

Do Banks or VCs Spur Growth?

by

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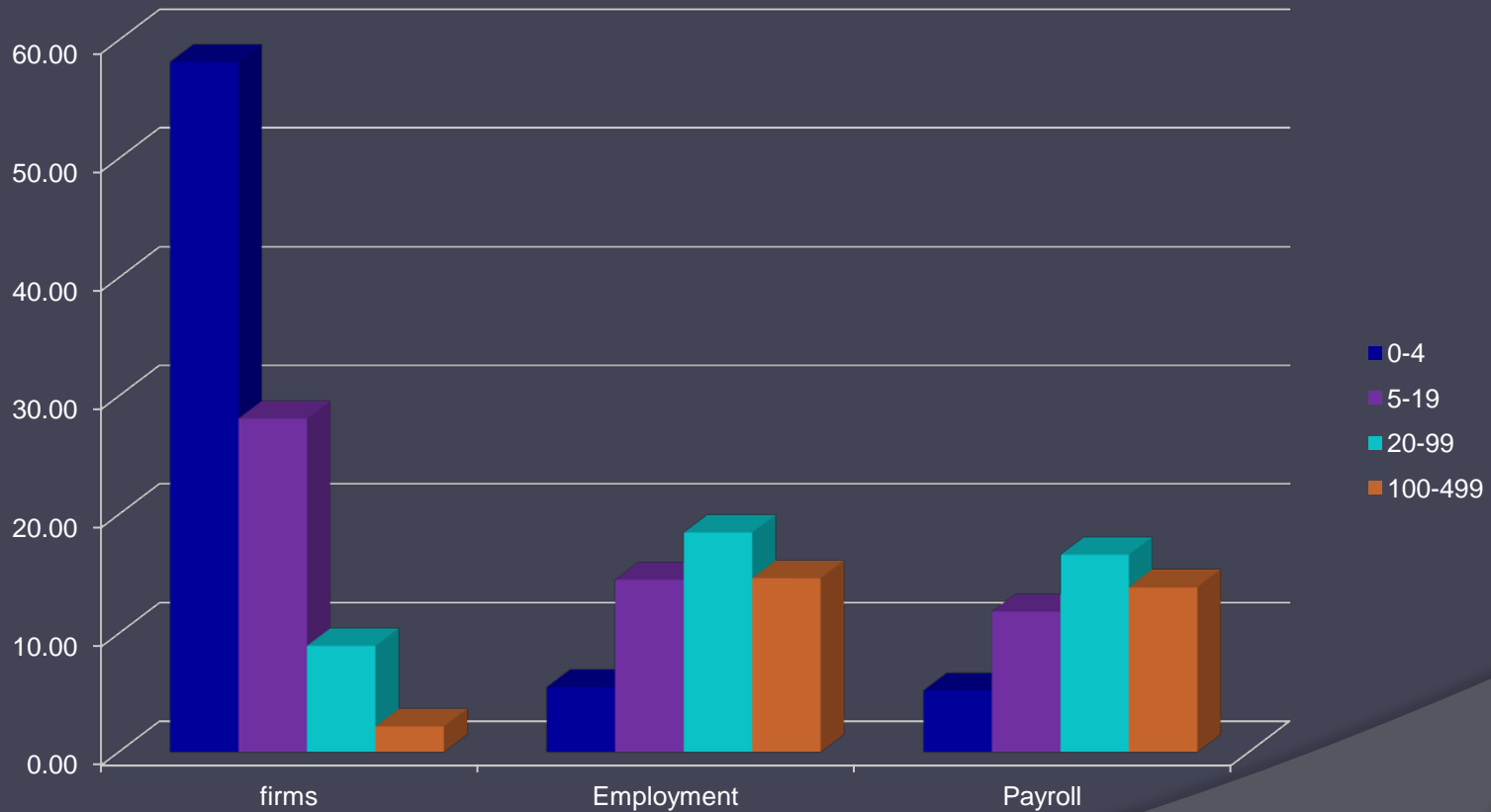
York University

and

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Share of total number of firms, employment and payroll by firm size categories (SME)



But...

