
INFORMALITY AND ACCESS TO FINANCE: EVIDENCE FROM INDIA

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WHAT IS (IN)FORMALITY?

- Different dimensions and means different things
- Working in the unofficial economy: Voluntary vs. involuntary?
- Inter-firm and intra-firm margins: registration does not mean compliance
- How do we define formality? Registration under formal authorities
 - General registration and tax registration

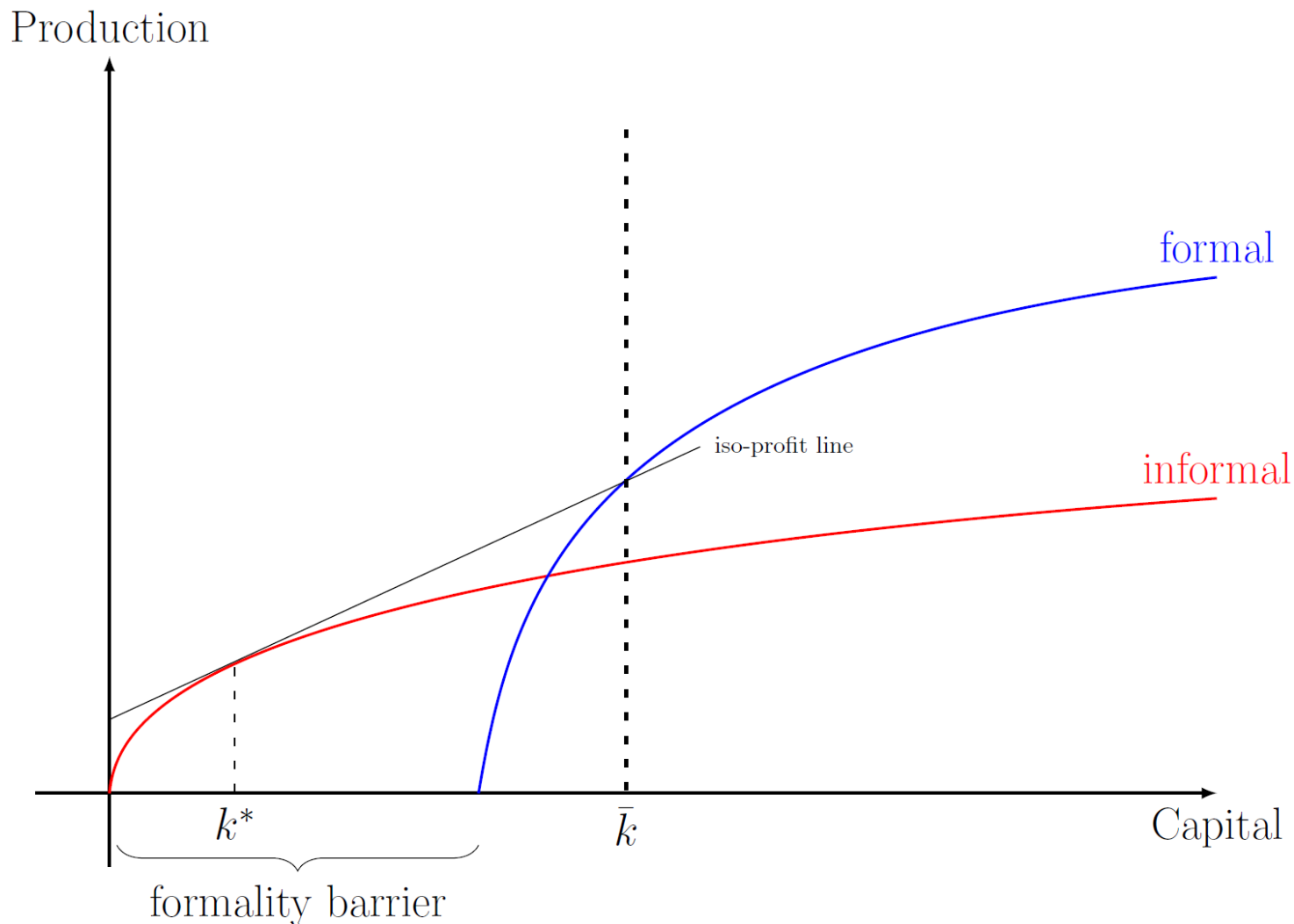
MOTIVATION

- **Informality** is a widespread phenomenon in developing countries
 - Informal firms' costs: limited access to formal services, distortions due to hiding from the authorities (Gordon and Li 2009), limited public good (Kleven et al 2009)
 - Informal firms' benefits: lower regulatory and tax burden
- Informality is often associated with lack of **access to finance** (Straub, 2005; Beck, Lin and Ma 2014)
- 44% percent of informal enterprises list **access to financing as the main obstacle of doing business**, but 14% for large formal enterprises (La Porta and Shleifer, 2014)

