

## Financing Matters

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**Abstract.** Farm systems in Australia are open systems. The financial openness of farm systems has implications for managing farms and, thus, implications for analysing farm management decisions and farm performance. In elaborating on this theme, capital investment in agriculture is considered and key ideas about agricultural financing and implications for farm management are identified. Focussing on the economics of farm management analysis, without corresponding equivalent attention to finance, is to do half the job.

**Keywords:** farm finance, farm management, capital investment in agriculture.

### Introduction

Farm systems are open systems. When European farming in Australia started with free land, labour was scarce. Successful grazing and farming was based on using fixed and working capital and little labour. Capital and labour resources were supplied initially from sources external to the grazing and farming operations. Wool flowed from the farms and capital and labour flowed to them. The political and legislative intent from the 1860s was to establish numerous small to medium-sized property owning farm families. Farming generated surpluses intermittently at first, then more consistently during the long boom of 1860-1890. Capital for fixed investment and working expenses was attracted into agriculture from the domestic economy and from international economies, especially banks from the UK. Right from the start, the openness of farming systems to a well developed financial sector supplying fixed and working capital has been one of the keys to success of farming in Australia.

Australia has a relatively small number of medium and large commercial farms that produce the majority of agricultural total output, while small and medium sized farms make up the great majority of farms and produce a small proportion of total output. These small and medium sized farms include a mix of farms run as sub-commercial operations because of the nature of the farmers' objectives and situations: lifestyle, off-farm income a major source of income, labour and management still in their best use, winding down, and so on.

Ninety-seven per cent of Australia's farms are operated as sole proprietorships, family partnerships, or family companies run along corporate lines. There are good economic

reasons for this being the case. There are good economic reasons for some farm businesses in some industries being part of a vertical integrated production, processing and marketing operation, as found in intensive animal and horticultural activities. There are good economic reasons for a small proportion of farm businesses being owned by equity investors and run along corporate lines while competing directly with similar sized family-owned farms. The phenomenon of non-farm entities aggregating equity capital from non-farm investors and buying farms has always been part of agriculture in Australia; usually in phases related to economic cycles. At different times in history governments have actively encouraged investment of non-farm equity into farming, by providing taxation incentives and subsidies.

Farm businesses in Australia earn returns on capital, made up of operating profit plus nominal and real capital gain, that range from being as good as any investment in the economy to extremely low returns to capital. In any year the top 25 per cent of farms by economic performance can earn total returns of 8-15 per cent on total capital, comprising 5-6% capital income and 3-10 per cent return on total capital as annual operating profit.

Values of agricultural land in every State of Australia have grown in real and nominal terms over the past 30 years, albeit fluctuating around this upward trend, and varying from region to region. In NSW, data on agricultural land values indicates growth of agricultural property values of around 6 per cent p.a. nominal since the mid-1970s (Eves 2010), with some short periods in recent times where this growth of capital value increased at higher rates. Across

Australia, agricultural land values generally increased steadily from mid-1970 to 1989, then fell sharply and recovered slowly by the end of the 1990s. Agricultural land prices have doubled in nominal terms from the late 1990s to 2007, a compound nominal growth rate of around 7 per cent pa. Nominal debt too has risen steadily, in line with rising nominal land values.

The focus in this paper is on implications that the financial openness of farm systems has for managing farms and, thus, implications for analysing farm management decisions and farm performance. In elaborating on this theme, capital investment in agriculture is considered and key ideas about agricultural financing and implications for farm management are identified. The common approach in agricultural economics of analysing farm businesses in comparative static, profit-maximising terms misses much, such as interesting and important cash, finance, balance sheet, dynamic change and risk angles. The paper proceeds as follows: first, a schematic illustration of farm business and financial intermediation is presented. Investment in agriculture is discussed. Key ideas and principles about financing agriculture are identified. Implications for farm management of these ideas and principles applying at the farm level are discussed.

### **Capital investment in Agriculture**

Sources of capital to agriculture in the 19th century feature prominently in writings about Australia's economic history. Some attention to how farmers finance investment in their businesses, and invest, is in the agricultural economics literature (Campbell 1958 a; b; Gruen 1957) and in the 1960s (Herr 1964), and through the 1970s and into the 1980s (Powell 1982).

