What motivates Ugandan NGOs to diversify?

Risk reduction or Private gain

Canh Thien Dang and Trudy Owens
School of Economics, The University of Nottingham
Aid channelled through NGOs and substitutes for local government

OECD aid through NGOs has grown massively
(Source: Aldeshev and Navara (2018, in millions $))

Ugandan NGOs provide essential public services

- Education and Training
- Community development and construction
- HIV prevention
- Child-related services
- Credit and Finance
- Healthcare
- Forestry Conservation
- Water and Sanitation
Why should we care about NGO diversification?

- NGOs important to delivery of development programmes and public services
- How to design incentive scheme to promote pro-social behaviours?
- Diversification could accommodate a wider range of beneficiaries but is costly
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- Diversification could accommodate a wider range of beneficiaries but is costly
  - Lack of focus (transaction costs, management inefficiency)
  - Mission vagueness that reduces legitimacy of NGO status

⇒ Why do NGOs diversify?
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⇒ Why do NGOs diversify?
Overview

Do Ugandan NGOs diversify activities *mainly* to reduce uncertainty (risks) related to funding or to gain personally (e.g. prestige, careerism, or impure altruism... )?

**Methodology** – Look at the effect of value-based incentives (contracted grants) on diversification

- **Theoretically**, if risk parameters $>$ personal gains, incentives $\downarrow$ diversification
- If personal gains $>$ risk parameters, incentives $\uparrow$ diversification

**Sample** – A unique dataset of 391 randomly sampled Ugandan NGOs

1. **Empirically**, exploit between-NGO variations in grants received after a historic flood in mid-2007
2. Exploit within-NGO variations in activities and incentives in 2002 and 2007
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Summary of results

An increase in the proportion of contracted incomes (e.g. grants, membership, fees) decreases the number of activities

Interpretation - NGOs getting more value-based incentives from stakeholders diversify less

• Diversifying to reduce risks as incentives are to create extra development, mission-related value
• Not personal gains as higher incentives are insurance against risks and NGOs would diversify more

Conclusion - No evidence for NGO decisions being mainly driven by personal gains
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What has been done in the literature

Behavioural motivators in firms and non-profits (Carpenter and Gong, 2016)

• Firms to reduce risks related to performance (Campa & Kedia, 2002); Managers to reduce uncertainty of performance measure and advance career (Aggarwal & Samwick, 2003)

• Impacts of diversification on NGOs’ financial stability and efficiency (Arikan and Stulz, 2016)

• NGOs to avoid excessively challenging locations, despite neediest (Fruttero & Gauri, 2005; Barr & Fafchamps, 2006) → *not mission-driven but rather personally*

Studies on designing incentives for pro-social efforts

• Imas (2014) – volunteer more if the stakes are low

• DellaVigna & Pope (2017) – monetary incentives work better than psychological motivators

• Gneezy et al. (2011); Besley & Ghatak (2005) – NGOs driven by impure altruism or “warm-glow”
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1. Motivation and related literature

2. Ugandan NGO data

3. Empirical strategies and Results

4. A model to relate value-based incentives and diversification

5. Discussion
At least 5 NGOs worked in each Ugandan district in 2008. A representative survey of 391 randomly sampled NGOs cover a range of activities including:

- Education and Training
- Community development and construction
- HIV prevention
- Child-related services
- Credit and Finance
- Healthcare
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- Education and Training
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NGOs have missions (e.g. fight poverty), apply for grants and decide on activities

Two sources of incomes

- Contractual (62% total income): grants, membership & user fees
  → We use the proportion of contractual incomes as INCENTIVES
- Voluntary donations and non-mission business income (38%)

Measure of diversification

→ Number of activities at the end of 2007 (4 on average)

Other organisations and managerial information

Number of activates: mean = 4
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Empirical strategies

\[ n_i = \gamma \times \text{INCENTIVES}_i + X'_i \gamma_X + \varepsilon_i \]

**Aim** – estimate the effect of INCENTIVES on diversification \( n \)

**Challenges** – \( \gamma \) is biased due to omitted variables that affect both INCENTIVES & \( n \)

- Unobserved managerial commitment or quality of employees

**Strategies**

1. Using between-NGO variations and an IV from the historic 2007 flood
2. Using within-NGO variations from recall information in 2002 and 2007
Empirical strategies

