Land Fragmentation, Market Integration and Farm Efficiency: Empirical Evidence from Kosovo

Sauer J.¹, Davidova S.² and Gorton M.³

1. Department of Agricultural Economics, University of Kiel, Kiel, Germany. jsauer@ae.uni-kiel.de
2. School of Economics, University of Kent, Canterbury, UK. S.M.Davidova@kent.ac.uk
3. Newcastle University Business School, Newcastle University, Newcastle upon Tyne, UK. Matthew.gorton@newcastle.ac.uk


Copyright 2012 by Sauer, Davidova and Gorton. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means,
Land Fragmentation, Market Integration and Farm Efficiency: Empirical Evidence from Kosovo

Introduction, Objective and Rationale

Mixed empirical evidence on the relationship between land fragmentation and land productivity/farm efficiency.

Previous studies fail to account for the heterogeneity of farm households assuming that all farms operated on the same frontier production function.

We analyze the effect of land fragmentation on farm efficiency in Kosovo. To recognize heterogeneity among agricultural production systems in Kosovo, we estimate the technology separately for different groups or “classes” of farms, identified using latent class modeling.

It is the first study of the effects of farm fragmentation that links the latent class model approach to the estimation of a multi-output production function and to the estimation of Morishima elasticities based on shadow price changes.

Kosovo Context

Small, landlocked country.

Farming accounts for 25% of GDP and between 25% and 35% of total employment.

Chronic labour market problems - official unemployment rate in 2009 of 47.5%. Of those looking for work in 2009, 60.1% had no formal qualification.

Typically small, household farms (1 – 5 hectares).

Data

Agricultural Household Surveys (AHS) conducted by the Statistical Office of Kosovo (SOK).


n = 2,217 agricultural households.

Land fragmentation measured in terms of Simpson Index and number of plots.

Market integration measured in terms of % of output of each crop sold and number of crops

Econometric Modelling

Technological processes are modeled by using a directional distance function, since multiple outputs are produced by the analyzed farms.

To measure an individual farms’ efficiency we use a parametric stochastic frontier approach Battese and Coelli (1995) estimator on the distance function is applied using an unbalanced panel data specification.

First- and second-order elasticities of the directional distance function estimated.

To measure changes in relative output and input quantities as a consequence of changes in relative prices, Morishima Elasticities of Substitution (MES) estimated. MES - a measure of the % change in relative factors for a % change in price.

Estimating a “common” technological frontier for a group of observations is misleading if the sampled farms are using different technologies.

We distinguish technologies by estimating for different groups or “classes” of farms. Specifically, explore the effects of fragmentation and market integration specific to technology types.

Estimation of the production structure is combined thus with a latent class modeling (LCM).

Results

Figure 1 presents the distribution of technical efficiency scores for the full sample (by construction ranging between 0 and 1). A larger index score indicates higher efficiency levels relative to other farms in the sample.

LCM: Three classes of farms identified.

For Class 2 (the largest group of farms when measured by number of farms in class), no significant relationship between land fragmentation and technical efficiency. Significant negative relationship between % of output not marketed and efficiency.

For other two classes of farms, different relationships between land fragmentation and efficiency. For Class 3, the least efficient group, the Simpson Index is positively associated with technical efficiency while the number of plots is not significant. For Class 1, the Simpson Index is negatively associated with efficiency while the number of plots is not significant.

Conclusions

1. Land fragmentation is not a major cause of technical inefficiency for the largest class of farms.
2. For some farms, however, (Class 1), fragmentation does increase inefficiency.
3. Results thus confirm that the usual approach of using one homogenous function to estimate fragmentation effects is misleading.
4. Policy initiatives to promote land consolidation have faced resistance from farmers in Kosovo. May reflect that most farmers rightly do not regard land fragmentation as a major impediment.

Contacts

JOHANNES SAUER (University of Kiel, Germany), SOPHIA DAVIDOVA (University of Kent, UK) and MATTHEW GORTON (Newcastle University, UK)

JOHANNES SAUER
jsauer@ae.uni-kiel.de

SOPHIA DAVIDOVA
S.M.Davidova@kent.ac.uk

MATTHEW GORTON
Matthew.gorton@newcastle.ac.uk