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<http://dx.doi.org/10.1016/j.worlddev.2016.09.009>

Market Access, Well-being, and Nutrition: Evidence from Ethiopia

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Summary. — We use a unique data source from a rural area in northwestern Ethiopia to analyze the relationship between household/individual well-being, nutrition, and market access. We find that households residing in relatively more remote areas consume substantially less than households nearer to the market, they are more food insecure, and their school enrollment rates are lower. Although their diets are also less diverse, we find no significant differences in mother and child anthropometric measures. Part of the differences in well-being that we do observe can be attributed to lower household agricultural production in remote areas. Nonetheless agricultural production differences alone do not account for all the differences in household consumption levels for remote households. An additional contributing factor is the terms of trade for remote households that negatively affect both the size of the agricultural surplus that these households market and the quantity of food items that they purchase. Reducing transaction costs for remote households and facilitating migration could help equalize well-being among more or less favored locations.

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Key words — market access, transport costs, rural infrastructure, agricultural production, well-being, nutrition, Ethiopia

1. INTRODUCTION

Achieving efficient access to markets through improved rural road infrastructure is often seen as a promising way of improving the well-being of poor rural populations in developing countries (World Bank, 2012). Improved rural road infrastructure has been shown to be associated with lower poverty (Gibson & Rozelle, 2003; Khandker, Bakht, & Koolwal, 2009; Lokshin & Yemtsov, 2005), higher household consumption (Dercon, Gilligan, Hoddinott, & Woldehanna, 2009; Stifel, Minten, & Koro, 2016), and improved health outcomes (Ahmed & Hossain, 1990; Lokshin & Yemtsov, 2005). The reasons advanced for these desirable associations are typically reduced transport and input costs, which are believed to result in higher agricultural productivity (Gollin & Rogerson, 2010; Stifel & Minten, 2008) and greater non-farm production (Binswanger, Khandker, & Rosenzweig, 1993; Fafchamps & Shilpi, 2003; Jacoby & Minten, 2009).

Much of the economics literature on the topic focuses primarily on identifying the causal impact of rural infrastructure on household well-being, and not on the mechanisms that perpetuate the impact (e.g., van de Walle, 2009). Moreover, despite the recent policy emphasis on making functional improvements to agricultural value chains and on assuring better market access in order to achieve better nutritional and health outcomes in developing countries (FAO, 2013; GAIN, 2013), there is little solid evidence of the impact of improved market access and lower transport costs on nutritional outcomes (e.g., Hirvonen & Hoddinott, 2014; Hoddinott, Headey, & Dereje, 2013; Vitzthum, 1992; von Braun & Kennedy, 1994).

We contribute to this gap in the economics literature by using a unique data source that not only permits us to estimate gradients of different measures of household and individual well-being (household consumption, education, food security, dietary diversity, and mother and child nutrition outcomes) over rural feeder roads (or the absence of such roads), but also allows us to explore the pathways through which remoteness from markets is related to well-being.¹ This is important because it can help us to identify the appropriate policy

environment that complements the substantial investments needed to build and maintain physical infrastructure. We find that households' access to markets, as measured by transaction costs to the nearest market (in this case, the same market), indeed is positively associated with household consumption and food security through the link between agricultural production and marketing. Further, there is room for additional agricultural investments, such as increased extension and modern input provision, in order to reach the most remote households. Finally, rural markets play an important role in the remoteness-well-being relationship. Efforts to reduce transaction costs associated with remoteness through improved feeder roads² may pay dividends by facilitating households' abilities to transform marketed surpluses into consumption goods and into healthier, more diverse diets. Given that we do not find a significant relationship between mother and child anthropometric measures and remoteness, however, the improved diets associated with greater market access appear to be insufficient to translate into improved nutrition outcomes.

Since roads are not randomly placed, an empirical challenge common to all studies that estimate the impacts of roads and improved market access on various outcomes is that the causal relationship between improved road access and the apparent outcomes (benefits) of this access are difficult to distinguish. In other words, it is difficult to determine if roads are placed in higher productivity or higher income areas, or if incomes and productivity are higher as a result of the roads.³ We address this problem of causation by conducting a household survey in a region in northwestern Ethiopia in which land quality characteristics do not differ systematically in the region.⁴ This sample area was selected purposefully in order that the primary differences between communities in the region are the transport costs between the communities and the particular market to which community members travel. In our

* The authors express their gratitude to DFID, USAID, and DFATD for funding this research under the Ethiopian Strategy Support Program II (ESSP II), a collaborative programme of the International Food Policy Research Institute (IFPRI) and the Ethiopian Development Research Institute (EDRI). Final revision accepted: September 26, 2016.

study area, these transportation costs differ substantially within the region, not because of road placement but because of the geography of the region.⁵ Ideally, this implies that transportation costs are effectively placed randomly in the survey area, and that market access can be interpreted as having a causal impact on measures of well-being. Although, we cannot concretely establish this, our sensitivity analysis, in which we show that land productivity does not differ systematically in the survey area, supports it.

The structure of the paper is as follows. Section 2 provides a description of the data, and Section 3 documents the relationship between household/individual well-being and market access. Section 4 explores the pathways that may explain the market access and well-being relationship. Discussion and concluding remarks are presented in Section 5.

