POVERTY TARGETING AND IMPACT OF A GOVERNMENTAL MICRO-CREDIT PROGRAM IN VIETNAM

Nguyen Viet Cuong
Vu Thieu
Duong Khanh Toan
Pham Minh Thu
Pham Minh Nguyet
Presentation outline

- Research objectives
- Introduction of the micro-credit program in Vietnam.
- Data sources.
- Poverty targeting of the program.
- Impact evaluation methods.
- Impact of the program on income and expenditure.
- Impact of the program on poverty.
- Conclusions.
Research objectives

- Poverty remains high in Vietnam. The Government has launched a program that provide micro-credit at low interest rate for the poor without collateral.
- Large money has been spent in the program.
- However, questions on targeting and impact of the program remain unanswered.
- The main research objective is to assess the program’s targeting and impact.
Micro-credit program

- The program is implemented by Vietnam Bank of Social Policies (VBSP) to provide the poor with preferential credit.
  - This bank was established in 2003.
  - Before 2003, the Bank for the Poor had implemented a similar program of micro-credit for the poor.
- To borrow credit from the program, a household should join a credit group.
Micro-credit program

There are several criteria that the household should meet to become a member of the credit group:

- Have a long-term residence permit at the locality in which the credit group is located.
- Have someone who is able to work (working force).
- Be classified as the poor by local authority.
- Have a demand for loan. The loan needs to be used in production, or consumption necessary for subsistence.
Micro-credit program

Steps in borrowing credit from the program:

- A member household sends application letter for loan borrowing to a credit group.
- The credit group verifies the list of applicants, and sends it to the People’s Committee in that commune.
- The People’s Committee verifies the list, and sends it to the nearest branch of the bank.
- The bank informs the household about the loan decision, and the household receives the loan.
Data sources

- Vietnam Household Living Standard Survey (VHLSS) in 2002 and 2004 collected detailed information on:
  - Characteristics and living standards of households, including the credit borrowing.
  - Characteristics of communes and villages in which households are living.
- The surveys were conducted by General Statistical Office (GSO) of Vietnam with technical supports from WB.
Data sources

- VHLSS 2002 and VHLSS 2004 cover 30000 and 9000 households, respectively.
- The VHLSSs 2002-2004 set up panel data of 4000 households.
- The surveys are representative for 8 geographic regions in Vietnam.
Poverty trend in Vietnam

In Vietnam, expenditure poverty lines over time are calculated by WB and GSO:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In VND (thousand)</td>
<td>1160</td>
<td>1790</td>
<td>1917</td>
<td>2077</td>
</tr>
<tr>
<td>In USD</td>
<td>92</td>
<td>128</td>
<td>128</td>
<td>132</td>
</tr>
</tbody>
</table>
## Poverty trend in Vietnam

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Red River Delta</td>
<td>62.54</td>
<td>29.27</td>
<td>22.44</td>
<td>12.14</td>
</tr>
<tr>
<td>North East</td>
<td>81.63</td>
<td>62.04</td>
<td>38.43</td>
<td>29.38</td>
</tr>
<tr>
<td>North West</td>
<td>80.98</td>
<td>73.35</td>
<td>68.03</td>
<td>58.57</td>
</tr>
<tr>
<td>North Central Coast</td>
<td>74.54</td>
<td>48.09</td>
<td>43.90</td>
<td>31.90</td>
</tr>
<tr>
<td>South Central Coast</td>
<td>47.20</td>
<td>34.46</td>
<td>25.15</td>
<td>19.01</td>
</tr>
<tr>
<td>Central Highlands</td>
<td>69.96</td>
<td>52.40</td>
<td>51.76</td>
<td>33.15</td>
</tr>
<tr>
<td>North East South</td>
<td>36.97</td>
<td>12.19</td>
<td>10.54</td>
<td>5.37</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>47.10</td>
<td>36.92</td>
<td>23.37</td>
<td>15.85</td>
</tr>
<tr>
<td><strong>All Vietnam</strong></td>
<td>58.12</td>
<td>37.37</td>
<td>28.84</td>
<td>19.49</td>
</tr>
</tbody>
</table>
## Program’s poverty targeting

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Poor (below pov. line)</th>
<th>Middle (between pov. line and 365 USD)</th>
<th>Rich (above 365 USD)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage rate: % households borrowing credit</td>
<td>11.84</td>
<td>7.27</td>
<td>2.26</td>
<td>6.78</td>
</tr>
<tr>
<td>Amount of borrowed credit (thousands VND)</td>
<td>3166</td>
<td>3628</td>
<td>4641</td>
<td>3576</td>
</tr>
<tr>
<td>Distribution of borrowing households</td>
<td>29.78</td>
<td>61.80</td>
<td>8.43</td>
<td>100</td>
</tr>
<tr>
<td>Distribution of borrowed credit amount</td>
<td>26.37</td>
<td>62.69</td>
<td>10.94</td>
<td>100</td>
</tr>
</tbody>
</table>
Program’s poverty targeting

