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VENTURE CAPITAL AND GENDER: DO FEMALE FOUNDERS RECEIVE EQUAL VALUATIONS?

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Abstract: This study examines whether female founders receive the same valuations as their male counterparts after securing comparable funding. While previous research has extensively investigated the gender funding gap, little research has examined valuations after female founders gain investors' trust. The results show that female founders receive lower valuations, driven by unfavorable investor perceptions. The study has also investigated if the industry choice or firm performance of female founded start-ups can explain the discrepancy between gender. However, the results do not align with previous literature and cannot serve as potential explanations for the gender valuation gap.

1. Introduction

The primary goal of start-ups is to develop innovative products or services with a strong focus on scalability and rapid growth. Start-ups aim to disrupt existing markets or create entirely new ones by leveraging innovative business models, advanced technologies, or unique customer engagement strategies (Berger 2020). However, in the early stages, start-ups face a high probability of failure due to several factors, including challenges in achieving product-market fit, operational inefficiencies such as untested processes or lack of experience, and the difficulty of securing external capital necessary for growth (Miloud et al. 2012; Berger 2020).

Most founders seek external capital from early-stage investors, such as venture capitalists and angel investors, as they recognize both the high risk of failure and the significant potential for rapid growth (Colombo 2023). For investors, this asset class offers a unique opportunity to achieve substantial returns, with the possibility of multiplying their initial investments (Drover et al. 2017).

To establish the value of their investment, founders and investors agree on a valuation of the start-up, which reflects its current worth (Drover et al. 2017). The valuation is especially important because the value of the company determines the proportion of the shares they receive in return for their investments (Miloud, Aspelund, and Cabrol 2012). Typically, early-stage investors prefer a lower valuation when entering a funding round, as this allows them to acquire a larger equity stake. In contrast, founders aim for a higher valuation to retain more equity, minimizing dilution and enhancing the start-up's appeal to future investors (Moro-Visconti 2021).

Until today the Venture Capital (VC) industry is male-dominated and research consistently shows that female founders face significant challenges navigating through it (Brush 2018). According to Kanze et al. (2020), female-founded start-ups receive less funding than male-founded start-ups, often due to investor biases and perceptions of risk. While achieving funding parity is

considered a milestone for gender equality in entrepreneurship, the question remains whether female founders receive the same valuation once funding is secured.

The existing literature has extensively documented gender differences in funding, but there is little evidence on whether these differences persist in valuation, even when funding levels are considered. Valuation plays a central role in determining founders' equity and future growth opportunities, so it is critical to examine whether female founders are treated equally by investors (Brush 2018). This question is particularly important given the dominance of male investors in the venture capital system, as their perceptions and decision-making processes can perpetuate or mitigate these inequalities (Serwaah & Shneor 2021). Understanding whether male investors assign the same valuations to female and male founders with comparable funding is crucial to addressing systemic biases in the start-up ecosystem.

This paper attempts to answer the question: *Do female founders receive the same valuation from male investors as their male counterparts when they receive the same funding?* The study aims to investigate the existence of a gender valuation gap by examining the relationship between the gender of founders and the valuation of start-ups. Furthermore, the mechanisms underlying this relationship are examined, focusing on industry and firm performance as main control variables. This approach provides important insights into the factors that contribute to valuation differences based on founder gender.

To investigate this, the thesis is structured as follows. Firstly, the literature review examines existing research explaining valuation and gender differences in the venture capital industry. Secondly, it introduces several potential theories, such as the internal resource-based theory, industry-based theory, and firm performance theory, which potentially influence the valuation of female founders and introduces the hypotheses. Thirdly, the methodology section describes the

data set and explains the empirical approach. Fourthly, the results section presents the findings, followed by a discussion of their implications. Lastly, the thesis aims to present limitations and areas for future research, followed by concluding remarks.

2. Literature Review

2.1 Understanding Start-up Valuation

Start-up valuation refers to the process of determining the worth of a start-up and evolves through distinct stages, each reflecting the company's potential for growth, innovation, market position, and risk factors (Dhochak & Doliya 2020). In the early stages, valuation is predominantly based on the start-up's potential, including its innovative concept, market opportunity, and the founding team's capabilities (Dhochak & Doliya 2020). As the company progresses to the growth stage, valuations typically increase, reflecting reduced risk and demonstrated success in achieving milestones such as revenue growth, market traction, or scaling operations (Cumming & Dai 2011). The final stage, exit valuation, occurs during an acquisition or initial public offering (IPO), where the company's worth is assessed based on its market position, financial performance, and long-term growth potential (Berger and Köhn 2018).

