Venture Capital Market in Korea : Evolution and Prospect

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Korea Venture Capital Market

- Pivotal role in the supply of capital to start-ups in Korea
- VC investment is 0.26% of GDP in 2021, 6th in OECD, larger than China (following OECD definition)

  * Israel (1.72%), United States (1.09%), Estonia (0.47%), Canada (0.47%), Finland (0.31%)
- Large presence of government supported venture capitals
- 32 unicorns up to July 2022, all in service sectors except two in cosmetics and one in biotech

- Two vehicles to launch venture funds
  - Venture Investment Promotion Act: Venture Investment Association (VIA) → VC market data collected by KVCA
  - Specialized Credit Finance Business Act: New Technology Venture Investment Association (NT-VIA)

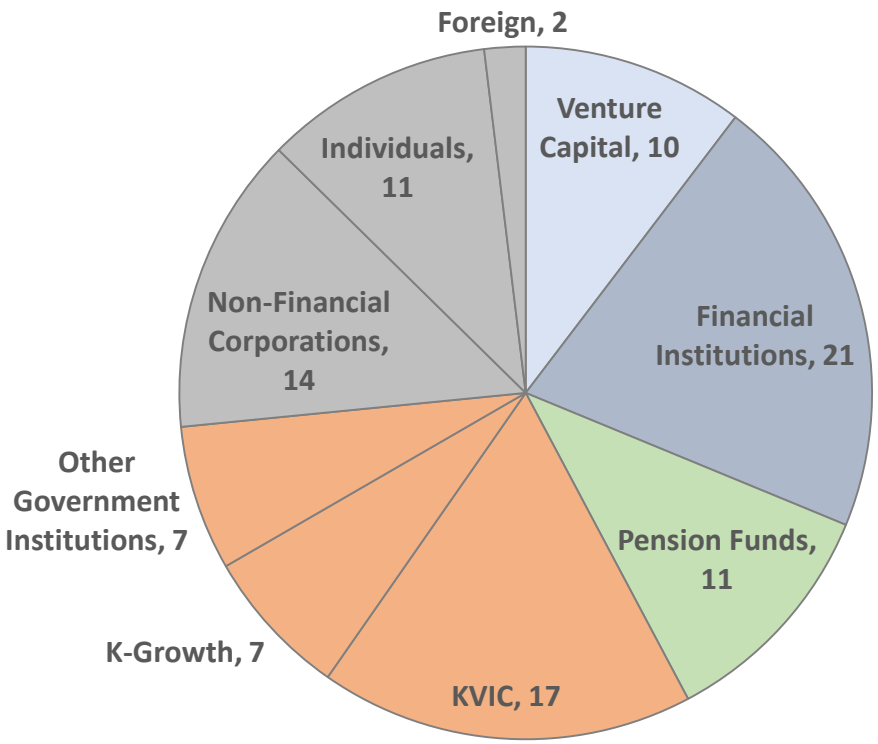
New VC Fund Formation and Investment through VIA and NT-VIA

Category		2018	2019	2020	2021	2022	Corr.
Venture Investment	VIA	3,425	4,278	4,305	7,680	6,764	0.99
	Both	5,918	7,528	8,096	15,937	12,471	
Fund Formation	VIA	4,841	4,241	6,886	9,498	10,729	0.96
	Both	7,579	7,870	10,008	17,797	17,305	

