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AGREKON

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Doelwit en omvang

Agrekon poog om navorsing en bespreking van landbou-ekonomiese aangeleenthede wat op Suider-Afrika betrekking het te bevorder. Dit sluit dissiplinêre-, multi-dissiplinêre- en probleemgeoriënteerde werk in. Die tydskrif verwelkom alle oorspronklike bydraes van 'n aanvaarbare professionele standaard. LEVSA en die redaksie onderskryf nie noodwendig, en aanvaar nie verantwoordelikheid vir verklaarde gesigspunte of menings, of die korrektheid van feite en syfers nie.

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Agrekon aims to promote research and discussions on agricultural economic issues related to southern Africa. It includes disciplinary, multi-disciplinary and problem orientated work. The Journal welcomes all original contributions of an acceptable professional standard. AEASA and the editors do not necessarily subscribe to or accept responsibility for viewpoints or opinions expressed, or the correctness of facts and figures.

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- Intekenaars in Suider-Afrika (Rand Monetêre Gebied): R50 per jaar (posgeld ingesluit).
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Die Landbou-ekonomie Vereniging van Suid-Afrika

The Agricultural Economics Association of South Africa

Doelstellings

- Om opleiding, navorsing en belangstelling in landbou-ekonomie te bevorder.
- Om toepassing van landbou-ekonomie ter oplossing van landbou-, landelike en nasionale probleme in suider-Afrika te bevorder
- Om skakeling tussen landbou-ekonomie op streeks-, nasionale en internasionale vlak te bevorder.
- Om die belange van landbou-ekonomie te bevorder.

Objectives

- To promote education, research and interest in agricultural economics.
- To promote the application of agricultural economics to solve agricultural, rural and national problems in southern Africa.
- To promote liaison between agricultural economists at regional, national and international levels.
- To promote the interests of agricultural economists.

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Die ledetal van LEVSA bestaan uit gewone lede, studenteledes, assessorlede en erelede. Gewone lede verteenwoordig die meerderheid en is persone wat minstens 'n driejaar universiteitsgraad verwerf het met spesialisasie in landbou-ekonomie, ekonomie, en/of ander toepassings van die ekonomie, of weens hul ondervinding, posisie en/of professionele belang in die toepassingsveld van landbou-ekonomie, as lede van LEVSA aanvaar is

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THE FARM SIZE-EFFICIENCY RELATIONSHIP IN SOUTH AFRICAN COMMERCIAL AGRICULTURE¹

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This paper briefly discusses the sources of economies of scale, with some international evidence. It provides a picture of the structure of South African agriculture, detailing distributions of farm size as well as some results of previous studies analysing farm size efficiencies. An analysis of farm size-efficiency relationship in commercial farming is done by utilising representative farm level survey data on the six major grain producing areas and an irrigation area over the period 1975-1990. The role of policy in explaining these relationships is discussed, while some conclusions are also drawn.

The findings have specific implications for land reform. The inverse farm size-efficiency relationship, which is also present in South African agriculture despite a history of policies favouring relatively large mechanised farms, implies that significant efficiency gains can be made if farm sizes in the commercial sector becomes smaller. An important element in such a process would be the removal of all policies and distortions favouring larger farms relative to smaller farms.

1. Introduction

At least two questions related to the productivity relations in South African agriculture, which have not been adequately addressed in South Africa before, are important when considering land reform:

- Are large mechanised farms and the present commercial white farms economically efficient relative to smaller holdings?
- What is the role of past policies in determining these observed productivity relations?

If larger farms are not efficient relative to smaller farms, then smaller farms and equalising the ownership distribution would enhance both efficiency and equity, and if policy created artificial economies of scale, they should be adjusted.

This paper has as objective to explore these issues by briefly reviewing the sources of economies of scale and international evidence on these issues, as well as analysing representative farm-level data in both the South African commercial sector. These analyses are conducted against the policy environment and changes therein, as well as other factors which influence farm production.

Section 2 briefly discusses the sources of economies of scale, with some international evidence. Section 3 provides a picture of the structure of South African agriculture, detailing distributions of farm sizes as well as some results of previous studies analysing farm size efficiencies. In section 4, an analysis of farm size-efficiency relationship in commercial farming is done by utilising representative farm level survey data on the six major grain producing areas and an irrigation area over the period 1975-1990. The role of policy in explaining these relationships is discussed in section 5, while some conclusions are also drawn.

2. Economies of Scale²

Sources of Economies of Scale

Lumpy inputs: Farm machinery -threshers, tractors and combine harvesters- are lumpy inputs, and reach their

lowest cost of operation per unit at relatively large areas. With the advent of agricultural mechanisation many people believed that the economies of scale associated with it are so large that it makes the family farm obsolete. Small owners would sell or lease their land to larger operators. However, it became quickly apparent that machine rental can permit small farmers to circumvent the economies of scale advantage associated with machines in all but the most time-bound of operations, such as ploughing and planting (seeding) in dry climates or harvesting where climatic risks are high. In those situations farmers compete for early service and therefore prefer to own their own machines. Thus, economies of scale associated with machines do increase the minimum efficient farm size, but by less than expected because of rental markets. The use of lumpy inputs leads to an initial segment of the production function that exhibits increasing returns with operational scale, but these technical economies vanish when farm size is increased beyond the optimal scale of lumpy inputs or when rental markets make the lumpiness of machines irrelevant.

Management skills and information, like machines, are indivisible and lumpy inputs, so the better the manager, the larger the optimal farm size. Technical change strengthens this tendency. The use of fertilisers and pesticides, and arranging the finance to pay for them, require modern management skills. So does the marketing of high-quality produce. In an environment of rapid technical change, acquiring and processing information becomes more and more important, giving better managers a competitive edge in capturing the innovator's rents. Therefore, optimal farm sizes tend to increase with more rapid technical change. However, some management and technical skills, like machinery, can be contracted from specialised consultants and advisory services or can be provided by publicly financed extension services. Contract farming for processing industries or bulk marketing companies often involves the provision of technical advice.

Access to credit and risk diffusion: Land, because of its immobility and robustness, has excellent potential as collateral, making access to credit easier for the owner of unencumbered land. On the other hand, rural credit markets are difficult to develop and sustain. There is therefore often severe rationing of credit, which can be partly relieved by the ability to provide land as collateral. The high transaction