Activation of Food Markets and Food Security: Impact of Cereal Banks in Northern Burkina Faso

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Abstract

This paper assesses the impact of a community-based food security intervention on nutrition and food security in rural Northern Burkina Faso. The NGO program provides credit and technical assistance to village-level organizations - called FSG - that buy, store and sell food-grain on isolated and thin local food markets. Relying on a randomization at the community level and anthropometric measurements before and after treatment, we find that FSG's have a positive and large impact on the nutritional status of both adults and children. It enables them to avoid deterioration in their nutritional situation after a drought. It also appears that the effects of the program are especially strong for people living in remote communities. Households bought food closer to their dwellings, at lower price and more according to their needs. Quite surprisingly, however, treated households did not consume more food than control households over the agricultural cycle. We argue that the timing of purchases is critical to understand this apparent puzzle. By purchasing food later on in the cycle, households manage better the allocation of consumption over the year. In particular, they can increase food consumption when heavy work is required in the field and they rely less on costly body fat storage. In addition, limiting storage in the dwellings allows treated households to avoid redistributive pressures exerted by close relatives and neighbours.

Extended Abstract

CONTEXT

It is a well-established fact that, if we leave fragile states aside, food insecurity tends to be concentrated in remote areas of the developing world. By definition, these areas have scattered populations that are physically isolated. From their remoteness, it follows that they are characterized by pervasive market imperfections associated with high transaction costs. How to reduce poverty, vulnerability and food insecurity in such deprived regions is a complex issue that has not been settled till today.

Food security is imperiled as a result of either absent local food markets or of natural monopolies. The outcome in both cases is the same: in the first situation, villagers have to walk long distances to reach a marketplace, implying high effective prices (that include transport costs), while in the second situation, they can buy locally supplied cereals but at excessively high nominal prices. In both cases, villagers typically face poor market conditions.

In order to mitigate the food access problem, many aid organizations and governments have widely promoted in the late 1970's the creation of local community organizations aimed at activating local food markets. Cereal banks are typical

example of these community-based interventions aimed at reducing market risks understood as either the availability risk (food supply becomes less reliable in times of need) or the price risk (food price rises in times of need). As a result, households will be better able to purchase food when they need it rather than to anticipate their purchases for fear of low availability and/or high prices at later dates. In this way, they can also reduce the costs of food storage.

INTERVENTION FEATURES

Most of the 3300 cereal banks that were inventoried in Sahelian countries in 1991 collapsed in the late 90's. Mismanagement, embezzlement of funds, and lack of trade opportunities explain this widespread failure (for a review of the problems, see World Bank, 2011). Many of them have proved unable to sustainably manage their activities, being obliged to discontinue them as external supports started decreasing.

While there had be no serious evaluation of their impact on food security, cereal banks and their derivatives benefited from a resurgence of interest over the last decade. The World Food Program of the United Nations, donor governments, and Non-Governmental Organizations, have been again supported thousands of cereal banks in Sahelian countries (USAID, 2012). A particularly interesting example is the program of Food Security Granaries (FSG) undertaken in 2002 in Burkina Faso and financed by the Belgian Fund for Food Security (FBSA). The idea was to revitalize a network of about 400 former cereal banks while paying a stronger attention to financial viability considerations.

The precise feature of the intervention are as follows: (1°) set up a local, informal storing and marketing organization whose function is to buy food grains, then store and sell them along the agricultural cycle, (2°) grant (gradually scaled up) annual credit to each village organization in the form of a revolving fund (at an annual interest rate of 9 percent), (3°) through the network of such cooperatives, shift grain from surplus to deficit village communities so that the latter can complement local supplies with external ones, and (4°) provide training and capacity-building for local management teams, as well as monitoring and multi-level technical assistance on a continuous basis.

A longer-than-ten years experience with the program appears to show that many of the local FSGs have indeed been able to sustain their operations. In no small measure, success may be reasonably attributed to the well-established presence of FNGN in Burkinabe villages and to the rigorous follow up of the Belgian NGO in charge of implementing the program in tandem with the FNGN.

OBJECTIVE, METHODOLOGY AND DATA

This paper is a first attempt to rigorously evaluate the impact of food security granaries (cereal banks) on nutrition and food security at the community, household and individual levels. The objective is not to dwell into the determinants of financial viability of the intervention but to focus on its impact and identify the pathways at stake.

To identify the causal effects of the program, we rely on a randomized scale-up of the program, which involves 40 eligible villages having never benefited from the

intervention in the past. We randomly assigned half of them to the treatment group and use the 20 remaining villages as control group. We also exploit pre-treatment data to control for initial chance differences across groups and subsequently increase the precision of our estimations.

