SURVIVAL OF START-UPS – CASE OF UKRAINE

by

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LIST OF ABBREVIATIONS

B2B Business To Business

IT Information Technology

UA Ukraine

US Unites States

EU European Union

KPMG Klynveld Peat Marwick Goerdeler

CDF Cumulative Distribution Function

R&D Research and Development

GDP Gross Domestic Product

KPI Key Performance Indicator

CHAPTER 1. INTRODUCTION

Nowadays, the issue of innovative development is quite acute in Ukraine. It is a key for the technological gap reducing, creating competitive enterprises and improving living standards. Young generations of Ukrainian citizen hope for higher trancparency, more digitalization and lower corruption. Innovation, especially driven by the IT sector can substantially support this needed development by innovations and their productization.

Startups play a vital role to support the innovative development. Aside of large corporations, especially startups with their flexibility and agility can find and foster new ideas and innovations. In large corporations innovations are often management initiatives with a marketing centered approach. For startups, anyhow, innovation is, in most of the cases, the only way to develop and place new successful products and services.

Nevertheless, several factors limit the dynamics of innovation processes in Ukraine. The first one is limited domestic capital market and high cost of domesctic funding sources. Second one is the lack of financial resources for the IT sector development, despite the fact, that this sector is one of the drivers of modern Ukraine digital transformation.

The local environment in Ukraine in terms of financial resources and the availability for startups and innovations is still not developed that high as in Europe or US. The support for startups from government is provided weakly. There are less financial tools from the side of the government to support and foster direct innovations through startups. During last years a seed of ecosystem for startups is growing and first startups reach Unicorn valuations, which is considered as a great success. Nevertheless, this ecosystem is quite undeveloped and still requires longer time to be a good foundation in terms of financial resource support for Ukrainian startups.

For the reasons, mentioned above, international venture capital can become relevant as a rapid and effective source of financing for enterprises in limited financial

resources conditions. However, an important prerequisite for attracting venture capital is the level of investment attractiveness of the company. Inasmuch as separate company is not able to influence the formation of the investment environment within the country, all responsibility for attracting investment falls on the shoulders of the company's team.

To attract financing from international capital markets, Ukrainian companies and startups have to develop a valid business model to reach break even and independence from external financial ressources rapidly. Preseed and seed venture investment stages are in place to support the testing and validation of the ideas, round A is to enter the market and show first traction. Round B and C are growth rounds and often steps to international business. Ukrainian startups have the ability to use the mentioned strategies, that crystalizes by this research, to survive till reaching the market entry and growth stage.

The main goal of this research was to determine factors, which increase probability of startup transferring from one venture investment stage to the other. To support innovation and startups in Ukraine, data of startups and their venture investment stages can give meaningful insights and hints for successful funding and growth strategies.

In this study was applied the approach of using logit regression model, which includes venture investment choices and some characteristics. To be precise, investment stages are seed venture investment stage and early venture investment stage and, in addition to it, the characteristics are: headquarter location of the startup, total funding amount, number of funding rounds and number of employees.

The data for this research was gathered from news websites of deals made between Ukrainian start-ups and investors, after it the further step was to check every deal made between the startup and the investor on the CrunchBase source. The data is from 2009 to 2019, it includes 184 observations of Ukrainian startups.

Based on the data driven analysis of mentioned data from startup financing rounds in Ukraine, it is clear to see, that the following findings as influence factors raise the chances to get the needed financial resources to succeed on the local and international market:

In the case startups company has more employers, comparing to the seed venture stage, the probability of receiving next investment venture stage is higher. Moreover, with higher funding amount chances to occur in the next investment venture slightly grow, comparing to seed venture investment stage.

CHAPTER 2. INDUSTRY OVERVIEW AND RELATED STUDIES

The following chapter is dedicated to consider global trends in venture investment in the world and in Ukraine, and assess whether Ukraine follows global trends or has its own special way of attracting venture capital.

In order to provide detailed global indusrty overview we used the report of KPMG Private Enterprise (2020).

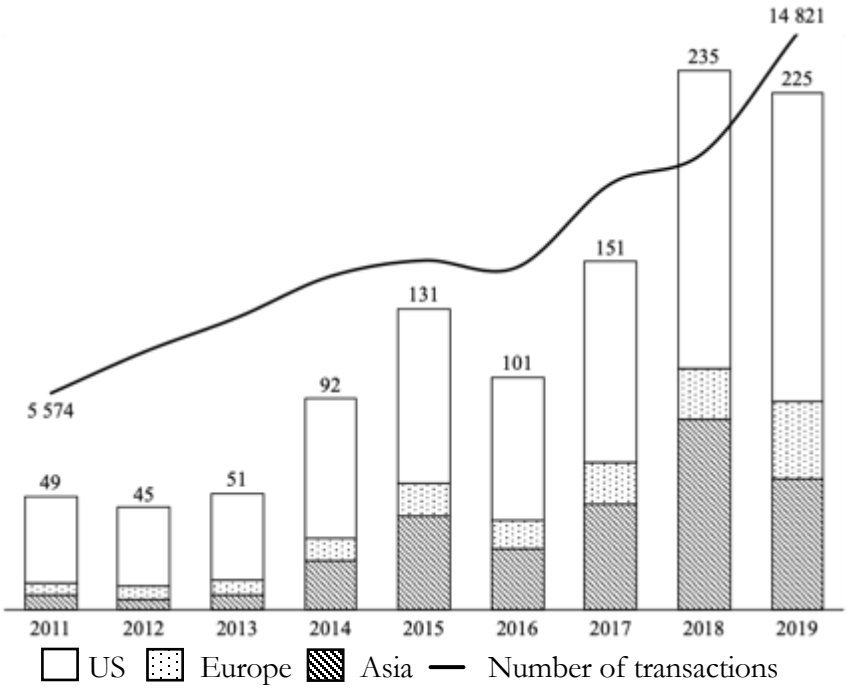
Since 2011, global venture capital investment has increased in absolute terms from $ 49 billion. Up to $ 225 billion in 2019 (figure 1). Thus, the annual volume of venture capital investment has increased 4.6 times in nine years.

