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RISK MANAGEMENT IN FARMING AND SOME IMPLICATIONS FOR

AGRICULTURAL EDUCATION

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There has been a marked increase of interest within the last two decades in agricultural risk and risk management. Much of this interest appears to arise from greater awareness of the relevance of risk reduction and business survival as major farmer objectives. This increased interest is reflected at a research level within the agricultural economics profession by a greatly expanded academic literature on decision theory and multiple objective programming, and in farm management teaching by a significantly greater emphasis on risk within the modern texts. Nevertheless there appears to be a notable difference in philosophical orientation between research workers in agricultural economics and teachers within the discipline of farm management.

Research in Agricultural Economics

At a research level most of the advances have come from developments in decision theory and in the application to agriculture of mathematical programming models. The Bernoullian or Bayesian approach to decision making has become dominant within the profession. This theory emphasises the importance of subjective estimates of probability and provides a process for

revising these probabilities as more information becomes available.

As with all theoretical developments in the social sciences, there is need for ongoing scrutiny of the validity and relevance of decision theory to real life problem solving. Wright (1983) has addressed some of these issues and has shown, at least at a conceptual level, that decision theory can be broad in its applications. This includes addressing situations where "unk-unks" - or unknown unknowns - and fuzzy problem definition are major issues. Nevertheless, the reality of most research models (as opposed to conceptual models) is that they require estimates of variance, and sometimes covariance, that can only be obtained from, or based on, historical data. Moreover, with most research models there is an implicit assumption that the mean and variance for important variables will either remain constant over time, or if they do change, then this will occur in a predictable manner. These comments should not be construed as a criticism of decision theory, but rather as a statement that we still have some way to go.

Teaching in Farm Management

The modern developments in decision theory have yet to make a major impact on farm management teaching, at least at the undergraduate level. This is not to suggest that decision theory is completely ignored. For example Anderson et al (1977) suggest in the preface to their text "Agricultural Decision Analysis" that decision analysis at its simplest level is asking "What choices? What consequences? What chances?" This approach has been incorporated as part of the structural framework of problem solving for many decades, and most students would have had at least some exposure to the concept of decision trees.

Perusal of farm management texts published within the last decade suggests that most authors have struggled to come to terms with how to deal with risk and risk management. Charting a course between sophisticated concepts and techniques on the one hand, and the need for easily understood strategies on the other has posed problems. There is no doubt that these recent texts, such

as the second edition of Barnard and Nix (1979), the third edition of Castle et al (1987), and Boehlje and Eidman (1984) all place much greater emphasis on risk and risk management than previous texts, but there is a lack of integration between decision theory and the suggested strategies. Taking Castle et al (1987) as an example, this American text describes the sources of risk, asserts that risk should be measured in terms of probability, and discusses the importance of farmer attitudes to risk. The authors then move on to describe various risk management strategies, including flexibility, diversification, ensuring security of land tenure, maintaining liquidity, using business structures that limit liability, having back up machinery, obtaining more information, and insurance. However, there is no obvious link between these strategies and the earlier sections on sources, attitudes, and probability. We hardly need a sophisticated theory to tell us that these approaches can be relevant, but we do need an operational framework to link the theories of risk and decision analysis to operational risk management strategies, and to help us decide on appropriate risk management strategies for specific circumstances.

The Source and Nature of Agricultural Risk

The starting point of any analysis as to how the farm management profession can improve the operational framework of risk assessment and management is to consider the source and nature of the risks that are operationally important.

An example of the perspective found in many undergraduate texts is provided by Castle et al (1987) who state:

"Some examples of the risks farmers face are as follows.

1. It will not rain at the right time.
2. The old tractor will break down.
3. Prices will go up after the grain has been sold.
4. Government regulations will change.
5. The employee will quit."

It would seem reasonable to question whether any one of these risks, apart from a change in government regulations, is by

itself likely to be a threat to the farm business, although any one of them might be the final straw that pushes the farm business into the financial abyss.

