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# The Impact of the Business Model on the Size of Investments Received by a Startup at the Series A Stage in the US Market

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**Abstract.** Numerous studies have been devoted to the factors influencing the market success of startups. However, at early stages of startup development, obtaining investments is a priority. Nevertheless, the topic of the influence of various factors, specifically the choice of business model, on the amount of investment received by a startup remains underexplored. Therefore, the aim of this research is to assess the impact of the business model on the amount of investment received by a startup at the Series A stage. The hypothesis being put forward is that the business model patterns utilized by the startup impact the amount of investment received at the Series A stage. To achieve this goal and test the hypothesis, Student's t-test and Mann-Whitney test were applied to a sample of 2313. As a result of the study, the influence of the business model for different industries was revealed. Considering that different business models have varying effects on the amount of investment, models leading to an increase or decrease in investment size were identified for startup founders. The results of this article enable startups to compare their chosen model with those that allow for larger investments and to adjust their chosen strategy. Additionally, this study stands out due to the uniqueness of the methods applied within the scope of the issues covered in the article and the unique sample size in assessing the impact of the business model factor. The findings of this research serve as a catalyst for incorporating the business model factor into further studies dedicated to a comprehensive assessment of a startup's investment attractiveness and the creation of a machine learning model to predict the success of obtaining investments and the amount of investment a startup can expect.

***Key words:*** business model; startup; Series A; investment; impact; industry; financing.

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## 1. Introduction

Startups are a popular form of business initiation: as of 2023, there are over 200,000 active startups worldwide[1], and that is only the ones still functioning. After all, 80 to 90% of startups fail for various reasons. [1] Accordingly, the number of failed startups is several times higher.

According to various studies, the main reasons for startup failure include: incorrect or non-existent business models, lack of funding for further development, lack of demand for the product or service, as well as poor or improper team organization and business processes.

It is worth noting that the percentage of failure due to a lack of funding for further development is high: estimates range from 21% [2] to 29% [3] and 34% [4], indicating that this problem is significant, and its resolution is crucial for the startup industry.

The sources of funding can include personal savings, loans from family/friends/acquaintances, bank loans, and various forms

[1] https://www.startupranking.com/countries

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of investments. However, obtaining a bank loan for a young company is problematic [5] due to the lack of sufficient positive cash flow in the first 2-3 years of the startup[1]. Therefore, many startups turn to investors who specialize in this type of activity.

Investors take on risk since, in the early stages of startup development, they cannot rely on operational indicators due to their absence. The only sources on which an investor can base their decision to finance or not are: their impression of the team and founders of the startup, the idea, the prototype, the value proposition, and the plan of how to create and capture that value, expressed in the business model.

The impression of the team and founders of the startup is difficult to evaluate since it requires taking into account both verbal and non-verbal factors, as well as various contingencies, such as the investor's mood at the time of the meeting.

Moreover, a sufficient number of such studies have been conducted to date. Such studies are based on surveying both the startup founders and investors, followed by comparing the obtained results. However, questions about the past can distort the actual data because certain factors that truly influenced the investor's decision may remain only in the subconscious of both the investor and the startup founders.

In contrast, research on various startup indicators serves as a counterbalance. These indicators include the utilized business models, team size, the amount of investments received at previous financing stages, the size of the potential market, and demand. Examining factual data about startups helps reduce the perception bias and allows for a genuine assessment of whether these indicators truly influence the startup, rather than being influenced solely by well-prepared pitches from the founders.

[1] https://www.demandsage.com/startup-statistics/#:~:text=There%20are%20currently%20around%2031.7,for%2099.9%25%20of%20US%20businesses

Moreover, the research "Startups' Roads to Failure" [2] emphasizes that an incorrect or nonexistent business model is the cause of failure in 35% of cases. Considering that an investor is interested in the success of a young company, they hypothetically pay attention to the model and base their decision, in part, on this factor.

Given that there is currently a lack of sufficient statistical research determining the impact of the choice of business model on the amount of investments received, the relevance of this study is high.

*The objective of this research* is to assess the impact of the chosen business model by a startup on the amount of investment obtained at the Series A stage.

*The proposed hypothesis* in this study is that the business model patterns used by startups impact the amount of investments received at the Series A stage.

*The article is structured as follows*. The first part of the paper examines existing research that identifies factors influencing investment size and the success of startups in securing investments. Methodological approaches and research limitations are also described. The second part presents the research findings and hypothesis testing. The article concludes with an interpretation of the obtained results, contributing to scientific research on this topic and serving as valuable material for startup founders. The practical value of this study lies in identifying patterns that lead startups to secure investments exceeding the industry average.

## 2. Literature Review

The popularity of scientific research on business models began to rise after the Internet boom of the 1990s. The definition of the term 'business model' varies in the literature depending on the emphasis of the defining author. For instance, Massa et al. [6], Zott et al. [7], and DaSilva et al. [8] in their review articles collected numerous definitions of the term 'business

model'. Generally, this term is interpreted as a formal and conceptual representation of how a business operates and how its business processes are structured.

The stages of startup financing are directly linked to its lifecycle. As startups progress through various stages from ideation to expansion, their needs change from technical resources to financial and managerial resources [9]. Consequently, the tasks for which startups require funding also change.

Ewens & Malenko [10] identifies 5 stages: seed, pilot version of the product, early, growth, and late. The acute need for financing arises at the 'early stage', when the company has a commercial product version, and the goal is the growth of the startup, market entry, and team expansion. At this stage, venture capital funds start investing in the startup. Andaleeb et al., in their research, combine the early stage and growth stage into one phase, which includes the Series A financing stage [11]. Tweten characterizes the Series A stage as a funding round that helps startups launch their products and services into the market, build a customer base, and scale operations to increase profitability[1].

Overall, there are numerous studies dedicated to creating a machine learning-based model predicting both the success of a startup and its success in obtaining investments. Lyu et al. [12] developed a machine learning model that predicts startup success (IPO or acquisition) with an accuracy of 20.8%. The authors use factors such as startup information (founding year, country, location, industry, etc.), founder information (academic degree, graduation year, gender, etc.), and information about past deals (date, investment size, number of investors, etc.) in their model. Greater prediction accuracy was achieved by Ross et al., whose model's accuracy reaches 90% [13]. The authors use a broader set of factors, including information about the startup stage, time between previous rounds, team size, etc. However, unaccounted-for data strongly influences the prediction results. In general, these models take into account a multitude of investment-related information received by the startup.

Similarly, there are numerous studies focused on creating a machine learning model that predicts whether a startup will receive investments, indicating its investment attractiveness. These studies differ in the set of factors they include in the model and the type of the model itself [14–16]. Accordingly, the studies achieve different levels of accuracy.

Gastaud et al. [16] in addition to general startup information and information about previous investors (founding date, funds raised, number of investors, etc.), added information about the startup's competitors to their model, resulting in a prediction accuracy of 65%.

The highest accuracy was achieved by Bai & Zhao [15]. The authors expanded the set of factors by including information about the product, detailed information about the team and founders (creativity, relevant work experience, etc.), the presence of a general strategy and marketing strategy, etc., resulting in a prediction accuracy of 73%. The researchers note that the 'Planning strategy' factor is one of the most influential in prediction. The business model itself is a component of the planning element in a company.

Despite the high prediction accuracy rates, there remains a significant probability of incorrect predictions, which can be attributed to various unaccounted-for factors.

Montani et al., in a review article on existing startup valuation methods, emphasize that these methods tend to rely on three key factors: future forecasts, consideration of various startup development scenarios, and understanding and attention to the chosen business model [17].