In general, there are three main periods that reflect the stages of venture capital development in the world:

- From 2011 to 2013 — the initial state, which is characterized by relatively small and stable investment, with a significant dominance of American capital;
- From 2014 to 2016 — the first period of rapid venture capital growth, which raised doubled in monetary terms, although the number of transactions increased relatively less, the share of Asia in borrowed capital began to significantly exceed the European one;
- From 2018 — the second period of rapid growth, which is characterized primarily by a significant increase in the number of transactions (14,821 agreements in 2019 against 8,585 agreements in 2014), a significant increase, as well as the number of large transactions (greater than 15 million) and the median size of the transaction, with an even larger share of capital raising in Europe (15% in value terms and 20% in the number of transactions, as of 2019).

Despite a small decline in the value of investments in 2019 ($ 10 billion less than in the previous period), the United States continued to dominate the global venture capital market, owning more than half of the world market.

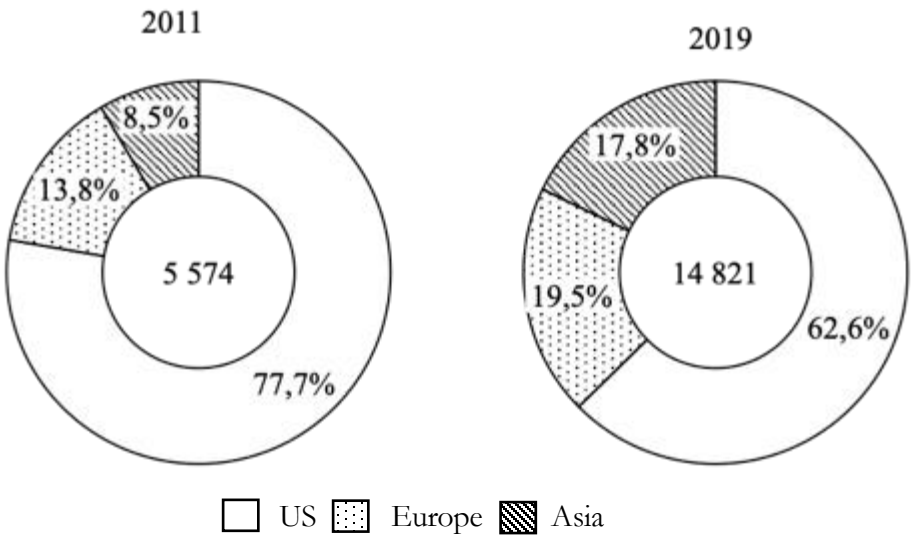
Figure 1. Dynamics of global venture investments by regions for 2011–2019 (billion dollars)



Source: https://assets.kpmg/content/dam/kpmg/xx/pdf/2020/01/venture-pulse-q4-2019-global.pdf

Another key trend in the global venture capital market is an increase in the average size of the transaction. This process is observed in the context of all stages of raising venture capital (Figure 2). Thus, if we compare the median size of investments under the agreement from 2012 with the indicators of 2019, then among the agreements of the seed stage, this indicator increased 3.4 times. The largest increase occurred in the last 2 years. The average amount of attracted investments per transaction increased 3.6 times in the early stages of venture investment and 1.7 times in the late stages.

Figure 2. Geographical structure of global venture capital by number of transactions by region in 2011 and 2019



Source: https://assets.kpmg/content/dam/kpmg/xx/pdf/2020/01/venture-pulse-q4-2019-global.pdf

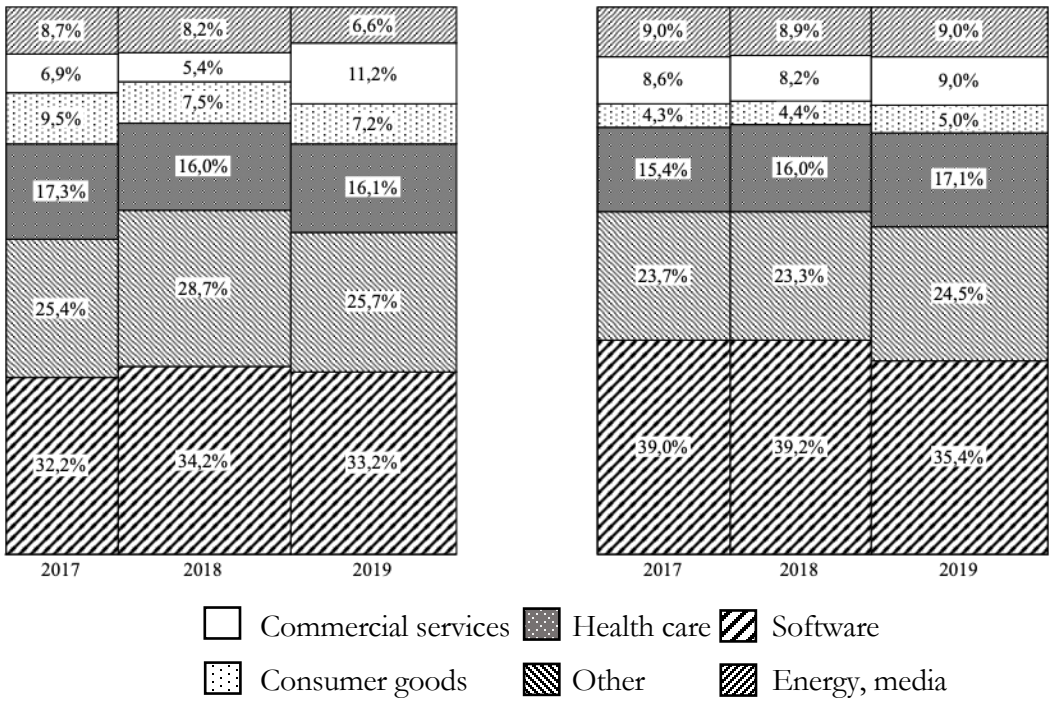
At the industry level, venture capital around the world continues to diversify (Figure 3) fintech continues to be one of the most attractive areas for investment (although the overall share is not very high), along with the biotechnology, logistics and food delivery sectors. In the technology segment, the leaders are solutions for artificial intelligence, automation, and process technology in the B2B sector. The latter especially dominated the European market.