THIS PAPER

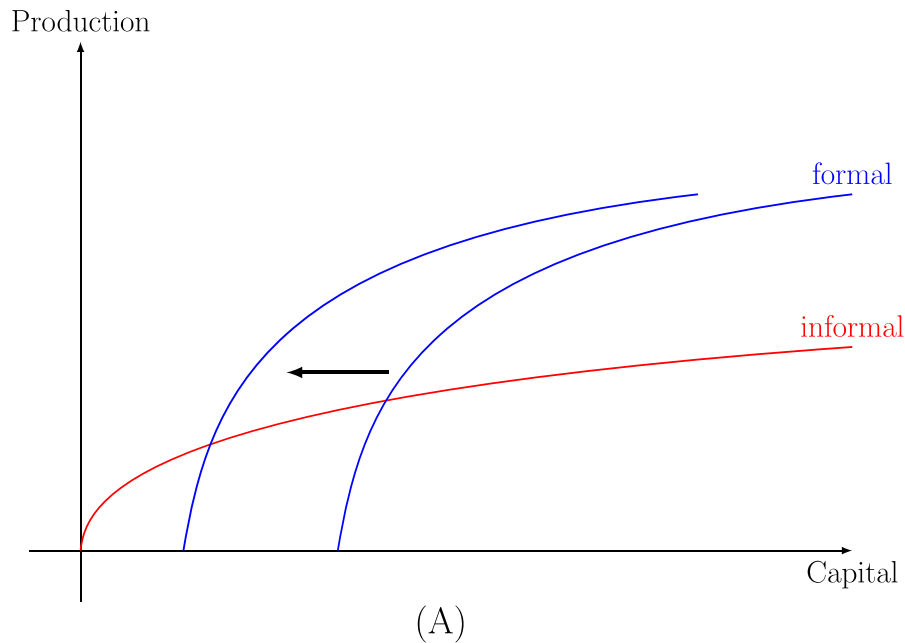
- Disentangles two channels of impact using data on Indian manufacturing sector:
 - **Transparency channel:** access to finance reduces the agency problem by making the firm's operation observable.
 - **Productivity channel:** financial development increases productivity by facilitating investment.
- Gauging the effect of two dimensions of financial development
 - Financial **outreach:** branch per capita
 - Financial **depth:** credit to GDP
- The evidence suggests outreach affects informality through transparency channel and depth through productivity.

CONCEPTUAL FRAMEWORK (STRAUB, 2005)



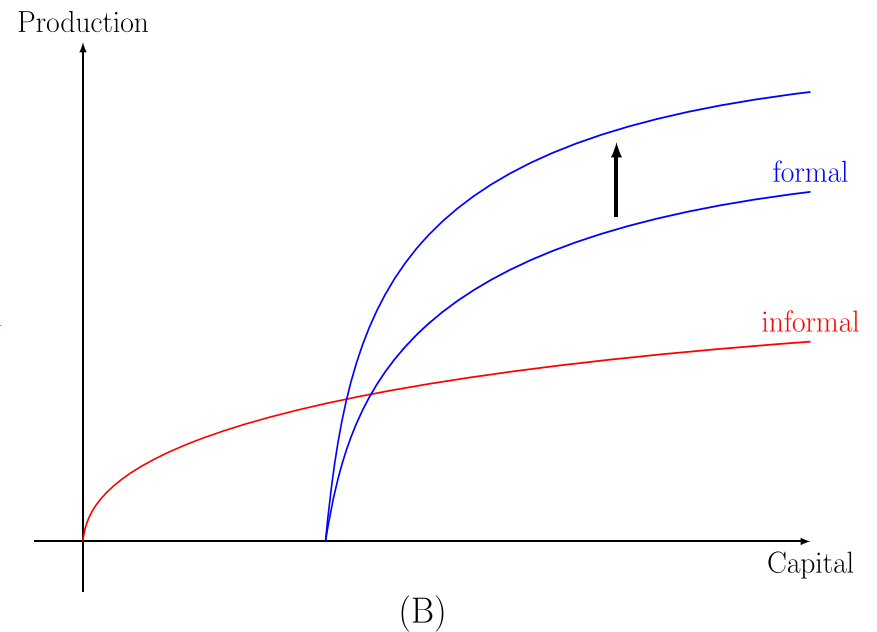
TWO CHANNELS OF IMPACT

increasing transparency



mainly on smaller firms

increasing productivity



mainly on bigger firms

DATA

- Representative manufacturing surveys from India
 - **Annual Survey of Industries (ASI)**: factories employing 20+ workers or 10+ workers with industrial power use
 - **NSS manufacturing survey**: the rest

