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**Farm Management Economic Analysis: A
Few Disciplines, a Few Perspectives, a
Few Figurings, a Few Futures.**

By

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Farm Management Economic Analysis: A Few Disciplines, a Few Perspectives, a Few Figurings, a Few Futures.

Prologue

Farm Management A: The essence of farm business management.

...If...(a)...pending change involves in addition an element of uncertainty, which is usually the case, the firm also assumes the additional function of uncertainty bearing...In the real world the production processes of the firm are being altered continuously. Routine procedure will not suffice. Change born out of dynamic circumstances, is ever present. Adjustments are called for. It is the entrepreneur who decides what must be done. The decisions of the entrepreneur are carried out within the framework of the firm. Two interrelated decisions must be made (a) the amount of adjustment that is necessary, (b) the method for making the adjustment; that is, what to do and how to do it. It is these adjustments of the firm that gives us the key to what we need to look for in our farm management research. To understand the basic nature of these adjustments is to know what is fundamental to the entrepreneurial problem in farming. Since the existence of the firm of necessity arises out of and is dependent upon dynamic conditions, it would appear that both the size of the firm and the success of the firm must be determined within a framework that allows for 'time' and 'change'.

Schultz, T.W., (1939), 'Theory of the Firm and Farm Management Research' American Journal of Agricultural Economics, 21:570-586.

Farm Management B:
The essence of farm management economic analysis, roughly.

One night after the threshing, Dad lying on the sofa, thinking, the rest of us sitting at the table, Dad spoke to Joe.

'How much,' he said, 'is seven hundred bushels of wheat at six shillings?'

Joe, who was looked upon as the brainy one of our family, took down his slate with a hint of scholarly ostentation.

'What did y'say, Dad - seven 'undred *bags*?'

'Bushels! *Bushels*!'

'Seven 'un-dered bush-els of wheat. *Wheat* was it, Dad?'

'Yes, *wheat*!'

'Wheat at ... at *what*, Dad?'

'Six shillings a bushel.'

'Six shillings a ... A, Dad? We've not done any a; she's only shown us *per*!'

'*Per* bushel, then!'

'Per bush-el. That's seven 'undred bushels of wheat a six shillin's per bushel. An'y' wants ter know, Dad -?'

'How much it'll be, of course.'

'In money, Dad, or -er?'

'Dammit, yes. *Money*!' Dad raised his voice.

For a while, Joe thought hard, then set to work figuring and rubbing out, figuring and rubbing out. The rest of us eyed him, envious of his learning.

Joe finished the sum.

'Well?' from Dad.

Joe cleared his throat. We listened. 'Nine thousan' poun'.

Dave laughed aloud. Dad said, 'Pshaw!' - and turned his face to the wall.

Joe looked at the slate again.

'Oh, I see,' he said, 'I didn't divide twelve t'bring t'pounds,' and laughed himself.

More figuring and rubbing out.

Finally, Joe, in loud, decisive tones, announced, '*Four* thousand, *no* 'undred an' twenty poun', fourteen shillin's an' -'

'Bah! *You* blockhead!' Dad blurted out, and jumped off the sofa and went to bed.

We all turned in.

Extract from *On Our Selection*, Steele Rudd, (1899).

Farm Management C: Visions Need Urging.

In this paper the vision is of a future where solving problems in farm management economics using information from analyses of unreal farm businesses - the usual, simple and easiest approach - is increasingly complemented by additional information from case studies of real farm businesses - the unusual, complex and hardest approach.

We were sitting outside old Tallwood cattle-station, in our white moleskin trousers, elastic-side boots, and cabbage-tree hats, watching two stockmen shoe a very wild brumby mare. We were all salves to the saddle and bridle, and there was nothing too heaving or hard. The boss squatted on a new four-rail fence. There were twenty panels of this fence, strong iron bark post-and-rails. The first rails were mortised into a big iron-bark tree, and there were four No. 8 wires twisted around the butt, passed through the posts and strained very tightly to the big strainer at the other end.

As though he had dropped out of the sky there appeared on the scene a very smart-looking man carrying a red-blanket swag, a water-bag, tucker-bag, and billycan. He put them down and said, "Is the boss about?"

We all pointed to the man on the fence. The new chap took his pipe out of his mouth and walked up, a bit shy-like, and said,

"Is there any chance of a job, boss?"

"What can you do?" asked the boss.

"Well, anything amongst stock. You can't put me wrong."

"Can you ride a buckjumper?"

"Pretty good," said the young man.

"Can you scrub-dash - I mean, can you catch cattle in timber on a good horse before they're knocked up?"

"Hold my own," said the young man.

"Have you got a good flow of language?"

The young man hesitated awhile before answering this question. So the boss said,

"I mean, can you drive a rowdy team of bullocks?"

"Just into my hand," said the young man.

The boss jumped down off the fence.

"Look here," he said, "It's no good you telling me you can drive a team of bullock if you can't."

And pointing to a little grave-yard he added,

"Do you see that little cemetery over there?"

The young man pulled his hat down over his eye, looked across, and said, "Yes."

"Well," continued the boss, "there are sixteen bullock-drivers lying there. They came here to drive this team of mine."

I watched the young man's face when the boss said that to see if he would flinch; but a little smile broke away from the corner of his mouth, curled around his cheek and disappeared in his earhole, and as the effect died away he said,

"They won't put me there."

"I don't know so much about that," said the boss.

“I’ll give you a trial,” the young man suggested.

“It would take too long to muster the bullocks,” said the boss. “But take that bullock-whip there” – it was standing near the big ironbark – “and say, for instance, eight panels of that fence are sixteen bullocks, show me how you would start up the team.”

“Right,” said the young man.

Walking over he picked up the big bullock-whip and very carefully examined it to see how it was fastened to the handle. Then he ran his hand down along the whip, examining it as though he were searching for a broken link in a chain. Then he looked closely to see how the fall was fastened to the whip. After that he stood back and swung it around and gave a cheer.

First he threw the whip up to the leaders, and then threw it back to the polers. He stepped in as though to dig the near-side pin-bullock under the arm with the handle of the whip, then stepped back and swung the big bullock around. He kept on talking, and the whip kept on cracking until a little flame ran right along the top of the fence.

And he kept on talking and the whip kept on cracking until the phantom forms of sixteen bullocks appeared along the fence – blues, black and brindles. And he kept on talking and the whip kept on cracking till the phantom forms of sixteen bullock-drivers appeared on the scene. And they kept on talking and their whips kept on cracking till the fence started to walk on, and pulled the big ironbark tree down.

“That will do,” said the boss.

