WOMEN'S TECHNOLOGY ENTREPRENEURSHIP IN TÜRKİYE: CHALLENGES IN ACCESSING FINANCE IN THE CONTEXT OF GENDER

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ABSTRACT

WOMEN'S TECHNOLOGY ENTREPRENEURSHIP IN TÜRKİYE:
CHALLENGES IN ACCESSING FINANCE IN THE CONTEXT OF GENDER

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The purpose of this thesis is to explore how women entrepreneurs experience entrepreneurship in the Turkish high technology sector, and how the gender arrangements affect women's technology entrepreneurship at the start-up and growth stages in terms of accessing finance. It is argued that women technology entrepreneurs in Türkiye face significant gender-based challenges that prevent them from accessing financial resources, bank loans, investment, and capital to develop their ventures. Patriarchal gender roles and related stereotypes that are perpetuated by the society and the institutions posited in the technology entrepreneurship ecosystem are likely to create additional barriers for women to acquire capital, finance, and business information. These barriers are often multiplied due to intersecting disadvantages and discriminations such as age and ethnicity.

The thesis uses a phenomenological research approach focusing on exploring women's experiences and by understanding the meaning they attribute to those experiences. Interviews with a sample of sixteen Turkish female high technology entrepreneurs were conducted for in-depth investigation of their subjective experiences and the

contexts in which these were situated. This thesis is one of the few extant studies demonstrating the major challenges that shape women's technological entrepreneurship in Türkiye both at start-up and at the growth stage, uncovering their personal gendered experiences rather than engaging with the male-female gender differences in the field.

Keywords: Türkiye, women, finance, technology, entrepreneurship

ÖZ

TÜRKİYE'DE KADINLARIN TEKNOLOJİ GİRİŞİMCİLİĞİ:
FİNANSMANA ERİŞİM ZORLUKLARININ TOPLUMSAL CİNSİYET
BAĞLAMINDA İNCELEMESİ

KARATAY, Cansu
Yüksek Lisans, Toplumsal Cinsiyet ve Kadın Çalışmaları Bölümü
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Bu çalışmanın amacı, Türkiye'de teknoloji sektöründe faaliyet gösteren kadınların girişimcilik deneyimlerini anlamak ve toplumsal cinsiyet kalıplarının kadınların teknoloji girişimciliğini özellikle finansmana erişim yönünden nasıl etkilediğini araştırmaktır. Araştırma; cinsiyete dayalı engel ve zorlukların, Türkiye'deki kadın teknoloji girişimcilerinin girişimlerini büyütmek için finansal kaynaklara, banka kredilerine, yatırıma ve sermayeye erişmelerini ciddi anlamda engellediğini savunmaktadır. Sosyal yaşamda var olan ve teknoloji girişimciliği ekosistemindeki kurumlarca yeniden üretilen ataerkil cinsiyet rolleri ve kalıpları, kadın girişimcilerin sermaye, finans ve iş bilgisi edinmelerinin önünde ek engeller oluşturabilmektedir. Bu engeller, yaş ve etnik köken gibi kesişen dezavantajlar ve ayrımcılıklar nedeniyle derinleşebilmektedir.

Tez, temelde kadınların bireysel deneyimlerine ve o deneyimlere atfettikleri anlama odaklanan fenomenolojik araştırma yöntemi kullanmaktadır. Bu kapsamda, Türkiye'deki on altı kadın teknoloji girişimcisiyle derinlemesine görüşmeler yapılarak onların öznel deneyimleri ve dahil oldukları bağlamın keşfedilmesi amaçlanmıştır. Bu

tez, Türkiye'de kadınların teknoloji girişimciliğini ve finansmana erişimlerini şekillendiren temel unsurları, cinsiyet karşılaştırmalarına girmeksizin kadınların doğrudan kişisel deneyimlerine odaklanarak ortaya çıkaran az sayıda çalışmadan biri olması sebebiyle literatüre katkı sağlamaktadır.