Start-up valuations are relevant to establish a price at which investors can buy equity. Typically, early-stage investors prefer a lower valuation when entering a funding round, as this allows them to acquire a larger equity stake. In contrast, founders aim for a higher valuation to retain more equity, minimizing dilution and enhancing the start-up's appeal to future investors (Berre & Le Pendeven 2023). For successful start-ups, valuations become crucial to determine the selling price of the business at an exit (Moro-Visconti 2021). The ultimate return for investors is

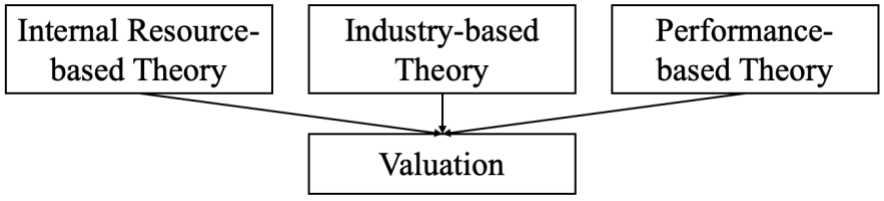
positively associated with the difference between exit proceeds at a liquidity event, such as an IPO or M&A, and the price they paid to invest in venture firms (Cumming & Dai 2011).

However, evaluating start-ups tends to be more difficult than evaluating established firms due to the lack of historical financial data and asymmetric information between investors and founders. Financial valuation techniques such as discounted cash flows, net present value, earnings multiple, option valuation, and net worth are commonly used in valuation, which are not applicable for early-stage start-ups as they strongly depend on accounting information (Dhochak & Doliya, 2020). Instead, the valuation of new companies depends largely on more qualitative determinants, leading to differences in the valuation determined by investors and founders. These valuations often favor investors, resulting in less favorable outcomes for founders (Imbierowicz et. al. 2024).

2.2 Conceptualizing Valuation

The valuation of new ventures has been a topic of ongoing scholarly debate. Dhochak & Doliya (2020) explored this issue by conducting an empirical study, linking strategic and nonfinancial factors to start-up valuations. Their findings indicate that three strategic theories – internal resource-based, industry resource-based, and performance-based - play a significant and positive role in determining the value of a new venture.

Figure 1: *Conceptualizing the Valuation Framework*



Source: Own Creation. Inspired by Dhochak & Doliya (2020)

2.2.1 Internal Resource-based Theory

In earlier literature, the internal resources of a firm were found to have a significant effect on the valuation of a firm. Several researchers have reported that the founder is the most important human resource and plays a critical role in fostering and developing the new venture. Miloud et al. (1992) investigated the impact of the founder's track record, including experience, technical knowledge, market know-how, and skills, on the growth of the business (Dhochak & Doliya 2020). For a successful start-up, a set of entrepreneurial skills is required to build the business reputation. From an investor's perspective, entrepreneurial skills or having hands-on experience in starting a business are assumed to increase the success rate of a new venture.

2.2.2 Industry-based Theory

The industry in which a start-up operates plays a critical role in its valuation, especially when internal fundamentals are limited. Key factors influencing valuation include product differentiation, competitive advantages, market perception, and the growth rate of the industry (Kanze et al. 2020). Product differentiation is particularly important as it provides competitive advantages and market defense opportunities, thereby increasing attractiveness to investors (Miloud et al. 2012). Industry growth rates also have a significant impact on valuation, with high-growth sectors offering greater scalability and faster returns on investment (Kanze et al. 2020). Valuation trends vary by sector; for example, e-commerce and HealthTech start-ups are often valued at a discount due to higher risks and longer development times, while Tech and FinTech start-ups are typically valued at a premium due to their scalability and rapid market penetration (Sievers, Mokwa, & Keienburg 2012). These differences highlight the need for sector-specific approaches for the valuation of start-ups.

2.2.3 Performance-based Theory

Firm performance is a significant indicator that investors associate with higher valuation outcomes. From a performance-based perspective, firm size is strongly influenced by the strength and structure of a company's external and internal networks (Kwapisz et al. 2018). Networks provide access to resources, partnerships, and talent acquisition, all of which promote a company's growth and scalability (Dhochak & Doliya 2020). Strong networks also enhance a start-up's ability to attract skilled employees, which contributes to greater operating capacity and company size, which are critical to performance and valuation (Zheng, Liu, & George 2010).

Investors often perceive larger companies as more stable and less risky as they utilize networks for competitive advantages such as resource flow and collaboration (Miloud et al. 2012). Colombo and Grilli (2005) also emphasize that start-ups with more employees are more scalable and achieve higher valuations.

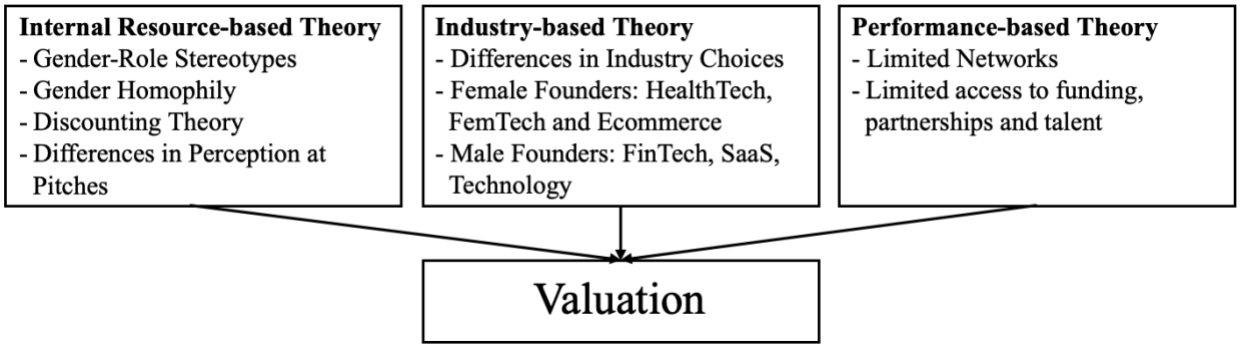
2.3 Venture Capital Industry and the Gender Discrepancy