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Between-NGO variations and an IV from the 2007 flood

\[ n_i = \gamma \times \text{INCENTIVES}_i + X_i' \gamma_x + \varepsilon_i \]

**Aim** – an IV that affects \( n \) only through changes in the proportion of contracted incomes

**Sources** – a historic flood after unexpected heavy rainfalls from July to September 2007

➤ Surge in international grants targeting the most severely affected districts
Between-NGO variations and an IV from the 2007 flood

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- Surge in international grants targeting the most severely affected districts
The 2007 flood is an exogenous event. The 2007 flood caused 57 deaths, a once-in-a-hundred-year event. Figure: Precipitation level (mm)

82/391 NGOs working in the most severely affected districted identified by UNOCHA and Ugandan Red Cross.
2007 flood as a positive shock to NGO’s international funding

The 2007 flood caused 57 deaths, a once-in-a-hundred year event.

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Between-NGO variations and an IV from the 2007 flood

\[ n_i = \gamma \times \text{INCENTIVES}_i + X'_i \gamma X + \varepsilon_i \]

**Aim** – an IV that affects \( n \) only through changes in the proportion of contracted incomes

**Sources** – a historic flood after unexpected heavy rainfalls from July to September 2007

- Surge in international grants targeting the most severely affected districts
- NGOs working in the affected areas likely to receive more international grants
- We use an IV (\( \text{AFFECTED}_i = 1 \)) - whether NGO worked in affected areas before 2007
  - We show that the decision to locate in these areas is not correlated with any characteristics in 2007
First-stage estimation

\[ \text{INCENTIVES}_i = \alpha \times \text{AFFECTED}_i + X'_i \alpha_X + \varepsilon_i \]

<table>
<thead>
<tr>
<th>FLOOD_AFFECTED</th>
<th>25.39 *** (4.65)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanderson-Windmeijer multivariate F test of excluded instruments: (Prob &gt; F)</td>
<td>31.70 *** (0.00)</td>
</tr>
</tbody>
</table>

**Interpretation** – Working in the most affected areas in 2007 significantly associates with a larger proportion of 2007 income from contracted sources (grants)
Threats to IV validity

\[ \text{AFFECTED}_i = 1 \text{ if NGO worked in one of the most affected districts in 2007} \]

**Threats** – decision of working in affected areas relates to factors other than funding sources

- ✔ Timing is exogenous – Ugandan rainfall pattern is white noise (Nvqvist, *JDE*, 2013)
- → NGOs hardly able to pre-select the locations in 2007 based on past rainfalls

- ☞ Self-selection into ”potential” areas to get funding at some point
- ☞ Look at NGOs working in areas with \( \geq 1 \) extreme flood from 1988 to 2017
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- NGOs hardly able to pre-select the locations in 2007 based on past rainfalls
- Self-selection into ”potential” areas to get funding at some point
- Look at NGOs working in areas with ≥ 1 extreme floods from 1988 to 2017
Affected NGOs statistically similar to unaffected NGOs

Areas vulnerable to ≥ 1 extreme flood from 1988 to 2017

NGOs in vulnerable vs non-vulnerable areas are generally similar
What if they differ in some unobservable ways?

- Redo the analysis using the sub-sample of NGOs working in vulnerable areas, treating the timing of the 2007 flood as the exogenous source.
- Use within-NGO variations to account for within-NGO differences (2nd strategy).
Results using between-NGO variations

\[ n_i = \gamma \times \text{INCENTIVES}_i + X'_i \gamma_X + \varepsilon_i \]

<table>
<thead>
<tr>
<th>Variables</th>
<th>Full Sample (N = 391)</th>
<th>Restricted sample (N = 280)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS</td>
<td>2SLS</td>
</tr>
<tr>
<td>Incentives</td>
<td>0.10</td>
<td>-2.44**</td>
</tr>
<tr>
<td></td>
<td>(0.23)</td>
<td>(1.07)</td>
</tr>
<tr>
<td>Controls</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. Estimates are multiplied by 100 for ease of interpretation. Restricted sample includes NGO working in areas vulnerable to \( \geq 1 \) extreme flood from 1988 to 2017.
Results using between-NGO variations

\[ n_i = \gamma \times \text{INCENTIVES}_i + X_i' \gamma_x + \varepsilon_i \]