year	1989-90	1994-95	2000-01	2005-06	2010-11
No. sample in ASI	49,323	57,908	37,055	49,637	46,843
No. sample in NSS	123,321	192,029	222,529	80,637	99,243

- We use sample weight to estimate the aggregate measures
- The unit of observation: state, year, industry

MEASURING INFORMALITY

- Registration:
 - under any authority/act
 - under tax authorities
- Three measures:
 - registration rate,
 - value-added share of registered firms
 - employment share of registered firms

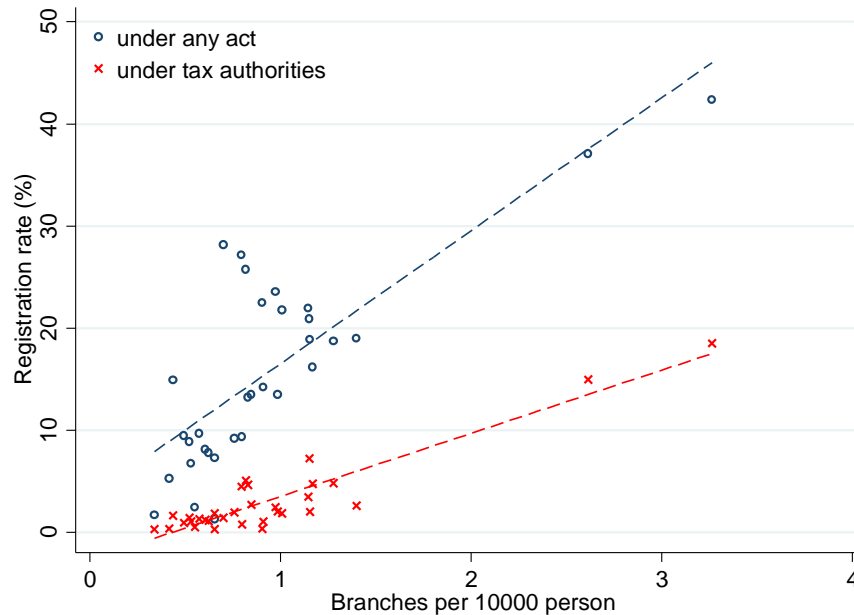
	name	Description	1989	1994	2000	2005	2010
(1)	Reg	percentage of registered under any act	8.32	11.81	10.72	10.44	15.19
(2)	Treg	percentage of registered under tax		1.21	1.71	1.81	3.34
(3)	Vreg	VA share of registered under any act (%)	82.49	83.67	81.05	87.45	92.74
(4)	Vtreg	VA share of registered under tax (%)		76.24	71.42	80.92	88.95
(5)	Ereg	employment of registered under any act (%)	26.83	34.86	32.96	33.70	46.88
(6)	Etreg	employment of registered under tax (%)		22.75	19.40	21.69	33.12

VARIABLES

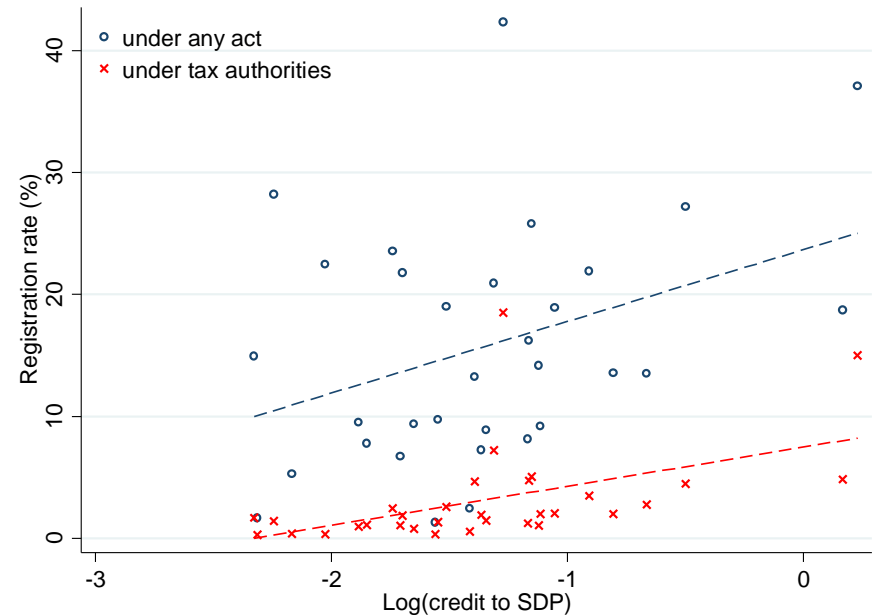
- Financial depth: outstanding credit to GDP
- Financial penetration: No. branches per capita
- **Endogeneity?** We exploit cross-industry variation in the need for external finance
- Industry dependence on external finance: index of Rajan and Zingales (1998)
- Control variables:
 - SDP percapita,
 - Government expenditures to SDP
 - tax enforcement per firm,
 - Forward linkages of industry (due to VAT)