“Not a bit of it,” said the young man, “where’s your woodheap?”

We all pointed to the woodheap near the old bark kitchen.

And they kept on talking and their whips kept on cracking till they made the fence pull the tree right up to the woodheap.

We were all sitting round on the limbs of the tree, and the young man was talking to the boss, and we felt sure he would get the job, when the boss called out,

“Get the fencing gear lads, and put that fence up again.”

“Excuse me for interrupting, boss,” said the young man, “but would you like to see how I back a team of bullocks?”

“Yes I would,” said the boss.

So the young man walked over and picked up the big bullock whip again. He swung it around and called out,

“Now then, boys, all together!”

And the phantom forms of the sixteen bullock-drivers appeared on the scene again; and they kept on talking and their whips kept on cracking, till every post and rail burst out into flame, and when the flame cleared away each post and rail backed into its place, and the phantom forms of the sixteen bullock-drivers saluted the young man, then bowed and backed, and bowed and backed right into their graves, recognising him as the champion bullock driver.

Skuthorpe, L., (1946), *The Champion Bullock-Driver*, in *‘Twenty Great Australian Stories’* (J.L Waten and V. G. O’Connor, eds), pp127-130. Dolphin Publications.

1/ Introduction

The request to write this paper – working title- ‘Something about Farm Management Economics’ – came from the incoming President of the AARES David Pannell who, by making this request, unwittingly cast himself in the role of the piano player in the brothel: implicated but having no moral responsibility for the goings on. My riding instructions from David Pannell were as follow:

What I'm after is someone who can speak to the large number of members whose job it is to worry about issues at the farm level, and give them something that they can take home with them and find useful in their work. I am worried that our invited speakers are virtually always on topics that are somewhat remote from the working lives of many members, particularly the younger members and rural-based ones. It's great to stimulate them with all this interesting stuff, but just occasionally it would be nice to give them something that was directly relevant to them (Pannell, pers.comm.)

That is a contract. What follows, properly titled ‘Farm Management Economic Analysis: a Few Disciplines, a Few Perspectives, a Few Figurings, a Few Futures’, is intended to be about farm management economic analysis, with farm management economic analysis having both particular and general meaning. Though as is their wont, the deconstructionists will make of it what they want.

Farm management economic analysis refers to:

- the processes of managers of particular farm businesses responding to technical, economic, financial, human, risk and institutional changes;

- the processes involved in making some of the decisions about some of the significant changes that are made to how a farm business is operated;
- the processes of managers of particular farm businesses implementing decisions about changing how the farm business operates;
- analyses of how the managers of more than one farm business may operate their businesses;
- analyses of one or many unreal farm businesses in order to draw conclusions about the management and operation of one or many real farms.

If the essence of farm management processes is dealing with change and dynamics, strategically and tactically, what are some of the changes that managers of farms have to deal with? In any short time, as the future rapidly becomes the present, actual production parameters change from the expected levels on which plans were made, and tactical adjustments are being made continuously. Many such decisions do not involve much analysis. In medium term, and in the wider economic environment, major change occurs. Prices change, costs change, technical possibilities change, fashions change, incomes change. Deregulation of output markets transfers power to consumers. Farmers face greater potential volatility of prices and costs than before, and have to take greater interest in marketing decisions than previously was the case for most products. Greater financial management skills and use of financial market instruments for managing risks are required. Further, changed public awareness of and concerns with resource quality issues within and beyond the farm gate mean that more considered use of inputs and farming methods is being demanded. The implications of these changes for farm

management in the next decade will be highly significant. Pressure on profits from rising real costs and falling real prices mean that farmers hoping to stay in business in the medium term face the imperatives of changing the scale and intensity of their business operations, as well as adjusting the composition and risk profile of their overall investment portfolio in accordance with the changes in risks, investment opportunities and family life cycle that are happening all the time.

Before looking where efforts might profitably go in farm management economic analysis to complement existing emphases in this area, it will be handy to have a look at where we have been. What follows next is a backward glance at the academic work undertaken in farm management in Australia.

2/ Farm Management Economic Analysis in Australia

All of the fundamentals of modern farm management economics have been around for at least the last half century, and much of it for a lot longer. Writings on farm management can be traced back to many years B.C., and wisdom from the distant past has often been used (e.g. Dillon 1980) in making the point that there are many ways in which the fundamental nature of farming as a business activity has changed little. More recently, in 1947 the Australian Ministry of Post-War Reconstruction and the Ministry of the Interior published a book entitled *Farm Management and Elementary Agricultural Economics*. The book comprised a series of 40 lectures about farm management and agricultural economics, written by R. B. McMillan, Senior Research Officer, Commonwealth Bureau

of Agricultural Economics and K.D. Campbell, Economics Research Officer, Division of Marketing and Agricultural Economics, NSW Department of Agriculture. The specifically farm management lectures covered the following topics:

- Managing a Farm
- Selecting the Farm
- The Size of the Farm Business
- The Selection and Combination of Enterprises
- The Selection and Use of Farm Power and Equipment
- Farm Labour
- The Economics of Farm Practices
- Adapting Farm Plans to Changing Conditions
- Useful Types of Farm Records
- Summarising and Studying Farm Records
- Farm Budgeting
- Farm Tenure
- Agricultural Credit and its Sources
- Problems of Agricultural Credit
- Insurance and Taxation
- Sound Purchasing Policies (Farm Equipment)
- Land Values and Rents
- Sociological Aspects

As well, various topics on agricultural marketing, commodity, trade and the role of agriculture were covered. In lecture one, it was stated that ‘farming has become a business as well as a way of life’ (p.1), and farm management means ‘management from the point of view of the economics of managing the farm as a business unit’ (p.2). A check of the content of the farm management economics textbooks from Australia and abroad published in the past decade or so, for example, Boehlje and Eidman (USA), Turner and Taylor (UK), or Makeham and Malcolm (Australia), reveals much similarity in coverage of subject matter and philosophy with the book written by McMillan and Campbell fifty years ago.

The history of academic effort in farm management economics in Australia has been recorded elsewhere. For example in 1965 in 'Farm Management as an Academic Discipline in Australia' by John Dillon (1965) described the period from 1900 to 1940 as 'The Forerunners', a period characterized in part by 'the lack of any specific institutional framework for farm management research and teaching; ...(and) in the main...the absence of any analytical principles or orientation to farm management problem solving as we now understand it (p.2). The next period, 1940 to 1965 was described as 'Enter Economics'. As well, Malcolm (1990) has reviewed the Australian farm management academic literature from 1940-1990.

