

1 Introduction

The present paper concerns the impact of large-scale land acquisitions (LSLA) on rural households. The precise nature of this relationship is highly divisive as a matter of economic theory. Some economists believe that foreign land acquisitions facilitate rural development by creating employment, increasing productivity, and improving access to finance. Similarly, it has been argued that foreign investment in land contributes to infrastructure development, state revenue, and energy security.

As noted, these propositions do not command universal acceptance. One argument against LSLA proceeds from distributive premises: the acquisition of land frequently entails the expropriation of customary right-holders. This problem is greatly compounded by the deployment of discretionary measures against natives of the host country, especially when the local administration is susceptible to corruption. Distributive issues aside, large-scale land acquisitions are theoretically liable to produce at least two negative externalities. First, land may be excluded from national agricultural production in order to satiate foreign demand for biofuels and food. Second, the use of water may become unsustainable for rural populations as the rural areas with best access to water are the ones that are most targeted by foreign investors.

This study seeks to add to the few empirical papers that have explored the issue of the effect of LSLA on rural development. The focus here is on rural development in Tanzania as the country presents an interesting example for an economic analysis of the impact of different land tenure policies on rural development.

3 The dataset

The analysis is based on a large panel dataset on rural Tanzanian households assembled by the World Bank's Living Standards Measurement Survey – Integrated Survey on Agriculture (LSMS-ISA), and published recently for the period 2008-2013. Data on

large-scale land acquisitions by foreign investors are taken from the Land Matrix database.

3.1 Land Matrix

The Land Matrix is a global and independent land monitoring initiative. The database is constantly updated and collects information on land deals from a variety of sources: research papers and policy reports, field-based research projects, official government records, company websites and media reports. Each deal is accompanied by information on the data source.

The Land Matrix collects information on large-scale land acquisitions of over 200 ha. For the purpose of the current research, the following information were collected on large scale land acquisitions in Ethiopia:

- Year of transaction completion, ranging from 2000 to 2016;
- Location of parcel (at the local level);
- Size of land acquisition in m²;
- Nationality of the acquirer

Entries that were undated, unverified or involving Tanzania-based companies were disregarded, as were those that lacked region-specific information.

3.2 WB's Living Standard Measurement Survey – Integrated Survey in Agriculture

The LSMS-ISA is a household survey project established by a grant from the Bill and Melinda Gates Foundation. Its conduct was entrusted to the LSMS team at the World Bank. The aim of the project is to collect household-level data on rural development in eight Sub-Saharan countries. The principal advantage of the survey lies in its extensibility to the other states covered by the LSMS-ISA dataset.

In Tanzania, the LSMS-ISA survey was carried out by the Tanzania National Bureau of Statistics. It collected information on 3,280 households representative of seven identified 'zones' of the country. The survey was organised in three 'waves' so that each household

was interviewed three times: 2008-2009, 2010-2011 and 2012-2013. For the purpose of the present research, the following indicators were retained:

- Area of fields: Field area (in hectares) owned and/or managed by the respondents was recorded using GPS by the enumerators conducting the survey. There are three possibilities for the impact of large-scale foreign land acquisitions on field area. The first is that the government rents predominantly unused land to foreigners, in which case we would see very little impact on rural households' land area. The second is that rural households' land is rented to the foreign firms, and that the government compensates the households more than the land was worth to the household. In this case LSLA is associated with a decrease in land-holdings, but an increase in wealth for the households (at least in the short term). The third possibility is that the households' land is taken and insufficient (or no) compensation is paid. In this case we would see a decrease in land-holdings and decrease in welfare for rural households.
- Land value: Survey respondents were asked to evaluate for how much they would rent their land to others for a period of twelve months. Again the impact of LSLAs on the value of land controlled by rural households is unpredictable. All else equal, LSLAs should drive up land scarcity and thus increase rental rates.
- Certification: Survey respondents were asked if they were in possession of a certificate for each of the land parcels they owned. The variable used is the total number of certificates held by the household. If LSLAs were a driver of improved property rights at the regional level, we would expect to see an increase in the relative number of certificates in the regions experiencing the most LSLA. On the other hand, if LSLAs encouraged government elites to expropriate rural households' existing property rights, we would see a relative decrease in certificates in the regions most affected by LSLAs. As was the case for the area-of-land variable, the impact of a loss of certificates on household welfare depends on the amount of compensation which accompanied the transfer of property rights.
- Food expenditure: Was collected as the amount spent to purchase food consumed by the household in the previous week. An increase in food expenditure may

indicate an increase in the price of food, as well as an increased dependence on purchased c.f. self-grown food. All else equal, either of these reasons for increased food expenditure would indicate lower welfare for the household. However, an increase in food expenditure may also occur due to an increase in household income. This, of course, would suggest increases in household welfare. In order to help distinguish the income driver from price and dependency drivers of increased food expenditure, we also study non-food expenditure.

- Non-food expenditure: Is the amount the household estimates it spent in the previous 12 months on non-food items. Increased disposable household income should be evident in an increase in non-food expenditure.
- Agricultural work (non-wage): Hours of work per week spent collectively by the household members in agricultural activities (for the household). This variable provides an alternative to the area-of-land variable as a measure of a potential shift away from land-holding and agricultural-based lifestyles.
- Hours of work per week spent collectively by the household members in non-agricultural activities (for the household); and
- Hours per week spent collectively by the members of a household in work for a wage, which includes both agricultural and non-agricultural activities for an employer.

Only data collected in rural areas are included in the dataset. Data on small towns and larger cities are disregarded as not relevant for the analysis of rural development.

4 Methodology

The Land Matrix dataset provides information on LSLAs by region and year, while the LSMS data set provides information at the household level for a panel of 3 years – 2009, 2011, and 2013. Accordingly, my fundamental approach to the analysis is to examine the relationship between regional-level measures of land acquisitions from 2009-2013 and changes in household-level outcomes from 2009 to 2013.

In this study I use the coarsened exact matching (CEM) algorithm described in Blackwell, Iacus, Porro and King (2011). Which non-parametrically matches cases and controls by generating strata from a set of characteristics of rural households in Tanzania. In order to ensure that there are sufficient matches between cases and controls, variables describing the required characteristics are coarsened into bins, much like in the construction of a histogram. The strata generated contain only observations which share the same bin for all of the different (coarsened) variables. The algorithm then calculates weights to be applied to each strata on the basis of the number of treatment and control observations it contains. Regressions using these weights simulate regressions on a dataset which is balanced in terms of the characteristics of the treatment and control groups.

Once matching is achieved, the analysis is completed by weighted regression of the change in the dependent variable on the dummy indicator for the treatment area. Weighted ordinary least squares is used for all variables except those for which the undifferenced variable is binary. Since differences of binary variables make take on values of -1, 0, or 1, these variables are analyzed using ordered logit with the CEM weights applied. Robust standard errors are calculated in all cases.

5 Results

It is hoped that a modest contribution to the existing empirical literature can be made by combining newly available panel data with a rigorous statistical methodology. The quantitative method allows for an unbiased observation of foreign land acquisitions to be carried out. The comparison with a similar study conducted in Ethiopia will allow for broader observations on the phenomenon of land acquisitions in Sub-Saharan Africa.