A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance from the Nova School of Business and Economics

ANALYSIS OF THE RELATIONSHIP BETWEEN VENTURE PERFORMANCE AND NON-FINANCIAL SUPPORT PROVIDED BY IMPACT VENTURE CAPITALISTS

MARC KLEIN

Work project carried out under the supervision of:

Antonio Miguel

31-01-2024

Table of contents

List of Abbreviations

CSRD - Corporate Sustainability Reporting Directive

EMIM - European Mainstream Investment Market

FCF - Free Cash Flow

GAN - Global Accelerator Network

GIIN - Global Impact Investment Network

MIS - Management Information System

MOIC - Multiple on Invested Capital

OLS – Ordinary Least Squares

PR - Public Relations

Q-Q - Quantile-Quantile

ROI - Return on Investment

SDGs - Sustainable Development Goals

SE - Standard Error

SFDR - Sustainable Finance Disclosure Regulation

SOM - Serviceable and Obtainable Market

SR – Success Rate

TAM - Total Addressable Market

VC - Venture Capital

VIF - Variance Inflation Factor

List of Tables

0. Abstract

Using data from the Portuguese impact venture capitalist maze impact, the relationship between non-financial support and the financial performance of portfolio ventures in the impact investment space is analyzed. For that, a meta-analytical approach is used after the impact investment market and the platform role of venture capitalists were discussed. Findings that can be derived from the analyses suggest that a positive correlation of non-financial support on financial performance depends on the support area and only includes successfully provided support in talent acquisition, PR and Marketing. However, non-financial support in general tends to be negatively correlated to financial venture performance.

Keywords: Venture capital; value-add services; VC platform; impact investments; startups

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

1. Introduction

Global venture capital (VC) is surpassing records in recent years with Europe being the fastest growing region for VC investments (European Startups 2021). Startups in Europe are reshaping the technical environment and forming the economy of the future, thereby contributing to economic and social vibrancy in their countries. The term startup is not universally consistent but can be defined as a company no older than 10 years with an innovative business model and the intention to grow (Bormans et al. 2019, 4). Despite a relative innovation deficit in the European startup ecosystem some years ago, Europe is now starting to show renewed optimism (McKinsey 2022). Central to this development is the presence of venture capitalists who are considered as one of the key catalysts of success of entrepreneurial firms (Croce et al. 2013, 1). Since young business ideas with impact potential are growing exponentially, investors are also shifting their investment focus to companies that prioritize not only profit but also impact (Impact Investing Institute 2020). Therefore, a new breed of investors known as "impact venture capitalists" has emerged in recent years while "impact investing" is becoming more popular (Honold et al. 2023).

Impact investing is about providing capital with the commitment to a measurable improved outcome for the three overarching impact themes of a sustainable planet, healthy people and resilient society. These topics align with the 17 UN Sustainable Development Goals (SDGs) and are also targeted through the EU action plan released by the European Commission in 2018. Especially due to the current mutually reinforcing shocks including the Ukraine war with a resulting energy and food crisis, surging inflation and debt tightening, impact investing is imperative to ensure long-term economic and financial stability (Trill Impact 2022).

In this space, venture capitalists have a new vision and want not only to generate financial returns but also "generate a measurable beneficial social and environmental impact". They do it by supporting startups, which are targeting the impact themes mentioned above, with capital

through minority investments and know-how (Chalkley 2023). This is called impact venture capital. When analyzing the general effect of the relationship between the engagement of a VC and its portfolio company performance, a positive association can be observed (Lohwasser 2020). This engagement can be divided into a financial and non-financial part. While financial support has long been recognized as a critical success factor for the growth of early-stage companies, non-financial support provided by (impact) VCs plays a growing pivotal role for the development of the portfolio ventures.

Several previous studies have examined the relationship between VC funding and business performance as well as the demand for non-financial resources from VCs and the startup characteristics in the mainstream investment market. However, the causality of venture performance and non-financial support in the impact venture capital space in Europe is still a pending research question as existing literature often does not quantify the impact of non-financial resources added by VCs on the investment and financial performance of the portfolio ventures (Quas et al. 2020, 1362). Therefore, this work will delve into the world of impact venture capital in Europe with a focus on non-financial support in cooperation with the Portuguese impact VC maze impact ("maze") and will answer the research question:

"Is there a link between venture performance and non-financial support provided by impact VCs?" For the further work, it is important to mention that the Multiple on Invested Capital (MOIC) is used as a proxy for venture performance and will be explained in detail in the following sections which are structured as follows: First, the European Venture Capital market, impact investments, VC platforms and non-financial support of VCs are explained, and respective hypotheses are developed. Second, the methodology applied to answer the research question and the data is described. Third, analyses including a mean difference test and regressions are following and respective results are reported. Finally, limitations and remaining future research questions are discussed and a conclusion is made.

2. Literature Review and Hypotheses Development

2.1 Venture capital and impact investments in Europe

Venture Capital is about providing capital in form of equity and expertise to startups to help them in reaching their full growth potential while not achieving the entire control and management of the operations (Hidayat et al. 2021). The European Venture Capital scene is growing despite the economic downturn and slowdown of investments worldwide. Alongside the U.S. and China, Europe has grown towards a significant player in the global venture capital sector with a record fundraising amount of €160 billion in 2022 (Smith 2023). Especially in Europe, there is a growing collective shift in mindset of investors from the stand-alone goal of achieving financial returns to targeting a broad range of social, environmental, and economic objectives which drives the demand for impact investments (Peterson 2022). The growing need for impact investment is also accelerated by the rising climate crisis and the pressure for investors, managers and entrepreneurs to comply with three main EU reforms including the Sustainable Finance Disclosure Regulation (SFDR), the Corporate Sustainability Reporting Directive (CSRD) and the EU Taxonomy (Trill Impact 2022). In this context, an impact investment needs to have intentionality, measurability, and additionality to be counted as such (Gagiotti et al. 2022, 25-27). In general, impact investments add a new variable "impact" to the existing variables of financial return and risk in the investment process. Those need to balance to align incentives and interests of all stakeholders (Ramaswamy 2021).

While the European mainstream investment market (EMIM) is estimated to be €17.8 trillion in 2022, the impact investment market accounts only for 3% of the EMIM with €562.9 billion according to the latest Global Impact Investment Network (GIIN) market sizing. The figures show that the impact investment market still has a minority stake in the EMIM. However, the relatively small market experiences a strong volume increase with a y-o-y growth of 26% in assets under management from 2020 to 2021 (Gagiotti et al. 2022, 3).

Especially venture capital is needed in the impact space as the next generation of young entrepreneurial talents want to establish scalable business models around new emerging problems in the today's society while generating impact. This requires funding from the private sector (Impact Investing Institute 2020).

As VC is growing in Europe at a record space, venture capitalists need to differentiate themselves to attract the most promising startups and to achieve the highest impact in the society (Fricke 2019). In the last two decades, it is evident that the most important asset for an investment firm is not capital, but people. This is reflected in external relationships and several activities next to the provision of capital of each VC firm (Bolotsky 2020). Therefore, VC firms differentiate themselves with different, so called, platform strategies.