Campbell (1959) had defined the starting point for modern farm management as the publication of Schultz' 1939 paper (see extract in Prologue) that focussed on change and dynamics as being what business management really was all about. The standard farm budgeting methods were well established by the 1940s (see Hopkin and Heady (1936), McMillan and Campbell (1947)). In the 1950s Earl Heady in 'Economics of Agricultural Production and Resource Use', said much, and did not leave much unsaid, about farm management economics, proving once again that people who say a lot are sometimes right. The 1950s saw production function estimation, and the start of linear programming and interest in optimisation of farm input and output combinations. During the 1950s Campbell, Williams and others had concluded that focussing on static optimization was essentially misplaced, because the outstanding characteristic, and requirement, in Australian agriculture was the regular adoption of new technology (Malcolm 1990). That

is, getting onto a new production function was more important than trying to optimize the resource mixes of some given production function.

Computers came and in the 1960s and 1970s the literature was running a banker with static linear programming and its refinements, systems simulation, comparative analysis, and the decision theory methods focussing on utility analysis and risky decision analysis. In the 1960s Cocks (1964) and Candler (1964) both emphasized the importance of focussing on *improving* existing situations, with decisions about improvement being made using whole farm and partial budgets, or in Cocks terminology, creeping around production surfaces using creep budgeting. In a world so uncertain as faced by managers of farms in Australia, the notion of answering the question 'how do I do a bit better over time in the face of change?' has more appeal than 'how do I make the most from the current set-up, now?'

Jack Makeham always argued that the technology, the people and the potential, are large parts of any farm business analysis, and that deciding on and implementing change is what farm management is mostly about. In 1968 in 'Farm Management Economics' Makeham (1968) wrote there were two major challenges facing farmers. These were:

- how to incorporate new technology profitably into the existing business organization;
- how to be sufficiently flexible, mentally and financially, to adjust resource management to meet both changed economic circumstances and widely varying climatic conditions (p.5).

In 1963 Glen Johnson (1963) argued that farm management economists, mostly in the US, but with Australians often in faithful pursuit, had become irrelevant because of a positivistic, technique-oriented emphasis. In response to Johnson's criticisms, Chet Baker (1965) argued the case for adopting a behavioural and a policy orientation. A behavioural emphasis was defined as attempts to describe 'what is' and 'what has been' and 'why it has been' and/or 'what it is'. Given 'what is' and 'our beliefs about what is' and 'why it is what it is' then the policy approach is about testing options to decide what ought we do to change 'what is' to 'what we'd like it to be' and 'how and when we should do it'. Thus Baker proposed a behavioural and policy dichotomy as an alternative to the positive and normative dichotomy. Whilst this seems helpful, and it would be unwise to treat with ignore such concerns, there is a sense in which these dichotomies are somewhat ritualistic and arbitrary when 'what is' and 'has been' and 'what might be' are in part mutually determining. That is, there is a sense in which the past creates the future: 'What is' determines in part 'what will be and what can be' (Dixon 1986, Bernstein 1996).

Musgrave (1976) looking backwards, made the criticism that many farm management techniques had been called but most had been found wanting. He talked about a 'sustained rummaging through a job-lot of techniques mostly of a programming nature...producing a few unthinking technicians but not producing many useful farm managers' recommendations of a general or specific nature' (p.139). Musgrave (1976) also talked about the potential dangers of a theoretician-practitioner gap – a problem that would not necessarily arise as long as enough people working in these areas had 'a foot in both camps' (p.142). He also reminded his readers of the conclusion of Anderson and

Hardaker (1972) that the scope for intuition is always high in farm management, thereby restricting the scope for technique-oriented progress.

(Note: Intuition may not be all it is cracked up to be. White (1999) cites research findings that decision makers who aid intuition by using formal decision analytical methods do better than those relying on intuition alone. Presumably, there is good and bad intuition, with right decisions often being attributed to good intuition after the event. Like common sense, good intuition is likely to derive from deep and rigorous understanding of how the system works. Good judgement may be a better term, with judgement deriving from knowledge about how systems have worked (experience) and how systems might work subsequently).

In 1978 John Dillon (1978) concluded the abstractions of many previous methods were too limiting, and that farm management was too holistic and human a process for partial economic emphases to take us very far in farm management analyses. Thus systems approaches would have to prevail. It would be difficult, and progress would be slow. By this time, and maybe because farming is indeed as Dillon explained, most academic workers in farm management economics had decided this was a rough shed and it was a fine day for travelling (Malcolm 1990).

Around this time, and despite the compelling appeal and usefulness of probabilistic ways of thinking being brought to bear on decision analyses and decision-making, it quickly became evident that, in farming as in all businesses, the required information for formal

probability analyses is usually missing (Sturgess 1972). Missing too is the large number of events that make applications of probability theory to actions, work. In the 1980s, Vic Wright (1983) argued that the decision theory methods were constrained in usefulness by problems associated with the specifications of the axioms of utility theory, and by the limits of information and the ambiguity of probability estimates. He concluded that in a highly uncertain world, there was not much point in more and more elaborate analyses of farm decisions.

One conclusion drawn from reviewing the past fifty years farm management in Australia Malcolm (1990) was that the emphases on production economic estimation of resource productivities; on linear programming approaches; on systems simulation, and on utility analysis and formalized probability analysis, had been of virtually no direct use as far as actual decision-making on farms went. At the same time the economic and financial forms of the whole farm, partial and cash flow budgets, using probabilistic ways of thinking or more precisely ‘strengths of belief about likelihoods of outcomes’, all allied to the power of the computer spreadsheet, were theoretically sound, were used to some extent, and still had a big role still to play in actual farm management decision analysis and decision making. At the same the programming and systems simulation methods were seen as having potentially useful roles to play in farm management economic research.

The main reasoning for these conclusions was that, as all models can only ever be partial representations of reality, and farm businesses are complex operations, then techniques

that enabled information about more of the important elements of the decision problem, both measurable and unmeasurable, to be incorporated into the analysis, should prevail over techniques that dealt with some parts of the decision problem in great depth but insufficiently encompassed all the important parts of the whole of the problem.

What happened in the 1990s? The power of computers has made possible more efficient modelling of more and more detailed aspects of the operation of whole farms, particularly biological interactions and financial eventualities, for purposes of both systems simulation and dynamic optimization analyses. The crop farm simulation work in Western Australia in the 1980s that resulted in the MIDAS model and its subsequent relatives and applications is but one good early example (Kingwell and Pannell, 1987).

