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Farming or Fighting? Agricultural Price Shocks and Civil War in Africa

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Summary. — This article links lower economic returns in the labor-intensive agricultural sector to a higher risk of armed conflict at the local level. It argues that income shocks, followed by rising unemployment and lower wages in the rural economy, facilitate rebel recruitment and strengthen civilian support for rebel movements. Focusing on Africa, the article introduces a location-specific measure of changes to the value of local agricultural output by combining sub-national crop production maps with data on movements in global agricultural prices. The results show that negative changes to the local agricultural price index significantly and substantially increase the risk of violent events.

Key words — economic shocks, income shocks, agricultural prices, civil war, armed conflict

1. INTRODUCTION

The association between low or negative economic growth and civil war is one of the most consistent and robust findings in the research on civil war (e.g., Collier & Hoeffler, 2004; Hegre & Sambanis, 2006). It is supported by one of the most influential economic theories of conflict holding that falling income increases individual incentives to join a rebellion by lowering opportunity costs (Bazzi & Blattman, 2014; Collier & Hoeffler, 2004; Grossman, 1991; Hirshleifer, 1995). [1] Yet, the relationship remains theoretically and empirically ambiguous. Recent studies, which attempt to address the bias arising from omitted variables and reverse causality in conventional growth-conflict regressions, report inconsistent findings (c.f., Besley & Persson, 2008; Bazzi & Blattman, 2014; Brückner & Ciccone, 2010; Miguel, Satyanath, & Serengeti, 2004). Scholars thus disagree whether falling income heightens conflict risk by increasing labor supply to rebel groups, or, to the contrary, dampens conflict risk by decreasing the economic pay-offs from violent predation and state capture (c.f., Besley & Persson, 2008).

The inconclusive findings suggest that the effects of income fluctuations could be heterogeneous across different economic sectors and areas of society. Yet, current research often ignores this heterogeneity. The conventional cross-national growth-conflict regressions not only conflate potentially diverging effects, but also mask the channel through which falling income influences conflict risk. At this level of aggregation alternative mechanisms, such as weakening state capacity, are observationally equivalent to the opportunity-cost mechanism. This leaves crucial research questions unanswered related to when and how income shocks increase individual incentives to partake in civil war violence. The opportunity-cost mechanism should primarily be triggered by income fluctuations that affect household poverty and economic opportunities at the local level. Addressing these questions thus requires situating the consequences of the specific income shocks in the context where they occur and requires more disaggregated research designs that allow for the identification of the mechanism at the level where it unfolds.

Addressing this gap, this article examines how income fluctuations in the labor-intensive agricultural sector influence the risk of civil war violence at the local level. It outlines an argument linking negative changes in the value of local agricultural output to higher incentives among the rural population to join rebel organizations and to support the rebels' radical agendas. I argue that what primarily drives this mechanism are the lower opportunity costs following raising unemployment and lower wages for peasants and wage-laborers in the rural economy, but may also be reinforced by the decreasing ability of the state to placate the peasantry at a time when state revenue from the agricultural sector drops.

To evaluate the relationship between local income shocks and violent conflict the empirical analysis combines sub-national, time-invariant, crop-production maps with information on movements in global agricultural prices to construct a location-specific and arguably exogenous measure of changes to the value of local agricultural output. The analysis relies on a grid structure that divides the African continent into sub-national units of 0.5×0.5 degrees (approximately 55×55 km at the equator) and utilizes geo-referenced event data on civil war violence between 1990 and 2010 from the Uppsala Conflict Data Program (UCDP) (Sundberg & Melander, 2013). The results show that changes to the local agricultural price index have considerable explanatory power in predicting the timing and location of violence at the local level. The negative relationship between the agricultural price index and the risk of violence is robust across a range of different statistical

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estimators, different model specifications and alternative operationalizations of independent and dependent variables.

These findings suggest a link between economic frustrations and individual incentives to directly partake in or support a rebellion. I find no evidence that increasing value of economic output in the agricultural sector precipitates violence through a rapacity effect. These findings also enhance our understanding of the particular channels through which worsening economic conditions heighten the risk of civil war by, at least partly, discriminating between the opportunity-cost mechanism and the effect of a weakened military and security apparatus. Agricultural price shocks could arguably reduce state counter-insurgency capacity as revenue from agricultural export and taxation falls, thus placing constraints on military spending. Yet, a lower ability to suppress insurgency should arguably not be conditioned on the local patterns of agricultural production in the way the results from this analysis suggest. The results thus favor the opportunity-cost explanation over the state capacity explanation linking local income shocks to a higher risk of armed conflict.

The article is organized as follows. I begin Section 2 by briefly reviewing the existing literature on negative or low economic growth and armed conflict to clarify the motivation behind my own approach. Section 3 outlines a theoretical mechanism specifically linking negative shocks in the rural economy to a higher risk of conflict violence. Section 4 introduces the research design and the data, and Section 5 presents the estimation results. The final section concludes.