2.2 VC platform strategies and value-add services

The traditional role of a VC fund that simply provides access to capital and becomes a board member of the portfolio company is outdated. Young entrepreneurs need more support in their early days when they do not have in-house resources yet (Hartnett 2017). Therefore, Heather Hartnett notes the emergence of "platforms" at VC funds in 2017. Platforms are positions of VC funds with a focus on post-investment assistance and non-financial resources for startups. Thereby, VCs can support their ventures indirectly by providing financial resources which can be used to boost their social and human capital and directly by providing access to non-financial support. Through that, the VC fulfils both a (i) "coaching function" which is about providing financial, strategy, management and marketing advice and a (ii) "professionalization function" including providing access to their network and the introduction of human resource policies (Quas et al. 2020, 1364-1365). More specifically, it is about offering access to in-house operators who connect, advise and consult on strategy and specific challenges (Manning 2019; Forward Partners 2021). These additional resources called "value-add services" are part of a VC platform and have become a key differentiator to founders in a complex VC market

(Bogoslaw 2023). Andreessen Horowitz and First Round Capital were two funds that have shown successful "platforms" and were pioneers of this idea (Hartnett 2017).

Though, most VC funds struggle to decide which value-add services to include in their platform and how the platform can fit in their investment strategy. This decision can be structured if VC funds categorize the people they work with and the activities they run into three categories: ecosystem, network and community. The ecosystem includes all the people that the VC might possibly engage with directly or indirectly and is similar to the total addressable market (TAM). The network could be considered as the serviceable and obtainable market (SOM) and include people which are not anonymous anymore and with whom the VC fund will often engage. The third category community includes a small circle of people who should "personally feel that they are affiliated with that firm and the firm should feel the same". These three segments help VC funds to find their most important community members which are crucial for the fund's platform strategy. The community members then become an extension of the VC team and are acting as promoters for a broad range of value-add services (Bolotsky 2020). But what is the actual benefit of a platform? The material advantage of a platform is difficult to measure. However, the real return on investment (ROI) can be defined through three key factors:

First, the platform increases the performance of a VC fund in terms of quantity and quality of the fund's deal flow and positioning. Second, portfolio companies can overcome their growth challenges with the help of the platform through the link between founders and experts from the wider network which leads to increasing chances of reaching the next funding round. Third, platforms support the VC investment team as it takes on key portfolio management tasks (Fricke 2019). This leads to the first hypotheses:

Hypothesis 1. *The more non-financial support a company receives, the better its financial performance.*

2.3 Challenges and insights of non-financial resources and value-add services

Startups are essential for innovation and economic development and rely on external financial and non-financial resources to become successful (Alvarez-Garrido and Dushnitsky 2016) as they are most likely resource-constrained (Hvide and Moen 2010). The financial constraint impacts the demand for non-financial resources and makes them harder to replace (Riepe and Uhl 2020). This makes non-financial resources including value-add services crucial for the success of a young venture (Aspelund et al. 2005).

Riepe and Uhl (2020) are highlighting the importance of networks, the connections to further investors in later funding rounds and marketing support for startups in early development stages as key non-financial support services. However, they noticed a difference in startups' demand for non-financial resources between startups with higher and lower financial constraints: As a result, financial constrained startups rely more heavily on connection to further investors to improve fundraising activities compared to non-financial constrained startups.

This once again shows that the relationship between investors and startups goes far beyond the supply of capital and covers several resource areas which leads to the second hypothesis:

Hypothesis 2. *The type of non-financial support provided by impact VCs influences financial performance.*

Furthermore, when analyzing value-add services provided by VCs which are most attractive to young entrepreneurs, Forward Partners (2021) observed that 59% of founders report a negative experience with value-add compared to their expectations. They highlight a value-add gap as 92% of venture capitalists self-describe as value-add investors while 47% of founders are claiming that value-add services would have no impact on their business at all. The reasons for that are mainly lacking specialized services, dishonesty and a lack of results-driven service offerings. Based on the study of Forward Partners, founders look for sector expertise, empathy and the ability of VCs to understand and differentiate their business. Moreover, VCs should

offer smart capital and capital with capability to stand out from the competition which includes ad-hoc advice to founders and the provision of outcome-driven services. However, the currently missing outcome and the lack of results leads to the third hypothesis:

Hypothesis 3. *The more requested non-financial support successfully provided, the better the financial performance of the portfolio venture.*

Which specific value-add services contribute to actual growth of the startups also depend on the business model of the young venture. Therefore, go-to-market support seems most valuable for B2B founders while mentoring being most helpful for B2C businesses (Forward Partners 2021). However, besides growth, profitability is important for startups which can be achieved through the monitoring systems of VCs. Monitoring is similar to indirect non-financial support which is mostly based on contractual mechanisms through that VCs can detect early where their portfolio companies require support. As a result, they then can allocate their non-financial support services more efficiently (Lohwasser 2020). This enables the startup to improve their operations which most likely leads to higher profitability.

Ultimately, non-financial resources result in time and capital savings for startups, enabling an expedited market entry (Alvarez-Garrido and Dushnitsky 2016).

3. Methodology & Data Analysis

To further analyze non-financial support and value-add services of impact VCs and their influence on venture performance, a correlational quantitative research design was used (Grand Canyon University 2023). For that, secondary external data (Tuama 2022) was provided by the Portuguese impact VC maze impact. The data set was cleaned and checked for missing data and outliers. In addition, a comparison between the data set and the outcome of previous studies was conducted based on a descriptive data analysis. Then, the hypotheses were tested with a mean difference t-test as well as simple and multivariate regressions based on the cleaned data set and with the help of the programming language R and RStudio. The mean difference t-test

was primarily used to identify whether there is a difference in the data between companies with a high or low valued financial performance measured by the MOIC. The multivariate and simple linear regressions were done to produce estimators with good sampling distribution properties by analyzing "how the independent variables affect the dependent variable using ordinary least squares (OLS)" (Newbold et al. 2013). Even though the data set available at the time of this work was not big enough to allow for many statistically significant outcomes, the following analyses were created to provide a robust base for extended research in the future.

3.1 Descriptive data analysis

The data samples used in this study are extracted from the Management Information System (MIS) of maze impact and are provided in Excel files. Maze is an impact investing firm which is supporting young ventures with a lock-step business model committed to delivering positive social and environmental outcomes with financial and non-financial support. The data consists of two data sets including financial and non-financial information of the portfolio companies in which the company names and business models are anonymized (e.g. Company 1, 2, 3 etc.).

3.1.1 Financial data description

The financial data sample consists out of 14 columns and 60 rows. The columns represent different categories (e.g. company number, investment stage, investment amount, investment date, valuation, MOIC) and rows include the number of investment tickets. Based on that, it became clear that maze invested in 36 companies between October 2019 and March 2023 with 60 investment tickets.

