Banks as "Anchors": The Role of Banks in Funding Innovation

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Motivation I

1. **VC investments** represent **key innovation drivers** for the US economy
   - 50% of the IPOs and 90% of R&D spending in public markets is done by VC-funded companies (Gornall & Strebulaev, 2020)
2. Bank-affiliated venture capitalists (**BVCs**) are investment vehicles affiliated with **financial institutions**
   - They are particularly important investors **outside main entrepreneurial hubs**, such as CA, MA, NY (Franklin, 2018) Preqin
3. The Volcker Rule **restricted** the ability of **financial institutions** to sponsor or invest in venture capital funds (Krawiec & Liu, 2015)

⇨ Was **innovation impaired** in these regions dependent on BVC investments? Pitchbook

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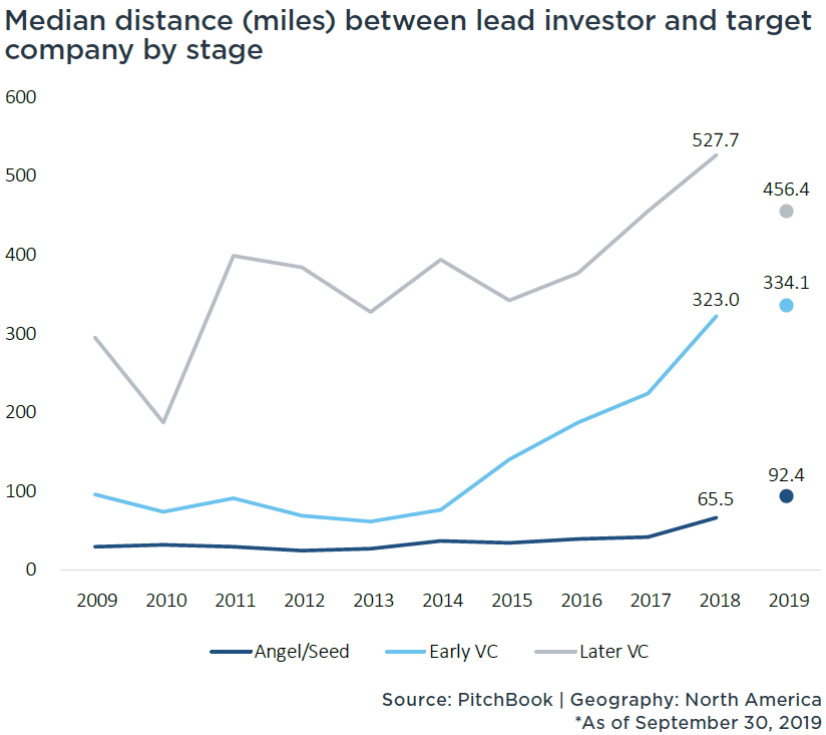
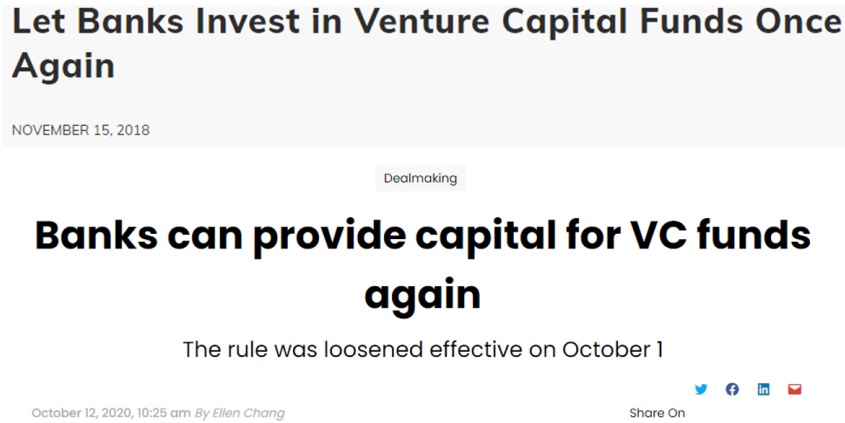
Motivation II

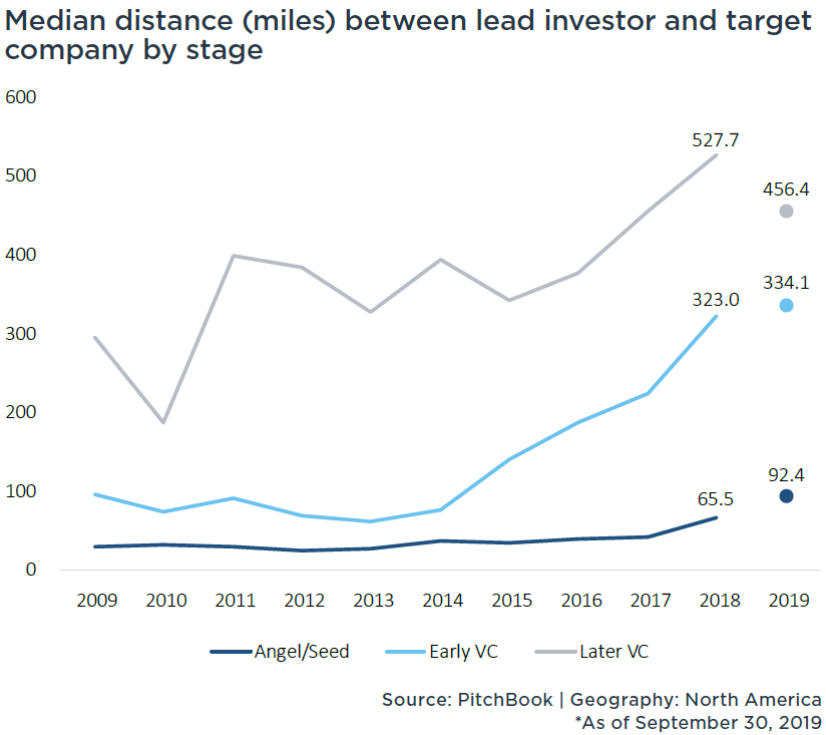


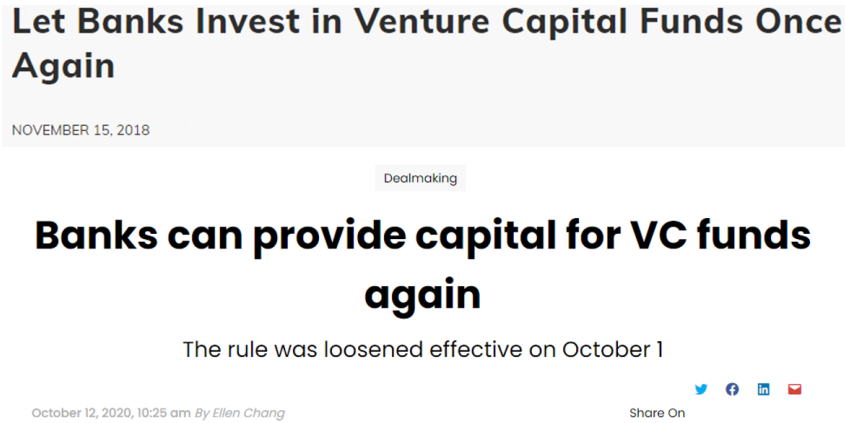


- BVCs use their rich geographical network to source deals
  - They act as strategic investors (Hellmann, Lindsey, & Puri, 2008)
  - They look for synergies and are profit-driven (Andrieu & Groh, 2012)

Capital One Ventures

Motivation II





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Capital One Ventures

This paper

I examine the role of **BVCs** in the **venture capital market** and I focus on the effect they had on **innovation** around the Volcker Rule

- **Three main findings:**
  1. Banks are **highly skilled** venture capitalists. BVC investments are highly predictive of start-up success, as measured by IPO and innovation rates
  2. Banks attract additional VC investors once they invest in a start-up. They play an **"anchor role"** for companies
  3. Banks are an important **sponsor of innovation** in regions underserved by independent VCs

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Preview of Analysis

- I look at all US VC investments since 1980:
  1. I use the propensity of start-ups to go public or get acquired to test if banks are skilled VC investors
  2. I use a PSM in a panel of company-rounds to infer that banks attract $2 million more and 0.5 additional investors after investing in a specific round
  3. I use the Volcker Rule as a DiD shock to find that companies see a drop of 6.5% in funding and 2.2% in innovation when located in a state with a one std. $\nearrow$ growth in BVC
  4. I conduct a robustness test using an IV approach to confirm the funding channel I propose

Related Literature

- Cross-selling services by banks: Puri (1996); Schenone (2004); Drucker and Puri (2005); Bharath, Dahiya, Saunders, and Srinivasan (2007)
  - I examine the "anchoring" role that banks play in the VC market
- Innovation and VC market: Nanda and Rhodes-Kropf (2017); Lerner and Nanda (2020); Howell, Lerner, Nanda, and Townsend (2021)
  - I look at innovation from the perspective of the VC investor
- Bank investments in the PE market: Hellmann et al. (2008); Ivashina and Kovner (2011); Fang, Ivashina, and Lerner (2013)
  - I contribute by focusing on investments at the VC stage