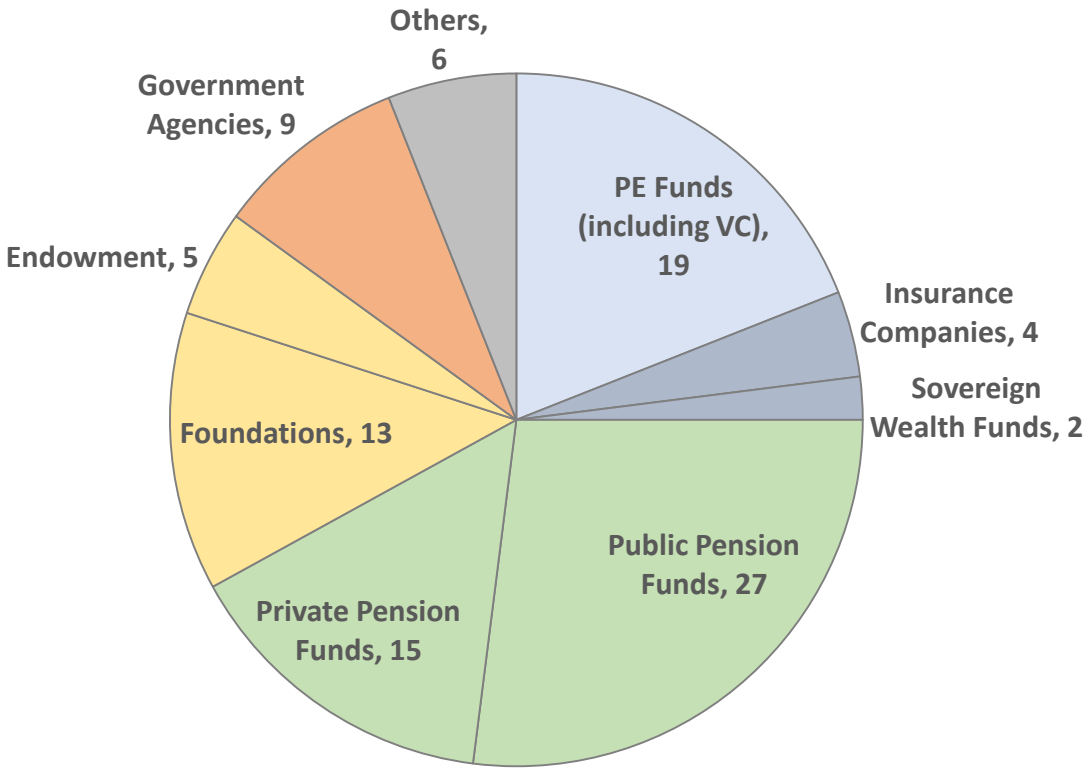
Korea Venture Capital Market

- VC funding sources are highly reliant upon government financing

Composition of New Venture Funds in Korea

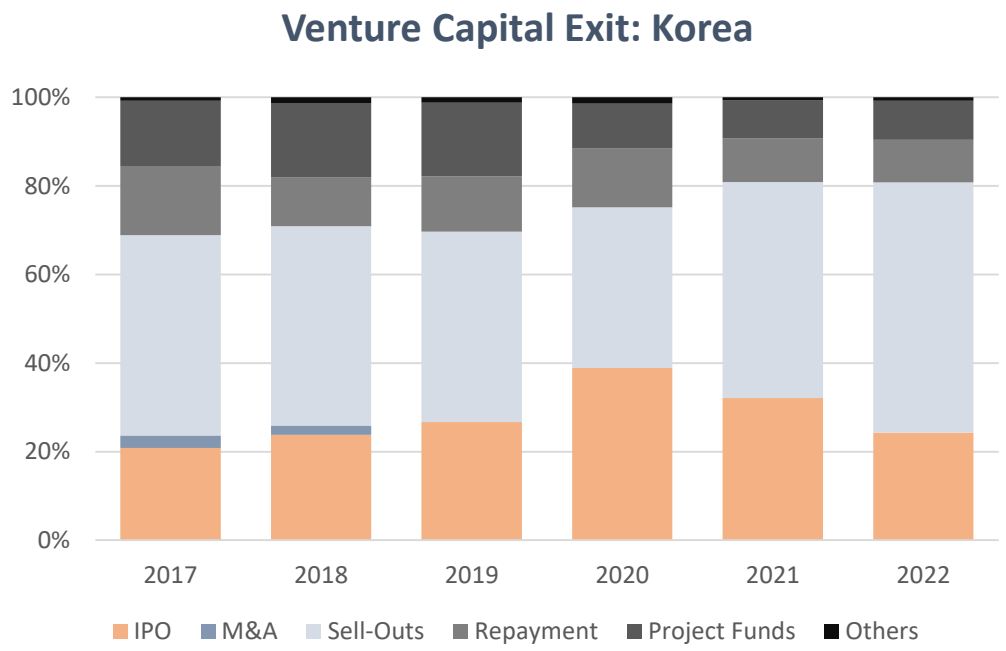


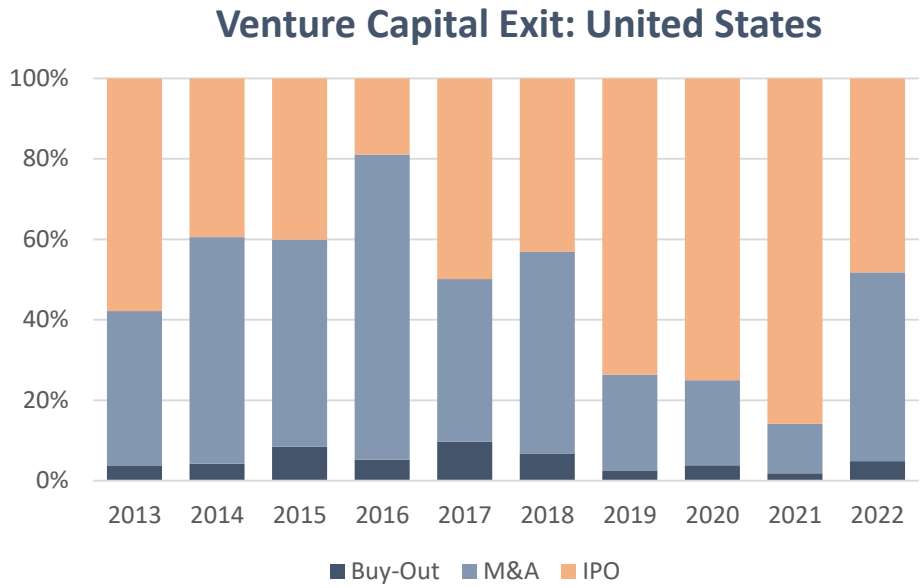
Global Top 100 Venture Fund LP Investors Composition

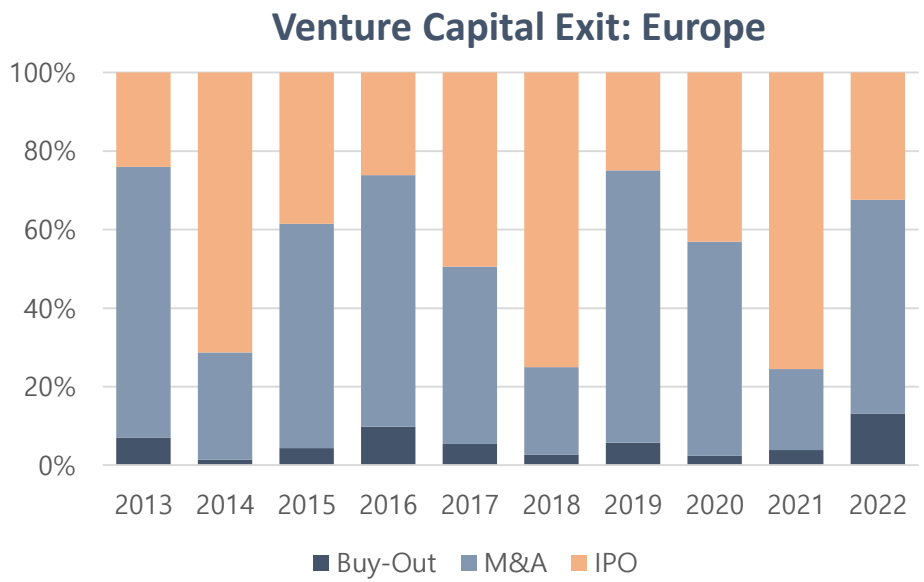


Korea Venture Capital Market

- Exits are mostly reliant upon the IPO market
- More than 60% of KOSDAQ IPO firms are VC-backed