Investment in agriculture has been characterised by lengthy continuous periods of investment and decay, reflecting economic cycles. Powell (1982) recorded the 1920s as a decade of rapid development in land and high investment in land and improvements, especially in land clearing for cropping and irrigation. The 1930s saw the Great Depression and rundown of capital stock, while the 1940s brought investment in machinery, with labour constraints causing rundown in improvements.

The 1950s, 1960s and 1970s was a time of fixed, later pegged, exchange rates and persistent deficits in the capital account of the balance of payments which, in combination, made agriculture the hope of the side. Policies, and the regulated banking system, aimed to foster exports by supporting agricultural production. Banks

were directed to set aside a proportion of total funds for lending to agriculture. Concessional interest rates were available too, though these had the effect of rationing capital away from agriculture. Tax incentives and subsidies encouraged investments in agriculture. Investment in machinery and adoption of new technology characterised the 1950s and 1960s. The end of the 1960s brought drought and low prices for farm products, which halted the investment boom of the mid-20th century. Bursts of prosperity occurred in the 1970s and 1980s, surrounded by surges of investment. Deregulation of the exchange rate and the banking system in the early 1980s changed things; financial markets developed to meet agricultural demands for capital at commercial market rates. Overall, the 1980s was characterised by a running down of the capital stock in agriculture (Lewis et al. 1988), which continued until the general economic recovery in the early 1990s.

The start of the 1990s saw the collapse of the wool Reserve Price Scheme followed in the mid-1990s by sustained general economic growth in which farmers experienced several extremely severe and widespread droughts, along with shorter regional wet and dry spells, and periods of high and low commodity prices. The adoption of technology was rapid. Machinery capacity and efficiency expanded. Capital continued to be substituted for labour, especially in broad-area cropping. Investments in pasture continued to run down as climates and markets for grazing products fluctuated markedly. From the end at the 1990s, investment in purchasing agricultural land grew apace across all industries.

Despite prolonged and widespread droughts since 2000, growth in the general economy towards the end of the 20th century and into the first decade of the 21st century saw growing investment links between the farm and non-farm sectors. Equity investment in agriculture by non-agricultural entities has always been a feature of agriculture in Australia. Investment vehicles to entice private equity into investing in agriculture emerged that were designed around offering tax concessions provided by tax law for investment associated with agriculture. At the same time as the tax system was moving away from treating agriculture in general as a special case deserving of special investment concessions and allowances and subsidies, new tax-based incentives were being developed to attract new investment into specific areas of primary production; initially forestry and plantation horticulture. The new model was based on what is called Managed Investment Schemes (MIS).

The MIS approach in theory was seen as a means of putting together funds from large numbers of relatively small investors to make possible investment in large-scale capital intensive activities that were risky and that would not otherwise be likely to happen. The tax system, giving immediate full deductibility of development expenditures, made the MIS investments attractive to high income earners facing high marginal tax rates.

In a manner not dissimilar to variants of the approach that had existed in the 1960s and 1970s, MIS schemes in the 1990s and 2000s came to display the full spectrum, from good to bad, of the key investment characteristics of informing investors, transparency, integrity and returns. In 2007 the Federal Government reviewed the MIS operation in response to agitation from competing agricultural investors not receiving equivalent taxpayer largesse. A good deal of taxpayer largesse comes in the form of bearing some of the burden of risk involved in the MIS assisted investments.

There has always been a small number of large equity (corporate) investors involved in specific types of agriculture requiring more capital investment than could usually be amassed by individuals and involving more risk than could usually be borne by individuals. For instance, there have always been a significant number of corporate owners involved in the beef industry of Northern Australia, simply because the size of capital investment required for the large holdings and cattle numbers and the risks involved ruled out smaller investors.

A significant recent change in the economy has been the rise of savings accumulated in superannuation and pension funds, and savings associated with the growth of China. These pools of capital are massive and some entrepreneurial rural financiers have been endeavouring to divert a tiny fraction of these savings into agriculture; a field of investment that is novel to fund managers. The 2007-08 spike in agricultural commodity, and food, prices focused the minds of financiers in some countries, such as some Middle-eastern countries and China, and resulted in a mini-surge of direct investment into agricultural landholdings in Australia. This was not unprecedented, having occurred in roughly every decade through Australia's history.

The recent phenomenon of entrepreneurs accumulating significant funds running to hundreds of million dollars to pursue investment opportunities in agriculture seems based primarily on profitability and, unlike MIS, not dependent on taxation opportunity.

