AUSTRALIAN AGRICULTURAL ECONOMICS SOCIETY AWARDS 1987

PH.D. THESIS PRIZE

The prize was awarded to Charles A. Wall for a thesis entitled 'Modelling a multiple output production system: the Australian sheep industry' submitted for the degree of Doctor of Philosophy of the University of Sydney.

Thesis Abstract

Despite the fact that joint production is a common characteristic of Australian broadacre agriculture much of the previous empirical research into production decisions in Australian agriculture has not explicitly accounted for multiple output production. In an attempt to extend the existing knowledge in this area, a profit function model was used to study production decisions in the Australian sheep industry. Three flexible functional forms were specified: the normalised quadratic, the generalised Leontief and the translog forms. The interrelationships which existed between different outputs were accounted for by cross-equation restrictions and by using a full information maximum likelihood estimator.

On the basis of selected properties it was concluded that the translog function was the preferred form for modelling the production technology of the Australian sheep industry. However, the estimated translog models were not fully consistent with the homogeneity, symmetry, monotonicity and convexity conditions. Hence, the results from the profit function models should be interpreted with care. From the model estimates it was shown that expected relative output prices, relative variable input prices, quantities of fixed inputs, technological change and rainfall had an important influence on production decisions.

The own-price elasticity estimates were highest for wheat and other crops with the estimate for wool usually the lowest. Except for wheat produced in the pastoral zone all own-price and cross-price elasticity estimates were less than unity. There were some marked differences between the price elasticity estimates for some outputs both between different agricultural zones and within the same agricultural zone. This observation is consistent with past studies where regional disaggregation has been found to be important.

The results of the tests for Hicksian technical change indicated that technical change was biased toward cropping relative to livestock in the pastoral and wheat–sheep zones over the time period under study. In addition, technical change was biased toward wool relative to cattle in the wheat–sheep zone. In the high rainfall zone, technical change was biased toward wool relative to cattle and also toward sheep relative to cattle. It was found that short-run returns to scale were decreasing.

The non-jointness hypothesis was tested using the normalised quadratic models and only in the pastoral zone was the hypothesis of non-jointness not rejected. In other words, it is only in the pastoral zone that single-output supply equations and single-output production functions should be specified. In the wheat–sheep and high rainfall zones all outputs should be specified as part of a multiple-output production system. The homothe-

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ticity restriction was not rejected for the wool–sheep combination in the pastoral and wheat–sheep zone models. All other combinations of outputs on which the homotheticity restriction was tested were rejected.

MASTER'S THESIS PRIZE

The prize was awarded to Paul A. Cashin for a thesis entitled 'The Australian wheat industry as a case study in partial deregulation' submitted for the degree of Master of Agricultural Science of the School of Agriculture and Forestry, University of Melbourne.*

Thesis Abstract

The first broad objective of this study was to survey developments in the theory of industry regulation, in the hope of understanding the economic paradox of a wheat industry which gains little (if anything) from the structure of regulation, yet clings tenaciously to that structure. The Stigler–Peltzman theories of regulation, which highlight self-interested action in the political arena, are found to offer the greatest insights into solution of this paradox.

The second objective was to evaluate regulation of the domestic wheat market, not simply within the typical public-interest framework, but also by applying a positive (private-interest) analysis. Price stabilisation schemes and monopoly marketing authorities have been the two main forms of regulation of the domestic market for wheat.

Traditional arrangements for stabilisation, in seeking to raise prices or reduce their variability, also imposed economic costs on the industry. This form of intervention was influenced more by the need to find a covert means of attaining various price and income goals, rather than a desire to increase efficiency in the marketing system.

Producer-dominated marketing authorities are the administrative vehicles for stabilisation of commodity prices and the provision of orderly marketing of rural products. In the case of wheat, the Australian Wheat Board's (AWB) monopoly of domestic marketing has been used to enforce its practice of price discrimination between domestic and export markets for wheat. Where statutory marketing and successful price discrimination go together, there is little chance of producers advocating deregulation of any given industry.

Yet the AWB's domestic monopoly has been unable to provide significant domestic price protection for wheat growers, mainly due to a fundamental asymmetry in movements of the world price of wheat. The continued existence of the AWB's domestic monopoly indicates that wheat growers perceive that the potential rather than actual nature of home-price assistance, and the additional deadweight costs of the AWB's monopoly, are not significant enough to offset the 'advantages' of the reduced political visibility of home-price assistance.

The third objective of this study was to set up two models of the domestic wheat industry: a general model of regulation and a model of the nature and temporal stability of the demand for stockfeed wheat in Australia.

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The general model pointed out that the more elastic is domestic demand for the regulated good, the greater is the likelihood of deadweight costs to society arising from any manipulation of the price of the regulated good in search of political support. It also indicated that the growth of deadweight costs from the late 1960s, and the wider dissemination of information about these costs, resulted in an increase in the marginal opposition of taxpayers to redistribution of wealth by regulation at any given level of grower profit.

This model extended work by Peltzman and others to explain the recent trend to deregulation of the wheat industry. A major insight was the recognition that rational regulators would be aware not only of the additional political support available from redistributing rents between groups, but also of the extra political support gained by implementing policies which enhance economic efficiency.

A single-equation model of the Australian demand for wheat for stockfeed between 1950 and 1985 was formulated. This model indicated that such wheat has a high own-price elasticity, relative to the demand for wheat for human consumption or industrial uses. Results from this model also indicated that there had been some instability in the factors influencing demand over this period.

Deregulation of the feed wheat sub-sector of domestic demand is shown to be a logical response to the growth in the deadweight costs of regulation of wheat marketing. The conclusion is that when these deadweight costs (and consequent political opportunity costs of maintaining the regulatory structure) rose above the net political support obtainable by redistributing wealth via industry regulation, support-maximising regulators abandoned regulation of the market for feed wheat.

JOURNAL ARTICLE PRIZE

The prize for the best article published in the *Australian Journal of Agricultural Economics* was awarded to P. Bardsley and M. Harris for the article entitled 'An approach to the econometric estimation of attitudes to risk in agriculture' published in Volume 31(2), pp. 112–26.