

Research on the Preferences of U.S. Venture Funding Deals in 2023 for the Industry in Which the Company Operates

Xianyang Lei *

School of Economics and Management, the Chinese University of Hong Kong, Shenzhen,
Shenzhen, 518000, China

* Corresponding author: 121020095@link.cuhk.edu.cn

Abstract. Since the effects of geopolitics and recession, venture capital deals have become more cautious and companies' access to capital has become more difficult. Therefore, this research will analyze 2023 U.S. venture capital deal data to explore venture capitalists' preference for the corporate industry. In previous similar studies, visual graphics were essential, which was also applied in this study. At the same time, OLS regression model was also used for verification in this research. The results show that in 2023, U.S. venture capital deals favor the technology industry, especially the two hot spots of artificial intelligence and biotechnology. There is a positive linear relationship between venture capital investment and corporate hot spots. When the company industry moves closer to the technology industry, the amount of venture capital investment increases significantly. However, the November-December data is still to be added. Forecasting the future preferences of the venture capital trading industry is also an issue that needs to be addressed. Finally, on the basis of previous studies, this paper also provides some meaningful results for venture capital market participants, hoping to help improve the efficiency of venture capital market.

Keywords: Preference, U.S. venture capital deal, visual graphics, OLS regression model.

1. Introduction

It is necessary and beneficial to explore the preferences of venture capital deals for the industry in which the company operates. According to Dong Jing, industry selection of venture capital firms is a key strategic decision [1]. Venture capital firms' industry preferences then determine which companies are able to access capital. Just as Carter said, finding capital can be a time-consuming but necessary task for businesses [2]. Especially in the context of continuous interest rate hikes in the United States in 2023 and constant geopolitical conflicts around the world, capital is more cautious about investment. According to Maier and Walker, with many companies struggling to access equity and debt markets, capital is hard to come by [3]. As a result, some firms become dependent on external capital [4]. One of these external capitals is venture capital. Venture capitalists can fund companies at any stage of development, as long as they are satisfied with the company's growth potential [5].

Yet some evidence suggests that venture capital deals will favor specific industries. Gupta, for example, reported that venture capital firms favor tech companies [6]. Ritter argued that risk averse venture capitalists will avoid young, less mature companies with high industry uncertainty in favor of stable companies like those in the oil industry [7]. Therefore, the purpose of this paper is to statistically research the preferences of venture capital deals in the United States in 2023 for the industry in which the company operates, which allows companies to quickly match the preferences of venture capitalists in their search for capital and thus obtain capital.

The topic of the essay is about research on the preferences of U.S. venture funding deals in 2023 for the industry in which the company operates. And venture capital firms' industry preferences are a part of the venture capital program evaluation system. Since the 1960s, American scholars such as Mayers and Marquis began to study the evaluation indicators of venture capital projects [8]. But their research focuses too much on financial considerations. Tyebjee then used questionnaires and factor analysis to come up with the first venture capital program evaluation system in the United States [9]. This was broadly categorized into product characteristics, market characteristics, financial status, and personal characteristics and experience of the entrepreneur. In recent years, many scholars have

adopted many advanced models to analyze the evaluation indicators of venture capital. For example, Yuan used the Matter-Element model, Yi used the data envelopment analysis model and so on [10, 11]. These studies add to the system of evaluation of venture capital indicators a large number of factors such as information management of the venture, personality of the entrepreneur, product performance, market attractiveness, production of raw materials and so on. It provides more basis for venture capital trading indicators. However, few studies have explored the impact of the industry in which a venture firm operates on venture capital transactions. In fact, this factor should be taken into account to improve the assessment system of venture capital trading indicators. That's what this research is trying to contribute to.

In summary, this research explored the preferences of U.S. venture funding deals in 2023 for the industry in which the company operates. If venture capitalists have corporate industry preferences and the amounts and evaluation criteria for venture deals vary with these preferences, this information may be important to business owners in narrowing down potential sources of funding and to scholars in refining the system of investment evaluation metrics for venture projects. And as MacMillan point out, by making venture capitalists aware of the importance that their peers place on certain standards, and by alerting small business owners to potential deficiencies that can be corrected before submitting a proposal for financing, enhanced knowledge will make venture capital markets more efficient [12].