Most of the agricultural opportunity seems to be based on the opportunities offered by owning agricultural land, following a period of sustained rise in nominal land values. These accumulators of equity capital have been selling the notion of opportunities in agriculture to various segments of the finance industry, including superannuation funds and rural property trusts. Forms of investment these funders have adopted range from direct equity in land which is then managed by employed managers, to purchase and lease-back with up-side profit shares, to innovative schemes providing working capital facilities in return for interest plus a share of the up-side risk, to franchising arrangements. Private equity partnerships are another form of farm finance. These are more common in dairying in NZ than in Australia. As well, the number of farms in high rainfall areas and not too far from major centres of population that are owned by people from urban areas has grown significantly.

Historically the combination of periodic agricultural booms, allied to a tax system that favoured investment in agriculture, especially land and improvements, has encouraged bursts of investment in agricultural land of equity from sources other than the existing farm population. While farmers are increasingly diversifying out of farming and building up non-farm assets, to a small extent non-farmers are diversifying into owning farm-land, but farming it for essentially non-commercial reasons.

### **Farm Financing**

There is a large literature on agricultural finance, with some agricultural economists from the US being particularly prominent: for instance, D.G. Johnson, E.O. Heady and the important contributions of Barry, Hopkin and Baker, singly and collectively. Barry and Stanton (2003, p.7) records D.G. Johnson recognising that 'financing matters'. Johnson (1947) highlighted capital rationing, the restriction of borrowing so that equity is maintained at a prescribed level and rates of return on capital kept at a high level. Capital rationing occurred because of uncertainty about borrowers' management ability and the risks of agricultural production and market prices. It had the effect of restricting farm size and occurred because of risk aversion of both the lender and the borrower. Capital rationing affected the combination of productive factors used and affected the scale of operations. Barry and Stanton (2003) summed up Johnson's contribution as follows:

In essence, Johnson was predating the modern approach to understanding lender-

borrower relationships, misaligned incentives, and incomplete contracting. He was explaining that 'financing matters'. Thus the preferences of the lender, expressed primarily through the level of available credit, could directly influence the managerial choices and rates of growth of farm businesses. These observations have been tested and largely confirmed by extensive empirical analyses over the past 50 years.

Barry and Stanton (2003) appreciated the contribution of Heady to matters financial in farm management. Heady (1952) said pretty much everything that is needed to be said about farm management economics, including giving proper credit to the role of finance and financing. Following Kalecki (1937), Heady emphasised the critical role of the principal of debt finance increasing risk; in particular, the role of debt to equity ratios (including lease obligations on leased assets along with interest on debt capital) and increasing financial risk as a more significant determinant of farm size than economies of size and scale. Heady (1952, p.550) argued: 'Size of farm is as much a function of uncertainty and the capital market as of technical scale relationships'. The extra costs of extra uncertainty and risk associated with larger farms can outweigh the cost-reducing gains from larger size. Access to and return on capital controls growth of firms. Heady also pointed out how diversification in production to manage risk has implications for optimal debt:equity ratios. He also highlighted the role of liquidity, including the significant role of unused borrowing capacity. Heady formalised the role of gearing as:

$$p=I/C(e-r),$$

where  $p$  is the expected rate of return on the farmers capital,  $e$  is the expected return on total capital,  $r$  is the market rate of interest,  $I$  is the total capital invested in the farm, and  $C$  is the farmers equity capital. Barry et al. (2000) in their classic text refined this formulation which makes explicit the relationship between gearing and growth.

Heady wrote about the perspective of borrowers and lenders. Lenders were uncertain about the physical production on a single farm; much more so than was the farmer. The operator is better acquainted with the particular situation and may view technical yields, if not price prospects, with greater knowledge than the loaning firm (Heady (1952, p. 550). Borrowers, however, determine some subjective equilibrium in which their attitude to risk and expected risk of returns are balanced to maintain a consistent level of utility.

Heady explained capital rationing in terms of internal and external capital rationing;

further developed by Barry et al. (2000). Barry and Stanton (2003) cites Heady as follows:

The farmer may refuse to use borrowed capital in a quantity to approximate equation of its marginal cost and marginal return...because of either of two reasons; one, risk aversion...; the other, termed credit rationing....capital rationing is largely the response of lending firms to uncertainty (Heady 1952, p.550).