This study relies on first-hand micro-level data collected in the explicit purpose of assessing the impact of the intervention and forming a dataset that covers three complete agricultural cycles (2010-2011, 2011-2012 and 2012-2013). The sample includes 400 households (or, equivalently, about 4500 individuals), who were visited five times over this period, at crucial moments of the agricultural cycle (before and after the lean season in the first and the third agricultural cycle).

Moreover, we have collected disaggregated data that go down to the individual level, which enables us to assess the nutritional status of all household members. Our dataset is exceptionally rich also because we have systematically gathered very detailed information about cereal transactions and behavioral patterns that will allow us to elucidate the mechanisms through which the impact is generated.

MAIN RESULTS AND DISCUSSION

Using anthropometric measurements, we show that FSG's have a positive and large impact on the nutritional status of both adults and children over a drought year (2011-2012). In particular, the intervention enables them to stabilize their nutritional situation while individuals in the control groups experience an adverse nutritional stress. It also appears that the effects of the program are not specific to FSG's users and are especially strong for people living in more remote communities. Interestingly, these heterogeneous effects are consistent with the very nature of this market-based intervention aimed at activating isolated and thin local food markets.

We also analyse individual and household actions, related to market transactions and stock management in particular, that are adopted in response to the intervention and drive its final impact. We use for that purpose detailed information about cereal transactions and find that the intervention lead to effective local food market activation. It increases the market share of local sellers or, similarly, decreases the total distance trodden by households to purchase cereals. We also find that the intervention is responsible for a significant average decrease in the price paid for cereals. Undoubtedly, the intervention allows for a better physical and economic access to food while, as for nutritional outcomes, this is especially true for households living in more remote villages. However, we do not find any evidence that this improved access translate into higher or better food consumption. As a matter of facts, the FSG's appear to have no impact both on the quantities of food consumed and on food diet diversity.

This in-depth analysis has highlighted an unexpected paradox. As things turned out, the intervention has a large and positive impact on nutrition. Quite surprisingly, however, households did not consume more food while bought it closer to their dwellings and at lower price. Moreover, our investigations suggest that the effort saved in purchasing closer is not sufficient to explain the impact on nutrition. Similarly, we have no evidence that the money saved has been used to purchase other nutrition-related goods. While those mechanisms can definitely be part of the story, they do not appear to be completely convincing in this context.

Our findings suggest more that the timing of purchases plays a critical role by affecting the allocation of consumption along the agricultural cycle. We show that households in treatment villages purchase more according to their needs. More precisely, the intervention has a negative impact on the quantity of cereals bought before complete stock depletion or, equivalently, on precautionary purchases. While storage losses concern very few households and are typically low, physical costs of storage do not appear to be a major issue in this arid region.

By contrast, qualitative evidences suggest that precautionary purchases signal abundance to visitors as well as to household members. It would increase solicitations from outsiders (longer stays of visitors) and make more difficult to limit the quantity of cereals prepared daily (internal free riding). Households also report that the cereal daily ration varies along the agricultural cycle with most of them increasing it at harvest time (when stocks are at their highest). More interestingly, some households manage to keep enough cereals in order to increase their consumption in the period of heavy fieldwork while others do not and eat substantially more in dry season. The latter would experience costly body fat accumulation. As there is no baseline for sections of the questionnaire on redistributive pressure and variations in the daily ration, we rely mainly on first difference estimations to provide quantitative evidences on those issues.

As expected, we find that the intervention decreases the number of days outsiders stayed and ate in the household. However, the effect is not large and could not explain the full impact on nutrition. A more striking result concerns variations in the daily ration. We observe that treatment households allocate better consumption according to energy needs by consuming more during the agricultural season. While the quantity of cereals over the agricultural cycle is about the same in treatment and control villages, the timing of consumption appears to be more efficient in FSG's villages. We also provide indirect evidences on the relationship between precautionary purchases and the body weight variations by using the data rounds collected before the lean season. As we have no such round of data collection in the drought year, we can only provide correlations using the first and the third year of the panel. In line with the previous findings, precautionary purchases are associated with greater fat accumulation as evidenced by larger BMI before lean season, same BMI after and higher seasonal weight variations.

By reducing the market risk (availability and price), the intervention enables households to delay their purchases (or, equivalently, reduce their storage) and to avoid costly body fat storing behaviours as well as redistributive pressures exerted by close relatives and neighbours. The cost of those pressures, we argue, is equivalent to a storage cost.