The VC industry remains a male-dominated industry, both in terms of the investors providing capital and the founders receiving it. Only 14% of start-up founders are female, while 86% of founders are male (Carta 2023). Similarly, the proportion of female investors is only 11%, meaning that the majority of decision-making power is in the hands of male investors. These inequalities contribute to the persistent gender funding gap. Women-led start-ups received less than 3% of all venture capital funding in 2023 (Schwab et al. 2017), putting female founders at a significant disadvantage when trying to secure the funding they need to scale their businesses. This gender imbalance leads to misperceptions and structural barriers that prevent female founders from accessing the necessary capital to grow their businesses (Malmström et al. 2020).

2.4 Application of the Valuation Framework

Building on the framework discussed previously, this section explores the intersection of valuation theories and the factors that contribute to gender differences in female founders in more detail. By examining the interplay of these valuation approaches and the systemic challenges faced by female founders, this analysis aims to uncover the underlying reasons for both the funding imbalance and the differential valuation of start-ups led by female founders.

Figure 2: *Applying the Valuation Framework*



Source: Own Creation. Inspired by Dhochak & Doliya (2020)

2.4.1 Applying the Internal Resource-based Theory

While the internal resource-based theory emphasizes the importance of entrepreneurial skills, experience, and networks for valuation, gender biases deeply embedded in societal and industry norms hinder the ability of female founders to fully leverage their internal resources (Dhochak & Doliya 2020). This section explores key dynamics such as gender role stereotypes, discounting theory, gender homophily, and differences in perceptions during pitches.

Gender-role Stereotypes: Research has shown that socially constructed gender role stereotypes significantly influence the perception of the competence of female founders. Women are often associated with collaborative traits such as caring and cooperation, while men are associated with agentic traits such as assertiveness and risk-taking (Kwapisz & Hechavarría 2018). Because entrepreneurial success has traditionally been associated with agency, female founders

are often assumed to lack the qualities necessary to run high-growth businesses (Kwapisz & Hechavarría 2018). These stereotypes can reduce investor confidence in the ability of female founders to drive business growth, even when there is objective evidence of their competence (Gupta et al. 2020).

Gender homophily: Gender homophily is the tendency of investors to prefer financing entrepreneurs or start-ups that are similar to themselves in terms of demographics, background, values, or experience (Snellman & Solal 2022). This phenomenon can manifest itself in various dimensions, including gender, ethnicity, educational background, or professional networks. The concept suggests that investors unconsciously favor founders that they perceive as more trustworthy or consistent with their own experiences, often at the expense of diversity in funding decisions (Snellman & Solal 2022). Therefore, in the prevailing male-dominated VC industry, Snelmann and Solal (2022) investigated that male founders are perceived as more competent and are favored by the mainly male investors to receive funding than female founders. In particular, female founders are systematically perceived as less capable than their male peers, and consequently less likely to be seen as representing attractive investment opportunities (Gupta et al. 2020).

Discounting Theory: According to Chiala 2024, female founders are often perceived differently due to a phenomenon known as discounting theory. This theory states that the achievements of minority groups, including those defined by gender or ethnicity, are often undervalued or dismissed by the majority (Chiala 2024). In the context of venture funding, this can mean that some investors attribute the successes of female founders to external factors such as quotas or special perks, rather than recognizing their competence and abilities (Snellman & Solal

2022). This misperception contributes to widening the funding gap, as female founders are exposed to additional biases that question the legitimacy of their achievements based solely on their gender.

Differences in Perception at Pitches: From an investor perspective, Kanze et al. (2018) also suggest a significant difference in the way investors approach male and female entrepreneurs during pitches. Investors tend to ask male entrepreneurs promotion-oriented questions that emphasize growth potential, vision, and achievements, while female entrepreneurs are more often asked prevention-oriented questions that focus on safety, loss prevention, and responsibility (Kanze et al. 2018). This type of questioning allows male founders to present their business models and successes in a more favorable light, while female entrepreneurs, whose answers focus on the status quo and risk mitigation, may appear less visionary. For early-stage start-ups, where key milestones have not yet been reached, these differences in questioning can contribute to funding disparities, as promotion-focused answers better align with investors' expectations of growth potential (Kanze et al. 2018).

Building on the literature, the thesis examines the relationship between gender and valuation. Gender stereotypes and biases have been shown to disadvantage female founders. This could result in lower valuations of their ventures compared to male-founded start-ups. This motivates the first hypothesis: *Female-founded start-ups receive lower valuations than male-founded start-ups (H1).*

2.4.2 Applying the Industry-based Theory

The industry in which a start-up operates has a significant impact on its valuation, with certain sectors considered more attractive by investors (Chiala 2024). For female founders, the choice of sector is often influenced by systemic and societal factors, leading to differences in valuation and funding outcomes. Female-led start-ups often operate in sectors that are less favored

by external capital providers, exacerbating the challenges of raising capital and achieving competitive valuations (Dhochak & Doliya 2020).

