

Social Barriers to Entrepreneurship in Africa: The Forced Mutual Help Hypothesis

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- Entry sunk costs to the formal sector (Djankov et al 2002)
- Excessive or inappropriate government regulations (Loayza 1996 and Botero et al. 2004).

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- In Kenya and Zimbabwe Fafchamps (2004) finds that only 32% of SME are in the hand of indigenous-African.
- Biggs and Shah (2006) find that the Indian in East Africa, the European in Southern Africa, the Lebanese in West Africa, dominate many of the major manufacturing activities.

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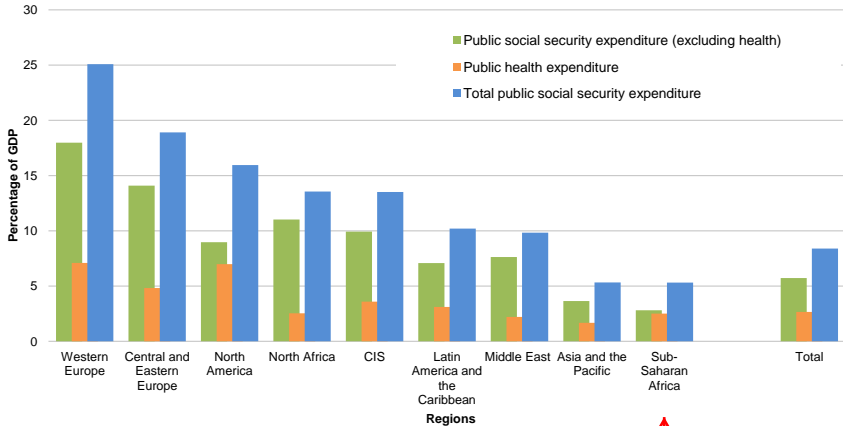
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- The limited size of the formal sector explains that direct taxation is only 7% of GDP in SSA (it is 22% in industrial countries)
- With low tax revenue as a proportion of GDP, African countries do not provide much social protection: difference between OECD and developing countries' public expenditure is the OECD's expenditure on social security (Tanzi-Schuknecht 2000).

**Total public social protection in percentage of GDP - regional estimates
Weighted by population**



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- Controlled laboratory experiments in rural Kenya (Jakiela and Owen 2010) and in Liberia (Nillesen, Beekman, and Gatto 2011) show that individuals are willing to reduce their expected profits to avoid making positive income shocks observable to their community.

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- The relevance of the theory is assessed with a sample of 7,514 formal manufacturing firms from 31 African countries.
- The fraction of missing entrepreneurs is computed with the estimated structural parameters of the model.

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- The results hold with any differentiable, increasing, concave in each of its argument production function: $f(\theta, L, K)$ (non parametric model)

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- Individual of type θ with a capital constraint K chooses to become an entrepreneur iff:

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\implies The more talented and wealthy people choose to become entrepreneur.

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$$\max_{L, L_r, \tau} \Pi^l = \theta K^\alpha L_l^{1-\alpha} - rK - wL - wL_r - \tau T$$

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\Rightarrow Independently of the value of $\beta \geq 0$ a local entrepreneur prefers to pay the family tax by hiring relatives in the firm.

- Local people choose to become entrepreneur iff :

$$\theta \geq \theta'(K) = \left(\frac{w + rK + (1 - \beta)T}{K} \right)^{\alpha} \frac{w^{1-\alpha}}{\alpha^{\alpha}(1 - \alpha)^{1-\alpha}}$$

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$$\theta \geq \theta^l(K) = \left(\frac{w + rK + (1 - \beta)T}{K} \right)^\alpha \frac{w^{1-\alpha}}{\alpha^\alpha (1 - \alpha)^{1-\alpha}}$$

\Rightarrow **Local people become less often entrepreneur than people of foreign origin:**