FINANCIAL DEVELOPMENT VS. REGISTRATION RATE

Financial outreach

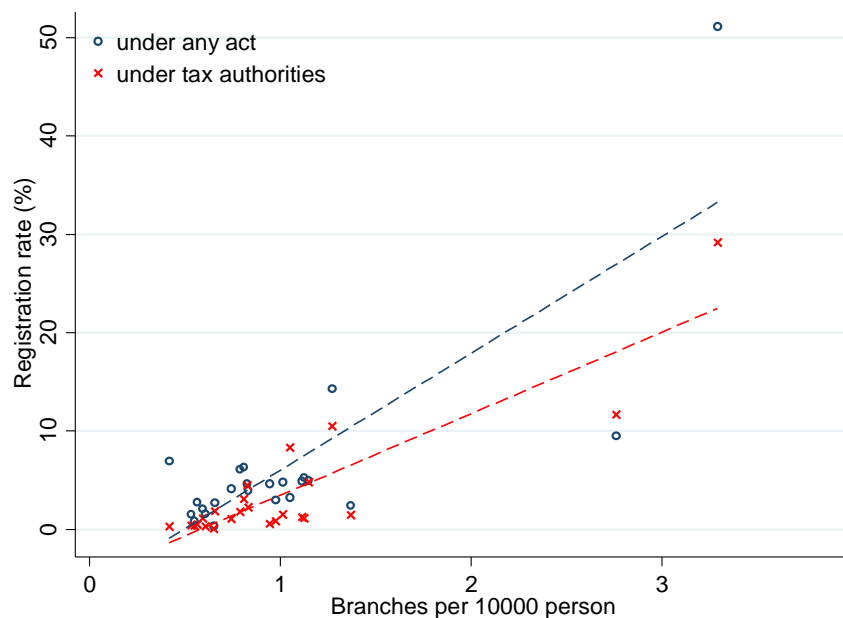


Financial depth

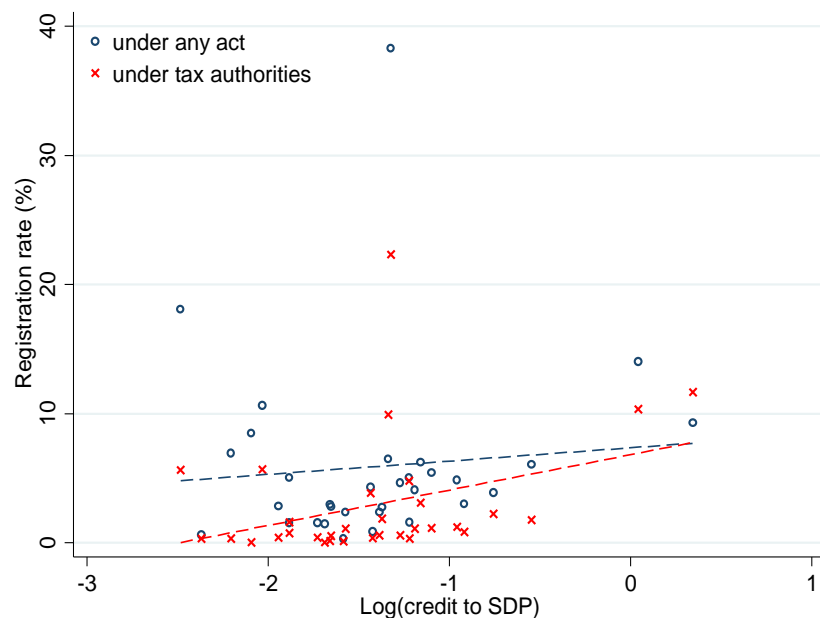


FINANCIAL DEVELOPMENT VS. REGISTRATION OF SMALL FIRMS (FIXED ASSET < 25TH PERCENTILE)