2. Methods

2.1. Data Sources

The data for this paper is collected from the Kaggle website to select the venture capital deals in the US from January 2023 through October 2023, totaling 171 observations. The dataset contains the dollar amount, company, valuation, industry and timing of U.S. venture deals in 2023.

2.2. Variable Selection

Since this paper focuses on venture capitalists' preferences for industry, industry is the primary indicator of selection. And the key factor to measure how much preference is the amount of investment in venture deals, so this project takes these two factors as the main research index.

2.3. Data Processing

For a better visualization, this project has made a categorization of companies in different industries and represented them with numbers. Numbers 1-6 represent Technology (Artificial Intelligence, Network Security, etc.), Business (Financial Services, Insurance, etc.), Medical (Healthcare, etc.), Resources (Mining, etc.), Manufacturing (Construction, Automotive, etc.) and Other (Transportation, etc.). It is possible to visualize this data to obtain Figure 1.

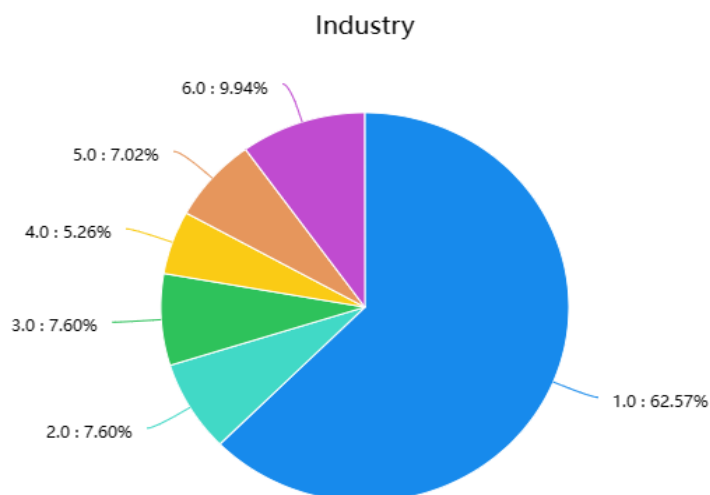


Figure 1. Industry share histogram

Some basic conclusions can be drawn by observing the industry histogram of these investee companies. First of all, the technology industry accounts for the largest proportion, in other words, the industry with the largest number of venture deals in the United States in 2023 is technology. Furthermore, venture capitalists may have a preference for the tech sector.

Similarly, this project categorized the amount of money per venture deal in the U.S. in 2023 and represented it numerically. 7 indicates less than \$200 million, 8 indicates \$200-500 million, and 9 indicates more than \$500 million. In this way, the proportion distribution of the amount size can be obtained as shown in Figure 2.