According to Hidayat et al. (2022), male founders are more likely to found a start-up in industries such as technology and finance, which are characterized by high scalability, low capital requirements, and rapid market penetration. These sectors are closely aligned with the preferences of venture capitalists who prioritize growth potential and quick returns on investment. In contrast, female founders are often associated with companies in sectors such as e-commerce, FemTech, and HealthTech (Hidayat et al. 2022). While these industries offer significant market opportunities, they tend to have moderate growth curves, longer development cycles, and higher upfront investments. Start-ups in HealthTech often face a complex regulatory environment that delays profitability, while FemTech companies often serve niche markets that are undervalued by a predominantly male investor base (Moro-Visconti 2021).

This discrepancy between the sectors chosen by female founders and the preferences of male-dominated venture capital decision-makers is a fundamental obstacle. Male investors often lack familiarity with the products and services offered by female founders, especially in sectors such as FemTech where market needs are specifically targeted at women. (Hidayat et al. 2022). This lack of familiarity can lead to undervaluation as investors may overlook the objective market potential of these companies (Dhochak & Doliya 2020).

To conclude, industry dynamics also play a critical role in shaping start-up valuations, including growth potential and market characteristics. Start-ups in certain industries may have higher valuations due to perceptions of scalability or innovation. This leads to the second hypothesis: *Industry has a significant impact on the valuation of female founders (H2)*.

2.4.3 Applying the Performance-based Theory

In the VC ecosystem firm performance and network can be linked, as it is based on personal connections and referrals of various stakeholders (Eddleston et. al 2016). This networked structure facilitates business syndication and resource sharing, but creates barriers for outsiders, especially women, who often do not have access to these established networks. Women have been excluded from traditional networks and established associations, where crucial networking and resource mobilization takes place (Dhochak & Doliya 2020). Female founders are also more likely to rely on female-only networks, particularly in the early stages of business development (Klyver & Terjesen 2007). While these networks provide valuable support and advice, they tend not to be as large and diverse as the competitive advantages offered by male-dominated professional networks (Zhao et al. 2021).

These dynamics limit their ability to develop the broad, diverse networks that are critical for accessing funding, partnerships, and especially for attracting talent. As a result, women-led businesses can lag behind their male-led counterparts in metrics such as revenue, profit, and business growth (Zhao et al. 2021). In addition, the size of the firm is a key indicator of performance and scalability, which are often associated by investors with higher valuation outcomes. This relationship is reflected in the third hypothesis: *Firm size has a significant impact on the valuation of female founders (H3)*.

2.5 Contribution to Literature

Previous research has primarily highlighted a significant funding gap between male and female founders. However, to contribute to the academic literature in the area of entrepreneurial finance and gender, this thesis aims to investigate whether female founders, once they successfully secure funding from male investors, receive a comparable valuation to male founders. This

approach is intended to determine whether female founders are disadvantaged not only in securing financing but also in the valuation of their companies by male investors. The research question to be tested in this paper is as follows: *"Do female founders receive the same valuation from male investors as their male counterparts when they receive the same funding?"*

This research will investigate whether gender biases go beyond access to funding and influence the perceived value of female-led start-ups, thus providing insights into how gender influences the valuation dynamics of start-ups in the venture capital ecosystem.

3. Data and Methodology

3.1 Sample and Data Collection

To investigate this relationship, a sample of 400 start-ups founded between 2016 and 2023 in Europe and the U.S. was analyzed based on the availability and quality of relevant financial information (Pitchbook 2024). The selection process ensured a balanced distribution of gender within subgroups while maintaining randomization across industries, founding years, and venture capital investors during the specified period. The sample size was reduced to 206 start-ups due to missing data, primarily valuation data of the latest round. These start-ups were selected from the PitchBook database, which provides comprehensive financial data on the capital markets, including detailed information on deals, valuations, financial ratios, and industry trends. PitchBook is widely used by venture capital and private equity professionals for its reliability and scope of data on public and private companies (Pitchbook 2024).

3.2 Overview of Variables

Table 1: *Variable overview*

Type	Variable	Description	Scale
Dependent	Valuation	Logarithm of Valuation	Continuous
Independent	Founder Gender	Dummy whether the founder is female or male	Dummy
Control	Industry	Categorised in different industry areas	Categorical
	Firm Size (Employees)	Number of employees to measure performance	Continuous
	Funding Rounds	Number of funding rounds to measure funding success	Categorical
	Total Funding	Logarithm of the total funding	Continuous
	Founding Year	Categorised in fiscal year when start-up has been founded	Categorical
	Firm Stage	Categorised in different development stages	Categorical

Source: Own creation

3.2.1 Dependent Variable

The dependent variable of this study is valuation, defined as the post-money valuation of each start-up, which represents the estimated value of the company at the time of data collection. The post-money valuation is calculated from the pre-money valuation plus the investment amount raised in the financing round (Veer & Bringmann 2021). The dataset captures valuations based on the last financing round, which is either the only or the last of several financing rounds (Pitchbook 2024).

