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Resilience mobility in Uganda: A dynamic analysis

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ABSTRACT

Household resilience to food insecurity can be considered as the capacity that ensures stressors and shocks do not have long-lasting adverse development consequences; it is, nowadays, one of the key words in the policy debate on development. Measuring resilience capacity and how it varies over time is extremely significant for policy makers and people living in risk-prone environments. More specifically, there is a gap of empirical evidence about what drives changes in resilience capacity status (i.e. moving from a low resilience profile to a high one, and viceversa). This paper applies econometric techniques for estimating household resilience and adopts transition matrices to estimate how it changes over time. Finally, multinomial logit and bivariate probit models are estimated to identify the main drivers of change. Our study finds that female headed households are less likely to become the most resilient; also this paper demonstrates that education and participation to household enterprises are positively associated with increased resilience capacity. This paper innovates the resilience literature by providing an evidence based analysis of the main drivers of resilience; it brings this evidence in the Uganda's context, focusing the attention of the policy makers on sub-sample of population which are worse off. More generally, our study suggests that resilience enhancing policies can bridge humanitarian and development interventions by demonstrating how long-term perspectives (i.e. those investing in education) can lead to an immediate increase of resilience.

1. Introduction

The concept of economic resilience is of increasing interest to policymakers. However, despite the growing importance of the idea of resilience, the concept has not yet been carefully defined or measured (Resilience Measurement Technical Working Group, 2013). It is still sometimes confused with the similar yet technically distinct concept of vulnerability (Adger, 2006).

Resilience is one of the key concepts for measuring household capacity to cope with shocks. As such, resilience is a crucial driver for projects, programs, actions and interventions in development economics.

The majority of the proposed approaches for measuring it reflect the diversity of disciplines and sectors (Benè, 2013) in which resilience has been applied. Several definitions of resilience are being used in the development and humanitarian space, and they all tend to share three common elements: (i) the capacity to bounce back after a shock; (ii) the capacity to adapt to a changing environment; and (iii) the transformative capacity of an enabling institutional environment.

When it comes to measurement, resilience proved to be a challenging concept. This is mainly due to the fact that resilience is not measurable *per se.* The Food and Agriculture Organization of the United Nations (FAO) has a lengthy history in measuring it, being the first to adopt the concept of resilience in the food security context (Pingali, Alinovi, & Sutton, 2005) and having proposed an econometric approach to measure it since 2008 (Alinovi, Mane, & Romano, 2008). More recently, Frankenberger, Spangler, Nelson, and Langworthy (2012), Vaitla, Maxwell, Tesfay, and Rounseville (2012), Smith et al. (2015); and Alfani, Dabalen, Fisker, and Molini (2015) have proposed different approaches, while d'Errico, Garbero, and Constas (2016) set the principles for quantitative measurement.

In this paper, resilience is defined as '*the capacity that ensures stressors and shocks do not have long-lasting adverse development consequences*' (Constas, Frankenberger, & Hoddinott, 2014; RMTWG, 2014). Given this definition, any analytical framework for measuring resilience should respect the following principles.

Resilience has to be benchmarked to an outcome: it includes the agent's status with reference to a given, normatively established output level (e.g. poverty line, minimum food caloric intake, etc.). In the socio economic analysis, the most widely outcome employed

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is food security (see Constas et al., 2014; FAO, 2016a; Smith et al., 2015).[1]

Resilience is a genuinely dynamic (i.e.: time-dependent) concept: it includes preparing for, being reached by and react to shocks. This implies that the analytical framework cannot be static and an appropriate time frame must be defined. Also, this implies dynamic frameworks with defined time intervals; panel data are the best solution in order to properly measure it. Unfortunately, finding panel data sets is not always easy; this is one of the reasons for the scarcity of literature on dynamic resilience (Ciani & Romano, 2011).

The analytical framework must be able to capture all possible pathways for achieving or deteriorating resilience. As a result, the analytical framework must be able to capture both negative shocks affecting the outcome (e.g. food security) and coping strategies that can be put in place. Shocks can be defined as "external short-term deviations from long-term trends, deviations that have substantial negative effects on people's current state of well-being, level of assets, livelihoods, or safety, or their ability to withstand future shocks" (Zseleczky & Yosef, 2014). As a consequence they can be both idiosyncratic (e.g.: death of breadwinner; livestock and other assets reduction; crop failure) and covariate (e.g.: climatic shocks; inputs/outputs price shocks; conflicts).

Resilience is context-specific: it is comprised of a set of ex-ante characteristics describing the relationship between shocks and development outcomes, such as food security (Barrett & Constas, 2014; RMTWG, 2014) that need to be specified case-by-case. As a consequence, every measurement model needs to be designed against a given case-study.