Over the last three years, the largest industries in terms of the share of borrowed capital were:

1. Software - 33.2% in monetary terms and 35.4% in the number of transactions;
2. Healthcare and pharmaceuticals - 25.7% and 24.5%;

3. Commercial services - 11.2% and 9%.

Figure 3. Sectoral structure of global venture capital investments in monetary terms (A) and by number of transactions (B) for 2017–2019, %



Source: https://assets.kpmg/content/dam/kpmg/xx/pdf/2020/01/venture-pulse-q4-2019-global.pdf

While considering the trends of venture investment in Ukraine, according to own estimates based on data from the open online source Ukraine Dealroom, in 2019, 81 agreements were closed with the participation of Ukrainian companies for a total of $ 485 million, which is 5.5 times more than in 2016. Considering the volume of investments in the period from 2011 to 2019 it can be noted that since 2016 there has been a significant increase in borrowed capital, which indicates the development of the industry and the attractiveness of Ukrainian IT projects for investors.

The Ukrainian venture capital market follows the global trends in the average size of attracted investments per one transaction. Thus, since 2011, the average amount of capital received in the early stages of investment has increased from $ 1.6 million. up to $ 7.9 million (4.9 times). Due to the fact that only a few Ukrainian startups attract investments at a late stage each year, and for the most part they are relatively extremely successful companies in their industries, the average amount of capital raised at a late stage is staggering even worldwide at 107.1 million dollars, which is almost four and a half times higher than five years ago. At the same time, the average amount of venture capital investments under the seed stage agreements gradually decreased from 700 thousand dollars up to 100 thousand dollars, because the number of new Ukrainian startups that receive initial venture capital is growing every year more rapid than the amount of funds are raised.

Considering venture capital investments in the field of IT in terms of specialization, using online source of AVentures DealBook (2019), over the past few years there has been a change in the areas of capital raising. Thus, if by 2017, using online source of AVentures DealBook (2018), the predominant segment was software development, which attracted 43.4% of total venture capital ($ 141 million in monetary terms), now most venture capital investment is made in the internet services sector - 77 % ($ 373.5 million). Software development dropped to second place in terms of investment in 2019 with a share of 19.2% (93.12 million).

The main driver of growth for the venture capital market in Ukraine is the IT sector: this is evidenced by the fact that most of the amount of venture capital coming to the country is attracted by Ukrainian IT companies and startups. Accordingly, to determine the investment attractiveness of the IT sector of Ukraine for venture investors, it is necessary to investigate the factors that increase the odds of startups to exist longer and achieve higher funding stages.

Relevant studies were made about factors that influence the survival of startups and the rate of startups survival. In the study, made by Gonzalez (2017) some reasons, that are considered as factors, that can ifluence on United States startups survival, were studied. The methodology was the following – author decided to use grounded theory and further comparison together as a method. This method included picking up the information across each replication and, as a next step, comparing with new categories as a data analysis technique. From author's perspective, results of the analysis broad the experience how to increase probability of the startup to survive.

In the study of Grant et al. (2019) the goal was to explore the behavior of Canadian startup surviving after investments, provided by angel investors. This type of investors, also well-known as private investors, is necessarily prosperous, financially flourishing individuals who provide financial support for the budding startup in exchange for ownership or partial ownership of the startup's company. Not infrequently angel or private investors conceivably occur among family circles or relatives, friends or acquaintances. Provided foundation by this kind of investor may occur either only one time in order to support business beginners going ahead or in a way of continuously injections to succor and assist startup in times of hardship and difficulties.

The support, received from angel investors, includes investments in range of $10 000-$15 000, niche expertise and help in attracting next round. Further step was to find the differences between them and Canadian startups population in the economy.

The main differences between mentioned studies and our is that we determined factors which increase probability of startup transferring from one venture investment stage to the another. Moreover, we investigated Ukrainian startups and, generally, different methodology was applied.

CHAPTER 3. METHODOLOGY

The aim of the following chapter is to provide a specification of model methodology and a description of the approach. In addition, the appropriateness of the method chosen for this study is provided.

In order to setup the regression model that applies for the current case, the relevance of the variety of currently existing and partially suitable for this case models needs to be considered.

Initially, the goal of applied methodology in our study was to determine factors that increase probability of startup to be successful on the market – to transfer from one venture investment stage to furthers. Therefore, as the dependant variable the venture investment stage was chosen. Considering that the predicted variable is a categorical variable, several regression models possibly might be applied as appropriate for this study. For instance, linear probability model, that is to apply linear regression. Another option is to use logit or probit models and their variety – multinomial logit or probit regression model, ordered logit or probit ordered regression models.

Linear probability model is uncomplicated to apply and estimate, however it has several disadvantages. The drawbacks are mainly regarding fitted probabilities and explanatory variables marginal effects. In this simple model the probabilities can be greater than one or less than zero and the partial effects of any independent variables are constant.