An increase in the proportion of contracted incomes (e.g. grants, membership, fees) decreases the number of activities
Results using within-NGO variations

\[ n_{it} = \gamma \times \text{INCENTIVES}_{it} + X'_{it} \gamma_X + \pi_i + \sigma_t + \epsilon_{it} \]

Information from recall data asked in the same 2008 questionnaire.

\[ t = 2002, 2007; \quad n_{i2002} = n_{i2007} - n_{i2007\,\text{introduced}} + n_{i2007\,\text{discontinued}} \]

\( \pi_i, \sigma_t \): organisation and time fixed effects

\( X'_{it} \): time-varying controls – whether changed focus/manager or expanded since 2002,

number of staff
## Results using within-NGO variations

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Number of activities</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td><strong>INCENTIVES</strong></td>
<td>-0.04</td>
<td>-0.25*</td>
<td>-0.36**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.15]</td>
<td>[0.14]</td>
<td>[0.18]</td>
<td></td>
</tr>
<tr>
<td><strong>TREND (2007 = 1)</strong></td>
<td>31.68***</td>
<td>41.68***</td>
<td>78.53***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[10.24]</td>
<td>[10.56]</td>
<td>[23.09]</td>
<td></td>
</tr>
<tr>
<td>Controls + FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Estimator</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
<td></td>
</tr>
</tbody>
</table>

Notes. *** p<0.01, ** p<0.05, * p<0.1. N = 369

### Interpretation

- NGOs relying more on contracted incomes diversify less (robust)
- NGOs tend to diversify more over time
A model to relate Incentives and Diversification
A risk-averse NGO and an altruistic stakeholder

Stakeholder only cares about the success of the mission net contracted grants

- Set a value-based incentive to motivate the effort
- NGO also chooses unobservable effort & diversification to reduce uncertainty and/or gain benefits

• If personal benefits $\gg$ reducing uncertainty, higher value-based incentive works as insurance against risks
  ➤ NGO diversifies more ➤ effect on diversification is positive

• If reducing uncertainty $\gg$ personal benefits, higher value-based incentive increases value-created effort
  ➤ NGO diversifies less ➤ effect on diversification is negative

• Interpretation – estimated incentive effect is negative for both within and between-variation estimates

☞ Ugandan NGOs diversify mainly due to risk-related factors rather than personal benefits
A risk-averse NGO and an altruistic stakeholder

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Higher reliance on stakeholder funding (e.g. grants, membership, fees) reduces the number of activities offered by Ugandan NGOs.

Consistent with Ugandan NGOs diversify mainly to reduce risks related to operation:

- Motivations might not dominantly be self-benefiting

- Donors provide funding stream & financial stability → NGOs focus on overarching mission

Drawbacks

- Distinguish between “good” (altruism) vs “bad” personal gain (careerism)

- IV estimates only applicable locally

Thank you for your attention!
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Table 1. Descriptive statistics for Ugandan NGOs in 2008

