Gendered Access to Finance
The Role of Team Formation, Idea Quality, and Implementation Constraints in Business Evaluations

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Access to finance crucial for unleashing the potential of entrepreneurship (Udry & Anagol, 2006; De Mel et al., 2009, Banerjee et al., 2015, Cai & Szeidel, 2022)

- Firms rarely grow beyond subsistence size (Hsieh & Olken, 2014)
- Access to finance is a common constraint (Banerjee & Duflo, 2014; Carpenter & Petersen, 2002)
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Women’s access to finance is particularly constrained

- Equity Financing
  - Lack necessary financing to start a business (OECD, 2017)
  - Challenges in attracting external equity (Ewens & Townsend, 2020; Hebert, 2020)

- Debt Financing
  - Smaller loan amounts (Agier & Szafarz, 2013; Bellucci et al., 2010; Demirguc-Kunt et al., 2018)
  - Higher interest rates (Asiedu et al., 2012)
  - More likely to be denied a loan (Morazzoni & Sy, 2022)
  - Required to provide more loan guarantees (Brock & De Haas, 2023)
Motivation: Female Entrepreneurship and Access to Finance

**Access to finance crucial for unleashing the potential of entrepreneurship**  
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⇒ Is the gap driven by demand or supply factors?  
Is there potentially a gender bias and what are its underlying mechanisms?
Our project

- Study gender bias and its underlying mechanisms on the **supply-side** of access to finance
  - Cooperation with one of the largest commercial banks in Uganda
  - Pre-registered lab-in-the-field experiment with 451 loan officers (LO)
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- Loan officers evaluate 5 business pitches in the same order
  - Exogenous variation in the gender of the entrepreneurs and their team formation
  - Combine evaluations with real-life data on start-up business performance
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• Study gender bias and its underlying mechanisms on the supply-side of access to finance
  • Cooperation with one of the largest commercial banks in Uganda
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• Loan officers evaluate 5 business pitches in the same order
  • Exogenous variation in the gender of the entrepreneurs and their team formation
  • Combine evaluations with real-life data on start-up business performance

⇒ Do loan officers evaluate male and female business projects differently? And if so, is the bias ...
  • ... located at the evaluation of business idea or the perceived implementation constraints?
  • ... more prevalent for teams or individual entrepreneurs?
  • ... driven by animus against female businesses?
Contributions

**Gender discrimination in entrepreneurial finance**

- **Gender bias in access to finance** (Asiedu et al., 2012, Agier & Szafarz, 2013; Bellucci et al., 2010; Demirguc-Kunt et al., 2018, Ewens & Townsend, 2020, Morazzoni & Sy, 2022)

- **Causal evidence for gender discrimination is rare** (Brock & De Haas, 2023)

**Determinants and biases in predicting business success**

- Prediction of entrepreneurial success is difficult, for both human experts and state-of-the-art machine learning approaches (Fafchamps & Woodruff, 2017; McKenzie & Sansone, 2019)

- Subjective evaluations and information-scarce credit markets allow for bias and favoritism (Blanchflower et al., 2003, Fisman et al., 2017; Beck et al., 2018; Macchi 2023)

**Underlying sources of gender bias in access to finance**

- Taste-based (Becker, 1957)
- Belief-based (Arrow, 1973; Phelps, 1972) discrimination (Gonzales Martinez et al., 2020; Montoya et al., 2020; Macchi, 2023)
Gender discrimination in entrepreneurial finance

- Gender bias in access to finance (Asiedu et al., 2012, Agier & Szafarz, 2013; Bellucci et al., 2010; Demirguc-Kunt et al., 2018, Ewens & Townsend, 2020, Morazzoni & Sy, 2022)
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Underlying sources of gender bias in access to finance

- Taste-based (Becker, 1957) or belief-based (Arrow, 1973; Phelps, 1972) discrimination (Gonzales Martinez et al., 2020; Montoya et al., 2020; Macchi, 2023)
Experimental Design
Experiment: Overview