- ⦿ The World Business Environment Survey (WBES) conducted in 1999 and 2000 for over 10,000 firms in more than 80 countries:

36% of all firms rate financing as major obstacle, 27% as moderate, 18% as minor and 19% as no obstacle.



Policy related discussion

- ◉ ***Small Business Jobs Act of 2010***

The new law is providing critical resources to help small businesses continue to drive economic recovery and create jobs. The new law extended the successful SBA enhanced loan provisions while offering billions more in lending support, tax cuts, and other opportunities for entrepreneurs and small business owners.

- ◉ ***U.S. Small Business administration VC programs:***

Small Business Investment Companies (SBICs)

New Markets Venture Capital Companies

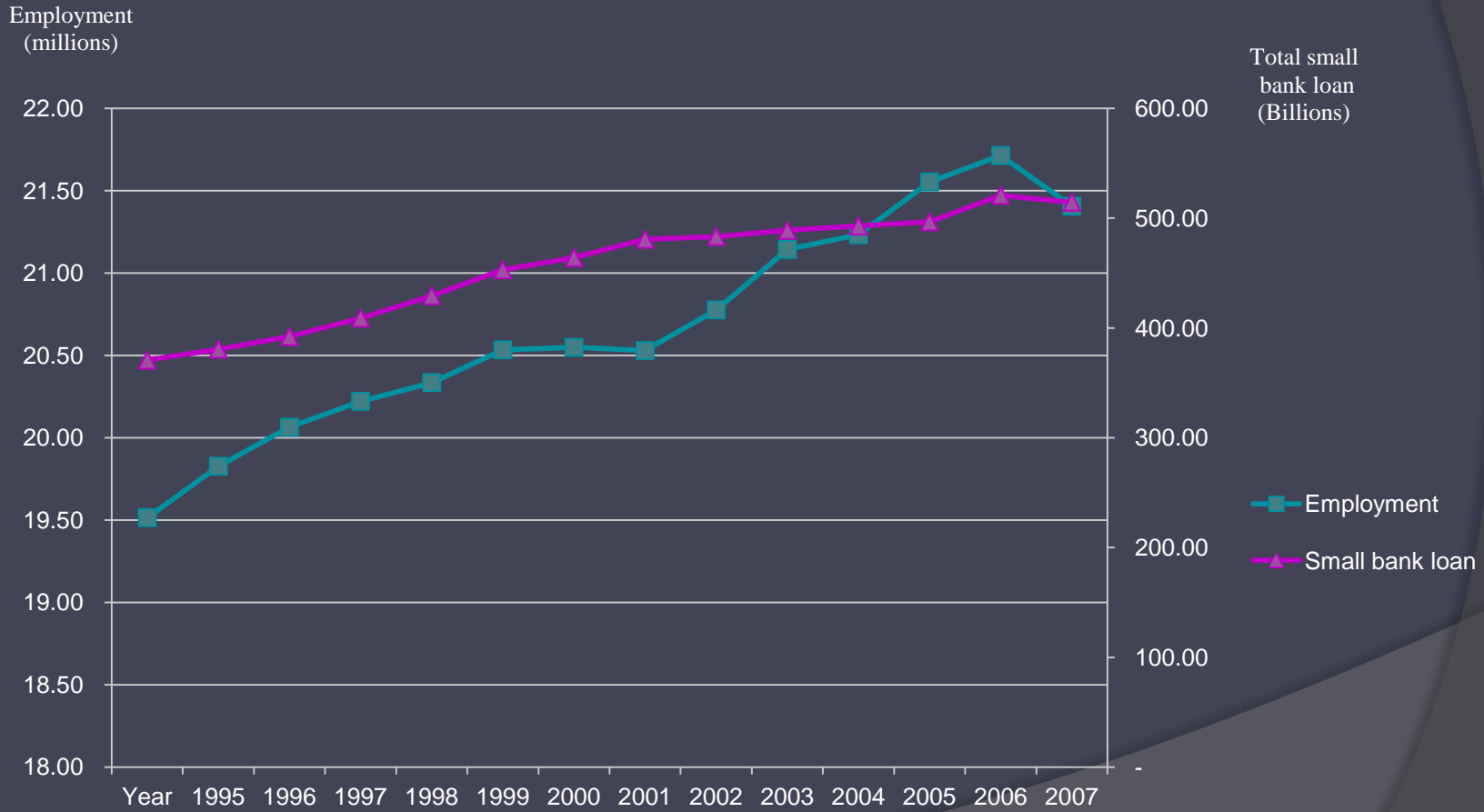
- ◉ ***Jumpstart Our Business Startups Act (JOBS Act) 2012***

