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Assets, Activity Choices, and Civil War: Evidence from Burundi

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Summary. — This article examines the relation between risky assets and activity choices in rural Burundi. The literature says that when assets are risky, their effectiveness as a buffer is eroded. A corollary of this is that even wealthier households will engage in income-skewing activities. Exploiting the differential degree in asset risk related to the spatial intensity of the civil war, we find that higher asset holdings do not induce households in the war regions to reduce investment in safe low-return activities—as opposed to households in other regions. This potentially explains (in part) the massive increase in poverty in the war regions.

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1. INTRODUCTION

It is well documented that rural households in developing countries face considerable risk in their generation of income, an inevitable consequence of engaging in rainfed agriculture on increasingly degraded soils.¹ The extent to which an adverse income shock translates into consumption shortfalls depends, among others, on the savings of the household and the existence and functioning of insurance and credit markets. If these markets are absent or imperfect, households have to deplete accumulated savings to maintain their consumption. Households without sufficient savings are in these circumstances faced with declining consumption levels, causing them to fall into poverty or become even poorer.

In most of the developing world, formal credit and insurance markets are imperfect or absent (see for example Hoff & Stiglitz, 1990). In these cases, households try to self-insure through the accumulation of savings or through informal insurance mechanisms at the village—or kinship level. The effectiveness of these informal insurance strategies has been studied, and generally it is concluded that these offer a limited insurance only against idiosyncratic income risk.² Savings on the contrary can provide an effective insurance against both idiosyncratic and nonidiosyncratic risks and can be de-accumulated to smooth consumption in situations when households are precluded from doing any borrowing at all (i.e., in the absence of credit markets; see Deaton, 1991).

A relevant form of liquid savings and insurance substitute in many developing countries is the accumulation of livestock (see, for instance, Binswanger & McIntire, 1987). Livestock is a popular productive asset with high expected returns through offspring, sale, or consumption of dairy products and use in farming systems. Livestock can be accumulated (bought) in good times and depleted (sold) in bad times for the purpose of consumption smoothing. A large body of mainly anthropologic and economic literature investigates this proposition, and it is generally found that sales of livestock play an important role in maintaining consumption following adverse income shocks (see for instance Rosenzweig and Wolpin (1993) for India and Swinton (1998) for south-central Niger).³

This *ex post risk coping* potential of livestock also influences the *ex ante risk management* choices households make to reduce total income variability.⁴ The hypothesis is that households with considerable savings will choose a portfolio of

income generating activities that is more risky (and also has a higher expected return) than households with little or no savings, since the former households can deplete their assets to maintain their consumption when things turn out bad. The poorer households will choose a low-risk (low-return) portfolio, because they do not dispose of sufficient assets for *ex post* risk coping. This kind of behavior, albeit logical from the poor farmer's point of view, would in the long-run lead to a permanent poverty trap, with poor households engaging in low-risk low-return activities and wealthier households specializing in higher-risk, higher-return activities, allowing them a further accumulation of productive assets over time.

Dercon (1996) examines the impact of the level of livestock holdings on crop choices by rural households. Applying Deaton's (1991) model of consumption under liquidity constraints to data from Western Tanzania, Dercon finds that households with lower livestock values allocate a larger share of their land to a low-risk low-return crop compared to households with higher livestock holdings. Poor households thus manage risk *ex ante* by choosing a low-risk portfolio, hereby sacrificing mean expected income. In a study on India, Morduch (1990) finds that asset-poor households devote a larger part of their land to safer crops compared to their wealthier counterparts.

An important limitation of the Deaton model (and the study of Dercon, 1996) is that it assumes that households have access to a risk-free asset. In practice, however, assets are risky, not safe. The relation between capital risk and investment and consumption has since long been studied in the economic literature (see for instance Phelps (1962) and Sandmo (1969)). In a development economics setting, Dercon (2002) examines the consequences of risky assets and finds that the effectiveness of assets as a buffer for consumption is eroded if assets are risky. A consequence of this is that even wealthier households (who have assets) will engage in *ex ante* income skewing if assets are risky. The rationale is that in the case of a bad income draw, households do not know whether they will be able to cope with this shock by selling off assets—because assets are risky too. Elbers, Gunning, and Kinsey (2007) quantify the effects of risk on economic growth when households do not have access to a safe asset. Using long-run panel data for rural

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households in Zimbabwe, they find that risk substantially lowers growth: Simulations show that after 50 years, the expected value of the capital stock under risk is 46% below the risk-free steady-state value. About two thirds of this reduction is due to the *ex ante* effect of risk: if assets are risky, households—both with and without assets—adapt their investment decisions in anticipation of a shock that has yet to materialize.⁵

In this article, we focus on the *ex ante* effect of asset risk on investment decisions. Exploiting regional disparities in asset risk related to the spatial intensity of the civil war in Burundi, we examine the effect of assets on the choice of income-generating activities. The empirical results show that when or where assets are perceived to be highly risky, even wealthier households—who would normally have the means of ex-post consumption smoothing—engage in income skewing to protect consumption. This result is found to be robust to different specifications of “safe” and “risky” investment activities.

This paper proceeds as follows: Section 2 offers descriptive data on the relationship between welfare, livestock holdings, and activity choices in rural Burundi and describes the higher degree of asset risk during the war. Section 3 specifies the empirical model to be estimated and deals with potential identification problems. Section 4 presents main results and robustness checks. The final section concludes.