Setting

- Loan officers in Uganda evaluate a set of business pitch decks
- Pitch decks from real-life start-up businesses

Exogenous Variations

1. Gender of the entrepreneur
2. Formation of entrepreneurial teams
   ⇒ Disentangle gender bias in evaluation of business idea vs. implementation constraints

Business Evaluations and Outcomes

- Business evaluations incentivized using actual business performance
- Costly screening
- Non-incentivized beliefs about business idea quality and business performance
Experiment: Design

Conceptual Framework

- Business pitch is presented with founder and implementer
  - Founder and implementer may or may not be the same person
- Perceived success ($B$) as a function of initial idea quality ($Q$) and idea implementation ($I$)
- Both success parameters are gender-specific $g = M, F \Rightarrow B(Q_g, I_g)$
Experiment: Design

Conceptual Framework

- Business pitch is presented with **founder** and **implementer**
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- Perceived success ($B$) as a function of initial idea quality ($Q$) and idea implementation ($I$)
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Exogenous Variation

- We vary both the **founder’s** and the **implementer’s** gender (male/female)
- We vary whether the business is proposed by a **team of two entrepreneurs or an individual**
Experiment: Business Evaluations
Experiment: The Business Evaluations

Founder

Green Market
Promoting agriculture through bringing Market closer to farmers
Experiment: The Business Evaluations

Green Market
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Experiment: The Business Evaluations

Founder

Implementer

Green Market
Promoting agriculture through bringing Market closer to farmers
Bin Daily is a business idea originated by [ ] during the entrepreneurship academy.

[ ] is 27 years old and has a bachelor in business administration and information technology from Kampala International University.

In the next pages, you will able to see the idea that presented at the end of the entrepreneurship academy.

Take your time to go over 's idea.
Revelation of Founder

*Bin Daily* is a business idea originated by [redacted] during the entrepreneurship academy.

[redacted] is 27 years old and has a bachelor in business administration and information technology from Kampala International University.

In the next pages, you will able to see the idea that presented at the end of the entrepreneurship academy.

Take your time to go over 's idea.

[Similar revelation of the implementer.]
1. Investment decision [for each pitch deck]
   - Invested amount [0-5,000 UGX]
   - Incentivized based on real-life business performance 1.5 years after pitching
   - Investment is doubled, if business reports positive profits; lost otherwise
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2. Best business [after seeing all pitch decks]
   - We ask which business generates the highest profits
   - Idea chosen as the best performing {0,1}
   - Bonus of 5,000 UGX if selected business with highest profits in real-life 1.5 years after pitching
Experiment: Evaluation Metrics

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3. Costly screening
   - Revise choices for payoff relevant pitch deck
   - Acquire additional information on entrepreneur(s) and their business
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4. Secondary outcomes (non-incentivized)
   - Idea quality
   - Beliefs about profits
Results
Results: Gender Bias for Individual Entrepreneurs

**Result 1:** Loan officers invest less in businesses of individual female entrepreneurs.

**Table 1: Investment Decision**

<table>
<thead>
<tr>
<th>Investment</th>
<th>Gender bias</th>
<th>LO gender</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (2)</td>
<td>High (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low (4)</td>
<td>High (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low (6)</td>
<td>High (7)</td>
<td></td>
</tr>
<tr>
<td>Female Entrepreneur</td>
<td>-245.24**</td>
<td>-355.85**</td>
<td>-265.18</td>
</tr>
<tr>
<td></td>
<td>(119.28)</td>
<td>(170.25)</td>
<td>(184.96)</td>
</tr>
<tr>
<td>Mean Dep. Var.</td>
<td>3,490.7</td>
<td>3,656.9</td>
<td>3,529.2</td>
</tr>
<tr>
<td>Observations</td>
<td>451</td>
<td>217</td>
<td>252</td>
</tr>
</tbody>
</table>