Data

1. Venture capital data (VentureXpert):
   - 39,106 US-based start-ups raising funding between 1970-2020
   - Information on funding rounds, investors, current company outcomes
   - Information on fundraising activity
2. Patent data (USPTO Patent Assignment Dataset and Patent Examination Dataset):
   - Disambiguated versions of USPTO Public PAIR data
   - 15 million patent applications corresponding to 9 million assignments
   - Matched to VentureExpert data using NBER's name standardisation procedure
3. Attention data (Google Trends):
   - Automation script to search all US-based start-ups in VentureXpert
   - Stem name search for companies raising funding after 2004
   - Focus on the period before the first VC financing round

Descriptive Statistics

BVC vs. IVC Investments

Descriptive Statistics: BVC vs. IVC Investments

	(1)	(2)	(3)	(4)	(5)
	IVC Firm		BVC Firm		(3)-(4)
VARIABLES	Non-Midwest Mean	Midwest Mean	Non-Midwest Mean	Midwest Mean	Mean Diff
Investment Size	8.105	6.815	7.832	7.274	0.558
Round Size	20.71	15.31	31.44	20.70	10.736*
Total Funding Volume	85.27	55.59	110.8	57.73	53.088**
Number Investors	9.968	8.708	12.76	8.974	3.786***
VC Activity (years)	4.636	4.491	5.591	4.763	0.828**
Age at Investment (years)	4.408	5.625	5.204	7.169	-1.964***
Round Number	3.119	3.037	3.491	3.121	0.370**
Success (1/0)	0.370	0.319	0.498	0.459	0.04
IPO (1/0)	0.0792	0.0615	0.0978	0.117	-0.019
Merger (1/0)	0.00819	0.00904	0.0183	0.0173	0.001
Acquired (1/0)	0.291	0.258	0.401	0.342	0.059*
Mean Age VC Firms	15.22	13.39	19.00	16.77	2.228**
Follow On	8.172	6.818	10.64	7.203	3.442***
PE Peak Year	0.271	0.236	0.485	0.463	0.022
NBER Recession Year	0.0912	0.104	0.146	0.177	-0.031
Observations	74,339	5,528	3,549	231	

VC investments between 2000 and 2020. All unique matchings between a VC firm and a company.

Descriptive statistics

1. Midwest is an important growing entrepreneurial region and is relatively more dependent on BVC financing
2. **VC start-ups in the Midwest:**
   - Are generally smaller
   - Funded later in their lifetime
   - Less successful
   - Funded less often during peak years of PE
3. **Bank VC investments in Midwest:**
   - Are equally large to non-Midwest VCs
   - More successful relative to independent VCs
   - Part of larger syndicates
   - Funded more often during peak years of PE

Empirical Analysis

Banks as Venture Capital Investors

BVCs are Skilled Venture Capitalists I

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Success	IPO	Merger	Employees	App. Patents	Granted Patents	Citations	Value Patents
Bank VC (0/1)	0.18***	0.08***	0.01***	0.52**	3.43***	2.72**	15.14***	47.40***
	(0.01)	(0.01)	(0.00)	(0.18)	(0.67)	(0.87)	(2.33)	(3.16)
Corporate VC (0/1)	0.03**	0.01	-0.00	0.11	1.38*	1.51***	2.24	6.26
	(0.01)	(0.01)	(0.00)	(0.08)	(0.66)	(0.46)	(1.39)	(3.93)
Government Affiliated VC (0/1)	-0.11***	-0.03***	-0.00	-0.82**	0.31	0.46	-3.58***	9.94
	(0.02)	(0.01)	(0.00)	(0.32)	(0.77)	(0.72)	(1.05)	(11.91)
Incubator VC (0/1)	-0.15***	-0.05**	-0.00	-0.55	-1.77**	-1.28***	-5.40***	-18.32***
	(0.02)	(0.02)	(0.00)	(0.55)	(0.55)	(0.38)	(1.43)	(4.24)
Independent VC (0/1)	0.13***	0.02*	0.01*	0.37	1.06***	0.78***	1.90***	4.20
	(0.01)	(0.01)	(0.00)	(0.39)	(0.27)	(0.22)	(0.23)	(4.65)
Constant	0.27***	0.06***	0.00*	3.81***	3.10***	3.02***	5.57***	18.54***
	(0.01)	(0.01)	(0.00)	(0.42)	(0.66)	(0.56)	(0.78)	(2.81)
Observations	38,588	38,588	38,588	1,029	3,370	3,364	6,557	6,557
R-squared	0.08	0.06	0.01	0.20	0.06	0.06	0.02	0.02
Controls	YES	YES	YES	YES	YES	YES	YES	YES
State FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Age FE	YES	YES	YES	YES	YES	YES	YES	YES

$$\text{Company Outcome}_i = \beta_0 + \beta_1 \text{Bank VC}_i + \beta_j \sum_{j=2}^{15} \text{Type VC}_i + \Phi X_i + \varepsilon_i$$

- **Success**$_i$ is a dummy equal to one if the company has been acquired, went public or merged by the end of the sample. **Employees**$_i$ is the ln(1 + number employees) at the end of sample value. **Patents**$_i$ measures the number of applications and grants 5 years after the last VC round.
- **Control variables: Type VC**$_i$ is a set of dummy variables for all investor types recorded in the VentureXpert data.

BVCs are Skilled Venture Capitalists II

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	Success	Success	Success	IPO	Employees	App. Patents	Granted Patents	Citations	Value Patents
Bank VC (0/1)	0.18***	0.02***	0.18***	0.07***	0.28**	2.14***	1.88**	12.12***	36.96***
	(0.01)	(0.00)	(0.01)	(0.00)	(0.10)	(0.58)	(0.60)	(2.57)	(8.86)
Peak Year (0/1)			0.14***	0.01***	0.01	0.47**	0.60*	10.10***	25.76***
			(0.01)	(0.00)	(0.08)	(0.16)	(0.29)	(0.91)	(7.74)
Bank VC x Peak Year			-0.11***						
			(0.02)						
Constant	0.37***	0.40***	0.30***	0.04***	4.23***	3.79***	3.53***	1.73	3.66
	(0.00)	(0.00)	(0.01)	(0.01)	(0.06)	(0.30)	(0.51)	(2.93)	(3.43)
Observations	38,588	38,588	38,588	38,588	1,029	3,370	3,364	6,557	6,557
R-squared	0.07	0.20	0.09	0.06	0.32	0.09	0.08	0.02	0.02
State FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Age FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Size Funding FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Founded Year FE		YES							
Controls			YES	YES	YES	YES	YES	YES	YES

$$\text{Company Outcome}_i = \beta_0 + \beta_1 \text{Bank VC}_i + \beta_2 \text{Peak Year}_i + \beta_3 \text{Bank VC}_i \times \text{Peak Year}_i + \Phi X_i + \varepsilon_i$$

- **Peak Year**$_i$ is a dummy equal to one if the first investment date is between 1985-1989, 1998-2000, 2005-2007 corresponding to expansion periods of the PE market, as defined in Fang et al. (2013).
- **Control variables: NBER recession**$_i$ is a dummy equal to one if the first investment took place between 1990-1991, March 2001-November 2001, December 2007-June 2009.

BVCs Attract Additional Funding: "Anchoring"

	Round Size	Nr Inv.	Round Size	Nr Inv.	Round Size	Nr Inv.	Round Size	Nr Inv.
$E(Y_1 - Y_0 \mid BVC = 1, X)$	2.26	0.50	2.14	0.48	2.06	0.50	1.43	0.43
t-value	2.05	5.43	1.87	5.15	2.00	5.90	1.52	5.47
Matches	1	1	3	3	5	5	10	10

- Propensity Score Matching of "Anchor" vs. "non-Anchor" rounds. I am comparing rounds following a BVC investment vs. similar rounds without.
- **Outcome variables ($\mathbf{Y}_{1,0}$):** Nominal $ amount and number investors in a round
- **Dependent variable:** Pre-Round Bank VC (0/1)
- **Independent Variables (X):** Pre-Round Size, Pre-Round Number, State, Industry, Pre-Round Company Age

Banks are Predictive of Success and Act as "Anchors"

1. Banks are highly skilled VC investors. Participation of a BVCs is associated with:
   - Higher IPO activity, real outcomes, innovation measures
   - Less successful outcomes during peak PE years
2. Following a bank VC investment in a funding round:
   - The size of the company's next round will be $2 million larger
   - The number of investors in the next round will be 0.5 larger