[1] Chris Tweten Guide To Startup Funding Stages: From Pre-Seed To IPO:// SPACEBAR collective – URL: https://spacebarcollective.com/startup-funding-stages

Weking et al. [18] have determined that the business model influences the success of a startup, namely its market survival. The authors found that only a portion of the business models, specifically 6 out of 16 that underwent selection stages, had an impact on the success of the startup.

The researchers analyzed a total of 55 business models developed by Gassmann et al. [19]. To test the influence of the business model, the authors used the Fisher's criterion and Chi-squared test. They divided the startups into groups based on whether they used or did not use the model, as well as whether they had failed or were still functioning in the market.

Prohorovs et al. [20] emphasize that venture investors primarily identify startup issues related to the business model, management skills, and high competition. The survey results of founders who did not receive investments also showed that entrepreneurs in 20% of cases identified "incorrectly chosen business model" as one of the key factors for failure. Additionally, the researchers examined the question of the startup's region: Latvian startups received investments twice the size of those received by Russian startups.

Böttcher et al. identified the influence of certain business model patterns on the size of Seed stage investments [21]. Weking et al. [18] used a binary labeling method to prepare the dataset and grouped startups into those that used a specific pattern and those that did not, for subsequent analysis. The statistical method used was biserial correlation. The results of this study show a weak influence of the business model on the size of investments received by start-ups, with a correlation coefficient of less than 0.3.

In summary, it can be stated that the issue of identifying factors influencing startup investment acquisition and investment amount, as well as predicting the success of investment acquisition, remains relevant. However, the level of development of this problem is difficult to characterize as high due to the existence of numerous complexes and objectively difficult-to-measure factors. As for the question of the impact of the business model on investment size, the degree of development of this issue is low due to the lack of sufficient studies that differentiate between various methods used, sample characteristics (different investment rounds, regions, industries, etc.). Additionally, there is a challenge in defining the business model patterns a company utilizes, as this information is not available in popular databases (e.g., Crunchbase). Nevertheless, the contribution of existing research on this issue is significant and opens opportunities for future studies.

## 3. Methodology

Startups for each examined business model can be divided into two groups: those that use a specific pattern and those that do not, as utilized in the studies by Weking et al. [18], Böttcher et al. [21], and others.

Therefore, to test the hypothesis of the study (that the employed business model patterns by startups influence the size of investments obtained at the Series A stage), a Student's t-test with unequal variances was employed for samples with a normal or near-normal distribution, and the Mann-Whitney U-test was used for samples with a non-normal distribution. Each group, whether using or not using a specific business model, should have more than 5 observations for the application of these tests. The Shapiro-Wilk test was used to assess normality. Additionally, outliers were removed using the quartile method for each business model and each group separately.

Based on the fact that a startup goes through various stages of investment, which significantly differ in the size of investments obtained, this study focuses only on one stage. The following reasons led to the selection of the Series A stage:

– Investment objectives: Organizing serial production (ensuring continuous service operation), hiring a complete team, implementing marketing activities [22].

Therefore, after obtaining investments at the Series A stage, startups begin implementing the chosen business model and applying the selected patterns. Thus, it is at this stage that startups need to provide a plan for implementing future internal processes and methods of interaction with consumers, which constitute the business model [23].

– Product status: The product has been developed, and there are trial sales results. Prior to the Series A stage, startups only engage in trial actions in the market and focus on refining the product to meet market requirements, which can be described as the Research and Development (R&D, RnD) process[1] [24]. Consequently, before the Series A stage, a startup does not resemble a typical operating company in the market and does not implement the chosen business model in its operational activities, only conducting test sales.

In summary, Series A is typically the first stage of venture funding for a startup. The goal of raising funds is to enter the market, initiate mass production, expand the company's workforce, and launch marketing activities.

Based on the theory of lifecycle stages by Adizes [25], a startup at the Series A stage is in the "Infancy" phase, which is characterized by the transition from refining and validating its idea to operational activities. Adizes highlights that the primary task of a company at this stage is to move away from generating ideas and dreams and start focusing on sales: "The organization-infant must sell, sell, and sell." Therefore, the most important aspects at the Series A stage are the business models that describe the process of interacting with consumers and generating sales, specifically how the company monetizes and earns revenue from its customers. These business models include various monetization models [26].

There are numerous classifications of business models, including those that encompass monetization models. One of the most popular classifications was proposed by Gassmann et al. [19] in 2013, which includes 55 business model patterns that describe various business processes of a company. However, over the past 10 years, numerous new business model patterns have emerged, and the most comprehensive list is provided by the company "Business Model Ideas"[2]. From these classifications, monetization models were identified and used in the study (Table 1). The developed classification consists of 15 monetization models.

[1] https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/building-an-r-and-d-strategy-for-modern-times

[2] https://www.businessmodelideas.com/

Table 1. **Monetization Models**

| Business model | Variable | Description |
|---|---|---|
| ADD-ON | BM_1 | The business model that provides additional options or features to the core product or service. This model is based on offering customers the opportunity to purchase additional features or options that enhance or expand the functionality of the core product. |
| ADVERTISING | BM_2 | The business model based on selling advertising space in various mass media channels. Companies that operate under this model generate revenue by placing advertisements on their platforms, such as websites, social media, radio, television, newspapers, magazines etc.. |
| AUCTION | BM_3 | The business model in which sellers of products and services sell their goods through an auction by setting an initial price and selling the item to the highest bidder. |

| Business model | Variable | Description |
|---|---|---|
| BARTER | BM_4 | The business model in which goods or services are exchanged between two parties without the use of monetary transactions. |
| COMMISSION | BM_5 | The business model based on receiving commissions from the sales of goods or services from other companies. A company operating under this model receives a certain percentage from each sale made through its platform or via its services. |
| DONATION | BM_6 | The business model in which companies and organizations accept donations from individuals or entities. It is based on voluntary contributions made to support the goals or mission of the company, project, or organization. |
| DYNAMIC PRICING | BM_7 | The business model in which the price of a product or service dynamically changes based on demand, supply, and other external factors. |
| FIXED PRICES | BM_8 | The business model in which the price of a product or service is fixed and does not change based on demand and supply. |
| FREEMIUM | BM_9 | The business model in which the core product or service is provided for free, and users can purchase additional options or features for an additional fee. |
| LEVERAGE CUSTOMER DATA | BM_10 | The business model in which a company utilizes its customers' data to make more effective business and marketing decisions. This model is based on collecting and analyzing a large volume of data about customers' behavior and needs, which can be obtained from various sources. |
| LICENSING | BM_11 | The business model in which a company grants another company the right to use its intellectual property rights, such as trademarks, patents, copyrights, technologies, or other know-how. |
| PAY PER USE | BM_12 | The business model in which customers pay only for the usage of a product or service. In the case of the PAY PER USE model, customers have the flexibility to use the product or service as they desire and pay based on their actual usage. |
| PAYWALL | BM_13 | The method of restricting access to the content of a web page until a one-time or recurring subscription payment is made. This term is commonly used in relation to the policies of media outlets and scientific journals for restricting access to online materials. |
| SUBSCRIPTION | BM_14 | Subscription-based business model, where a company provides consumers with access to its products or services through regular, often monthly or annual payments. |

*Source:* developed by the authors based on the classifications by Oliver Gassmann et al. [19], Business Model Ideas service (URL: https://www.businessmodelideas.com/), and others [27-30]

Table 2. **Example of binary marking of startup for the use of business model patterns**

| Business model | 1 | 2 | 3 | 4 | … | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|
| Appl. | 0 | 0 | 1 | 1 | … | 0 | 1 | 1 | 0 |

*Source:* The business model DNA: Towards an approach for predicting business model success [31]

Following Böhm et al. [31], each startup was examined for the use of each business model pattern. Thus, a binary record was created for each startup, where 0 indicates that the model is not used, and 1 indicates that the model is used (Table 2).