Anahtar Kelimeler: Türkiye, kadın, finansman, teknoloji, girişimcilik

To all women and men who dare to change the world for the better

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LIST OF ABBREVIATIONS

AI – Artificial Intelligence

BIGG – Bireysel Genç Girişim

EBRD – European Bank for Reconstruction and Development

EIS – Entrepreneur Information System

GEM - Global Entrepreneurship Monitor

ICT –Information and Communication Technologies

IPR – Intellectual Property Rights

KAGIDER – Women Entrepreneurs Association of Türkiye

KGF – Credit Guarantee Fund of Türkiye

KOSGEB – Small and Medium Enterprises Development Organization

R&D – Research and Development

P&D – Product development

SME – Small and medium sized enterprises

STEM - Science, technology, engineering, and mathematics

TDZ – Technology Development Zone

Tech – Technology

TEKNOFEST – Teknofest Aerospace and Technology Festival

TMMOB – Union of Chambers of Turkish Engineers and Architects

TÜBİTAK – The Scientific and Technological Research Institution of Türkiye

TURKPATENT – The Turkish Patent and Trademark Office

TURKSTAT – Turkish Statistics Institute

USD – United States Dollars

CHAPTER 1

INTRODUCTION

1.1. Subject Matter and Research Questions

Women entrepreneurship has been on rise as from 1980s on, making substantial contributions to the world's gross domestic product ever since. Global Entrepreneurship Monitor (GEM) study (2021) suggests that approximately 274 million women run their own businesses globally while an additional 139 million women manage established businesses. On top of that, around 144 million women invest in ventures. These numbers are expected to rise further with the increasing digitalization in the post-pandemic world.

Nevertheless, despite ample evidence for the benefits of increasing women's economic participation, both to women themselves and to wider societies, gender gaps and gender-based segregations in employment, economic activity and entrepreneurship continue to affect women's entrepreneurship adversely. Parallel to their lower participation in labour force than men globally, today women are also less likely to be entrepreneurs and they face more disadvantages in starting and running businesses. In around 40 percent of the economies, women's early-stage entrepreneurial activity is half or less than half of men's (Kelley et al., 2017). A recent GEM report (2023) also suggests that globally, one in six women report an intention to start a business in the near future, compared to one in five men. This gender gap indicative of a systematic pattern of economic inequality on the basis of gender constraints women's potential to decide for themselves and to have an equal position as men in the society by limiting their opportunities. However, advancements in women's economic empowerment are proven to boost women's productivity and income; reduce women's and overall poverty and income inequality (Fund, 2018). Moreover, globally women entrepreneurs tend to pursue business in a limited number of sectors that are characterized by low productivity, low technology, and low growth (World Bank, 2014). Women are also less represented in the STEM fields in Türkiye and across the world, due to several challenges in entering the field as employees and researchers, leading to a significant gender gap (EUROSTAT, 2021).

There are substantial gender gaps and inequalities in all aspects of life in Türkiye, especially evident in labour force participation and entrepreneurship behaviour. According to the GEM 2018 & 2019 report, Türkiye ranks 15th in 48 countries in terms of start-up entrepreneurship activity, indicating a high potential for entrepreneurship in the country. However, women's entrepreneurship lags far behind the level of men's: Only 11.3 percent of firms have majority female entrepreneurship, 9 percent of small and medium-sized enterprises are owned by women, and women represent only 3.9 percent of top managers in Turkish firms (WFID Partnership, 2022). This is mainly related to the lack of effective solutions to the supply- and demand-side issues in women entrepreneurship field, which is perpetuated by the lack of a comprehensive policy to promote women's employment and entrepreneurship (Ecevit, 2007). Women entrepreneurs who operate in traditional sectors such as services and trade usually have difficulties in accessing equity finance and credit (Çak & Degermen, 2015), business related trainings and information, and networks, along with balancing work and family and dealing with gender stereotypes and sexism (Ozasir et. al., 2023).

Reviewing the gender arrangements in the institutions of the respective countries and their impact on women's business ownership, studies (Abou-Moghli & Al-Abdallah, 2019; Panda, 2018; Kapinga & Montero, 2017) from less industrialized countries argue that women encounter harsher barriers in starting and running businesses due to societal structures, elevated level of sexism, and gender-based segregation in the labour markets. On the other hand, technology is a social construct and is also gendered. Gendering is a process where power relations are replicated and reproduced in entrepreneurial context. Although women's involvement in technology has been increasing gradually over the last decades in Türkiye, there is limited academic research on women's technology entrepreneurship.