Table 1: Descriptive financial data analysis

	N	Min	Mean	Median	Max
Ticket size (in €m)	60	0.040	0.456	0.438	1.250
Total funding (in €m)	36	0.177	0.759	0.656	2.859
Valuation (in €m)	36	0.163*	0.538*	0.531*	1.011
Weighted average MOIC	36	0.0x	1.18x*	1.0x*	2.6x

Note: * excluding zero values

The investments were allocated during the funding stages Acceleration, Pre-seed, Seed and Series A including round extensions in Pre-Seed and Seed. As shown in Table 1, the total invested capital adds up to €27.4m with ticket sizes ranging from €40.2k to €1.25m and a median size of €437.6k. The total funding amount per company ranges from €177.0k to €2.9m with a median of €656.3k. However, maze invested mostly in Seed and Seed extensions (56.7% of all distributed tickets) as well as in Pre-seed and Pre-seed extensions (33.3%) based on the number of tickets invested in each stage (cf. Appendix 1). After the first investment, 17 companies (47.2% of the portfolio companies) received a second investment in a later funding round, 6 companies (16.7%) received a third investment, and one company (2.8%) received a fourth investment from maze. To measure the investment and financial performance as well as the success of value creation for the invested startup, the MOIC is used. This is due to a restricted financial data access for each portfolio venture. However, this can be justified by the fact that the primary driver of the MOIC is the financial performance of the invested company through high growth or strong profits (CFI 2023). Additionally, the MOIC is used as a classical metric for early-stage startups to assess valuation mark-ups as most companies are in such early stages that it is impossible to use cash-based metrics or free cash flow (FCF) (Gompers et al. 2020).

The MOIC is calculated by dividing the latest absolute valuation by the invested capital at the latest valuation date on the 31 August 2023 as shown below:

(1) MOIC = Latest absolute valuation / Investment amount

In this context, a higher MOIC is assumed to reflect a better financial performance of the startup which leads to a higher absolute valuation (CFI 2023). Maze invested with several tickets in the same startup in different funding rounds. This resulted in several absolute valuations and different MOICs for one startup. Therefore, an average absolute valuation as well as a weighted average of all MOICs for every company was calculated. For the average absolute valuation of

each company, the individual valuations of the funding rounds were added up and divided by the number of funding rounds:

(2) Valuation = (Valuation #1 + Valuation #2 + … + Valuation #N) / # of funding rounds

Based on this calculation, the lowest average absolute valuation is €0.0k or €163.9k when excluding the zero values while the highest valuation rests at €1.01m. The median lies at €531.2k when excluding the valuations of zero. In addition, the weighted average MOIC was calculated by adding up the products of the MOIC of each ticket and the amount of invested capital of each funding round and dividing the sum by the total funding amount the company received:

*(3) Weighted average MOIC: (MOIC #1 * Ticket amount #1 + MOIC #2 * Ticket amount #2 + …+ MOIC #N * Ticket amount #N) / (Sum of Ticket amount #1 + #2 + … + #N)*

The weighted average MOICs range between 0.0x and 2.6x, whereas 4 companies have a MOIC of 0.0x, 19 companies have a MOIC of 1.0x and 13 companies have a MOIC >1.0x. The majority (75% or 3 out of 4) of the companies with a MOIC of 0.0x did not ask at all for non-financial support. Therefore, they have been treated as missing values as no valuation seem to be available and they do not seem to be interested in non-financial support. These companies have been excluded in the cleaned data set and therefore in the regression analyses. The overall average MOIC is 1.1x and 1.2x when excluding zero values respectively. Whenever MOIC is mentioned in the following chapters, the weighted average MOIC per company is inferred.

3.1.2 Non-financial data description

The non-financial data sample consists of 19 columns and 248 rows and shows different non-financial support requests by the portfolio ventures of maze. These requests are made through the creation of digital support tickets which are executed by maze. The columns include again different categories (e.g. the ticket ID number, the company number, ticket status, support area, date of ticket request etc.) whereas the rows represent the different non-financial support tickets.

Therefore, 248 support ticket requests were created by the portfolio companies between May 2022 and September 2023. Since the last evaluation date of the MOIC was in August 2023 and the data sets should have the same end date, the data set was adjusted at this point. Therefore, the requested tickets were only counted until the end of August 2023 which resulted in 239 requested support tickets. In addition, the support tickets of one company with a weighted average MOIC of 0.0x where excluded due to the reasons mentioned in 3.1.1. This led to a final total number of 236 support tickets used for the analysis which are represented through the variable "Count" in the analysis later. The non-financial support requests are clustered by many categories with the most important being (i) the anonymous company, (ii) support priority (e.g., no support, low, medium, high), (iii) ticket status, (iv) support area and (v) date of request. The ticket status includes failed to act, in progress, not started, opportunity, and success. The average Success Rate (SR), which includes all tickets only with the status "success", of the requested tickets is 72% (cf. Appendix 2). This amount is significantly higher compared to the study of Forward Partners (2021) where 65% of founders claimed that investors tried but failed in providing services beyond capital which would result in a success rate of 35%. The support areas include 8 different topics such as the (i) access to the Global Accelerator Network (GAN) through which the portfolio companies can get access to software and cloud services at discount, (ii) Commercial Introductions ("Commercial Intros"), (iii) Fundraising Support, (iv) Marketing, (v) Mentorship, (vi) Public Relations (PR), (vii) Talent and (viii) Other. However, most support tickets were requested in the areas of Fundraising Support (39%), Commercial Introductions (20%) and Mentorship (14%) (cf. Appendix 3). This outcome is also in line with previous studies (Forward Partners 2021; Riepe and Uhl 2020).

Overall, 29 companies requested non-financial support through at least one ticket request including 28 companies with a MOIC of >0.0x. Thus, 7 companies did not ask for any non-financial support. On average, a portfolio venture asked 8x for non-financial support.

3.2 Variables

Dependent variable. The weighted average Multiple on Invested Capital is used as the dependent variable and as a proxy for financial performance of the portfolio ventures.

Independent variables. In order to analyze the influence on the dependent variable, several independent variables are used: The total number of requested non-financial support tickets by company ("Count"), the SR of the tickets (e.g. if 5 of 10 tickets were successfully processed and executed, the SR would be 50%) and the number of requested tickets for all 8 different support areas mentioned above by company. For the calculation of the SR, the ticket status was merged. Therefore, all tickets which don't have the ticket status "success" were reflected as "failed".

Control variable. The total funding amount per company is used as a control variable.

3.3 Mean difference t-test

Before performing the regression analyses, a mean difference t-test (mean difference test) was conducted to see potential differences between companies with a high and low financial performance measured by the MOIC. For that, the data set described above was divided into two groups. Group 0 includes all companies with a MOIC of 1.0x while Group 1 covered all companies with a financial performance greater than 1.0x. Companies with a MOIC of 0.0x were excluded due to reasons mentioned above in the descriptive data analysis. Additionally, Group 1 was adjusted by removing all companies with a MOIC not 10% higher than the MOICs of Group 0 to only include the highest and lowest values excluding zero values. At this point, it did not make sense to use the upper and lower quartiles. This is because many companies have a MOIC of 1.0x which cannot be divided in different quartiles due to missing differentiation factors. To fulfill the prerequisites for the mean difference t-test, a Bartlett test was performed. The Bartlett test checked for the homogeneity of variances between the two groups and the response variable. The response variable was in each test the different support

areas, the SR or the variable Count. If the p-value of the Bartlett test was below .05, then the null hypotheses of equal differences in variances between the two groups was rejected and a Welch's t-test was performed. This affected the independent variables PR, Fundraising Support and Other which are highlighted with a star in Table 2 below. Otherwise, an equal variances t-test was performed. The test statistic mentioned in Table 2 refers to the k-squared value in case of the Bartlett test and to the t-value for the t-test. The calculated mean in each case is the mean of the number of requested non-financial support tickets in that specific area in each group or the mean of the success rate and the number of support tickets ("Count").