2. THE STUDY AREA, DATA AND DESCRIPTIVE STATISTICS

The sample area for this study is located in Alefa *woreda* (commune) in the rugged terrain of northwestern Ethiopia (see Figure 1). This area was chosen because the large variation in transportation costs over a relatively short distance allowed us to carefully assess the impact of these varying costs in a situation of similar physical and climatic conditions. The study site is an isolated area with little to no electricity and mobile phone access and without any development or humanitarian assistance programs provided by non-governmental organizations. The starting point for the study area is the market town of Atsedemariam, which is connected to a major

metropolitan area, Gonder, to the northeast by a gravel road that is passable all year round.

Trucks regularly ply the road between Atsedemariam and the markets in Gonder and beyond with goods originating from and destined for Atsedemariam. Communities exist to the west of Atsedemariam where access to outside markets is available for the most part only through Atsedemariam because of the difficult terrain. Further, access to Atsedemariam (and onward to Gonder) is limited to routes that are accessible mainly to foot traffic only, although motorcycles can pass along some portions. To transport agricultural produce to Atsedemariam and to transport agricultural inputs and consumer goods back from Atsedemariam, community members rely on donkeys. Farmers in the survey area rely on the cooperative office of Atsedemariam as their source of modern inputs.

Households were surveyed in a series of seven sub-districts (or *sub-kebeles*) along the route emanating from Atsedemariam. For sampling purposes, equal numbers of households were interviewed in five different distance brackets, measured in travel time by donkey, from the market of Atsedemariam. With a target of 850 households, 170 households were interviewed in each distance category.⁶ Households were sampled evenly from sub-districts within each category to assure a relatively homogenous spread of households over the space between Atsedemariam and the most remote households in Fantaye sub-district. The purpose of this sampling method was to obtain a representation of households in the sub-districts along the route from the market at Atsedemariam to Fantaye, not to be representative of the population in the *woreda*. The survey took place over a five-week period in

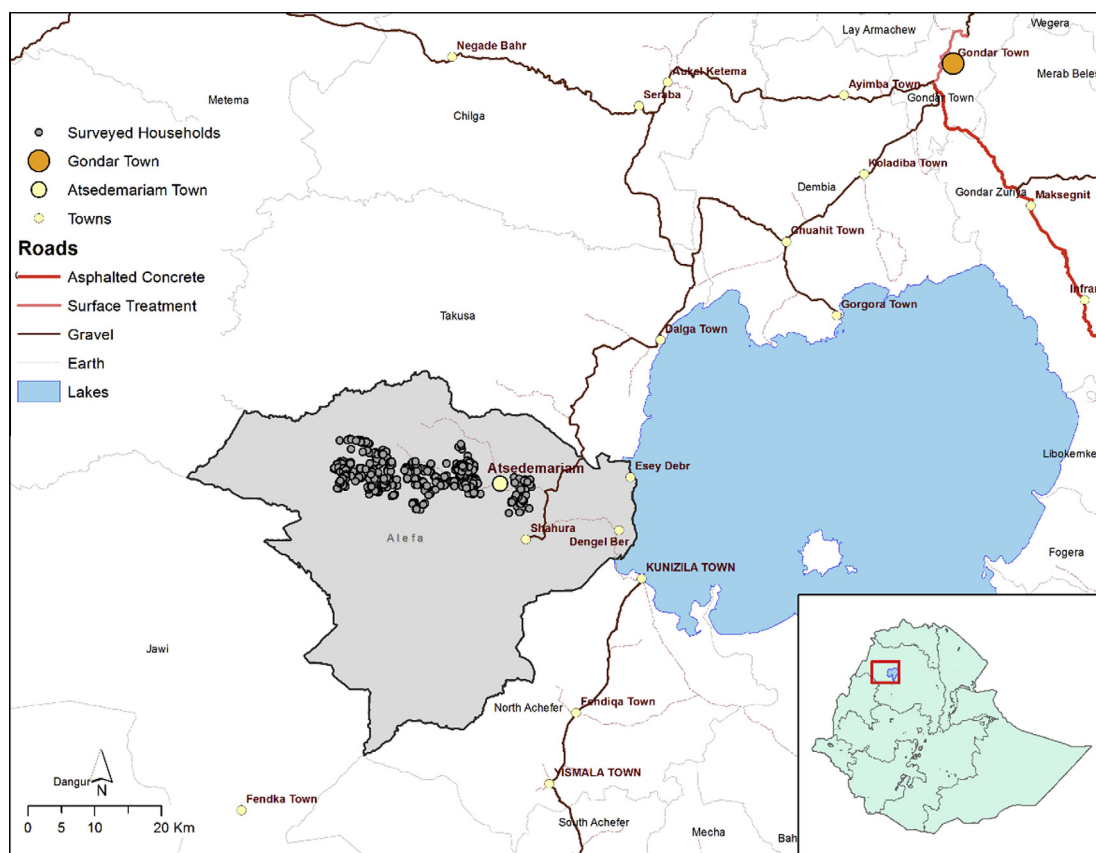


Figure 1. Map of the survey area. Source: Ethiopian Rural Transport Survey 2011.

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