To facilitate analysis and improve interpretability, the valuation data is transformed into its natural logarithm. This logarithmic transformation counteracts the skewed distribution typically observed in financial datasets due to the presence of outliers with extremely high or low valuations. It also allows the regression coefficients to be interpreted as percentage changes, making the relationship between the score and the independent variables more intuitive and suitable for analysis.

3.2.2 Independent Variable

As argued in the theoretical framework, this research will use the metrics of the internal resource-based theory, industry-based theory, and performance-based theory as a measurement of valuation (Dhochak & Doliya 2020). To investigate the internal resource-based theory, the independent variable of this analysis is the gender of the founder, which is coded as a binary variable, with "1" representing female founders and "0" representing male founders. This variable is intended to capture potential gender-based disparities in how start-ups are valued in the venture capital market. Prior research suggests that female founders may face biases in valuation processes, receiving lower valuations compared to male founders with similar business metrics (Kanze et al. 2018). By including gender as an independent variable, this study aims to assess whether there is a statistically significant difference in start-up valuations based on the founder's gender.

3.2.3 Control Variables

As shown in Table 1, several variables have been included to ensure a more accurate model to investigate the effects of founder gender on valuation outcomes. As previously shown in the conceptual model and literature review, industry and firm size have been identified as additional variables to identify possible explanations for valuation outcomes.

Firstly, the variable industry investigates how gender affects the type of industry chosen, which in turn influences the valuation of the start-up. Thus, it categorizes start-ups into industries such as SaaS/Technology, HRtech/Edtech, Ecommerce, FinTech, FemTech, and Others. This categorization allows for an analysis of whether certain industries are perceived as more valuable due to their scalability and growth potential, or undervalued due to investor biases or risk perceptions, which may disproportionately affect female founders (Hidayat et al. 2022).

Secondly, the variable firm size, measured by the number of employees, serves as a proxy for firm performance. The latest available data following the most recent investment round has been used to capture future performance potential. This variable aims to determine whether gender influences firm performance, which in turn affects start-up valuation. Thirdly, the variable total number of funding rounds accounts for all completed funding rounds, including the most recent, based on the latest available data. This variable reflects a start-up's maturity and investor interest, as a higher number of funding rounds typically signals growth potential, market validation, and sustained investor confidence, which are associated with higher valuations. Fourth, total funding is included as a control variable to account for the financial resources a start-up has already received that may directly affect its valuation. By controlling for total funding, the analysis ensures that the effects of gender, industry, and company performance on valuation are isolated and prevents the capital raised from disrupting the observed relationships. To facilitate analysis and improve interpretability, the funding data is transformed into its natural logarithm as well. Fifth, the founding year variable controls for the founding year of the start-up and considers the economic conditions, venture capital trends, and technological advances at the time of founding. Including this variable ensures that valuation comparisons reflect differences in the market environment, allowing for a more accurate analysis of the factors influencing start-up valuations. Lastly, the variable firm stage represented by stages including Seed Stage, Early Stage, and Growth Stage, controls for the development stage of each start-up and has been extracted from the latest available data. Since start-ups at later stages typically have higher valuations due to proven growth and stability, accounting for the firm stage helps isolate the effect of gender on valuation.

3.3 Methodology

A quantitative approach, specifically an Ordinary Least Squares (OLS) linear regression model with industry-fixed effects, has been chosen to quantify the relationship between founder gender and start-up valuation, as it allows for statistical inference and pattern identification across a broad dataset. The dataset used in this study is cross-sectional, capturing data from a snapshot in time, which is suitable for analyzing start-up valuation patterns over the selected period. To test hypotheses 1, 2 and 3, the statistical analysis will use a linear OLS regression to examine the relationship between the independent variables and the dependent variable. To evaluate the results, this study considers significance levels of 0.01 (***), 0.05 (**), and 0.1 (*).

First, to test hypothesis 1, the effect of gender and the control variables on the dependent variable valuation is tested in Model 1:

(1) $Valuation = \alpha + \beta_1 Gender + \beta_2 Funding\ Rounds + \beta_3 Total\ Funding + \beta_5 Founding\ Year + \beta_4 Firm\ Stage + \varepsilon$

Next, to test hypothesis 2, Model 2 examines the effect of industry alongside the control variables on the valuation of female founders:

(2) $Valuation = \alpha + \beta_1 Gender + \beta_2 Industry + \beta_3 Funding\ Rounds + \beta_4 Total\ Funding + \beta_5 Founding\ Year + \beta_6 Firm\ Stage + \varepsilon$

Last, to test hypothesis 3, the effect of firm size alongside the control variables on valuation is examined in Model 3:

(3) $valuation = \alpha + \beta_1 gender + \beta_2 industry + \beta_3 firm\ size + \beta_4 funding\ rounds + \beta_5 total\ funding + \beta_6 Founding\ Year + \beta_7 firm\ stage + \varepsilon$

4. Results

4.1 Descriptive Statistics

Before presenting the main results, Appendix 1 shows the overall descriptive statistics of the individual variables used in the study, as well as the descriptive statistics of each subgroup "female founders" and "male founders". By investigating the overall variables and comparing them to the subgroups, several interesting observations can be made.