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Mean</th>
<th>(2) SD</th>
<th>(3) Min</th>
<th>(4) max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of activities</td>
<td>4.288</td>
<td>1.861</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Herfindahl-Hirschman index (HHI)</td>
<td>0.538</td>
<td>0.224</td>
<td>0</td>
<td>0.993</td>
</tr>
<tr>
<td>INCENTIVES</td>
<td>61.59</td>
<td>40.27</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>KAMPALA</td>
<td>0.393</td>
<td>0.489</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>CHANGE FOCUS</td>
<td>0.242</td>
<td>0.429</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>DISTRICTS</td>
<td>3.750</td>
<td>5.986</td>
<td>1</td>
<td>57</td>
</tr>
<tr>
<td>GEOGRAPHICAL EXPANSION</td>
<td>0.467</td>
<td>0.500</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>NUMBER OF STAFF</td>
<td>34.87</td>
<td>94.01</td>
<td>1</td>
<td>1,284</td>
</tr>
<tr>
<td>VOTE_ACTIVITY</td>
<td>0.434</td>
<td>0.496</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>FEMALE</td>
<td>0.260</td>
<td>0.439</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>RELIGIOUS TITLE</td>
<td>0.227</td>
<td>0.419</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>TENURE</td>
<td>6.670</td>
<td>5.392</td>
<td>0.250</td>
<td>45</td>
</tr>
<tr>
<td>OTHER_NGOS</td>
<td>1.444</td>
<td>6.342</td>
<td>0</td>
<td>108</td>
</tr>
<tr>
<td>FLOOD_AFFECTED</td>
<td>0.196</td>
<td>0.398</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes: INCENTIVES is measured as revenue from local grants, international grants, and membership and user fees as a percentage of total revenue. KAMPALA takes the value 1 if the NGO has the headquarter in the capital and 0 otherwise. GEOGRAPHICAL EXPANSION and CHANGED FOCUS take the value 1 if the NGO expands geographically or changes its focus in the last five years, respectively; 0 otherwise. VOTE_ACTIVITY takes the value 1 if the NGO requires a vote from either its oversight committee or its members or some external body before introducing a new activity. NUMBER OF STAFF is the number of staff working for the NGO in 2007. RELIGIOUS TITLE takes the value 1 if the manager has a religious title, 0 otherwise. TENURE indicates how long the current manager has been with the NGO. OTHER_NGOS indicates the number of other NGOs that the manager is currently involved. There was one NGO whose manager reports working for more than 100 NGOs. If we exclude this NGO, the results remain unchanged. See Table A5 in Appendix for a sensitivity analysis when we exclude NGOs whose managers working for more than 10, 15, and 100 NGOs.
Appendix – Robustness to clustered standard errors

<table>
<thead>
<tr>
<th></th>
<th>Panel A. 2SLS results for full sample (N = 391)</th>
<th>Panel B. 2SLS results for restricted sample (N = 323)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Prob&gt;</td>
</tr>
<tr>
<td>INCENTIVES</td>
<td>-2.53</td>
<td>0.00</td>
</tr>
<tr>
<td>KAMPALA</td>
<td>-56.54</td>
<td>0.00</td>
</tr>
<tr>
<td>CHANGED FOCUS</td>
<td>35.56</td>
<td>0.00</td>
</tr>
<tr>
<td>DISTRICT</td>
<td>4.32</td>
<td>0.00</td>
</tr>
<tr>
<td>GEOGRAPHICAL</td>
<td>45.26</td>
<td>0.00</td>
</tr>
<tr>
<td>EXPANSION</td>
<td>26.04</td>
<td>0.00</td>
</tr>
<tr>
<td>LOGSTAFF</td>
<td>-47.67</td>
<td>0.00</td>
</tr>
<tr>
<td>VOTE_ACTIVITY</td>
<td>-14.48</td>
<td>0.00</td>
</tr>
<tr>
<td>RELIGIOUS</td>
<td>10.69</td>
<td>0.00</td>
</tr>
<tr>
<td>TENURE</td>
<td>-0.31</td>
<td>0.00</td>
</tr>
<tr>
<td>TENURE_SQUARED</td>
<td>-2.23</td>
<td>0.00</td>
</tr>
<tr>
<td>OTHER NGOS</td>
<td>467.85</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Notes: 95% confidence intervals for pairs clustered bootstrapped-based standard errors and p-values are reported. Estimates are multiplied by 100 for ease of interpretation. The samples used are either full (including all available NGOs) or restricted (including NGOs most vulnerable to an extreme flood during the period 1988 – 2017). Bootstrapping is at 500 replications.
## Balance Test