Artificial intelligence from OpenAI, integrated into the Bing search engine, was used to label the startups. To verify the accuracy of determining the business models used by the startups, a random sample of 10 startups was taken from the dataset. The authors manually identified the corresponding patterns used by these startups and compared the results with the artificial intelligence-generated labels. In 7 cases, there was a complete match in the binary labeling results for all patterns, and in 3 cases, there was a partial match. The overall accuracy was calculated by taking the ratio of matching labeling results for each pattern (134 values out of 140 total values for the 10 startups), resulting in 95.7% accuracy.

The dataset consists of 2,313 startups operating in the USA, sourced from the Parsers VC database[1]. All these companies received investments at the Series A stage.

From 2016 to February 2023, the startups and their latest investment stage, Series A, were analyzed. To mitigate the influence of industry-specific factors[2], the startups were categorized by industry. Based on existing classifications such as the List of Industries in the Russian Federation, the North American Industry Classification System (NAICS), and the International Standard Industrial Classification (ISIC) in their latest revisions, a customized industry classification was developed (Table 3).

Table 3. **Classification of industries used in the study**

| Industry | Variable |
|---|---|
| Agriculture, aquaculture, forestry | IN_1 |
| Construction | IN_2 |
| Education and science | IN_3 |
| Entertainment and culture | IN_4 |
| Finance, financial services, insurance, pensions, real estate services | IN_5 |
| Manufacturing (heavy, light, high-tech etc.) | IN_6 |
| Medicine and Healthcare | IN_7 |
| Mining | IN_8 |
| Services | IN_9 |
| Software | IN_10 |
| Trade and catering | IN_11 |
| Transportation, logistics and communications | IN_12 |
| Utilities | IN_13 |
| Other | IN_14 |

*Source:* developed by the authors.

The average, median, and standard deviation of the investment size received at the Series A stage vary depending on the industry (Table 4). Industries with the highest average investment size include Mining, Medicine and Healthcare, and

[1] https://parsers.vc/

[2] https://www.ycombinator.com/library/series-a-guide

Table 4. **Descriptive statistics of the sample**

| Total | Count | Mean | Median | Standard Deviation | Max | Min |
|---|---|---|---|---|---|---|
| | 2313 | 20585574 | 12000000 | 51919707 | 1500000000 | 70000 |
| Agriculture, aquaculture, forestry | 37 | 15150000 | 11000000 | 10544673 | 40000000 | 2000000 |
| Construction | 14 | 10918571 | 10000000 | 6566387 | 23000000 | 1000000 |
| Education and science | 51 | 9401270 | 8500000 | 4841135 | 22000000 | 1750000 |
| Entertainment and culture | 87 | 13774851 | 10000000 | 10168108 | 46000000 | 75000 |
| Finance, financial services, insurance, pensions, real estate services | 153 | 13517974 | 12000000 | 7343057 | 33850000 | 200000 |
| Manufacturing (heavy, light, high-tech etc.) | 128 | 15872031 | 12900000 | 10056675 | 46000000 | 70000 |
| Medicine and Healthcare | 368 | 19385247 | 14000000 | 15388492 | 65000000 | 600000 |
| Mining | 4 | 30750000 | 26000000 | 14908052 | 52000000 | 19000000 |
| Services | 137 | 11217051 | 10000000 | 5740493 | 27000000 | 751000 |
| Software | 971 | 12838778 | 11000000 | 6986104 | 35000000 | 95000 |
| Trade and catering | 119 | 10868436 | 10000000 | 6888149 | 30000000 | 605800 |
| Transportation, logistics and communications | 63 | 13833571 | 10500000 | 9296848 | 40000000 | 900000 |
| Utilities | 18 | 12277489 | 11600000 | 9554223 | 35000000 | 200000 |

*Source:* developed by the authors

Manufacturing. Industries with the lowest average investment size include Education and Science, Trade and Catering, and Construction.

Given that the average and median investment sizes vary significantly depending on the industry, indirectly confirming the influence of the industry factor on investment size, an additional Kruskal-Wallis Test was conducted [32, 33]. This test reveals statistically significant differences between groups divided by the factor under consideration. The Kruskal-Wallis Test was chosen for the following reasons: the variances of the groups differ, and the number of observations in the groups is not the same.

To examine the impact of the business model factor, industries with more than 100 observations (startups) were selected. These industries include: (1) Finance, financial services, insurance, pensions, real estate services; (2) Manufacturing (heavy, light, high-tech etc.); (3) Medicine and Healthcare; (4) Services; (5) Software; (6) Trade and catering.

## 4. Research Results

The distribution of investment sizes based on industry is presented in Figure 1.

The graph illustrates differences in the distribution of investment sizes based on industry. The Kruskal-Wallis Test yielded a p-value of approximately 0.00, indicating

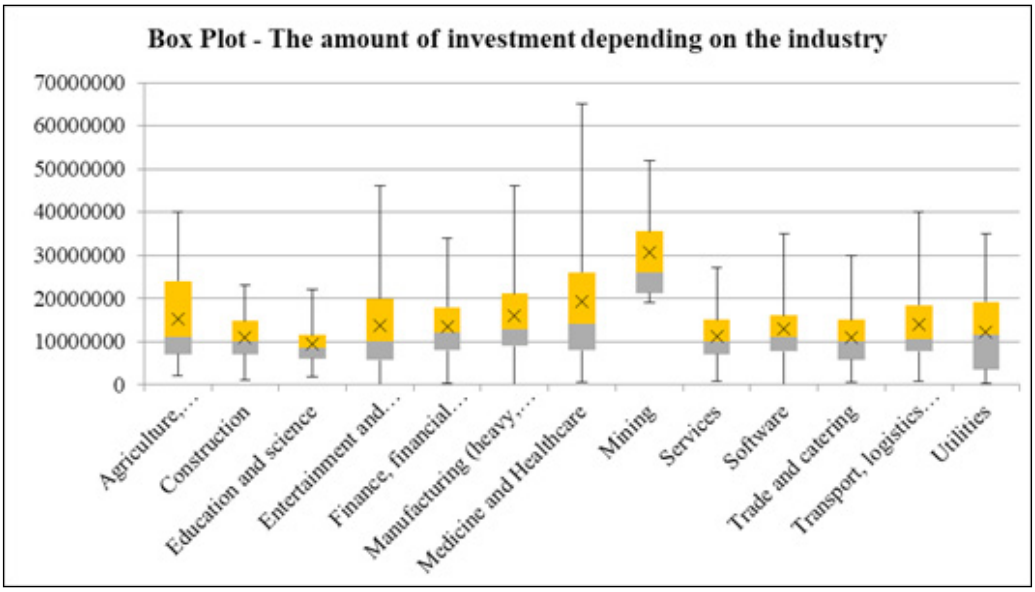


**Figure 1.** Box plot – The amount of investment depending on the industry

the influence of the industry factor on investment size. Consequently, the need to conduct U-tests and T-tests separately for each industry was confirmed.

The results of the analysis, normality tests, and p-values for the Student's t-test and Mann-Whitney test are presented in Tables 5 and 6. The Shapiro-Wilk test for each pattern in all industries showed that in at least one of the two groups (those using the pattern or not), the distribution is non-normal. However, there are borderline cases where the U-test shows a p-value greater than 0.1 while the T-test shows a p-value less than 0.1. For such cases, an additional check for normality distribution was conducted by plotting frequency graphs of investment size values. If the distribution closely resembled a normal distribution, the result of the T-test was accepted.