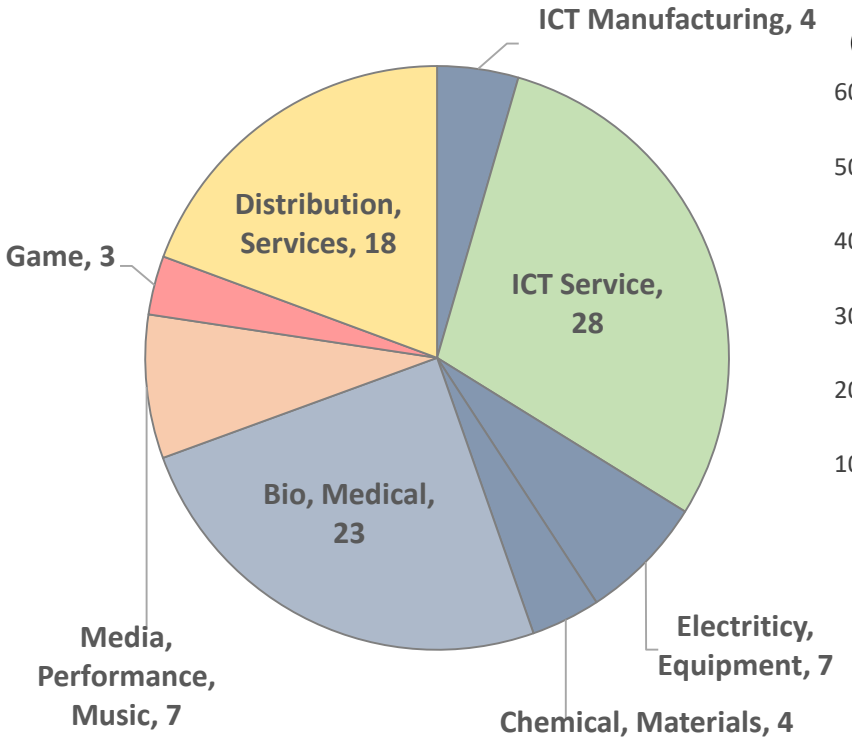




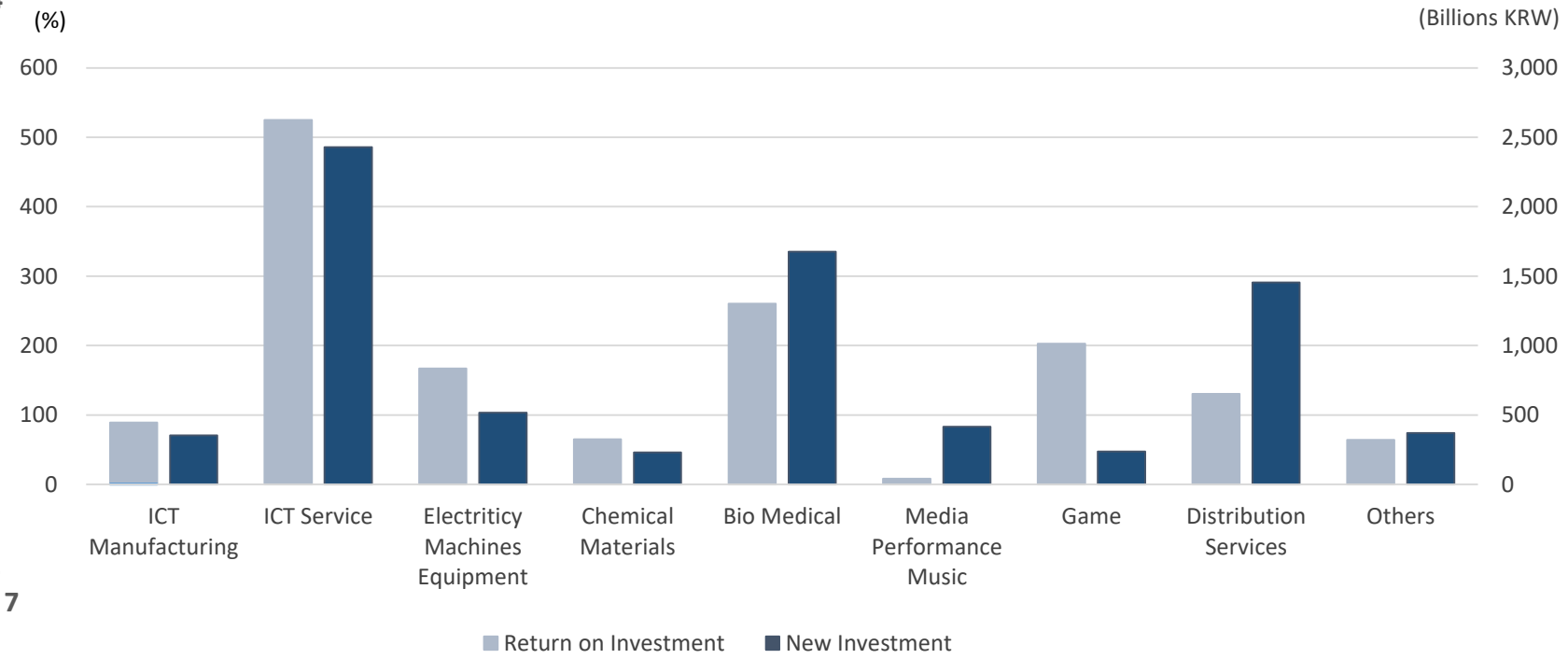
Korea Venture Capital Market

- Investment amount is closely linked to the (expected) return from the investment to the industry
- Concentrated on service sectors and much smaller on manufacturing except biotech industry

Industry Composition of New Investment (2018-2022)



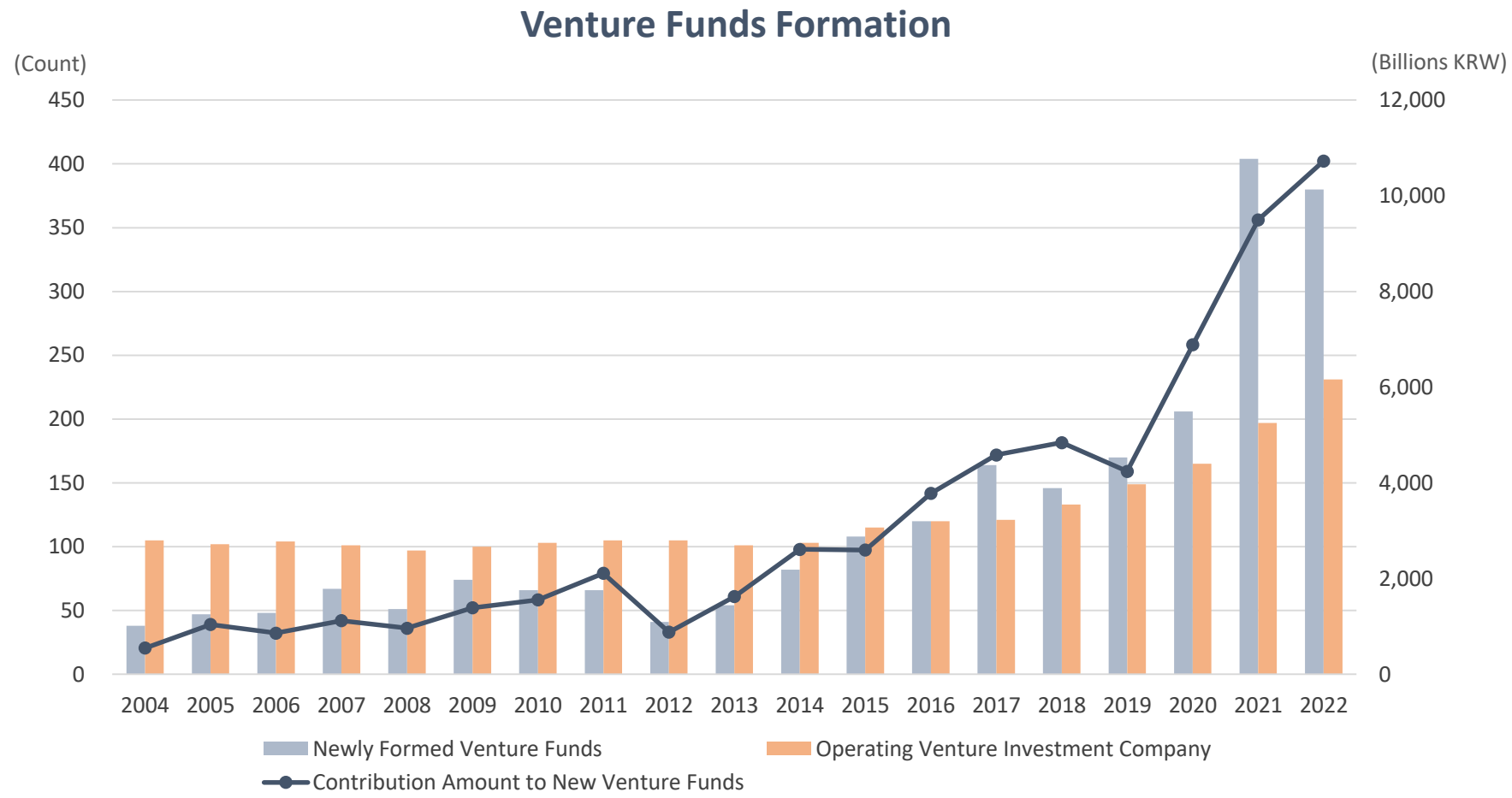
Average Return on Investment and Total Amount of New Investment by Industry (2021)