2. INCOME SHOCKS AND ARMED CONFLICT

The relationship between low or negative economic growth and the outbreak of armed conflict is considered one of the strongest, consistent, and most robust associations in the extant literature on civil war (c.f., Collier & Hoeffler, 2004; Hegre & Sambanis, 2006). In spite of this, the channel through which falling income affect the risk of civil war remains little understood.

To begin with, the relationship is theoretically ambiguous. A negative association between falling income and conflict is supported by one of the most influential economic theories holding that individual incentives to rebel rise when economic opportunities and income fall (Collier & Hoeffler, 2004; Grossman, 1991; Hirshleifer, 1995). The focus on individual-level incentive structure also accords with motivation-based accounts for rebel participation. One example is found in the early literature on agrarian revolutions, which explain collective violence as a response to increasing poverty and subsistence crises among the rural working class with the commercialization of agriculture and changing economic relations between landlords and peasant tenants (c.f., Moore, 1966; Paige, 1975; Popkin, 1979; Scott, 1976; Wolf, 1969). Other scholars, however, point out that lower economic output also reduces the spoils to fight over and *ceteris paribus* should reduce the time and resources devoted to fighting (Besley & Persson, 2008; Fearon, 2007). If anything, *rising* revenue will increase the risk of conflict by raising the economic pay-offs from violent predation and heightening the prize of state capture among the elites (Arezki & Brueckner, 2014). A third section of this literature does not dispute the direction of the relationship per se, but interprets it, not as an effect of increased supply of rebel labor with a growing pool of unemployed youth, but as a state capacity effect. Low or negative growth constrains states' investment in military and infrastructure, and thus weakens state counter-insurgency capacity (Fearon & Laitin, 2003; Herbst, 2004).

This theoretical ambiguity is reinforced by inconclusive empirical evidence in support of any of the above contentions. Conflict-growth regressions relying on cross-national research designs make the identification of causal mechanisms futile. At this level of aggregation alternative causal mechanisms, such as lowered opportunity costs or weakened state capacity, are often observationally equivalent. Recent studies have also pointed to the potential bias arising from omitted variables and reverse causality in conventional approaches. Efforts to identify exogenous variation in income shocks have used rainfall variation (Bohlken & Sergenti, 2010; Jia, 2012; Miguel *et al.*, 2004; von Uexkull, 2014) or commodity price shocks (Bazzi & Blattman, 2014; Besley & Persson, 2008; Brückner & Ciccone, 2010). Yet, the results emerging from these studies are inconsistent. Whereas some studies find evidence that negative economic shocks increase the risk of conflict (Brückner & Ciccone, 2010; Miguel *et al.*, 2004; Savun & Cook, 2010), other studies report the opposite (Besley & Persson, 2008), or no effect of price fluctuations on conflict outbreak (Bazzi & Blattman, 2014).

One reason for the inconclusive findings may be that effects are heterogeneous across economic sectors and areas of society—a heterogeneity that is not easily captured in country-level studies. In their sub-national study of violence across Columbian municipalities, Dube and Vargas (2013) exploit the fact that price shocks in the labor-intensive agricultural sector disproportionally affect household income and thus influence the opportunity-cost motive, whereas price shocks in the capital-intensive oil sector disproportionally affect state revenue, and thus influence the pay-offs from state capture (See also Dal Bó & Dal Bó, 2011; Bazzi & Blattman, 2014). Dube and Vargas' micro-level approach allows for the identification of diverging effects and for taking location-specific contextual and spatial factors into account. Yet, the single case study has limitations in terms of external validity. There is hence a need for large-N, comparative work on the effects of economic shocks that moves beyond country-level aggregates, while covering a larger set of countries.

Answering to this gap, this article adopts a meso-level approach by using sub-national data on the characteristics of local agricultural production together with high-resolution spatial data on the occurrence of civil war violence. Utilizing fluctuations in world market prices as an, arguably, exogenous source of variation in the value of local agricultural produce, it studies the effect of location-specific income shocks on the risk of political violence across African countries in the 1990–2010 period.[2] The next section discusses the mechanism linking downturns in the agricultural sector to a higher risk of conflict violence.

3. AGRICULTURAL PRICE SHOCKS AND VIOLENT MOBILIZATION

The opportunity-cost mechanism suggests that lower prices and thus lower returns in the agricultural sector increase the risk of conflict as peasants and wage laborers in the rural economy will see the relative returns from fighting, compared to farming, increase (Collier & Hoeffler, 2004; Grossman, 1991; Hirshleifer, 1995). More specifically, I expect negative agricultural price changes to facilitate the growth of rebel organizations through the effect on rural poverty. The agricultural sector is labor intensive and employs a large share of the labor force in the developing world. Since agriculture accounts for a large share of income for many rural households, external shocks that affect the economic returns from agriculture are