Table 2: Mean difference t-test results

	p-value	Test Statistic	Mean Group 0	Mean Group 1
Independent variables				
Marketing				
Bartlett test	0.752	0.100		
t-test	0.756	0.315	0.176	0.125
Other				
Bartlett test	0.014	6.087		
t-test*	0.049	2.073	0.941	0.250
GAN				
Bartlett test	0.965	0.002		
t-test	0.827	0.220	0.294	0.250
Mentorship				
Bartlett test	0.609	0.260		
t-test	0.873	-0.161	1.294	1.375
PR				
Bartlett test	0.008	6.989		
t-test*	0.206	-1.781	0.117	0.500
Commercial Intros				
Bartlett test	0.205	1.609		
t-test	0.516	0.658	1.88	1.250
SR				
Bartlett test	0.893	0.018		
t-test	0.513	-0.665	0.725	0.806
Talent				
Bartlett test	0.050	3.828		
t-test	0.115	-1.640	0.588	1.625
Fundraising support				
Bartlett test	0.004	8.314		

t-test*	0.131	1.571	4.06	1.500
Count				
Bartlett test	0.235	1.401		
t-test´	0.421	0.819	9.353	6.875

Note: *Welch's t-test

In Table 2, there can be interesting findings observed for the variables PR, SR, Talent, Fundraising Support and Count; however, only a few of the outcomes are significant at a 15% significance level. The first three variables tend to show a substantial higher mean in Group 1 than in Group 0. This indicates that companies with a better financial performance requested more support in the areas of PR and Talent than the companies with a worse performance on average. In addition, the SR of the requested ticket was also eight percentage points higher on average for companies with a higher financial performance. A surprising result can be found for the Fundraising Support and Commercial Intros. Therefore, the number of requested fundraising support tickets was over 2.6x higher for companies with a lower financial performance than for companies with a higher valuation, indicating a higher need for fundraising support leading to worse financial performance. Similarly, it can be observed that companies with a low MOIC ask for more help to find new clients (i.e. Commercial Intros). That it is in general unwise to require more support independently of the support area, can be observed by focusing on the mean of the Count variable as companies with a better financial performance asked for less non-financial support. This leads to the interpretation that a higher need for support reflect a worse financial performance of the portfolio ventures. Since most of the outcomes are statistically not significant, these interpretations will be compared and checked again in the next chapter with the simple and multivariate linear regression models.

4. Regression Analysis & Interpretation of Results

4.1 Model and assumptions

The multivariate linear regression model needs to meet several assumptions so that the estimators are unbiased and efficient. If this is true, then the tests also have a good explanatory

power (Newbold et al. 2013). These assumptions include (i) linearity, (ii) constant variance in the error terms (i.e. no heteroskedasticity), (iii) independent error terms (i.e. no autocorrelation), (iv) normally distributed error terms, and (v) no multicollinearity. However, as the data set consists out of cross-sectional data and not time-series data, assumption (iii) is not the primary concern for this test and was therefore not tested in detail (Universität Innsbruck n.d.). To ensure that the data set conform to all other model assumptions, different tests have been conducted. The linearity was tested through a scatterplot with a lowess curve which showed a linear pattern. The constant variance in the error terms was tested through a Breusch-Pagan test which approved the assumption that there is no heteroskedasticity. The fourth assumption was tested by calculating the mean of the residuals and by drawing a Quantile-Quantile (Q-Q) Plot of Residuals. The last assumption of no multicollinearity was approved by using the variance inflation factor (VIF). Based on the VIF factor, there appeared to be multicollinearity in the model when including the independent variables Count, Fundraising Support, and Commercial Intros all together. Therefore, it seems to be redundant to include all three variables in the model. This is logical as the variable Count is automatically reflected in the other variables as they are part of the total number of support tickets. Therefore, the variable Count became disposed and the model was checked again for multicollinearity. After removing the variable, the VIF analysis now signaled no multicollinearity as all remaining variables have VIF-values below five which seems to be ideal to obtain efficient estimators in the regression (James et al. 2013). Based on the above tests, all relevant assumptions became approved (cf. Appendix 4).

Following the previous assumption tests and the descriptive data analysis, the below multivariate regression model equation was developed and used:

$$[1]\ MOIC = \beta_0 + \beta_1\,(SR) + \beta_2\,(Talent) + \beta_3\,(GAN) + \beta_4\,(Commercial\ Intros) + \beta_5\,(Mentorship) + \beta_6\,(PR) + \beta_7\,(Fundraising\ Support) + \beta_8\,(Marketing) + \beta_9\,(Other) + \beta_{10}\,(Total\ Funding) + \varepsilon$$

As the independent variable Count showed multicollinearity in the model above, the variable was removed and used in a separate simple linear regression model which analyzes the stand-alone effect of the quantity of non-financial support provided on the MOIC:

$$[2]\ \text{MOIC} = \beta_0 + \beta_1\ (count) + \varepsilon$$

To account for the small data set in the interpretation of results, the alpha level was increased to .15 as it was done by researchers in previous studies with small data sets. This minimizes the weighted combined error rate of Type 1 and 2 errors and increases the chance for some statistically significant results (Maier and Lakens 2022).

4.2 Results and discussion

After the data set was described, all dependent and independent variables defined, the research approach explained, and the regression models developed, the results can be presented. The results of the multivariate regression are shown in Table 3 below. Model (1) displays the regression [1] including all independent variables. Models (2 – 7) exclude the least significant variable from the prior regression to test the model's robustness and to account for any model specification errors (e.g., Marketing had the highest p-value in Model 1 and was therefore the least significant variable which was not included anymore in Model 2). This approach was used to try to achieve significant outcomes given the small data set.

Table 3: MOIC regression results using the multivariate regression [1]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Independent variables							
Marketing	0.013						
	(0.389)						
Other	-0.030	-0.030					
	(0.112)	(0.107)					
GAN	-0.113	-0.116	-0.103				
	(0.218)	(0.195)	(0.185)				
Mentorship	-0.048	-0.047	-0.049	-0.042			
	(0.093)	(0.086)	(0.083)	(0.081)			
PR	0.185	0.186	0.187	0.147	0.096		
	(0.211)	(0.205)	(0.199)	(0.183)	(0.151)		