Financial outreach

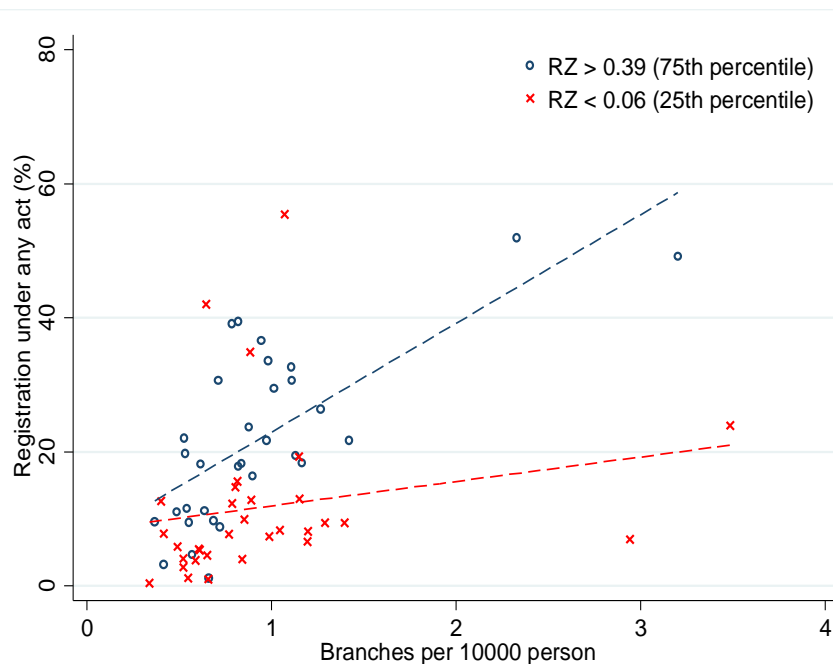


Financial depth

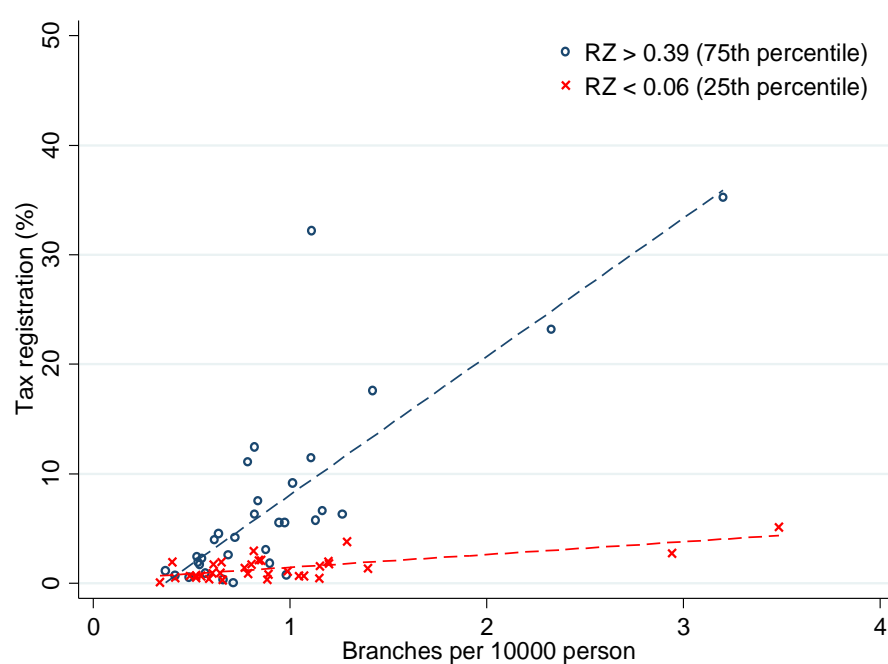


REGISTRATION, EXTERNAL DEPENDENCE AND FINANCIAL OUTREACH

General registration

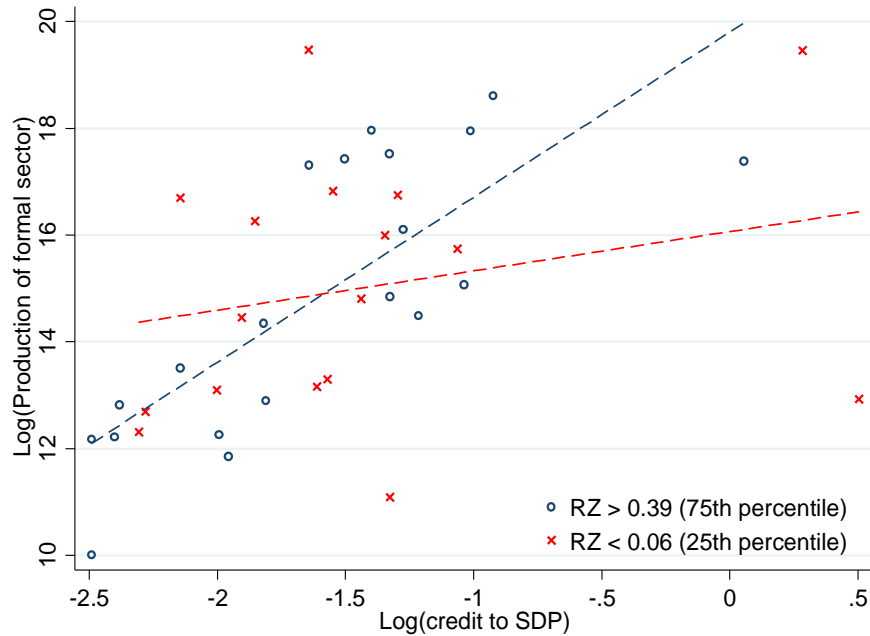


Tax registration

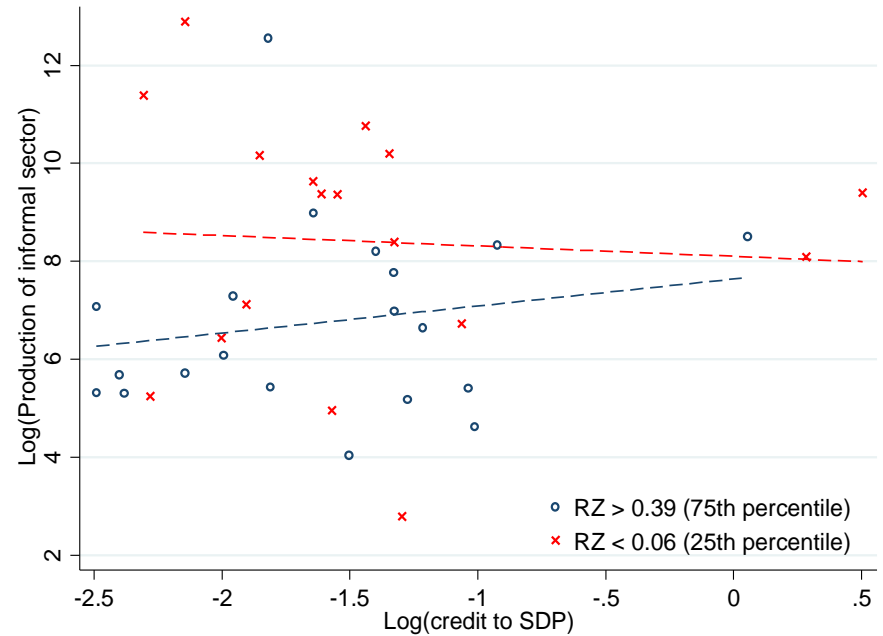


PRODUCTION, FINANCIAL DEPENDENCE AND FINANCIAL DEEPENING

Formal sector



Informal sector



METHODOLOGY

- Base line regression:

$$Inf_{ist} = a_i + b_s + c_t + \alpha_1 FD_{st} + \alpha_2 X_{st} + \varepsilon_{ist}$$

- Exploiting cross-industry variation in external dependence

$$Inf_{ist} = a_i + b_s \times c_t + \beta_1 RZ_i \times FD_{st} + \beta_2 RZ_i \times X_{st} + \beta_3 FL_i \times Y_{st} + \varepsilon_{ist}$$

- *Inf*: informality measure,
- *FD*: financial development measure
- *RZ*: external dependence of industry
- *FL*: forward linkages of industry
- *X*, *Y*: control variables
- *a*, *b*, *c*: industry, state and time fixed effects