2. LIVESTOCK AND ACTIVITY CHOICES IN RURAL BURUNDI

Burundi is a small, landlocked, and mountainous country in Eastern Africa, bounded on the north by Rwanda, on the east and south by Tanzania, and on the west by Lake Tanganyika and the Democratic Republic of Congo. The country has a high tropical climate, on the whole temperate and even cold, with a large number of micro-climates and considerable variation between years.

Although rural households in Burundi manage a portfolio of activities to generate their income, subsistence agriculture remains the dominant economic activity of the rural population. Main food crops grown are beans, sweet potatoes, cassava (accounting for over 50% of total dietary energy supply), and bananas. Coffee is the most important cash crop, accounting for approximately 80–85% of total exports in 1998 (FAO, 2005). Livestock is widely held in rural Burundi and represents the principal form of capital accumulation for farmers (Cochet, 2004).⁶

The latest civil war in Burundi erupted in 1993, when the first democratically elected president and a Hutu was assassinated by Tutsi soldiers in a failed coup attempt. As the news of the coup spread to the rural provinces, Hutu peasants committed large-scale massacres of Tutsis and moderate Hutus. Within days, approximately 100,000 Burundians lost their lives in what was later acknowledged as genocide (United Nations, 1996). The Tutsi army retaliated against the Hutus, continuing what would become the most severe civil war in Burundi's history, in terms of both human lives and socioeconomic destruction. Since the onset of the war in October 1993, GDP fell an average of 3% annually, resulting in a cumulative decline of 30% over the 1993–2004 period. Income *per capita* is estimated to amount USD 83 in 2004 *vs.* USD 214 in the early years of the 1990s (IMF, 2007). The livestock sector suffered heavy losses since the onset of the conflict in 1993, mainly due to theft and pillaging (FAO, 1997). According to UNDP estimates, between 32% and 46% off all livestock have been pillaged and/or killed during the war in Burundi (UNDP, 2006).

(a) Asset risk and intensity of the civil war

In this article, we will use data on rural households available from the 1998 Priority Survey (The Republic of Burundi, 1998). During this survey, a total of 6668 households were interviewed, 3908 of whom lived in rural areas. One rural province (Makamba) could not be interviewed due to ongoing battles between rebels and government forces.⁷ During the period of the survey (1998–99), rural households in Burundi were confronted with differential degrees of asset risk (risk of asset losses) depending on the intensity of the civil war in their province of residence. Qualitative evidence suggests that three north-western provinces were particularly affected by the conflict, both before and during the time of the survey: Bubanza, Bujumbura rural, and Cibitoke.⁸ These provinces were among the richest before the civil war erupted in 1993 and experienced a dramatic decline in welfare during the 1993–98 period. One paragraph of the Interim Poverty Reduction Strategy Paper of November 2003 is worth quoting to support our point:

[...] the provinces that have seen the highest increase in poverty are those that suffered most from the conflict [...]. Many provinces that were doing relatively well in 1990 found themselves with higher poverty levels following the crisis: the provinces of Bubanza, Cibitoke and Bujumbura Rural fell from fifth, first and fourth place, respectively, in 1990 [...] to places 14, 12 and 8 in the national ranking for 1998, with poverty levels of between 50 and 75 percent. (The Republic of Burundi, 2003).

There is also quantitative evidence that these provinces suffered most from the war. A document by the Food and Agricultural Organization (FAO) says that out of an estimated total population of 6200,000 in 1998, 572,462 people or 9% were living in regroupment camps (FAO, 1998). Officially, these camps were set up by the government to protect the Hutu population from the Hutu rebel factions. In reality, the Hutu population was forced into the camps to prevent them from providing support to armed rebel groups. Camps were set up in those provinces where rebel activity was extensive and clashes were regular. The regrouped population amounted to 10% in Bujumbura Rural, 22% in Cibitoke, and 54% in Bubanza (FAO, 1998). Overall, these three provinces (of a total of 16) accounted for over 47% of total regrouped population.

A 2002 demographic survey carried out by the United Nations Population Fund examined war-mortality and asked each respondent whether or not his/her parents were killed during the civil war (1994–2001). Within the three provinces mentioned above (Bubanza, Cibitoke, and Bujumbura Rural), the proportion of respondents of whom at least one parent was killed during the war amounted to 12.4% in the 1994–98 period and 6.0% in the 1997–98 period. For the rest of the rural provinces, these figures were 3.9% and 0.8%, respectively (United Nations Population Fund, 2002).⁹ Hence, war mortality was much higher within the war-provinces.

In the analysis, we assume that the risk of asset loss was higher in the provinces that were most affected by the violence. Risk was higher in those regions since livestock—the major asset in rural Burundi—can easily be looted. How realistic is this assumption? Table 1 shows that the livestock sector in Burundi suffered heavy losses over the 1990–98 period with a drop in the aggregate number of tropical livestock units of 23%.

This decline is predominantly due to theft and pillaging during the war (FAO, 1997; UNDP, 2006). The burden of this decline was not shared evenly across regions. Table 2 shows the evolution of livestock holdings at the household level during 1993–98 for the war and nonwar provinces. The figures given in Table 2 come from two distinct household surveys and as

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