Commercial Intros	-0.019	-0.018	-0.025	-0.025	-0.030	-0.025	
	(0.064)	(0.049)	(0.039)	(0.039)	(0.037)	(0.036)	
SR	0.435	0.438	0.425	0.368	0.343	0.337	0.398'
	(0.345)	(0.319)	(0.303)	(0.284)	(0.275)	(0.271)	(0.253)
Talent	0.074	0.073	0.080	0.086	0.086	0.090	0.088*
	(0.065)	(0.063)	(0.056)	(0.054)	(0.053)	(0.052)	(0.051)
Fundraising support	-0.013	-0.013	-0.104	-0.014	-0.014	-0.014	-0.016
	(0.016)	(0.016)	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)
Control variable							
Total Funding	0.088	0.088	0.117	0.146	0.153	0.172	0.149
	(0.244)	(0.234)	(0.203)	(0.193)	(0.188)	(0.184)	(0.179)
N	28	28	28	28	28	28	28
Residual Std. Error	0.404	0.392	0.383	0.375	0.369	0.364	0.360
F-statistics	0.615	0.724	0.846	0.956	1.110	1.286	1.524
R^2	0.266	0.266	0.263	0.251	0.241	0.226	0.209
Adjusted R^2	-0.166	-0.101	-0.047	-0.011	0.024	0.050	0.072
p-value	0.781	0.682	0.575	0.488	0.389	0.305	0.228
Note:	( ) = SE		'p<0.15; *p<0.1; **p<0.05; ***p<0.01				

Overall, most of the independent variables shown seem to have no statistically significant impact on the financial performance measured by the MOIC. However, some intriguing tendencies can be discovered. The results show a positive size effect of the Success Rate of requested non-financial support indicating a positive effect on the financial performance. This leads to the interpretation that portfolio companies with a high ratio between requested support and successful received support tend to show a better financial performance. More specifically, if the Success Rate would increase by 1%, the MOIC would increase by 0.00398 based on the figure in Model (7) holding all other variables constant. Thus, it highlights that it is important for VCs to successfully support their portfolio ventures in topics they ask for to achieve a better financial performance. When removing the least significant variables, the p-value of the success rate decreased constantly. Following that, the results become statistically significant ($p = 0.128$) at a 15% significance level in the last Model (7). In addition, the validity of the results is reinforced by the findings of the mean difference tests which are in line with the regression result, according to which the companies with the best financial performance (i.e. Group 1) also

had higher SR's on average. With these findings, Hypothesis 3, saying that a higher success ratio is leading to a better financial performance, can be accepted at a significance level of 15%. Another important insight can be extracted when focusing on the independent variable Talent. Support in the area of talent acquisition seems to positively affect the financial performance. Thus, one more support action for Talent would increase the MOIC by 0.08 based on the figure in Model (7) holding all other variables constant. After removing the least significant variables, the results are significant at a 10%-level ($p = 0.096$) in Model (7). Therefore, it can be suggested that there is very likely a link between this support area and financial performance. This can also be affirmed through the mean difference test where companies with a higher MOIC also asked for more support in talent acquisition. The result is also in line with existing literature, in which the importance of networks as a key non-financial support area is highlighted (Riepe and Uhl 2020). This in even more emphasized since talent is becoming one of the most requested and expected platform resources founders ask for (Kumar 2023). However, this fact is only partially reflected in the descriptive data set as Talent amounted only for 11% of all non-financial support requests and ranked 4th compared to other support areas. This insight is especially interesting since there is the largest gap in perception regarding the impact of VCs in the area of recruitment between VCs and founders (Fritjofsson 2022).

Other variables with a tendency of a positive effect on financial performance include Marketing and PR, even though they were not statistically significant. Marketing seems to have only a small positive effect size on financial performance and was the least significant variable which is why it was deleted after the first regression. The coefficient of Public Relations is decreasing when removing other independent variables which shows that the initial estimate was maybe inflated by omitted variable bias. The general positive relationship can be explained by the fact that young entrepreneurs require planned PR activities to achieve positive communication with the target audience to develop their brand successfully. As most of them fail in identifying the

best PR tools, they need external support from, for example, VCs (Koppalakrishnan and Firdausi 2021). The positive relationship of PR is also once again in line with the outcome of the mean difference test in which the companies with a higher MOIC on average requested more support for PR activities.

Besides the positive effects mentioned above, it can also be observed that five independent variables tend to have a negative effect size on financial performance. However, none of these variables are statistically significant and, in most cases, only with a very low effect-size close to zero. These variables include access to the GAN network, Mentorship, Commercial Intros, Fundraising Support and Other. This is interesting, as I expected especially for Fundraising Support and Commercial Intros a positive effect as it was already highlighted by other studies to be important for a startup success (Riepe and Uhl 2020; Forward Partners 2021). However, these results match with them of the mean difference test in which the companies with the worst financial performance asked for more support in those areas mentioned above. While is it hard to interpret these results, I also remain skeptical given the very low coefficient and high respective p-values. Given the different relationships of the support areas with the financial performance based on both, the mean difference test and the regression, Hypothesis 2 can be accepted, indicating that the type of non-financial support provided by the impact VC influences financial performance. However, the hypothesis can only be accepted for sure through the statistically significant outcome in the area of Talent which showed a positive size effect.

When looking at the goodness-of-fit measure of the whole model R^2 of 26.6% in regression [1], it can be said that the model is adequate to yield some indicative results. This is further supported by a median of residuals for all models close to zero. Nevertheless, it also suggests that certain significant factors that could account for the variations in financial performance are missing and were omitted. This makes sense as the main driver of MOIC is the performance of the underlying investment which is not reflected in the current regression due to missing data.

It can be expected that including this additional information, the goodness-of-fit of the regression would increase. However, when insignificant variables are eliminated from the model, R^2 stays constant from the Model (2-4) and only decreases slightly in the Models (5-7). This indicates that the variables which were removed (e.g. Marketing, Other, GAN) did not significantly influence the goodness-of-fit of the model and therefore did not improve the prediction in the variation of the dependent variable. Additionally, it is important to mention that the overall model is not statistically significant, even if single coefficient appeared to be significant in Model (7) as the p-value of the Models (1-7) is well above the 10%- and 5%-significance threshold. Despite this, it can be observed that the F-statistics increases and the p-value of the model decreases every time an insignificant variable is removed from the Model. This indicates that the large amount of insignificant independent variables in the beginning led to unnecessary complexity and noise. By removing them, the model's overall fit improved which seems to be statistically significant as the p-value decreases at the same time.

Table 4: MOIC regression results using the simple linear regression [2]

	(1)
Independent variable	
Count	-0.012
	(0.011)
Control variable	
Total Funding	0.094
	(0.184)
N	28
Residual Std. Error	0.377
F-statistics	0.739
R^2	0.056
Adjusted R^2	-0.019
p-value	0.487
Note:	( ) = SE; 'p<0.15; *p<0.1; **p<0.05; ***p<0.01

Table 4 shows the results of the linear regression based on the regression [2]. It can be observed that the number of requested non-financial support tickets seem to have a small negative size-effect on the financial performance. However, the outcome is not statistically significant

(p=0.270). Despite existing literature claiming that startups can overcome their growth challenges with the help of a VC platform, highlighting non-financial support as a crucial factor for startups success and stating a faster access to market with non-financial support which would assume a positive effect for a high number of support tickets (Fricke 2019; Aspelund et al. 2005; Riepe and Uhl 2020; Alvarez-Garrido and Dushnitsky 2016), the above outcome shows a contrary view. Therefore, Hypothesis 1, claiming more non-financial support is leading to a better financial performance must be rejected due to the negative size effect. This is further supported by the outcome of the mean difference test in which companies with a poor financial performance received more support.