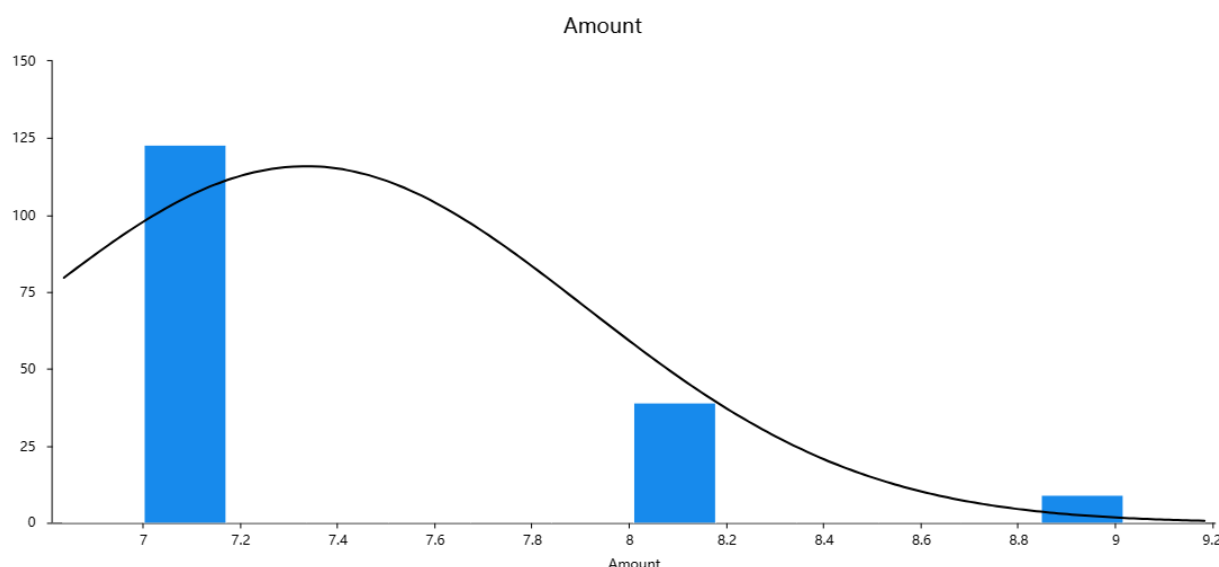


Figure 2. Proportion Distribution of the Amount Size

Obviously, the frequency of venture capital transactions with the amount of more than 500 million i.e., the frequency of 9 is 9 times. And of those nine deals, five occurred in the tech sector. As a result, well-capitalized venture capitalists also seem to have a preference for the technology sector.

But research on the amount of venture deals in relation to the industry and specific investment hot spots within the tech industry still needs to be done in a more precise and intuitive way.

2.4. Method Introduction

Regression analysis can be a method of predicting a response variable (dependent or outcome variable) using one or more independent variables (explanatory variables). In general, regression analysis can be used to pick explanatory variables that are related to the response variable and describe the relationship between the two. This is therefore a good method to study the relationship between the amount of venture capital deals and the industry in which the company operates. Since this relationship only involves the two variables of industry and amount, it can be regression by ordinary least square (OLS) method.

Figure 3 shows a scatter plot of U.S. venture capital transactions in 2023. The horizontal axis shows the industry segments in which the company operates. Due to the large number of industries, only some of them are indicated here. The vertical axis is the amount of investment.

The dots in the figure 3 represent venture capital transactions. For a better linear regression, it needs to assign values to the preferences that a segment is subject to. For example, Artificial Intelligence has been invested in the greatest number of times and the amount invested is evenly distributed, so it is identified as "very preferred" with an assigned value of 10. Sectors such as Digital Media have the least number of transactions and are identified as "Not Preferred" and assigned a value of 1. 1-10 therefore indicates an increasing level of preference. So, the independent variable in the linear regression is the degree of preference, represented by the numbers 1-10. The dependent variable, in turn, is the amount of venture capital transactions.