It is worth to mention that data that was gathered and used for this study includes three types of venture investment stage – seed stage, early-stage venture and late-stage venture. However, only two startup companies exist in late venture investment stage, therefore it was decided to exclude this choice of venture investment choice in order not to provide imprecise results of the analysis. As far as multinomial logit regression, multinomial probit regression, ordered logit regression and ordered probit regression

models require minimum three choices of venture investment stages, which is in our case only two stages – seed and early-stage venture, we are not able to apply them in current study.

For the reasons, mentioned above, the simple binary response models like logit or probit regression models are quite applicable in the current case. In binary response models the difference between interpretations does not differentiate noticeably. However, the main dissimilarities between logit and probit is that the logit regression model is applied basing on the assumption of extreme value type errors and probit bases itself in the assumption of normal errors. In addition to the issue of differences between logit and probit regression models it is worth to mention that logit model is been applied more straightforward than the probit model, therefore this kind of regression model is more unchallenging to deal with and, obviously, is more commonly used. Thereby, in our study logit regression model was applied.

For the purpose of estimating startups that can be transferred from one venture investment stage to another, having quantitative and qualitative characteristics of Ukrainian startups on some investment stages, it was discovered what leads to a startup for being on the particular investment stage and the way startup can be transferred to another investment stage. The data for each startup consists of the several venture investment choices and some characteristics:

- Venture investment choices (type):
    - 0 = seed stage;
    - 1 = early venture stage.
- Characteristics:
    - total funding amount (tfa);
    - number of funding rounds (nround);
    - headquarter location of the startup (hq);
    - number of employees (memb).

In order to provide the way how the chosen model is been applied, estimated and interpreted, the theoretical perspective around this model needs to be provided and described.

According to the Wooldridge (2018) the class of binary response model of the form is:

$$P(y = 1|x) = G(\beta_0 + \beta_1 x_1 + \cdots + \beta_k x_k) \quad (1)$$

Where $x_1 \ldots x_k$ are independent variables, $\beta_1 \ldots \beta_k$ are coefficients, β_0 is the intercept and values of the function G exist precisely between zero and one. This guarantee that estimated response probabilities take values only between zero and one.

While considering the logit model, G is the logistic function:

$$G(z) = \exp(z) \,/\, [1 + \exp(z)] = \Lambda(z) \quad (2)$$

Which is strictly between zero and one for all real numbers z. This is considered as cumulative distribution function CDF, which is increasing, for standard logistic random variable.

The model for venture investment choice for our case is:

$$P(type = 1|tfa, nround, hq, memb) =$$

$$= \Lambda(\beta_0 + \beta_1 * tfa + \beta_2 * nround + \beta_3 * hq + \beta_4 * memb + \varepsilon_i \quad (3)$$

Where the dependent variable "type" equals 1 in case when startup company succeed and is transferred to early-stage venture (esv). Simultaneously, ε_i represents error term, $\beta_1 \ldots \beta_4$ stand for coefficients and β_0 is the intercept.

However, having non-linear model, the usual interpreting of the coefficients is less straightforward. In this type of the model the goal is to receive the outcome in probabilities terms, where every effect is non-linear, because, as already was mentioned, values of the received probabilities are restricted between zero and one. Therefore, in order to make the model being interpreted better in the scale that provides more sense to making predictions marginal effects are being used.

There are two ways to obtain mentioned above marginal effects: partial effect on average and average partial effect.

Partial effect on average includes determining the average value of each indicator in the sample. After it these averages values are inserted in the equation 4 and marginal effects is computed.

$$n^{-1} \sum_{i=1}^{n} g(\widehat{\beta_0} + x_i \hat{\beta}) \quad (4)$$

Where $g(\widehat{\beta_0} + x_i \widehat{\beta}) = \exp(\widehat{\beta_0} + x_i\hat{\beta}) / [1 + \exp(\widehat{\beta_0} + x_i\hat{\beta})]$ (5)

However, this case is not representative in the current case for our sample, because parameters are not normally distributed. Therefore, another approach of obtaining marginal effects needs to be applied – average partial effect, where value of every observation is inserted into average value calculation (Equation 6). The obtained result of the average value represent how probability of success is changing while some factor is changed by some units. Probability of the success is considered when dependent variable takes its value 1. Thus, in other words, the average value shows how the probability of choosing value 1 is changing if some factors are changed by some units. In our case, probability to choose 1 is the probability of startup being in the early-stage venture.

$$n^{-1}\sum_{i=1}^{n}\{G[\widehat{\beta_0}+\widehat{\beta_1}x_{i1}+\cdots+\widehat{\beta_{k-1}}x_{ik-1}+\widehat{\beta_k}(c_k+1)]$$
$$-G(\widehat{\beta_0}+\widehat{\beta_1}x_{i1}+\cdots+\widehat{\beta_{k-1}}x_{ik-1}+\widehat{\beta_k}c_k)\} \quad (6)$$

To sum up, marginal effects show the change in probability when the predictor or independent variable increases by one unit. For binary variables, the change is from 0 to 1, so one 'unit' as it is usually thought (Torres-Reyna, 2014).

CHAPTER 4. DATA

The goal of the following chapter is to describe data and its preparation for the analysis.

The data was gathered from news websites of deals made between Ukrainian startups and investors. The further step was the following – every deal was checked on the CrunchBase source. The data is starting from 2009 up to 2019, it includes 184 observations of Ukrainian startups, which are completely sufficient for the analysis.

Out of the available data, we focused to 6 variables, that are used for the applied model. These variables are the important influence factors of startup success to achieve further venture investment stage.

The year of a financial funding round is the first variable. The variable name in the model is "year". Political and economic environment over time have an impact to startup funding possibilities. Looking at the Figure 4 the distribution of financing over the time is to see. We chose "year" as time unit.