Using different language and terms to current-day, Johnson and Heady formalised relationships between credit, farm production and financial risk, and set out the important elements of lender-borrower relationships in agricultural finance (Barry and Stanton 2003). In modern terms, financial contracts need to recognise the existence of asymmetric information and the importance of aligned and misaligned incentives (Barry and Stanton 2003). Most notably, following Johnson, Heady, Barry, Hopkin and Baker, among others, were able to build extensively on strong foundations of farm financing.

In the Australian agricultural economics literature, Campbell (1958 b) pondered the question of changes in the formation and supply of capital for agriculture and changes in the level of farm investment. He put forward the 'residual funds hypothesis': 'the most plausible formulation would treat investment outlay as a residual defined as the net income realised from current operations less tax commitments and some conventional allowance for farm family living expenses' (1958 b, p.6). The residual funds hypothesis was proposed because standard profit maximisation theories of investment, even when taking some account of uncertainty and risks and managerial considerations, did not seem to provide a useful explanation of managerial actions (Herr 1964, p.108). The residual funds hypothesis contends that farmers faced with fluctuating incomes allocate a relatively constant amount to consumption and the fluctuating balance is available for investment.

Herr (1964, p.103) conceded the residual funds hypothesis had intuitive appeal and some empirical evidence, but queried the direction of causation expressed by the identity  $I=Y_d-C$ , where  $Y_d$  is disposable income and  $C$  is consumption. Herr (1964) said:

While it will be argued that the direction of causation runs from income to investment, an argument could be made for the reverse view. Nevertheless, the direction of causation is generally implied by the twin assumption that (i) there exist investment opportunities,

and (ii) the speed at which investment opportunities are seized depends on internal liquidity (p.103).

That is, capital rationing is an important phenomenon too.

The question of time period in which relevant decisions are made is also important. As Herr said: 'in the long run income must be the source of all investment and consumption outlays' (p.103). But, in short-run periods, changes in liquid assets as well as outside funds come into the question. Herr sums up:

This distinction does not alter the main thesis of the residual funds hypothesis, namely that internal liquidity is the determining factor, but it shifts emphasis from spending out of income in the long-run to spending out of balances for short-run decisions.

Herr modified the residual funds hypothesis:

Long run  $I = f(Y_d, C)$

Short run  $I = f(Y_d, C, A_l, D)$  where  $A_l$  is liquid assets and  $D$  is outstanding debt.

The line of causation remains fraught: do cash surpluses determine borrowing or does borrowing determine cash surpluses? Disentangling this remains a challenge; for example Hennessy and O'Brien (2005) in the US found that farm characteristics such as system, size, and profitability were important factors affecting farm investment and they rejected the theory that farm income drives farm investment.

Herr also found that investment patterns differed according to areas and activities, and suggested that evidence of new investment at particular times and subsequent size of activity (e.g. area of crop) led to the conclusion that for some amount of investment an accelerator model may be more appropriate than a residual funds hypothesis. Waves of new investment and disinvestment and replacement investment certainly characterise investment in farms, influenced by taxation and cost of capital, e.g. (Powell 1982; Lewis et al. 1988).

Herr (1964) had suggested that the explanatory power of the residual funds model would all but disappear if external financing, risks, uncertainty, as well as management, none of which are explicitly introduced in the residual funds hypothesis explaining farm investment, were explicitly considered. Such factors could be accounted for and measured. That is, external financing and risks and uncertainty could be accounted for then these factors, reflected as they are in equity ratios and income variability, would become the main determinants of investment and not internal funds.

Since freeing up the financial system in the early 1980s, the situation in agricultural

financing in Australia bears out Herr's observations. Bank lending to agriculture has increased and interest charges are related to individual risk. Bank finance supplied to farms is determined strongly by a loan applicant's situation, meeting predetermined key criteria, such as minimum equity benchmarks and debt servicing capacity, five-year cash flow projections, subjective assessments of management capacity and an overall risk rating added to interest rates. Farmers nowadays face more financing choices than ever and, with a long run of low inflation years just past, farm borrowings, asset values and debt:equity ratios have increased steadily.

### **Financing Matters - Implications for Farm Management Analysis**

In this section it is argued that financing matters: the traditional narrow focus and over-emphasis in much farm management economic analysis on optimising input and output combinations to maximise short-period profit, whilst under-emphasising time, risk, dynamics, finance and growth in wealth, is in effect, answering questions no-farmers are asking. Efficiency at a time and over time is a necessary but far from sufficient requirement of good farm business performance. Financing over a planning period, telling all about liquidity and growth in wealth, matters just as much.