Expansion of Venture Capital Market in Korea

- Total contribution to new venture funds : average annual growth rate 17.9% from 2005 to 2022

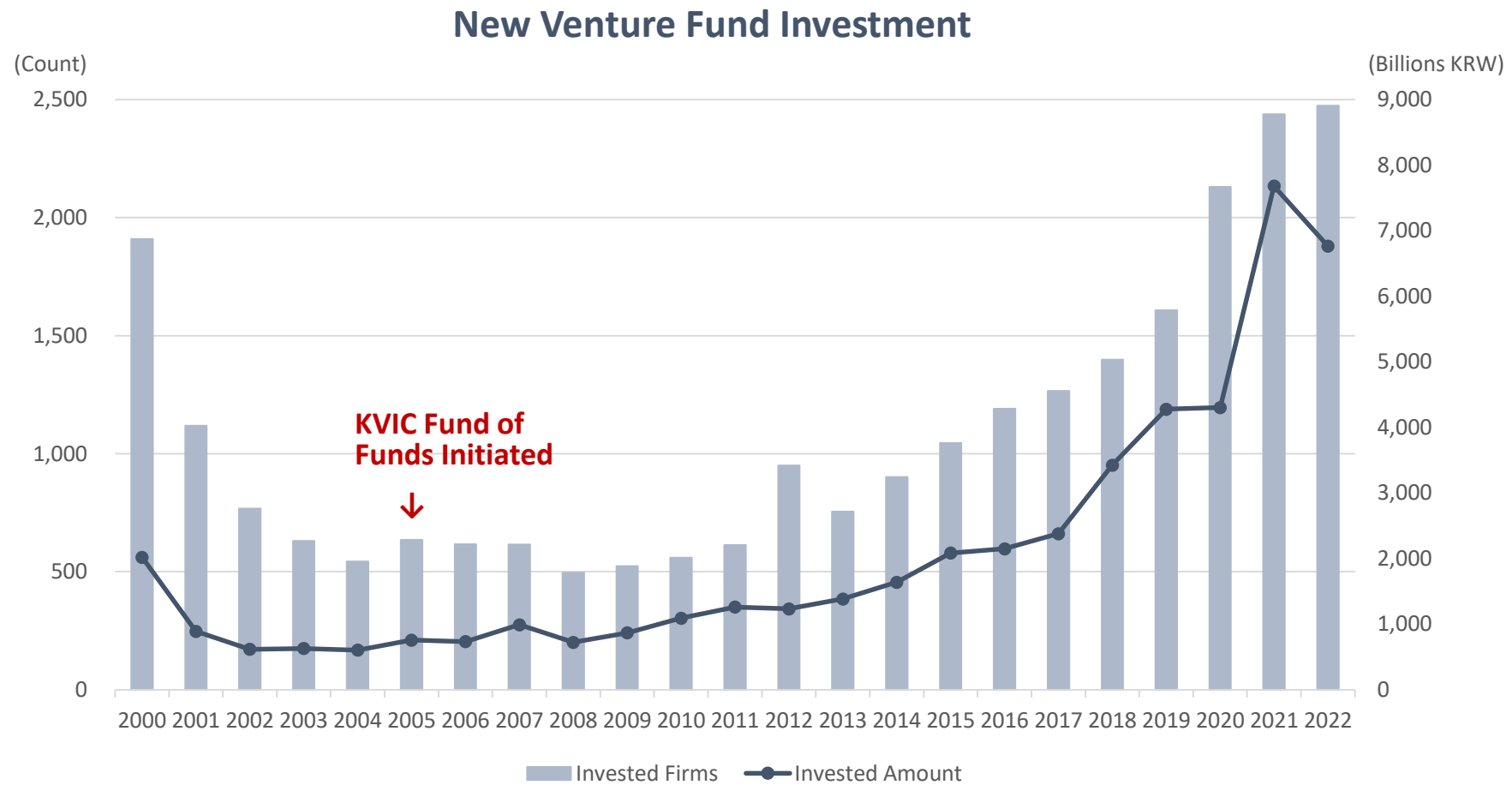
  * Average annual GDP growth rate was 4.9% nominal and 3.2% real during the same period



Expansion of Venture Capital Market in Korea

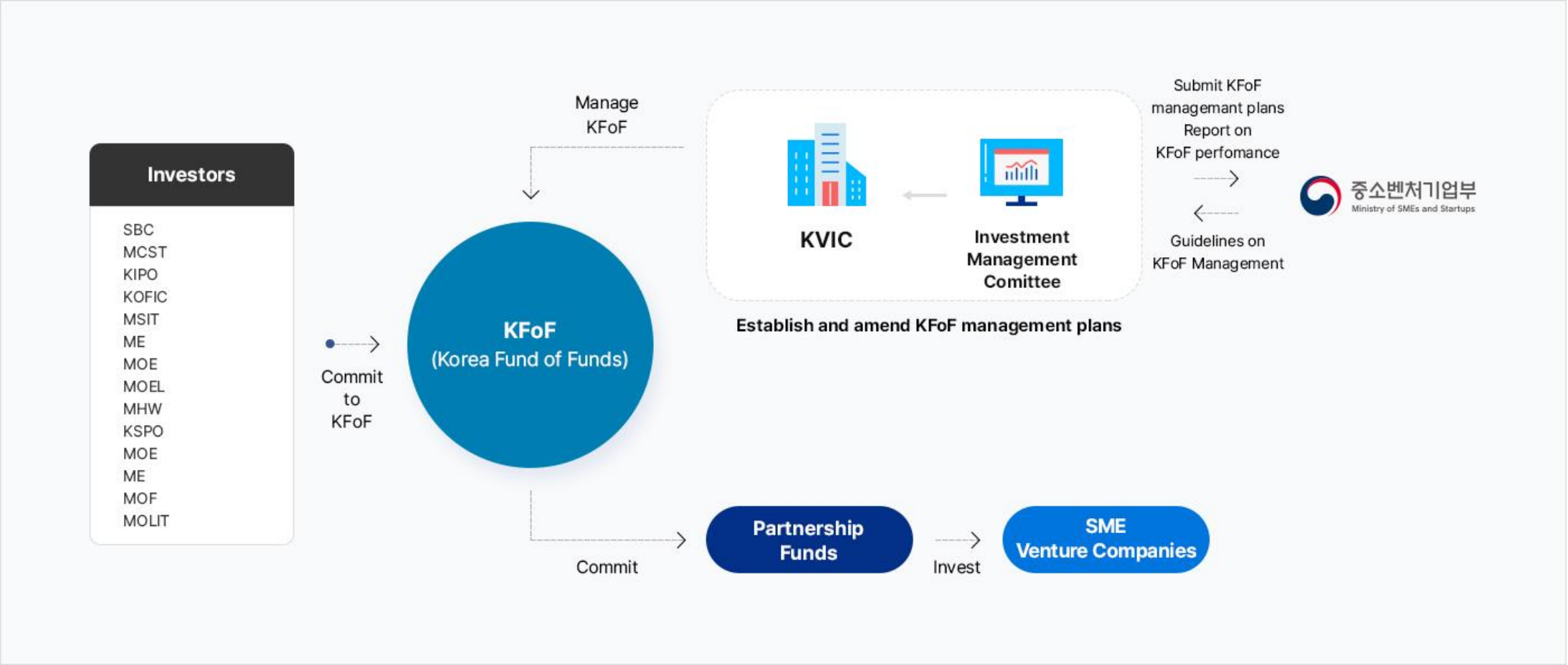
- New venture fund investment grew at average annual growth rate 14.4% from 2005 to 2022

