

What Does Venture Capitalists Learn From IPO Failures?

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Abstract: Venture capital investors focus on early-stage enterprises, the market participants have limited information about their prospects. Their investment decisions involve complicated factors and potentially the failures in the past can affect their future investment decisions. In this paper, within the context of venture capital investment, I examined the impact of the rate of IPO failures in one sector on future investment in the same sector. However, the direction of effect is ambiguous. The learning effect from past failure can be positive if the VC investors gain valuable experience from it. Alternatively, the learning effect can be negative as it reveals the VCs' incapability to invest in that given sector. I exploit a data set from Preqin and a fixed-effect model to help me identify results that are consistent with a positive learning story. This finding contributes to our understanding of how VC investors make investment decisions and how financial market participants react to failures more broadly.

Keywords: IPO, venture capital, fixed-effect model

1. Introduction

Venture Capital Investment, referred to as VC, refers to the investment of investors with the financial strength to fund entrepreneurs with specialized technology and good market development prospects, but lack start-up capital, and bear the risk of investment failure in the entrepreneurial stage. The investment purpose of investors is not to hold shares, but to obtain high returns through different exit methods such as IPO or mergers and acquisitions after the expiration of the investment project and realize the circular appreciation of funds. Since most of the investment projects are high-tech enterprises, the developed venture capital market can often promote the transformation of scientific and technological advantages into competitive advantages and enhance international competitiveness, which is of great significance for providing financial support for the knowledge economy. The United States is the birthplace of venture capital, dating back to the 1920s and 1930s. The United States is also the country with the most developed venture capital and the most complete legal system in the world today. In this article, we hope to provide reference significance for the development and improvement of China's venture capital market through the examination of US venture capital institutions.

In terms of research methods, this paper will mainly use the fixed effect model of panel data to exclude the influence of unrelated variables, to study whether the assumptions made by VCs under the influence of investment failure are valid, and finally draw conclusions.

2. Literature Review

2.1. Overview of Venture Capital

Venture capital (VC) has a great influence on the global economy. Although the age of its market is young, the total of public companies with VC backgrounds has employees that are more than four million people [1]. Kaplan find it necessary to search it because firms that go through IPO and have VC background account for half of them [2]. Harris et al think that the performance of VC markets is better than the public markets [3]. And these VC firms will usually not only provide capital expenditure but also provide guidance and so on. Gompers thinks venture capital plays a role in start-ups as the monitoring function in venture capital [4].

2.2. Effect of VC Itself

In the two channels of the VC Investment Company's exit path, IPO has a larger return, but it faces greater risks than mergers. Agarwal proposed that the cause of failure may fail, in addition to IPO-related trading features (Timing, Initial Returns, And Firm Age) Company accounting measures (Financial Accounting Variables and Fundamental Measures of Risk may have Expert Information: Under-writers, (Venture Capitalists, And Auditors), especially he emphasizes that a higher prestige can give a certification so that the company IPO failure rate decreases [5].

We believe that we also have similar reputation effects in earlier VC investments: companies that have high reputations, have better follow-up performance. More-over, this service requires a premium to supplement the input of a high reputation [6]. Sorensen has divided 10 groups for 1666 VCs according to their own experience (business year), but why is the high reputation VC will have a positive impact on investment companies [7]? What is the decision of this positive impact? Sorensen put forward three reasons First, experienced VCs may be better at monitoring and managing companies. In this paper, I will discuss what kind of characteristics managers can bring more benefits to investment companies.

3. Hypothesis Development

Some scholars have studied the influence of internal managers on the reputation of VC institutions. Harris R S studies the impact of manager turnover [8]. Huang Jian and Hermansson C proposed that the CEO's acquisition ability is positively correlated with the possibility of post-IPO acquisitions [9-10].

In this article, I want to fill in the blank on the impact of VC failures on managers' subsequent investment decisions.

Hypothesis 1: If a VC institution achieves a successful IPO case, it will be more enthusiastic about the institution choosing to exit through an IPO, and vice versa.

The IPO risk is huge. According to China's authoritative media "Sina Finance", Japan's SoftBank Group has invested in more than 600 companies around the world. But in 2019, the failed IPO of SoftBank investment company WeWork took a reputational hit to SoftBank. SoftBank's Vision Fund has lost nearly \$9 billion in recent years. We believe that a failed project of an investment company will bring external doubts about its reputation, which will make other investment companies choose a less risky M&A approach.