$$\theta^l(K) \geq \theta^f(K)$$

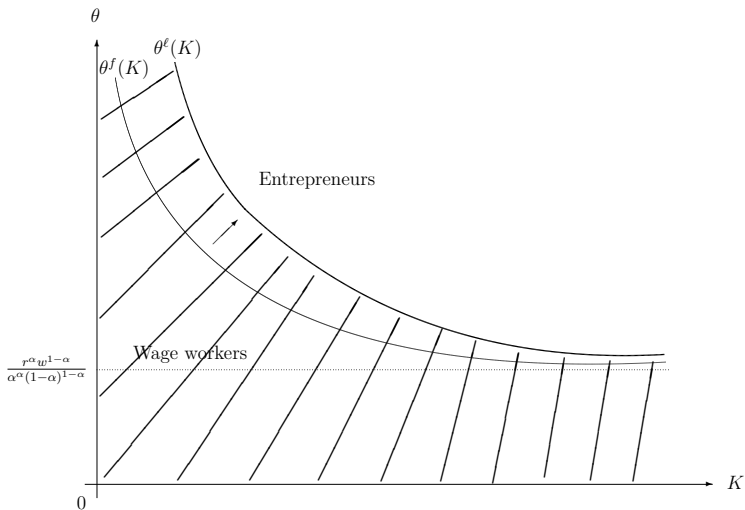


Figure 1: Entrepreneurship decision

Empirical analysis: The Data

- World Bank's Enterprise Survey Database.
 - ▶ 31 Sub-Saharan African Countries.
 - ▶ Between 2002 and 2007
 - ▶ 7,514 manufacturing firms in the formal sector.
 - ▶ Because in most countries the number of small and medium firms is far greater than the number of large firms surveys generally oversample large establishments. \Rightarrow Use a stratified random sampling methodology.
- No information on the entrepreneurs' nationality/ethnicity
 \Rightarrow Use ownership status.

Recruitment channel in foreign and local firms

| Means used by firms to find workers | Private Domestic Firms | Private Foreign Firms | Difference between Foreign and Domestic |
|-------------------------------------|------------------------|-----------------------|---|
| Through family/friends | 63,86% | 41,40% | -22,46% *** |
| Public or Private placement office | 6,40% | 10,93% | 4,53% *** |
| Public announcement/advertisement | 16,38% | 32,65% | 16,28% *** |
| Other | 13,37% | 15,01% | 1,65% |

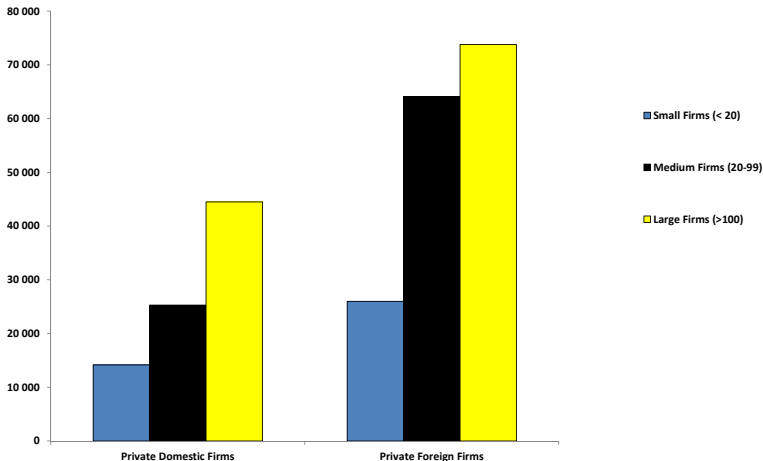
Workforce Composition

| | Private Domestic Firms | Private Foreign Firms | Difference between Foreign and Domestic |
|---|------------------------|-----------------------|---|
| Description of firms' workforce | | | |
| Blue Collar (Pct) | 75.08% | 72.16% | -2.92% *** |
| White Collar (Pct) | 24.92% | 27.84% | 2.92% *** |
| Supervision Ratio (Pct) | 45.17% | 58.44% | 13.26% *** |
| Average Education of a production worker | | | |
| 0 - 3 years | 11.5% | 8.7% | -2.81% * |
| 4 - 6 years | 30.3% | 22.6% | -7.61% *** |
| 7 - 9 years | 48.6% | 53.8% | 5.21% ** |
| 10 - 12 years | 6.1% | 11.1% | 4.99% *** |
| More than 13 years | 3.6% | 3.8% | 0.21% |
| % of the workforce having the following education level | | | |
| Nb: this question was only asked in countries surveyed between 2002 and 2005 | | | |
| Answers are taken into account only when the sum is equal to 100% | | | |
| Less than 6 years | 26.9% | 21.8% | -5.11% *** |
| 6 - 9 years | 24.3% | 18.8% | -5.54% *** |
| 10 - 12 years | 34.5% | 36.6% | 2.08% |
| More than 12 years | 14.2% | 22.8% | 8.55% *** |

