

FARM INVESTMENTS: ALTERNATIVE OWNERSHIP STRUCTURES THAT ADDRESS THE LIQUIDITY VERSUS PROFITABILITY CONUNDRUM

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Abstract

Investing in farmland is fraught with conflicting signals. Oltmans (2001) concludes that while investing in land may generally be profitable it is seldom, if ever, feasible on a cash flow basis. He argues that the non-depreciable nature of land and long-term capital gains are incompatible with the capital recovery terms sought by investors and lenders. He also notes that literature on farmland investment tends to focus on either the returns (profitability) or the cash flow (feasibility) but not on both simultaneously. To assist in the debate it is helpful to split the farm into two businesses that are often, but not necessarily, linked – the property business, where success is measured by changes in asset values over time and is driven by smart purchase and sale decisions, and the farming business, where success reflects effective and efficient sustainable operation of the resource base. By determining the profitability, liquidity and wealth creation for three ownership structures (land leasing, sharefarming, equity partnerships) from the perspective of both the farming entity and the passive investor (property owner or non-managing equity partner) it is possible to identify for each player the measures most relevant to their expectations from the investment and the factors which most influence them. If the assets of the property business and the farming business are owned by different parties there is no need for an aggregate measure of business performance. The challenge is to determine 'fair' returns to each player; is profit, cash flow or wealth creation criteria the basis for such a comparison? For the property business investors the opportunity cost of capital comes from the farming 'rent' and what they believe the property business will deliver over time (many expect at the very least an inflation proof investment). The opportunity cost of capital for the farming business investors must allow for depreciating assets. Historically the property business has outperformed the farming business although its returns have been three times as volatile as farming returns (Nartea and Basanta(1998), Brown (1999)).

Introduction

Investment appraisal is a technique often learned with great difficulty and rapidly forgotten. However it is a very useful tool to evaluate farmland purchase decisions. Considering annual profitability measures only in deciding whether or not to undertake a long-term investment like farmland purchase can be misleading due to the volatility of annual profit and because these measures overlook the nature of farming returns. This paper backgrounds the issue, describes

measures of profitability and financial feasibility for both the property and the farming businesses and proposes solutions to the liquidity versus profitability conundrum.

Farmland Investment

Investing in farmland is fraught with conflicting signals. In an interesting paper Arnold Oltmans (2001) concludes that while investing in land is generally profitable it is seldom, if ever, feasible on a cash flow basis. He argues that the non-depreciable nature of land and long-term capital gains are incompatible with the capital recovery terms sought by investors and lenders.

If these are the facts about investing in land why do people continue to buy land and what makes it worthwhile for them? Or do we agree with those rural professionals who state that farmers are not clear in their investment decisions; are they too influenced by 'lifestyle' factors to make rational decisions? And are non-farmer landowners similarly afflicted with emotional bias in their investment decisions?

Researchers have demonstrated that, historically, farm businesses have achieved attractive returns but is that relevant in today's investment climate? To assist in this debate it is helpful to split the farm into two businesses that are often, but not necessarily, linked – the property business, where success is measured by changes in asset values over time and is driven by smart purchase and sale decisions, and the farming business, where success reflects effective and efficient sustainable operation of the resource base. While property business decisions may determine whether a business still exists or not it is the farming business and its decisions that drive sustainable resource use.

The problem in measuring the aggregate businesses' performance is that success in one business (e.g. capital gain) can cause a measure of apparent failure in the other (e.g. reduced Return on Assets) when, in fact, both businesses could be performing well. This is exacerbated in that returns to land is a principal determinant of farmland price (Cloughley & Journeux (1992). Oltmans (2001) showed that as well as producing current earnings, land is also a vehicle for accumulating wealth so delivers to two common farming goals. With more liquid investments such as shares an increase in their value without an improvement in earnings is often a prompt to sell; similarly an improvement in earnings not reflected in an improved share value is a prompt to buy. While this may seem simple in principle, reported earnings are historical (and not always reliable or comparable) and share values reflect expectations for future earnings; there is still ample opportunity to get it wrong with liquid investments. Land investments are illiquid, not easily reversed nor is it simple to purchase an agricultural land investment. Farming companies listed on the stock exchanges in Australasia have all spectacularly collapsed or redirected their activities away from farming.