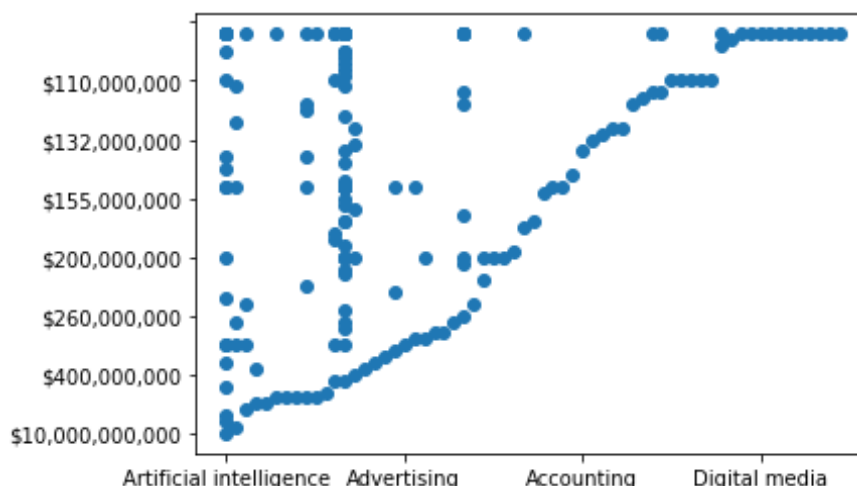


Figure 3. The scatter plot of U.S. venture capital transactions in 2023

3. Results and Discussion

3.1. Visualization of Venture Capital Preferences for Hotspot

The main result is that venture capitalists have a significantly strong preference for AI and biotechnology. While traditional industries such as energy and apparel do not receive preferences. As shown in the industry hotspot preference graph in Figure 4, venture capital preferences gradually rise as industry hotspots gradually converge like the technology sector. Especially as soon as the hotspot enters the tech sector, venture capital preferences have exploded. Venture capital has a clear positive linear relationship with industry hotspots. Once again, this illustrates that U.S. venture capital deals in 2023 are more skewed toward tech-based industries.

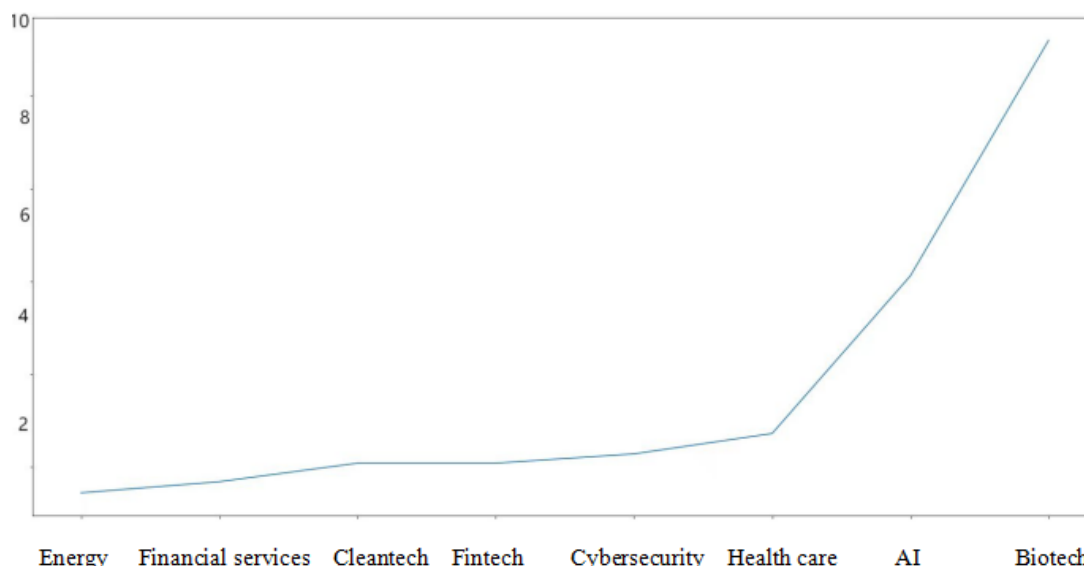


Figure 4. Industry hotspot preference graph

3.2. OLS Model Validation

Table 1 shows ordinary least square (OLS) results. It shows that the R-squared equals to 0.404 which means the model has a general goodness-of-fit. And the standard error equals to 0.063 which means the degree of fit between capitalists' industry preference and industry hotspot is very good. These two results also show that OLS models can be used. What's more, the P-index is equal to 0.000 less than 0.0001 which indicates a confidence level of 99.99% or more. This indicates that there is at

least a 99.99% probability that venture capital preferences will become higher as the industry hotspot moves closer to the technology category.

Table 1. OLS Regression Results

coef	std err	t	P> t
0.4086	0.063	6.480	0.000

Although the results seem clear enough, this is only for January-October venture capital deals in the U.S. in 2023. November-December data will still have an irresistible impact on the results. However, the data for November-December is not currently available, which means that the predicted results are only close to an accurate preference, but it is still not the most accurate result as the hotspots of venture capital trading will change with the market over the period.