This thesis investigates the dynamics determining women high technology entrepreneurs' access to finance and capital in Türkiye, with special focus on the influence of gender norms, codes, gender-based discrimination and gendered institutions. This thesis is one of few to study the main challenges that shape women's technology entrepreneurship in Türkiye in terms of accessing finance both at startup and growth stages, focusing on their direct individual experiences rather than on gender differences in the area. Sub- research questions are defined as follows:

i. What are the main challenges and motivations of women technology entrepreneurs in Türkiye?

ii. What are the main factors and institutional mechanisms that shape women's technology entrepreneurship?

iii. How do gender arrangements, gendered institutions and regulatory framework affect women's competencies to grow their tech-oriented business?

iv. What kind of sexist challenges do women tech entrepreneurs have in Türkiye in accessing finance and capital while growing their businesses? How are they interrelated with gender norms and inequalities in society?

v. How can these challenges be overcome?

The technology sector in Türkiye is marked as a field where well-educated, digitally literate, and qualified personnel are dominantly active, and where private and professional networks of people are critical for business and individual success (PAL, 2020). Thanks to its high income and turnover potential, it is a new field for women, albeit with particular challenges ahead of them. Still, there is a male domination in the technology entrepreneurship. TURKSTAT data shows that only 28 and 22 percent of employers in ICT and scientific & technical sectors were women in 2017, respectively (PAL, 2020). Technology entrepreneurship may require a different set of skills and resources for entrepreneurs compared to starting and growing business in conventional sectors. Again, extant studies indicate that women encounter challenges and barriers related to gender-based stereotypes and gendered institutions in the entrepreneurship ecosystem that hinder their abilities to grow businesses (Ozasir et. al., 2023).

Creative labour precarity has been a long discussed topic in the academic literature, even though it is rather absent in the technology and industry policies of the Global South economies including Türkiye. Technological innovation and creativity is an important part of economic growth discussions in the neoliberal world and the post-modern era of capitalism. It could be argued that modern capitalism ideologically pushes for entrepreneurialism, which is a demand for entrepreneurial mindset, to encourage the individuals to remain active, take responsibility for their own subsistence, and do lifelong learning to remain competitive in neoliberal markets. However, this is done not by dictating the demand to the citizens, but rather by ensuring that individuals internalize the responsibility and own entrepreneurship (Ikonen, 2013). This could also be called as self-subordination (Vähämäki, 2009), as the entrepreneurs feel the responsibility to handle precarity, uncertainty in the labour markets and changing trajectories, and even discriminations that they are exposed to, including gender based segregation and sexism. This kind of creative labour precarity is valid for all forms of work, not necessarily differentiating between entrepreneurship and wage employment. Even though

entrepreneurship unlocks opportunities for people to exploit new markets, these opportunities are only available to a certain group with necessary social capital, where one cannot necessarily talk about a fair competition (Ikonen, 2013), particularly when gender dynamics such as women's disproportionate paid and unpaid work, and gender based oppression that exist in the society and institutions are considered as an additional layer to the picture.

Access to finance and capital is cited as the primary need of Turkish women entrepreneurs, who encounter significant hardships in accessing bank finance and investments due to several reasons, some being gender-related. These include limited financial and business knowledge, lack of collateral, and lack of gender-responsive and inclusive financial products and services that consider women entrepreneurs' particular needs. There is growing number of public and private sector programs and mechanisms to support technology entrepreneurship in Türkiye; still, most of the financial challenges for traditional women entrepreneurs are valid for female high-tech entrepreneurs. In addition, there are additional challenges and opportunities peculiar to technology startups, which are influenced by care work responsibilities based on imbalanced gender division of labour, such as domestic responsibilities, motherhood, ability to access business advisory, investment, and networks.

The thesis argues that women technology entrepreneurs in Türkiye face significant gendered patterns of disadvantages that prevent them from accessing financial resources, bank loans, investment, and capital to grow their ventures. Elaborated gender roles and stereotypes, including direct and indirect sexism, that are perpetuated by the society and institutions posited in the technology entrepreneurship ecosystem may create additional barriers for women to acquiring capital, finance, and business information. These barriers caused by sexism[1] are often multiplied due to intersecting disadvantages and discriminations such as age and ethnicity.