What we do in this paper?

- ❖ We compare the effects of two main sources of entrepreneurial finance on SME activities:
 - Small bank loan
 - venture capital (VC).
- ❖ We consider four main indicators of entrepreneurship:
 - new firms, new establishments, new firm employment, and new firm payroll.
- ❖ Four types of firm size groups

Some facts (I)

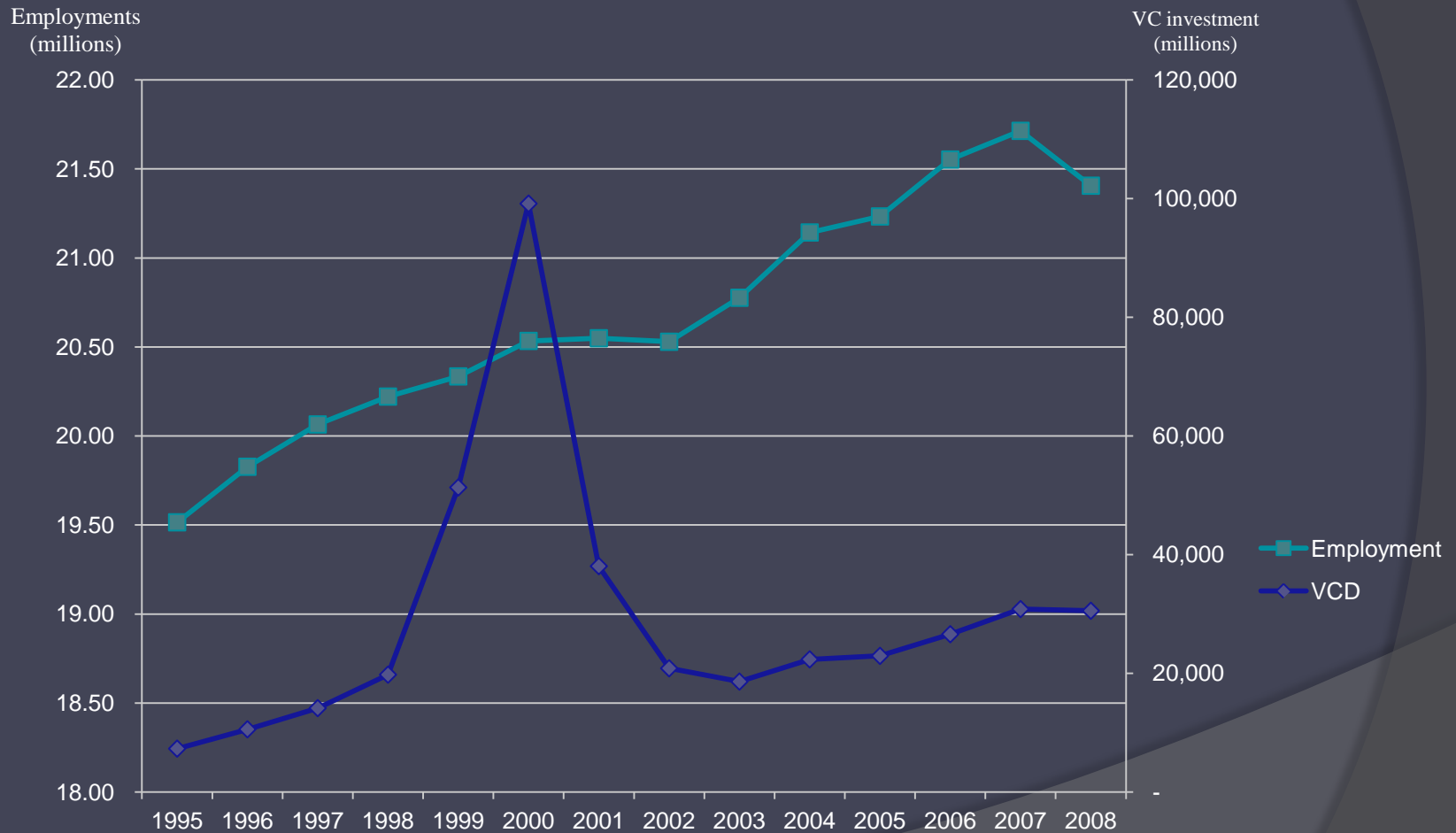
Total small bank loan and total employment