- Poor targeting since:
  - Credit group and People’s Committee are reluctant to include very poor households in the borrowing list. Very poor households might have low repayment capacity.
  - Poverty classification of commune authorities is different from that of WB and GSO of Vietnam.
## Program’s poverty targeting

<table>
<thead>
<tr>
<th>Region</th>
<th>Poor (GSO-WB)</th>
<th>Middle</th>
<th>Rich</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red River Delta</td>
<td>57.26</td>
<td>39.69</td>
<td>3.06</td>
<td>100</td>
</tr>
<tr>
<td>North East</td>
<td>72.53</td>
<td>26.72</td>
<td>0.75</td>
<td>100</td>
</tr>
<tr>
<td>North West</td>
<td>95.66</td>
<td>4.34</td>
<td>0.00</td>
<td>100</td>
</tr>
<tr>
<td>North Central Coast</td>
<td>80.64</td>
<td>19.01</td>
<td>0.35</td>
<td>100</td>
</tr>
<tr>
<td>South Central Coast</td>
<td>65.19</td>
<td>33.86</td>
<td>0.94</td>
<td>100</td>
</tr>
<tr>
<td>Central Highlands</td>
<td>70.88</td>
<td>29.12</td>
<td>0.00</td>
<td>100</td>
</tr>
<tr>
<td>North East South</td>
<td>25.26</td>
<td>55.34</td>
<td>19.40</td>
<td>100</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>49.95</td>
<td>49.80</td>
<td>0.26</td>
<td>100</td>
</tr>
<tr>
<td><strong>All Vietnam</strong></td>
<td><strong>62.31</strong></td>
<td><strong>34.86</strong></td>
<td><strong>2.83</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Methods of impact evaluation

- Parameters of interest:
  - Average treatment effect on the treated (ATT):
    \[ ATT = E(Y_1 - Y_0 | D=1) \]
  - where:
    - \( Y_1 \) is potential outcome in the presence of the program.
    - \( Y_0 \) is potential outcome in the absence of the program.
    - \( D \) is program participation, \( D = 1 \) for participants, 0 otherwise
Methods of impact evaluation

- Parameters of interest:
  - When the program provides continuous treatment for recipients, we can define the marginal treatment effect on the treated:

\[
AMT(D^c) = \frac{df_{D^c>0}(D^c)}{dD^c}
\]

- where:
  - \(D^c\) is the continuous program variable, i.e., size of loan that a household obtains.
  - \(f_{D^c>0}(D^c)\) is a function of treatment effect on the treated.
Instrumental variables method

- Instrumental variables method:
  \[ Y_i = \alpha + X_i \beta + D_i \theta + X_i D_i \gamma + \varepsilon_i \]
  - where:
    - \( Y \) is outcome variable.
    - \( D \) is program variable which can be binary or continuous.
    - \( X \) conditioning variables.
  - An instrumental variable, \( Z \):
    \[
    \text{Cov}(D_i, Z_i \mid X) \neq 0
    \]
    \[
    \text{Cov}(\varepsilon_i, Z_i \mid X) = 0
    \]
Instrumental variables method

- Instrumental variables:
  - Distance from the village to the nearest bank.
  - The poverty rate of commune in which household are living.

- These are community variables. They would not be present in the outcome equations.
Difference-in-difference method

- When panel data are available, we can estimate the program impact using difference-in-difference estimator:

\[
\text{ATT}\,(X) = \left[ E(Y_{1A} \mid X, D = 1) - E(Y_{0A} \mid X, D = 0) \right]
- \left[ E(Y_{0B} \mid X, D = 1) - E(Y_{0B} \mid X, D = 0) \right]
\]

- where:

  - \( Y_{1A} \) is outcome with program after program implementation
  - \( Y_{0A} \) is outcome without program after program implementation
  - \( Y_{0B} \) is outcome before program implementation
The program impact is estimated using matching method (nearest neighbors and kernel matching).