1.2. Subject Matter and Research Questions

This thesis adopts a feminist research approach, where the institutions and mechanisms that shape the journeys of the technology entrepreneurs in Türkiye are critically assessed through a gender lens. It problematizes Turkish women tech entrepreneurs' diverse situations as well as gendered institutions in the entrepreneurial sphere, and attempts to examine the issues to

[1] Sexism is "actions or attitudes that discriminate against people based solely on their gender" (EIGE, 2024).

realize justice for women and men in its own context. Last but not least, the research aims to suggest new ideas, future research and policy recommendations to remove barriers and oppressive structures affecting women entrepreneurs operating in the technology field (Gringeri et. al., 2010).

Since the inception of the first academic work on female entrepreneurship, the research has deviated from purely descriptive analyses relying on quantitative methods to a combined method of qualitative and quantitative analyses, informed increasingly by conceptual frameworks (Henry et. al., 2016). Alternative methodologies to entrepreneurship and women's entrepreneurship research are being proposed and/or used in several publications, such as women's experiences in entrepreneurial process, real-life stories, ethnographic methodology, novel persuasive case-based approach, discourse analysis, focus groups, in-depth interviews, case studies and other qualitative methods (Hjorth & Steyaert, 2004; Arum & Müller, 2004; Neergaard & Ulhøi, 2007; Henry et. al., 2016; Datta & Gailey, 2012; Strüder, 2003). As such methods allow listening to the experiences of women and discovering the diversity among women entrepreneurs in different contexts, they shall be more instrumental in revealing the gender arrangements in all spheres of entrepreneurship ecosystem, and their impact on women's entrepreneurship across contexts, cultures, and regions.

Interpretive research has been increasingly used in entrepreneurship research (Bruni et al., 2004). An interpretive approach serves to exploring entrepreneurship as a subjective and highly personal phenomenon (Ezzedeen & Zikic, 2012). Entrepreneurship is a socially constructed phenomenon, where gender is a critical factor that shapes the overall entrepreneurial journey (Ahl, 2006; Bruni et al., 2005; Brush et al., 2009). For this reason, qualitative research methods are suitable for the aim of this research to understand technological women entrepreneurs' experiences in the growth stage of their businesses, and particularly the challenges they faced in the context of gender.

Fundamentally, the research on women entrepreneurship must serve to perceiving entrepreneurship as a gendered phenomenon; and comprehending women's entrepreneurship through all dimensions by shedding light to women's diverse realities, experiences, challenges, and opportunities. This must be done not only by studying the concept's differences from male entrepreneurship, but also by examining groups of women from diverse backgrounds. Finally, the research must expose and abandon desert the biased definitions and discourses on entrepreneurship, business ownership and leadership, since these which are usually associating such concepts with male norms. Overall, the methodology and approach

to female entrepreneurship must diverge from an individualistic and positivist approach that "other" women and converge to one which explores women in its own context.

In line with the feminist methodology, a phenomenological approach is adopted in this research to comprehend the challenges ahead of growing tech-based businesses of women entrepreneurs in Türkiye. Phenomenology refers to the description of phenomena as personally experienced by individuals (Ezzedeen & Zikic, 2012). My approach used semi-structured in-depth interviews with women entrepreneurs who run tech-based firms mainly in the metropoles of Türkiye as the means of data collection where the interviews give women the opportunity to elaborate the context, content, and meaning of their experiences. The questions were open-ended in a semi-structured (online) interview format.

Snowball sampling technique was used in the recruitment of participants. The initial pool of subjects was created through personal and professional contacts, who recommended similar other women who would be interesting for the purpose of this research. I specifically targeted women who run business in Türkiye who use technology in the production of its business operations, or produce technological products or services as the main product of her business. All subjects were asked about their experiences about the finance-related challenges in their entrepreneurial journey, from start-up to stabilization and growth phase. I included entrepreneurs from various socio-cultural and geographical backgrounds, mainly from metropoles including Istanbul, Ankara and Izmir, to reflect the impact of cultural differences on the entrepreneurial experiences of women.

My final sample comprised sixteen women. Their ages ranged from mid-20s to 60s. Most of the interviewees hold graduate degrees, three of them having a PhD. Industries comprised information and communication technologies (ICT), biotechnology, robotics and engineering, Artificial Intelligence (AI), bioengineering and genetics, archeology, imaging technologies, and marine engineering. Businesses included different lifecycles such as start-up, stabilizing and mature firms.