  * Average annual GDP growth rate was 4.9% nominal and 3.2% real during the same period



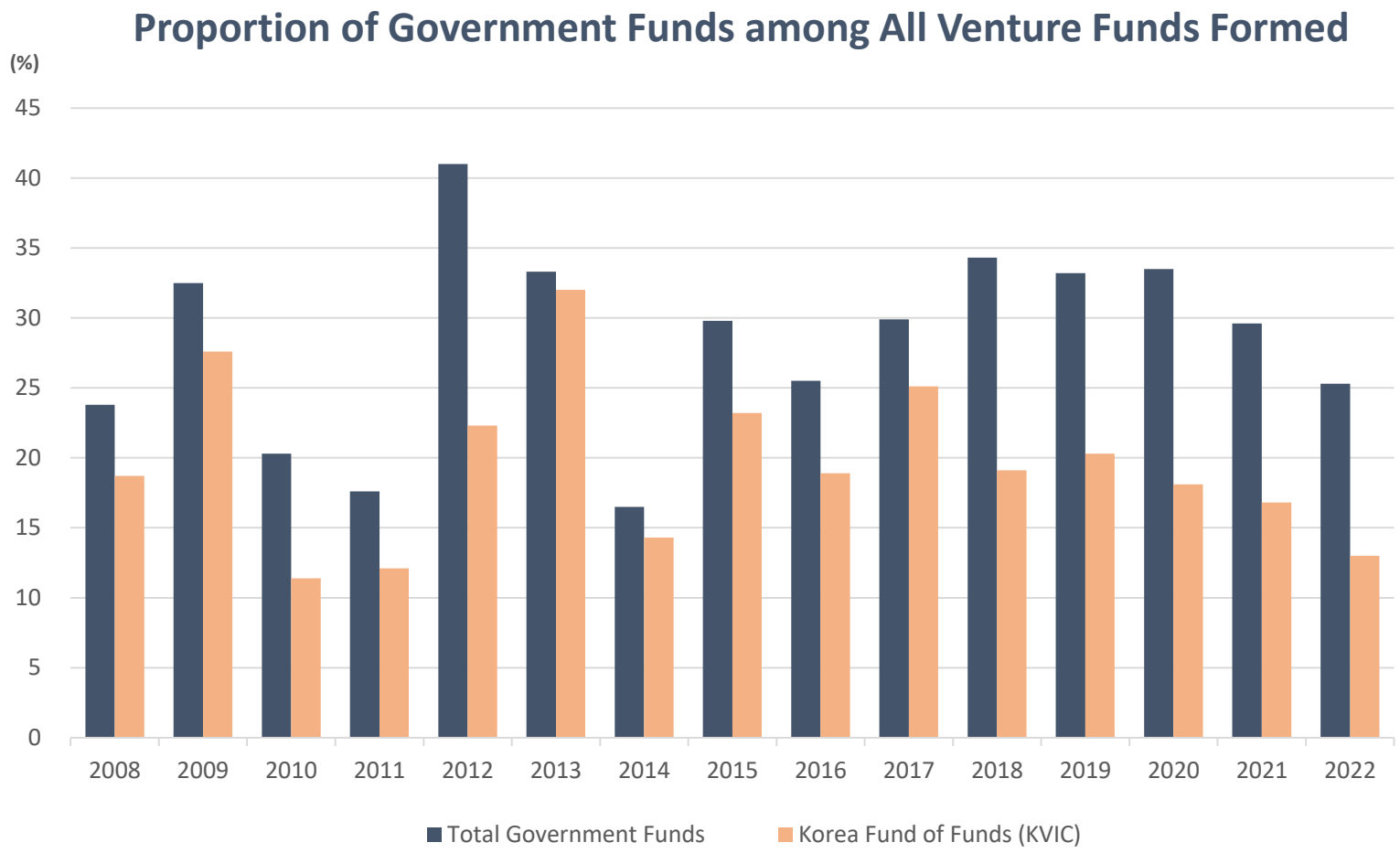
Role of Government in Korean VC Market

- KVIC Funds : Established as a government-financed fund of funds in 2005 based on the “Special Measures for the Promotion of Venture Businesses Act”, managed by Ministry of SMEs and Startups



Role of Government in Korean VC Market

- Large presence of government-supported venture capitals still continues
  (United States: government funds consist of 4.4% of total venture capital investment in 2022)



Role of Government in Korean VC Market

- Large presence of government-supported venture capitals still continues

Proportion of Government Supported Venture Funds

(Billions KRW)

	2018	2019	2020	2021	2022
Total Venture Funds Formation	4,841	4,241	6,886	9,498	10,729
	100.0%	100.0%	100.0%	100.0%	100.0%
KVIC Contributed	2,816	2,324	3,375	4,197	3,857
	58.2%	54.8%	49.0%	44.2%	36.0%
Non-KVIC Public Funds Contributed	1,056	798	2,476	1,913	2,506
	21.8%	18.8%	36.0%	20.1%	23.3%
Pure Private Sourced	970	1,119	1,035	3,388	4,365
	20.0%	26.4%	15.0%	35.7%	40.7%

Proportion of Enterprises Financed by Government Supported Venture Funds

		USA	GBR	KOR	CHN	IND	JPN	FRA	GER	CAN	ISR	SIN	HKG
Enterprises with GVC Finance	First Round	13%	21%	60%	22%	18%	33%	41%	41%	49%	9%	23%	7%
	All Round	17%	24%	62%	23%	19%	36%	45%	44%	55%	13%	23%	8%
Enterprises with an Exit		20%	18%	16%	22%	21%	19%	18%	15%	31%	19%	20%	21%

Size of VC Funds

- VC tends to increase funds allocated to follow-up investment (53.0% in 2017 → 71.2% in 2021)
- However, the size of follow-up investment is not materially different from initial investment (KRW 2.16B vs 1.88B in 2017, 4.57B vs 3.15B in 2021), largely due to the scarcity of large size venture funds
- KVIC and other government-supported fund of funds have allocated most of their resources to small- or medium-sized venture funds, but recently started to finance larger funds such as secondary funds or scale-up funds