Historically the property business has out performed the farming business although returns have been three times more volatile than farming returns (Nartea and Basanta(1998), Brown

(1999)). Nartea and Basanta(1998), and Brown (1999) have shown that farm returns (both property and farming) fluctuate significantly differently to those from stocks and bonds. Both Brown (1999) and Nartea and Basanta(1998) recommend investment in farmland/farming, stocks and bonds in varying proportions as a risk management strategy. Nartea and Pellegrino (1997) showed that 68 per cent of farmland risk could be eliminated through effective diversification; a diverse portfolio of investments (stocks, bonds and farmland) reduced risk to a third of that from farmland alone. Oltmans (2001) referred to recent studies showing total rates of return to farmland comparing favourably with non-farm assets when adjusted for risk. He also observed that literature on investing tends to focus on either the returns (profitability) or the cash flow (feasibility) but not both simultaneously.

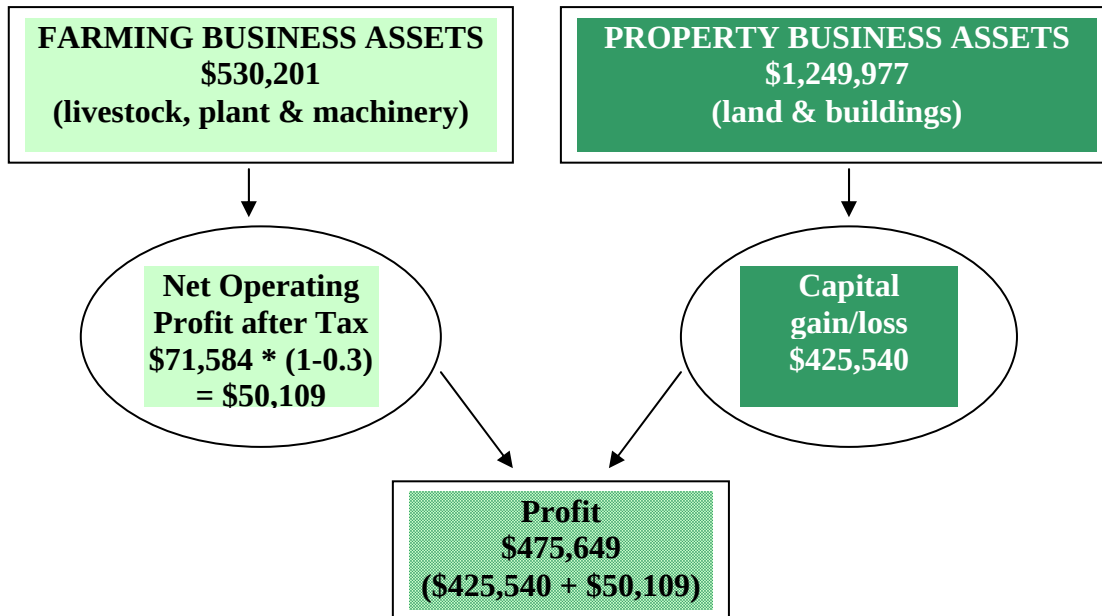
While farmers are often criticized for accepting low farming returns, from their farming business, and relying heavily on property returns they are operating businesses in which few assets depreciate. The opportunity cost of their capital is a combination of the returns from the farming business and the property business (many expect at the very least an inflation proof investment).

Farmland assets in the US over the last 30 years have accounted for 70-80% of total farm assets (Oltmans, 2001) and recent NZ surveys have similar values (The Economic Service, 2001 & 2000, DEXCEL, 2001 & 2000). It is therefore important to determine the impact on farm business profitability and feasibility, of investing in farmland.

