A comparison of dairy production systems in Ireland and Northern Ireland

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Introduction and Background

A lively and robust literature around the concept of dairy productivity has developed in recent years. Much of this has been motivated by the ongoing reforms of the Common Agricultural Policy (CAP), and the focus on dairy productivity is intensifying in anticipation of the abolition of the Milk Quota regime in 2015.

Much of the resulting research takes the form of cross-country analyses of productivity. One difficulty in interpreting the results of such studies is determining the extent to which differences in productivity are attributable to differences in farm structure, and the extent to which the prevalent technology explains productivity gaps. The question as to whether a common technology exists in the compared samples is very important, as the answer either leads to the specification of a single production frontier for all farms, or to a sample specific frontier for each country.

Our goal in this paper is to explore the production relationships that exist in two very similar countries – Ireland and Northern Ireland. To this end, we use data from the Farm Accountancy Data Network (FADN) for our comparison. The FADN data is well suited to this purpose as it is a harmonised data set of high-quality accounting data using representative samples of farms in each country.

Methodology

We first compile various descriptive statistics and carry out hypothesis tests to examine differences in the structure of the dairy sector in both countries.

We then estimate production functions for specialist dairy farms in Ireland and Northern Ireland using identical specifications to facilitate the comparison of parameter values. In addition to using standard panel techniques, we also estimate frontier functions (*i.e.* the production function mapped by efficient producers) for both countries using a Stochastic Frontier (SF) methodology due to Battese and Coelli (1995).

Although the resulting parameter estimates look broadly similar, the results of Chow tests of the parameter estimates (*i.e.* the variables' *effects* as opposed to the variables' means) confirm that differences in the parameter values cannot be explained due to sampling variation alone; specialist dairy farms in the north and the south are best considered as two distinct populations. We interpret this result as evidence of differences in the production technology prevalent in the two countries.

References

Coelli, T. J., Rao, D. S. P., O'Donnell, C. J., & Battese, G. E. (2005). *An introduction to efficiency and productivity analysis*. New York: Springer Verlag.

Coelli, T. J. (1995) "Recent developments in frontier modeling efficiency measurement", Australian Journal of Agricultural Economics, 39, 219–45.