* The above graph is based on firms with less than 20 employees.

Some facts (I)

Dynamics of employment and VC investment



* The above graph is based on firms with less than 20 employees.

Main findings:

- ❖ We find the effect of VC to be both economically and statistically significant in stimulating new firms, new establishments, new employment, and new payroll.
- ❖ A 1-standard deviation increase in VC finance gives rise to an increase in the growth of new establishments by approximately 33%, firms by approximately 37%, employment by approximately 22%, and payroll by approximately 6%.
- ❖ Results are robust to controls for endogeneity.
- ❖ We do not find similar evidence for small bank loans.

Relevant literature

- ❖ Bank credit and small business
 - Petersen and Rajan (2002); Berger et al (2005); Berger and Black (2011); Black and Strahan (2002); Puri, Rocholl, and Steffen (2009)
- ❖ Venture capital and entrepreneurship
 - Gompers and Lerner (1999); Bertoni, Colombo and Grilli (2011); Samila and Sorrensen (2009)
- ❖ Venture capital versus bank credit
 - Berger and Schaeck (2011); Robb and Robinson (2010)

Data

- ❖ Entrepreneur activities: US Small Business Administration
- ❖ Venture capital investment: PWC/National Venture Capital Association MoneyTree™ report
- ❖ Small business loans: U.S. FFIEC Reports of Condition and Income (“Call Reports”)
- ❖ Other control variables: population, GDP, education, banking market structure, policy indices, Patent counts.

Methodology

- ❖ Baseline model: OLS model with state and year fixed effect.

- $\text{Ln}[Y(t-0)] = S + Y + B \cdot X(t-1)$

- ❖ Instrumental variables regressions

Methodology

- ❖ For each dependent variable, we disaggregate into four employee-size buckets:
 - 0-4 employees, 5-19 employees, 20 -99 employees, 100-499 employees
- ❖ Four aspects of business activities
 - Growth rate of number of firms, growth rate of number of establishments, growth rate of number of employees, growth rate of total payroll

Methodology

- ❖ Our key state-level measure of bank lending to small businesses observed as of year (t-1) is disaggregated into three dollar-size buckets:
 - Bank loans of \$1 - \$100,000
 - Bank loans of \$100,001 - \$500,000
 - Bank loans of \$500,001 - \$1,000,000

Methodology

- ❖ State-level control variables, lagged for one period:
 - Growth rate of personal income
 - Log of cumulative 20-year patent counts
 - Fraction of population with college education
 - Public policy indices from Fraser Institute: Size of Government Index, Takings/Taxation Index, Labor Freedom Index

