1 Introduction

Farming in Australia is a fascinating and extremely competitive business activity that abounds in challenges and opportunities; for the best performers, it is financially rewarding and personally fulfilling. The farming game is well-loved most of the time by most of the people in it. Farming is the business of organising and combining and reorganising people and natural resources such as land, sunlight, rainfall and irrigation water, plants and animals with feed, fuel, fertiliser, chemicals, electricity, labour, management skill, specialist knowledge, capital equipment, financial capital and time, in order to produce agricultural products. This is done in ways that more often than not, and for many years, are profitable, are compatible with the investor's view of the risk involved, and help to fulfil the goals of the farmers – all achieved in the face of much uncertainty and risk.

The essential nature of farming has changed little over thousands of years, but nowadays farming *as a business* changes continuously and dramatically in the highly developed economies. In Australia, for instance, farming as a way of using land, labour and capital is increasingly falling into several distinct categories. In one category, farming is a large business activity, usually family-owned, involving tens of millions of dollars of capital investment and millions of dollars of

gross income, and is able to earn rates of return on investment comparable to other large businesses in the economy. In another category are smaller, but still substantial, family businesses that also involve quite a few millions of dollars of investment and turnover, and earn competitive returns on capital. A characteristic of the owners of farm businesses in these above-mentioned two categories is that the owner-managers and managers regard themselves more as working 'on' the business rather than only working 'in' the business. Farms of the size described above make up 20–30% of the total number of farms and contribute 70–80% of the annual total value of agricultural output.

The next couple of categories of farms are those that are typical small to medium-sized family-owned enterprises. These farms make up 70–80% of all farms and contribute 20–30% of the annual total value of agricultural output. The medium-sized operations have total capital invested of $2–4 million and earn returns on investment of 3–6% p.a., while the smaller operations face a struggle to earn enough profit to expand and stay in business.

The final category of farming operations is farms owned by people who derive all or most of their income from doing something other than farming, and own farmland for reasons to do with enjoying rural lifestyles. In areas of the country within reasonable proximity of major population centres and attractive natural environmental features, this category of owners of farmland is growing rapidly.

The content of the ensuing chapters of this book is relevant mostly to the situations faced by owners and managers of, and workers in, farm businesses in the first two categories (large and growing medium-sized operations), and to those operators of medium-sized operations who aspire to growth.

While emphasising the central importance to success in farming and related businesses of mastering the technology of agriculture, we have not included much information about general agricultural technology in this text. Farmers today have access to vast amounts of current technical information about every aspect of their daily activities. We emphasise the point that mastering the technology is a necessary condition of success, but this isn't sufficient, on its own, to achieve profits and growth. The associated knowledge that is required – about economic ways of thinking, finance and risk – is the subject matter of this book.

In Chapter 2 we explain why economics is the core discipline of farm management analysis, and why the farm management economic approach is the 'whole farm' approach. This is the approach of considering the human, technical, economic, financial, risk and institutional aspects of how a farm system operates, and of changing the system in order to evaluate all the costs and benefits and

net benefits involved. Economic ways of thinking about farming questions are explained and demonstrated throughout the text.

In Chapter 3 we explain the use of tools of analysis to evaluate the health and prospects of a farm business.

Chapter 4 is about analysing the prospects for investment in innovations, which is the key to survival, profits and growth of farm businesses. Return on capital and net cash flow and growth in net worth are the criteria; whole farm budgets, partial budgets and discounted cash flow budgets are the tools.

In Chapter 5, on managing risk and uncertainty, techniques for analysing risky decisions are explained and strategies for managing the main risks in farm businesses are explored.

In Chapter 6, on marketing agricultural products, the focus is on ways in which farmers can sensibly identify their place in the agribusiness system(s) of which they are a part. This is used to explain how analysis can enable valid decision making about whether, and how, capital and expertise can be employed to enhance the value of farm output, given the farm's production capabilities.