BASELINE REGRESSION FOR REGISTRATION RATE

	All firms				Fixed assets < 25 th percentile			
	proportion of registered under any act		proportion of registered under tax		proportion of registered under any act		proportion of registered under tax	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Branches per capita	21.408		9.066***		17.253***		16.251***	
	(13.900)		(2.438)		(5.626)		(4.329)	
Log (Credit/SDP)		2.088		0.044		3.977		2.456***
		(3.966)		(0.916)		(2.921)		(0.882)
Log (SDP pc)	0.389	0.985	-0.176*	0.160	0.330	0.471	-0.435***	-0.196
	(1.250)	(1.222)	(0.103)	(0.152)	(0.533)	(0.523)	(0.143)	(0.120)
Government exp. / SDP	16.735	8.534	-1.431	-3.314	-11.014	-16.304	5.350	0.584
	(20.028)	(18.803)	(5.246)	(5.102)	(10.258)	(10.162)	(10.224)	(9.801)
Enforcement exp. / No. firms	-0.594	-0.407	0.153	0.291*	1.079***	0.777**	0.001	-0.091
	(0.920)	(0.874)	(0.200)	(0.156)	(0.353)	(0.300)	(0.312)	(0.390)
Constant	6.323	27.005	27.583***	33.755***	14.831	36.895***	10.663	27.813**
	(17.705)	(19.985)	(9.574)	(9.346)	(8.812)	(10.153)	(10.973)	(10.766)
Observations	3023	3023	2716	2716	2675	2675	2385	2385
R-squared	0.577	0.574	0.457	0.452	0.301	0.300	0.215	0.209

EXPLOITING EXTERNAL DEPENDENCE

	proportion of registered under any act				proportion of registered under tax			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RZ × branches per capita	22.686***		22.701***		7.532***		6.898***	
	(8.142)		(8.199)		(2.370)		(2.484)	
RZ × log(Credit/SDP)		11.909***		12.622***		2.372***		2.368***
		(3.046)		(3.428)		(0.536)		(0.494)
RZ × log(SDP pc)	-1.870*	0.196	-1.702	0.453	-0.238	0.425	-0.129	0.492*
	(1.069)	(1.022)	(1.058)	(0.967)	(0.338)	(0.289)	(0.342)	(0.281)
RZ × Government exp./SDP	-38.063	19.736	-37.187	24.041	-5.117	5.311	-5.201	5.476
	(37.479)	(44.727)	(38.892)	(47.615)	(13.397)	(11.109)	(12.655)	(10.664)
FL × Enforcement exp./No. firms			-1.077	-1.367			0.501*	0.483**
			(0.799)	(0.876)			(0.269)	(0.224)
FL × log(SDP pc)			0.046	0.089			0.110**	0.123**
			(0.100)	(0.118)			(0.046)	(0.045)
Constant	30.907***	30.917***	43.221***	40.241***	31.825***	30.997***	31.166***	29.958**
	(8.781)	(8.281)	(10.479)	(10.692)	(11.249)	(11.187)	(11.215)	(11.231)
Observations	2525	2525	2365	2365	2188	2188	2124	2124
R-squared	0.638	0.645	0.643	0.652	0.484	0.484	0.488	0.489

- Comparing 25th and 75th percentiles, the effect magnitude is approximately twice higher for branches.
- Demand effect? The qualitative results are the same if we exclude the bigger half of the industries in each state and year.

EXPLOITING EXTERNAL DEPENDENCE

Same regression for the sample of small and large firms

	proportion of registered under any act				proportion of registered under tax			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fixed asset < 25th percentile of respective industry and year								
RZ × branches per capita	16.746*		15.428*		4.624*		3.518	
	(8.978)		(8.478)		(2.349)		(2.321)	
RZ × log(Credit/SDP)		5.492		5.946		1.826***		1.916***
		(3.894)		(3.752)		(0.627)		(0.671)
Fixed asset > 25th percentile of respective industry and year								
RZ × branches per capita	10.112		10.312		5.349		5.029	
	(10.263)		(10.474)		(3.489)		(3.611)	
RZ × log(Credit/SDP)		11.127***		11.447***		1.869**		1.892**
		(3.683)		(3.947)		(0.813)		(0.808)