For this research, all interviews were transcribed and all notes from the interviews and observations were collected. The individual readings were then gathered to generate the emergent categories of the challenges and experiences of tech-based women entrepreneurs in the startup and growth stage, some were then refined to sub-categories for deeper analysis. The discussion part was enriched with the specific quotations from the interviewees relevant to the topic, which were translated from Turkish to English by the author.

Table 1: Demographic and basic business information of respondents

Pseudonym	**Age**	**Education**	**Sector / Industry**	**Business Cycle**	**Marital Status**	**Having children**	**Years of professional experience in the field**	**Shareholder structure of her business**	**Scale**	**Whether to do R&D activities**
WE1	25	Graduate degree in STEM field	Biotechnology	Stabilizing	Single	No	3	Multiple shareholders (incl. male and females)	Micro SME	Yes
WE2	32	Graduate degree in STEM field	Marine, information technologies	Start-up	Single	No	10	Two shareholders (female and male)	Micro SME	Yes
WE3	61	Professor, PhD in STEM field	Information technologies, artificial intelligence	Mature	Married	Yes, 2 children	40	Multiple shareholders (incl. male and females)	Corporate enterprise	Yes
WE4	53	Graduate degree in STEM field	Health technologies	Stabilizing	Married	Yes, 3 children	30	Sole shareholder	Micro SME	Yes
WE5	40	Graduate degree in management	Digital marketing and logistics	Stabilizing	Married	Yes, 1 child	17	Multiple shareholders (incl. male and females)	Micro SME	Yes
WE6	36	Undergraduate degree in STEM field	Robotics and mechatronics	Stabilizing	Married	Yes, 2 children	14	Sole shareholder	Small sized enterprise	No
WE7	35	Graduate degree in STEM field	Biotechnology	Start-up	Married	No	12	Sole shareholder	Micro SME	Yes
WE8	40	PhD in STEM field	Information Technologies	Stabilizing	Married	Yes, 1 child	4	Two shareholders	Micro SME	Yes

Pseudonym	Age	Education	Sector / Industry	Business Cycle	Marital Status	Having children	Years of professional experience in the field	Shareholder structure of her business	Scale	Whether to do R&D activities
								(female and male)		
WE9	Ageless (preferred not mentioning)	Graduate degree in STEM field	Information Technologies	Mature	Single	No	22	Multiple shareholders (incl. male and females)	Micro SME	Yes
WE10	52	Graduate degree in STEM field	Information and Communication Technologies	Mature	Married	Yes, 1 child	30	Sole shareholder	Small sized enterprise	Yes
WE11	40	Undergraduate degree in management	Information Technologies	Mature	Married	Yes, 1 child	7	Multiple shareholders – family business	Medium sized enterprise	Yes
WE12	30	Graduate degree in STEM field	Mobile technologies	Stabilizing	Single	No	7	Two shareholders (female and male)	Micro SME	Yes
WE13	35	PhD in STEM field	Bioengineering and genetics	Startup	Divorced	No	13	Sole shareholder	Micro SME	Yes
WE14	33	Graduate degree in STEM field	IT, cartography, archeology	Stabilizing	Single	No	11	Sole shareholder	Micro SME	Yes
WE15	28	Graduate degree in STEM field	Pharmacy, cosmetics	Stabilizing	Single	No	4	Sole shareholder	Micro SME	Yes
WE16	44	Graduate degree in STEM field	Information Technologies, imaging technology	Mature	Divorced	Yes, 1 child	20	Multiple shareholders (incl. male and females)	Small sized enterprise	Yes

As the researcher, my main challenge was to align my sample of interviewees with the feminist approach and the gender lens that is at the heart of this study. It should be noted that most of the women participated in the study could be called "sophisticated" elite, coming from higher socioeconomic and comparatively privileged backgrounds, are experienced in giving interviews and responding questionnaires, and are more likely to know what the researcher wants to hear (Bailey, 2008). For this reason, from time to time I needed to reverse or expand the questions in order to enable the participants to open up about their vulnerabilities, realize and assess various forms of sexism and class inequalities that they have witnessed or experienced, and gender related challenges that they have encountered in their entrepreneurial journeys. Having said that, my approach has always been to accept their statements, feelings and insights related to their experiences as expressed for my analysis, as well as to evaluate them in order to make inferences in line with my argument.