In each of the chapters the all-pervasive theme is risk and uncertainty, and control. The emphasis throughout the book is on how to decide what to do that is likely to be best, when there is much that isn't known, much that cannot be known, and much that is beyond the control of the farmer.

In the next chapter, the techniques and ways of thinking about the state of health and prospects for growth of a business are explained.

2 The business of farming

In this chapter, readers are introduced to the nature of the tasks and challenges of managing agricultural businesses in a modern market economy. Understanding the business of farming involves understanding the 'whole farm' business system, as well as the economic system beyond the farm gate.

THE 'WHOLE FARM' BUSINESS SYSTEM

Introduction

The main components of the farm business system are:

- human elements – goals, labour, management, attitudes to risk and uncertainty;
- technical elements
- economic, financial, growth and investment aspects; and
- risks and uncertainties of the farm system.

The main components of the economic system beyond the farm gate that impact on farm business systems are:

- the behaviour of people and firms in competing businesses;
- suppliers and customers;
- non-agricultural economic sectors; and
- institutional, political and social forces.

In this environment, farmers and their counterparts in the agricultural and input supply chains have to ask themselves, and answer, key economic questions about their businesses. Farm management economic questions a farmer or farm family will want to answer about their business will include:

- What is likely to be the return on all the capital invested in the business, as it currently operates? This is also known as the efficiency, or productivity, of the resources invested in the business.
- What is likely to be the return on our own capital invested in the business, as it currently operates?
- How much is our net worth likely to grow?
- How might we improve the most likely future return on the capital invested in the business?
- Of the alternative means of improving the productivity of the resources in the business, which means are likely to be best?
- What combination of our own and other people's capital is the business likely to be able to service?
- What combination of our own and other people's capital is likely to enable our own capital (net worth or equity) to grow at a satisfactory rate?
- What will be the best means of acquiring the services of land, and what should we pay?
- What will be the best means of acquiring the services of a particular piece of machinery or equipment?
- Should we add capital to the existing land resources that are under our control in order to improve productivity of the whole farm resources?
- How will we set the business up to cope with the reality that yields and quality of product will fluctuate considerably from year to year because of climatic variability, and prices will fluctuate considerably because of market volatility?

The main challenge facing managers of farm businesses is to successfully incorporate new ideas into how they run their business and to be sufficiently flexible, mentally and financially, to continually change how they think about their business and what they do in it. Ability to reorganise in the face of change is the key to survival and success in farm management.

Farm management analysis

Farm management analysis is a type of intellectual enquiry into changes in resource use on farms. It is a structured process of organising and manipulating information about resources used in farm systems. This information is used to generate further information about the expected extra costs and benefits that are likely to result when a change is made to the way the farm system operates. The expected net benefit of using resources in a farm system in a particular way is compared with the expected net benefit of using the resources in an alternative way. In essence, farm management analysis is farm benefit-cost analysis.

Farm management analyses are carried out in the following segments of the economy:

- *Within farm businesses*: by farmers making what they can of their situation in which much is unknown and unable to be known, where great uncertainty prevails, and where much is uncontrollable.
- *Within public research and development (R&D) organisations*: by people working in R&D in the fields of science, agricultural and natural resource science, agricultural economics or rural social science.
- *Within private rural input supply and output processing businesses*: by researchers and providers of goods and services representing both established and new technology used in farm production, and by firms adding services to farm production.
- *At sources of information to farmers*: by publicly funded and private business people who provide information directly to farmers as advisers, consultants and providers of education services. They operate professionally in between the farmers and those primarily involved in farm-related R&D.

There is an overlap of people and flows of farm management information – and misinformation – between these arbitrarily defined segments of the rural economy involved with the analysis of choices relevant ultimately to the management of farms. Usually, in investigations of farm management questions,

great effort is made to ensure 'good science'. However, 'good economics' is just as important.