Statistics

Firm size category	Variable	N	Mean	Std Dev	Median
0-4	Pct Firms	698	0.877	1.721	0.857
	Pct Establishments	699	0.868	1.711	0.844
	Pct Employment	679	0.971	1.474	0.850
	Pct Payroll	679	4.169	3.360	4.000
5-19	Pct Firms	698	0.721	1.492	0.795
	Pct Establishments	698	0.642	1.486	0.681
	Pct Employment	698	0.793	1.694	0.878
	Pct Payroll	698	4.119	2.164	4.104
20-99	Pct Firms	698	1.211	1.989	1.115
	Pct Establishments	699	0.922	2.863	0.380
	Pct Employment	699	1.286	2.295	1.384
	Pct Payroll	698	4.933	2.850	5.234
100-499	Pct Firms	699	1.705	2.544	1.270
	Pct Establishments	698	2.015	3.653	1.451
	Pct Employment	698	1.950	3.156	1.847
	Pct Payroll	698	5.861	3.776	5.959

Regression analysis (I)

Firm size category		Pct Firms		Pct Establishment		Pct Employment		Pct Payroll	
0-4	Log(SBL)	-0.182 (-0.127)		-0.194 (-0.125)		-0.329*** (-0.125)		-0.186 (-0.388)	
	Log(VCD)		0.069* (-0.039)		0.068* (0.039)		0.015 (0.039)		0.007 (0.12)
	N	669	703	670	704	651	685	651	685
	R-square	0.74	0.745	0.741	0.746	0.662	0.656	0.374	0.365
5-19	Log(SBL)	-0.021 (-0.13)		-0.005 (-0.131)		0.033 (0.164)		-0.17 (-0.223)	
	Log(VCD)		0.114*** -0.04		0.116*** -0.04		0.089* (0.05)		0.057 (0.069)
	N	669	703	670	704	669	703	669	703
	R-square	0.638	0.641	0.63	0.628	0.55	0.553	0.497	0.487
20-99	Log(SBL)	0.116 (0.187)		0.221 (-0.198)		0.102 (-0.206)		-0.314 (-0.255)	
	Log(VCD)		0.154*** (0.058)		0.061 (0.06)		0.159** (0.064)		0.196** (-0.079)
	N	669	703	670	704	670	704	669	703
	R-square	0.568	0.56	0.768	0.763	0.611	0.604	0.617	0.604
100-499	Log(SBL)	-0.317 (-0.263)		-0.89** (-0.351)		-0.492 (-0.337)		-0.526 (-0.431)	
	Log(VCD)		0.04 (0.082)		-0.169 (-0.108)		0.03 (0.104)		-0.032 (-0.132)
	N	670	704	669	703	669	703	670	704
	R-square	0.482	0.47	0.554	0.545	0.448	0.459	0.369	0.362

Regression analysis (II) – firm size group 5-19

	Pct Firms		Pct Establishment		Pct Employment		Pct Payroll	
Log(SBL)	-0.064		-0.043		0.001		-0.224	
	-0.125		(0.126)		(0.161)		(0.218)	
Log(VCD)	0.113***		0.114***		0.084*		0.113***	
	(0.039)		(0.039)		(0.05)		(0.039)	
Pct personal income	-0.005	-0.008	-0.005	-0.007	-0.002	-0.005	0.003	-0.008
	(0.011)	(0.011)	(0.011)	(0.011)	(0.014)	(0.014)	(0.019)	(0.011)
Education	0.369	-0.442	0.281	-0.751	1.581	1.253	1.656	-0.442
	(2.743)	(2.661)	(2.772)	(2.685)	(3.532)	(3.413)	(4.784)	(2.661)
Log(Patent 20yr)	0.837***	0.874***	0.819***	0.874***	0.799***	0.86***	1.031**	0.874***
	(0.236)	(0.215)	(0.238)	(0.217)	(0.303)	(0.275)	(0.419)	(0.215)
Size of Government Index	0.834***	0.88***	0.809***	0.831***	0.902***	0.934***	0.229	0.88***
	-0.164	-0.16	-0.166	-0.161	-0.211	-0.205	-0.287	-0.16
Takings and Dis. Tax Index	-0.629***	-0.617***	-0.606***	-0.595***	-0.685***	-0.672***	-0.542**	-0.617***
	-0.144	-0.141	-0.146	-0.142	-0.186	-0.181	-0.253	-0.141
Labor freedom Index	0.96***	0.682***	0.897***	0.656***	1.153***	0.845***	2.857***	0.682***
	(0.263)	(0.25)	(0.266)	(0.252)	(0.339)	(0.321)	(0.459)	(0.25)
N	660	694	660	694	659	693	659	694
R-square	0.671	0.672	0.66	0.656	0.578	0.578	0.538	0.672