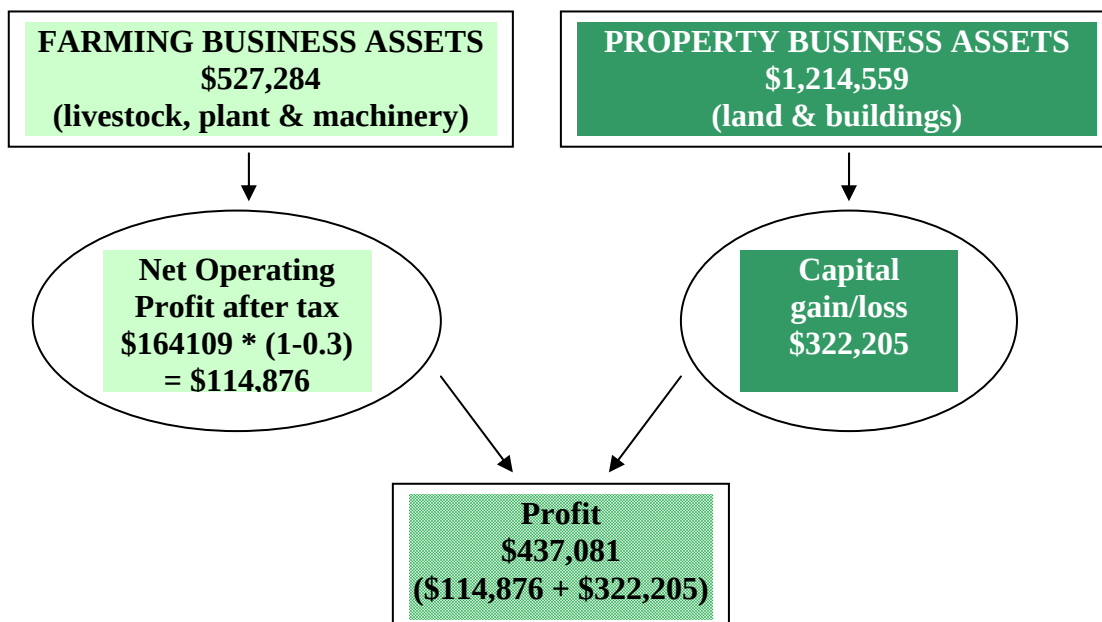
Profitability

Too frequently rural professionals use the terms profit and cash surplus (liquidity) interchangeably. As identified above the overall profitability of a farm investment is the sum of the returns from its farming and property business. The farming business delivers primarily a cash result and the property business does not. 'Asset rich, cash poor' is commonly used in farming, suggesting liquidity difficulties identified by Oltmans as the persistent cash flow problems of the farm sector. The problem inherent in a land investment is described by Oltmans (2001) as one of liquidity not profitability.

Profitability is the total of the returns from the farming business, the operating profit after tax, and capital gains or losses from the property business. The returns for 2000/2001 using the weighted average all classes data from the New Zealand Sheep and Beef Farm Survey 2000/01 (The Economic Service, 2001) are shown below. The capital gain increases the return for this business nine-fold from a \$50,109 return from the farming business to a total return of \$475,649 when the capital gain of \$425,540 from the property business is added. The profit of \$475,649 provides a return of 26.7% from total opening assets valued at \$1,780,178 (land and buildings of \$1.25m plus livestock, plant and machinery of \$530,201).



The owner-operator data from the Economic Survey of New Zealand Dairy Farmers 2000/01 (Dexcel, 2001) are shown below. The capital gain of \$322,205 nearly quadruples the return for this business from \$114,876 for the farming business to \$437,081 with the additional capital gain from the property business. The profit of \$437,081 provides a 25% return from total opening assets of \$1,741,843 (land and buildings \$1,214,559 and \$527,284 for livestock, plant and machinery).



The return on assets after tax (net operating profits after tax / opening assets) for these two farms in 2000/2001 was 2.8% and 6.6% respectively. Using that measure alone as an indication of returns and as a guide to investment decision making who would have decided to buy land and miss out on the 25-26% return?

The above analysis is for one year only and does not take into account the timeframe of the investment. Nor does it recognise that property business returns are highly volatile. In 1996/97 and 1997/98, for example, dairy land values fell (Dexcel, 2001).

To take account of the time value of money Oltmans (2001) used a capital budgeting framework. He calculated the internal rate of return and the net present value to evaluate the profitability of the investments. He then applied a cost of funding to determine the financial feasibility of funding the investment over the time frame given.

Oltmans (2001) method is further explored by Shadbolt and Gardner (2002) who used a sheep and beef cattle farm example to determine that with an average operating profit of \$264/ha per year that yielded a 6% return on assets of \$4400 ($\$264 \div 0.06 = \4400) a funding cost of 8% (\$352) cannot be met; there would be a 2% shortfall (\$88/ha/yr) if the farm was totally funded by debt ($\$88 = \$352 - \$264$). This would quickly lead to a liquidity crisis unless alternative arrangements were found. One common, often short-term, response is not rewarding the family for the true market value of their labour and management. Another arrangement is termed 'passive' equity funds. These funds would receive no or little return but at the end of a 15 year term would benefit from any improvement in asset value.

Shadbolt and Gardner (2002) calculated that an increase of just under 4% per annum on asset values from the property business in their example farm would provide a combined return of 8% over the 15 years. If equity holders were confident of at least that 4% growth in asset values, they might find this an attractive investment. Such investors would however need patience and be reconciled to this investment being a growth rather than an income investment. This has been well understood by many successful farming families over the years.