When done in accordance with the tenets of appropriate theory, the information generated by farm management analysis informs the decisions of managers of farm resources in ways that are likely to contribute to them achieving some of their goals. The alternative approach – analyses that violate tenets of economic theory – are likely to generate information that leads to conclusions, decisions and actions that do little or nothing to advance the cause of researchers and farmers achieving their goals. Too often, analyses of farm management questions show little evidence of knowing, first, that the maximum isn't the optimum, and so the science/technical emphasis on maximising physical output per unit input is flawed; second, that the future is a different world, and so the accounting focus on looking backwards at averages and minimum average costs of production is also flawed; and third, that the whole of the farm system is the domain on which to focus when analysing changes to farm management practice.

In the conduct of farm management analysis, the textbook representation of economically rational decision-making behaviour of managers is but part of the story. In practice, usually and sensibly, decision makers also draw on other sorts of knowing. Constraints of time and resources and 'ability to know' dictate that a 'fast and frugal' (Gigerenzer and Kerr 1999) approach to decision making has to apply. Furthermore, of course, a bad decision can turn out to be the right decision through the intervention of chance, and vice versa. In an uncertain world, relatively simple analysis based on a few key bits of information is the practical way to go – but the economic logic has to be right! The case is made throughout this text for good decisions based on sound analysis of the important relevant information obtainable by the decision maker, given the constraints of resources and time. Sound approaches to decisions will contribute to decision makers achieving more of their goals than will the alternative approaches of acting randomly, or worse, conducting consistently bad decision analysis and hoping to be consistently lucky.

The whole farm approach

Analyses of questions about choices, or problems, cannot be useful if the focus is on only the technical parts of the question and other parts of the question that are significant, such as economic forces or social conditions, are ignored. The philosophy of farm management economic analysis is that it is more useful

to identify and solve the whole of a farm business problem in an approximate manner, than it is to identify and solve a small part of a problem extremely well while leaving out significant parts of the question at hand. For instance, it is of little value to identify that the grazing management of the livestock system is poor, or that the state of the soils or pastures isn't state-of-the-art, and therefore must be the main problem. It could be that the main problem is that the equity of the owners in the business is so low that the annual debt servicing requirements exceed the annual cash surplus expected to be available for servicing debt; or the farm family may be dysfunctional with conflicting goals; or the farm managers may be at a stage of their career when they are no longer motivated to pursue innovation or growth. (They may already know how to farm better than they do!)

Farm management analysis is an interdisciplinary activity: the human element is included and is the starting point; the technical basis of agricultural economic analysis has to be sound; economics is the integrating and core discipline; the business has to be financially feasible; risk and control in the face of uncertainty and volatility permeates all activity; and the role and influence of economic, institutional, political and social forces beyond the farm have to be recognised fully. Knowledge from, and an emphasis on, all these facets of agriculture culminates in the ability of managers to reorganise farm resources and to succeed.

In the process of explaining how firms operate in the economy, the aim of agricultural economic analysis is to put the components together into a whole, albeit a simplified whole, but one in which all the elements that have an important bearing on the question are considered. In contrast, science often focuses on part of this whole but, while dealing completely with and 'fixing' the small part of the whole, has difficulty explaining how the whole business, or the relevant and connected parts of the agricultural economy, works. Narrowly focused science has limited capacity in prescribing solutions to problems of the whole business because there are no technical solutions to farm problems, only technical components of people-based solutions to what ultimately are 'people problems'. The farm management economic approach is thus the whole farm approach. In practice, there is no other approach to identifying correctly, and solving, problems of farm business systems. The method is to start with the people; sort out the technical system; and then analyse the benefits and costs and finance and investment and growth and marketing prospects of the whole farm system in light of the important risks and uncertainties and the major influences that are beyond the farm gate and so beyond the control of the farmer.

Economics: The core discipline of farm management analysis*

The key task of farm management is making choices between alternatives. Farm management analysis is about analysing those choices. Economics is the discipline of choice. Economics entered farm management analysis from the middle of last century, and became the core discipline of academic work in farm management. In the context of farm management analysis, what does 'core discipline' mean? It is the discipline that organises the practically obtainable relevant information about a question, or series of questions, into a framework and form that enables a choice to be made. The choice is between alternative actions faced by management that, in the light of the goals, is informed, reasoned and rational.