The location of Headquarter of the startup is our second variable. The variable name in our model is "hq", which corresponds to the head quarter of the startup company. In our study we focus to Ukrainian startups. Therefore, we collected data about financial funding rounds especially of startups with headquarter in Ukraine and used the variable value UA. It was decided to aggregate countries, which are in the European Union as one headquarters location, as variable value EU. For startups good funding region is, nevertheless, the USA-based venture ecosystem. To compare financial funding rounds, we collected data from Ukrainian startups with Headquarter location in USA with the variable value US.

The total funding amount in USD is the third variable. The variable name in the model is tfa, which corresponds to the total funding amount. A solid funding means

a solid foundation in terms of financial resources. Startups use these financial resources to develop products and services. A common use of the financial resources is, nevertheless, the marketing spending in order to realize growth for sales of the developed products and services. Therefore, the total funding amount is often an indicator for trust of investors in a startup and its founder-team, as also an important resource for the innovation power and success of startups. It is important to understand, that the level of funding rounds is globally differently distributed. Financial funding rounds in Ukraine are expected to be less than in Europe. Whereas financial funding rounds in USA are again bigger than in Europe.

The current financial funding round is our fourth variable. The variable name in our model is nround, which corresponds to the number of funding round. Startups raise capital in so-called financing rounds. The typical rounds are friends and family, preseed, seed, early venture stage, series A, series B, series C, etc. The aim for startups is to raise in every financing round capital at an increasing company valuation. Because, based on this valuation the shares for investors are calculated. With a higher share, investors can have a bigger influence to the startups and the founders-team.

The type of the financing round is the fifth variable. The variable name in the model is type. Based on our gathered data, we differentiate startup financing rounds as seed stage with the variable value "seed" and "Early venture stage" with the variable value "esv". Seed stages often have only the product or service as an idea and need first financial resources to develop first prototypes to test these ideas. At the early venture stage, venture investors and venture funds provide the financial resources. Often the early venture stage indicates that a startup has all prototype and product development successfully done and is ready to enter the market.

The amount of team members or employees of a startup altogether is our sixth variable. The variable name in our model is memb. We don't differentiate between founding-team members and employees. The amount of team members and employees

are an indicator for the ability to develop rroducts and services, provide proper customer support and sales activities as also manage all organizational tasks. Based on the gathered data, we clustered the amount of team members and therefore used the ID as variable value in the model as follows (Table 1):

Table 1. Values of the team members variable

Variable Value	Number of Team Members
1	1-10
2	11-20
3	21-50
4	51-100
5	101-200
6	201-500
7	501-1000

The dataset includes several types of the variables – quantitative variables and categorical variables. Therefore, the following description of the data is divided into the two corresponding parts, as well as accompanying tables.

Starting from data statistics description of the quantitative variables (Table 2), the values of the variable "Total funding amount" is in the range of the amount of money invested from $4000 up to $28,4 million. The average funding amount among all startup companies corresponds to $1,3 million.

Continuing description of the data statistics for quantitative variables "Number of funding rounds" variable values correspond to the being in the range from 1 to 13. The mean number of investment rounds for all dataset is, rounding, approximately 2.

Table 2. Descriptive statistics for the quantitative variables from the dataset

Variables	Mean	Standard Deviation	Min	Max
Total funding amount	1323504	3544333	4000	28400000
Number of rounds	2.168	2.0748	1	13

Describing data statistics for categorical variables only number of observations from the dataset can be provided (Table 3). Inasmuch as was mentioned before, late-stage venture investment stage startup companies were removed from the dataset for the reason of the data lack.

Hence, considering the variable "Venture investment stage", the majority of the startups from the dataset are in the seed venture investment stage – 153 companies to be precise. Other 31 startup companies are situated in early-stage venture investment stage.

Continuing describing the data statistics for categorical variables the variable "Year" of the startup being founded starts from 2006 up to 2019. It is worth to notice, that the year of 2014 was the most fruitful in terms of the amount of 31 startups been founded.

In regard to the research question of our study it is expectable that the majority of the startups from the dataset have headquarters located in Ukraine – 104 companies to be precise. At the same time 57 startup companies locate their office in United States, whereas 23 companies have their headquarters in Europe.

According to the dataset, the majority of the startup companies has the number of employees, that corresponds to 11-20 members of the team. The number of companies, that have bigger teams is decreasing quite sharply. Thus, less startups have

bigger team with 21-50 people in it. The same applies to the sizes of the team with 51-100 employees. Eventually, only 7 startups have number of workers starting from 101 up to 200 members.

Table 3. Descriptive statistics for the categorical variables from the dataset

Variables	Number of observations
Venture investment stage	
Early-Stage Venture	31
Seed	153
Year	
2006	2
2007	1
2008	5
2009	6
2010	7
2011	14
2012	16
2013	28
2014	31
2015	23
2016	24
2017	19
2018	7
2019	1
Headquarter	
UA	104
EU	23
US	57
Members	
11- 20 members	123
21- 50 members	38
51- 100 members	16
101- 200 members	7

The highest average funding distribution was achieved in 2007 and 2015. These years it was equal to 27.7 and 2.5 million USD respectively. In all of the other years average

funding did not exceed 1.5 million USD. The lowest average funding amount is observed in 2019 and corresponds to 65 thousand USD.

The highest median funding measured annually is reached in 2007 (27.7 million USD). Median funding is lower than the average funding nearly for all of the years (see Figure 4 as an illustration).

The highest funding amount is observed for the early-stage projects (Figures 5). Average total funding amount for such projects is equal to 5.3 million USD and median is relatively lower – 2 million USD.

The average funding for the seed venture investment stage is 9.7 times lower than for the early-stage venture and amounts to 0.536 million USD. Medians for an early stage and seed type are 2 and 0.2 million USD.