David Pannell, Ross Kingwell and colleagues have used these methods to help test the relative importance of getting inside the head of the farmer decision-maker when analysing a decision as compared with the relative importance of getting other aspects of the decisions right (e.g. as summarized in Pannell et.al. 2000). The conclusions reached were that including farmers risk preferences in a formal way was less important to good decision analysis and achieving farmers goals than making sure that technical and dynamic aspects of such decisions are well represented in the models used in the analysis of the decisions. Relatedly, Kingwell et.al. (1993) found that getting tactical decisions right in the occasional highly favourable seasons can do more for achieving farm family aims than worrying too much about including risk aversion of decision-makers in

decision analyses. After giving figurings about feelings a solid workout during the 1970s, Jack Makeham concluded:

There have been major difficulties in converting many of the insights (of utility analysis) into a form which is useable by either farmers or their advisors. It would seem to us that utility analysis was a well-bred horse, who performed encouragingly in the trials. Some of the boys backed it heavily for the big race. It led early, but fell in a hole half way up the straight. The lads did their brass. (p176, Makeham and Malcolm, 1981).

In overview, while the whole farm approach remained the nominal cornerstone of academic approaches to farm management economic analysis, in the absence of a micro-micro theory of business-people behaviour (Liebenstein 1979), the academic imperatives of specialization to learn more and more about less and less, seems to have dominated academic efforts in farm management, when what is really required for farm management economics is to try to know more and more about more and more. Arguably, the balance of disciplinary emphases represented in much of the work done in academic farm management in Australia ended up being inappropriate. The impression remains that much work in farm management in Australia has been too narrowly method, or technique, oriented, with the inherent problem of the technique defining the scope of the problem and the inquiry into it. This not to poke borak at the methodological Blue Ducks, or the following of widdershins, as Candler (1962) put it 'heading up Blind Alleys', that has gone on. If these questions had not been pursued, and if we did not know that such pursuits were not rewarding, we would yet have to find this out.

Future Emphases

There is ever-present the danger of repeating the mistakes of the past, where rapidly growing computer capabilities led to the thinking 'it now can be done so we'd better do

it', i.e. mistaking the feasible with the sensible. Another approach, instead of a relatively narrow focus on having method or technique, whether old or new, determine the question, is to have greater focus on the problems we are trying to solve in farm management economic work. That is, a greater focus on identifying and understanding the nature of the problem correctly, on what is needed to be known to analyse a particular problem sufficiently well to reach a conclusion or decision about it. The various farm management techniques on offer then are of interest merely as to whether or not they are appropriate to analysing the problem at hand. Track records of methods, and horses for courses, becomes the criteria for choice of method, with a better chance of keeping the whole farm and big pictures in mind.

A problem-oriented farm management approach makes clear the nature of farm management analysis, where the key is correct identification of the problem, and understanding of the problem, based on sound definition of what is the current situation, and what are the constraints and the potentials. Once this is knowledge is established, the usually few possible solutions can be made clear efficiently. Also made clear is that identification of problems and analysis of solutions involves using information from a few disciplines, looking from a few perspectives, carrying out a few figurings and investigating a few futures (the *status quo* is never an option). Technique comes into it merely as an issue of choosing the technique appropriate to the task as defined by the nature of the question at hand. The nature of the problem determines the appropriate mix of disciplines, the appropriate perspective, the appropriate technique and the relevant futures to ponder.

Even with regard to the critically important technical and dynamic aspects of problems, and the growing capacity to model farming systems, care is needed to boil it down to the essence of what information on dynamic relationships is critical, and for which decisions. This is because in accounting for the dynamics of systems multitudes of possible permutations and combinations can quickly make the analysis intractable. Still, the most critical dynamics ought to be able to be tackled with a small number of key 'comprehensive' scenarios.

In farm management economics, the traditional emphasis on risk/volatility as something to be minimized has been at the expense of a more realistic emphases that would have been on risk/volatility not only as something farmers manage to live with, but equally important, risk/volatility as a major source of the opportunities for management and of the opportunities to prosper and grow. How best to manage businesses to exploit the consequences of risk/volatility on those who manage it less adeptly than their competitors remains one of the great neglected questions of the past fifty years of farm management in Australia. Also missing for many years in Australian farm management economics was much focus on financial management, gearing and growth in Australian farming, the type of work typified by the content of the US text 'Financial Management in Agriculture' by Barry, Hopkin and Baker (1978).

The future is a different world. In all business, major decisions are made in the face of many great unknowns and unknowables – as well as many important unmeasurables.

This is why management is required – to form sound judgements to inform decisions and influence actions. Bernstein (1996) defines risk management as follows:

The essence of risk management lies in maximizing the areas where we have some control over the outcome while minimizing the areas where we have absolutely no control over the outcome and the linkage between effect and cause is hidden from us (p.197).

Bernstein (1996) then argues the fact that probability theory does not and cannot work very well in application in business decisions because of the paucity of the necessary information and the relative ‘fewness’ of events and outcomes, and the reality that Arrow’s (1992,cited in Bernstein 1996) ‘Clouds of Vagueness’ will continue to characterize business decision environments, all means that businesses have a chance to create their own futures.

Given that farmers do many things to try establish, roughly, a situation for themselves and their business which is risk-durable to the degree that they are content with, then an offensive view of risk, volatility, consequences and management in the face of future change may prove rewarding, not least simply to balance the traditional defensive focus on risk management.

In advocating a more problem oriented approach, less technique oriented approach in farm management economics an over-riding proviso is the notion that if conclusions about how something works or solutions to problems are to be influential in contributing to change, the process of reaching conclusions, especially the key economic and technical detail and the logic, have to be transparent for decision-makers to believe results and act

on them. All conclusions, even from the most elaborate analyses, depend critically on the magnitude of a usually very small number of key parameters. This should be absolutely clear to decision-makers weighing up the information resulting from the analysis.

Most of a good answer to a decision question of a farm business can be captured with a few key numbers in a few key budgets that are technically and economically sound and rigorous - economic arithmetic if you like (for example, see Davidson (1965). Finesse of simple budgets is likely to be inefficient in terms of extra information from extra analysis adding little value in terms of the behaviour-changing impacts of the outcomes of the analysis and can of course even be negative in effects, or lack of it, on users of the outputs of the analysis.

To sum up: The farm management approach remains by definition the whole farm approach (even though sometimes people talk about the whole farm approach to farm management as though there is some other approach!). If the management of farms is characterized as being a process involving human, technical, economic, financial, risk and institutional (beyond-the-farm-gate) elements, then processes of answering questions about farm management ought to have plenty of scope to incorporate aspects of all of these elements, in an appropriate balance, looked at from a small number of angles, for some imagined futures, as required. As Jack Makeham put it 'We're woods persons, not trees persons'.