**Notes.** OLS Regressions. *** p < 0.01, ** p < 0.05, * p < 0.1.
Result 1: *Loan officers invest less in businesses of individual female entrepreneurs.*

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- Prediction of business failure 4 percentage point higher ($p=0.063$) for female businesses (18.2% of the failure prediction of males)
Result 2: *Female entrepreneur’s business is less likely selected as the best business.*

- Female businesses 7 percentage points less likely selected as the best relative ($p = 0.052$)
- Reduction of 27% of the average of a male entrepreneur’s business (26%)
- Results more pronounced for high gender biased, female and unexperienced loan officers

Regression Analysis
Result 3: No systemic gender bias of loan officers when evaluating entrepreneurial teams.

- No significant difference for
  - female founder
  - female implementer
  - female teams

- Very small point estimates (< 2% of the mean of the dependent variable)

- No heterogeneous effects by loan officer’s gender bias, gender, or experience
Results: Gender heterogeneity affects selection of top-performing business

Result 4: No systemic gender bias when selecting the best business of entrepreneurial teams.

Result 5: Loan officers prefer same-gender teams when selecting the best business.
Results: Gender heterogeneity affects selection of top-performing business

Result 4: *No systemic gender bias when selecting the best business of entrepreneurial teams.*

Result 5: *Loan officers prefer same-gender teams when selecting the best business.*

![Graph showing probability to choose as most profitable for different gender combinations.](Regression Analysis)
Results: Robustness

Patterns in responses consistent across different variables for project quality

- Positive correlation b/w investment, idea quality, and selecting the business as the most profitable (all \( p < 0.01 \))
- Negative correlation b/w investment and the probabilistic belief of whether the business has failed (\( p < 0.01 \))

Sufficient variation across pitch decks

- Investments ranging from 3,065 UGX to 3,460 UGX (\( p < 0.01 \))
- Ceiling or floor effects thus cannot explain the null result

Robust to only considering the first choice/pitch deck

Robust to excluding least accurate/attentive participants
Mechanisms
Taste-based vs. Belief-based Discrimination?

- Is there gender bias in costly screening?
- Is idea quality rated differentially by gender?
- Is there a general bias against individual entrepreneurs as opposed to teams?
Result 6: *No gender bias in requesting additional information.*

**Costly screening**

- Surprise chance to re-evaluate investment decision for payoff-relevant project
- Option to request additional information, e.g., external finance, sales
- Lack of information about female businesses should lead to costly screening on information deemed relevant IF prior beliefs can be adjusted

**No difference** between female and male entrepreneurs (individuals AND teams)
Result 6: *No gender bias in requesting additional information.*

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We cannot detect belief-based discrimination ....
Result 7: No different perception of quality of male and female business ideas.

Table 2: Idea Quality [Individual Entrepreneurs]

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<tr>
<td>Female Founder</td>
<td>0.6</td>
<td>-1.8</td>
<td>-4.9</td>
<td>4.6</td>
<td>-6.2</td>
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<tr>
<td></td>
<td>(4.1)</td>
<td>(5.2)</td>
<td>(4.8)</td>
<td>(4.0)</td>
<td>(3.9)</td>
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<td>Mean Dep. Var.</td>
<td>69.12</td>
<td>63.30</td>
<td>71.05</td>
<td>74.05</td>
<td>75.85</td>
</tr>
<tr>
<td>Observations</td>
<td>86</td>
<td>81</td>
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<td>107</td>
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Notes. Idea quality is an index based on two questions: 1) Does this business idea meet a need or solve a problem in Uganda? and 2) Is there a market for this business idea in Uganda? Participants rated their agreement on a scale ranging from 0 (completely disagree) to 100 (completely agree). *** p < 0.01, ** p < 0.05, * p < 0.1.
Results: Gender Bias for Individual Entrepreneurs