### Table OA3: Balance checks for NGOs with or without information on revenue composition

<table>
<thead>
<tr>
<th></th>
<th>Without</th>
<th>With</th>
<th>Difference</th>
<th>t-statistics</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of activities in 2007</td>
<td>4.13</td>
<td>4.29</td>
<td>-0.16</td>
<td>-0.72</td>
<td>0.47</td>
</tr>
<tr>
<td>No. of new act. 2002</td>
<td>0.53</td>
<td>0.73</td>
<td>-0.20</td>
<td>-1.72</td>
<td>0.09</td>
</tr>
<tr>
<td>No. of discontinued act. 2002</td>
<td>0.40</td>
<td>0.36</td>
<td>0.03</td>
<td>0.33</td>
<td>0.74</td>
</tr>
<tr>
<td>Other NGOs</td>
<td>1.98</td>
<td>1.44</td>
<td>0.53</td>
<td>0.61</td>
<td>0.54</td>
</tr>
<tr>
<td>Kampala Headquarters (=1)</td>
<td>0.44</td>
<td>0.39</td>
<td>0.05</td>
<td>0.84</td>
<td>0.40</td>
</tr>
<tr>
<td>No. of working districts</td>
<td>4.41</td>
<td>3.94</td>
<td>0.47</td>
<td>0.60</td>
<td>0.55</td>
</tr>
<tr>
<td>Change focus (=1)</td>
<td>0.20</td>
<td>0.24</td>
<td>-0.04</td>
<td>-0.88</td>
<td>0.38</td>
</tr>
<tr>
<td>Number of staff (log)</td>
<td>2.78</td>
<td>2.80</td>
<td>-0.02</td>
<td>-0.14</td>
<td>0.89</td>
</tr>
<tr>
<td>Religious affiliation</td>
<td>0.26</td>
<td>0.23</td>
<td>0.03</td>
<td>0.57</td>
<td>0.57</td>
</tr>
<tr>
<td>Manager Tenure</td>
<td>7.39</td>
<td>6.67</td>
<td>0.72</td>
<td>1.04</td>
<td>0.30</td>
</tr>
<tr>
<td>Manager’s wealthy</td>
<td>0.06</td>
<td>0.08</td>
<td>-0.02</td>
<td>-0.65</td>
<td>0.51</td>
</tr>
<tr>
<td>Taxes on Grant</td>
<td>0.14</td>
<td>0.12</td>
<td>0.02</td>
<td>0.47</td>
<td>0.64</td>
</tr>
<tr>
<td>Having a bank account (=1)</td>
<td>0.81</td>
<td>0.73</td>
<td>0.08</td>
<td>1.52</td>
<td>0.13</td>
</tr>
<tr>
<td>Having overdraft</td>
<td>0.10</td>
<td>0.08</td>
<td>0.02</td>
<td>0.70</td>
<td>0.48</td>
</tr>
<tr>
<td>Languages</td>
<td>3.26</td>
<td>3.78</td>
<td>-0.52</td>
<td>-1.46</td>
<td>0.15</td>
</tr>
<tr>
<td>Learn from other NGOs</td>
<td>0.20</td>
<td>0.13</td>
<td>0.06</td>
<td>1.51</td>
<td>0.13</td>
</tr>
<tr>
<td>Evaluated by other NGOs</td>
<td>0.57</td>
<td>0.58</td>
<td>-0.01</td>
<td>-0.13</td>
<td>0.90</td>
</tr>
<tr>
<td>Asked for Fin. account</td>
<td>0.52</td>
<td>0.56</td>
<td>-0.04</td>
<td>-0.72</td>
<td>0.47</td>
</tr>
<tr>
<td>Worked with other NGOs (=1)</td>
<td>0.44</td>
<td>0.52</td>
<td>-0.07</td>
<td>-1.21</td>
<td>0.23</td>
</tr>
<tr>
<td>Has NGOs as member (=1)</td>
<td>0.17</td>
<td>0.24</td>
<td>-0.07</td>
<td>-1.30</td>
<td>0.19</td>
</tr>
<tr>
<td>Vote Activity (=1)</td>
<td>0.26</td>
<td>0.37</td>
<td>-0.11</td>
<td>-1.94</td>
<td>0.05</td>
</tr>
<tr>
<td>Monitored (=1)</td>
<td>0.64</td>
<td>0.63</td>
<td>0.01</td>
<td>0.23</td>
<td>0.82</td>
</tr>
<tr>
<td>International Travel (=1)</td>
<td>0.64</td>
<td>0.63</td>
<td>0.01</td>
<td>0.23</td>
<td>0.82</td>
</tr>
<tr>
<td>Manager has uni. degree (=1)</td>
<td>0.83</td>
<td>0.86</td>
<td>-0.03</td>
<td>-0.81</td>
<td>0.42</td>
</tr>
<tr>
<td>Value of equipment (log)</td>
<td>15.72</td>
<td>15.64</td>
<td>0.07</td>
<td>0.25</td>
<td>0.80</td>
</tr>
<tr>
<td>Value of rented vehicle (log)</td>
<td>5.48</td>
<td>6.10</td>
<td>-0.62</td>
<td>-0.77</td>
<td>0.44</td>
</tr>
<tr>
<td>Belong to an international NGO</td>
<td>0.10</td>
<td>0.07</td>
<td>0.03</td>
<td>1.07</td>
<td>0.28</td>
</tr>
<tr>
<td>Health Clinic (=1)</td>
<td>0.10</td>
<td>0.14</td>
<td>-0.04</td>
<td>-0.89</td>
<td>0.37</td>
</tr>
<tr>
<td>Female manager (=1)</td>
<td>0.22</td>
<td>0.27</td>
<td>-0.05</td>
<td>-0.81</td>
<td>0.42</td>
</tr>
<tr>
<td>No. of members in last meeting</td>
<td>0.10</td>
<td>0.14</td>
<td>-0.04</td>
<td>-0.89</td>
<td>0.37</td>
</tr>
<tr>
<td>Find needs of community</td>
<td>0.22</td>
<td>0.27</td>
<td>-0.05</td>
<td>-0.81</td>
<td>0.42</td>
</tr>
<tr>
<td>Ever received grant (=1)</td>
<td>0.68</td>
<td>0.63</td>
<td>0.04</td>
<td>0.68</td>
<td>0.49</td>
</tr>
</tbody>
</table>