The *total funding* variable has been log-transformed to account for data skewness, excluding outliers, and to allow relative comparisons. The mean of the log-transformed total funding is 0.9782, which corresponds to an average funding amount of approximately $2.8 million the start-ups of the sample have received. Comparing the subgroups, female founders have a mean value of log-transformed total funding of 0.9410, which corresponds to an average funding amount of $2.5 million. In contrast, male founders have a mean log-transformed total funding of 1.0216, which corresponds to an average funding amount of $3.1 million. These results show that female founders on average receive are consistent with previous literature highlighting the existence of a gender funding gap (Kanze et al. 2020). Secondly, the valuation variable has been log-transformed as well, where the mean of the log-transformed valuation is 1.4799. This corresponds to an average valuation of approximately $40.39 million. The log-transformed valuations range from 0.56 to 2.65, corresponding to valuations ranging from $8.75 million to $ 265 million. Now, comparing the results to the subgroups, the mean of the log-transformed valuation for female founders is 1.3727, which can be translated to an average valuation of $39.45 million. Whereas, for male founders the mean of the log-transformed valuation is 1.6051, resulting in an average valuation of $49.78 million. These results indicate that female founders receive a lower valuation than their male counterparts, even when they receive the same amount of funding.

Additionally, by investigating the industry variables further interesting observations can be made. For example, the proportion of female founders in the SaaS, Technology, and FinTech sectors is lower, as the results of the mean are 0.0990 and 0.1531 respectively, compared to 0.3894 and 0.2631 for male founders. These results are consistent with previous literature, which suggests that male founders tend to found a start-up in these industries (Moro-Visconti 2021). Conversely, female founders are more prevalent in the HealthTech, E-Commerce, and FemTech sectors with values of 0.2162, 0.3245, and 0.1441 respectively. In contrast, male founders appear to be underrepresented in these sectors, with values of 0.0842, 0.0947, and 0.0286, which further confirms the patterns described in the existing literature, indicating a "valuation gender gap" (Moro-Visconti 2021; Kanze et al. 2018).

4.2 Regression Results

In the following section, the results of this study's regressions are presented in Table 2. Model 1 constitutes the baseline of this study, including the main independent variable founder gender, and the control variables. Models 2 and 3 sequentially add the respective independent variables of industry and firm size in employees, capturing firm performance. Model 3 examines all variables in a single regression. For all regressions, variance inflation factors (VIF) were created to test for multicollinearity between the variables as shown in Appendix 2. The mean of the VIF is 2.08, indicating that there is only a very low level of multicollinearity.

Table 2: *Regression results*

	Model 1	**Model 2**	**Model 3**
	Valuation	Valuation	Valuation
Founder_Gender	-.1703054 ** (.0282799)	-.1540214 ** (.0299302)	-.1508638 ** (.0297858)
Industry			
SaaS/ Technology		.003925 (0.1052)	.0106175 .0436345

HealthTech		-.006800 .051562	.0007413 .051094
Ecommerce		-.052253 .048786	-.041364 .048473
FinTech		.0519672 .0487341	.551481 .048213
FemTech		-.0232809 0692394	-.008114 .048782
Others		-.0099866 .0580898	.0020439 .0576795
Firm_Size (Employees)			.0006364 * .0003433
Total_funding	.7662824 ** .0404147	.7497937 ** .0411807	.727881 ** .0425879
Founding_year			
2017	-.0236681 .0681359	-.012711 .0687524	-.0148518 .0683185
2018	- .0844092 .0587677	-.0733927 .0589245	-.083152 .0587805
2019	-.0180359 .0544006	-.0181827 .0545446	-.020102 .0542025
2020	-.0046235 .05528	.0022984 .0557994	.0023598 .0554393
2021	-.0016333 .0571566	.0053816 .0573381	.0053559 .0569681
2022	-.0444765 .0753831	-.0751876 .0765596	-.0702451 .0761123
2023	-.1538801 .1042606	-.2077111 * .1061158	-.194571 .1057041
Firm_stage			
Seed	.045478 .065876	.049456 .0660045	.0501375 .0667424
Early Stage	.0568928 * .0324303	.0625821 * .0330889	.0558834 .0330733
Growth	.0757087 .0579115	.0964976 ..0588825	.0943053 .0585145
Overall R^2	0.7928	0.8023	0.8058

Source: Own creation

Hypothesis 1 states that female-founded start-ups receive lower valuations than male-founded start-ups. In line with this expectation, Model 1 shows a negative and statistically significant (coefficient = -.1703054, $p < 0.01$) relationship between female founders and start-up valuation. Specifically, this means that the valuation of start-ups founded by female founders is on average 0.1703 units lower than the valuation of start-ups founded by male entrepreneurs, holding all other factors constant. Furthermore, a relatively high R^2 value of 0.793 indicates that the model explains approximately 79.3% of the variance in the dependent variable based on the independent variables included. This suggests that the model has a good fit and provides meaningful insights into the relationship between the variables. To conclude, hypothesis 1 cannot be rejected.