1.3. Organization of the Thesis

The second chapter involves the theoretical discussion around women's technology entrepreneurship globally and in Türkiye, pointing to the existing patterns of gender segregation that affect women's entrepreneurial journey particularly in the technology industry. Chapter 3 presents the main insights and findings of the research in relation to the existing literature of women technology entrepreneurship and overall entrepreneurial ecosystem in Türkiye. The analysis aims to uncover the main factors and gendered institutional mechanisms that shape women's technology entrepreneurship, and particularly in accessing finance and capital while growing their businesses. Chapter 4 is devoted to discussion and conclusions, and provides recommendations for gender-inclusive ecosystem programs to promote women's technology entrepreneurship as well as offering thoughts for future scholarship in gender and technology entrepreneurship.

CHAPTER 2

THEORETICAL BACKGROUND

2.1. Technology entrepreneurship in the economy and the entrepreneurial ecosystem

Although there is no universal definition of entrepreneurship, the theory of entrepreneurship is rooted in the work of Joseph Schumpeter, who simply defines entrepreneurship as innovative venture creation (Henrekson & Sanandaji, 2017). In his definition, the entrepreneur is the key agent, or the primus motor of capitalism, which creates an innovative and growth-oriented business (Schumpeter, 1911 [1934]). In the entrepreneurship definitions that are made by various researchers afterwards, the common concept is "the risk". Therefore, technology entrepreneurship could be defined around the same concept, that is linked to business or venture development in the technological domain where a certain risk is involved (Nacu & Avasilcăi, 2014).

Technology entrepreneurship is crucial for economic development, creation of jobs, and growth of societies, particularly in this modern period of capitalism. Willie et. al. (2011) defines the features of technology entrepreneurship as (i) high potential opportunity, (ii) technology-intensive opportunity, (iii) unique technology that can drive new business in the market, (iv) elevated risk of failure, (v) longer time needed to market the product, and (vi) high demand of infrastructure, facilities, and resources.

Willie et. al. (2011) draws the framework for technology entrepreneurship development: It starts with the generation and screening of ideas, which is promising in terms of business profit for the investor. It is followed by the feasibility assessment, which examines the technical, economic, and commercial viability of the business idea proposed. According to the results of the feasibility assessment, prototypes are developed, which is the transformation of the initial idea to a physical product or service until it is decided that the outcome is adequately competitive. After the prototyping, the entrepreneur proceeds to the patenting and approval by the state to prevent others from commercially exploiting his/her invention for a given period.

Once the prototype and idea are patented, the entrepreneur proceeds to the phase of production and marketing of the products or services. Adoption refers to the product's entering its life cycle in the outer competitive environment.

As this framework demonstrates, there are distinct phases and dimensions of technology entrepreneurship that affect each of these steps. To begin with, technology entrepreneurship is heavily dependent on the development of a stimulating entrepreneurial ecosystem, which is basically "a set of actors that interact and exchange resources in a network under an institutional regime and an infrastructure" (van Rijnsoever, F. J., 2020). An enabling entrepreneurial ecosystem consists of a number of factors that shape the start-up, growth and survival of newly established technological firm in a specific region (van Rijnsoever, F. J., 2020). Among others, a sustained network between the startups and other actors of the ecosystem is a critical component of a successful entrepreneurial ecosystem (Feld, 2020), which facilitates growth of high-tech startups through finance, advisory, information and connection to markets. Education and information organizations including universities, vocational education and training initiatives, research and development departments of corporations, think-tank organizations compose a knowledge subsystem in the entrepreneurial ecosystem, and lead to the flourishing of knowledge, qualified human resource, and specialized equipment to help tech-based ventures grow (Cooke, 2002).

The business support network is equally significant for the development of technology entrepreneurship. This encompasses value network in order to commercialize the product (van Rijnsoever, F. J., 2020). An adequate information and communication technology (ICT) infrastructure is also part of this network, which allows the development and dissemination of ideas and information to attract consumers of the tech-based enterprise. Moreover, an enabling Intellectual Property Rights (IPR) protection framework is critical for the facilitation of technology entrepreneurship (Parameswar et. al., 2019).

