; trend to better-insulated homes and central heating reducing need for warm clothes; fashion changes; demands from China; and inability of Australian and New Zealand farmers to reduce production in the short term.

Note that the real prices of beef, butter, and lamb have held relatively well compared with the price of wool and other commodities.

Figure 2 Trade weighted index comparison. for each commodity, the relative exchange rate is weighted according to value of product sold to each country, indexed to 1985. (Source: Meat and Wool Boards' Economic Service 1996)

Figure 3 World commodity price trends, nominal vs real. The thin line shows the nominal price fluctuations from 1950 to 1994, measured in US currency. The thick line adjusts the nominal price for inflation, as per the US domestic CPI, index to 1975.

New Zealand price trends

Net prices received by farmers in \$NZ for output commodities follow similar trends, as illustrated in Figure 4 and Table 2. Exchange rate movements give short-term variation from international price trends. Changing production systems, or new technology, or marketing incentives, may add value by changing to a more valuable product, or achieve better residual margin for farmers, thus improving returns.

However, it is inevitable that the downward trend in international prices when measured in real terms will inevitably reduce the net price received by farmers.

Production trends

Figure 5 and Table 3 illustrate trends in key production parameters over time. Of concern to sheep farmers is that in the past 65 years, New Zealand's lambing percentage has lifted by only 20%, and there has been no significant change in wool production per head since 1950. By comparison, dairy production per cow has almost doubled in the last 80 years, wheat yields are two-and-a-half-times greater than what they were in the 1920s, and broiler chickens eat 50% less food today than they did in 1967 to achieve the same weight gain.

Discussion

New Zealand farmers have been very good at developing and implementing new technologies and systems as a means of maintaining profitability in the face-of-declining real returns. Aerial topdressing, electric fencing, motorbikes, new herbage cultivars and contract shearing gangs are examples of means used to lift productivity per hectare and per labour unit.

A key to improving competitiveness is efficiency per unit of limited resource. New Zealand pastoral farmers have increased production and profit per hectare, while also achieving dramatic increases in stock numbers per person. Although real, changes in per hectare productivity are difficult to quantify. Changes in stock numbers per labour unit can be gauged from the increase in size of dairy herds since 1918 (Table 3 and Figure 5).

Table 1 International commodity prices, nominal and real.

Commodity	Description	Nominal	Real	Year
Bananas	US cents/lb	7.3	1480	1950
	Latin America (US Ports)	11.1	1000	1975
		19.9	649	1994
Beef	US cents/lb	25.5	876	1951
	All origins (US Ports)	60.2	1000	1975
		105.8	637	1994
Butter	US cents/lb	24.0	905	1951
	New Zealand	50.4	1000	1975
		84.5	607	1994
Lamb	US cents/lb	29.4	804	1958
	NZ (London)	67.8	1000	1975
		125.7	671	1994
Jute	US \$/metric tonne	201.0	1033	1957
	Bangladesh (Chilta.-Chalna)	371.0	1000	1975
		466.7	453	1994
Rice	US \$/metric tonne	132.6	801	1950
	United States (New Orleans)	373.0	1000	1975
		466.7	453	1994
Tobacco	US cents/lb	714.6	1381	1952
	United States (All markets)	1842	1000	1975
		2975	585	1994
Cotton	US cents/lb	32.8	1403	1953
	United States (10 markets)	45.1	1000	1975
		73.7	592	1994
Coffee	US cents/lb	50.5	1378	1950
	Brazil (New York)	82.6	1000	1975
		143.3	628	1994
Tea	US cents/lb	51.2	1700	1951
	Average Auction (London)	62.4	1000	1975
		83.2	493	1994
Crossbred Wool	US cents/kg	185.2	1598	1952
	Australia-NZ (UK)	234.5	1000	1975
		319.0	493	1994
Rubber	US cents/lb	41.4	3118	1950
	All origins (New York)	29.9	1000	1975
		48.9	593	1994

Table 2 Trends in prices to New Zealand farmers.

	Description	Nominal	Real	Year
Lamb	PM 14.5 kg	2.63	11.80	1945
	NZ average, \$/hd	4.61	11.05	1960
		7.02	7.02	1975
		32	5.40	1995
Beef	Cow: M grade	36	63	1969
	145.5-170kg, cents/kg	36	36	1 9 7 5
		157	26	1995
Dairy	kg Milk Solids	0.20	1.48	1916
	Average Farm Gate \$/kg	0.36	1.19	1951
		0.40	0.96	1960
		0.75	0.75	1975
		3.40	0.57	1995
Wheat	Forward Contract	53	87.50	1970
	\$/tonne	92	92.00	1975
		288	48.63	1995
Wool	NZ Auction Average	45.8	200	1947
	c/kg (clean)	224	740	1951
		104	242	1961
		128	128	1975
		554	94	1995

A similar trend on sheep farms is masked by the large number of part-time farms.

However, sheep and beef farmers have not significantly improved animal genetics and the ability to turn grass into meat. While some individual sheep farmers are making relatively good genetic progress, the industry as a whole has not. Although a number of sheep farmers consistently achieve a lambing percentage over 160, New Zealand's overall lambing percentage has remained close to 100% since 1950.

Whereas other agricultural systems are concurrently increasing output per hectare or animal, increasing the quality of output, and achieving greater productivity per person, the sheep and beef industry has primarily focused on running greater livestock numbers per person, has expected the processing sector to achieve any product quality improvement, and has achieved little improvement in animal efficiency.