### Notes:
- t-tests of characteristics between 87 NGOs without information revenue composition (excluded from the analysis) and 301 NGOs with the information. We demonstrate that the missing information is likely due to random factors. Variables’ names are self-explanatory. Other NGO indicates the number of other NGOs managed by the manager. Change focus: whether the NGO change focus in the last five years, Managers’ wealthy: whether the manager comes from a wealthy family, Languages: number of langauge the manager speaks, Asked for Fin. Account: whether the NGO was ever asked for a financial account, Worked with other NGOs: whether the NGO collaborated with any other NGOs Has NGOs
A risk-averse NGO and an altruistic stakeholder

NGO chooses effort and diversification for a mission set by stakeholder (donor, members, users)

$$v = e + \epsilon(n)$$

$v$: measure of development value; $e$ unobserved effort; $\epsilon(n) \sim N(0, s^2/n)$ uncertainty diversifiable by $n$

Stakeholder offers a contract: $w = w_0 + \alpha \times v$. ($\alpha$: value-based incentives)

NGO accepts and maximises: $u(W) = -\exp(-rW)$ where $W = w - k e^2/n + \lambda \ln n - \beta n$.

$r$ risk-aversion; $s^2$ risk variance; $k$ disutility from effort; $\lambda, \beta$ private benefits and costs from diversification

Stakeholder sets $\alpha$ to maximises:

$$E(v) + G(\alpha, k) - w$$

Expected development value
Empathy toward the NGO
Grant
A risk-averse NGO and an altruistic stakeholder

NGO chooses effort and diversification for a mission set by stakeholder (donor, members, users)

\[ v = e + \epsilon(n) \]

\( v \): measure of development value; \( e \) unobserved effort; \( \epsilon(n) \sim N(0, s^2/n) \) uncertainty diversifiable by \( n \geq 1 \)

Stakeholder offers a contract:

\[ w = w_0 + \alpha \times v. \quad (\alpha: \text{value-based incentives}) \]

NGO accepts and maximises:

\[ u(W) = - \exp(-rW) \quad \text{where} \quad W = w - ke^2/n + \lambda \ln n - \beta n. \]

\( r \) risk-aversion; \( s^2 \) risk variance; \( k \) disutility from effort; \( \lambda, \beta \) private benefits and costs from diversification

Stakeholder sets \( \alpha \) to maximises:
A risk-averse NGO and an altruistic stakeholder

NGO chooses effort and diversification for a mission set by stakeholder (donor, members, users)

\[ \nu = e + \epsilon(n) \]

\( \nu \): measure of development value; \( e \) unobserved effort; \( \epsilon(n) \sim N(0, s^2/n) \) uncertainty diversifiable by \( n \geq 1 \)

Stakeholder offers a contract: \[ w = w_0 + \alpha \times \nu. \] (\( \alpha \): value-based incentives)