Table 5. **Analysis Results**

| Industry | Finance, financial services, insurance, pensions, real estate services | | | Manufacturing (heavy, light, high-tech etc.) | | | Medicine and Healthcare | | |
|---|---|---|---|---|---|---|---|---|---|
| Business model | Normality | T-test | U-test | Normality | T-test | U-test | Normality | T-test | U-test |
| BM_1 | – | – | – | – | – | – | – | – | – |
| BM_2 | – | – | – | – | – | – | – | – | – |
| BM_3 | – | – | – | – | – | – | – | – | – |
| BM_4 | – | – | – | – | – | – | – | – | – |
| BM_5 | No | 0.75 | 0.45 | No | 0.10 | 0.10 | No | 0.56 | 0.65 |
| BM_6 | – | – | – | – | – | – | – | – | – |
| BM_7 | No | 0.33 | 0.29 | – | – | – | No | 0.46 | 0.40 |

| Industry | Finance, financial services, insurance, pensions, real estate services | | | Manufacturing (heavy, light, high-tech etc.) | | | Medicine and Healthcare | | |
|---|---|---|---|---|---|---|---|---|---|
| BM_8 | No | 0.79 | 0.47 | No | 0.13 | 0.10 | No | 0.00 | 0.00 |
| BM_9 | No | 0.63 | 0.43 | – | – | – | No | 0.00 | 0.05 |
| BM_10 | No | 0.38 | 0.54 | No | 0.44 | 0.64 | No | 0.00 | 0.00 |
| BM_11 | No | 0.78 | 0.60 | No | 0.70 | 0.57 | No | 0.00 | 0.00 |
| BM_12 | No | 0.87 | 0.69 | No | 0.09 | 0.25 | Close | 0.01 | 0.23 |
| BM_13 | – | – | – | – | – | – | – | – | – |
| BM_14 | No | 0.12 | 0.19 | No | 0.36 | 0.28 | No | 0.00 | 0.00 |

*Source:* developed by the authors

Table 6. **Analysis Results**

| Industry | Services | | | Software | | | Trade and catering | | |
|---|---|---|---|---|---|---|---|---|---|
| Business model | Normality | T-test | U-test | Normality | T-test | U-test | Normality | T-test | U-test |
| BM_1 | – | – | – | No | 0.56 | 0.54 | – | – | – |
| BM_2 | No | 0.78 | 0.83 | No | 0.02 | 0.02 | No | 0.06 | 0.02 |
| BM_3 | – | – | – | – | – | – | – | – | – |
| BM_4 | – | – | – | – | – | – | – | – | – |
| BM_5 | No | 0.45 | 0.47 | No | 0.00 | 0.00 | No | 0.91 | 0.68 |
| BM_6 | No | 0.33 | 0.61 | No | 0.05 | 0.09 | No | 0.05 | 0.02 |
| BM_7 | – | – | – | No | 0.28 | 0.46 | No | 0.52 | 0.98 |
| BM_8 | No | 0.98 | 0.50 | No | 0.56 | 0.53 | No | 0.39 | 0.89 |
| BM_9 | No | 0.34 | 0.32 | No | 0.05 | 0.09 | No | 0.94 | 0.83 |
| BM_10 | No | 0.30 | 0.34 | Close | 0.03 | 0.20 | No | 0.78 | 0.75 |
| BM_11 | No | 0.04 | 0.01 | No | 0.71 | 0.92 | No | 0.37 | 0.55 |
| BM_12 | No | 0.00 | 0.02 | No | 0.32 | 0.16 | No | 0.06 | 0.23 |
| BM_13 | – | – | – | No | 0.38 | 0.48 | – | – | – |
| BM_14 | No | 0.50 | 0.92 | No | 0.15 | 0.57 | Close | 0.04 | 0.25 |

*Source:* developed by the authors

The necessary number of observations for the AUCTION and BARTER business model patterns was not reached in any industry. The ADD-ON and PAYWALL models, on the other hand, have a sufficient number of observations only in the "Software" industry.

To confirm the hypothesis regarding the impact of business models on investment

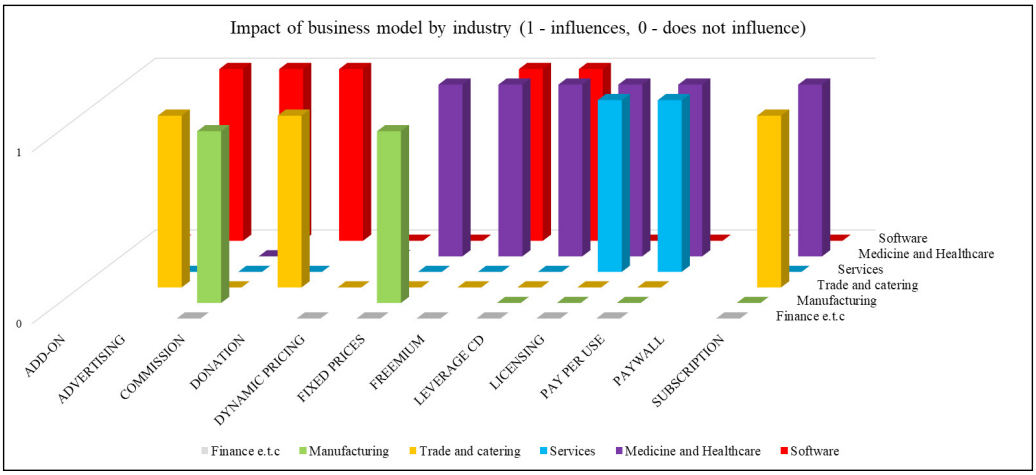


**Figure 2.** Influence of business model on investment size depending on industry

*Source*: developed by the authors

size, a criterion of p-value > 10 was used. The analysis showed that the business model has an influence in 5 out of the 6 industries considered, except for the "Finance, Financial Services, Insurance, Pensions, Real Estate Services" industry.

The business models presented in Figure 2 have an impact on investment size, with values equal to 1.

The results of the business model pattern analysis indicate that the impact of business models on investment size varies depending on the industry to which the startup belongs. Additionally, each of the business models that influence investment size has an effect in two industries simultaneously.

Considering that the Student's t-test and Mann-Whitney test determine whether there are statistically significant differences between two groups, a graph (Figure 3) was constructed to show whether the use of a particular pattern leads to an increase in investment size compared to the industry average. This is done by comparing the average investment size when choosing a specific model to the overall average investment size within the industry.