2/ Synthesizing real and unreal farm management analyses in problem-oriented approaches to farm management

So far it has been suggested that a problem-orientation may well prove a useful approach to thinking about whole farm management methods. The major reason for advocating a problem-oriented approach to farm management analysis derives from the view that the truth of any matter is never evident from one angle only. The truth of a matter is best approached by coming at the matter from a number of perspectives, using a number of methods, and a range of disciplinary knowledge.

However, questions of balance arise. First, the right balance of disciplinary emphases has to be brought to bear on issues affecting farm management in order to correctly identify and understand the problem. The right balance of disciplinary knowledge is then required to help solve the problem. The right balance of perspectives is required to ensure there are no big angles being missed.

The notion of bringing the appropriate balances of disciplinary emphases, perspectives and methods to bear on the problem at hand is cadged from Kenneth Boulding (1956, 1974) who talked of there being an ‘optimum degree of generality’ to solve a problem. This ‘optimum degree of generality’ lies somewhere between the totally abstract and the totally general, neither of which are meaningful. Used with care, the whole farm, interdisciplinary approach, where human, technical, economic, financial, institutional and risk aspects are all considered in analyses in a balance appropriate to the problem, has

proved to be extremely valuable in an applied research and a practical problem solving sense.

In what areas of inquiry is there a 'felt need' for sound farm management economic analysis, along the whole farm lines outlined so far? With a problem-orientation, the question becomes 'what are the types of problems that need to be dealt with?'

Most obvious is the case of deciding on farms about how to change the system to achieve the productivity gains necessary to survive and grow – decision analysis on farms. The second major area is farm management beyond the farm gate. This includes such activities as evaluating the potential net gains of particular scientific research findings if they were to be adopted on a significant number of farms, and evaluating alternative policy options, nowadays more likely to about such matters as the natural environment, water, adjustment, taxation, product quality, than old style price policy.

The methods for evaluating important farm decision questions is well established (See section 3.1). Just enough information and enough figurings to make a good decision is needed. At present, the standard whole farm budgeting techniques for analysing major decisions are not widely used in farm management. Most farmers make their decisions about major changes to their farming system on the basis of judgement and experience, at best doing some rudimentary cash flow calculations. Most do it well enough for their business to survive, albeit at various levels of economic efficiency, for usually a couple of decades. Note here that that most farm decisions that have to be made are of a short

term tactical nature, not so much requiring efforts at extensive analysis as much as efforts at making the decisions work. In farm management economics and decision analysis, the emphasis is on the decisions that have big consequences for the achievement of the farm family goals over time.

What are we to make of the phenomenon that even the simple tools and techniques of the farm management texts in practice do not get used a great deal. The question is not whether or not farmers use these techniques very much or not; more appropriately the question is ‘do farmers who use a structured way of thinking about problem solving and act accordingly, look at the whole question from a few angles, do a few figurings, explore a few scenarios, make better decisions than they would otherwise?’ That is, are the methods that have been developed and have been available for a long time, useful in achieving the ends that they are designed to achieve?

By the very nature of farming and farmers it can never be expected that a great proportion of farmers will be inclined to master and use what we know as farm management economic techniques of decision analysis. Still, in the continuum from purely random to the purely rational modes of decision analysis, neither of which occur in practice, it seems likely to be more useful over time to deal with important business choices and changes, even opportunistic decisions, in as thoughtful, orderly and structured way as time permits. To the extent that there is merit in the farm management approach, and attempts are made to use the standard farm management methods to some extent, an interesting question is why are bowdlerized versions of proper farm management

budgeting as common, or more so, than correct versions? (for more on this see Ferris and Malcolm (1999).

What about evaluating scientific research output or policy options in farming contexts? Ultimately, such changes have to be analysed for the farm system of the potential adopter or affected farm business. However, research and policy is also subject to analysis beyond the farm gates of the potential adopters or affected farm business, usually for typical representations of farming systems and businesses in question. Such analyses are most commonly carried out at a higher level of abstraction than is done for particular farm businesses – real farm families are not part of such analysis for starters. Representative farm models are usually the first run of such analyses. (Note: representative does not mean arithmetic average. Averages are artificial constructs, whose only ‘virtue’ is ease of estimation). Whilst this is a useful start, the required abstraction means that a gap is inevitable between analysis of research findings and policy options based on analysis of ‘representative’ farming situations and the true situation of individual farm businesses.

Using artificial farm businesses constructed for analytical purposes can be a powerful, highly useful approach, as long as these artificial businesses are typical in the ways most important to the analysis of the types of operations that exist in the distribution of businesses in the population of interest. However, the general attractiveness of looking at questions from a number of angles dictates that analyses of effects of research findings and policy changes on the situation of representative, but unreal, farms would be

enhanced by some parallel, real, whole farm case studies because representative or average farms do not actually exist.

While any model is only a partial representation of reality, including real farm models, conclusions from the analyses of 'unreal' farms would be more convincing after being challenged and complemented by results from real farm case studies in which more of the real situation can be included. The gap between conclusions based on the abstraction of representative situations and the less abstract real farm case study situation could be reduced, and a better judgement about the true consequences of research findings or policy changes able to be formed. More of the truth of the questions of interest will be known.

A further reason for advocating the use of real farm case studies to accompany representative farm analyses is that while it is possible to generalize to some degree about 'what seems to be' at the present on the basis of empirical evidence of the present situation, it is impossible to generalize about any future situations, individual or semi-aggregate- because each farm business has a different past, and will have a different future. The extra detail about the options and possibilities of real farm situations, and goals of the farmers, will play a role in determining their future situations.

Finally a reason for arguing for this synthesis now is that case study theory has come on somewhat in recent times (Yin, R.K. (1993), (1994); Stake, R. E. (1998); Howard, W. H., and MacMillan, R. (1991); Eisenhardt, K.M. (1989), (1991); Sterns et.al. (1998); Crosthwaite et.al. (1997)). While a significant practical constraint on greater use of case

studies is that, done properly, they are costly in terms of resources and require highly developed, specialist skills, the returns in information are correspondingly of high value.

For instance, imagine a response to a policy question that went as follows:

Analysis of the effects of, say, changes in water pricing policy would have these sorts of effects on these couple of typical types of farming operations from among the population of farmers affected by the proposed policy change. However, the representative farm model does not capture fully the real situation which is made up of many farm families at different stages of life and farming career, with a range of different equity positions and investment opportunities for their business, and requiring a range of different capital investments to respond to the likely changes that will follow the change in policy. Therefore half a dozen whole farm case studies of farming operations have been done as well. The case study farms have been selected to be like farm businesses from important parts of the spectrum of farms that exist in the region of interest. As can be seen each farm business will be affected by the proposed policy change in some ways differently and in some ways similarly, to each other, and to the representative farm model.