Another critical aspect of entrepreneurial ecosystems is the financial support network, to ensure financial resources for technological ventures to access to seed capital, working capital, investment, and growth finance for their operations (Parameswar et. al., 2019). In a sophisticated entrepreneurial ecosystem, financial support network would include banks, non-bank financial institutions, FinTechs, venture capital firms, grantors, governmental funding mechanisms, business angels, crowdfunders, etc.

Intermediary institutions, such as business incubators and accelerators, are helpful for building linkages between startups and other stakeholders in the ecosystem (Bruneel et al., 2012). This could be through two main processes: meeting and mating (Kalmijn & Flap, 2001). Meeting refers to gathering of two potential partners for a specific business objective, while mating refers to their tie formed after the meeting.

Government policies play a substantial role in the development of an enabling entrepreneurial ecosystem for the flourishing of technology-based ventures. First, they shape the macroeconomic factors, which are directly linked with the risk that the entrepreneurs are exposed to in the process of initiating and growing a business. Governments could initiate support programs that avail affordable financing, business advisory and networking opportunities for startups. Specific incentives to facilitate university-industry partnerships for flourishing R&D activities could be launched by the governments. It is also the state policies that form the IPR framework as well as the ICT infrastructure, which directly affect entrepreneurial behavior.

2.2. Women's Technology Entrepreneurship: Progress and the Gendered Context

Since the 1970s, entrepreneurship has been a rapidly growing research field in management research, with its own publications, research centers, and endowed chairs (Ahl, 2006). Apart from the discussion on defining the entrepreneurship, most of the early research on entrepreneurship, particularly of Schumpeter's, focused on the "person", rather than the entrepreneurship action, which is described as a distinguished, extraordinary personality with an ambition to grow his business. Later empirical research showed that the profile of entrepreneurs might be too wide, most of which are composed of small business owners that are usually content with keeping their businesses in a manageable size (Ahl, 2004). The research on entrepreneurs and entrepreneurship then needed to be developed and refined to first understand why anyone would behave in a particular way. Nevertheless, for long time, discussions about the entrepreneur led to the thought of a man, not a woman. Even before the specific work on women entrepreneurship has started, the masculine language used in the articles of leading entrepreneurship research journals validated the perception of masculinity of the "entrepreneur" as an image (Ahl, 2004). This is substantially related to the significance of gender constructions and segregation that have been prevailing in the economic sectors which define "proper" roles for men and women, where women are pushed to remain in private

sphere and excluded from public domains and work life. Although we see this kind of sexism less apparent in the industrializing economies, it is still powerful albeit in more indirect and concealed way which works against aspirant women in the entrepreneurship and technology entrepreneurship in particular at the level of gendered attitudes, prejudices and institutional dynamics which disadvantage women vis-a-vis men.

It was eventually revealed that entrepreneurship is a gendered phenomenon or economic venture which reflects and reconstructs women's and men's economic roles; and therefore the gendered setting and different implications for both men and women led to increasing research efforts on women entrepreneurship theory and practices (Yadav & Unni, 2016). Previously, it was assumed that the individual entrepreneur is generic and does not differ except compared to non-entrepreneurs, and therefore there is no need to study women separately as they would have similar characteristics to men entrepreneurs. However, this assumption ignores the fact that the organization and entrepreneurship theories were developed on the samples of men and mainly by men (Hurley, 1991), and are usually gender-blind (Martin, 2000). Thus, the current theory may not fully capture the essence of women's entrepreneurial behaviour and distinct characteristics in business ownership as well as the impact of gendered policies and institutions on women's entrepreneurship until other samples and gendered aspects of entrepreneurship are studied.

Over the last 20 years, and especially after the mid-2000s, women's entrepreneurship research gained a new dimension with new methods and tools, application of new theories and perspectives, particularly as to comprehending the role of gender in the whole ecosystem as a factor that defines the entrepreneurship of individuals. Although the share of such publications is still modest in the millennial literature, the emerging research and theories investigate the impact of gender constructions and sexism on women's experience of business ownership, the main characteristics that affect the share of women entrepreneurs in the overall entrepreneurial activity in specific countries, and the links between women entrepreneurship and gender equality, sociocultural context, national policy, and overall economic development (Cardella et. al., 2020).