The impact of the business model is not unidirectional across different industries. For instance, the use of the ADVERTISING model leads to above-average investment size in the "Trade and Catering" industry, while it results in below-average investment

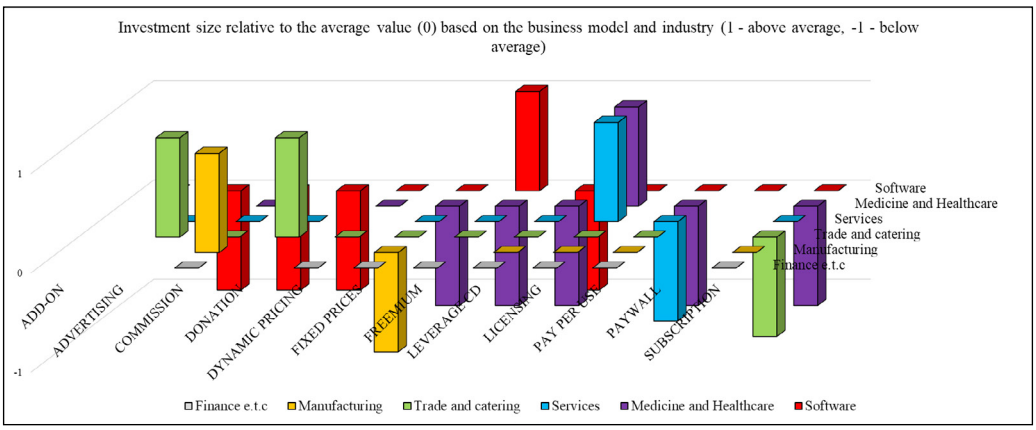


**Figure 3.** Influence of business model on investment size relative to the industry average

*Source*: developed by the authors

size in the "Software" industry. Similarly, the COMMISSION, DONATION, and FREEMIUM models can lead to both smaller and larger investment sizes depending on the industry. This variation is due to the specific processes occurring in different industries[1] [34].

## 5. Discussion

### *5.1. Confirmation of the hypothesis*

Based on the results of the conducted T-test and U-test, which showed that for 5 out of the 6 examined industries, there exist business model patterns leading to statistically significant deviations of investment levels from the industry average, the business model factor is statistically significant. Consequently, the hypothesis posed in this study has been confirmed.

The findings of this research align with the results of a survey conducted by Gompers et al. [35], in which 74% of venture investors highlighted the significance of the business model in their decision-making process.

Considering that the business model impacts the size of obtained investments, which in turn influences startup success, this study corroborates the findings of Cantamessa [2] on the importance of choosing a business model for startup success.

Regarding studies developing machine learning-based models for predicting investment success [14-16], this study can complement such work. If we assume that the choice of a business model can influence not only the investment size but also whether a startup receives investments at all, this research can supplement models that predict investment success using machine learning. These previous studies often had a considerable rate of false positives: ranging from 35% to 27%, likely due to a limited set of factors.

The results of this study also support the outcomes of the statistical research conducted by Böttcher et al. [21] regarding the influence of the business model on investment size. However, there are differences in the results: while Böttcher et al. [21] found that using the FREEMIUM model increases the size of investments received by startups, this study shows that the use of the FREEMIUM model increases investment size only in the "Software" industry, while in the "Medicine and Healthcare" industry, it actually reduces investment size. This discrepancy is explained by the consideration of the industry factor influencing startup investment acquisition in this research, as discussed by Tateossian[2].

Additionally, this study confirmed the influence of the industry factor on investment size. Based on the investment distribution graph by industry (Figure 1) and the results of the Kruskal-Wallis Test, the "Mining", "Medicine and Healthcare", and "Manufacturing" sectors receive larger investments, which could be related to industry-specific characteristics and high capital expenditures required for equipment and technology in these sectors.

Conversely, the industries of "Education and science", "Trade and Catering", and "Construction" receive the lowest investments. In the case of "Education and science" and "Trade and Catering", the reason could be lower CAPEX costs, as these industries largely specialize in services. In other words, industries providing services don't require setting up production lines, workshops, etc. Similarly, in the "Construction" industry, startups are more oriented toward auxiliary services rather than contracting organizations, requiring investments mainly for specialized equipment rather than production lines.

[1] https://www.smartsheet.com/retail-store-operations

[2] https://www.forbes.com/sites/forbesagencycouncil/2022/11/11/4-factors-that-can-affect-startup-success/?sh=6377186b6e48

### *5.2. Influence of the industry factor*

Moreover, the industry factor also influenced the variations in business model patterns that lead to increased or decreased investment size. For some industries, this phenomenon can be explained as follows:

*Services.*

In the 'Services' industry, startups with a 'Licensing' business model receive, on average, larger investments. This is due to the widespread practice of franchising in the United States. A significant portion of companies that utilize franchising operate in the service sector[1]. Licensing, like franchising, involves transferring rights (licenses) to use intellectual property.

Such a business model also enables quick brand scalability in the market and requires lower capital expenditures because franchisees and companies purchasing licenses invest in launching the business independently.

*Medicine and Healthcare.*

Startups with the LICENSING model receive more investment compared to companies with other models. This fact can be associated with the high proportion of service-providing companies in this industry, as well as the prevalence of scientific research and development. In the case of services, companies can sell the rights to offer their services and use their intellectual property to other companies. Alternatively, companies developing various medical technologies can license the production of their products and the use of their innovations. Implementing the LICENSING model enables faster and more cost-effective distribution of innovations in the market, as it avoids the need for startup-driven production and service delivery efforts.

*Trade and Catering.*

In this sector, business models ADVERTISING and DONATION lead to above-average investment sizes. The DONATION model is often used for fundraising in charitable foundations, contributing to societal well-being. Companies in the trade and hospitality sector directly interact with consumers and society, making their company image and public perception crucial. Given the growing popularity and applications of the ESG (Environmental, Social, and Governance) concept, startups aligning with this concept and driving social change become more investment-attractive. This is reflected in the emergence of the term "impact investing" in 2007, signifying "investments made with the intent to generate measurable social and environmental impact alongside a financial return."[2]. There exists a global network of impact investors known as the "Global Impact Investing Network" which fosters the development of companies driving social change[3]. Overall, when a startup prioritizes societal and environmental welfare, it requires more investment and becomes more investment attractive.

Regarding the ADVERTISING model, startups can promote various products on their platforms in addition to direct sales, generating an additional source of revenue that enhances their investment appeal. However, due to the nature of the trade and catering industry, where companies closely and directly engage with consumers, the advertising model's effect is only significant within this sector.

*Manufacturing.*

The COMMISSION model enables startups to generate additional revenue. For instance, in the creation of complex technological devices, a company can integrate third-party software, providing access to customers and charging a commission for it. Similarly, using the COMMISSION model is feasible when selling both their own products and

[1] https://www.franchise.org/sites/default/files/2022-02/2022%20Franchising%20Economic%20Outlook.pdf

[2] https://www.skolkovo.ru/cases/impakt-investirovanie-investicii-budushego/

[3] https://thegiin.org/

complementary goods from external companies on their trading platform to end users, while charging a commission for these transactions. This approach also enhances the potential profit margin, thereby increasing the investment appeal of the startup.

*Software.*

FREEMIUM allows providing access to digital products to all users, enabling consumers to familiarize themselves with the product before purchasing it. This raises the number of potential individuals entering the Attention and Interest stages of the AIDA concept funnel [36]. Implementing FREEMIUM increases, the potential customer base, thus elevating the count of paying users and making the startup more investment-attractive.

### *5.3. Limitations*

This study has revealed the influence of the business model on investment size and how business model patterns impact different industries. However, the study does not uncover the reasons behind these results — why a particular business model leads to an increase in investment size in one industry while another model decreases it. To establish a causal relationship, further research is needed, such as surveys of investors and startup founders [37], or an examination of the peculiarities of business processes within each industry.

Secondly, the findings of this study highlight the specific effects of the business model on investment size only for startups at the Series A stage operating in the US market. Complementary research could explore the impact of the business model at other stages (e.g., Seed or Series B) and in other markets (Europe, Southeast Asia).

Thirdly, while this work considers the influence of each business model individually, it does not account for the combined effect of using multiple models, which may introduce its own nuances. Many companies often employ multiple business model patterns simultaneously, such as FREEMIUM and SUBSCRIPTION [38].

