BUY AS YOU NEED
NUTRITION & FOOD STORAGE
IMPERFECTIONS

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Motivation

Intervention, design and data

Context of Study

Impact on Food and Nutrition Security

Puzzling Evidence

Conclusion
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Seasonality in Consumption

- **Seasonality in income translates into seasonality in consumption** for many poor households engaged in rain-fed agriculture (Kandkher, 2012)

- **Most of acute hunger and undernutrition occurs in the annual so-called ‘hungry season’** (Ferro-Luzzi and Branca, 1993; Devereux, 2012)

- **Imperfections in credit and saving markets as well as imperfect labour and food markets** used to explain seasonality (Osborne, 2005; Stephens and Barrett, 2011; Gilbert et al., 2016)
Cereal banks

- **Cereal banks as a popular intervention to address food market imperfections** in the 80’s (3300 in place in West Africa in 1990, USAID 2012)

- **Most collapse in the 1990s when external support decreased** because of problems of mismanagement, embezzlement, ... (Shepherd 2012)

- **Resurgence of interest over the last 10 years** (support of the World Food Program, EU, donors and local governments....)

- **Limited evidence on impacts** of programs that address food market imperfections (ie. Basu and Wong 2015, Jatta 2015)
This Paper

- We carefully evaluate the impacts of cereal banks on food security over a drought year, in a region where seasonal food insecurity is of primary concern.
- We show that
  - Positive impacts on food access (availability and price)
  - No overall increase in the quantity of food purchased by the household but a change in the timing of purchase
  - Large and positive impacts on nutritional status after the hungry season
- We argue that the program helps to avoid costly storage where storage can take the form of household storage or body mass storage, and we discuss the nature of these costs
Related literature

- **Stock management and savings at family level** viewed as self-insurance against unpredictable shocks (Newbery, 1991; Platteau, 1991; Fafchamps et al., 1998).

- **Impact of seasonality on current consumption** (Paxson, 1993; Dercon and Krishnan, 2000) and **on health status** (Behrman, 1988, 1993; Sahn, 1989; Branca et al., 1993; Bhagowalia et al., 2011).

- **Use of anthropometric measures** instead of consumption to assess fluctuations in the nutritional level of individual household members (Dercon and Krishnan, 2000; Alderman et al., 2006; Vaitla et al., 2009) and the **short and long term effects of policies against malnutrition** (Hoddinott et al., 2008; Yamano et al., 2005). Closely related to our effort is Abay and Hirvonen (2016).

- **Effectiveness and sustainability of cereal banks** (Basu and Wong, 2015; Barrett, 1996).
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Intervention Features

- SOS faim (Belgium) and FNGN (Burkina Faso) **reactivated a network of former cereal banks in Northern Burkina Faso** and created the so-called 'Food Security Granaries' (FSGs)

- In each village, **set up of an informal storing and marketing cooperative that buys (mainly) foodgrain outside the village and sells throughout the year** (through the network of such cooperatives, grain shifts from surplus to deficit regions)

- Each village cooperative has **access to annual credit (gradually scaled up)** while credit performance is carefully monitored and future access to loan is strictly denied in case of problem

- Local management teams are **trained, monitored and receive continual technical assistance**
Village-level RCT (scale-up phase)
Sample of 40 V, 400 HH and 4500 IND

2010 – 2011

Post – harvest

Lean

Nov

2011 – 2012

Post – harvest

Lean

Nov

2012

Round 1

Round 2

Round 3

BASELINE

TREATMENT

Random assignment of FSGs
(set up in 20 villages, credit and monitoring)

Selection of 40 villages
(among eligible villages)

Evaluation of the intervention
(after one year of activity)
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Rural Northern Burkina Faso
Subsistence Farming Households

- **Subsistence farming households** → 25 % selling any agricultural products and less than 3 % selling foodgrain
- **High exposure to rainfall shocks** → from 30 % of foodgrain net buyers after good harvest to 75 % after bad one
- **Income diversification** → 95 % of households own livestock, 86 % have a micro-business, 57 % participate in artisanal gold mining
- **Segmented and non-competitive village food markets** → 40 % not connected by road and 70 % without any regular foodgrain sellers
Over a Drought Year
Successful implementation
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Households bought food closer to their dwellings...
at lower prices...
but did not consume more (or better) food
However ... better nutritional outcomes!
Impacts higher in more remote areas
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Double-edged Puzzle
The Storage Costs Story

- How is food stored? **On ear in household granaries or through body-mass accumulation after harvest** (Dugdale and Payne 1987, Devereux et. al. 2011, Global Nutrition Report 2015)

- **By delaying purchases**, household members would then be able
  - to reduce physical storage costs → Very small losses in household granaries or for bought grains
  - to be less exposed to (external) redistributive pressure → Impact only marginally increases total food availability per capita
  - **to avoid temptation and free-riding in the household resulting in costly body-fat accumulation** → Difficulties to limit large food intake early in the season (when physical work has not started)

- We cannot formally prove that the latter mechanism is at play but we do observe a **correlation between early purchase (’before stock depletion’) and body-mass accumulation**

- A lot of **supportive evidences from Burkina** and other places about the existence of such ’social’ or behavioral costs of storage
Other Possible Explanations

- **Other nutrition-related expenses** → No impact on health expenditures (the year following the intervention), no change in diet diversity

- **Better Quality of grain** sold by FSGs → Not mentioned as an advantage of FSGs and impact not concentrated on FSGs users

- **Lower energy expenditure** in treatment villages
  - Lower investment in agricultural production → No significant difference in yield in following year (small increase)
  - Lower stress → ’La paix du coeur’ (peace of heart) mentioned in focus group
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- Rigourous evaluation of cereal banks/FSG type of intervention → Large impacts on nutrition on adult and children despite relatively small volumes sold

- The pathways are unexpected by program managers → The intervention enable villagers to delay their purchases and better allocate consumption over the year

- Sustainability issue → Only half of the targeted treatment communities benefited from the program renewal because of mismanagement at the network level
Thanks for your attention

With the financial support of