Figure 4. Average and median funding distribution by years, USD

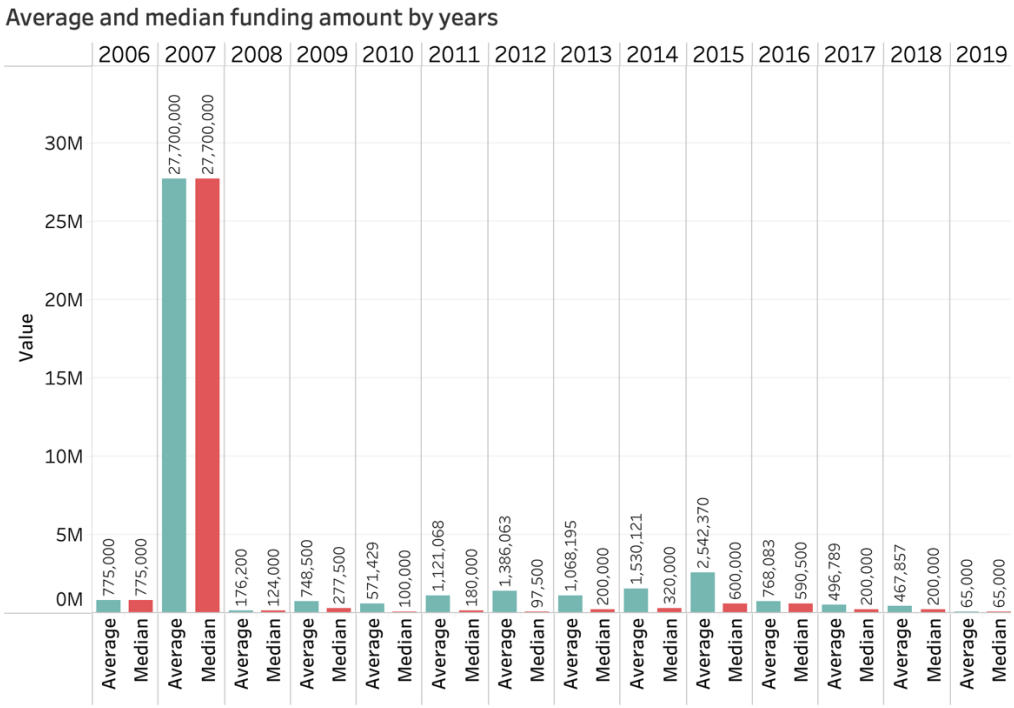
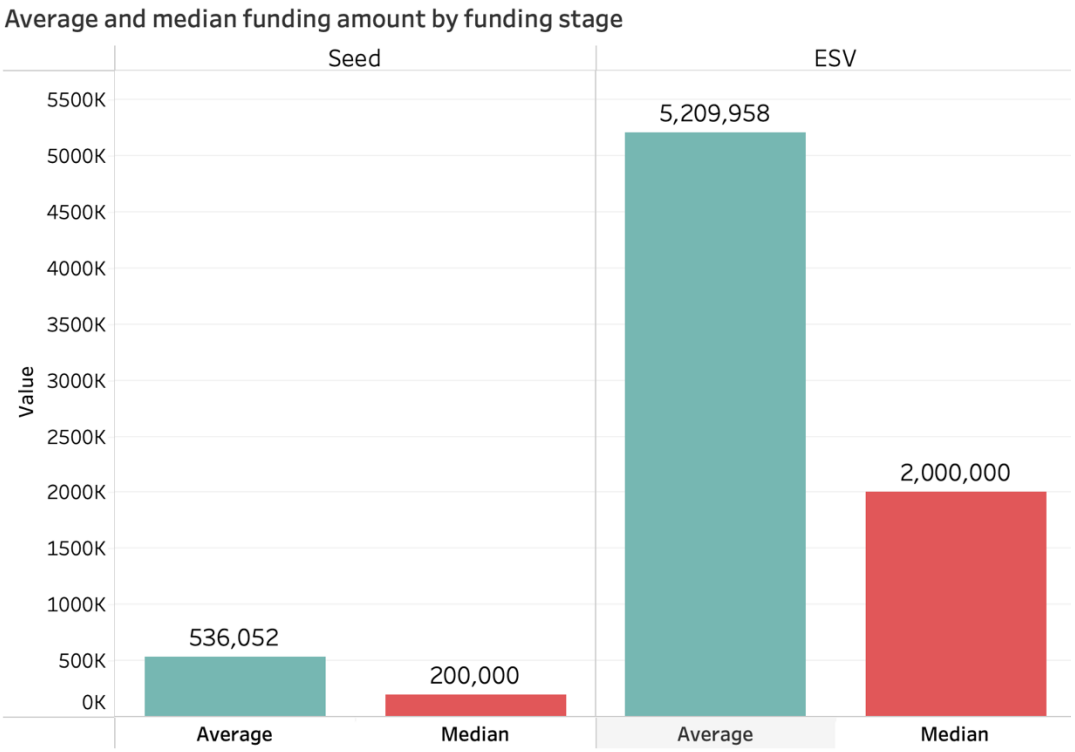


Figure 5. Average and median funding amount by the funding stage, USD



The most intensive period in terms of numbers of projects was during 2013-2015 and the highest one was achieved in 2014 (24 seed and 7 early-stage findings). Thereare less projects in EU than in US and Ukraine nearly all of the years (Figures 6 and 7).