Average Size of Venture Funds in Korea and the United States

		2018	2019	2020	2021	2022
New (Billions KRW)	Number of Funds	146	170	206	404	380
	Total Amount	4,841	4,241	6,886	9,498	10,729
	Per Fund	33.2	24.9	33.4	23.5	28.2
Operating (Billions KRW)	Number of Funds	805	920	1,078	1,431	1737
	Total Amount	24,136	27,393	33,286	41,579	51,265
	Per Fund	30.0	29.8	30.9	29.1	29.5
US VC Funds (Millions USD)	Median	30.0	34.5	35.6	30.2	40.0
	Mean	106.1	120.8	140.6	150.1	228.4

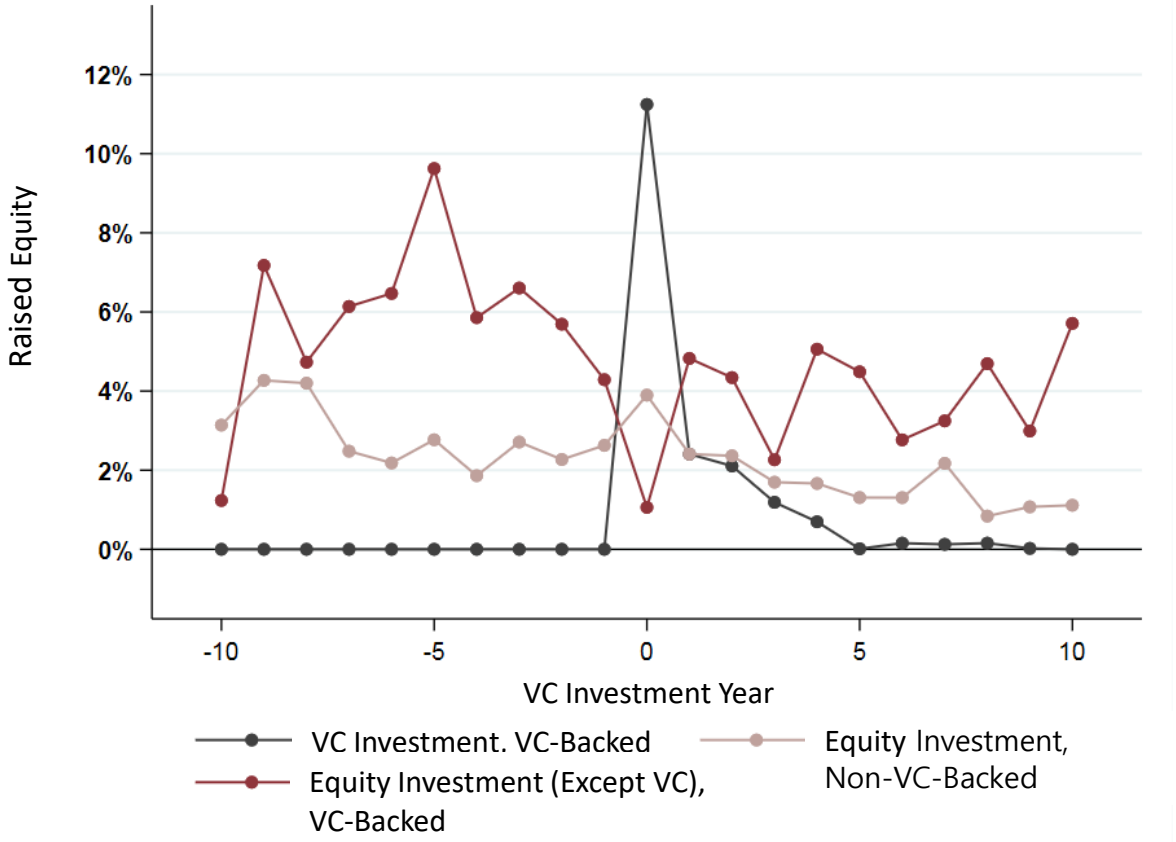
Key Questions

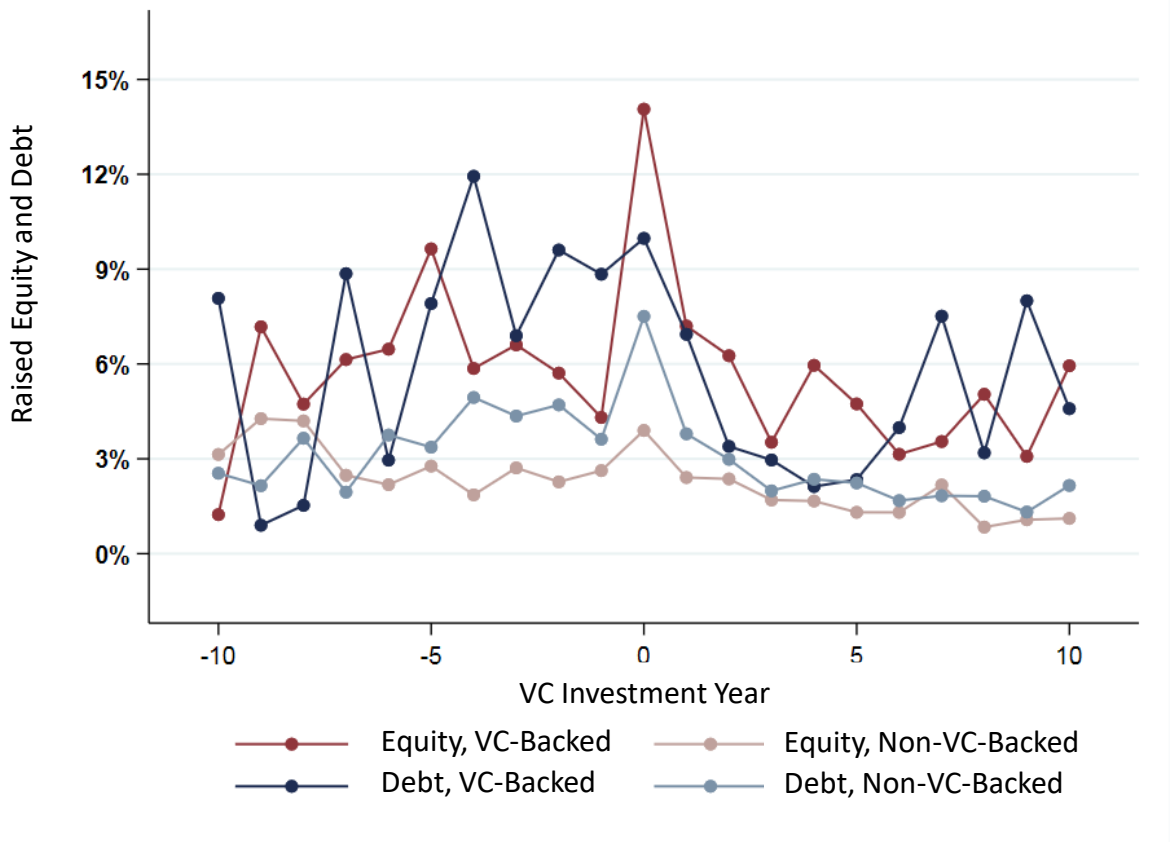
- VCs are designed to address the information asymmetry problem that tends to be severe among early stage firms
  - Equipped with expertise to produce information about the firm's potential profitability and value
  - Holds equity to be compensated for a high risk and participate in the management to raise the firm value
- In a well-performing VC market, VC can successfully
  - Reduce the information asymmetry to facilitate follow-up investment (or keep investing more by themselves) to the firms that are expected to have higher profitability and value in the future
  - Guide the firm's management to raise the firm's future profitability and value
- In order to examine whether Korean VC market performs well, focus on **manufacturing firms at scale-up stage**
  - Compared to service sectors, show much smaller amount invested in manufacturing firms
  - Compared to service sectors, information asymmetry is more likely to persist until the time to exit from the investment → lower investment return is expected, and it actually is the case
  - Check whether VCs are facilitating financing to the firms with high profitability potentials, or failing to do so
  - For manufacturing firms, we can use **patent activity** to capture the characteristics of each firm's innovation, both direction and output, and their relationship with future profitability and firm values