4.3 Robustness check

To ensure the robustness of the results, all four prerequisites for the linear regression were successfully tested and approved which indicates meaningful results (cf. Appendix 4). In addition, it was observed that the omission of the variable with the highest p-value in each subsequent regression did not lead to any significant changes of the coefficients or in any change of direction in the following regressions. Furthermore, a sensitivity analysis was computed by eliminating standardized residuals that fall outside the interval -0.25 and 0.5 which was graphically set based on the scatterplot shown in Appendix 4.1 to account for outliers. As the significance and coefficients remain predominantly stable without the outliers, the outlying effect sizes seem do not drive the findings.

5. Limitations and Future Research

5.1 Limitations

Naturally, the analyses are subject to various limitations. First, this study is based on a small data set with data points of only 36 companies mainly in the pre-seed and seed funding stages. This is the main reason of mostly non-significant results. Therefore, only minor size effects between the variables could have been observed which become probably stronger once more

data is available. These size effects should be primarily seen as tendencies which have to be approved again at a later stage with a higher data density. Another limitation includes the effect of time as the portfolio of maze will probably stagnate soon in terms of the number of invested companies due to capital restrictions while the number of requested support tickets will continue increasing. As maze invests in companies over time, there is a timing gap between the investment date and the end date of the analysis period. This means that a company in which maze invested a few months ago most likely generated fewer support requests than other companies in which maze invested already in 2019. This could skew the results. This can be prevented in the future through two ways: First, data sets from different impact VCs with the same impact investing strategy and funds at the end of their lifetimes could be used. Second, the model should be re-runed at the end of the life of the fund when a fair comparison between the number of investments and the number of non-financial support activities is possible which will lead most likely to stronger correlations and more solid conclusions.

However, the limitation of mainly non-significant results is slightly extenuated by the fact, that two different analyses (i.e., mean difference test and simple/multivariate regression) were conducted which showed logically the same outcomes and were predominantly in line with existing literature. The next limitation represents the MOIC as proxy for the startup's financial performance. Though, as most ventures are in the pre-seed and seed stage in which they often do not have revenues, the MOIC seem to be a fair proxy at this stage. Furthermore, there is the possibility of omitted variable bias. This refers to the potential that relevant variables influencing both the dependent variable (i.e. MOIC) and the existing independent variables are left out which could lead to distorted results. These omitted variables could include market conditions, management experience or macroeconomic trends. Due to lack of data availability, these variables couldn't be used as control variables, resulting in only one control variable. Next, the specific impact investing strategy of maze could be associated with the financial

performance of the portfolio ventures and could limit the explanatory power when comparing to other impact VC funds (Ugwumadu 2019). Finally, the characteristics of maze, such as their experience, reputation or the partners' human capital, could have an influence on their ability of providing non-financial resources which could have affected the provided data set (Quas et al. 2020).

5.2 Future research

In general, future research should consider the limitations mentioned above, particularly re-running the statistical models with a larger data set. Besides that, the outcome of the analyses, highlighting that the amount of non-financial support seems to be negatively associated with financial performance, creates an interesting future research topic. Even though the outcome is statistically not significant, it underlines the key question in the venture capital space of whether VCs really add value besides providing capital. Another research topic could be the analysis of the long-term impact of non-financial support on financial performance. This would include a longitudinal analysis comprising the differentiation of the provided non-financial support in different funding stages and the respective financial performance in each stage. This analysis could not be conducted due to incomplete time data in this study. Besides that, it would also be interesting to analyze the impact of non-financial support on venture performance in specific sectors and across different business models of impact startups while comparing these outcomes to existing studies of non-impact startups. As the study was based on data from an impact venture capitalist, it would also make sense to include impact metrics in future regressions and to analyze how these are correlating with the non-financial support activities and financial performance.

6. Conclusion

The platform function of VCs is becoming increasingly important. Founders of young ventures are asking for more and individualized non-financial support. This study adds to existing

literature on startup performance in the impact space by using proprietary data from maze measuring the startups' non-financial resource demand. The startups in this study were mostly asking for support in fundraising, commercial introductions, and mentorship, which all three seem to have a negative influence on the financial performance of the portfolio ventures. On the other side, support in the areas of talent acquisition, PR and marketing seem to have a positive size effect on venture performance. Overall, it is important that VCs fulfill the startup demand for specific support requests as successfully provided support also seem to have a positive impact on financial performance. However, the results show a tendency that, in general, companies which require or ask for more support consequently perform worse. Based on that, the research question can be answered given the fact that there is a link between venture performance and non-financial support provided by impact VCs. But the support provided by impact VCs needs to be classified, as a positive or negative link is dependent on the specific support area as described above. Even though some support areas are positively linked with financial performance, the general question of value-add by VC arises due to the negative relationship of support amount and financial performance. This is quite interesting and needs to be further analyzed if the support provided through the platform functions of VCs really influences the financial performance or has an impact on other areas of young businesses.

Despite the fact, that mostly no significant results could be derived from the statistical models, the developed regression models can be used for future research and can be filled with more data once the portfolio of maze is growing or data from several impact VCs is combined. Through that, the tendencies of correlations on which the conclusion was made need to be validated again to achieve more meaningful results. In the end, this work adds significant value and creates a solid base to the research in the impact investing space with a special focus on the relationship between non-financial support and financial performance of impact startups which can be exaggerated in the future through more data.

7. References

Alvarez-Garrido, Elisa, and Gary Dushnitsky. 2016. "Are entrepreneurial venture's innovation rates sensitive to investor complementary assets? Comparing biotech ventures backed by corporate and independent VCs." *Strategic Management Journal.* 37(5): 819-834. https://econpapers.repec.org/article/blastratm/v_3a37_3ay_3a2016_3ai_3a5_3ap_3a819-834.htm.

Aspelund, Arild, Terje Berg-Utby, and Rune Skjevdal. 2005. "Initial resources' influence on new venture survival: a longitudinal study of new technology-based firms." *Technovation,* 25(11): 1337-1347. https://doi.org/10.1016/j.technovation.2004.06.004.

Bogoslaw, David. 2023. "The rising star of platform services." Venture Capital Journal, January 3. https://www.venturecapitaljournal.com/the-rising-star-of-platform-services/.

Bolotsky, Cory. 2021. "Ecosystem, network, and community. The strategy behind your VC firm's most important relationships." Medium, November 23. https://bolotsky.medium.com/vc-ecosystem-network-and-community-2778c4054c18.

Bormans, Jan, Massimo Privitera, Emily Bogen, and Thomas Cooney. 2019. European Startup Monitor 2019/2020. Accessed November 21, 2023. https://www.europeanstartupmonitor2019.eu/EuropeanStartupMonitor2019_2020_21_02_2020-1.pdf.

CFI. 2023. "Maximizing Returns: Understanding MOIC in private equity." Corporate Finance Institute, October 23. https://corporatefinanceinstitute.com/resources/wealth-management/moic-private-equity/.

Chalkley, Alex. 2023. "What exactly is an impact venture?" Venturenomix, June 27. https://venturenomix.co.uk/what-exactly-is-an-impact-venture/.

Croce, Annalisa, José Martí, and Samuele Murtinu. 2013. "The impact of venture capital on the productivity growth of European entrepreneurial firms: 'Screening' or 'value added' effect?" *Journal of Business Venturing*. 28(4): 489-510. https://doi.org/10.1016/j.jbusvent. 2012.06.001.