Figure 6. Distribution of the funding statuses by years

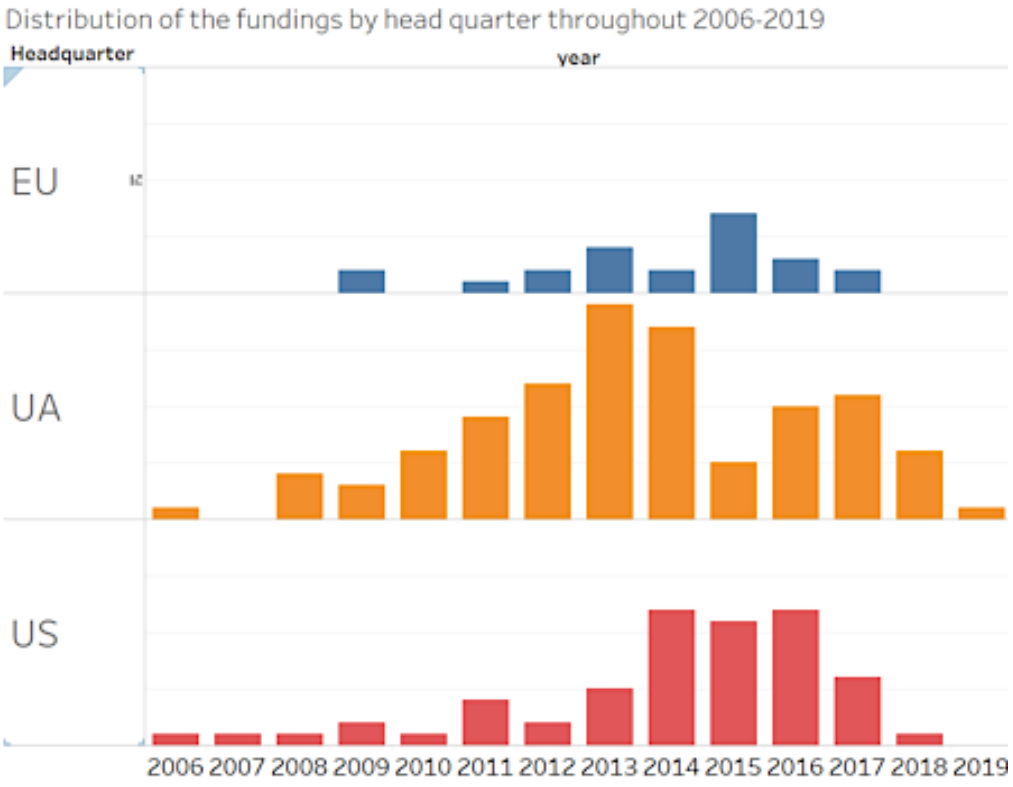
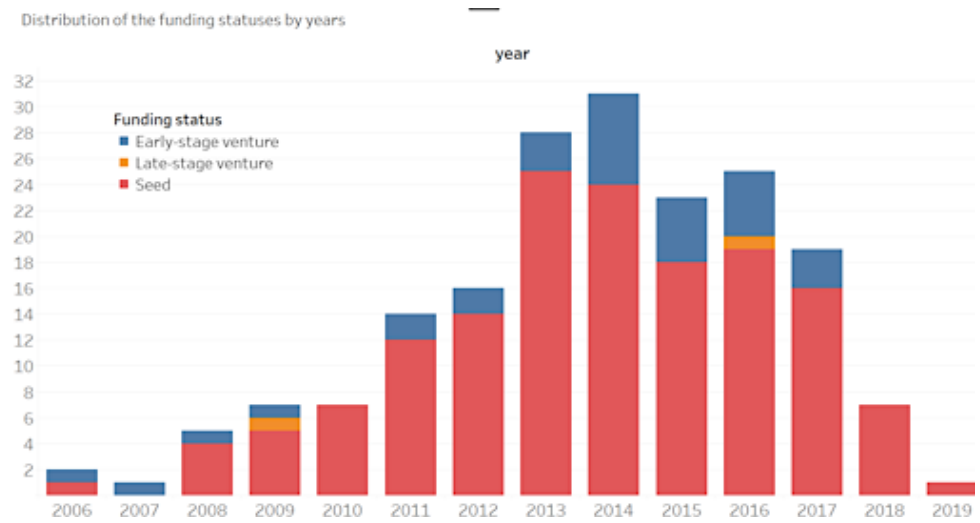


Figure 7. Distribution of the funding statuses in 2006-2019



CHAPTER 5. RESULTS

This chapter is designed for the estimation results of the logit regression model of the Ukrainian startups which can be transferred to further venture investment stages.

As was mentioned in previous chapters, the logit regression model was applied in this study.

After running this model, the coefficients can be received (table 4).

Table 4. Estimation results

Dependent variable	Coefficients	SE
tfa	0.000000**	0.000000
nround	-0.2407*	0.1362
hqEU	0.0240	0.8824
hqUS	0.3555	0.6654
memb3	1.8049***	0.6754
memb4	3.1801***	0.8883
memb5	1.0990	1.2525
Constant	-2.9660***	0.5059
Observations	184	
Log Likelihood	-51.5130	
Akaike Inf. Crit.	119.0260	
Note:	*p<0.1; **p<0.05; ***p<0.01	

Nevertheless, coefficients above of the logit regression model cannot be interpreted in usual way.

However, it is possible to make conclusion about the statistical significance of the coefficients considering received P-values (table 5).

Table 5. The statistical significance based on P-values

Dependent Variable	z	P> | z |
tfa	2.0427	0.0411
nround	-1.5821	0.1136
hqEU	0.0271	0.9784
hqUS	0.5188	0.6039
memb3	2.2557	0.0241
memb4	3.0763	0.0021
memb5	0.7367	0.4613

As far as not every variable has P-value lower than 0.05, the case of statistical insignificance among some of the variable is faced.

Starting from the variable tfa, which corresponds to the total funding amount, it can be clearly seen, that its P-value is lower than 0.05, which means that the current variable is statistically significant. This result proves quite obvious understanding of the process of venture investment principal of startups in general – the further venture investment stage the startup is occurred in, the higher amount of investment was received. For instance, the case when startup company receives, roughly, 1 million USD as investment cannot happen, or happens quite rarely, for startups that currently are in the late-stage venture investment level.