$\rightarrow$ relative to a similar start-up without bank VC investment

BVCs Add Value to Their Investments I

DiD approach					
	(1)	(2)	(3)	(4)	(5)
VARIABLES	All VC-backed companies	IPO companies	Acquired companies	Failed companies	Active companies
One year after * BVC	0.028	0.203**	-0.026	0.192	-0.009
	(0.034)	(0.096)	(0.056)	(0.307)	(0.034)
Two years after * BVC	0.063	0.216	-0.098	0.086	0.073
	(0.042)	(0.130)	(0.081)	(0.312)	(0.050)
Three years after * BVC	0.136***	0.391***	-0.061	0.118	0.146**
	(0.032)	(0.104)	(0.066)	(0.228)	(0.060)
Four years after * BVC	0.196***	0.585***	-0.032	0.115	0.182***
	(0.034)	(0.101)	(0.058)	(0.250)	(0.059)
One year after	0.114***	-0.004	0.142***	0.075	0.122***
	(0.008)	(0.025)	(0.013)	(0.052)	(0.012)
Two years after	0.141***	0.030	0.175***	0.150**	0.144***
	(0.009)	(0.024)	(0.013)	(0.063)	(0.012)
Three years after	0.124***	0.025	0.153***	0.157**	0.126***
	(0.009)	(0.027)	(0.011)	(0.068)	(0.012)
Four years after	0.077***	0.013	0.085***	0.151***	0.082***
	(0.007)	(0.020)	(0.010)	(0.034)	(0.009)
Constant	0.971***	1.074***	0.981***	0.912***	0.950***
	(0.004)	(0.015)	(0.008)	(0.045)	(0.006)
Observations	29,807	2,478	8,002	401	17,513
R-squared	0.825	0.838	0.822	0.807	0.831
Year FE	YES	YES	YES	YES	YES
Company FE	YES	YES	YES	YES	YES

$$\text{Ln(1+Pat.App.)}_{i,t} = \beta_0 + \beta_s \sum_{t=1}^{4} \text{After}^s_{i,t} + \gamma_s \sum_{t=1}^{4} \text{After}^s_{i,t} \times \text{BVC}_i + \textit{Year}_t + \textit{Company}_t + \varepsilon_{i,t}$$

- Panel regression measuring the incremental amount of innovation done by BVC-funded companies relative to IVC

BVCs Add Value to Their Investments II

BVCs add value through multiple channels:

- Cross-selling of advisory services (IPO, M&A, financing) GS
- Trade financing, tax and liquidity planning RBC
- Tailored banking solutions for the founder and management team (credit cards, personal lending) SVB
- Existing network of industry relationships acquired through SME lending Citi
- Local network of suppliers, distributors helping the start-up

Empirical Analysis

Volcker Rule Shock

Volcker Rule as a Shock to BVC Funding

1. **State-level** measure of the entrepreneurial market growth for bank VC funds
   - Used the period **before Volcker Rule** (1970-2013) to build the **average growth** of bank VC investments in a state BVC Growth
2. DiD analysis between 2008-2020 where the **post period** starts with the **2014** Volcker Rule implementation Timeline
3. Look at the state, fund, company level effects on funding raised:
   - Number and total volume of **funding drops** at the state level
   - Size of **individual funds decreased**
   - First **rounds decrease** at the company level
4. Number of **patent applications drops** following the regulation

State-level Volcker Rule Shock

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Nr Funds All	Nr Funds All	Nr Funds 2011-2017	Nr Funds All	Vol Funds All	Vol Funds All	Vol Funds 2011-2017
Bank Dep. x Post	-0.738***	-0.745***	-0.518*		-1.533*	-1.539*	-2.387**
	(0.226)	(0.231)	(0.256)		(0.826)	(0.858)	(1.019)
GDP State		0.245				0.201	
		(1.240)				(4.160)	
Top Quart. Bank Dep. x Post				-0.325**			
				(0.152)			
Constant	1.728***	1.722***	1.630***	1.835***	5.145***	5.141***	5.141***
	(0.038)	(0.046)	(0.042)	(0.042)	(0.138)	(0.155)	(0.168)
Observations	371	371	198	174	371	371	198
R-squared	0.854	0.854	0.885	0.911	0.711	0.711	0.742
State FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES

$$\text{State Fundraising}_{i,t} = \beta_0 + \beta_1 \text{Bank Dep}_i \times \text{Post}_t + \beta_2 \text{Bank Dep}_i + \beta_3 \text{Post}_t + \beta_4 \text{GDP State}_{i,t} + \Phi X_i + \rho Z_t + \varepsilon_{i,t}$$

- **Nr Funds**$_{i,t}$ and **Vol Funds**$_{i,t}$ are the natural logarithm of the number and volume of funds raised in state i during year t
- **Control variables: Bank Dep**$_i$ is our time-invariant, state-specific continuous measure of yearly BVC growth rate. Post is dummy equal to 1 after 2014.

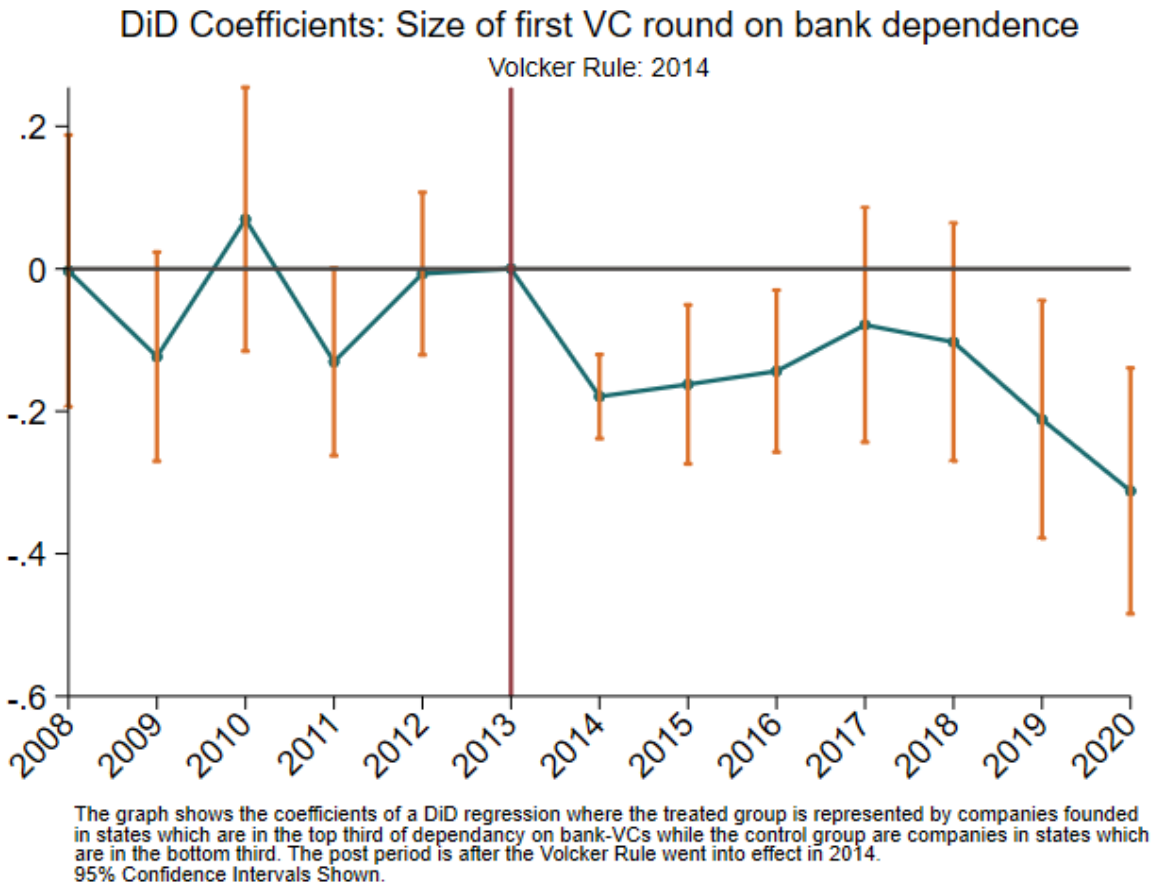
Company-level Volcker Rule Shock: Funding I

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Size First Round All	Nr Investors First Round All	Size First Round All	Size First Round 2012-2016	Size First Round 2012-2016 (No CA)
Bank Dep x Post	-0.507***	-0.093*		-0.295**	-0.328**
	(0.144)	(0.051)		(0.112)	(0.132)
Top Third Bank Dep x Post			-0.140*		
			(0.074)		
Constant	1.603***	1.171***	1.609***	1.443***	1.314***
	(0.013)	(0.005)	(0.007)	(0.011)	(0.019)
Observations	15,347	15,347	12,268	5,992	3,619
R-squared	0.137	0.098	0.133	0.118	0.126
State FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

$$\text{Outcome First Round}_{i,t} = \beta_0 + \beta_1 \text{Bank Dep}_i \times \text{Post}_t + \beta_2 \text{Bank Dep}_i + \beta_3 \text{Post}_t + \Phi X_i + \rho Z_t + \varepsilon_{i,t}$$

- **Size First Round**$_{i,t}$ and **Nr Investors First Round**$_{i,t}$ are the natural logarithms of the nominal size and number of investors raised in the first round by company i in year t.
- **Economic Magnitude:** A one standard deviation increase in the **Bank Dep**$_i$ corresponds to a 6.5% drop in size and a 1.14% drop in number of investors BVC Growth

Company-level Volcker Rule Shock: Funding II



Dynamic version of the regression presented in the previous table.