Firms access to credit

| Credit | Private Domestic Firms | Private Foreign Firms | Difference between Foreign and Domestic |
|--|------------------------|-----------------------|---|
| Overdraft Facility or Line of Credit | | | |
| Yes | 39,48% | 57,60% | 18,11% *** |
| If Yes. In what type of Institutions | | | |
| Private commercial banks | 82,07% | 87,13% | 5,06% * |
| State-owned banks | 9,43% | 4,95% | -4,48% ** |
| Non-bank financial institutions | 6,96% | 3,96% | -2,99% |
| Other | 1,55% | 3,96% | 2,41% ** |
| Financial statement reviewed by an external auditor | | | |
| Yes | 51,21% | 77,97% | 26,76% *** |
| Did the Firm Apply For a Loan | | | |
| Yes | 22,92% | 27,74% | 4,82% *** |
| If Yes. Does This Loan Requires a Collateral | | | |
| yes | 84,99% | 83,06% | -1,92% |
| Of What Type | | | |
| Land | 57,19% | 61,76% | 4,58% |
| Machinery | 44,44% | 59,22% | 14,78% *** |
| Intangible Assets | 24,32% | 25,49% | 1,17% |
| Personal Assets | 36,04% | 24,27% | -11,76% ** |
| If No. Why the firm did not apply for a loan | | | |
| No need for a loan | 31,88% | 51,87% | 19,99% *** |
| Application procedures are complex | 19,25% | 11,20% | -8,05% *** |
| Interest rates are not favorable | 21,10% | 18,88% | -2,22% |
| Collateral requirements are unattainable | 10,28% | 5,39% | -4,89% *** |
| Size of loan and maturity are insufficient | 2,88% | 2,49% | -0,39% |
| Did not think it would be approved | 14,60% | 10,17% | -4,44% *** |

Foreign firms are more profitable than local firms: profit (\$) per employee



Labor to capital ratio

| Equations | (1) | (2) | (3) | (4) | (5) |
|--|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Dependent Variable | Labor / Capital (\$ Ratio (log) | Labor / Capital (\$ Ratio (log) | Labor / Capital (\$ Ratio (log) | Labor / Capital (\$ Ratio (log) | Labor / Capital (\$ Ratio (log) |
| Constant | -8.238 (25.68)*** | -8.009 (22.75)*** | -8.985 (18.93)*** | -9.093 (19.15)*** | -8.813 (17.78)*** |
| 100 % of the firm is owned by domestic private sector (dummy) | 0.395 (3.42)*** | 0.218 (1.48) | 0.393 (3.20)*** | 0.550 (3.41)*** | 0.372 (2.18)** |
| Firms' characteristics | | | | | |
| Firm offers training programs (dummy) | -0.139 (1.20) | -0.443 (2.18)** | -0.100 (0.87) | -0.101 (0.87) | -0.556 (2.48)** |
| Training dummy * 100 % domestic dummy | | 0.379 (1.77)* | | | 0.566 (2.29)** |
| Access to credit | | | | | |
| Firm has an overdraft or credit facilities (dummy) | | | -0.833 (5.82)*** | -0.599 (2.60)*** | -0.483 (2.08)** |
| Overdraft dummy * 100% domestic dummy | | | | -0.294 (1.36) | -0.441 (1.95)* |
| Access and/or cost of financing is a major or severe constraint (dummy) | | | -0.143 (1.17) | -0.143 (1.17) | -0.139 (1.14) |
| 100% of working capital is financed through internal fund (dummy) | | | -0.196 (1.14) | -0.198 (1.15) | -0.197 (1.16) |
| Observations | 4 675 | 4 675 | 4 465 | 4 465 | 4 465 |
| R-squared | 0.38 | 0.38 | 0.39 | 0.39 | 0.39 |
| Method OLS. Standard errors are clustered at the country / industry level. | | | | | |
| Absolute value of robust t statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1% | | | | | |
| Country, year, size, age, activity, location of the firms and export, ISO norms, average education of the workforce, union, dummies, are included in all the regressions | | | | | |

Firms' profitability

| Equations | (1) | (2) | (3) | (4) | (5) |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Dependent Variable | Total Sales (\$) Per Employee (log) | Total Sales (\$) Per Employee (log) | Total Sales (\$) Per Employee (log) | Total Sales (\$) Per Employee (log) | Total Sales (\$) Per Employee (log) |
| Constant | 9.210 (56.70)*** | 9.169 (52.78)*** | 8.019 (29.50)*** | 7.941 (27.93)*** | 7.911 (27.99)*** |
| 100% of the firm is owned by domestic private sector (dummy) | -0.334 (6.53)*** | -0.301 (4.85)*** | -0.345 (6.89)*** | -0.230 (3.22)*** | -0.209 (2.84)*** |
| Firms' characteristics | | | | | |
| Capital Stock (log) | 0.076 (10.44)*** | 0.075 (10.40)*** | 0.072 (10.21)*** | 0.073 (10.25)*** | 0.073 (10.18)*** |
| Firm offers training programs (dummy) | 0.130 (3.92)*** | 0.186 (2.18)** | 0.107 (3.02)*** | 0.107 (3.01)*** | 0.159 (1.71)* |
| Training dummy * 100% domestic dummy | | -0.070 (0.76) | | | -0.065 (0.65) |
| Access to credit | | | | | |
| Firm has an overdraft or credit facilities (dummy) | | | 0.304 (5.28)*** | 0.474 (4.85)*** | 0.461 (4.60)*** |
| Overdraft dummy*100% domestic dummy | | | | -0.213 (2.31)** | -0.197 (2.04)** |
| Access/ cost of financing is a major or severe constraint (dummy) | | | -0.236 (3.29)*** | -0.235 (3.28)*** | -0.236 (3.28)*** |
| 100% of working capital is financed through internal fund (dummy) | | | -0.018 (0.41) | -0.019 (0.44) | -0.019 (0.45) |
| Observations | 4 661 | 4 661 | 4 452 | 4 452 | 4 452 |
| R-squared | 0.81 | 0.81 | 0.82 | 0.82 | 0.82 |

Method OLS. Standard errors are clustered at the country / industry level.