European Startups. 2021. "Europe stepping up to global tech leadership." Accessed October 15, 2023. https://europeanstartups.co/.

Forward Partners. 2021. "Money is not enough." Accessed November 18, 2023. https://www.forwardpartners.com/more-than-money.

Fricke, Jakob. 2019. "The rise of platform: Europe's venture capitalists are stepping up support for their portfolio companies." Sifted, December 12. https://sifted.eu/articles/vc-platform-field-guide.

Fritjofsson, Carl. 2022. "Do VCs add value? 4 years later, the answer remains: sometimes." Medium, May 23. https://blog.creandum.com/do-vcs-add-value-4-years-later-the-answer-remains-sometimes-49c53a8865b4.

Gaggiotti, Gianluca, Alessia Gianoncelli, and Raffaella de Felice. 2022. "Accelerating Impact." *Evpa,* December 1. https://www.evpa.ngo/insights/accelerating-impact.

Gompers, Paul A., Will Gornall, Steven N. Kaplan, and Ilya A. Strebulaev. 2020. "How do venture capitalists make decisions?" *Journal of Financial Economics.* 135(1): 169-190. https://doi.org/10.1016/j.jfineco.2019.06.011.

Grand Canyon University. 2023. "Types of quantitative research methods and designs." Accessed October 5, 2023. https://www.gcu.edu/blog/doctoral-journey/types-quantitative-research-methods-designs.

Hartnett, Heather. 2017. "The rise of 'The Platform' for venture capital funds." Forbes, September 28. https://www.forbes.com/sites/heatherhartnett/2017/09/28/the-rise-of-the-platform-for-venture-capital-funds/?sh=764388b44841.

Hidayat, Sutan E., Omar Bamahriz, Nadiah Hidayati, Citra A. Sarik, and Ginanjar Dewandaru. 2022. "Value drivers of startup valuation from venture capital equity-based investing: A global analysis with a focus on technological factors." *Borsa Instanbul Review*. 22(4): 653-667. https://doi.org/10.1016/j.bir.2021.10.001.

Honold, Dirk, Enrico Reiche, and Gerhard Wacker. 2023. "German Venture Capital Market faces declining resilience." PWC, December 07. https://www.pwc.de/en/deals/venture-capital-market-study.html#:~:text=The%20expected%20IRR%20of%20portfolio,from%2024%20%25%20to%2028%20%25

Hvide, Hans K., and Jarle Moen. 2010. "Lean and Hungry or Fat and Content? Entrepreneurs' Wealth and Start-Up Performance." *SSRN*. 56(8): 1242-1258. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1012012

Impact Investing Institute. 2020. "Venture capital and impact investing: changing the world one idea at a time." Accessed November 26, 2023. https://www.impactinvest.org.uk/latest/events/venture-capital-and-impact-investing-changing-the-world-one-idea-at-a-time/.

James, Gareth, Daniela Witten, Trevor Hastie, and Robert Tibshirani. 2013. "An introduction to statistical learning: with applications in R." New York: Springer.

Koppalakrishnan, Premila and, Jahadhiya Firdausi. 2021. "Analyzing the role of public relations for startup success." *International Journal of Business Marketing and Management*. 6(2): 07-14. https://issuu.com/www.ijbmm.com/docs/8340436206.

Kumar, Sabrina. 2023. "VC Platform Global Summit Teaches Us That Access to Talent is a New Form of Currency." HuntClub, May 12. https://www.huntclub.com/blog/vc-platform-global-summit-teaches-us-that-access-to-talent-is-a-new-form-of-currency.

Lohwasser, Todor S. 2020. "Meta-analyzing the relative performance of venture capital backed firms." Diskussionspapier des Instituts für Organisationsökonomie (working paper), No. 4/2020. *Econstor.* https://www.econstor.eu/bitstream/10419/217220/1/1698075596.pdf.

Maier, Maximilian, and Daniël Lakens. 2022. "Justify Your Alpha: A Primer on Two Practical Approaches." *Advances in Methods and Practices in Psychological Science,* 5(2): 251524592210803. https://doi.org/10.1177/25152459221080396.

Manning, Stephanie. 2019. "Why VC firms investing in platform to compete." Forbes, May 8. https://www.forbes.com/sites/valleyvoices/2019/05/08/why-vc-firms-are-investing-in-platform/?sh=7499a3002b94.

McKinsey. 2022. "What makes the difference for Europe's top start-ups." Accessed October 3, 2023. https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/what-makes-the-difference-for-europes-top-start-ups.

Newbold, Paul, William Carlson, and Betty Thorne. 2013. *Statistics for Business and Economics.* Essex: Pearson Education Limited.

Peterson, Alyssa. 2022. "Why does impact Investing attract sophisticated investors?" GCV, December 16. https://www.growthcapitalventures.co.uk/insights/blog/why-does-impact-investing-attract-sophisticated-investors.

Quas, Anita, Jose Martí, and Carmelo Reverte. 2020. "What Money Cannot Buy: A new approach to measure venture capital ability to add non-financial resources." *Small Business Economics*, *57*(3): 1361–1382. https://doi.org/10.1007/s11187-020-00352-w.

Ramaswamy, Anita. 2021. "The three dimensions of investing today are risk, return, and impact. Experts say investors concerned about e." Business Insider, June 10. https://www.businessinsider.in/cryptocurrency/news/the-three-dimensions-of-

investing-today-are-risk-return-and-impact-experts-say-investors-concerned-about-esg-need-to-do-their-homework/articleshow/83416850.cms.

Riepe, Jan, and Kristina Uhl. 2020. "Startups' demand for non-financial resources: descriptive evidence from an international corporate venture capitalist." *Finance Research Letters*, *36*: 101321. https://doi.org/10.1016/j.frl.2019.101321.

Smith, Craig S. 2023. "Europe's venture capital scene is narrowing the gap with the US despite global investment slowdown." Forbes, February 14. https://www.forbes.com/sites/craigsmith/2023/02/14/europes-venture-capital-scene-is-narrowing-the-gap-with-the-us-despite-global-investment-slowdown/?sh=52d809754993.

Trill Impact. 2022. "*Annual Impact Review 2022."* Accessed November 10, 2023. https://www.trillimpact.com/upl/files/193295/trill-annual-report-2022-9.pdf?t=747999540.

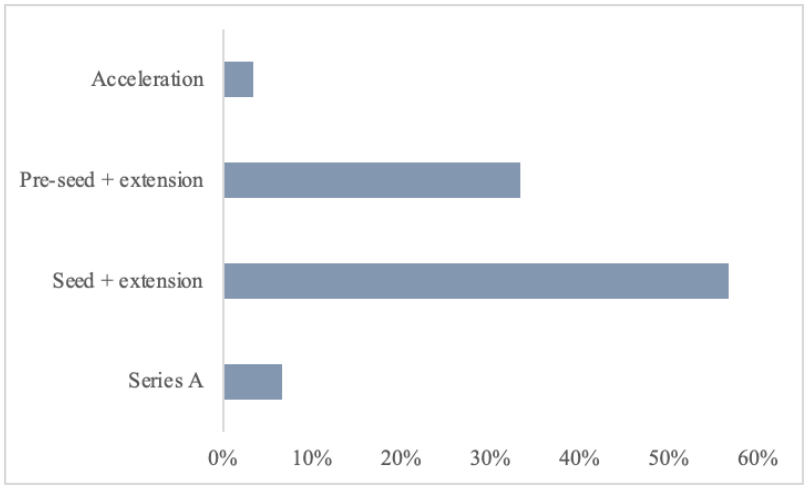
Tuama, Daragh Ó. 2022. "What is secondary data? A guide." Code Institute, July 26. https://codeinstitute.net/global/blog/secondary-data/.