Thus the approach being advocated is for some synthesis of the individual ‘practical’ real farm case study methods based on whole farm, partial and cash flow budgets and the ‘research’ approaches used to analyse representative or unreal farms. The techniques used are not the issue. The notion here, whatever farm management methods are being used, is to add the extra insights that are made possible by the additional complexities of real farm case studies to the findings of more abstract representative farm models. To help close the gap between research findings about abstract farm situations and possible responses to change and the individual real farm complexities that help determine adoption and rates of change.

Further, and importantly, the analytical format used to test out a research idea on a real farm provides a framework (e.g. a skeleton budget) that can be efficiently adopted and adapted to any real farm situation where the research results in question warrant analysing for that farm. In this way research analyses can be linked via real case studies to other farm situations where potential changes are evaluated and decisions are made about those changes.

The hoped-for outcome of such an approach to closing gaps between research and reality would be that we will be less likely to be answering questions that no one is asking, or are likely to ask.

In the rest of this paper a number of specific topics related to farm management are discussed briefly in the context of a problem-oriented farm management and of synthesizing real and unreal farm management economic analyses.

3/ Farm Management Economic Analysis: Some Issues

The issues covered in this section are:

- (i) minimum requirements for sound whole farm management analysis;
- (ii) complementing farm management research analysis with farm management case study methods;
- (iii) farm management methods and environmental concerns,
- (iv) benchmarking and farm management;

- (v) modelling for science versus modelling for management decision analysis;
- (vi) farm management education;
- (vii) composition and emphases in a future farm management economics text

3.1 Minimum requirements for sound whole farm management analysis

The changes that farmers confront in order to maintain net incomes and increase wealth and achieve as many of their other compatible aims over time are accompanied by increased demands on management capabilities. While most of these increased management capabilities required will be, as always, of a technical nature, the need for greater sophistication in financial management and investment decisions, price risk management, and meeting consumer requirements, will mean that there is potential for the application of farm management methods to problem-solving to make an increased contribution to efficient resource use.

As a first step it is incumbent on those who carry out farm management analyses of any sort from any perspective to get it right in terms of theory. Thus, farm modelling exercises, be they sophisticated or simple, need to correctly account for such factors as expected inflation effects on cash flows, required rates of returns and interest rates, including a reasonable estimate of tax implications of changes, accounting for productivity change over time in a technical sense and for potential changes in real prices and real required rates of return. This really means the critical distinction between economic and financial analysis need to be made, as well as distinction between capital

and current expenditures. Transparent, meaningful ways of accounting for the magnitude of important parameters about which little may be known are part of any analyses.

Farm management economic analysis does not have to be complicated. The logic is: ‘what is the situation’, ‘what is likely to be the new situation if I do this, or that, or nothing different at all’ and ‘am I likely to be sufficiently better off, all things considered, for it to be worthwhile doing this instead of doing that or doing nothing different at all?’

A simple form of analysing a farm business is to establish ‘what is’ the situation, then explore ‘what might be’. As well as return to capital and debt servicing ability, linking the profit and cash budgets indicates expected growth in equity. The ‘with change’ situation can be examined using either a steady state partial budget or expected whole farm budgets for the situations with particular changes. The net benefits and financial viability from making a change are examined using discounted and financial cash flow budgets. For major decisions, risk and its possible consequences can be investigated by exploring possible futures using scenario analyses, breakeven budgeting and sensitivity testing, for a small number of possibilities for the few key numbers in the budgets. A mix of partial and whole farm perspectives are used and in these budgets dollars and interest rates are consistently nominal or real and tax estimates are included. This is all straightforward and would not warrant reiterating here except for the fact that more often than not these simple analyses are carried out in many flawed ways. Care and effort is required to ensure that the following aspects of these analyses are done properly:

- technical basis of budgets have to be sound (this is self-evident, but surprisingly it is not always the case), including effects of a change on the operation of the rest of the farm and internal dynamics;
- economic and financial budgets need clear differentiation;
- real and nominal monetary terms and interest rates need clear distinction;
- tax aspects have to be included, and calculated using nominal terms;
- discounting procedures need to be clear and fully understood: many errors creep into analyses when discounting processes are not transparent;
- perspective has to be the correct way. Usually this means the with-without situations have to be right. This is the key to such analyses. For example, clear with-without criteria shows that productivity losses from soil degradation that would otherwise occur but is prevented by some investment is a benefit.
- financing methods affect value, and financial feasibility is as important a criteria as economic returns.
- project life and salvage values can be important.

Most significant decisions can be judged on the basis of a few simple sums in which the measurable bits of the situation are counted, with the results then tempered by consideration of the unmeasurable aspects of the case in hand. There are always some aspects of decisions, which are not measurable, because response functions of particular circumstances are not known, or because the future is unknowable, or because a sensible price cannot be put on everything. No amount of analysis can make the unknowable future knowable. However, it is sensible to think about the range of possible outcomes of doing some particular things in the unknowable future, and to think about how likely these outcomes may be. When it is not

known what will happen, it is useful to think about what would need to happen for the action in question to turn out to be a good investment, and to think about how likely it is that the required levels of important parameters in the decision will actually happen. This approach is called the breakeven method, and it is useful when a situation being analysed has some key unknowns.

The fact that often hybrid analyses are carried out which do some of the right things but not all of them, in various combinations, and may result in the right decision because of the uncertainty regarding everything in the analysis, is not a justification for hoping to get it right by getting it wrong. There is more chance of getting it right by getting it right.

3.2 Complementing farm management research analyses with farm management case study methods

Case studies are legitimate means of inquiry about how parts of the world works. Case study approaches seem to be gaining legitimacy as research tools (see for example Yin, R.K. (1993), (1994); Stake, R. E. (1998); Howard, W. H., and MacMillan, R. (1991); Eisenhardt, K.M. (1989), (1991); Sterns et.al. (1998); Crosthwaite et.al. (1997)). The oft-thought ‘problem’ of being unable to generalize to populations from unique case studies is neither here nor there – if that is the question of interest then different methods apply. Case studies generalize to theory, not to populations in a statistical sense (Yin 1993, 1994). Of interest is the ‘fit’ of how a case firm actually works compared to how theory explains how firms seem to work. Again, approaching questions from several angles, one of which is case studies, would seem a safe bet.

