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LOT SIZE AND BREED EFFECTS ON CATTLE PRICES REVISITED

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Todd and Cowell (1981) in their study of within-sale price variation at cattle auctions provided empirical evidence on the effects of a range of factors on cattle prices at auction. There are some aspects about the evidence relating to lot size and breed effects on cattle prices which tend to undermine confidence in the conclusions drawn in relation to these factors. These aspects relate to the rationale underlying the postulated effects and the empirical evidence for these effects.

The Basis for Possible Premiums Related to Lot Size and Breed

Lot size

Todd and Cowell argue that larger lots allow buyers to meet quality specifications more easily. Larger lots may attract a price premium because buyers may match more accurately a few large lots to quality specifications than numerous small lots.

While this argument is plausible it is by no means self-evident. There are two additional factors to be considered. First, the willingness to pay a premium and the size of that premium will depend on the narrowness of the quality specifications. Quality specifications are more narrowly defined for domestic type cattle than for export type cattle, so that any lot size effect on price is likely to vary with cattle type, and there will probably be no lot size effect for some types of cattle.

Second, the presentation of livestock at cattle auctions is such that there is normally substantial variation between animals within a pen with respect to carcase weight and quality attributes such as fat cover (see Todd and Cowell 1981 and Naughtin and Holland 1982). In addition, livestock buyers must expect to make significant errors in the subjective assessment of carcase attributes for particular pens of animals. A livestock buyer's professional skill lies as much in the smallness of the bias in his estimates, which enables the assembly of a line of livestock within given price, weight, and quality limits at the end of a sale, as in the consistency of individual pen estimates. Uncertainty about the quality of the product before him must significantly curtail the willingnes of a rational livestock buyer to pay price premiums for larger lots to meet quality specifications. Indeed under some circumstances the purchase of a larger number of smaller lots will reduce a buyer's exposure to risks arising from errors in estimation. Similarly, if the interlotting process involved the assembly of larger lots at the expense of greater heterogeneity of animals within lots, then a buyer may meet quality specifications more accurately by buying a larger number of smaller lots.

Todd and Cowell have given insufficient attention to the likelihood that there will be situations at livestock auctions where the payment of lot size premiums would not be consistent with economic rationality.

Breed

Some indications of the probable effect of breed on cattle prices can be gained from the results of technical research. It is useful to extend the summary of technical research presented by Todd and Cowell further in relation to breed. Kellaway (1971) in an overview paper summarised the results of breed comparisons of carcase characteristics as follows. If breeds are compared at similar carcase weights then:

(a) there is little or no difference between the dressing percentages of beef breeds of *Bos taurus* origin, and dairy breeds have lower dressing percentages than beef breeds;
(b) breeds differ in the proportion of fat and saleable meat in a carcase—the differences are small, if any, between traditional beef breeds, but are more significant for some other breeds, for example, Charolais and Friesian;
(c) there are no breed differences of economic significance in the distribution of muscle within a carcase; and
(d) breed differences in meat quality are small.

On the basis of these results, breed differences in per head prices or liveweight prices could be anticipated due to differences in dressing percentage, but there does not appear to be any technical basis for differences in the dressed weight prices paid for animals of traditional beef breeds at similar carcase weights.

The absence of a breed effect on cattle prices in the c/kg pricing model of Todd and Cowell is consistent with the conclusions above, but there is little technical basis for the result that Hereford cattle attract a price premium over Shorthorn cattle in the dollars/head pricing model.

The Numeraire

Todd and Cowell used both dollars/head and c/kg as a numeraire for the dependent variable price. The choice of numeraire affected the significance of the lot size and breed variables, but in other respects the results were similar. Todd and Cowell chose to give primary emphasis to the dollars/head pricing model, and they attributed the discrepancy in the results from the two models to the transformation of the dependent variable in the c/kg pricing model. On this view, dollars/head measures the actual price paid and the consequences of transformation of the dependent variable are not fully understood.

An alternative view is that the c/kg price reflects more accurately the value of the carcase meat, and that this is the primary valuation made by commercial buyers. The dollars/head price is a transformed variable which incorporates subjective assessment of carcase weight and quality. The adjustment for weight variation incorporated in the dollars/head pricing model is inevitably less than perfect, so that dollars/head can be viewed as an inefficient numeraire compared to c/kg.

However, there is a problem with this latter view because the observed price in c/kg is not a perfect numeraire. The observed price is normally the actual price paid, calculated after carcase weight information becomes available, and not the price the buyer believed he was paying at the time of sale. The degree of correlation between the two price variables is not known, but is presumably fairly high. Thus neither

dollars/head nor c/kg is fully satisfactory as a numeraire for price in models of the kind used by Todd and Cowell.

Against this background the Todd and Cowell results need to be treated with some caution, particularly where there are conflicting results from the dollars/head and c/kg pricing models. There seems to be no substantitive basis for the preference of dollars/head as a numeraire to c/kg.

Conclusions

The conclusions drawn by Todd and Cowell that lot size and breed are significant factors affecting cattle prices are dubious on the basis of the evidence presented. The results of the two pricing models provide conflicting evidence about the significance of those factors, and there seems to be little basis for the choice of one set of results over the other. The rationale underlying the lot size effect may apply in some but not all situations, while the conclusions drawn in relation to breed are difficult to reconcile with the results of technical research on breed effects on carcase characteristics. In view of these considerations, the suggestion by the BAE (1981) that livestock agents provide an interlotting service to realise price premiums for larger lots seems premature.

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