* All regressions include both year and state fixed effects.

Regression II (Con't)

Firm size category		Pct Firms		Pct Establishment		Pct Employment		Pct Payroll	
0-4	Log(SBL)	-0.193		-0.203		-0.35***		-0.280	
		(0.127)		(0.125)		(0.126)		(0.392)	
	Log(VCD)	0.080**		0.078**		0.029		0.08**	
		(0.039)		(0.039)		(0.039)		(0.039)	
20-99	Log(SBL)	0.044		0.151		0.044		-0.366	
		(0.184)		(0.198)		(0.203)		(0.249)	
	Log(VCD)	0.172***		0.072		0.176***		0.172***	
		(0.057)		(0.061)		(0.063)		(0.057)	
100-499	Log(SBL)	-0.331		-0.885**		-0.551*		-0.615	
		(0.261)		(0.351)		(0.329)		(0.419)	
	Log(VCD)	0.019		-0.181*		0.026		0.019	
		(0.082)		(0.108)		(0.103)		(0.082)	

* All regressions include both year and state fixed effects.

Causality?

- ❖ IV for VC investment: Samila and Sorenson (2011)

$$LP\ returns_{it} = \sum_j \sum_{s=t-1}^{t-3} \frac{ER_s \ln(1 + LP_j)}{1 + dist_{ij}},$$

- ❖ IV for small bank loan:
 - Fraction of banks with adjusted capital ratio less than 4%,
 - Banking sector Herfindahl–Hirschmann Index
 - Fraction of assets held by with asset less than 100 (300) million dollars

IV regression

Firm size category		Pct Firms		Pct Establishment		Pct Employment		Pct Payroll	
0-4	Log(SBL hat)	-0.484	-0.487	-0.48	-0.486	-0.781**	-0.843**	-1.545	-2.038**
		(-0.322)	(-0.334)	(-0.319)	(-0.331)	(-0.319)	(-0.329)	(-1.027)	(-1.033)
	Log(VCD hat)	0.087**	0.088**	0.087**	0.088**	0.017	0.025	-0.021	-0.016
		(0.042)	(0.043)	(0.041)	(0.043)	(-0.041)	(-0.043)	(-0.133)	(-0.134)
5-19	Log(SBL hat)	0.001	-0.128	0.099	-0.026	0.196	0.091	-1.04*	-1.506***
		(0.324)	(0.337)	(0.320)	(0.333)	(0.412)	(0.403)	(0.565)	(0.555)
	Log(VCD hat)	0.114***	0.132***	0.118***	0.136***	0.075	0.08	0.002	0.024
		(0.041)	(0.043)	(0.041)	(0.043)	(-0.053)	(-0.052)	(-0.073)	(-0.071)
20-99	Log(SBL hat)	-0.084	-0.055	-0.798	-0.791	-0.378	-0.343	-0.726	-0.642
		(-0.464)	(-0.479)	(-0.504)	(-0.524)	(-0.513)	(-0.535)	(-0.636)	(-0.661)
	Log(VCD hat)	0.205***	0.193***	0.095	0.074	0.212***	0.223***	0.202**	0.224***
		(0.060)	(0.062)	(0.065)	(0.068)	(0.066)	(0.069)	(0.082)	(0.085)
100-499	Log(SBL hat)	0.267	0.202	0.308	0.618	0.009	-0.15	-0.209	-0.704
		(0.677)	(0.700)	(0.908)	(0.940)	(0.853)	(-0.890)	(-1.094)	(-1.121)
	Log(VCD hat)	0.019	0.027	-0.254**	-0.273**	0.053	0.061	-0.036	0.021
		(0.088)	(0.090)	(-0.118)	(-0.122)	(0.111)	(0.115)	(-0.141)	(0.145)