The emphasis placed on operating profit over the years by farmers and consultants has not been misplaced because as this improves so also does liquidity and farm investments become income as well as growth investments. If improvements in operating profits are not achieved the farm might still be a growth investment but it could have liquidity problems that will diminish any growth achieved.

Alternative Ownership Options

One alternative to land ownership is leasing. If the land and buildings were leased at 6% of their market value of \$3300 (\$198/ha) the \$264/ha operating profit would provide a net return of \$66/ha. To deliver to an 8% opportunity cost of capital over the 15 years on the investment in stock and plant of \$1100, the lease option would need to achieve \$88/ha; an improvement in operating profit of 8.3% above that achieved in the land purchase option (from \$264/ha to \$286/ha). As the assets either depreciate (machinery and plant) or can be particularly volatile (livestock) in a lease option, returns need to be higher to be in line with land inclusive investments.

Other ownership options include share leasing in which both parties to an arrangement share business risks and equity sharing where ownership is spread between off-farm and on-farm members. Equity share arrangements have operated in large family farm ventures for many years.

To explore these ownership structures further consider a 400 cow dairy farm in which the land and buildings are worth \$2,276,280, the dairy cooperative shares \$546,720, the livestock \$400,000 and the plant and machinery \$150,000.

Profitability

The operating profit for this farm is forecast to be \$215,600 or \$1767/ha. Without accounting for capital gains/losses this generates a return of 6.4% on assets of \$3.373m. This is the return expected for both an owner operator (who has already fully reimbursed family labour) and an investor in an equity partnership (Table 1). Returns, as calculated by a simple two variable sensitivity analysis, range from 2.6 to 11.9% (Appendix One – Equity share arrangement).

If the investment was split with the land owned by a landowning company (the property business) and a 45% sharemilker contracted to run the farm (the farming business) their returns on assets would be 5.8% and 9.4% respectively (Table 1). In this arrangement both parties share risk and both would gain and lose from variations in milksolids prices and production. The sharemilker, who carries most of the operating costs of the business would have a much greater range in returns (-1.2 to 24.5%) than the landowning company (3.3 to 9.4%) (Appendix One). The emphasis sharemilkers put on productivity is therefore understandable.

Under the cash lease option the returns on assets to the landowner are 6% of the land value while the lessee, who owns the dairy company shares, livestock, plant and machinery achieves 7.2%. While the landowner has no variation in returns under a cash lease arrangement, lessee returns range from -4.6% to 24% (Appendix One).

Some of these investments are in assets that appreciate over time, other are not so it is necessary to extend this analysis to include time value of money. Also allowed for should be the possibility that land and livestock values may not be the same at the end and the beginning of the analysis. The risk analysis at this point must extend beyond the simple two variable sensitivity tables used in the return on assets analysis above. Using @RISK to introduce variability in prices, yields and final market value of assets and the same approach as in the previous example, the Internal Rate of Return and its variability has been calculated for the various ownership structures (Table 1). The results include the calculated range (at the 5% and 95% confidence limits) and assume no appreciation in land values.

For both the equity partnership and the landowning company to achieve a 9.2% sharemilker internal rate of return, land values would have to rise by 5.7% per year. For the lessor to achieve the 7% internal rate of return, land values would have to increase by 1.8% per year.

The internal rate of return for both the sharemilker and lessee have a much greater range than those for the equity partnership and landowning company and although more profitable options on average, they are also more risky. A further risk for the former not calculated here is due to the fixed term of their contracts; they do not have the choice of when to sell their assets. An additional risk to the landowners also not shown here is that the sharemilker or lessee will mismanage land and buildings. This may not affect earning capacity in the short term but could have a negative impact in the long-term.

Profitability	Equity Partnership	Landowning Company	Share-milker	Lessor	Lessee
Return on Assets (RoA)	6.4% (2.6-11.9)	5.8% (3.3-9.4)	9.4% (-1.2-24.5)	6%	7.2% (-4.6-24)
Internal Rate of Return (IRR) with no capital gain	6.2% (3-10%)	5.6% (4-8%)	9.2% (2-18%)	5.8% (5-6%)	7.0% (0-17%)
Capital Gain per year required for equivalence	5.7%	5.7%		1.8%	

Table 1: Profitability criteria (and their variability) for various ownership structures, Return on Assets (minimum and maximum values from the sensitivity tables), IRR (5% and 95% confidence limits from @RISK outcome probabilities) and the capital gain required by the land owning structures to provide the same IRR as their related non-landowning structure.