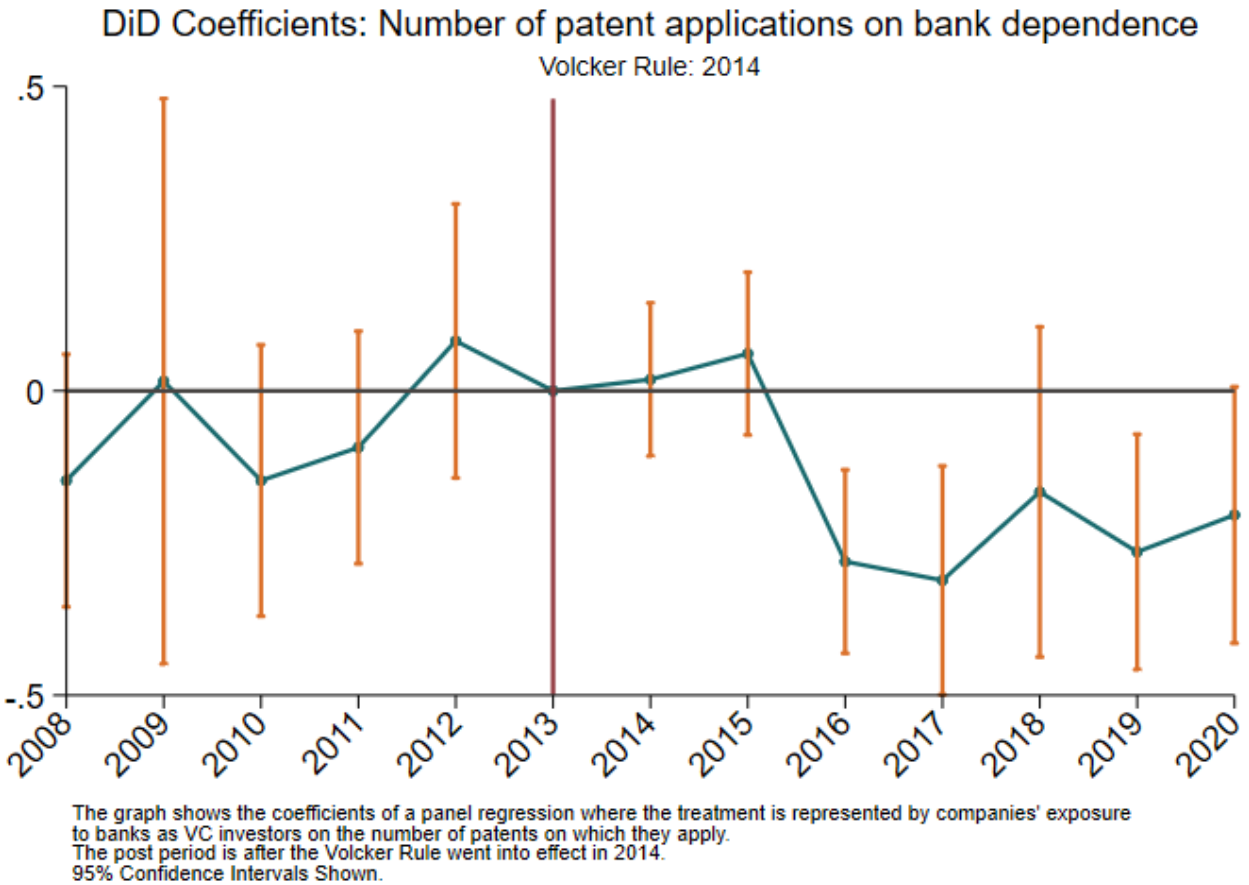
Company-level Volcker Rule Shock: Patents I

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Nr Applications All	Nr Applications All	Nr Applications All	Nr Applications No CA	Nr Applications 2010-2018 (No CA)
Bank Dep x Post	-0.181**	-0.337**		-0.233*	-0.249*
	(0.080)	(0.138)		(0.109)	(0.129)
Bank Dep	-0.155**				
	(0.066)				
Post	0.051***				
	(0.017)				
Top Third Bank Dep x Post			-0.090**		
			(0.038)		
Constant	1.123***	1.154***	1.150***	1.096***	1.105***
	(0.014)	(0.031)	(0.024)	(0.016)	(0.018)
Observations	11,976	11,976	10,394	6,334	4,727
R-squared	0.006	0.009	0.006	0.035	0.035
State FE	NO	NO	NO	YES	YES
Year Application FE	NO	YES	YES	YES	YES

$$\text{Nr Applications}_{i,t} = \beta_0 + \beta_1 \text{Bank Dep}_i \times \text{Post}_t + \beta_2 \text{Bank Dep}_i + \beta_3 \text{Post}_t + \Phi X_i + \rho Z_t + \varepsilon_{i,t}$$

- **Nr Applications**$_{i,t}$ is the natural logarithm of the number of submitted applications in a given year t by company i
- **Economic Magnitude:** A one standard deviation increase in the **Bank Dep**$_i$ corresponds to a 2.2% drop the number of filed patent applications

Company-level Volcker Rule Shock: Patents II



Dynamic version of the regression presented in the previous table.

Robustness Analysis

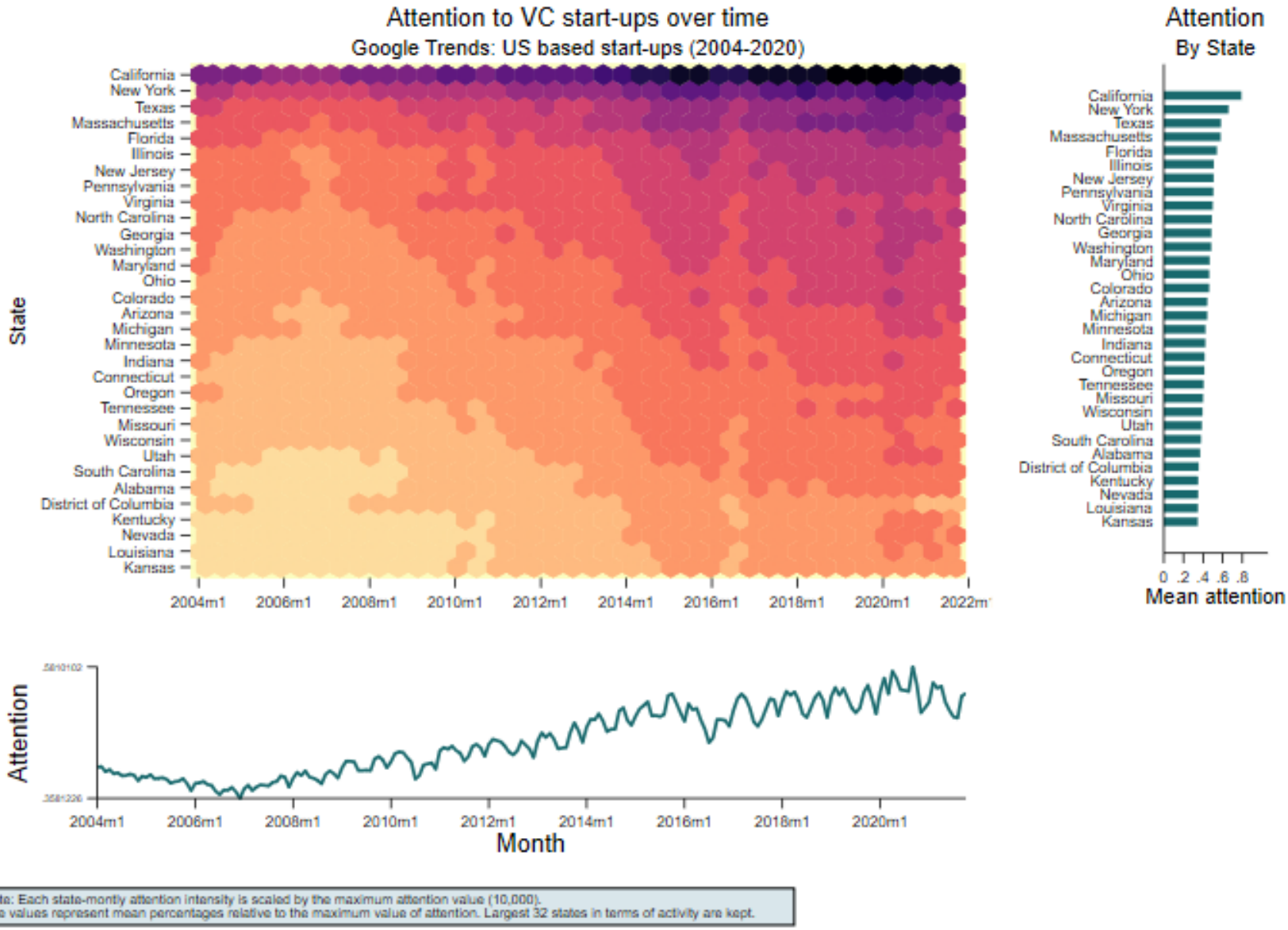
Google Trends Attention Channel

Skip

Google Trends Attention to Start-ups

1. Use **attention to companies** before their first VC round to predict funding
   - Use this variation in funding to predict the **likelihood** of companies **applying for patents**
   - Instrument valid since **patent applications** are highly **expensive** and start-ups **need VC funding** for them
2. Instrument is **highly predictive** of raising VC funding
   - **Channel disappears** for start-ups located in **regions strongly affected** by Volcker Rule