IV regression I (Con't)

Number of employees		log(firms)		log(Est)		log(Employment)		log(Payroll)	
	Parameter	Estimate	t Value	Estimate	t Value	Estimate	t Value	Estimate	t Value
20-99	lag_log(VCN)	0.1255	4.49	0.1457	5.13	0.1195	3.90	0.1436	3.55
	lag_log(SML loan)	0.0060	1.80	0.0077	2.26	0.0031	0.84	-0.0033	-0.69
	log(pop)	0.2922	4.05	0.1582	2.16	0.3991	5.04	-0.0116	-0.11
	lag_log(gdp)	0.2126	8.92	0.1822	7.52	0.1831	7.00	0.5007	14.51
	education	0.2410	3.78	0.2582	3.98	0.2830	4.04	0.3704	4.01
	log(patent_5yr)	-0.0003	-0.05	-0.0042	-0.83	0.0013	0.24	-0.0128	-1.77
	share_asset_100	0.0261	0.87	-0.0203	-0.67	-0.0090	-0.27	-0.0270	-0.62
	HHI	-0.0714	-3.13	-0.0413	-1.78	-0.0508	-2.03	-0.0511	-1.54
	size_of_gov	0.0004	1.04	0.0006	1.65	0.0006	1.56	0.0014	2.83
	Takeings_and_Discim_	0.0006	1.16	0.0006	1.17	0.0002	0.33	-0.0005	-0.64
	Labor_freedom	-0.0008	-1.67	-0.0010	-2.15	-0.0004	-0.85	-0.0001	-0.21
	N								
R-square (overall)		0.9995		0.9995		0.9995		0.9992	
100-499	Parameter	Estimate	t Value	Estimate	t Value	Estimate	t Value	Estimate	t Value
	lag_log(VCN)	0.2173	6.11	0.2246	5.33	0.1762	3.92	0.2508	4.58
	lag_log(SML loan)	0.0017	0.39	0.0103	2.04	0.0011	0.20	0.0032	0.48
	log(pop)	0.0954	1.04	-0.1844	-1.69	0.2345	2.02	-0.2470	-1.75
	lag_log(gdp)	0.2872	9.46	0.3264	9.07	0.3229	8.42	0.6451	13.80
	education	0.1555	1.92	-0.1607	-1.67	0.0096	0.09	0.1248	1.00
	log(patent_5yr)	-0.0027	-0.43	0.0010	0.13	0.0133	1.66	0.0105	1.08
	share_asset_100	-0.0451	-1.18	-0.1972	-4.36	-0.1709	-3.55	-0.1324	-2.25
	HHI	-0.0657	-2.26	-0.0578	-1.68	-0.0476	-1.29	-0.0362	-0.81
	size_of_gov	0.0011	2.51	0.0004	0.78	0.0016	2.83	0.0023	3.30
	Takeings_and_Discim_	-0.0012	-1.98	-0.0003	-0.36	-0.0020	-2.53	-0.0033	-3.41
	Labor_freedom	0.0006	1.09	0.0000	0.06	0.0014	1.82	0.0029	3.22
N		650		650		650		650	
R-square (overall)		0.9992		0.9988		0.9989		0.9986	

* All regressions include both year and state fixed effects.

Robustness check

- ❖ Exclude California and Massachusetts;
- ❖ Re-estimate small bank loan based on the location of loan recipient;



Conclusion

- ❖ We find the effect of VC to be both economically and statistically significant in stimulating new firms, new establishments, new employment, and new payroll.
- ❖ Results are robust to controls for endogeneity,
- ❖ We do not find similar evidence for small bank loans.

Thanks!