Hypothesis 2: The failed investment of venture capital institutions in a certain field will make managers reduce their investment in this industry or field in the future.

We believe that this has something to do with managers' prudence in facing risks. Compared with the private market, public companies have greater potential for financing at high valuations, but also consume more capital costs. For example, the 2008 financial crisis has been continuously and

extensively studied and discussed in recent years. Therefore, we speculate that managers who have experienced financial crises will be more cautious about risk. Since IPOs are riskier, they will reduce their preference for IPOs, so the data in Figures 1 and 2 plummeted in 2008.

4. Data and Empirical Strategy

4.1. Empirical Model

We are trying to examine the effects of past failures on future investments. Given the data, we construct a panel data set at the fund firm*sector*quarter level. The number of observations is 1,171,000. The identification strategy in this paper is the following fixed-effects model.

$$\ln(1 + y_{i,c,t}) = \beta \text{Failed}_{i,c,t-1} + a_i + b_{c,t} + \varepsilon_{i,c,t} \quad (1)$$

In the model, $y_{i,c,t}$ is the amount of deals/value of deals of investor i in industry c in quarter t . As I have two outcome variables: quantity and value, the two versions of failure measurements are: $\ln(1 + \text{Num. of Failed Investments}_{i,c,t})$ or $\ln(1 + \text{Total Value of Failed Investments}_{i,c,t})$. $\text{Failed}_{i,c,t-1}$ can be both, which is a measure of the intensity of failure in the past quarter. In addition, in the model, I include a_i are investor-level fixed effects. $b_{c,t}$ are industry*time fixed effects. a_i can control five-investor-specific factors that can affect investment but are time-invariant. $b_{c,t}$ on the other hand, measures the sector dynamics that are common to all investors in the same quarter and potentially affect VC investors' decision investments. Alternatively, to show that the effect is indeed a learning effect within the same sector, I also design the following specification as a placebo test. Based on the main specification above, I add another variable $\text{Failed_Other}_{i,c,t-1}$, which represent the failures of IPO from sectors other than c that are invested by the VC investor. Since learning from failures is mostly likely to happen within the same sector, namely one sector's failures won't affect the investment decision of another sector next period.

$$\ln(1 + y_{i,c,t}) = \beta_1 \text{Failed}_{i,c,t-1} + \beta_2 \text{Failed_Other}_{i,c,t-1} + a_i + b_{c,t} + \varepsilon_{i,c,t} \quad (2)$$

Table 1: Descriptive statistics.

Variable	mean	sd	min	p50	max	N
Panel A: All Observations in the Panel						
Number of Deals	0.043	0.227	0	0	9	1,170,519
Value of Deals	1.262	33.252	0	0	7750	1,170,519
Number of Failed Deals	0.000	0.015	0	0	3	1,170,519
Value of Failed Deals	0.006	0.536	0	0	87	1,170,519

Table 1: (continued).

Number of Other Failed Deals	0.001	0.026	0	0	3	1,170,519
Value of Other Failed Deals	0.020	0.958	0	0	87	1,170,519
Panel B: Non-zero Values						
Number of Deals	1.097	0.394	1	1	9	45,852
Value of Deals	37.850	178.275	0	12	7750	39,024
Number of Failed Deals	1.017	0.159	1	1	3	237
Value of Failed Deals	35.014	19.845	2	30	87	208
Number of Other Failed Deals	1.028	0.209	1	1	3	741
Value of Other Failed Deals	33.575	20.449	0	30	87	695

5. Results and Discussions

5.1. Descriptive Analysis

This article uses stata software to interpolate the indicators that affect the decision-making of venture capital institutions, through the number of failed deals, the value of failed deals, the number of analyses of deals, the value of deals, and other indicators to find factors influencing the decision-making of VCs.