An alternative perspective on risk and risk management is provided by Renborg (1988). He suggests in a paper to the 1988 International Farm Management Conference that "since 1973 uncertainty has taken on dimensions of sudden changes". Renborg contends that a major problem of risk management is that we live in turbulent times of great uncertainty where fundamental changes can occur suddenly, and where history does not necessarily provide insights into the future. Renborg lists oil crises, environmental shocks, food shortages, overproduction, dramatic changes in interest rates, inflation, computer revolutions and robotization as having occurred since 1973. He suggests further changes can be expected from biotechnology, new oil crises, famine waves and changing agricultural policy. He did not add, but could have added, that changing social attitudes towards conservation, environmental degradation, food quality and the multiple use of rural lands are other issues that are likely to impact. The so called "greenhouse effect" seems likely to trigger another set of dramatic environmental changes. And of course there may also be a new set of "unk-unks" which by definition cannot be forecast.

Although Renborg talks of sudden change, and indeed many of these events manifest themselves as sudden change, the underlying physical, social and economic forces often develop quite slowly. As these forces build up there are initially few obvious effects on farm businesses. However, eventually the physical or economic environment is stressed to the point where there is either a rapid change or even a sudden shock, often triggered by an act of legislation or government policy.

The key attributes of the risks that Renborg is concerned with are that they are external to the farm, they result from events that are often unexpected, and they can be represented by a change to the expected value and variance of one or more variables. Any necessary farmer responses are likely to be strategic, involving major changes to the farming system, a

resetting of specific targets and maybe even resetting of general objectives.

In contrast to this, many of the risks with which authors such as Castle et al (1977) are concerned, result from events within the farm, most can be identified in advance as possibilities, and most are not associated with any long term shift in the physical, social or economic environment. The majority of these events can be dealt with by a tactical response. Perusal of the research literature on decision theory suggests a similar tendency to be inward looking, and to focus on tactical issues such as level of fertiliser, rates of pesticide, plant varieties, and the stochastic nature of production functions.

There is considerable evidence that the physical and economic environments have indeed become more turbulent within the last 15 years. We know that the changes during this time that Renborg (1988) refers to are true because we have personally lived through them. Also, increasing yield variance has been reported by Hazell (1984) in relation to India and by Webster and Williams (1988) for wheat production in Britain. Napier (1988) has claimed that returns from farming in Australia are becoming more unstable.

Causes of Business Failure

An obvious approach to help clarify what are the real problems of risk and risk management would be to investigate the reasons that some farm businesses fail while others succeed. Do farms fail because of a lack of technical skills, lack of business skills, lack of size, high financial gearing, bad luck, lack of foresight, choice of inherently risky activities, poor strategic planning skills, or poor implementation and tactical ability?

There are a number of problems with this type of analysis. The first relates to the definition and identification of failed farms. Those businesses that are foreclosed by mortgagor action are clearly business failures, as are voluntary sales where the owner admits he or she has no other business option. However, other situations where farmers retire or sell up voluntarily can

become more debatable, and the ostensible reasons can be quite different to the reality.

A second problem is that failed businesses disappear and once failure has occurred they are no longer available for analysis.

A third problem is the difficulty of separating out fundamental causes from more apparent short term disasters. For example, a drought may be the final event that triggers farm business failure, but the fundamental cause may well be structural or strategic and may have been building up over a long time. A fourth problem with studies of business failure is that they are essentially historical, and if we are entering a more unstable world as previously suggested, then history may not provide the necessary insights to the future.

In the absence of rigorous research as to the reasons why some farmers fail and others succeed the opinions of farm consultants, extension workers and others in professional contact with farmers become important. Cooney (1988) suggests that in the New Zealand context the farmers who will survive the present restructuring of the economy will be those who have the skill to continually monitor their personal situation, and make necessary decisions early enough. Napier (1988) has suggested that successful farmers in Australia are characterised by being at the same time both conservative and progressive. The implication of this statement is that successful farmers are those who monitor developing situations carefully and react cautiously to new ideas and strategies. However they move decisively to adopt these ideas when either a need for change or benefits of change have been identified.

Acceptance of these ideas, together with the perspectives of Renborg (1988) leads to the concept that risk management is largely about identifying the needs and benefits of change, and then managing the process of change. This in turn highlights the need for an appropriate information flow and a process for information assessment and decision making. This process must encourage strategic redirection of the total business when this is required, as well as tactical responses to ongoing situations.