VALUE-ADDED AND EMPLOYMENT SHARES

	VA share of registered under any act		VA share of registered under tax		employment share of registered under any act		employment share of registered under tax	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RZ × branches per capita	-0.059		-0.011		-0.146		-0.368	
	(0.564)		(0.629)		(0.942)		(1.124)	
RZ × log(Credit/SDP)		0.354**		0.530**		0.450**		0.879***
		(0.133)		(0.205)		(0.218)		(0.157)
RZ × log(SDP pc)	-0.079	-0.075	-0.038	-0.034	-0.129	-0.131***	-0.038	-0.060
	(0.081)	(0.064)	(0.096)	(0.096)	(0.083)	(0.047)	(0.141)	(0.097)
FL × Enforcement exp./No. firms	-0.071	-0.085	-0.049	-0.067	-0.007	-0.025	-0.026	-0.059
	(0.052)	(0.057)	(0.084)	(0.091)	(0.062)	(0.075)	(0.101)	(0.118)
FL × log(SDP pc)	0.007	0.007	0.015	0.016	0.008	0.008	0.006	0.007
	(0.006)	(0.005)	(0.011)	(0.011)	(0.005)	(0.005)	(0.011)	(0.010)
RZ × Government exp./SDP	-1.442	0.463	-1.176	2.040	-0.770	1.671	-3.453	2.021
	(2.241)	(2.183)	(3.328)	(2.719)	(1.974)	(2.804)	(4.650)	(3.536)
Constant	3.883***	3.731***	2.749***	2.432***	3.582***	3.387***	3.806***	3.434***
	(0.520)	(0.544)	(0.469)	(0.559)	(0.416)	(0.417)	(0.481)	(0.501)
Observations	2306	2306	1926	1926	2306	2306	1925	1925
R-squared	0.699	0.702	0.654	0.658	0.747	0.750	0.692	0.699

FINANCIAL DEVELOPMENT & PRODUCTIVITY

	Production		Production of registered		Production of tax registered		Production of unregistered	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RZ × log(Credit/SDP)	0.539***		0.913***		1.048***		0.042	
	(0.176)		(0.202)		(0.251)		(0.130)	
RZ × branches per capita		0.377		0.497		0.858		0.258
		(0.827)		(1.069)		(1.200)		(0.728)
RZ × log(SDP pc)	-0.056	-0.096	-0.132	-0.189	-0.111	-0.190	-0.098	-0.120
	(0.079)	(0.100)	(0.108)	(0.129)	(0.131)	(0.145)	(0.064)	(0.085)
RZ × Government exp./SDP	4.238	1.450	4.948	0.177	7.058	1.042	2.940	2.786
	(2.784)	(3.295)	(3.622)	(4.387)	(4.618)	(5.426)	(2.752)	(2.499)
Constant	9.744***	9.791***	8.996***	9.084***	9.452***	10.135***	7.794***	7.782***
	(0.583)	(0.576)	(0.650)	(0.693)	(0.759)	(0.657)	(0.506)	(0.516)
Observations	2518	2518	2460	2460	1978	1978	2128	2128
R-squared	0.829	0.826	0.833	0.828	0.797	0.791	0.790	0.790

	Value-Added		Value-Added of registered		Value-Added of tax registered		Value-Added of unregistered	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RZ × log (Credit/SDP)	0.265		0.618**		0.885**		-0.081	
	(0.192)		(0.295)		(0.375)		(0.146)	
RZ × branches per capita		0.439		0.583		0.806		0.300
		(0.817)		(1.231)		(1.381)		(0.855)
RZ × log(SDP pc)	0.005	-0.036	-0.070	-0.128	-0.006	-0.080	-0.060	-0.083
	(0.067)	(0.098)	(0.105)	(0.139)	(0.148)	(0.163)	(0.062)	(0.086)
RZ × Government exp./SDP	2.756	1.453	2.478	-0.707	4.920	-0.131	2.882	3.409
	(2.547)	(2.863)	(3.878)	(4.470)	(5.194)	(6.109)	(2.761)	(2.526)
Constant	8.530***	8.534***	7.365***	7.401***	7.666***	7.938***	7.487***	7.453***
	(0.430)	(0.428)	(0.335)	(0.386)	(0.569)	(0.590)	(0.537)	(0.567)
Observations	2457	2457	2385	2385	1886	1886	2125	2125
R-squared	0.766	0.765	0.795	0.793	0.761	0.757	0.758	0.758

CONCLUSION

- Previous literature has shown the positive effect of financial development on the share and size of formal sector.
- We distinguish between two functions of financial development in the relationship: increasing transparency and enhancing productivity
- Financial outreach mainly affects informality through transparency channel (reducing the agency problem).
- Financial deepening mainly affects informality by enhancing the productivity of the formal sector.