Liquidity

The higher the returns the greater the level of debt the various ownership options can carry. If interest rates are 8% the sharemilker could support 100% debt, the lessee up to 80% while the amount able to be borrowed by the equity partnership, the landowning company and the landowner who leases land will depend on the cash required from the business. This can often be a point of difference and friction between off-farm and on-farm investors in an equity partnership. Even if they require no cash and view these as purely growth investments as the returns are below the cost of debt they could not borrow all the funds required, but would have to put in some 'passive' funds.

Cash flow or dividend requirements will influence the chosen level of debt as will the requirement to pay off debt over time. If the sharemilker took a 100% debt position there would be little cash available to repay debt. As the return on equity is less than the return on assets if the cost of debt is higher than the return on assets this would also be a disincentive for all but the sharemilking entity to take on debt. Assuming debt is to be repaid over the 15 years of the analysis and basing debt levels on commonly held practice, the cash surplus after tax, principal repayments and capital expenditure is calculated for each ownership structure (Table 2). The interest rate assumed is 8% for the land owning entities and 8.5% for the sharemilker and lessee who have less security and more variable outcomes. It is also assumed that the landowning entities who have less debt require \$30,000 per year as drawings/dividends from their 'passive' equity; the sharemilkers and lessees whose labour and management has been fully rewarded draw no additional funds.

Liquidity	Equity Partnership	Landowning Company	Sharemilker	Lessor	Lessee
Debt/Assets %	33%	30%	50%	30%	40%
Farm Cash Surplus	\$20,904 (-\$33,190 to \$84,664)	\$10,870 (\$-17,608 to \$44,434)	\$11,009 (-\$13,342 to \$39,693)	\$8,122	\$15,625 (-\$38,470 to \$79,385)
Probability of a cash deficit	31%	31%	27%	0%	33%
Probability of a cash deficit with 20% debt	6%	6%	6%	0%	17%

Table 2: Liquidity (and its variability) for each ownership structure (giving 5% and 95% confidence limits from @RISK outcome probabilities) under assumed debt levels and the probability of a cash deficit occurring for each structure.

Individual attitude to risk will influence how much debt an entity takes on; a sharemilker who is a risk taker might handle 80% debt but one who is more cautious or who has a more cautious

banker will settle at a lower level. For owner operators, sharemilkers and lessees liquidity problems can be partially managed by using family labour as a buffer while in equity partnerships this is seldom the case.

A wide range of outcomes is produced by the risk analysis for the lessee in particular, and sharemilker, who carry all or most of the burden of business risk. The range of outcomes for the landowning company falls between that of the lessee and sharemilker. While the equity partnership also has a wide range of outcomes the probability is 31% that it will have a deficit, assuming a \$30,000 dividend; without the dividend the probability of a deficit is only 9%. The lessee on the other hand could be in deficit one year in every three. If the debt levels are 20% of total assets for all ownership options, the probability of deficits is reduced but the lessee could still be in deficit 17% of the time. Only by lowering the lease payment from 6% to 5% of land value or by dropping debt levels to 5% does the probability of deficits fall below 10%. Sharemilkers' and lessees' drawings are often less than the market value of family labour assumed in this analysis. This enables them to borrow more and to pay debt off faster; another example of how family labour is a useful buffer in managing liquidity.

Wealth creation

Net present value (NPV) of the cash flow for each ownership structure is a measure of wealth creation; it is the present value of the future stream of cash generated by an investment. With an internal rate of return (IRR) of 9.2% the sharemilking investment is the only structure with a positive NPV at an 8% discount rate. The equity partnership and landowning company have a similar NPV if land values increase by 4% per year and 4.3% per year respectively. For the lessor to have a similar NPV to the lessee, land values must increase by 3.2% per annum.

If the NPV is calculated on the cashflows after income tax, interest and principal repayments for each ownership structure at a 5.6% post tax discount rate, differences between the options narrows. To generate the same wealth or NPV as the sharemilker the annual increase in land values must be just 3.64% and 3.82% for the equity partnership and the landowning company respectively and lessor land values need only increase by 2.7% for a similar NPV to the lessee. Historically land in New Zealand has increased in value by 11% per annum (Nartea and Basanta 1998).

The value of livestock does not appreciate but is instead linked to product prices and can be highly volatile and as plant and machinery is replaced and has the same value at the end as at the beginning, the sharemilking and leasing options would not appear to generate wealth. The NPV criterion assumes that cash surpluses generated throughout the life of the investment are reinvested and not spent; in practice it takes discipline to achieve this assumption.