Ugwumadu, Judith. 2019. "Private equity firms ramping up ESG integration, study finds." IR magazine, February 22. https://www.irmagazine.com/esg/private-equity-firms-ramping-esg-integration-study-finds.

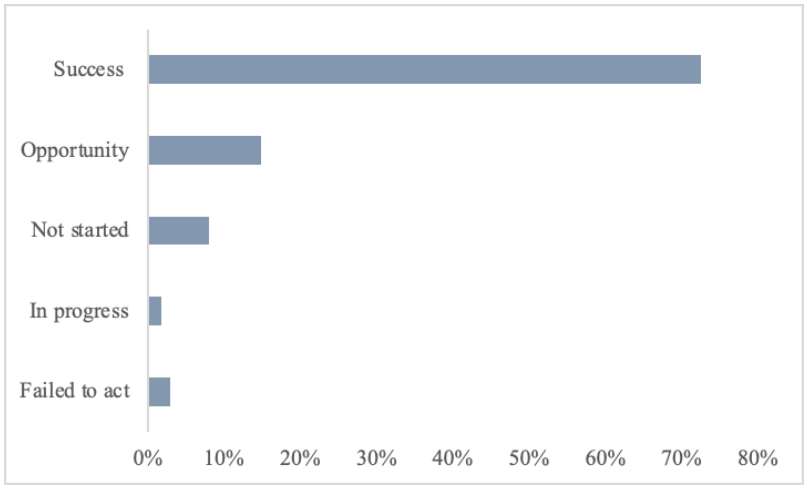
Universität Innsbruck. n.d. "*Methoden der Empirischen Wirtschaftsforschung.*" Accessed October 30, 2023. https://www.uibk.ac.at/econometrics/.

8. Appendices

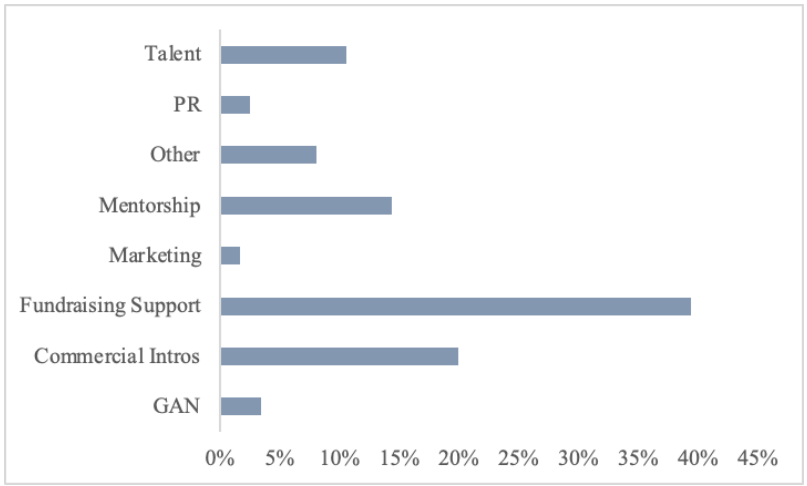
Appendix 1: Funding tickets per investment stage (in %)



Appendix 2: Requested non-financial support tickets by ticket status (in %)



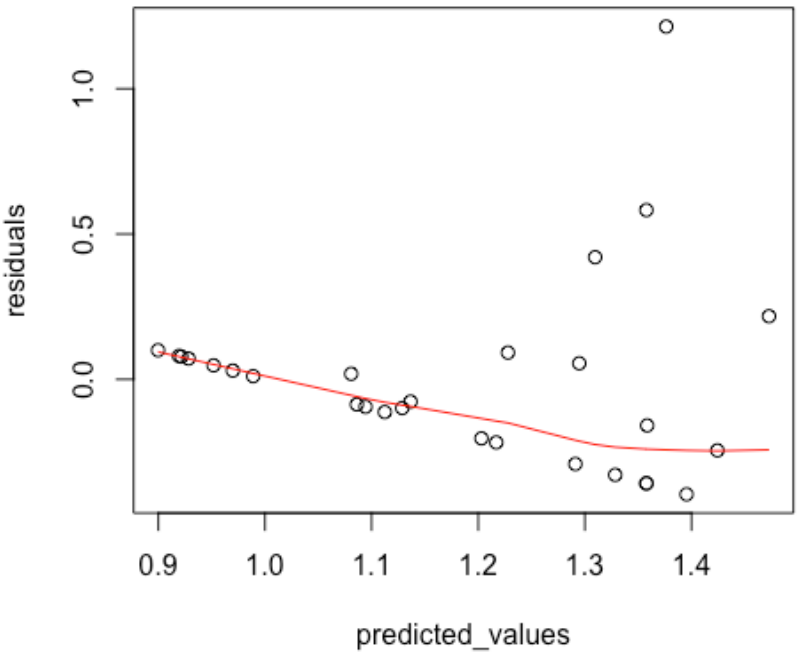
Appendix 3: Requested non-financial support tickets by support area (in %)



Appendix 4: Ordinary least squares method assumptions

4.1 Linearity

The scatterplot with a lowess curve shows a mostly linear pattern.



4.2 Multicollinearity

	VIF-Model with variable "Count"	VIF-Model without variable "Count"
Independent variables		
Count	96.284	-
SR	1.636	1.636
Talent	3.959	1.491
GAN	1.852	1.673
Commercial Intros	16.004	3.118
Mentorship	4.621	1.849
PR	2.303	1.839
Fundraising Support	60.644	1.199
Marketing	3.811	3.200
Other	2.169	2.170
Control varibale		
Total Funding	1.535	1.535

Through the check for multicollinearity by calculating the Variance Inflation Factor (VIF) for the independent variables, very high VIF values for Count, Fundraising Support and Commercial Intros can be observed which raises concerns for multicollinearity. The remaining variables displays VIF-values below 5. After removing the Count variable, the VIF analysis signals no multicollinearity anymore as all other variables display VIF-values below 3.2.

4.3 Heteroskedasticity

Breusch-Pagan test:

The Breusch-Pagan test shows a p-value of 0.70 which is above the threshold ($p<0.05$). Therefore, the null hypotheses of constant variance (i.e. homoskedasticity) cannot be rejected as there is no strong evidence of heteroskedasticity. Thus, heteroskedasticity seems not to be present.

4.4 Normal errors

The mean of the residuals is -3.295975e-17 which is close to zero. This indicates normally distributed errors. In addition, this can be also observed through the Quantile-Quantile (Q-Q) Plot of Residuals where most points are close to the straight line with minor deviations.