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... BUT no indication for taste-based discrimination for the business idea itself
⇒ Strong beliefs about gender differences in implementation ability and constraints!
Results: No Difference in the Evaluation of Individuals and Teams

Result 8: *No difference in the evaluation between individuals and teams.*

### Table 3: Teams vs. Individuals

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<td>(.17)</td>
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<td>(1.20)</td>
<td>(1.36)</td>
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Team formation alleviates concerns about female implementation ability and constraints
Conclusion & Implications
Take-Aways

1. Gender-bias in evaluation of individual female entrepreneurs, not of entrepreneurial teams
2. No gender bias in costly screening or subjective idea quality assessment
   ⇒ Gender bias due to differential assessment of individual women’s entrepreneurial ability and external constraints
Conclusion

Take-Aways

1. Gender-bias in evaluation of individual female entrepreneurs, not of entrepreneurial teams
2. No gender bias in costly screening or subjective idea quality assessment
   \[ \Rightarrow \] Gender bias due to differential assessment of individual women’s entrepreneurial ability and external constraints

Why is there gender bias only for individual female entrepreneurs?

- Team signals commitment to business (Kelly et al., 2016)
  - Women more likely to open business out of necessity, teams less so
- Team overcomes gender incongruence-based bias (Brock & De Haas, 2023)
  - Positive selection? Signal cooperativeness? (Goldin, 2020; Ashraf et al., 2023)

Generalizability of results

- Selection, attrition, naturalness, and scaling satisfied (List, 2020)
- Results comparable to Brock & De Haas (2023) in Turkey, scoring higher on financial development and gender equality indices
Take-Aways

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Implications

• Belief-based discrimination on women’s capabilities and implementation
  ⇒ Are these beliefs correct or biased? If biased, how?
  ● Crucial questions for designing policies to reduce bias!
    ● If beliefs are correct: need to reduce structural disadvantages of female entrepreneurs
    ● If beliefs are biased: need to provide information to correct beliefs

• Different gender bias for individual entrepreneurs vs. teams
  ⇒ What drives this penalty? What are the implications?
  ● Teams vs. individual entrepreneurs in general:
    ● Start-ups of entrepreneurial teams are more profitable in high-income countries
    ● Accelerators and incubators promote team creation
  ● Credibly signalling team compositions becomes important
  ● Possibilities to apply jointly for funding as an entrepreneurial team
I look forward to your questions and comments!
Appendix
Experiment: Setting

Instructions and Comprehension Checks

Pitch Deck Evaluation [5 decks]

Part I

Revealing Founder
Presenting Pitch Deck
Idea Quality
Revealing Implementer
Attention Check
Beliefs about Profits
Investment Decision

[sequence per pitch deck]

Part II

Best Business

Part III

Requesting Additional Information

Part IV

Gender Norms & Demographics

Payouts
Result 1: Loan officers invest less in individual businesses of female entrepreneurs than of male entrepreneurs.

- Prediction of business failure 4 percentage point higher (p=0.063) for female businesses (18.2% of the failure prediction of males)

Table 4: Beliefs about Business Success [Individual Entrepreneurs]

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<tr>
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<td>-1.223</td>
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<tr>
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<td>(2.187)</td>
<td>(2.210)</td>
<td>(2.568)</td>
</tr>
<tr>
<td>Mean Dep. Var.</td>
<td>22.47</td>
<td>41.80</td>
<td>35.73</td>
</tr>
<tr>
<td>Observations</td>
<td>451</td>
<td>451</td>
<td>451</td>
</tr>
</tbody>
</table>

Notes. 100 points could be allocated among the three different scenarios. The question was phrased as follows: What is the chance that this business idea will 1) fail within the first year, 2) survive the first year, but only make small profits, and 3) survive the first year and make large profits. Mean Dep. Var indicates the mean of the dependent variable of the reference group. Standard errors are heteroskedasticity-robust and reported in parentheses. The table includes pitch deck FE in both Panels. *** p < 0.01, ** p < 0.05, * p < 0.1.
Results: Gender Bias for Individual Entrepreneurs - Investment Distribution Function

Cumulative Probability

Investment

- Female Entrepreneur
- Male Entrepreneur
Result 2: A female entrepreneur’s business is less likely selected as the best relative to an otherwise identical business with a male entrepreneur.