Venture Capital and the Financing of Manufacturing Firms

- For the firms expected to have higher profits and values, VCs can ① make a follow-up investment by themselves, or ② attract more financing from external sources and exit
- Use matched sample of firms with a similar probability of VC investment to compare with non-VC-backed firms

Financing of VC-Invested Firms Around the Time of VC Investment (Compared to Non-VC-Invested Firms)

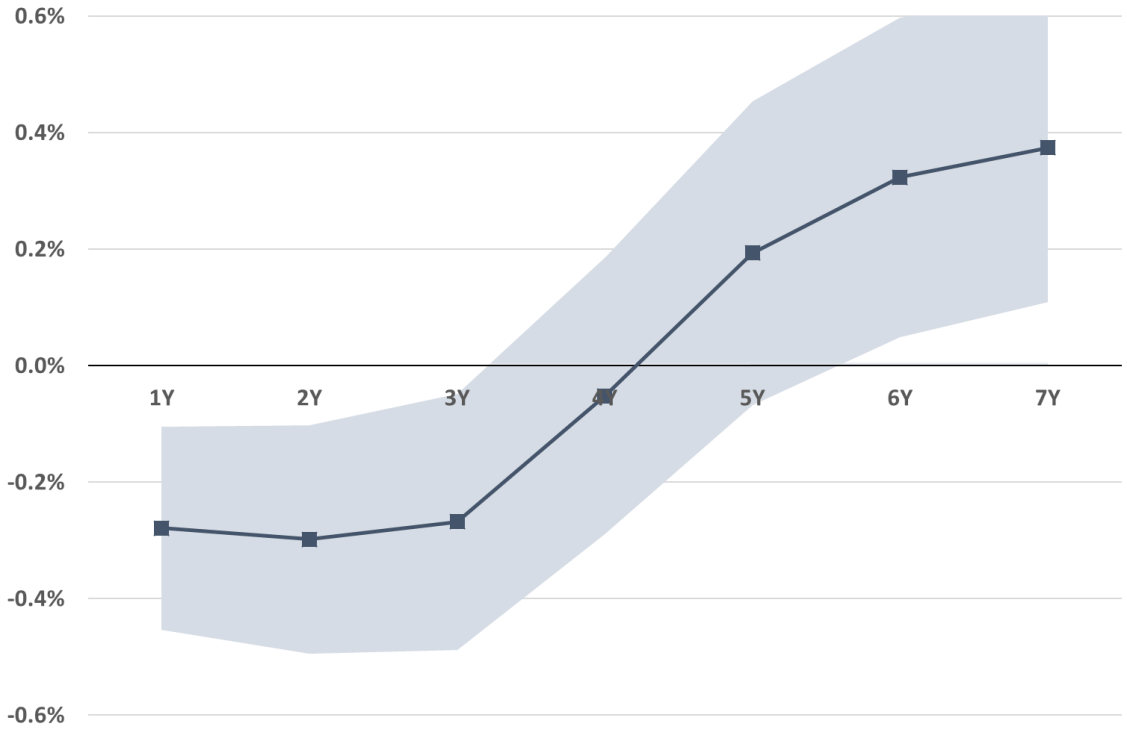


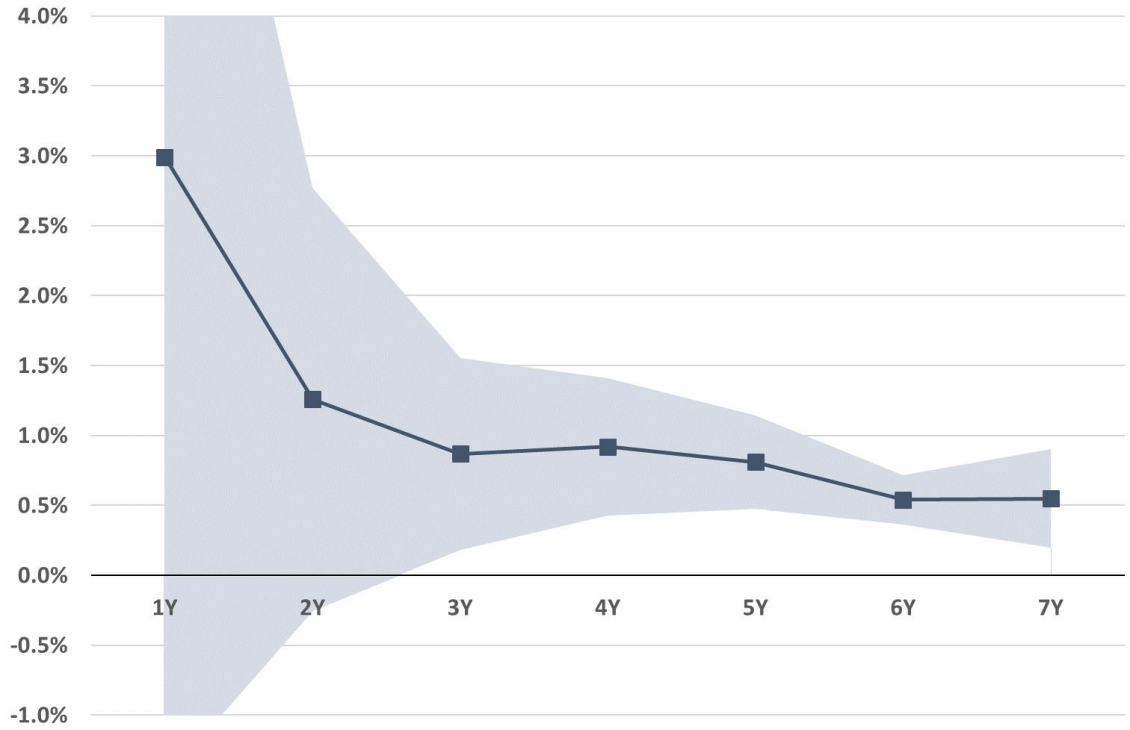


Radical Innovations

- Define radical patents as the inventions that draw on knowledge that is fundamentally new to the field, measured ex-ante using the citation patterns between patents → firms generating more radical patents have more radical innovation direction