Based on this analytical framework, Uganda seems to be the most appropriate case study for a dynamic analysis.

Uganda's economic situation makes it a unique example of a country that struggles between efficiency (for instance, it is a major provider of food and agricultural products for neighbouring countries) and food security threats. This makes Uganda particularly prone to shocks and sensible to macro and micro economic fluctuation that can affect both resilience and food security. Uganda is one of the poorest nations in the world; in 2005, 31.1 percent of the population lived below the poverty line. Although this figure decreased over time, it is still quite significant (World Bank, 2016). Even though enormous progress has been made in reducing poverty incidence, poverty remains chronic in rural areas, where more than 85 percent of households mostly rely on farming as the main source of income.

Marked disparities remain between urban and rural population. Poverty is 14 percent higher in rural than urban areas, and is highest in the Northern and Eastern regions, estimated at 44 percent (Uganda Bureau of Statistics, 2013). Inequalities among economic and social environments are still particularly relevant.

The Central region of Uganda, where the capital is located, is privileged in both infrastructure and economic infrastructure (see Table 11). Meanwhile, the Northern region suffers from economic and social deprivation.

Moreover, given its heavy reliance on agriculture and the aridity of some areas, Uganda is still highly exposed to climatic shocks that can affect food security and reduce resilience. Agriculture is the dominant sector in the economy; however the household level of production often falls below the needs of the household, making those families particularly vulnerable to food insecurity (USAID – United States Agency for International Development., 2011).

Climate change can expose households to challenges that are fundamentally different than those routinely considered; these are either an *unknown unknown* (for instance completely new shocks) or a *known unknown* (that is, known types of shocks that affect households differently than they did before). Climate change is closely correlated to food insecurity. Poor households often cannot cope with shocks and this makes them more exposed to a loss of food security; quite often they need to adopt risk management strategies that can compromise their future income generating capacity (that is, assets smoothing).

Still more, Uganda has a recent past history of well-documented conflicts that took place in the Northern region. Conflict is a precipitating cause of food insecurity both directly (FAO, 2016b; Howe, Stites, & Akawai, 2015; Miguel, Satyanath, & Sergenti, 2004; Simmons, 2013; Fearon, 2010; Fearon & Laitin, 2003; Hsiang, Burke, & Miguel, 2013; Miguel, 2007) and indirectly (Blattman & Miguel, 2010; Brinkman & Hendrix, 2011; Cramer, 2003; De Waal, 2015). This is especially relevant for Uganda's Northern region, together with other factors such as lack of income and assets to meet basic needs like food, shelter, clothing and acceptable levels of health and education. Households faced conflict-related shocks with long-term impacts, including the fragmentation of families, death of a parent, long-term insecurity or long-term effects of insecurity (for example loss of a spouse, particularly true for female-headed households, who are widowed over a long period; or casual labour in remote and infertile areas that rarely contributes to the accumulation of assets).

This paper employs FAO Resilience Index Measurement and Analysis (RIMA) methodology (FAO, 2013). It contributes to existing literature by presenting a dynamic analysis of resilience, looking at changes of the resilience capacity within households, taking into account the key determinants of top-down resilience movement from the highest to the lowest resilience capacity and vice versa. The analysis is made not only from the national point of view, but also takes into account regional disparities, giving special attention to the Northern region, which has been significantly battered by conflicts.

The paper is organised as follows: section 2 briefly recalls the importance of a resilience-based analysis of development issues. The next two sections describe the methodological steps for carrying out the resilience index estimation at the household level and the analysis of its changes over time. Then, after a brief introduction to the Uganda case study and the data used in the empirical application, the most important results are discussed in the next two sections. These are focused on the comparison of resilience index estimates from three different years and on the analysis of determinants of the resilience index dynamics over time. Finally, a concluding section summarises the most important findings of the paper.

2. Theoretical framework

Resilience is a dynamic concept, showing complex and far-from-equilibrium dynamics (Batabyal, 2003; Levin et al., 1998). A dynamic analytical framework is essential to better understand the household livelihood strategies used in the case of shocks, given that both positive and negative shocks could affect a household.[2] Ideally, the two effects need to be captured to better analyse the long-term effect of shocks and the related coping strategies. In the case of consumption or assets smoothing strategies, reducing short-term consumption could become a positive coping strategy in the long-term perspective of investments.[3]

Resilience measurement should be able to capture all possible pathways to well-being in the face of shocks. Fig. 1 describes what happens to a household's well-being when a shock occurs and resilience mechanism enters into action.

[1] Further discussions on the linkages between food security and resilience can be found in Alinovi et al. (2008).

[2] High food price shock could have a negative effect on some households but could translate into a positive effect for producers and sellers.

[3] One can focus on capital accumulation in a high food price moment, investing in food production in order to promote a longer period of well-being.