**Table 5: Best Business Decision**

<table>
<thead>
<tr>
<th>Best Business</th>
<th>Gender bias</th>
<th>LO gender</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low  (2)</td>
<td>High (3)</td>
<td></td>
</tr>
<tr>
<td>Female Entrepreneur</td>
<td>-0.07*</td>
<td>-0.11**</td>
<td>-0.13**</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.05)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Mean Dep. Var.</td>
<td>0.26</td>
<td>0.21</td>
<td>0.33</td>
</tr>
<tr>
<td>Observations</td>
<td>451</td>
<td>217</td>
<td>199</td>
</tr>
</tbody>
</table>

Notes. OLS Regressions. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. 
Result 3: *No systemic gender bias of loan officers when evaluating teams in incentivized investment decisions.*

**Table 6: Investment Decision**

<table>
<thead>
<tr>
<th>Investment</th>
<th>Gender bias</th>
<th>LO gender</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (1)</td>
<td>High (2)</td>
<td>Female (4)</td>
</tr>
<tr>
<td>Female Founder</td>
<td>7.27</td>
<td>-179.28</td>
<td>-86.33</td>
</tr>
<tr>
<td></td>
<td>(86.11)</td>
<td>(120.96)</td>
<td>(123.87)</td>
</tr>
<tr>
<td>Female Implementer</td>
<td>-59.54</td>
<td>-97.11</td>
<td>-188.07</td>
</tr>
<tr>
<td></td>
<td>(83.68)</td>
<td>(126.27)</td>
<td>(130.93)</td>
</tr>
<tr>
<td>Female Founder&amp;Implementer</td>
<td>40.33</td>
<td>137.75</td>
<td>209.18</td>
</tr>
<tr>
<td></td>
<td>(120.58)</td>
<td>(181.80)</td>
<td>(190.10)</td>
</tr>
<tr>
<td>Mean Dep. Var.</td>
<td>3,352.2</td>
<td>3,395.6</td>
<td>3,353.5</td>
</tr>
<tr>
<td>F-Statistic</td>
<td>.017</td>
<td>1</td>
<td>.25</td>
</tr>
<tr>
<td>P-value</td>
<td>.9</td>
<td>.31</td>
<td>.62</td>
</tr>
<tr>
<td>Observations</td>
<td>1804</td>
<td>936</td>
<td>804</td>
</tr>
</tbody>
</table>

*Notes. OLS Regressions. *** p < 0.01, ** p < 0.05, * p < 0.1.*
Results: Gender heterogeneity affects selection of top-performing business

**Result 4:** No systemic gender bias of loan officers when evaluating teams in best business decision.

**Result 5:** Loan officers are more likely to select an idea as the best when it comes from a team of the same gender.

### Table 7: Best Business Decision

<table>
<thead>
<tr>
<th>Best Business</th>
<th>Gender bias</th>
<th>LO gender</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (2)</td>
<td>High (3)</td>
<td>Female (4)</td>
</tr>
<tr>
<td>Female Founder</td>
<td>-0.01</td>
<td>0.05</td>
<td>-0.06</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.04)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>Female Implementer</td>
<td>-0.02</td>
<td>-0.00</td>
<td>-0.09*</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Female Founder&amp;Implementer</td>
<td>0.08**</td>
<td>0.14**</td>
<td>0.18***</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Mean Dep. Var.</td>
<td>0.21</td>
<td>0.23</td>
<td>0.18</td>
</tr>
<tr>
<td>F-Statistic</td>
<td>2.4</td>
<td>.27</td>
<td>2.5</td>
</tr>
<tr>
<td>P-value</td>
<td>.12</td>
<td>.6</td>
<td>.12</td>
</tr>
<tr>
<td>Observations</td>
<td>1804</td>
<td>936</td>
<td>868</td>
</tr>
</tbody>
</table>