Absolute value of robust t statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

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- We want to estimate how many are missing.
- We rely on structural estimation to quantify the gap.

Structural estimation procedure

- We assume that the entrepreneurial ability is as follows

$$\ln \theta_i = \delta_0 + \delta_1 \ln(1 + S_i) + \delta_2 \ln(1 + X_i) + \epsilon_i$$

where S_i are the years of education, and X_i years of experience of agent i . The error terms ϵ_i are assumed to be IID $N(0, \sigma^2)$.

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- The allocation of agents in entrepreneurship ($E_i = 1$) and wage work ($E_i = 0$) can be modeled by $E_i = \begin{cases} \mathbb{I}\{\theta_i \geq \theta^f\}, & \text{if } i \in \mathcal{F} \\ \mathbb{I}\{\theta_i \geq \theta^l\}, & \text{if } i \in \mathcal{L} \end{cases}$

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- The probability of becoming entrepreneur is given by

$$\Pr[E_i = 1] = p^i \Pr(\theta_i \geq \theta^f) + (1 - p^i) \Pr(\theta_i \geq \theta^l)$$

where p^i is the probability that agent i is a foreigner.

Structural Maximum Likelihood Estimates

$$\ln \theta_i = \delta_0 + \delta_1 \ln(1 + S_i) + \delta_2 \ln(1 + X_i) + \epsilon_i$$

| Type | Parameter | Name | Whole sample | Better solidarity | Worse solidarity | Difference Pvalue |
|------------|--------------------------|---------------|--------------------|--------------------|--------------------|-------------------|
| Foreigners | Log ability - constant | δ_{0f} | 6.507 (0.0004) | 5.9210 (0.0006) | 6.718 (0.0015) | 0.0000 |
| | Log ability - education | δ_{1f} | 0.3212 (0.0005) | 0.4141 (0.0003) | 0.2760 (0.0042) | 0.0000 |
| | Log ability - experience | δ_{2f} | 0.2103 (0.0123) | 0.3814 (0.0002) | 0.1845 (0.0041) | 0.0000 |
| | Stand. dev. for ability | σ_f | 0.4529 (0.0012) | 0.7231 (0.0002) | 0.3162 (0.0059) | 0.0000 |

Asymptotic standard errors in parenthesis * Not significant

Structural Maximum Likelihood Estimates cont.

| Type | Parameter | Name | Whole sample | Better solidarity | Worse solidarity | Difference Pvalue |
|--------|------------------------------------|-----------------------|---------------------------|---------------------------|---------------------------|-------------------|
| Locals | Log ability - constant | δ_{0l} | 6.815 (0.0002) | 5.302 (0.0006) | 7.061 (0.0012) | 0.0000 |
| | Log ability - education | δ_{1l} | 0.3011 (0.0002) | 0.3912 (0.0004) | 0.2021 (0.0025) | 0.0000 |
| | Log ability - experience | δ_{2l} | 0.1901 (0.0142) | 0.3002 (0.0002) | 0.1445 (0.0018) | 0.0000 |
| | Stand. dev. for ability | σ_l | 0.3891 (0.0011) | 0.6901 (0.0009) | 0.1283 (0.0052) | 0.0000 |
| All | Capital returns | α | 0.0412 (0.0025) | 0.0781 (0.0016) | 0.0392* (0.0253) | 0.0584 |
| | Log-likelihood | | -4686 | -2370.1 | -2480.2 | |
| | Number of Obs. | | 9258 | 4619 | 4639 | |
| | Frac. missing entrepreneurs | m | 0.0715 (0.0044) | 0.0706 (0.0055) | 0.0781 (0.0076) | 0.000 |

Asymptotic standard errors in parenthesis

* Not significant at 5%

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- Empirical analysis is consistent with the theoretical results.
- The structural estimation suggests that between 7% and 10% of wages workers in the formal sector would be entrepreneurs if there was no FMH constraint.
- Lack of social security deteriorate formal domestic firms development and growth, and hence taxation.
- This sheds a new light on the reforms undertaken recently in many developing and emerging countries (e.g. India, China, Brazil).

Government spending in social security