Google Trends Variable Construction



Google Trends Attention on Funding

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Size First Round	Size First Round	Size First Round	Size First Round	Size First Round	Size First Round
Attention growth (-12m)	0.741***			0.518***		
	(0.153)			(0.136)		
Attention growth (-6m)		0.437***			0.327***	
		(0.086)			(0.082)	
Attention growth (-3m)			0.187**			0.132**
			(0.076)			(0.064)
Constant	1.704***	1.722***	1.740***	1.716***	1.727***	1.741***
	(0.011)	(0.007)	(0.007)	(0.010)	(0.006)	(0.006)
Observations	4,567	4,567	4,567	4,552	4,552	4,552
R-squared	0.077	0.072	0.066	0.182	0.181	0.177
State FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE				YES	YES	YES
Company Age FE				YES	YES	YES

$$\text{Size First Round}_{i,t} = \beta_0 + \beta_1 \overline{\Delta}\text{Attention GoogleTrends}_{i,t-k} + \Phi X_{i,t} + \varepsilon_{i,t}$$

- **Size First Round**$_{i,t}$ is the natural logarithm of the nominal amount of first-round funding raised in year t by company i
- **Controls:** $\overline{\Delta}$Attention GoogleTrends$_{i,t-k}$ is the average change in the attention the company received in the k months before its first round at time t

2SLS of Google Trends Attention on Patents

	(1)	(2)	(4)	(5)	(6)
VARIABLES	Next App. 6m OLS	Size First Round First Stage	Next App. 6m 2SLS	Next App. 6m Post: High Dep.	Next App. 6m Post: Low Dep.
Size First Round (IV)			0.145**	0.184	0.283***
			(0.070)	(0.524)	(0.067)
Size First Round	0.031***				
	(0.007)				
Attention growth (-6m)		0.327***			
		(0.094)			
Constant	0.118***	1.763***			
	(0.013)	(0.009)			
Observations	3,275	3,271	3,271	267	1,324
R-squared	0.051	0.210	-	-	-
State FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Age FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

$$\text{Size First Round}_{i,t} = \beta_0 + \beta_1 \overline{\Delta}\text{Attention GoogleTrends}_{i,t-6} + \Phi X_{i,t} + \varepsilon_{i,t}$$

$$\text{Patent Application}_{i,t+6} = \beta_0 + \beta_1 \overline{\Delta}\widehat{\text{Size First Round}}_{i,t} + \Phi X_{i,t} + \varepsilon_{i,t}$$

- **Next App. 6m**$_{i,t}$ is a dummy variable equal to one if company i has submitted a patent application in the following 6 months after its first funding round in year t

Conclusion

1. Banks are important investors in the VC market
2. They are highly skilled in making successful investments and act as "anchors" to these companies
3. The Volcker Rule shock brings a negative externality on innovation through the bank VC channel
4. I use a company-level attention variable to underline the effects of the Volcker Rule on innovation

Thank you!

Conclusion

1. Banks are important investors in the VC market
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Thank you!

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Citi Ventures BVC Example

WHAT WE DO

Explore

We bring an outside-in perspective to sensing and acting on market signals, investigating emerging trends in technology and financial services and exploring their potential use with our clients.

Incubate

We take an experimental, business- and product-agnostic approach to solving client and Citi problems—testing, refining, and launching new solutions that help people, businesses, and communities thrive.

Invest

We fuel and propel growth by investing in and partnering with cutting-edge companies that are shaping the future of financial services and positively impacting a changing world.

We accelerate innovation and growth by exploring, incubating, and investing in new ideas in collaboration with Citi colleagues, our clients, and the innovation ecosystem.

EXAMPLES OF OUR WORK

Bridge built by Citi℠

A digital lending platform that helps small and medium-sized businesses—particularly Minority Depository Institutions—connect with regional, local, and community banks for loans up to $10 million. Venture Innovation worked with the Citi Commercial Bank to develop and launch the platform, which is currently available to businesses in the Southeast and Rockies regions of the U.S.

Learn More >

City Builder® by Citi

A free, data-driven platform designed to help investors, developers, municipalities, and community members make impactful place-based investments. City Builder provides investors with tools and information on a wide variety of community needs and opportunities to make a positive impact.

Learn More >

Onward

A fintech platform designed to help co-parents manage shared finances for their children more easily. The idea for Onward was incubated, tested, and developed within Venture Innovation. The app launched publicly in March 2021 and Citi Ventures participated in the company's first funding round.

Learn More >

OUR APPROACH

Envision

We identify technological, behavioral, economic, and societal "white spaces" where Citi can create positive change and engage the next generation of high-growth clients.

Collaborate

We partner inside and outside of Citi to develop sustainable growth strategies, competitive IP, and solutions to unmet market challenges.

Launch

We incubate and deliver dynamic new solutions that serve unmet market needs, utilizing multiple paths to market—from internal incubation to new venture spin-outs.

CAPABILITIES & FOCUS AREAS

Blockchain and Digital Assets

Blockchain technology is driving a revolution in financial services, from digital currencies to decentralized finance (DeFi) and non-fungible tokens (NFTs). How can we help shape the transition to a financial system built on these technologies and enable the new possibilities they entail? Our Zürich-based team is exploring that question in partnership with key players across Europe's crypto ecosystem.

Public-Private Innovation

The economy of the future will increasingly be driven by Environmental, Social, and Governance (ESG) targets that will require unprecedented partnership between the private and public sector to achieve. How can we help develop collaborative platforms that accelerate this shift and foster the innovation needed to usher this economy in?

Racial Equity Design and Data Initiative (REDDI)

As diversity and inclusion take center stage around the world, how can we help pioneer technology practices that reduce bias and increase equity for people and communities of color? Our U.S.-based REDDI team is looking into a range of solutions.

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High and Low Dry-Powder Ecosystems

VC ecosystems with highest local capital ($M) per startup*

	Dry powder ($M)**	Active VC companies (#)	Dry powder per active VC company ($M)
San Jose-San Francisco-Oakland, CA	$56,936.2	4,711	$12.1
Boston-Worcester-Providence, MA-RI-NH-CT	$13,467.8	1,413	$9.5
New York-Newark, NY-NJ-CT-PA	$13,039.7	2,584	$5.0
Seattle-Tacoma, WA	$2,174.8	656	$3.3
Chicago-Naperville, IL-IN-WI	$1,425.1	539	$2.6

Source: PitchBook | Geography: North America
*As of September 30, 2019
**As of December 31, 2018

VC ecosystems with lowest local capital ($M) per startup*

	Dry powder ($M)**	Active VC companies	Dry powder per active VC company ($M)
Minneapolis-St. Paul, MN-WI	$31.2	240	$0.1
Pittsburgh-New Castle-Weirton, PA-OH-WV	$21.4	154	$0.1
Portland-Vancouver-Salem, OR-WA	$50.5	236	$0.2
Dallas-Fort Worth, TX-OK	$77.8	272	$0.3
Miami-Port St. Lucie-Fort Lauderdale, FL	$87.5	291	$0.3

Source: PitchBook | Geography: North America
*As of September 30, 2019
**December 31, 2018

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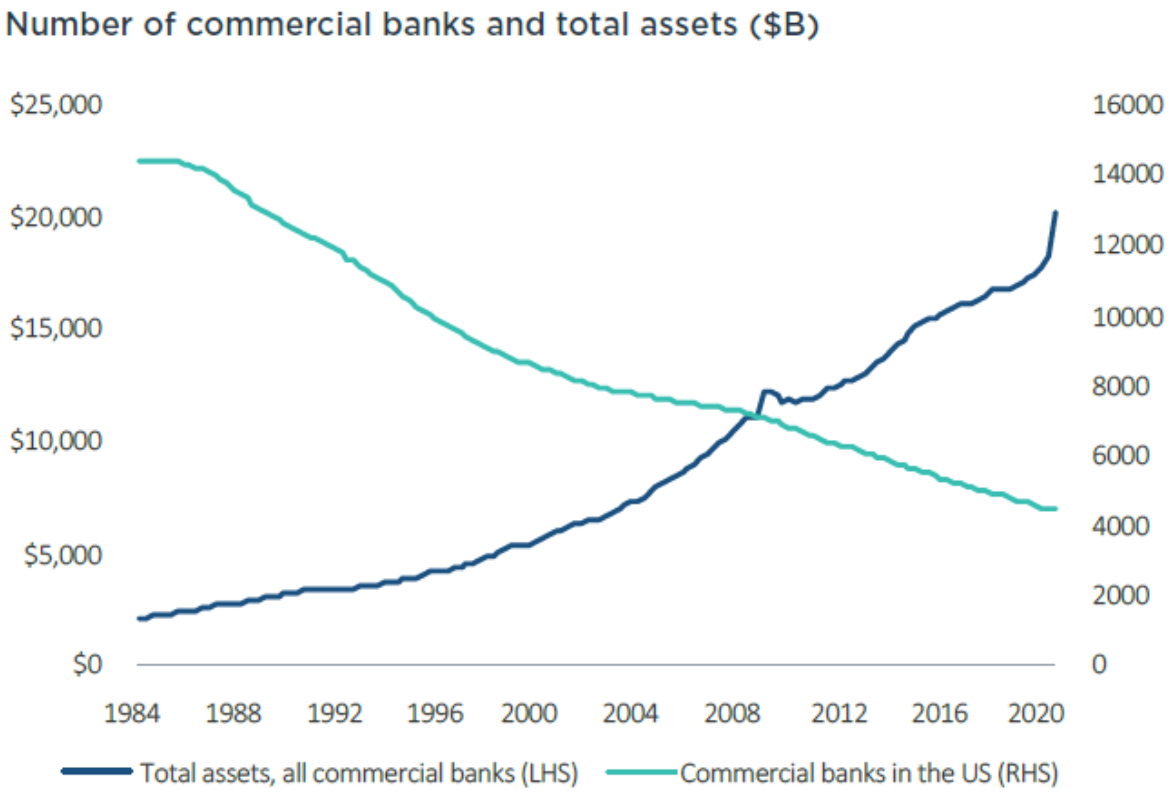
Financial Sector Consolidation