NGO accepts and maximises: \[ u(W) = -\exp(-rW) \] where \( W = w - k \frac{e^2}{n} + \lambda \ln n - \beta n. \)

\( r \) risk-aversion; \( s^2 \) risk variance; \( k \) disutility from effort; \( \lambda, \beta \) private benefits and costs from diversification

Stakeholder sets \( \alpha \) to maximises:

\[
\underbrace{E(\nu)} + \underbrace{G(\alpha, k)} - w
\]

Expected development value + Empathy toward the NGO Grant
A risk-averse NGO and an altruistic stakeholder

NGO chooses effort and diversification for a mission set by stakeholder (donor, members, users)

\[ \nu = e + \epsilon(n) \]

\( \nu \): measure of development value; \( e \) unobserved effort; \( \epsilon(n) \sim N(0, s^2 / n) \) uncertainty diversifiable by \( n \geq 1 \)

Stakeholder offers a contract:

\[ w = w_0 + \alpha \times \nu. \quad (\alpha: \text{value-based incentives}) \]

NGO accepts and maximises:

\[ u(W) = - \exp(-rW) \text{ where } W = w - k \frac{e^2}{n} + \lambda \ln n - \beta n. \]

\( r \) risk-aversion; \( s^2 \) risk variance; \( k \) disutility from effort; \( \lambda, \beta \) private benefits and costs from diversification

Stakeholder sets \( \alpha \) to maximises:

\[ E(\nu) + G(\alpha, k) - W \]

Expected development value + Empathy toward the NGO - Grant
A risk-averse NGO and an altruistic stakeholder

NGO chooses effort and diversification for a mission set by stakeholder (donor, members, users)

\[ \nu = e + \epsilon(n) \]

\( \nu \): measure of development value; \( e \) unobserved effort; \( \epsilon(n) \sim N(0, s^2/n) \) uncertainty diversifiable by \( n \geq 1 \)

Stakeholder offers a contract:

\[ w = w_0 + \alpha \times \nu. \quad (\alpha: \text{value-based incentives}) \]

NGO accepts and maximises:

\[ u(W) = - \exp(-rW) \text{ where } W = w - k\varepsilon^2/n + \lambda \ln n - \beta n. \]

\( r \) risk-aversion; \( s^2 \) risk variance; \( k \) disutility from effort; \( \lambda, \beta \) private benefits, costs from diversification

Stakeholder sets \( \alpha \) to maximises:

\[ \underbrace{E(\nu)}_{\text{Expected development value}} + \underbrace{G(\alpha, k)}_{\text{Empathy toward the NGO}} - w \]
Timeline and equilibrium

- Stakeholder offers a grant based on a development value $v$
- Stakeholder also cares about the NGO (empathy $G$) and payment $w$
- NGO chooses (observable) diversification $n$ and (unobservable) $e$
- $n$ reduces variance of $v$
- NGO gains net benefits from $n$

\[ e^* = \frac{\alpha^*}{k} \]

\[ n^* = \frac{\lambda}{2\beta} + \frac{1}{2} \sqrt{\left(\frac{\lambda}{\beta}\right)^2 + 2 \frac{r}{\beta} s^2 \times \left[ \alpha^* (r, s^2, \lambda, k, \beta) \right]^2} \]

$v$ is realised and the agent is fully compensated.
The total effect of Incentives on Diversification

\[
\frac{\partial n}{\partial \alpha^*} = \frac{\partial n}{\partial r} \frac{\partial \alpha^*}{\partial r} + \frac{\partial n}{\partial s^2} \frac{\partial \alpha^*}{\partial s^2} + \frac{\partial n}{\partial \lambda} \frac{\partial \alpha^*}{\partial \lambda} + \frac{\partial n}{\partial k} \frac{\partial \alpha^*}{\partial k} + \frac{\partial n}{\partial \beta} \frac{\partial \alpha^*}{\partial \beta}
\]

- If personal reasons $\gg$ reducing risks, the incentive effect is positive
- If reducing risks $\gg$ personal reasons, the incentive effect is negative

Interpretation – estimated incentive effect is also negative

- Ugandan NGOs diversify mainly due to risk-related factors rather than personal benefits