At the same time, this is just an overall trend of preference in the U.S. risk trading market. The preferences of some venture capitalists who are only interested in specific sectors need to be analyzed separately.

4. Conclusion

In order to obtain financing, business owners must identify potential investors and set up portfolios favored by venture capitalists. By designing an investment proposal that meets the needs of venture capitalists, the success rate of obtaining capital can be increased. By capturing the current market buzz, a business can be favored by more venture capital. This requires identifying venture capitalists and their preferences for the industry.

In this study, venture capital deals in the United States from January-October 2023 were analyzed. Venture capitalists have a preference for specific industries or hotspots. Venture capital has a preference for the technology sector especially artificial intelligence and biotechnology. OLS regression also verified the rationality of these results. However, these results seem to have been in evidence for some time. The year 2023 is being hailed as the tech year of artificial intelligence. In the first half of the year a chatbot called the most powerful ever, ChatGPT, detonated the investment world. ChatGPT as a representative of the AI self-generation technology, so that artificial can only realize from perception to understand the world Road generation to create the world of the giant leap. Not only that, but in the second half of 2023, the "miracle weight loss pill" came out of nowhere. Danish pharmaceutical company Novo Nordisk's third-quarter revenue and Wegovy sales greatly exceeded market expectations. It's no surprise, then, that venture capitalists are favoring the two hotspots of artificial intelligence and biotechnology.

These findings have implications for risk market participants. Business owners can determine in advance the direction of business development that investors prefer, thus reducing the difficulty of obtaining capital. Venture capitalists can learn which industry hot spots their peers prefer in order to improve their investment direction. The efficiency of venture capital markets would be greatly improved. Last but not the least, although this study provides some meaningful information, further research remains to be done. For example, in the absence of news incentives, whether venture capitalists have a preference for existing industries. In addition, it is possible to count venture capital trades over a longer period of time and try to predict the future preferences of venture capital trades for use by those who specialize in venture capital.

References

- [1] Dong Jing, Xie Yundian. Performance feedback and industry selection for corporate venture capital. *Nankai Business Review*, 2022, 25 (2).
- [2] Carter R, Van Auken H. Venture capital firms' preferences for projects in particular stages of development. *Journal of Small Business Management*, 1994, 32 (1): 60.

- [3] Maier J, D Walker. The Role of Venture Capital in Financing Small Business, Journal of Business Venturing, 1987.
- [4] Carter R, H Van Auken. Personal Equity Investment and Small Business Financial Difficulties, Entrepreneurship. Theory and Practice 15, 1990.
- [5] Kuratko D, R Hodgetts. Entrepreneurship: A Contemporary Approach. Chicago: Dryden Press, 1989.
- [6] Gupta A. K, Sapienza H. Determinants of venture capital firms' preferences regarding the industry diversity and geographic scope of their investments. Journal of business Venturing, 1992, 7 (5): 347 - 362.
- [7] Ritter J. The 'Hot Issue' Market of 1980, Journal of Business, 1984.
- [8] Myers S, Marquis D. Successful industrial innovations. A Study of factors underlying innovation in selected.
- [9] Roberts E B. High stakes for high-tech entrepreneurs. Understanding venture capital decision making. Loan Management Review, 1991.
- [10] Yuan Y, Sheng H, Shi H. Research on Evaluation System of Internet Venture Capital Project based on Matter-Element Method. International Journal of Hybrid Information Technology, 2016, 9 (9): 393 - 410.
- [11] Yuanjun, Z, Zengrui T. Research on evaluation of venture capital fund project based on data envelopment analysis model. Journal of Computational and Theoretical Nanoscience, 2016, 13 (2): 1266 - 1274.
- [12] MacMillan I, R Siegel, P Narasimha. Criterion Used by Venture Capitalists to Evaluate New Venture Proposals, Journal of Business Venturing, 1985.