Source: Federal Financial Institutions Examination Council (US); Board of Governors of the Federal Reserve System (US). Retrieved from FRED, Federal Reserve Bank of St. Louis, August 31, 2020 | **Geography: US**

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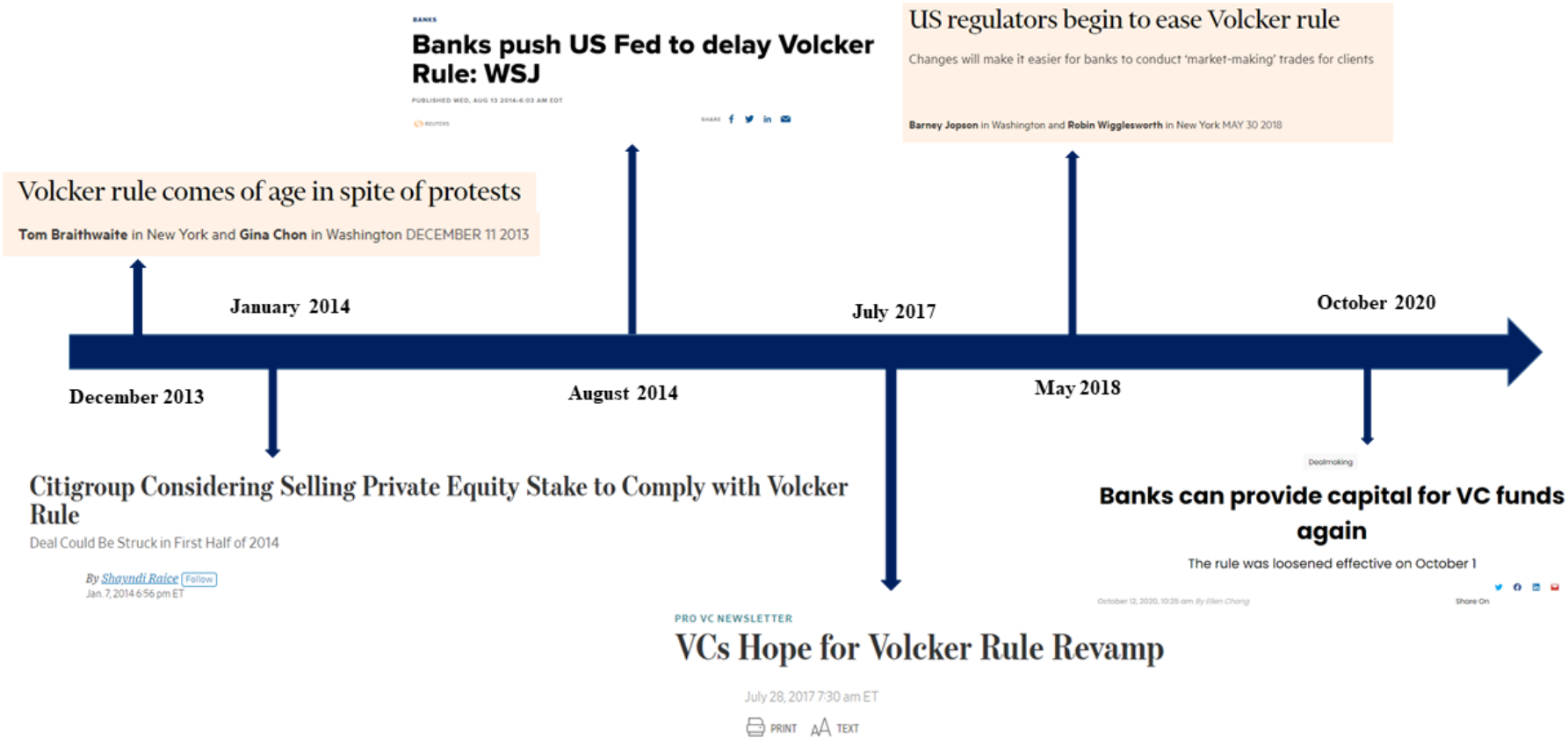
Volcker Rule Timeline



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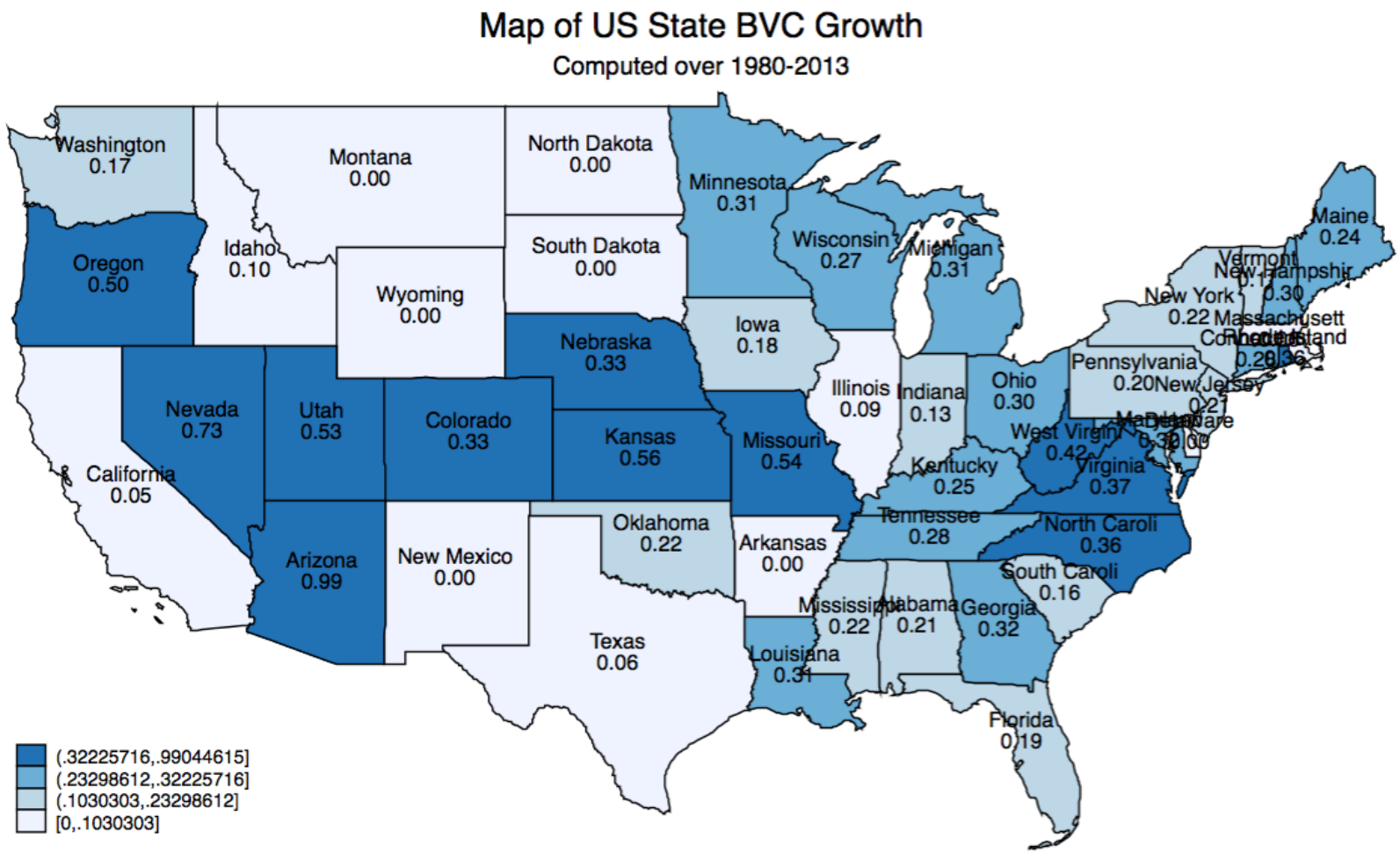
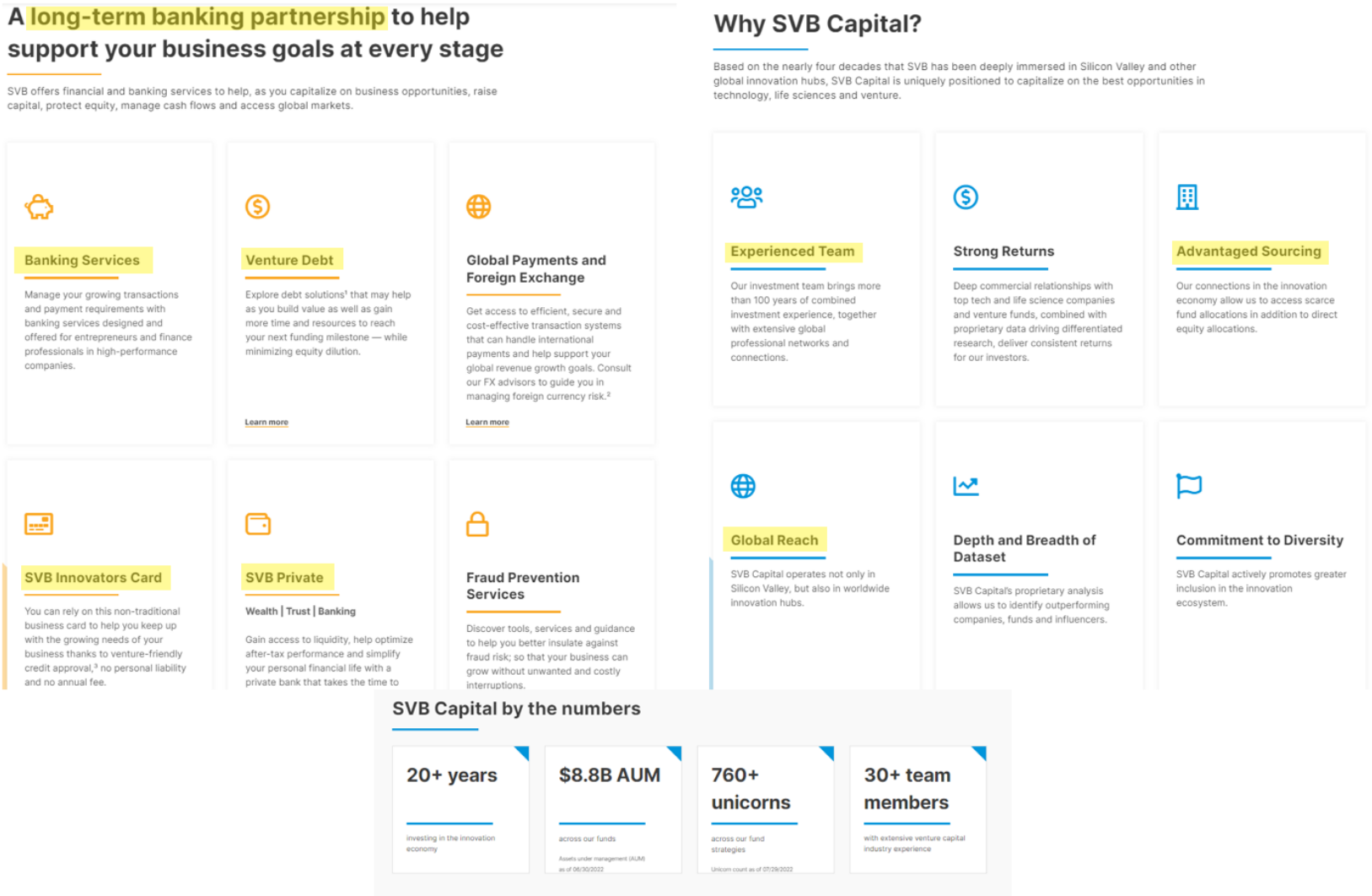
BVC Growth's $\sigma = 0.18$



