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A SIMPLE
WOOL MARKETING
SIMULATION MODEL

A Thesis Presented in Partial Fulfillment
of the Requirements for the
Degree of Master of Agricultural Science
at Massey University

by
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A C K N O W L E D G E M E N T S

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The New Zealand Wool Marketing Study Group was set up in December, 1964 to investigate and report on all relevant aspects of wool marketing. The terms of reference of the Wool Marketing Study Group included the requirement that they should examine methods of containing wool price fluctuations whilst retaining the existing auction system as the basic method for the disposal of wool.

The present study, supported in part by the Wool Marketing Study Group, examines what the effect would have been if alternative Wool Commission floor and ceiling price policies had been in force at New Zealand wool auctions for the historical period 1952/53 through 1965/66.

1.2 Aim of the Study

The aim of the study was to develop and test a wool marketing simulation model which would describe and summarise the performance of the New Zealand wool market, at auction, under a variety of demand conditions and Wool Commission floor and ceiling price policies.

This involved:

- (a) The construction of a simulation model which would incorporate some of the more important features of the New Zealand wool market, with sufficient flexibility to allow for;
 - (i) the implementation of different decision rules (policy parameters) for the purchase and sale of wool by the Wool Commission, and
 - (ii) the inclusion of structural parameters to indicate the magnitude and direction of the responsiveness of the wool trade to price movements and to the various Wool

Commission policies.

- (b) Inclusion in the model of measures, such as average price and variance in price, which would be important in summarising the outcome of each Wool Commission policy (or simulation run), and in indicating if and how these policies were significantly different from what actually happened over the historical period being considered.
- (c) The conversion of the model to computer programmes.
- (d) Running the simulation programmes for a variety of parameter (value) combinations, (representing Wool Commission policies and market demand conditions).
- (e) Attempting to infer from the simulation runs, for the period being considered, what Wool Commission policies would have been viable, and what would have been the effect of changes in demand for wool brought about by the Wool Commission's policies.

The aim of the study was not to estimate or conclude what values of the parameters are the "right" ones for the New Zealand wool market, rather it was to make "if ..., then ..." statements; if these had been the conditions ruling, then this would have been the outcome.

1.3 Thesis Guide

This section indicates the manner in which the thesis is presented.

Chapter 2 is primarily a review of some of the literature on wool marketing. The aim of the chapter is to acquaint readers with the context of the present study. The chapter reviews studies which have documented the extent of wool price fluctuations at auction in New Zealand, and studies which have attempted to summarise or explain the relationship between the demand for wool and wool prices.

Chapter 3 describes in some detail the operations of New Zealand wool auctions. The chapter also includes a consideration of price stabilisation

schemes, particularly floor and ceiling price policies, which could be superimposed on the wool auction. Measures which would summarise the performance of auction under alternative floor and ceiling price policies are then discussed. A number of simulation studies which investigate the effect of alternative floor and ceiling price policies have been carried out within the context of the Australian wool auctions, and Chapter 3 concludes with a review of these studies.

Chapter 4 discusses the salient features of the use of simulation in research. The chapter demonstrates how simulation under certain conditions can enable the researcher to generate information which would otherwise be difficult or impossible to obtain. A description of important aspects of the construction and operation of a simulation model, together with the method of drawing conclusions from the numerical results obtained, is also presented.

Chapter 5 details the construction of the Wool Marketing Simulation Model used in this study. For the purposes of presentation the three parts of the model are described individually. The first part to be presented is the quantitative balance which accounts for all wool sold at auction in a given week by calculating first the price at which the market will be cleared, and then the amount of wool bought by the wool trade and the residual bought or sold by the Wool Commission. The second part to be described is the inclusion of financial or revenue implications of the quantitative balance. Finally, ten summary measures are described in terms of variables in the model.

Chapter 6 comments on the realism of the model, in particular the quantitative balance.

Chapter 7 provides an analysis of the results obtained from running the simulation model for various parameter combinations. Two methods of inference are used in interpreting the results from a series of simulation runs. The chapter can be divided into two distinct parts. The first part discusses the theoretical background to the two methods, while the second part records the

empirical results obtained by using them.

Chapter 8 concludes the thesis by summarising briefly the inferences which can be drawn from the study.