Farm management concerns the behaviour of complex systems. A useful starting point for agricultural economists is recognition that the neo-classical theory of the firm is not about the actual individual behaviour of firms – or firms in aggregate for that matter, in the sense that neoclassical theory does not about saying ‘this is the case’ as much as it is about saying ‘if this was the case, then this is what would logically follow’. Also, eschewing the confusion between *ultimately* and *only* is also valuable: what may *ultimately* determine outcomes, say economic factors, is not what *only* determines outcomes. Much else is involved, in all businesses, including, and maybe especially, in farming. Case studies enable the ‘much else’ to be dealt with more widely and deeply than in other analyses that have a shallower, narrower focus on individual farm businesses and a broader focus on a number of farm businesses.

3.3 Farm management methods and environmental concerns

Whilst from a production perspective, what most of the total number of farmers do does not make a large difference to total annual gross value of agricultural production, from the perspective of natural resource quality and environmental concerns, all farmers are managers of the natural resources of the country and so what all farmers do is of interest.

The economic imperative is that to be profitable over time farmers have to use the resources they control in a way that is sustainable, and to be sustainable they have to be profitable. Public concerns arise where what is deemed profitable and sustainable for

private users of natural resources is not deemed to be the same 'profitable and sustainable' that other members of society perceive and require. However, to answer questions about environmental effects the facts of each case have to be ascertained, generally on the basis of what is happening paddock by paddock, whole farm business by whole farm business. For example, is this farmer farming his/her farm in a way that increases nutrient composition of water flows in the catchment? Is this farmer farming his/her farm in a way that will result in the destruction of some flora and fauna that is increasingly important because there is not much of it left? Once the facts of the case at hand are established, and if the answer to the above questions is 'yes', some further questions follow: Is it phenomena beyond the farm that are of interest? Is permanent change occurring? Is the phenomenon avoidable with a change in farming practice i.e. is reducing or preventing the phenomenon compatible with a continuation of using the resources for agricultural purposes? Then: How does it happen and why? How does the farming system need to be changed to prevent or reduce the phenomenon? What are the costs and benefits of change? How much? To whom?

The next question that follows is: How might a farm management economist usefully analyse a question about public effects of the operation of a private farming system. One way is to first establish how the farm system operates and at what level of intensity and profitability, using whole farm balance sheet, profit budget and cash budget, for near past and near future if unchanged. This is called 'What Is' analysis . Having done this the focus turns to 'what might be!' This encompasses imagining the state of this farm business in the short to medium future, with and without the couple of main changes that

may be possible and analysing the net economic and other gains from making these possible changes. This is done using the partial budget, The potential changed whole farm situation is explored- the expected balance sheet, profit and cash budgets tell about this.

The comparison of the futures - what might be without change to the farming system and what might be with changes are both different to the current situation. The current status quo is not a valid comparator. It is either one future without certain changes or one future with certain changes. Either way, the future situation will be different to the current situation. Comparing alternative futures gives a basis for judgement about whether concerns about the state of natural resources on and beyond the farm are valid; whether the situation of a natural resource is likely to be improved or worsened according to imported criteria; whether the on-farm changes produce added public benefits or costs; and whether measures are required to encourage or discourage the types of changes the farmers are likely to have to make to the way their system is operated in order to remain profitable and sustainable and if so, the nature and extent of these measures.

The combination of case study theory combined with farm management economic theory makes a powerful foundation for a useful analytical approach to analysing questions of natural resource use and preservation on and off farms. The nature of environmental concerns means that in the case by case analyses required, the appropriate units of inquiry are likely to be both the whole farm business and paddock by paddock.

3.4 Benchmarking and farm management methods

Plenty has been said already about the folly for farm management purposes of the latest incarnation of comparative analysis (see Malcolm 1990, Makeham and Malcolm 1991, Ferris and Malcolm 1999). Whether this has mainly come about from consultants confused about whether it is Tuesday or Bourke Street (Victoria; Pitt Street or Christmas, NSW), or illywhackers running slanters, does not much matter.

Morselizing a whole farm business into component parts and checking how those bits perform in the context of that whole is standard activity analysis – a starting point in farm management analysis. It is done as part of constructing the whole that is ultimately the unit of analysis. The leap into the world of comparative analysis comes when the performance of these component parts in one unique system, that is about to change in a dynamic agriculture, is considered to have some relation to the performance of equivalent component parts in a completely different system (all farmers are different, all systems are different), that is also about to change in a dynamic agriculture. There are no benchmarks for yet to be introduced change.

3.5 Modelling for science versus modelling for management decision analysis

There is a big difference! The tradition in Australia has been for interested scientists to model part of the agricultural system that interests them, initially for the purposes of science. That is, to identify gaps in knowledge, and to run simulation inquiries. Then, recognizing that farm systems are not conducted only for the fun of it (though there may

be an element of this), it seems like a good idea to put some dollar measures into the model somewhere and call the result a decision support system. The result is that a tool designed to do something well, such as model the operation of the biology of a system in considerable detail, is thought to also be what is needed to help farmers make decisions about changing their farm system. Unfortunately, despite the immense detail of part of the system that is usually modelled, large parts of the whole farm are missing, or if included, commonly, in a partial and other erroneous ways (usually some simplistic cash flows or single activity gross margins analysis). The critical capital aspects of change are rarely included properly, if at all, let alone return on extra capital, effects on gearing and liquidity, as well as effects on the technical and economic operation of the rest of the activities of the farm business.

What farm management economists require from the agricultural systems modellers are the technical coefficients for potential changes to the operation of the production system. The tools for analysing changes to farming systems in the whole farm context are already available, and are very powerful, but they must be in competent hands to be useful.

3.6 Farm management education

The outstanding characteristic of the most successful managers of businesses is their mastery of information; thus the educational requirements of farm managers can be considered in the broad framework of helping to equip them to 'master information'. More specifically, the main requirement of contemporary farm management education is

for students and practitioners to learn to bring rigorous ways of processing information from a range of disciplines to bear in solving business problems of a multi-disciplinary and multi-dimensional nature, in managing businesses in a risky environment where much is unknown and much is unknowable.

Changes in the business environments in which Australian farms have to operate, particularly deregulation of commodity and capital markets, has meant that generally such businesses are exposed to more competition and to the vagaries of markets in inputs and outputs more than has been the case. Even though the move towards free trade and greater competition will continue to be slow, with a good deal of backsliding as well, more than ever the race will go to the 'fittest' farm businesses. Arguably, much of Australian farming has always been fit because one way or another they managed right from the start to export most of the agricultural products they produced.