The variable is computed at the state level as the average yearly growth rate in the number of BVC investments in the period before the Volcker Rule, 1980-2013.
Map split is done by quartile of state dependence.

Volcker Rule | DiD

Silicon Valley Bank (BVC Example)



A long-term banking partnership to help support your business goals at every stage

SVB offers financial and banking services to help, as you capitalize on business opportunities, raise capital, protect equity, manage cash flows and access global markets.

Banking Services

Manage your growing transactions and payment requirements with banking services designed and offered for entrepreneurs and finance professionals in high-performance companies.

Venture Debt

Explore debt solutions[1] that may help as you build value as well as gain more time and resources to reach your next funding milestone — while minimizing equity dilution.

Learn more

Global Payments and Foreign Exchange

Get access to efficient, secure and cost-effective transaction systems that can handle international payments and help support your global revenue growth goals. Consult our FX advisors to guide you in managing foreign currency risk.[2]

Learn more

SVB Innovators Card

You can rely on this non-traditional business card to help you keep up with the growing needs of your business thanks to venture-friendly credit approval,[3] no personal liability and no annual fee.

SVB Private

Wealth | Trust | Banking

Gain access to liquidity, help optimize after-tax performance and simplify your personal financial life with a private bank that takes the time to

Fraud Prevention Services

Discover tools, services and guidance to help you better insulate against fraud risk; so that your business can grow without unwanted and costly interruptions.

Why SVB Capital?

Based on the nearly four decades that SVB has been deeply immersed in Silicon Valley and other global innovation hubs, SVB Capital is uniquely positioned to capitalize on the best opportunities in technology, life sciences and venture.

Experienced Team

Our investment team brings more than 100 years of combined investment experience, together with extensive global professional networks and connections.

Strong Returns

Deep commercial relationships with top tech and life science companies and venture funds, combined with proprietary data driving differentiated research, deliver consistent returns for our investors.

Advantaged Sourcing

Our connections in the innovation economy allow us to access scarce fund allocations in addition to direct equity allocations.

Global Reach

SVB Capital operates not only in Silicon Valley, but also in worldwide innovation hubs.

Depth and Breadth of Dataset

SVB Capital's proprietary analysis allows us to identify outperforming companies, funds and influencers.

Commitment to Diversity

SVB Capital actively promotes greater inclusion in the innovation ecosystem.

SVB Capital by the numbers

20+ years	$8.8B AUM	760+ unicorns	30+ team members
investing in the innovation economy	across our funds	across our fund strategies	with extensive venture capital industry experience
	Assets under management (AUM) as of 06/30/2022	Unicorn count as of 07/29/2022	

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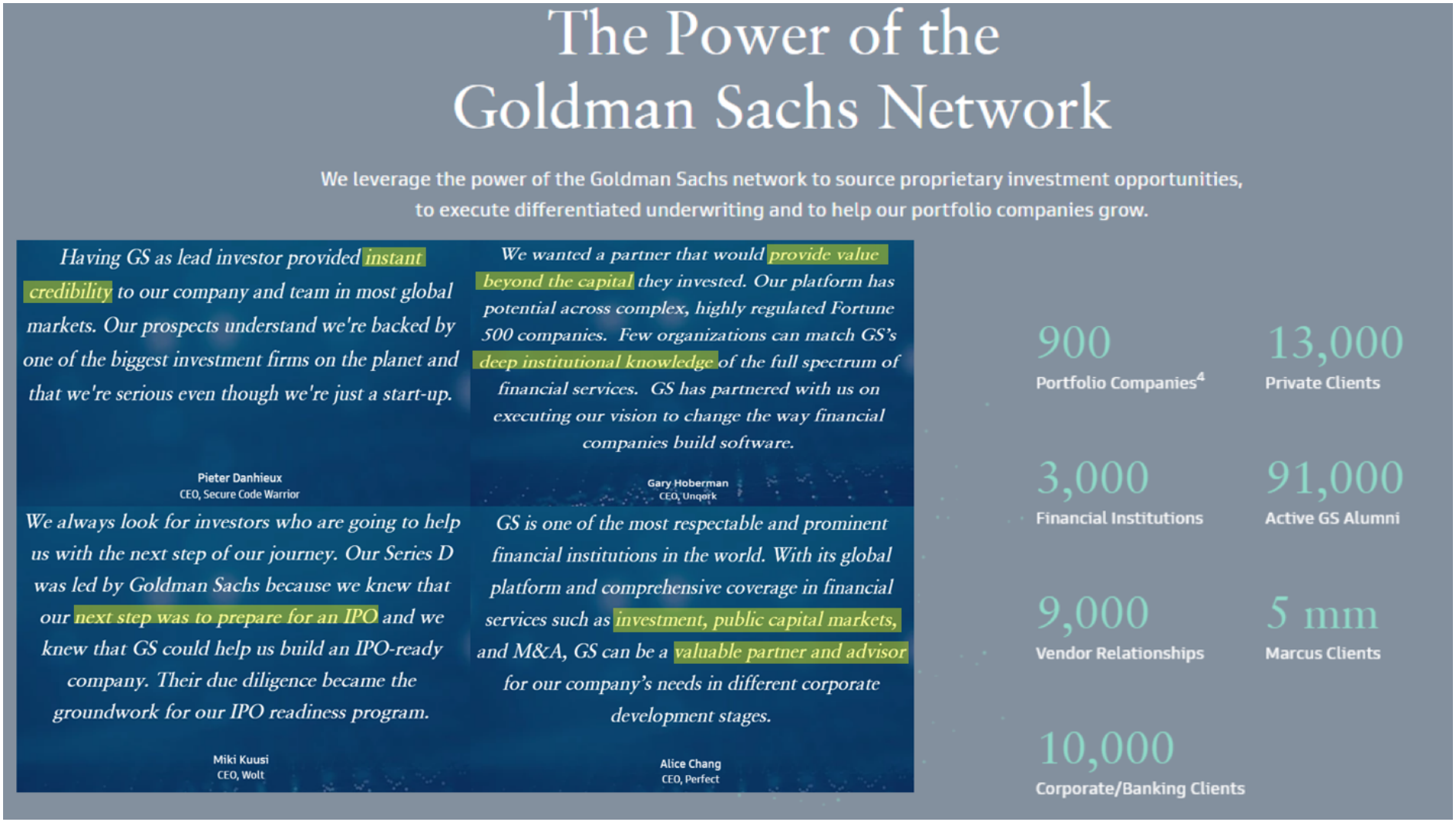
Goldman Sachs (BVC Example)



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Royal Bank of Canada (BVC Example)

Products & Services

We support tech companies of all sizes, across all stages, with innovative products and services.