The ways modern market economies operate now reflect the influence of insights of great economic thinkers over several centuries. Less prevalent, and less influential, is the economic way of thinking about farming choices that has been rigorously developed since the mid-20th century by some major thinkers about farm management economics. The relationship between economics and applied farm management analysis has been neither comprehensive nor consistent over time.

Economics encompasses a number of key sub-disciplinary areas that are particularly significant for the management of farms. These disciplinary areas are farm production economics (input–output relationships), risk, finance, marketing, time, and the microeconomics of choices and actions of groups of firms responding to market forces. Farm management analysis encompasses considering alternative actions under risky and uncertain circumstances. Economics – the discipline of choice – is central to farm management analysis (McConnell and Dillon 1997). Choosing between alternative uses of resources draws on a number of key economic principles – namely, comparative advantage, diminishing marginal returns, equi-marginal returns, cost analysis, opportunity costs, input and output relationships, size and scale, gearing and growth, risk, time and tradeoffs between goals. Economics is needed to bring the many relationships of a system, and between systems, to some common unit or basis of comparison. If this isn't done, it isn't possible to analyse systems meaningfully or to compare alternatives meaningfully in terms of expected benefits and expected costs. That is the first reason economics is the core discipline of farm management analysis.

* Some of the central ideas in this book are dealt with in B. Malcolm, 'Where's the economics? The core discipline of farm management analysis has gone missing!', Presidential Address, 48th Annual Conference of the Australian Agricultural and Resource Economics Society, 2004, in *Australian Journal of Agricultural and Resource Economics*, September 2004.

Farm systems are dynamic and complex. The second reason economics is the core discipline derives from the rigorous, abstract and conceptual nature of economic enquiry. The emphases in economics on the counter-factual and the counter-intuitive, and on the subsequent rounds of cause and effects, go a long way in helping to clarify understanding of complex, dynamic, whole farm systems. Economic principles tell what information is needed, and conveniently organise such information in ways that suit analysis of benefits and costs. Most importantly, the logic of economics helps in defining the question in a way that facilitates finding solutions. The question is the answer!

The third reason economics is the core discipline of farm management analysis is that economics sets much of the agenda for the decisions that have to be made. Knowledge and techniques from economics are combined with empirical data to help make decisions about *what* to produce and market, the *method* to use in producing and marketing, and *when* to produce and market farm product.

Finally, the main focus of farm management is the implementation of new ideas and production technology amid reorganisation of the farm business in the face of powerful and continual market forces for structural change. Factors beyond the farm gate, in markets, play a bigger role over time in determining the extent to which farmers' goals, such as wealth accumulation, consumption and leisure, are achieved over time. Indeed, such forces can be as influential as the actions farmers take within their farm boundaries. Components of the larger economic picture, including changing the comparative advantage of competitors, the cost-price squeeze, and pressures for adjustment and adoption of new technology, are critical to farm management analysis and farm business success. All of this happens in an activity with limited scope for product differentiation, such that the conventional tenets of business marketing commonly do not apply.

The discipline of economics plausibly explains the setting for and influences on behaviour of many agents (producers/firms and consumers) beyond the farm gate. Economics facilitates plausible conjecture and expectations about the behaviour of competing and complementary businesses, and about changes in industry structure. It anticipates to a degree the external forces for internal change on farms. Keen appreciation of wider economy phenomena and forces brings valuable insights to decisions about opportunities created for farm entrepreneurs by counter-cyclical behaviour; to asset valuation; to financing, gearing and growth decisions; to activity mix choices; to investment timing; to intensification and extensification; to risk diversification; and, of course, to the increasingly important off-farm investment portfolio decisions. Thus the fourth reason why economics is the core discipline of farm management analysis is that