



Methodological Evaluation of Smallholder Farms Systems in South Africa: A Difference-in-Differences Approach to Assess Efficiency Gains

Bongani Khumalo^{1,2}, Siphon Nkosi^{1,3}, Nokuthula Sithole⁴, Sofiat Mhlongo⁵

¹ University of Limpopo

² Cape Peninsula University of Technology (CPUT)

³ Department of Advanced Studies, Agricultural Research Council (ARC)

⁴ Wits Business School

⁵ Agricultural Research Council (ARC)

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Correspondence: bkhumalo@yahoo.com

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Author notes

Bongani Khumalo is affiliated with University of Limpopo and focuses on Physics research in Africa.

Siphon Nkosi is affiliated with University of Limpopo and focuses on Physics research in Africa.

Nokuthula Sithole is affiliated with Wits Business School and focuses on Physics research in Africa.

Sofiat Mhlongo is affiliated with Agricultural Research Council (ARC) and focuses on Physics research in Africa.

Abstract

Smallholder farms in South Africa face challenges that affect their operational efficiency and profitability. A theoretical framework will be developed using DID econometric techniques. The model will compare pre- and post-intervention periods within matched control and treatment groups. The theoretical framework provides a robust method for assessing smallholder farm efficiency gains using DID econometrics, offering insights into policy interventions and resource allocation. Implementing this model can aid policymakers in understanding and improving agricultural productivity among smallholders. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, agricultural economics, econometrics, spatial analysis, productivity measures, stochastic frontier, randomized experiments*

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