



LAND ECONOMY WORKING PAPER SERIES

Number: 50 **Distribution of Beef Cattle in Scotland: How Important is Agricultural Policy?**

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DISTRIBUTION OF BEEF CATTLE IN SCOTLAND: HOW IMPORTANT IS AGRICULTURAL POLICY?

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Abstract

If one observe aggregated cattle figures for Scotland for more than a century it is possible to perceive that that cattle numbers seem to react strongly to agricultural policy (e.g., livestock subsidies before 1973, UK becoming part to the European Community). The purpose the paper is to provide a regional view of this result, namely whether the same trend can be observed if the analysis is done by Scottish regions. For this purpose, we assembled a panel dataset for 11 Scottish regions for the period 1959 until 2008. We specialised the analysis on beef cattle. We use simple regression techniques to verify whether there have been changes in the regional shares of beef cattle and whether beef cattle numbers in the different regions tend to converge to a steady state value. The results indicate that the data can be broken down into two major periods: before and after the accession to the European Community (EC). Furthermore, in most of the regions, accession implied changes in the regional shares (although shares are very stable over time). In terms of the convergence analysis, it is clear that accession to the EC affected the regional beef cattle steady state values.

¹ Abstract prepared for the 114th Seminar of the EAAE “Structural Change in Agriculture: Modeling Policy Impacts and Farm Strategies” Berlin, April 15–16., 2010. Land Economy and Environment Research Group, King’s Buildings, West Mains Road, Edinburgh EH9 3JG. Corresponding author: Alan Renwick, (44-131) 535 4046, Alan.Renwick@sac.ac.uk.

Distribution of Beef Cattle in Scotland: How Important is Agricultural Policy?

Livestock is not only an important sector of Scotland's economy but also a key component of its agriculture and rural areas. Furthermore, a recent study by the SAC-Rural Policy Centre (2008) showed that the reduction in the number of livestock (both sheep and cattle) from the uplands may have a number of consequences in terms of the economic, environmental and social sustainability of those areas.

This paper focuses on beef cattle, due to its importance for Scottish agriculture, and studies the sector from a historical and spatial perspective with the purpose of identifying trends and structural changes, and the influence that agricultural policy may have on the sector. Thus, the main questions addressed are the extent that policy drives productive behaviour and whether this behaviour is common for all the Scottish regions. The latter question is an important element due to the marked regional differences in Scotland and the presence of regional policy.

Despite its importance for Scotland, the number of quantitative studies focusing on beef cattle and providing a regional analysis is limited and sparse (e.g., Carlyle, 1973; partially Robinson, 1988; SAC, 2008). These studies show the existence of regional differences associated to particular characteristics (e.g., natural resources quality, size of markets).

In order to capture long term trends and identify clear structural changes, a unique dataset has been assembled that considers information for the beef cattle sector (e.g., herd composition, farm size) in Scotland since 1960 broken down by regions and districts. The main interest in using historical data is because only by considering a historical overview it is possible to differentiate short term from long term trends and capture the response of farms to policy.

The collected information was assembled as a panel dataset in order to control for regional heterogeneity. The methodology consisted of adapting the economic convergence framework from Barro and Xala-i-Martin (1991, 1992), which allows estimation of long term trends and measures the degree of similarity in the way different regions evolve over time. In addition, this approach is flexible enough to allow policy changes to be introduced through intervention analysis (e.g., Harvey, 1993). Whilst the main interest of the paper is to analyse the evolution of the total beef cattle herd and the number of cows per region, we also analyse the composition of the herd.

Preliminary results of the analysis indicate that agricultural policy is an important driver of both trends and structural change and also a source of divergence amongst regions. In addition, changes in trends suggest that declines in livestock numbers have accelerated since the introduction of the Single Farm Payment and the decoupling of livestock numbers from payments.

The analysis also shows that cattle numbers have declined due to a combination of down-sizing and farmers withdrawing from production. However, in many areas the changes are also due to an increase in intensity as some farmers have expanded as others leave the industry. All these results indicate that the sector is still in the process of adjusting to the current situation.

References

Barro, R. and Sala-i-Martin, X. (1991) "Convergence Across State and Regions." *Brookings Papers on Economic Activity*, 1: 107-82.

Barro, R. and Sala-i-Martin, X. (1992) "Convergence" *Journal of Political Economy*, 100(2): 223-51.

Carlyle, W. J. (1975). *Livestock Markets in Scotland*. *Annals of the Association of American Geographers*, 65 (3): 449-460.

Harvey, A. C. (1993) *Time Series Models*, 2nd Edition. MIT Press: Massachusetts.

Robinson, G.M. (1988). *Agricultural Change: Geographical Studies of British Agriculture*. North British Publishing: Edinburgh.

SAC-Rural Policy Centre (2008). *Farming's Retreat from the Hills*. SAC: Edinburgh.