Hypothesis 2 specifies that the industry has a significant impact on the valuation of female founders. Contrary to the expectation that engaging in industries with perceived lower potential could explain the valuation gap, Model 2 provides insignificant results and only a slight change of the coefficient for the founder's gender (coefficient = -0.1540, $p > 0.01$). This indicates that the industry only explains the valuation gap to a limited extent, as a more significant reduction in the coefficient close to 0 would be expected if industry choice were a key factor. Furthermore, the R^2 is 0.8085, indicating that the inclusion of the industry variable only leads to a slight improvement in the explanatory power of the model. Therefore, hypothesis 2 is rejected.

Hypothesis 3 proposes that firm size, as a proxy for future performance, significantly impacts the valuation of female-founded start-ups. However, the results indicate that firm size is not significantly related to valuation, as observed in Model 2. Additionally, the founder gender coefficient (coefficient = -0.1508) remains largely unchanged after controlling for firm size. This suggests that firm size does not explain the valuation gap, as a substantial reduction towards 0 in the gender coefficient would be expected if firm size were a key factor. Moreover, the R^2 value of

0.8085 shows minimal change compared to the previous models, indicating that the inclusion of the firm size variable does not significantly improve the model's explanatory power. Therefore, Hypothesis 3 is rejected.

5. Discussion

Despite the substantive interest in the gender funding gap in the VC industry, little has been researched on the topic of start-up valuation and gender in early-stage start-ups. Thus, the purpose of the study was to test if differences in start-up valuation between female and male founders exist, once they received the same amount of funding and have already gained investor trust. By applying the valuation framework by Dhochak & Doliya (2020) to the context of founder gender, this work aimed to explain the dynamics that influence valuation, including internal-resources, industry and firm performance and networking capabilities.

The findings fail to reject Hypothesis 1, showing that female-founded start-ups receive significantly lower valuations than their male-founded counterparts. This confirms the persistence of gender disparities in valuation despite achieving successful fundraising and investor trust. The results align with existing literature highlighting the systemic disadvantages faced by female founders in entrepreneurial finance. In this study, the negative coefficient of female founders is mainly explained through the different unfavorable investor perceptions. Firstly, gender-role stereotypes might reinforce investor perceptions, with female founders often seen as less agentic and risk-taking, traits traditionally associated with entrepreneurial success (Eagly & Mladinic 1989). Furthermore, the discounting theory further explains how female founders' achievements are undervalued or attributed to external factors, undermining their perceived competence

(Snellman & Solal 2022). These biases persist even when objective metrics such as funding amount are held constant, reinforcing the need for a re-evaluation of investor practices.

The findings reject Hypothesis 2, which posited that industry choice significantly impacts valuation of female founders, was not supported. The inclusion of industry variables in the model yielded insignificant results, suggesting that differences industry only can explain the valuation gap to a very limited extent. While literature suggests that male founders dominate high-growth, high-return sectors like Tech and FinTech, and female founders are overrepresented in sectors like HealthTech or FemTech, this study finds that the valuation gap cannot be explained by controlling for industry. More specifically, the industry-based theory cannot explain the differences in valuation. This may indicate that systemic biases overshadow sectoral considerations, with female founders undervalued regardless of the industries they operate in. It also underscores the need for industry-specific research to explore how industry dynamics interact with gender in influencing start-up valuation.

Similarly, hypothesis 3 was rejected, which stated that firm performance, measured as firm size in employees, would play a significant role in valuation outcomes for female founders. Although firm size was controlled for, it showed no significant effect on valuation. Additionally, the coefficient for founder gender remained largely unchanged, suggesting that other factors, play a more important role in valuation differences. This suggests that similar to the industry-based theory, firm performance as a measure of future growth potential does not adequately explain valuation differences between female and male founders.

Firm size is often seen as an important indicator of a company's performance and operational success, factors that investors traditionally associate with higher valuations. However, the results suggest that this relationship does not hold consistently for start-ups founded by women.

One reasonable explanation is that the interpretation of firm performance could lead back to deep-rooted gender biases that may lead investors to undervalue the scalability and future success of female-led firms, even if they are of comparable size to their male-led counterparts. This is consistent with previous research indicating that investors' assessment of potential performance is often based on subjective factors, such as perceptions of leadership qualities and competence, which are shaped by gender stereotypes (Eagly & Mladinic 1989).

6. Limitations and Future Research

Several limitations of this study could potentially limit the explanatory power of the results. These limitations are mainly due to the research design and the data sample characteristics. Future research should apply a variety of research methods. By incorporating qualitative approaches, such as interviews with investors and founders, future studies could provide deeper insights into the underlying mechanisms of the existing gender valuation gap. This could include examining investors' decision-making processes, perceptions of founder characteristics and the dynamics of pitch interactions. Such methods would complement quantitative analyses by uncovering nuanced factors that contribute to valuation differences, allowing for holistic understanding of the issue.

Furthermore, this work has not been able to include revenue or another financial metric measuring firm performance, as financial information of most early-stage start-ups is not publicly disclosed on databases such as PitchBook and Orbis. This may have impacted the comprehensiveness and applicability of the findings. Thus, future research should expand the scope of analysis to include a wider range of founder attributes and, more importantly, incorporate firm performance metrics to provide a more inclusive and comprehensive understanding of how both founder characteristics and firm performance influence valuation.