The variable nround, number of rounds, is statistically insignificant, as its P-value is higher than 0.05, which is also explainable from business point of view. Number of rounds not necessarily corresponds to the success of the startup. In market experience some cases with receiving different amount of investment per one round were noticed, for

instance some company can be given 100 million USD as a venture investment per one round of investment, whereas another startup company is able to achieve 50 million USD per five founds of investment. Therefore, following mentioned logic, number of rounds do not reflect success and performance of the startup companies.

Considering the variables hqEU and hqUS, which corresponds to the startup headquarter, situated in Europe or in United States, they are both statistically insignificant, because their P-values are lower than 0.05.

The variables memb3 corresponds to having in startup team the following number of employees – from 21 to 50 people. This variable, as it is clearly can be seen from the table above, is statistically significant, which means, that number of startup team has its impact on the success of the startup itself.

The same situation with variable memb4. This variable includes 51-100 startups team members and is statistically significant, as its P-value is higher than 0.05.

However, the variable memb5, that includes 100-200 members of the startup company team, is statistically insignificant, because the P-value for this variable exceeds 0.05 value. This can be explained considering the following – the dataset, gathered for our study, includes only 7 observations of startups that have this team size. Therefore, the statistical insignificance can be occurred because the lack of the data.

Having these results, we can state, that some of the coefficients in used model are statistically significant and can be interpreted in the following way.

The main goal of applying logistic regression model was to estimate the results. Since I already mentioned, that preliminary coefficients cannot be interpreted in usual way, other way of estimation results needs to be applied. This method includes interpreting the marginal effects, that are obtained from the logit regression model (table 6).

Table 6. The marginal effects on the probability to transfer to the next investment venture stage

Variables	Marginal Effects
tfa	3.447473e-06
nround	-1.966935e+00
hqEU	1.967732e-01
hqUS	2.995923e+00
memb3	1.852616e+01
memb4	4.782137e+01
memb5	1.111950e+01

The interpretation behind these marginal effects is the following.

Starting from the variable tfa, which corresponds to the total funding amount, if it increases by 1 million USD, the probability of the startup's company to transfer from seed venture investment stage to the early venture investment stage is higher by 3%, comparing to the seed venture stage. In other words, startup receives higher amount of investments with transferring to the further venture investment stages.

Next step is to interpret the nround – number of rounds. With every additional round the probability of the startup being on early venture investment stage, comparing to seed stage, is lower by 1.9%.

The results that are observed with the variable hqEU, which corresponds to the startup headquarter, situated in Europe, is the following - if the headquarter of the startup is located in Europe, the probability that company will be at the early venture investment stage is increasing by, approximately, 0.2 %, if the headquarter is transferred from Ukraine to European Union, comparing to the seed venture investment stage.

The outcome, regarding the variable hqUS, which corresponds to the startup headquarter, situated in United States is the following - if the headquarter of the startup is located in United States, the probability that company will be at the early venture investment stage is increasing by, approximately, 3 %, if the headquarter is transferred from Ukraine to United States, comparing to the seed venture investment stage.

If the number of employees changes from 1-20 to 21-50, the probability that the company will be at the early venture investment stage is higher by 18%, comparing to the seed venture investment stage.

While moving to team that includes 51-100 members, the probability that the company will be at the early venture investment stage is rising up to approximately 48%, comparing to the seed venture investment stage.

However, when moving to the team members 101 and more – the probability that the company will be at the early venture investment stage do not increase so instantly, only 11%, comparing to the seed venture investment stage.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

In this study we determined factors, which increase probability of startup transferring from one venture investment stage to the other using the applied approach of logistic regression model. For the mentioned analysis the data for this research was gathered from news websites of deals made between Ukrainian start-ups and investors and checked on the CrunchBase source.

The results of our study show that having estimation of the regression model, that if the startup can get funded within seed stage with higher financial stages, the probability to reach the early venture investment stage, comparing to seed venture investment stage, is higher.

Also, the regression model shows a higher probability for Ukrainian Startups to reach the early venture investment stage if the amount of Team members and Employees is increasing.

For the reasons, mentioned above, our recommendations for startups founders are the following.

Startups should be very selective in the choice of investors. It is important to raise a higher amount in a few financial rounds. Therefore, the founder team must focus to build trust and a solid founding story. The founding story needs to contain not only successful prove of concepts, but also first tests on local market, for example. Startup founders should work highly with KPI and be data-driven, to gain the trust in their investors.

Next to a solid founding story, a well-developed branding and marketing strategy must be in place. Only if startups can demonstrate traction or trustworthy ways to reach it, investors will be ready to invest higher amounts.

Ukrainian startups should seek international investors for their financial rounds, as in Europe and especially US, the financial funding rounds are in general higher. It can occur because of the special attractiveness for US and European investors as labor costs in Ukraine are still at a lower level.

The way to execute our recommendation might be done by launching the startup and to locate the headquarter in the United States for example. However, the R&D centers must be located in Ukraine. Developers form R&D centers can receive their wage in Ukraine, which is included into Ukrainian GPD. The headquarters, that are situated in United States, will perform nominal legal functions, in particular raising capital, and will report according to American norms. Nevertheless, Ukraine will have an economic effect, because all the main R&D centers are located there.

In addition to a solid founding story, well developed products and services, and support by lower labor costs, it is a recommendation for startups in Ukraine to hire good talents early and increase the team size relatively fast – in accordance to the cash flow capabilities.

Bigger team sizes help to distribute the manifold startup tasks to the right talents and can speed up the way of the achievement of traction for the developed products and services.

Regarding the issue of the future work in this area our suggestions are to execute survival analysis. This analysis, to be detailed, includes the investigation of the time, when every startup company was launched and whether it still exists on the market, and to explore in details, from the survival point of view, not only the probability of the startup being on some venture investment stage, having quantitative and qualitative characteristics, but the probability of the startup remaining on the market.

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