## 6. Conclusion

The research objective set in this study has been achieved: based on the investigations into the issues addressed in this work, a methodology was developed, a sample of 2313 American startups that had reached the Series A stage was defined, results were obtained that confirm the influence of the business model factor on investment size, and business model patterns that contribute to increasing and decreasing investment size were identified.

Building upon the research findings, the practical significance of this study is as follows:

– Startups planning to enter the Series A round can compare their chosen business model with the models from this study that lead to larger investments. They can then revise their strategy and consider adopting a more investment-attractive model. Given that this study focuses on startups operating in the US market, its results can be extended to the global market, considering that the US serves as a leader in this field and a benchmark for other regions.

– Opting for a more investment-attractive business model indirectly indicates higher chances of success for a startup. Therefore, any startup can analyze its chosen model using the results from this study.

– There exists a challenge in accurately and definitively assessing the business model patterns a startup employs. The introduction of a new evaluation system for startups by investors can facilitate this process, and publishing this information can fuel further research. The outcomes of this study encourage and call upon investors to act in this manner.

The theoretical significance lies in the fact that this research unveils new aspects of the issue of startup investment acquisition, proving the influence of the business model factor, and stimulates the undertaking of new studies based on its results.

Possible avenues for future research include:

1. Investigating the influence of not only monetization models but also other business model aspects, such as cost structure and expenditure patterns.

2. Examining the impact of the business model on stages other than Series A.

3. Exploring the influence of the business model on startup samples from countries other than the United States.

4. Investigating the effects of different combinations of business model patterns on investment size.

5. Developing a machine learning model that predicts investment size based on startup parameters, including the employed business model patterns and other indicators such as age, team size, investment size in previous stages, etc.

## References

1. Krishna, A., Agrawal, A., Choudhary, A. (2016). Predicting the Outcome of Startups: Less Failure, More Success. *2016 IEEE 16th International Conference on Data Mining Workshops (ICDMW).* IEEE. 798–805. https://doi.org/10.1109/ICDMW.2016.0118

2. Cantamessa, M, Gatteschi, V, Perboli, G, Rosano, M. (2018). Startups' Roads to Failure. *Sustainability,* Vol. 10, Issue 7, 2346. https://doi.org/10.3390/su10072346

3. Yusupova, A.T., Ryazantseva, A.V. (2022). High-Tech Entrepreneurship in the Russian Regions: Conditions for the Emergence of New Companies. *Regional Research of Russia,* Vol. 12, 143–153. https://doi.org/10.1134/S207997052202023X

4. Bednár, R., Tarišková, N. (2017). Indicators of startup failure. *Industry 4.0,* Vol. 2, Issue 5, 238–240. Available at: https://stumejournals.com/journals/i4/2017/5/238.full.pdf

5. Cassar, G. (2004). The financing of business start-ups. *Journal of Business Venturing,* Vol. 19, Issue 2, 261–283. https://doi.org/10.1016/S0883-9026(03)00029-6

6. Massa, L., Tucci, C.L., Afuah, A. (2017). A critical assessment of business model research. *Academy of Management Annals,* Vol. 11, No. 1, 73–104. https://doi.org/10.5465/annals.2014.0072

7. Zott, C., Amit, R., Massa, L. (2011). The business model: recent developments and future research. *Journal of Management,* Vol. 37, Issue 4, 1019–1042. https://doi.org/10.1177/0149206311406265

8. DaSilva, C.M., Trkman, P. (2014). Business model: What it is and what it is not. *Long Range Planning,* Vol. 47, Issue 6, 379–389. https://doi.org/10.1016/j.lrp.2013.08.004

9. Schuh, G., Studerus, B., Hämmerle, C. (2022). Development of a Life Cycle Model for Deep Tech Startups. *Journal of Production Systems and Logistics,* Vol. 2, 5. https://doi.org/10.15488/11730

10. Ewens, M., Malenko, N. (2022). Board Dynamics Over the Startup Life Cycle. *Finance Working Paper No. 687/2020.* European Corporate Governance Institute, 56 p. http://dx.doi.org/10.2139/ssrn.3640898

11. Pal, A. (2021). *Financing Small Tech Firms in India vs. Canada: A Comparative Study.* http://dx.doi.org/10.2139/ssrn.3890898

12. Lyu, S., Ling, S., Guo, K., Zhang, H., Zhang, K., Hong, S., Ke, Q., Gu, J. (2021). Graph neural network based vc investment success prediction. *Arxiv preprint* arXiv:2105.11537, 11p. https://doi.org/10.48550/arXiv.2105.11537

13. Ross, G., Das, S., Sciro, D., Raza, H. (2021). CapitalVX: A machine learning model for startup selection and exit prediction. *Journal of Finance and Data Science,* Vol. 7, 94–114. https://doi.org/10.1016/j.jfds.2021.04.001

14. Sharchilev, B., Roizner, M., Rumyantsev, A., Ozornin, D. (2018). Web-based startup success prediction. *Proceedings of the 27th ACM International Conference on Information and Knowledge Management,* 2283–2291. https://doi.org/10.1145/3269206.3272011

15. Bai, S., Zhao, Y. (2021). Startup investment decision support: Application of venture capital scorecards using machine learning approaches. *Systems,* Vol. 9, Issue 3, 55. https://doi.org/10.3390/systems9030055

16. Gastaud, C., Carniel, T., Dalle, J.M. (2019). The varying importance of extrinsic factors in the success of startup fundraising: competition at early-stage and networks at growth-stage. *ArXiv preprint* arXiv:1906.03210, 14 p. https://doi.org/10.48550/arXiv.1906.03210

17. Montani, D., Gervasio, D., Pulcini, A. (2020). Startup company valuation: The state of art and future trends. *International Business Research,* Vol. 13, No. 9, 31–45. https://doi.org/10.5539/ibr.v13n9p31

18. Weking, J., Böttcher, T.P., Hermes, S., Hein, A. (2019). Does Business Model Matter for Startup Success? A Quantitative Analysis. *Proceedings of the 27th European Conference on Information Systems (ECIS),* Stockholm & Uppsala, Sweden, 77. Available at: https://aisel.aisnet.org/ecis2019_rip/77

19. Gassmann, O., Frankenberger, K., Csik, M. (2013). The St. Gallen business model navigator. *Working Paper University of St. Gallen*. University of St. Gallen. Available at: https://bmi-lab.com/business-model-navigator-full-paper

20. Prohorovs, A., Bistrova, J., Ten, D. (2019). Startup success factors in the capital attraction stage: Founders' perspective. *Journal of East-West Business,* Vol. 25, Issue 1, 26–51. https://doi.org/10.1080/10669868.2018.1503211

21. Böttcher, T.P., Bootz, V., Zubko, T., Weking, J., Böhm, M., Krcmar, H. (2021). Enter the Shark Tank: The Impact of Business Models on Early Stage Financing. *In: Innovation Through Information Systems Volume III: A Collection of Latest Research on Management Issues.* Lecture Notes in Information Systems and Organisation. Vol. 48. Edited by F. Ahlemann, R. Schütte, S. Stieglitz. Springer Cham, 275–289. https://doi.org/10.1007/978-3-030-86800-0_20

22. Yusuf, A. (1997). An empirical investigation of the organisation life cycle model for small business development and survival in the South Pacific. *Journal of Enterprising Culture,* Vol. 5, No. 4, 423–445. https://doi.org/10.1142/S0218495897000247

23. Li, J. (2004). Place to Space: Migrating to E-business Models. *Journal of Small Business and Enterprise Development,* Vol. 11, Issue 3, 418–419. https://doi.org/10.1108/14626000410551690