To estimate AMT:

- Firstly, impact, $\Delta_i$, is estimated for all households borrowing credit in data samples.
- Secondly, impose a linear function of impact:
  \[ \Delta_i = \alpha + \beta D_i^c + u_i \]
  where $\beta$ measures AMT.
Impact results: Instrumental variables method

<table>
<thead>
<tr>
<th>Treatment variables</th>
<th>Log of expenditure per capita</th>
<th>Log of health care expenditure per capita</th>
<th>Log of education expenditure per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMT</td>
<td>0.00019*</td>
<td>0.00088*</td>
<td>0.00271**</td>
</tr>
<tr>
<td></td>
<td>[0.00012]</td>
<td>[0.00053]</td>
<td>[0.00108]</td>
</tr>
<tr>
<td>ATT</td>
<td>0.91771</td>
<td>1.45623</td>
<td>2.71244*</td>
</tr>
<tr>
<td></td>
<td>[0.60026]</td>
<td>[0.94351]</td>
<td>[1.62134]</td>
</tr>
</tbody>
</table>

* significant at 10%; ** significant at 5%; *** significant at 1%
## Impact results: Instrumental variables method

<table>
<thead>
<tr>
<th>Treatment variables</th>
<th>OUTCOME VARIABLES</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Log of income per capita</td>
<td>Log of crop income per capita</td>
<td>Log of livestock income per capita</td>
<td></td>
</tr>
<tr>
<td><strong>AMT</strong></td>
<td>0.00024*</td>
<td>0.00192**</td>
<td>0.00110</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.00014]</td>
<td>[0.00094]</td>
<td>[0.00078]</td>
<td></td>
</tr>
<tr>
<td><strong>ATT</strong></td>
<td>2.08042*</td>
<td>1.23245*</td>
<td>2.05109*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1.17914]</td>
<td>[0.73141]</td>
<td>[1.22321]</td>
<td></td>
</tr>
</tbody>
</table>

* significant at 10%; ** significant at 5%; *** significant at 1%
Impact results: Difference-in-difference with matching

- No statistically significant impact is found on outcome variables.
Impact on poverty

Impact of the credit program on poverty is measured by the difference in poverty indices in the presence and absence of the program.

- Poverty indices:

\[ P_\alpha = \frac{1}{n} \sum_{i=1}^{q} \left( \frac{z - y_i}{z} \right)^\alpha \]

- Impact is measured by:

\[ \Delta P_\alpha = P_\alpha (D = 1, Y_1) - P_\alpha (D = 1, Y_0) \]
Impact on poverty

- The problem is that we don’t observe $P_\alpha(D = 1, Y_0)$ directly. We can estimate it using estimation of $Y_0$ of the participants.

- The outcome equation:
  \[ Y_i = \alpha + X_i \beta + D_i \theta + X_i D_i \gamma + \varepsilon_i \]

- The predicted outcome in the absence of the program:
  \[ \hat{Y}_{i0} = \hat{\alpha} + X_i \hat{\beta} \]
Impact on poverty

Then we follow Elbers, et al. (2003) to estimate poverty rate:

$$\hat{P}_0(D = 1, Y_0) = \frac{m_i}{M} \sum_{i=1}^{N} \hat{P}_i$$

where:

$$\hat{P}_i = E[ P_i | X_i, D_i = 0, \hat{\alpha}, \hat{\beta}, \hat{\sigma}^2 ] = \Phi \left[ \frac{lnz - \hat{Y}_{i0}}{\hat{\sigma}} \right] = \Phi \left[ \frac{lnz - (\hat{\alpha} + X_i \hat{\beta})}{\hat{\sigma}} \right]$$

$\hat{\sigma}$ is estimator of the standard deviation of error term in the outcome equation.

$mi$ is the size of household $I$

$M$ is the total population of the participating group

$N$ is the number of households in the participating group
## Impact on poverty

<table>
<thead>
<tr>
<th>Poverty indices of participants</th>
<th>Actual</th>
<th>No-credit counterfactual</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>0.3720***</td>
<td>0.4630***</td>
<td>-0.0909***</td>
</tr>
<tr>
<td></td>
<td>[0.0199]</td>
<td>[0.03171]</td>
<td>[0.0338]</td>
</tr>
<tr>
<td>P1</td>
<td>0.0947***</td>
<td>0.1507***</td>
<td>-0.0560**</td>
</tr>
<tr>
<td></td>
<td>[0.0071]</td>
<td>[0.02749]</td>
<td>[0.0270]</td>
</tr>
<tr>
<td>P2</td>
<td>0.0341***</td>
<td>0.0664***</td>
<td>-0.0323*</td>
</tr>
<tr>
<td></td>
<td>[0.0034]</td>
<td>[0.0197]</td>
<td>[0.0194]</td>
</tr>
</tbody>
</table>
Conclusions

- The credit program does not reach the poor well. It has low coverage and high leakage rates.
- Positive impact of the program is found on households’ expenditure and income per capita using instrumental variables method.
- The program also has positive and statistically significant impact on poverty of the participants.
- However, no statistically significant impact is found using the diff-in-diff method. Further study should be conducted to check robustness of the estimation results.
Thank you very much!