Communication, Search and Mobile Phones

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Overview of Talk

• Motivation and Research Question
• Context and Intervention
• Sampling and Experimental Design
• Data and Outcomes
• Progress to Date and Next Steps
Motivation

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Kichabi
Motivation

• Information is costly, especially in remote rural areas
  o Costly information can lead to inefficient market outcomes

• Mobile phones have reduced the costs of searching for information and improved market efficiency, but how these gains are distributed is poorly understood
  o Empirical evidence on the impacts on agricultural outcomes is mixed (Fafchamps and Minten 2012, Cole and Fernando 2012, Casaburi et al 2014, Aker and Ksoll 2013)

• Why?

Motivation

• The reduction in search costs associated with mobile phones is typically constrained by the size of one’s social network
  o Mobile phones reduce the cost of communicating within a social network, but their impacts on searching for new contacts is based on pre-existing social connections
  o An issue for firms and households
• In many countries, this constraint has been partially addressed by providing an “information clearinghouse” (telephone directory or the internet)
• In sub-Saharan Africa, mobile phones have proliferated without a complementary service providing information about other members of the network
• How can this be overcome?
Research Question

• **Research Question:** How do information constraints related to household-agricultural firm communications affect firms’ and households’ behavior and productivity?

• **Approach:** Randomly vary households’ access to an informational tool (a mobile phone directory of agricultural firms) that lowers households’ search costs, as well as firms’ access to potential clients.

• **Outcomes and mechanisms:** Revenues, profits, number of employees, number of customers, number of calls, sales volume.

• **Our project:** A proof of concept to see how and whether a reduction in households’ search costs affects firms’ profits.

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Agricultural Markets in Tanzania

• Purchased inputs are available at trading towns and larger villages
  • Stock-outs are frequent, especially for improved seeds and agro-chemicals
• Other inputs (labor, animals, tractors) are available but access is mediated (almost entirely) by face-to-face contacts
• Focus groups and previous survey work indicate that
  • Many farmers incur large transaction costs in searching for inputs
  • Mobile phones are rarely used for business purposes
  • Few farmers have access to phone numbers of individuals that they have not met face-to-face
• From the firm perspective, there are few mechanisms for advertising services
Intervention: Kichabi

- Kitabu cha biashara
- A mobile phone directory of all agricultural firms within a given area
Intervention: Kichabi

• Conduct a census of all agricultural-related formal and informal firms in trading towns (villages) in central Tanzania
  o These include agricultural input suppliers, output sellers, transporters, laborers and pharmacies (eight sectors)
  o Collect data on their name, ownership status, firm size, sector (service), location and contact information

• Produce a mobile phone directory listing (a subset of) firms

• Distribute directories to agricultural households

• The treatment will affect both firms and agricultural households, although we will primarily be focusing on firm-level outcomes at this stage
Sampling

- Six districts (27 contiguous wards) and 108 villages in the Dodoma and Manyara regions
- Of the 108 villages, we chose 49 villages (with 136 sub-villages) in which to conduct the firm census (“Group A”) – based upon minimum population size
  - Remaining villages are “Group B”
- Within these 49 villages, we conducted a census of all informal and formal agricultural firms across eight sectors
  - 1506 firms participated (about 70 percent take-up)
  - After cleaning = 1495 firms
- 1/3 of these firms were sampled for the baseline (after stratifying by village and sector)
<table>
<thead>
<tr>
<th>Sector</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trading and Wholesale</td>
<td>244</td>
<td>16.32</td>
</tr>
<tr>
<td>Merchant/Retail</td>
<td>704</td>
<td>47.09</td>
</tr>
<tr>
<td>Transport</td>
<td>61</td>
<td>4.08</td>
</tr>
<tr>
<td>Hiring and Labor</td>
<td>41</td>
<td>2.74</td>
</tr>
<tr>
<td>Agri Processing</td>
<td>114</td>
<td>7.63</td>
</tr>
<tr>
<td>Repairs</td>
<td>188</td>
<td>12.58</td>
</tr>
<tr>
<td>Non-Agri Services</td>
<td>102</td>
<td>6.82</td>
</tr>
<tr>
<td>Financial Services</td>
<td>35</td>
<td>2.34</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>0.40</td>
</tr>
<tr>
<td>Total</td>
<td>1,495</td>
<td></td>
</tr>
</tbody>
</table>
## Characteristics of Firms in our Census

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean</th>
<th>s.d.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent is male (=1)</td>
<td>0.82</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Respondent age</td>
<td>37.96</td>
<td>11.33</td>
<td>15</td>
<td>76</td>
</tr>
<tr>
<td>No. of employees</td>
<td>1.35</td>
<td>3.74</td>
<td>0</td>
<td>62</td>
</tr>
<tr>
<td>Own mobile (=1)</td>
<td>0.99</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Motivation

Source: GSMA 2009

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Proposed Experimental Design

- First stage: Stratify by district and ward and randomly assign villages to either treatment (list some firms in that village) or control (no firms listed)
- Second stage: Within treatment villages, stratify by sector and randomly assign sub-village sectors (firms) to be included in the directory or not
  - Choice based in part on research questions, cost, feasibility of randomization
- Distribute directories to all villages (Group A plus Group B)
- Compare outcomes of firms in treatment villages with those in control villages
- Compare outcomes of control firms in treatment villages with control firms in control villages (within-village spillovers)
- We will be unable to measure for between-village spillovers
Proposed Experimental Design

• Across 49 villages and with 8 sectors, we have 400 strata (actually 300), or 5 firms per strata
• Within the strata we have 516 clusters (sub-village sector groups), or 2 clusters per stratum
• Within each cluster, have 3 firms (varies by sector)
Data and Outcomes

• Baseline survey (October)
• Follow-up survey (May-July)
• Phone surveys (maybe)
• Firm-level outcomes
  • Direct: Number of calls, number of contacts, foot traffic
  • Indirect: Sales, revenue, employment, inventories
• Firm census completed
• Baseline firm survey completed
• Randomization in process
• Phonebooks in the process of being printed
Next Steps

- Finalize directory printing and distribution
- Organize firm phone surveys
- Plan for follow-up surveys