For your unique needs!

Venture Debt

Get the financing you need to grow or extend runway while minimizing dilution to founders and early investors.

- Flexible financial structure
- Sector agnostic for companies at all stages of growth

Value where you want it!

Exclusive Incentives

Get an added competitive advantage with special offers and discounts in our marketplace, including:

- Amazon Web Services (AWS)
- Google
- Dell

Banking

Make the most of every dollar your business earns and spends with banking that meets your unique needs.

- Business banking
- Corporate credit cards
- Treasury management

Global Business Solutions

There's an entire world of opportunity out there. Don't let international borders limit your growth.

- Cross-border banking
- Foreign exchange

Strategic Advisory Services

Make the big decisions easier and drive results with the help of our specialized expertise.

- RBCx Platform
- RBCx Capital
- RBC Capital Markets

Lending

Finance your next stage with our specialized lending solutions specifically designed for scaling tech companies.

- Operating facilities
- Term debt
- Enhanced SR&ED financing

Capital Solutions

We offer a complex suite of credit financing solutions for venture capital and growth equity firms.

Capital Call and Subscription Lines

Loans to bridge the timing of capital deployments.

Management Company Financing

Operating loans for fund managers, designed to smooth cash flows and bridge expense obligations.

General Partner Facilities

Facilities to support the liquidity needs of fund partners and employees.

Cash Management

A complete suite of transactional banking services, including wires, direct deposits, and business online banking.

Foreign Exchange

RBC Capital Markets supports clients in over 100 countries, offering forex, hedging, and international transaction support.

Private Banking

Wealth advisors and private banking teams with decades of experience supporting the unique needs of investors.

Advisory Services

Support and advice on all aspects of fundraising, fund setup and management, and capital introductions.

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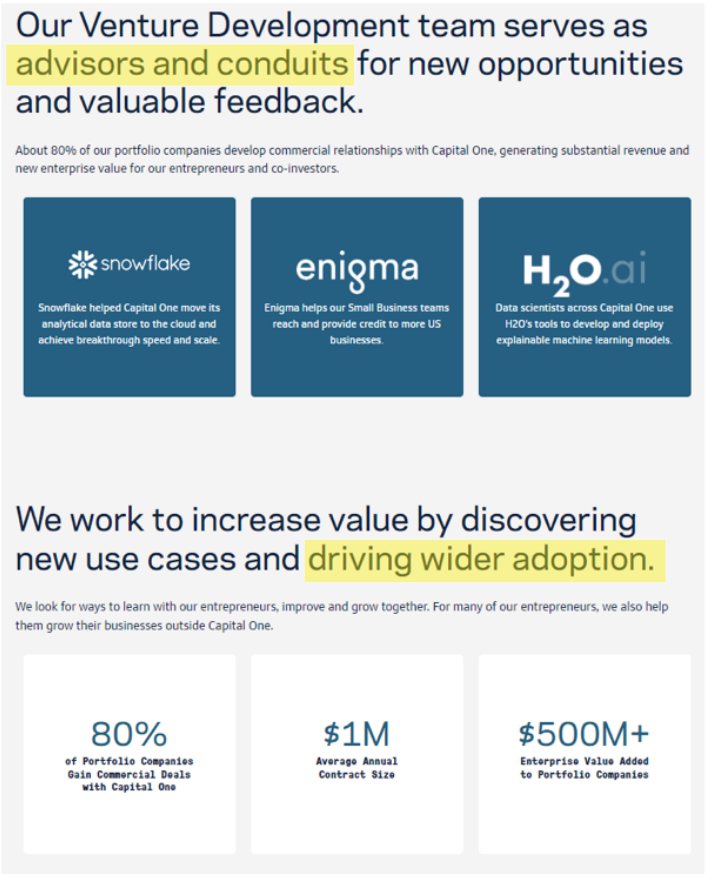
Capital One (BVC Example)



Our Venture Development team serves as advisors and conduits for new opportunities and valuable feedback.

About 80% of our portfolio companies develop commercial relationships with Capital One, generating substantial revenue and new enterprise value for our entrepreneurs and co-investors.

snowflake
Snowflake helped Capital One move its analytical data store to the cloud and achieve breakthrough speed and scale.

enigma
Enigma helps our Small Business teams reach and provide credit to more US businesses.

H2O.ai
Data scientists across Capital One use H2O's tools to develop and deploy explainable machine learning models.

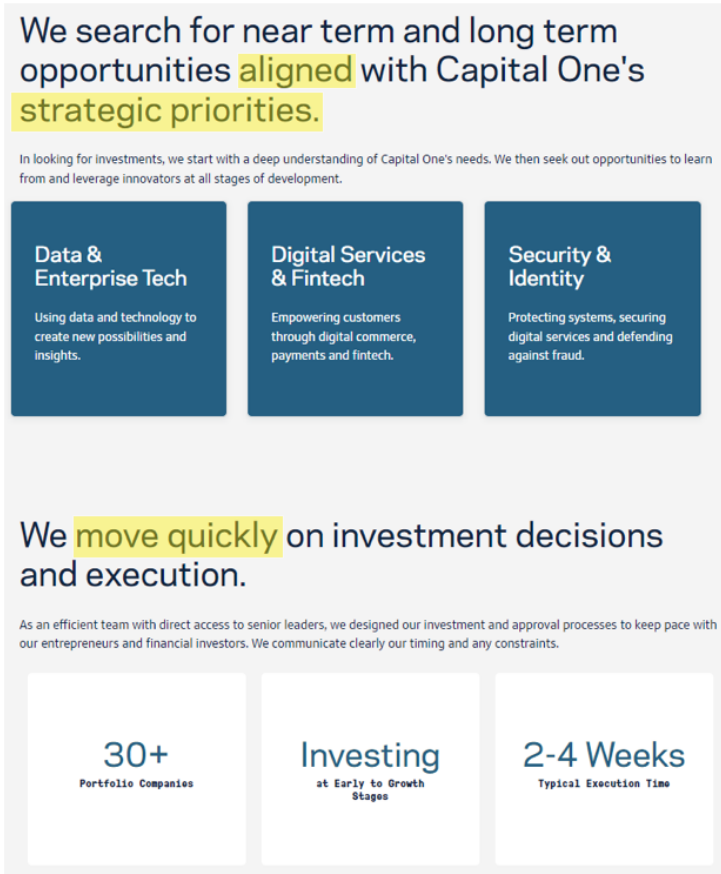
We work to increase value by discovering new use cases and driving wider adoption.

We look for ways to learn with our entrepreneurs, improve and grow together. For many of our entrepreneurs, we also help them grow their businesses outside Capital One.

80%
of Portfolio Companies Gain Commercial Deals with Capital One

$1M
Average Annual Contract Size

$500M+
Enterprise Value Added to Portfolio Companies



We search for near term and long term opportunities aligned with Capital One's strategic priorities.

In looking for investments, we start with a deep understanding of Capital One's needs. We then seek out opportunities to learn from and leverage innovators at all stages of development.

Data & Enterprise Tech
Using data and technology to create new possibilities and insights.

Digital Services & Fintech
Empowering customers through digital commerce, payments and fintech.

Security & Identity
Protecting systems, securing digital services and defending against fraud.

We move quickly on investment decisions and execution.

As an efficient team with direct access to senior leaders, we designed our investment and approval processes to keep pace with our entrepreneurs and financial investors. We communicate clearly our timing and any constraints.

30+
Portfolio Companies

Investing
at Early to Growth Stages

2-4 Weeks
Typical Execution Time

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Pitchbook Repeal Volcker Excerpt

Impact on Venture Capital

We agree that VC funds pose little to no systemic risk to the financial system and that there appears to be limited rationale for including them under the broader covered fund definition. VC funds are often promoted as an engine for fueling innovation, and that sentiment was explicit in the revisions: "The agencies believe the exclusion for qualifying venture capital funds will support capital formation, job creation, and economic growth, particularly with respect to small businesses and start-up companies."[21] A section from the Comments portion is worth citing in its entirety as well:

> "Several commenters said an exclusion for venture capital funds would benefit underserved regions where venture capital funding is not readily available currently. One commenter said venture capital fund sizes are often too small for institutional investors, and banks have historically served an important source of investment for small and regional venture capital funds. This commenter said the loss of banking entities as limited partners in venture capital funds has had a disproportionate impact on cities and regions with emerging entrepreneurial ecosystems areas outside of Silicon Valley and other traditional technology centers."[22]

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