

Creditor Protection Law and Venture Capital Investment in Africa Country-level Evidence

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Outline

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Motivation

- **Advocacy**
- Change laws to increase venture capital and private equity investment (EMPEA, 2015)
- **Country Level**
- Creditor protection law is a public good
- Changes occur through state actors, whose independent jurisdiction is limited to countries' national boundaries
- Country of investment funds' destination
- **Africa**
- Ranked by limited partners as one of their Top 3 most attractive markets (Haque, 2015)

Conceptual Framework

- Cleary et al. (2007)
- Negative relationship between investment and internal funds for companies with negative or very low internal funds
- Exogenous shock effects are magnified where information asymmetry is more severe

An increase in creditor protection law should have a larger effect on venture capital than on private equity investment

- $H_0 : \beta_{venture\ capital} > \beta_{private\ equity}$

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Related Literature

- **Developed Countries**
- Allen and Song (2003)
- **Developing Countries**
- Groh and Wallmeroth (2015)

Contribution

- Instrumental variable to account for simultaneity bias
- African venture capital and private equity data to test information asymmetry aspect of Cleary et al.'s (2007) theory

Empirical Model

- 2SLS instrumental variable, random effects specification

Structural form

$$\begin{aligned} (y_{it} - \hat{\theta} \bar{y}_i) &= (1 - \hat{\theta}) \beta_0 + (X_{it1} - \hat{\theta} \bar{X}_{i1}) \beta_1' + (\Gamma_{itk} - \hat{\theta} \bar{\Gamma}_{ik}) \beta_k' + (v_{it} - \hat{\theta} \bar{v}_i) \\ v_{it} &= \alpha_i + \omega_t + \varepsilon_{it} \end{aligned}$$

Reduced form

$$(X_{it1} - \hat{\theta} \bar{X}_{i1}) = (1 - \hat{\theta}) \pi_0 + (\Psi_{it1} - \hat{\theta} \bar{\Psi}_{i1}) \pi_1' + (\Gamma_{itk} - \hat{\theta} \bar{\Gamma}_{ik}) \pi_k' + (v_{it} - \hat{\theta} \bar{v}_i)$$

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- 2SLS instrumental variable, random effects specification

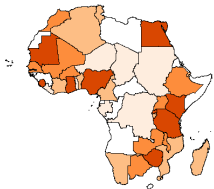
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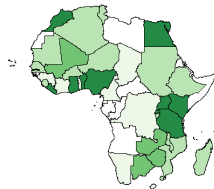
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$$(X_{it1} - \hat{\theta}\bar{X}_{i1}) = (1 - \hat{\theta})\pi_0 + (\Psi_{it1} - \hat{\theta}\bar{\Psi}_{i1})\pi_1' + (\Gamma_{itk} - \hat{\theta}\bar{\Gamma}_{ik})\pi_k' + (v_{it} - \hat{\theta}\bar{v}_i)$$

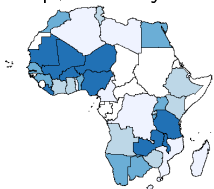
Dependent Variable



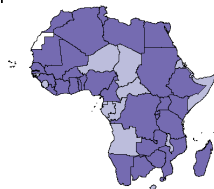
Seed, start-up, or early venture capital



Expansion venture capital



Private equity



All

Key Independent Variables

X_{it}

- Strength of legal rights index (World Bank)
- Sum of ten components creating a score ranging from 0 to 10
- Higher values represent stronger collateral and bankruptcy law

Ψ_{it}

- Bank branch density (World Bank)
- Number of retail locations of commercial banks in a country per 100,000 adults excluding the main office, which are not legally distinct subsidiaries

Control Variables

Γ_{itk}

- Shareholder protection law
- Bankruptcy efficiency and costs
- Contract enforcement efficiency and costs
- Sentiment on legal process, criminal, and property law

Γ_{itk}

- Start-up costs and procedures
- Number of GPs in country
- Real GDP growth rate
- Unemployment rate
- Real interest rate
- STEM journal publications per 1000 people
- 2006 to 2010 year dummies

Summary Statistics

Table 1: Summary statistics for data excluding South Africa: 2006 to 2010

Variables	mean	standard deviation	minimum	maximum	observations	% missing
Seed, start-up, or early	2.5366	1.9848	1	12	123	53.58
Expansion	2.3826	1.8381	1	9	115	56.6
Private equity	2.9917	2.5868	1	16	121	54.34
All	8.8351	8.997	1	50	194	28.15
Collateral & bankruptcy law	4.1566	2.0526	1	10	249	6.04
Bank branch density	5.4529	7.5773	0.2977	46.2092	247	6.79
Ease of shareholder suits	4.6908	2.0802	0	10	249	6.04
Director liability	3.0803	2.4498	0	9	249	6.04
Disclosure	4.5341	1.9155	0	8	249	6.04
Insolvency recovery rate	19.7052	16.0786	0	57.5	249	6.04
Closing cost	22.6053	13.8472	7	76	209	21.13
Days to enforce contract per procedure	17.6318	7.2727	5.6327	41.8293	249	6.04
Cost to enforce contract	48.6321	34.4337	14.3	151.8	249	6.04
Rule of law score	-0.7146	0.6419	-2.67	0.99	260	1.89
Start-up cost	155.6787	204.8292	1.4	1314.6	249	6.04
Start-up days per procedure	4.7215	3.376	1.1	15.2941	249	6.04
GP firms	5.4249	5.0792	1	31	193	27.17
GDP growth	0.0257	0.0406	-0.1795	0.1851	257	3.02
Unemployment rate	9.2025	6.9232	0.6	37.6	245	7.55
Real interest rate	14.57	60.383	-42.3102	572.9363	161	39.25
Journal articles	116.1088	319.1919	0	2431.2	260	1.89
Control of corruption score	-0.62	0.5808	-1.92	0.97	255	3.77

Estimation Strategy

- Estimate empirical model for each investment stage separately and compare coefficients
- Logarithmic dependent variable
- Standard errors clustered by country
- Predictive mean matching imputation of missing data
- Two-stage Heckman selection
 - Control of corruption score to satisfy exclusion restriction

Results

Table 2: 2SLS instrumental variables, random effects estimation: Excluding South Africa

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Early Heckman	Expansion Heckman	Private equity Heckman	All Heckman				
Collateral & bankruptcy law	0.2398** (0.1019)	0.2345*** (0.09)	0.2088** (0.0992)	0.2503** (0.1)	0.1468 (0.1094)	0.0582 (0.137)	0.2422 (0.1993)	0.2479 (0.2731)
λ	-	0.124 (0.5081)	-	-0.3859 (0.6242)	-	0.1251* (0.628)	-	0.0059 (0.6801)
Observations	122	122	116	116	117	117	186	186
Countries	40	40	40	40	38	38	46	46
No. of imputations	20	20	20	20	20	20	20	20
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Delta standard errors adjusted for clustering by country are in parentheses;*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Summary and Conclusion

- A unit increase in a country's strength of collateral and bankruptcy law index score has a significantly positive effect on venture capital investment.
- The magnitude of the effect is largest at the seed, start-up, or early venture capital stage
- The evidence supports Cleary et al.'s (2007) theory that effects of a shock to financially constrained companies in imperfect financial markets are magnified where information asymmetry is most severe.