In Table 1, there are two panels. Panel A shows the summary statistics for variables in the panel data. The panel data is constructed for each VC investor in each quarter during its survival period between 1990 and 2020. Therefore, there must be many observations with zero values as VC investors won't make investments as frequently as quarterly. On average each VC investor has 0.043 each quarter, which can be translated into 0.52 deals each year, which is a reasonable number. At the quarterly level, the number of deals is very small which is even true for failed deals. I also summarize the variables conditional on them being non-zeros in Panel B. Actually, there are not that many failed IPOs at the quarterly level. There are 237 investors* quarterly level observations with failed IPO. It suggests that IPO failures are infrequent and stark events that potentially pose huge shocks to VC investors. That's also why we focus on failed IPO ventures.

5.2. Main Results: The Within-Sector Effects on Investment

In Table 2, I show the results of the regression model (1). It informs us of the impacts of failed IPOs on future investment in the same sector. We have two versions of failure, one is measured using the number of deals and the other is using the value of deals. For each version, I also consider different specifications of the regression model. In the first specification for each failure definition (1) and (4), I include no fixed effects. In columns (2) and (5), I include investor fixed effects; in columns (3) and

(6), I include both investor and industry*quarter fixed effects. From the table, we can see that the coefficients are positive and significant across all specifications. Moreover, the coefficients are decreasing when I include more controls. It implies that there are indeed investor-specific and industry-specific factors that affect the investment and committing them might bias the estimates.

Table 2: The impacts of past failures on future investment (Within-Sector).

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(1+Number of Deals)			ln(1+Value of Deals)		
Failure(Number)	0.154*** (0.011)	0.108*** (0.011)	0.094*** (0.011)			
Failure(Value)				0.115*** (0.009)	0.075*** (0.009)	0.066*** (0.009)
Constant	0.020*** (0.000)	0.020*** (0.000)	0.020*** (0.000)	0.065*** (0.000)	0.065*** (0.000)	0.065*** (0.000)
Investor Fixed Effects	No	Yes	Yes	No	Yes	Yes
Industry*Quarter Fixed Effects	No	No	Yes	No	No	Yes
N	1148300	1148253	1148253	1148300	1148253	1148253
R-sq	0.000	0.050	0.073	0.000	0.060	0.075

Standard errors in parentheses: * p<0.05; ** p<0.01; *** p<0.001

5.3. Placebo Test: The Cross-Sector Effects on Investment

We expect to see only within-sector effects (the results in section 5.2) and zero effects from cross-sector. This is indeed true as shown in Table 3. Likewise, we have two versions of the definition of failures, either based on the number or value of deals. Apart from that, I add one more variable in each specification that represents the failures of other sectors' companies that the VC investor invested. Across all specifications, the within-sector coefficients (coefficients before "Failure") still survive and cross-sector coefficients (coefficients before "Other Failure") are not significant at all. It suggests that such effects are truly a phenomenon of positive learning from past failures in the same sector.

6. Conclusion

Their investment decisions involve complicated factors and potentially the failures in the past can affect their future investment decisions. In this paper, within the context of venture capital investment, I examined the impact of the rate of IPO failures in one sector on future investment in the same sector. However, the direction of effect is ambiguous. The learning effect from past failure can be positive if the VC investors gain valuable experience from it. Alternatively, the learning effect can be negative as it reveals the VCs' incapability to invest in that given sector. This finding contributes to our understanding of how VC investors make investment decisions and more broadly how financial market participants react to failures.

Table 3: The Impacts of Past Failures on Future Investment (Within-Sector and Cross-Sector).

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(1+Number of Deals)			ln(1+Value of Deals)		
Failure (Number)	0.154*** (0.011)	0.107*** (0.011)	0.094*** (0.011)			
Other Failure (Number)	0.006 (0.006)	-0.012 (0.006)	-0.004 (0.006)			
Failure (Value)				0.115*** (0.009)	0.075*** (0.009)	0.066*** (0.009)
Other Failure (Value)				0.003 (0.005)	-0.007 (0.006)	-0.012 (0.015)
Constant	0.020*** (0.000)	0.020*** (0.000)	0.020*** (0.000)	0.065*** (0.000)	0.065*** (0.000)	0.065*** (0.000)
Investor Fixed Effects	No	Yes	Yes	No	Yes	Yes
Industry*Quarter Fixed Effects	No	No	Yes	No	No	Yes
N	1148300	1148253	1148253	1148300	1148253	1148253
R-sq	0.000	0.050	0.073	0.000	0.060	0.075

Standard errors in parentheses: * p<0.05; ** p<0.01; *** p<0.001

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