Risk sharing and the economics of M-PESA

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The problem:
M-PESA as a risk spreading tool

- Formal insurance is limited

- Informal insurance exists, but is often incomplete......why?

- Moral hazard: information asymmetries
- Limited commitment: contract enforcement
- Transaction costs
Summary of findings

• The consumption of households who don’t use M-PESA falls by about 7% - 10% when they suffer negative shocks

• Lower transaction costs allow households who use M-PESA to smooth these risks perfectly
The M-PESA concept

• Remote account storage accessed by simple SMS technology
• Cash-in and cash-out services provided by M-PESA agents
Customer and Agent growth

Customers

Agents

Millions

0 2 4 6 8 10 12 14 16

Oct-06 Apr-07 Nov-07 Jun-08 Dec-08 Jul-09 Jan-10 Aug-10 Feb-11 Sep-11

2007 2008 2009 2010 2011

0 5,000 10,000 15,000 20,000 25,000 30,000

Jack - M-PESA
Note: partial data only

Jack - M-PESA
Note: partial data only
Dec 2008

Note: partial data only

Jack - M-PESA
Our household survey

- 3,000 households across most of Kenya
Who is using M-PESA?

Households outside Nairobi

Median consumption ~$2 per day
Banking for the unbanked?

Households outside Nairobi
Median consumption ~$2 per day

Jack - M-PESA
How do people use M-PESA?

- Remittances
- Airtime
- Saving

Transactions

2009 data

Share of households

Jack - M-PESA
How often do people use M-PESA?

- Less often: 24%
- Once a year: 4%
- Every 6 months: 4%
- Every 3 months: 14%
- Monthly: 43%
- Every 2 weeks: 6%
- Weekly: 5%
- Daily: 2%
Empirical strategy

\[ c = \alpha + \gamma \text{Shock} + \mu \text{User} + \beta \text{User} \times \text{Shock} + \text{controls} \]

- Users are richer (\( \mu \))
- Shocks don’t hurt users so much (\( \beta \))
- Shocks hurt (\( \gamma \))
## Basic Results

<table>
<thead>
<tr>
<th></th>
<th>OLS$^A$</th>
<th>Panel$^B$</th>
<th>Panel$^C$</th>
<th>Without Nairobi$^C$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M-PESA User</strong></td>
<td>0.553***</td>
<td>-0.090**</td>
<td>-0.016</td>
<td>-0.008</td>
</tr>
<tr>
<td></td>
<td>[0.037]</td>
<td>[0.036]</td>
<td>[0.047]</td>
<td>[0.049]</td>
</tr>
<tr>
<td><strong>Negative Shock</strong></td>
<td>-0.207***</td>
<td>0.241**</td>
<td>0.232</td>
<td>0.120</td>
</tr>
<tr>
<td></td>
<td>[0.038]</td>
<td>[0.116]</td>
<td>[0.169]</td>
<td>[0.141]</td>
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<tr>
<td><strong>User*Negative Shock</strong></td>
<td>0.101**</td>
<td>0.176***</td>
<td>0.156**</td>
<td>0.150**</td>
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<tr>
<td></td>
<td>[0.050]</td>
<td>[0.050]</td>
<td>[0.062]</td>
<td>[0.065]</td>
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<tr>
<td><strong>Shock, Users</strong></td>
<td>-0.105***</td>
<td>0.052*</td>
<td>0.055</td>
<td>0.050</td>
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<tr>
<td></td>
<td>[0.033]</td>
<td>[0.028]</td>
<td>[0.035]</td>
<td>[0.037]</td>
</tr>
<tr>
<td><strong>Shock, Non-Users</strong></td>
<td>-0.207***</td>
<td>-0.069**</td>
<td>-0.068</td>
<td>-0.056</td>
</tr>
<tr>
<td></td>
<td>[0.038]</td>
<td>[0.032]</td>
<td>[0.043]</td>
<td>[0.045]</td>
</tr>
</tbody>
</table>

A: Full sample with time Fes;        B: Full sample with controls + interactions  
C: Full sample, controls + interactions, time and time x location FEs
Improving Agent Access

Distance to the closest agent (km)

- Mean Distance: 3.5 km (40% change)
- 5th Percentile: 0.5 km (22% change)
- 25th Percentile: 1 km (28% change)
- 50th Percentile: 1.5 km (14% change)
- 75th Percentile: 2 km (33% change)

Jack - M-PESA
## Using Agent Roll Out

<table>
<thead>
<tr>
<th></th>
<th>Agents w/in 1km</th>
<th>Agents w/in 2km</th>
<th>Agents w/in 5km</th>
<th>Agents w/in 20km</th>
<th>Distance to Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Shock</td>
<td>0.152</td>
<td>0.122</td>
<td>0.148</td>
<td>-0.176</td>
<td>0.619***</td>
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<td>[0.152]</td>
<td>[0.153]</td>
<td>[0.160]</td>
<td>[0.140]</td>
<td>[0.203]</td>
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<tr>
<td>Agents</td>
<td>-0.022</td>
<td>-0.003</td>
<td>0.018</td>
<td>-0.002</td>
<td>0.051</td>
</tr>
<tr>
<td></td>
<td>[0.039]</td>
<td>[0.031]</td>
<td>[0.024]</td>
<td>[0.006]</td>
<td>[0.054]</td>
</tr>
<tr>
<td>Agents*Shock</td>
<td>0.055***</td>
<td>0.050***</td>
<td>0.021**</td>
<td>-0.002</td>
<td>-0.058***</td>
</tr>
<tr>
<td></td>
<td>[0.019]</td>
<td>[0.015]</td>
<td>[0.010]</td>
<td>[0.005]</td>
<td>[0.019]</td>
</tr>
</tbody>
</table>
Mechanisms

• Consumption smoothing could be effected through
  – Remittances
  – Savings
  – Information/communication

• We find remittances are the dominant factor
  – Larger network