Conclusion

Many farmers do not use the techniques available to assess both profitability and feasibility of investing in farm businesses. These techniques help explain the complexities of investing in both depreciating and appreciating assets. As Oltmans (2001) demonstrates the inherent problem in investing in an appreciating asset like land is a cashflow one, not an income or profitability one. He states that land as a growth asset is more suited to equity financing than debt financing; few banks are willing to be either passive or patient in their demands for cashflow! The solution lies in the use of passive equity funds that require no cash return in the short term but rely on longer term growth prospects. If the assets of the property business and the farming business are owned by different parties there is no need for an aggregate measure of business performance. The challenge is to determine 'fair' returns to each player; is profit, cash flow or wealth creation criteria the basis for such a determination? Return on assets based on annual operating profits is not a fair measure for determining rewards as it does not take into account risk, capital gain or time value of money. Unfortunately some sharemilking agreements have been altered in the landowners' favour because of an undue emphasis placed on return on assets.

Returns for the property business investors include farming 'rent' and expected returns from the property business over time (many expect at the very least an inflation proof investment). Their returns are less variable than those for farming business investors. The high variability in returns for farming business investors requires greater emphasis on liquidity as a measure of success and for a range of risk management strategies to be in place to reduce the probability of cash deficits. Bankruptcies are not uncommon among sharemilkers.

Measures of success for the property business and the farming business differ so to ensure 'fairness' it may be more relevant to aim to meet the expectations of each party without attempting to achieve equivalent returns.

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**APPENDIX I: SENSITIVITY ANALYSES OF RETURN ON CAPITAL
TO MILK PRICE (\$/KG MS) AND MILK PRODUCTION (KG MS/COW)**

EQUITY SHARE ARRANGEMENT							
Milk Price \$/kgMS							
6.4% \$	3.00 \$	3.40 \$	3.80 \$	4.20 \$	4.60 \$	5.00	
300	2.6%	3.7%	4.9%	6.1%	7.3%	8.4%	
320	3.1%	4.4%	5.6%	6.9%	8.2%	9.4%	
340	3.7%	5.1%	6.4%	7.7%	9.1%	10.4%	
350	4.0%	5.4%	6.8%	8.1%	9.5%	10.9%	
360	4.3%	5.7%	7.1%	8.5%	10.0%	11.4%	
370	4.6%	6.1%	7.5%	9.0%	10.4%	11.9%	
SHAREMILKER							
Milk Price \$/kgMS							
9.4% \$	3.00 \$	3.40 \$	3.80 \$	4.20 \$	4.60 \$	5.00	
300	-1.2%	2.1%	5.3%	8.6%	11.8%	15.0%	
320	0.5%	3.9%	7.4%	10.8%	14.3%	17.7%	
340	2.1%	5.7%	9.4%	13.1%	16.8%	20.4%	
350	2.9%	6.7%	10.4%	14.2%	18.0%	21.8%	
360	3.7%	7.6%	11.5%	15.4%	19.2%	23.1%	
370	4.5%	8.5%	12.5%	16.5%	20.5%	24.5%	
LANDOWNING COMPANY							
Milk Price \$/kgMS							
5.8% \$	3.00 \$	3.40 \$	3.80 \$	4.20 \$	4.60 \$	5.00	
300	3.3%	4.1%	4.8%	5.6%	6.4%	7.1%	
320	3.7%	4.5%	5.3%	6.1%	7.0%	7.8%	
340	4.1%	4.9%	5.8%	6.7%	7.6%	8.4%	
350	4.2%	5.1%	6.0%	6.9%	7.8%	8.7%	
360	4.4%	5.4%	6.3%	7.2%	8.1%	9.1%	
370	4.6%	5.6%	6.5%	7.5%	8.4%	9.4%	
LESSEE							
Milk Price \$/kgMS							
7.2% \$	3.00 \$	3.40 \$	3.80 \$	4.20 \$	4.60 \$	5.00	
300	-4.6%	-1.0%	2.6%	6.2%	9.9%	13.5%	
320	-2.8%	1.1%	4.9%	8.8%	12.6%	16.5%	
340	-1.0%	3.1%	7.2%	11.3%	15.4%	19.5%	
350	-0.1%	4.1%	8.3%	12.6%	16.8%	21.0%	
360	0.8%	5.2%	9.5%	13.8%	18.2%	22.5%	
370	1.7%	6.2%	10.6%	15.1%	19.5%	24.0%	