7. Concluding remarks

By examining the relationship between gender and the valuation of start-ups, this study contributes to the literature on entrepreneurial finance and answers the research question: *Do female founders receive the same valuation from male investors as their male counterparts when they receive the same funding?* To answer this research question, the results show that there is a negative and significant relationship between female founders and valuation, which confirms that even when female founders have successfully secured funding their start-ups are still valued lower than their male counterparts. In this study, this difference is explained by unfavorable investor perceptions towards female founders.

Furthermore, this study investigated whether the choice of industry could explain the gender valuation gap, as previous literature suggests that female founders are more likely to start in industries with lower growth potential and asset heavier, such as e-commerce, HealthTech, and FemTech, which could have a negative impact on valuations. However, the results do not support this hypothesis, suggesting that industry choice alone is not responsible for the observed differences in start-up valuations.

Additionally, this study examined whether lower firm performance among female founder's accounts for the gender valuation gap. However, the findings do not support this hypothesis, indicating that performance metrics alone cannot explain the observed disparities. Even when controlling for firm size, a common proxy for performance, the gender valuation gap persisted. This suggests that systemic biases or other unobserved factors, such as investor perceptions or networking advantages, likely play a more critical role in driving the differences in valuation outcomes.

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9. Appendix

9.1 Appendix 1: *Descriptive Statistics*

	Overall					Female Founders					Male Founders				
Variable	N	Mean	Std.Dev.	Min	Max	N	Mean	Std.Dev.	Min	Max	N	Mean	Std.Dev.	Min	Max
Valuation	206	1.4799	0.3868	0.56	2.65	103	1.3727	0.3616	0.56	2.48	103	1.6051	0.3792	0.91	2.65
Founder Gender	206	0.5000	0.4997	0	1	103					103				
Funding Rounds	206	2.3932	1.0479	1	8	103	2.6036	1.1463	1	8	103	2.1473	0.8625	1	8
Total Funding	206	0.9782	0.3948	0	1.99	103	0.9410	0.4032	0	1.74	103	1.0216	0.3822	0	1.99
Firm Stage	206	1.5728	0.6184	1	3	103	1.6126	0.6765	1	3	103	1.5263	0.5426	1	3
Seed Stage	206	0.4951	0.5011	0	1	103	0.4954	0.5022	0	1	103	0.4947	0.5026	0	1
Early Stage	206	0.4368	0.4972	0	1	103	0.3963	0.4913	0	1	103	0.4842	0.5024	0	1
Growth Stage	206	0.0679	0.2522	0	1	103	0.1081	0.3119	0	1	103	0.0210	0.1443	0	1
Founding Year	206	4.9757	2.0373	1	8	103	4.2342	2.1017	1	8	103	5.8421	1.5731	1	8
2016	206	0.8252	0.2758	0	1	103	0.1261	0.3334	0	1	103	0.1356	0.0987	0	1
2017	206	0.0631	0.2437	0	1	103	0.0900	0.2876	0	1	103	0.0574	0.1356	0	1
2018	206	0.1165	0.3216	0	1	103	0.1351	0.3434	0	1	103	0.1052	0.1026	0	1
2019	206	0.1990	0.4002	0	1	103	0.1981	0.4004	0	1	103	0.0315	0.1758	0	1
2020	206	0.2087	0.4073	0	1	103	0.1621	0.3702	0	1	103	0.0947	0.2944	0	1
2021	206	0.1747	0.3806	0	1	103	0.0990	0.3001	0	1	103	0.2631	0.4426	0	1
2022	206	0.0533	0.2253	0	1	103	0.0360	0.1872	0	1	103	0.736	0.2626	0	1
2023	206	0.0191	0.1383	0	1	103	0.0090	0.0949	0	1	103	0.0315	0.1758	0	1
Industry	206	3.4417	1.7926	1	7	103	3.4864	1.8283	1	7	103	3.3894	1.7582	1	7
SaaS/Tech	206	0.2961	0.4576	0	1	103	0.1531	0.3528	0	1	103	0.3894	0.4902	0	1
HealthTech	206	0.1213	0.3273	0	1	103	0.2162	0.4135	0	1	103	0.0842	0.2791	0	1
Ecommerce	206	0.1553	0.3631	0	1	103	0.3245	0.3001	0	1	103	0.0947	0.2944	0	1
FinTech	206	0.1747	0.3806	0	1	103	0.0990	0.2876	0	1	103	0.2631	0.4408	0	1
FemTech	206	0.0485	0.2154	0	1	103	0.1441	0.2741	0	1	103	0.0286	0.1268	0	1
Firm Size	206	37.461	42.738	2	442	103	34.873	48.717	2	442	103	40.484	34.482	4	200

9.2 Appendix 2: *Variance Inflation Factor*

Variable	**VIF**
Founder Gender	1.44
Industry	
SaaS/Tech	2.71
HealthTech	1.85
Ecommerce	2.05
Fintech	2.24
Femtech	1.49
Others	1.68
Firm Size (Employees)	1.38
Funding Rounds	1.88
Total Funding	2.16
Founding Year	1.17
2017	1.79
2018	2.28
2019	3.15
2020	3.49
2021	3.17
2022	1.96
2023	1.37
Firm Stage	
Seed Stage	1.32
Early Stage	1.72
Growth Stage	1.40
Mean VIF	**2.08**

Source: Own creation