Notes. OLS Regressions. *** p < 0.01, ** p < 0.05, * p < 0.1. Standard errors clustered at the individual level.
### Table 8: Requesting Information Items [Individual Entrepreneurs]

<table>
<thead>
<tr>
<th></th>
<th>Requested info</th>
<th># items</th>
<th>Team Member</th>
<th>References</th>
<th>Experience</th>
<th>Network</th>
<th>Family F.</th>
<th>External F.</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>Female Entrepreneur</td>
<td>.061 (.104)</td>
<td>.043 (.264)</td>
<td>-.009 (.064)</td>
<td>-.027 (.041)</td>
<td>-.007 (.056)</td>
<td>-.029 (.052)</td>
<td>.040 (.055)</td>
<td>.062 (.058)</td>
<td>.011 (.073)</td>
</tr>
<tr>
<td>Mean Dep. Var.</td>
<td>.37</td>
<td>.72</td>
<td>.12</td>
<td>.1</td>
<td>.1</td>
<td>.097</td>
<td>.046</td>
<td>.097</td>
<td>.15</td>
</tr>
<tr>
<td>Observations</td>
<td>86</td>
<td>86</td>
<td>86</td>
<td>86</td>
<td>86</td>
<td>86</td>
<td>86</td>
<td>86</td>
<td>86</td>
</tr>
</tbody>
</table>

Notes. OLS Regressions. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. 
### Table 9: Requesting Information Items [Teams of Entrepreneurs]

<table>
<thead>
<tr>
<th>Requested info # items</th>
<th>Team Member</th>
<th>References</th>
<th>Experience</th>
<th>Network</th>
<th>Family F.</th>
<th>External F.</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F. Founder</td>
<td>-.10</td>
<td>-.03</td>
<td>.06</td>
<td>.05</td>
<td>.02</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(.08)</td>
<td>(.05)</td>
<td>(.05)</td>
<td>(.04)</td>
<td>(.03)</td>
<td>(.04)</td>
</tr>
<tr>
<td></td>
<td>F. Implementer</td>
<td>-.09</td>
<td>-.04</td>
<td>-.01</td>
<td>-.01</td>
<td>.02</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>(2)</td>
<td>(.07)</td>
<td>(.05)</td>
<td>(.05)</td>
<td>(.04)</td>
<td>(.03)</td>
<td>(.04)</td>
</tr>
<tr>
<td></td>
<td>F. Founder&amp;Implementer</td>
<td>.17</td>
<td>.11</td>
<td>-.02</td>
<td>-.01</td>
<td>-.04</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>(3)</td>
<td>(.11)</td>
<td>(.07)</td>
<td>(.06)</td>
<td>(.06)</td>
<td>(.05)</td>
<td>(.07)</td>
</tr>
<tr>
<td>Mean Dep. Var.</td>
<td>.39</td>
<td>.75</td>
<td>.13</td>
<td>.094</td>
<td>.097</td>
<td>.083</td>
<td>.055</td>
</tr>
<tr>
<td>F-Statistic</td>
<td>.0335</td>
<td>.342</td>
<td>.168</td>
<td>1.03</td>
<td>.82</td>
<td>.382</td>
<td>.934</td>
</tr>
<tr>
<td>P-value</td>
<td>.855</td>
<td>.559</td>
<td>.683</td>
<td>.311</td>
<td>.366</td>
<td>.537</td>
<td>.334</td>
</tr>
<tr>
<td>Observations</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td>365</td>
</tr>
</tbody>
</table>

Notes. OLS Regressions. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. 