24. Singh, A. (2021). *Significance of Research Process in Research Work*. https://dx.doi.org/10.2139/ssrn.3815032

25. Adizes, I. (2004). *Managing Corporate Lifecycles*. Adizes Institute Publishing. Available at: https://archive.org/search?query=external-identifier%3A%22urn%3Aoclc%3Arecord%3A243597462%22

26. Jabłoński, A., Jabłoński, M. (2020). *Digital Business Models: Perspectives on Monetisation*. London, Routledge, 214 p. http://dx.doi.org/10.4324/9780429322679-4

27. Dijkman, R.M., Sprenkels, B., Peeters, T., Janssen, A. (2015). Business models for the Internet of Things. *International Journal of Information Management,* Vol. 35, Issue 6, 672–678. https://doi.org/10.1016/j.ijinfomgt.2015.07.008

28. Olsen, R.K., Solvoll, M.K. (2018). Reinventing the business model for local newspapers by building walls. *Journal of Media Business Studies,* Vol. 15, Issue 1, 24–41. https://doi.org/10.1080/16522354.2018.1445160

29. Schuh, G., Wenger, L., Stich, V., Hicking, J., Gailus, J. (2020). Outcome economy: Subscription business models in machinery and plant engineering. *Procedia CIRP,* Vol. 93, 599–604. https://doi.org/10.1016/j.procir.2020.04.146

30. Fiig, T., Goyons, O., Adelving, R., Smith, B. (2016). Dynamic pricing–The next revolution in RM? *Journal of Revenue and Pricing Management,* Vol. 15, 360–379. https://doi.org/10.1057/rpm.2016.28

31. Böhm, M., Weking, J., Fortunat, F., Müller, S., Welpe, I.M., Krcmar, H. (2017). The Business Model DNA: Towards an Approach for Predicting Business Model Success. *Wirtschaftsinformatik und Angewandte Informatik*. St. Gallen, 1006–1020. Available at: https://wi2017.ch/images/wi2017-0333.pdf

32. McKight, P.E., Najab, J. (2010). Kruskal-wallis test. *The Corsini Encyclopedia of Psychology,* Vol. 1, 1–10. https://doi.org/10.1002/9780470479216.corpsy0491

33. Ostertagova, E., Ostertag, O., Kováč, J. (2014). Methodology and application of the Kruskal-Wallis test. *Applied Mechanics and Materials,* Vol. 611, 115–120. https://doi.org/10.4028/www.scientific.net/AMM.611.115

34. von Delft, S., Zhao, Y. (2021). Business models in process industries: Emerging trends and future research. *Technovation,* Vol. 105, 102195. https://doi.org/10.1016/j.technovation.2020.102195

35. Gompers, P.A., Gornall, W., Kaplan, S.N., Strebulaev, I.A. (2020). How do venture capitalists make decisions? *Journal of Financial Economics,* Vol. 135, Issue 1, 169–190. https://doi.org/10.1016/j.jfineco.2019.06.011

36. Ghirvu, A.I. (2013) The AIDA Model for Advergames. *The USV Annals of Economics and Public Administration,* Vol. 13, Issue 1, 90–98. Available at: http://www.annals.seap.usv.ro/index.php/annals/article/viewFile/497/548

37. Ch, P.D., Idqan, F., Imam, S.A. (2019). Factors affecting investor decisions to invest in startup: a case study of startup XYZ. *Russian Journal of Agricultural and Socio-Economic Sciences,* Issue 5 (89), 217–226. http://dx.doi.org/10.18551/rjoas.2019-05.27

38. Sato, S. (2019). Freemium as optimal menu pricing. *International Journal of Industrial Organization,* Vol. 63, 480–510. https://doi.org/10.1016/j.ijindorg.2018.12.006

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# Влияние бизнес-модели на размер инвестиций, полученных стартапом на стадии Series A на рынке США

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**Аннотация**. Множество исследований посвящено факторам, влияющим на рыночный успех стартапа. На ранних стадиях развития стартапа приоритетным является получение инвестиций. Однако тема влияния различных факторов, а именно выбора бизнес-модели, на размер инвестиций, полученных стартапом, является малоизученной. Целью данного исследования является оценка влияния бизнес-модели на размер инвестиций, полученных стартапом на стадии Series A. Проверяемая гипотеза – используемые стартапом паттерны бизнес-модели влияют на размер полученных инвестиций на стадии Series A на рынке США. Для достижения цели исследования и проверки гипотезы были применены Т-тест Стьюдента и тест Манна – Уитни на выборке из 2313 стартапов для сравнения групп, которые используют определенный паттерн бизнес-модели и не используют. В результате исследования было выявлено влияние бизнес-модели для разных отраслей. Исходя из того, что различные бизнес-модели имеют разное влияние на размер инвестиций, для основателей стартапов были выделены модели, приводящие к увеличению размера инвестиций и к уменьшению. Результаты данной статьи позволяют стартапам сравнить выбранную ими модель с теми, которые позволяют получить больший размер инвестиций, и изменить выбранную стратегию. Данное исследование отличается оригинальностью примененных методов и уникальным размером выборки в рамках оценки влияния фактора бизнес-модели. Результаты данного исследования служат толчком к включению фактора бизнес-модели в дальнейшие исследования, посвященные комплексной оценки инвестиционной привлекательности стартапа и создания модели машинного обучения для прогнозирования успешности получения инвестиций и размера инвестиций, на которые может рассчитывать стартап.

***Ключевые слова:*** бизнес-модель; стартап; Series A; инвестиции; влияние; отрасль; финансирование.

## Список использованных источников

1. *Krishna A., Agrawal A., Choudhary A.* Predicting the Outcome of Startups: Less Failure, More Success // 2016 IEEE 16th International Conference on Data Mining Workshops (ICDMW). IEEE, 2016. Pp. 798–805. https://doi.org/10.1109/ICDMW.2016.0118

2. *Cantamessa M., Gatteschi V., Perboli G., Rosano M.* Startups' Roads to Failure // Sustainability. 2018. Vol. 10, Issue 7. P. 2346. https://doi.org/10.3390/su10072346

3. *Yusupova A.T., Ryazantseva A.V.* High-Tech Entrepreneurship in the Russian Regions: Conditions for the Emergence of New Companies // Regional Research of Russia. 2022. Vol. 12. Pp. 143–153. https://doi.org/10.1134/S207997052202023X

4. *Bednár R., Tarišková N.* Indicators of startup failure // Industry 4.0. 2017. Vol. 2, Issue 5. Pp. 238–240. URL: https://stumejournals.com/journals/i4/2017/5/238.full.pdf

5. *Cassar G.* The financing of business start-ups // Journal of Business Venturing. 2004. Vol. 19, Issue 2. Pp. 261–283. https://doi.org/10.1016/S0883-9026(03)00029-6

6. *Massa L., Tucci C.L., Afuah A.* A critical assessment of business model research // Academy of Management Annals. 2017. Vol. 11, No. 1. Pp. 73–104. https://doi.org/10.5465/annals.2014.0072

7. *Zott C., Amit R., Massa L.* The business model: recent developments and future research // Journal of Management. 2011. Vol. 37, Issue 4. Pp. 1019–1042. https://doi.org/10.1177/0149206311406265

8. *DaSilva C.M., Trkman P.* Business model: What it is and what it is not // Long Range Planning. 2014. Vol. 47, Issue 6. Pp. 379–389. https://doi.org/10.1016/j.lrp.2013.08.004

9. *Schuh G., Studerus B., Hämmerle C.* Development of a Life Cycle Model for Deep Tech Startups // Journal of Production Systems and Logistics. 2022. Vol. 2. P. 5. https://doi.org/10.15488/11730