The other significant trend has been the reduction in contribution to net household income from the farm operation. There is a worldwide trend to greater off-farm income, or pluri-activity. For example, in 1949, 39% of farm operators in the United States also worked off-farm, whereas by 1982 this had risen to 54%, and 57% by 1987 (Taylor *et al.* 1995). No research data exist on New Zealand trends, but better roads and vehicles, technology and machinery allow one person to achieve what used to require two. A change in society's perceptions and expectations, and growth in "hobby and lifestyle" farming have also contributed. The net result is less reliance and reduced demand on agriculture for net family income.

Conclusions

The current profitability squeeze, particularly for sheep and beef farming, while very real, is not a new phenomenon. The need to become constantly more

Figure 4 Price trends to New Zealand farmers. The thin line shows the nominal price, and the thick line adjusts the nominal price for inflation as per the NZ Consumer CPI.

Lamb - \$ per head Beef - cents per kg Dairy - \$ per kg
Wheat - \$ per tonne Wool - cents per kg

Figure 5 Physical production trends,

efficient, increase productivity, and improve quality, has existed since intensive farming first began in New Zealand. It is unlikely this trend will stop. There are

Table 3 Physical production trends, New Zealand averages.

	Description	1918	1934	1945	1960	1975	1995
Wool	kg greasy/sheep wintered (kg)		4.5		5.6	5.5	5.9
Lambing%	lambs tailed/ewes wintered (%)	81	87	94	98	93	108
Lamb weight	Average, NZ kill				14.7	14.0	14.8
Dairy production	kg MF/cows in milk, 1 Dec		101	109	124	128	156
Dairy herd size	1918-1945, Settlement block numbers. Thereafter average herd size	20		35	57	117	193
Wheat	Total production/area planted (t/ha)	1.6	2.5	2.6	3.9	3.1	5.5
Broiler chicken	Weight gain in 42 days (kg)				(1967) 0.8	1.28	2.25
Chicken feed	Weight gain on 1 kg feed (gm) (at 1.7kg LW)				(1967) 290	435	600

three choices facing every person relying on farming for their income.

1. Improve value of output through value (i.e., quality).
2. Reduce cost of production through improved economies of scale or productivity efficiency.
3. Accept a lower return on capital and reduce income expectations.

This problem has faced every farmer since the turn of the century.

The positive message for farmers today is to realise that despite the trends outlined in this paper, farmers in the past identified and implemented solutions which were profitable and rewarding. The opportunities and solutions for farmers in 1996 are different to those of 1930, 1950 and 1970.

Every other farmer in the world is faced with the same trends and long-term problems. The biggest profits and rewards will continue to go to those who are the most successful in identifying and implementing appropriate new technologies and systems.

For sheep and beef farmers, the challenges are greater than for other farming sectors. The relatively small gain in production efficiency from sheep and beef animals has resulted in a loss of competitive advantage compared with alternative products and land uses, particularly dairy, cropping, chicken, pork, synthetic fabrics, and forestry. However, those same problems are facing sheep and beef farmers throughout the world, and the challenge is to find and implement solutions before our competitors.

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REFERENCES

- Brash, D. 1992. The exchange rate and monetary policy. *Reserve Bank Bulletin*, 55/4: 324-333.
- Davison, R. 1995. Farm Sector Exchange Rates, Production, Financial Trends and Aggregate Output. *P a p e r No. G2079. Meat and Wool Boards' Economic Service.*
- Davison, R. 1996. Financial Factors affecting the Sheep and Beef Farm Sector 1995-96 End of Season Report. *Paper no. G2102, Meat and Wool Boards' Economic Service.*
- NZ Meat and Wool Boards' Economic Service 1996. Trade weighted exchange rates. Unpublished.
- Taylor, C.N.; Little, H. M. 1995. Means of Survival? A study of off farm employment. Taylor Baines and Associates, pp. 12-13.

OTHER SOURCES USED TO COMPILE TABLES AND GRAPHS

- Agriculture and Pastoral Statistics of New Zealand 1861-1954. Published 1955. Department of Statistics. A14, A15, A32.
- Agricultural Statistics: 1970-71, 14; 1979-80. 72-74; 83-84, 14, 15. Department of Statistics.
- Annual Report of Crown Lands and Mines 1918. *Appendices to the Journals of the House of Representatives, Vol 1, Section C.*
- Annual Report of Department of Lands and Survey

1945. *Appendices to the Journals of the House of Representatives, Vol I. Section Cl.*
- Davison, R. 1996. Economic Position of the meat and wool industries: 1995-96. *Paper No. G2097*. Meat and Wool Boards' Economic Service.
- Financial Budget Manual 1996. Lincoln University. **B251-253.**
- Farm Production Statistics 1966-67. Department of Statistics. p. 22.
- International Financial Statistics Yearbook. International Monetary Fund. 1995, pp. **178-181**; 1992, pp. **164-167**; 1979, pp. 74-77.
- New Zealand Official Yearbook 199.5. p. 572.
- Primary Production in New Zealand. Department of Statistics.: 1948, pp. 141-145; 1956, pp. **154-158**; 1962, pp. 160-164.
- Situation and Outlook for NZ Agriculture, 1991. Ministry of Agriculture and Fisheries: 1991, pp. 43, 50, 55, 63, 85; 1986, pp. 41, 47, 53, 60, 76.
- Willis, K, 1994. The New Zealand Poultry Meat Industry. Published by Enterprise New Zealand Trust as a resource for senior students and teachers.
- US Bureau of **Labour** Statistics 1996. Internet address <http://statis.bls.gov:80/cgi-bin/surveymost>
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