Implications for Farm Management

Farm management in Australia and New Zealand has always been closely allied at an academic level to agricultural economics, to the extent that it is often assumed - particularly by economists - to be a sub discipline of production economics. The influence of Earl Heady has been fundamental, both through his writings (for example Heady, 1952) and also his personal influence on many Australian and New Zealand postgraduates.

More recently, with the publication of American farm management texts such as Kay (1981) and Marsh et al (1981) we have seen increased emphasis at the undergraduate level on management as a process that draws upon disciplines such as economics, accounting, sociology and the agricultural technologies so as to plan, organise, direct and control the farm business. The decision making process includes observation, problem definition, data collection, analysis, decision making, implementation and assessment. These concepts have been drawn from general management theory as taught in many American business schools. They are described in many management texts such as Longenecker and Pringle (1981) and Hodgetts (1986).

Despite increased recognition within farm management teaching of these management process theories, it is questionable whether the farm management profession has used these theories to their potential. For example, the previously cited farm management texts typically discuss the management decision making process in the first chapter - and indeed sometimes incorporate it in the title of the text. However once Chapter One has been concluded there is either minimal or no further mention given to the decision making process, and any suggestions that the process must be iterative, with major emphasis on linking the components, is quickly forgotten. Thus, although the management process may be described as the cornerstone of management, the evidence within the texts is less than convincing. It is easy to get the impression that the process of management serves mainly as an excellent framework for organising and classifying management topics according to whether they relate to planning, implementation or control.

Renborg (1988), writing from a European perspective, suggests that much greater emphasis needs to be given to this process of management, particularly as it relates to strategic management and risk management. He draws on general management theory to develop a strategic planning model which focuses on

1. the world around the farm and the possibilities and threats coming from it;
2. the strong and weak points of the farm and farmer;
3. key participants (such as family, competitors, suppliers, financial institutions) and their attitudes; and
4. markets and products.

The key issue is not that a new theory is either required or being developed, but rather that the principles of strategic management as taught in business schools need to be and can be applied to modern farm management. In particular, more emphasis must be given to the fundamental premise of strategic management that many of the crucial business risks and opportunities arise from forces external to the business. The function of strategic management then becomes "one of balancing internal and external forces and marshalling the organisation's resources to meet the many external opportunities". (Rowe et al, 1986). In essence, farming businesses need to become more outward looking, not because they can influence the outside world in any significant way, but because they must react to outside threats and opportunities. The decision making process provides an ideal framework, but it must be redirected to focus more clearly on strategy, risk and the management of change.

Some agricultural economists may see this emphasis on strategic management as a threat to the importance of agricultural economics as the underpinning discipline of farm management. However the problem of farm management is not an overemphasis on economics, but an underemphasis on management. Indeed it is this lack of emphasis on management theory in general and strategic management in particular that helps explain why agriculture is so often perceived, at least in academic circles, as a production science rather than a business. The discipline of farm management needs to develop links with departments and schools of

business management and administration to complement the existing links with agriculture and agricultural economics.

Implications for Agricultural Education

A major thrust of this paper has been to develop the idea that risk management is, to a large extent, synonymous with identifying the need for change and then implementing that change. If it is accepted that many of the risks to farmers arise beyond the farm gate then it follows that students of agriculture need to study a number of disciplines that are external to the farm. Examples are ecology, environmental science, law, politics, policy, marketing, consumer behaviour and social behaviour.

The problem is how to include these subjects in curricula that are already full of subjects. There is a tendency to include those subjects that are clearly and immediately relevant. To argue that subjects should be included so that graduates can better deal with "unk-unks" would stretch the patience of some of our husbandry and science colleagues. And indeed many students themselves would not be easily convinced that a knowledge of ecological principles, business law or consumer behaviour may be more important than a detailed knowledge of current farming technologies and practices. The question that we have to come back to, however, is what will be the major risks to farming businesses over the next three decades. Will farmers fail because they did not understand the changing social, physical and economic environment, or will they fail because they did not understand the required on farm skills? If both are important then we must find room in our courses for both, and continue the debate as to the appropriate balance.

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