The big implication of recognising that 'Financing Matters' is to broaden and reorder the approach to farm management analysis into something more fruitful. This entails several major changes, viz:

Starting with the balance sheet, not the farm activity, for the planning and analysis period in question;

assessing annual farm performance in terms of three criteria: efficiency (profit), liquidity (cash flows) and wealth or growth (change in equity); and

applying risk analysis techniques to annual debt servicing ability, liquidity and growth prospects as well as to the question of expected efficiency/expected return on capital.

An approach to this end is set out below:

(i) Balance Sheet at start of relevant planning period:

Total Assets Controlled (including leased assets if any), Total Debt (including present value of future lease payments if leased assets), and Equity

(ii) Annual Whole Farm Profit and Growth Budget

Expected Gross Income

Minus Activity Variable Costs

Equals Expected Whole Farm Gross Margin  
 Minus Overhead Costs  
 Equals Expected Operating Profit (Efficiency  
 when expressed as Return on Total Capital)  
 Minus Interest and Lease Costs  
 Equals Expected Net Profit (Return to Equity)  
 Minus Estimated Income Tax  
 Equals Net Profit after tax  
 Minus Consumption/Drawings above operator  
 allowance (if owner operator) if any, or Add  
 Back operator allowance above  
 consumption/drawings  
 Equals Growth (change in wealth).

This formulation tells about Efficiency and  
 Growth, and incorporates the critically  
 important links between efficiency and  
 gearing and growth. Liquidity must also be  
 included in any farm management analysis.  
 This requires the expected cash flow budget.

(iii) Expected sources of cash for the coming  
 year/planning period

Expected uses of cash before debt servicing  
 obligations

Equals annual Net Cash Flow before interest  
 and principal

Minus Interest

Minus Principal

Equals annual Net Cash Flow after debt  
 servicing.

Having quantified efficiency, growth and  
 liquidity aspects of the farm management  
 analysis in question, a check is given by the  
 end of period balance sheet (iv below) in  
 which change in equity calculated as equity  
 end minus equity at start will reconcile with  
 growth as estimated in the profit and growth  
 budget (ii).

(iv) Expected Balance Sheet at End of  
 year/planning period.

As in (i) but with changes in debt from  
 repayments, changes in asset values from  
 changes in inventories and depreciation, and  
 changes in assets or debt arising from  
 positive or negative expected NCF after debt  
 servicing.

The overall effect of the calculations outlined  
 above is to provide information about the  
 performance of the business that is likely for  
 the relevant planning period in terms of  
 measures that comprise important  
 components of the goals of the farm family –  
 which are more than solely economic  
 efficiency. Liquidity and growth in equity (net  
 worth) are, commonly, at least as important  
 and usually more important goals than  
 economic efficiency; recognising though that  
 economic efficiency is a significant part of the

way liquidity and growth goals can be  
 pursued and met.

Assessing potential financial health, or stress,  
 from changes to farm plans is as important  
 as assessing whether a potential change to  
 the farm plan is a good investment in terms  
 of economic efficiency (profit, return on  
 capital). Business financial health and stress  
 derive from both income and debt situations.  
 The ratio of debt to total assets, the term of  
 the debt and the interest rate on debt, partly  
 determine the extent to which debt is  
 contributing to business financial health or  
 stress; the rest of the story is in income,  
 cash and assets. Investments need to be  
 both profitable and cash flows need to be  
 available to service debt. The point is that  
 assessing the performance and vulnerability  
 of farm businesses requires a multi-  
 dimensional perspective. Just as partial  
 'benchmarks' of activity performance are  
 inadequate, partial measures of business  
 health too are inconclusive.

### Conclusion

Farms systems are open financial systems. A  
 financial system channelling funds efficiently  
 from the non-farm sector to the farm sector,  
 and doing so in many and varied ways that  
 meet the specific and different requirements  
 of farm businesses is the key to a farm sector  
 that is liquid and, as a consequence, makes it  
 possible for farmers to use resources  
 efficiently and to grow their wealth. Farm  
 management research requires a multi-  
 dimensional focus; focusing on economic  
 efficiency alone is insufficient. Financing  
 matters.

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**Appendix**

Table 1. Financial Intermediation