Several major themes underlie any discussion about the future educational requirements of farm management practitioners. One theme is the critical role of information in successful farm business management and marketing in a dynamic world. Another theme concerns the nature of agriculture in Australia, and the particular usefulness of understanding technical, economic and human aspects of the operations of businesses related to agriculture in order to manage them successfully.

Farm management analysis is the most demanding area within the general field of agricultural science, because of the breadth and depth of knowledge required to do it

well. Farm management analysts need to have a sound training in agricultural science and technology so that they are able to recognise possible applications of research results to improving farm productivity and know the difference between competing explanations for what they see happening on farms. A sound training in production economics is an imperative - this is the theoretical framework within which problems can be solved. (It is hard to believe that benchmarking as an 'analytical' activity would have been given its recent third life in Australian agriculture if benchmarkers had even a vague inkling of the production economic way of thinking). Close exposure to practical farming is also essential in order to appreciate the detail and the nature of farming as a technical/business/human activity and to see farm problems as they are seen by the farm family.

3.7 Composition and Emphases in a Future Farm Management Text

At the start of this paper, an outline one of the first farm management texts in Australia was given (McMillan and Campbell 1947). The material covered differed little from modern farm management texts. Looking at the McMillan and Campbell text, then at Makeham (1968), Makeham and Malcolm (1981, 1991) it is worth pondering what different or added emphases would be part of a new farm management text that would be relevant for the next decade. Remembering of course that such texts are primarily for training professionals who will be advising farmers – they will not be widely studied or used by most potential farmers (though this will increase slowly as the number of professionally trained farm managers increases). Because of the differences of Australian

farming to that of all other countries, the Makeham texts emphasized the technology of farming, the management of risks and volatility of outcomes and the inclusion of risk in decision analysis more than did other texts world-wide. These emphases remain fundamental to understanding farm management in Australia. Those emphases should remain in a future text, as of course should emphasis on the production economic way of thinking. The Makeham texts also emphasized the budgeting methods far more, and accounting and record-keeping far less, than comparable texts world-wide. That would remain. Emphasis on financial management and rigorous investment analysis was increased markedly in the later of the Makeham texts. Those emphases would remain high. Additional emphases would be on:

- the theory, role and use of farm case studies. This would be made explicit and rigorous, compared with being implicit and naïve as previously;
- technical and economic evaluation of resource-improving/degradation-ameliorating changes to farming systems (the techniques are there, the examples would be added);
- technical and economic aspects of fine-tuning usage of inputs that are becoming increasingly costly in real terms, either as private or public costs;
- identifying which decisions require what type and extent of analysis, and information requirements;
- notions of perspective; learning the with/without style of thinking rigorously;
- notions of strength of belief and the limits to the experiences of the past being able to help know about anything much the future (compared with formal probability figurings) and theoretical aspects of scenario analysis would make up main change to risk management emphasis

- price risk management techniques – not necessarily because most farmers will or should use them, but for understanding of the way these tools can work, throughout the marketing chain, to reduce farm price risk;
- risk management as an offensive as well as defensive strategic approach;
- somehow, do more than nod towards the human element.

What else?

Some concluding comments follow.

4/ Concluding Comments

A glance through history suggests that in the most important ways, the fundamental elements of managing a farm has altered little. Within the farm boundary it is and has always been a biological, human and economic/financial process. This is subject over time to much volatility of outcomes, and hence, in any agricultural production period, subject to much risk that the possible outcomes that could occur will occur, subject to much influence from beyond the farm gate on what can be done, and involving much that is unknown and much that is unknowable.

Over time of two classes of agriculture are emerging: traditional commercial agriculture and other agriculture or activities related as much to a way of living as to business aspects of farming. The continued adjustment out of agriculture of those farm owners and managers who either are unable to earn sufficient from their resources to continue in agriculture or simply wish to retire because of age, or find they have a better use of their

resources, will mean that that as the number of fully commercial farmers becomes less, and the relative contribution of off-farm income to these farms increases. Then pressure intensifies to manage well, creating potential for the traditional farm management methods to play a bigger role than they have hitherto.

Too often economic analyses of agricultural choices can be found in which fundamental principles of economic logic are violated; unfortunately, analysts often perpetrate bad economics, bringing high levels of rigour to their own field and accepting or perpetrating any old nonsense outside of their field. Why do farm management economists get so agitated with non-economists efforts at economic analysis? A large part of the answer is that it is not hard to get the farm management economics right and it is frustrating to see analysts, often with an agricultural science background, get the economics wrong when the evidence from history is that the disciplinary rigour of scientific training makes an excellent foundation for applying economic principles and logic. So often, elementary errors are made and /or, even worse, analysts sometimes make up their own economics whilst blithely ignoring a couple of hundred years of profound intellectual effort which has gone into working out economics as a theoretical and applied discipline. The plaintive plea from the scientist when told that their pet idea is economic nonsense “Isn’t there some other sort of economics you could do which would make the idea sensible?” resounds regularly.

Economists are accused of assuming away too much of reality (and it is not hard to find economists for whom reality is a special case!) but the irony of ironies is that it is the non-economist, the analysts who see just their part of the problem, or who regard virtually

everything as being important *except* economic aspects of a situation, who are making the biggest assumptions, who are assuming away a significant part of the world. Good economists look at the whole of the problem, starting with the people and the technology, and get the economics, finance, risk and institutional bits right too. The decision analysis rule remains - measure what you can and think hard about what you cannot measure.

Ultimately the justification for advocating the use of farm management analytical techniques that have been around for a long time and have not been widely used, yet pass the tests of theoretic soundness and common sense, is that this knowledge will be around a lot longer than any of the farmers of the past fifty years were or will be. Given the nature of learning and change in farming and new mastery of information by new farmers, there is a reasonable chance that a higher proportion of farmers in the next relevant time, compared to the past period, may enhance the efficiency of their businesses by adding use of the simple farm management budgeting tools, on the computer spreadsheet, to the already extensive stock of intuition they use in decision making to help make good farm management decisions better.

The gist of this paper has been that people who are armed with a mix of farm related disciplinary knowledge, the intellectual wherewithal to look at questions about the management of farm businesses from a number of perspectives, the ability to do some farm management figuring, and the capacity to imagine a few different futures, can do much that is useful in informing farm decision analysis and decision-making; in evaluating agricultural research; and in judging agricultural and environmental policy measures. A few disciplines, a few perspectives, a few figurings and a few futures is

sufficient for good farm management analysis. Sophisticated thinking and simple figuring is the rule.

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