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**Modelling Decisions of Woolproducers:
Hierarchical Decision Models and
Personal Construct Theory**

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by

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Abstract

Models used to predict the supply of agricultural commodities that may be reliable for minor changes in key variables often have difficulties when major changes in the variables occur. A general aim of this research was to advance some explanations for the differences in forecasting performance between situations of major and minor changes in key variables.

A major part of the study was to find a descriptive and predictive model of behaviour, which allowed these stimuli to be elicited, while minimising the level of contamination of the results from the theoretical assumptions of the model. An in-depth appraisal was made of the various models of decision making based on utility theory. It was concluded they involve assumptions and behaviours that decision makers are unwilling or unable to comply with for some simple decisions, but more important, for complex decisions.

An approach was chosen that incorporated Gladwin's (1977) hierarchical decision model and Kelly's (1955) personal construct theory. Personal construct theory provides an explanation for human behaviour and learning, and for selection of aspects in the hierarchical decision models that are used as the operational models of people's decision processes. The approach allows for the simplifying procedures people use in making their decisions. Theoretical bias is reduced because no assumptions are made about which factors should be included in the models. Models of production and marketing decisions based on this approach were developed and tested using information from wool producers in the Armidale Rural Lands Protection Board area of the New England Tableland in NSW. Most of the models achieved success rates of 80 per cent or better for individual decisions.

The results of the study show graziers in the New England area used simplifying rules and strategies to make their production and marketing decisions. Many wool producers seemed to ignore a great deal of the information about changes in relative prices, sometimes unconsciously and sometimes as a deliberate strategy. Evidence

was found that some producers were not aware of changes in the relative profitability of enterprises that had the potential of increasing the short-term profitability of their businesses. In their experience, trying to predict prices and change enterprises in response to price was not likely to lead to greater profits in the long run, and entailed expenditure that might put the viability of their business at risk.

Price was influential in all decisions, but its effect varied from decision to decision and within different stages of the decision. Short-term price changes sometimes drew producers' attention to the need to consider changing their enterprise mix, although if the price change was minor, or sometimes even fairly major, they ignored it. For long-term decisions, such as changing enterprises, producers had little confidence in anyone's ability to predict prices in the future. They tended to rely on their experience of what had proved successful on their country in the past.

An important conclusion was that producers used decision rules that were in the nature of on/off switches rather than a continuous adjustment process. What their responses imply is that the assumption of fixed sensitivity to the value of a variable in econometric models may not be appropriate. It is not appropriate at the individual level, and the collective response of wool producers in this study to the collapse of wool prices suggests it may not be appropriate at the aggregate level, either. Research needs to be undertaken to develop empirical techniques that embody the behavioural rules outlined in this thesis and that can deal with the 'how much?' question.

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Glossary

1x - first-cross: Cross arising from mating merino ewe to a prime lamb sire; often a Border Leicester. Sold as prime lambs or as 2x dams.

2x - second-cross: Cross arising from mating a 1x ewe (typically Border Leicester-Merino) to a prime lamb sire (Dorset, Suffolk, Southdown). Sold as prime lambs.

2T - two-tooth: 1-year-old sheep with two permanent lower front teeth.

4T - four-tooth: 2-year-old sheep with four permanent lower front teeth.

ABARE: Australian Bureau of Agricultural and Resource Economics (formerly the BAE).

ABS: Australian Bureau of Statistics.

AWC: Australian Wool Corporation

BAE: Bureau of Agricultural Economics.

cfa - cast for age: Sheep that are discarded from the flock because of their age.

cull: Sheep that are discarded from flock because of faults, poor wool quality, teeth, age, etc.

dry ewe: Ewe not pregnant or lactating.

hoggett: Weaned lamb up to 1 year old.

RPS - Reserve Price Scheme: Scheme operated by the Australian Wool Corporation which set a minimum price for wool.

weaner: Lamb recently separated from its mother.

wether: A male sheep that was castrated as a lamb.

woolcutter: A wether or dry ewe used solely for wool production.