Impact of 1 Standard Deviation Increase in Radicalness of Innovation on Average Profit (Left, % of Asset) and Average Excess Returns (Right, Annual %) for the Period of Next N Years





Venture Capital and the Financing of Manufacturing Firms

- Venture Capital makes the invested firm's financing decision more efficient, more consistent with the patterns that modern corporate finance theory expects
- Firms with more radical innovation: lower short-term profitability but higher long-term profitability, takes long time until firm value uncertainty is resolved and undervaluation disappears
- VC-backed firms do not want to rely on equity financing while their market valuation is low → VCs fail to resolve the information asymmetry about the impact of radical innovation on future profitability

Impact of 1 Standard Deviation Increase in Innovation Measure on the Financing of Manufacturing Firms

	Patents		Total Citations		Radical Innovation	
% of Asset	All Firms	VC Effect	All Firms	VC Effect	All Firms	VC Effect
Equity Financing	0.013***	-0.020	0.43***	2.64***	-0.05	-2.93***
	(0.003)	(0.020)	(0.07)	(0.45)	(0.08)	(0.66)
Debt Financing	-0.003	-0.010	-0.11*	0.07	0.04	1.24**
	(0.002)	(0.017)	(0.06)	(0.39)	(0.07)	(0.56)
Difference	0.016***	-0.012	0.53***	2.60***	-0.10	-4.24***
	(0.004)	(0.028)	(0.09)	(0.62)	(0.11)	(0.90)

Venture Capital and the Financing of Manufacturing Firms

- However, a large capital injection is required to promote the performance of firms at the scale-up stage
- VCs tend to induce firms to pursue more radical innovation only when the size of equity financing is large enough
- The more equity financing is, the larger the positive impact of VC investment on firm growth, profitability, and the ex-post influence of corporate innovation

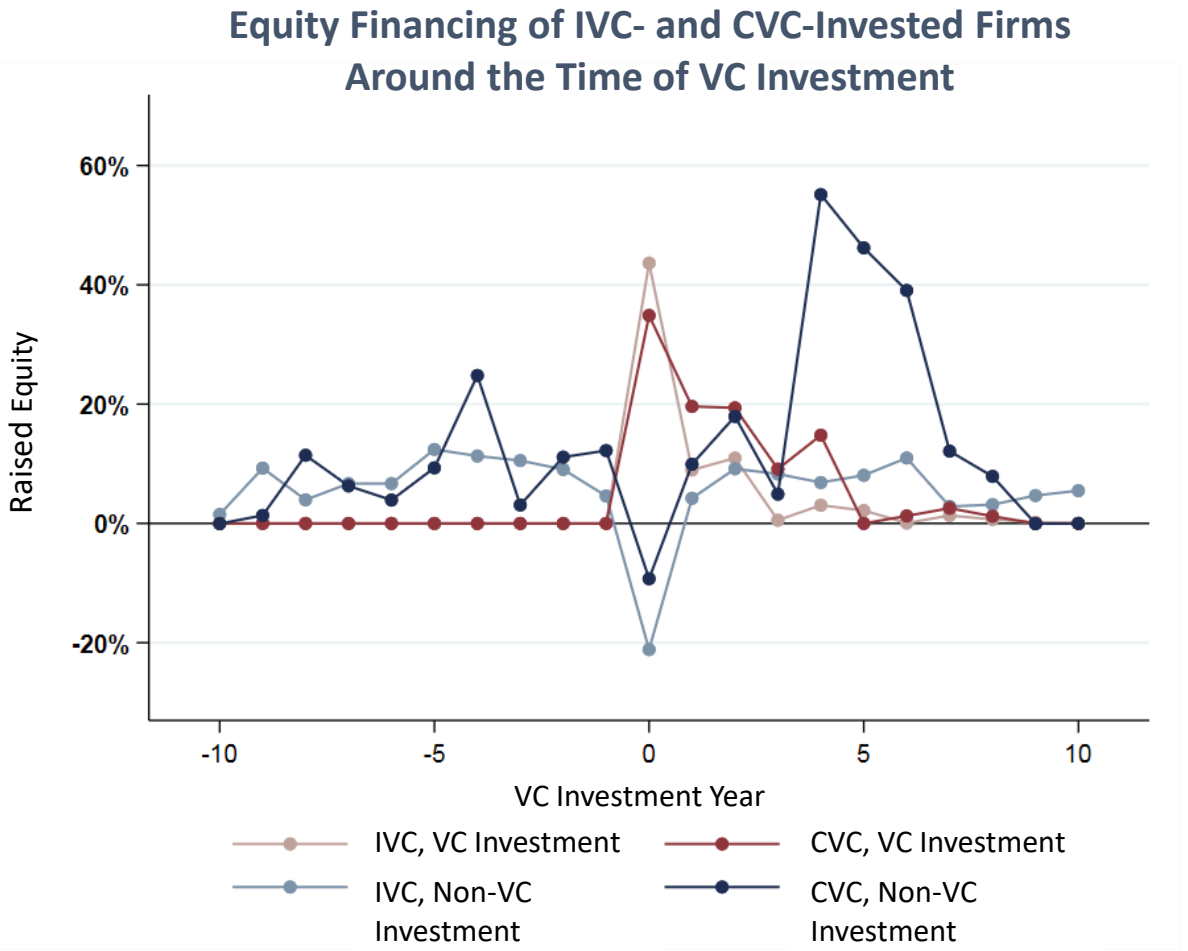
The Relationship between the Size of Equity and Debt Financing and the Impact of VC Investment on the Performance of Manufacturing Firms (Innovation Measures: Multiple of 1 Standard Deviation, Financial Measures: % of Asset)

			Radical Innovation			
% of Asset	Patents	Total Citations	Patents	Ratio	Sales Growth	Profits
Equity Financing	0.347	0.189**	0.676*	0.282*	0.232***	0.039**
Debt Financing	0.063	0.033	-0.116	-0.109	-0.109	-0.017

- Problem is that VC-backed firms at the scale-up stage do not receive enough financing due to the information asymmetry that their VCs are also failing to solve
- Solution: ① Nurture large VCs so that they can make follow-up investment by themselves rather than finding external sources of financing ② Help VCs reduce the information asymmetry ③ Expand the role of VCs more capable of reducing the information asymmetry

Policy Direction

- Nurture large VCs so that they can make follow-up investment by themselves rather than finding external sources of financing : Allocate more public funds to large-scale venture funds
- Help VCs reduce the information asymmetry: Promote partnership between start-ups and established large firms
- Expand the role of VCs more capable of reducing the information asymmetry : Corporate Venture Capitals (CVC)
- Korean government takes steps to pursue all of the above policy directions, along with direct injection of public funds to venture funds specifically aiming to invest in key innovative industries



Thank you!