Effects of a Green Revolution in Africa: A CGE Analysis

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Abstract
Agriculture is the most important source of income in most of the African countries. 80 per cent of the households live in the rural areas and almost 70 per cent of them are dependent on agriculture for their livelihood. However, total factor productivity (TFP) in Africa lags behind the global average. Given this background, the main purpose of this study is to analyse the effects of a potential African 'green revolution' on the different regions in Africa and African trade including with the EU-28, China and USA. This is done using a modified version of the GLOBE model which is a global, dynamic general equilibrium model and is based on the GTAP data. For the purpose of this study, we assume that green revolution would change the yields in all African regions as a result of the changes in TFP. We introduce this the relationship between yields and TFP explicitly to the model. Then we run two sets of stochastic scenarios by using Gaussian Quadrature approach. The first set introduces the historical statistical distribution of the changes in the yields to the model. The second set assumes that mean and variance of the historical distribution changes as a result of green revolution. In both cases, the TFP is endogenized to replicate the yield changes consistently.The results suggest that most significant impact is observed in Western Africa. Trade and production pattern of all regions are affected significantly. African regions increases production and exports of the main staple significantly.

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