10. *Ewens M., Malenko N.* Board Dynamics Over the Startup Life Cycle // Finance Working Paper No. 687/2020. European Corporate Governance Institute, 2022. 56 p. http://dx.doi.org/10.2139/ssrn.3640898

11. *Pal A.* Financing Small Tech Firms in India vs. Canada: A Comparative Study. 2021. http://dx.doi.org/10.2139/ssrn.3890898

12. *Lyu S., Ling S., Guo K., Zhang H., Zhang K., Hong S., Ke Q., Gu J.* Graph neural network based vc investment success prediction. Arxiv preprint arXiv:2105.11537. 2021. 11 p. https://doi.org/10.48550/arXiv.2105.11537

13. *Ross G., Das S., Sciro D., Raza H.* CapitalVX: A machine learning model for startup selection and exit prediction // Journal of Finance and Data Science. 2021. Vol. 7. Pp. 94–114. https://doi.org/10.1016/j.jfds.2021.04.001

14. *Sharchilev B., Roizner M., Rumyantsev A., Ozornin D.* Web-based startup success prediction // Proceedings of the 27th ACM international conference on information and knowledge management. 2018. Pp. 2283–2291. https://doi.org/10.1145/3269206.3272011

15. *Bai S., Zhao Y.* Startup investment decision support: Application of venture capital scorecards using machine learning approaches // Systems. 2021. Vol. 9, Issue 3. P. 55. https://doi.org/10.3390/systems9030055

16. *Gastaud C., Carniel T., Dalle J.M.* The varying importance of extrinsic factors in the success of startup fundraising: competition at early-stage and networks at growth-stage. ArXiv preprint arXiv:1906.03210. 2019. 14 p. https://doi.org/10.48550/arXiv.1906.03210

17. *Montani D., Gervasio D., Pulcini A.* Startup company valuation: The state of art and future trends // International Business Research. 2020. Vol. 13, No. 9. Pp. 31–45. https://doi.org/10.5539/ibr.v13n9p31

18. *Weking J., Böttcher T.P., Hermes S., Hein A.* Does Business Model Matter for Startup Success? A Quantitative Analysis. Proceedings of the 27th European Conference on Information Systems (ECIS), Stockholm & Uppsala, Sweden. 2019. 77. URL: https://aisel.aisnet.org/ecis2019_rip/77

19. *Gassmann O., Frankenberger K., Csik M.* The St. Gallen business model navigator. Working Paper University of St. Gallen. University of St. Gallen, 2013. URL: https://bmilab.com/business-model-navigator-full-paper

20. *Prohorovs A., Bistrova J., Ten D.* Startup success factors in the capital attraction stage: Founders' perspective // Journal of East-West Business. 2019. Vol. 25, Issue 1. Pp. 26–51. https://doi.org/10.1080/10669868.2018.1503211

21. *Böttcher T.P., Bootz V., Zubko T., Weking J., Böhm M., Krcmar H.* Enter the Shark Tank: The Impact of Business Models on Early Stage Financing // In: Innovation Through Information Systems Volume III: A Collection of Latest Research on Management Issues. Lecture Notes in Information Systems and Organisation. Vol. 48. Edited by F. Ahlemann, R. Schütte, S. Stieglitz. Springer Cham, 2021. Pp. 275–289. https://doi.org/10.1007/978-3-030-86800-0_20

22. *Yusuf A.* An empirical investigation of the organisation life cycle model for small business development and survival in the South Pacific // Journal of Enterprising Culture. 1997. Vol. 5, No. 4. Pp. 423–445. https://doi.org/10.1142/S0218495897000247

23. *Li J.* Place to Space: Migrating to E–business Models // Journal of Small Business and Enterprise Development. 2004. Vol. 11, Issue 3. Pp. 418–419. https://doi.org/10.1108/14626000410551690

24. *Singh A.* Significance of Research Process in Research Work. 2021. https://dx.doi.org/10.2139/ssrn.3815032

25. *Adizes I.* Managing Corporate Lifecycles. Adizes Institute Publishing. 2004. URL: https://archive.org/search?query=external-identifier%3A%22urn%3Aoclc%3Arecord%3A243597462%22

26. *Jabłoński A., Jabłoński M.* Digital Business Models: Perspectives on Monetisation. London: Routledge, 2020. 214 p. http://dx.doi.org/10.4324/9780429322679-4

27. *Dijkman R.M., Sprenkels B., Peeters T., Janssen A.* Business models for the Internet of Things // International Journal of Information Management. 2015. Vol. 35, Issue 6. Pp. 672–678. https://doi.org/10.1016/j.ijinfomgt.2015.07.008

28. *Olsen R.K., Solvoll M.K.* Reinventing the business model for local newspapers by building walls // Journal of Media Business Studies. 2018. Vol. 15, Issue 1. Pp. 24–41. https://doi.org/10.1080/16522354.2018.1445160

29. *Schuh G., Wenger L., Stich V., Hicking J., Gailus J.* Outcome economy: Subscription business models in machinery and plant engineering // Procedia CIRP. 2020. Vol. 93. Pp. 599–604. https://doi.org/10.1016/j.procir.2020.04.146

30. *Fiig T., Goyons O., Adelving R., Smith B.* Dynamic pricing–The next revolution in RM? // Journal of Revenue and Pricing Management. 2016. Vol. 15. Pp. 360–379. https://doi.org/10.1057/rpm.2016.28

31. *Böhm M., Weking J., Fortunat F., Müller S., Welpe I.M., Krcmar H.* The Business Model DNA: Towards an Approach for Predicting Business Model Success // Wirtschaftsinformatik und Angewandte Informatik. St. Gallen, 2017. Pp. 1006–1020. URL: https://wi2017.ch/images/wi2017-0333.pdf

32. *McKight P.E., Najab J.* Kruskal-wallis test // The Corsini Encyclopedia of Psychology. 2010. Vol. 1. Pp. 1–10. https://doi.org/10.1002/9780470479216.corpsy0491

33. *Ostertagova E., Ostertag O., Kováč J.* Methodology and application of the Kruskal-Wallis test // Applied Mechanics and Materials. 2014. Vol. 611. Pp. 115–120. https://doi.org/10.4028/www.scientific.net/AMM.611.115

34. *von Delft S., Zhao Y.* Business models in process industries: Emerging trends and future research // Technovation. 2021. Vol. 105. P. 102195. https://doi.org/10.1016/j.technovation.2020.102195

35. *Gompers P.A., Gornall W., Kaplan S.N., Strebulaev I.A.* How do venture capitalists make decisions? // Journal of Financial Economics. 2020. Vol. 135, Issue 1. Pp. 169–190. https://doi.org/10.1016/j.jfineco.2019.06.011

36. *Ghirvu A.I.* The AIDA Model for Advergames // The USV Annals of Economics and Public Administration. 2013. Vol. 13, Issue 1. Pp. 90–98. URL: http://www.annals.seap.usv.ro/index.php/annals/article/viewFile/497/548

37. *Ch P.D., Idqan F., Imam S.A.* Factors affecting investor decisions to invest in startup: a case study of startup XYZ // Russian Journal of Agricultural and Socio-Economic Sciences. 2019. Issue 5 (89). Pp. 217–226. http://dx.doi.org/10.18551/rjoas.2019-05.27

38. *Sato S.* Freemium as optimal menu pricing // International Journal of Industrial Organization. 2019. Vol. 63. Pp. 480–510. https://doi.org/10.1016/j.ijindorg.2018.12.006

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## ДЛЯ ЦИТИРОВАНИЯ

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