The literature on women's technology entrepreneurship has been developing mainly since the 2010s, most of it being focused on the advanced industrialized countries. Researchers have reviewed the push and pull (motivation and obstacle) factors for women entrepreneurs, and how technology is engaged with these factors in a gendered environment.

2.2.1. The significance of social capital and education: Making sense of the Turkish context

Gender-based segregation has been a prolonging characteristic of modern labour markets, which is related to particular macro-level conditions. This segregation is both horizontal and vertical, meaning that women and men tend to work in different types of jobs as well as in different positions in work hierarchies (Hillmert, 2015). Education and training systems and policies are among the critical determinants of the gender segregation in occupations and fields of work. Studies suggest that educational segregation among men and women lead to gender-based occupational segregation (Sahoo & Klasen, 2018).

Women entrepreneurs' education level can be correlated with their motivations for business-creation activities; therefore it can be claimed that human capital increase of women via education could have a significant impact on both their rate of economic engagement and the longevity of their business activities (Çetindamar et. al., 2012). However, women's inability to benefit sufficiently from educational opportunities may affect their competence in entrepreneurship. Looking at the picture of female entrepreneurship in Türkiye, women in urban settings who are more educated usually have technical skills and can mobilize monetary savings for their work, turn to entrepreneurship as a part of their professional development. On the other hand, deprived women, who are usually located in rural and peri-urban areas with fewer education opportunities and capital, perceive entrepreneurship as a life and livelihood strategy. Women in rural areas, therefore, may find it more challenging to grow their entrepreneurship in conjunction with the additional cultural, structural, and financial barriers they need to overcome. To sum up, it could be claimed that Turkish women are more involved in necessity-based entrepreneurship, rather than opportunity-based entrepreneurship (Karadeniz, 2011).

When we look at the education figures in Türkiye by gender, we cannot see great differences in terms of primary and elementary education (TURKSTAT, 2022). However, even though there has been a serious decrease in early school dropouts in the last decade, Türkiye still has the highest dropout rates among all EU members and candidate countries. According to EUROSTAT 2021 data, Türkiye had the highest share of early leavers from education and training in the Western Balkans and Türkiye region, with 27.5 percent of young men and 25.8 percent of young women (aged 18-24 years). The same research suggests that across Türkiye and Western Balkans region, more men than women graduated from tertiary education in

STEM disciplines in 2021, which is likely to pose a negative impact on women's entrepreneurship and employment in the STEM fields.

Research conducted by PAL (2020) in Türkiye show that women entrepreneurs in technology hold higher education levels than the average, most having at least a graduate degree, which encourages women to become high-impact entrepreneurs. On the other hand, half of female tech entrepreneurs interviewed within the scope of the study did not graduate from the STEM fields, but hold a degree in social or administrative sciences. Study by Atalay & Varol (2016) with women entrepreneurs in high tech sectors in Ankara also confirms high education levels among female tech entrepreneurs.

2.2.2. Gendered barriers to entry to technology entrepreneurship

Entrepreneurship is a societal phenomenon (Davidsson, 2003), and is affected by economic, regulatory and social institutions. Labour market conditions and particularly women's access to decent work shape their decisions toward starting a firm. Reviewing the gender arrangements in the institutions of the respective countries and their impact on women's business ownership, studies (Abou-Moghli & Al-Abdallah, 2019; Panda, 2018; Kapinga & Montero, 2017) from the Global South argue that women encounter harsher barriers in starting and running businesses due to gendered societal structures. On the other hand, technology is a social construct and is also gendered. Gendering is a process where power relations are replicated and reproduced in entrepreneurial context.

Being a heavily male-dominated industry, technology sector has been hostile to women for years (Bilimoria et al., 2008), leading to the exclusion of women from technology related sectors which has been in tandem with the structural transformations in the economy. This applies not only to women entrepreneurs, but also to women employees working in the field (Simard et al., 2008). Sassler et. al. (2017) also found that women having a degree in computer science are 14 percent less likely to be employed in STEM areas compared to their male counterparts. For the entrepreneurial sphere, technology is a field where women need to overcome higher barriers than men to enter and succeed due to a great level of vertical and horizontal gender segregation (Dautzenberg, 2012). In the recent golden age of technology based in the Silicon Valley, women in technology remain to be exposed to severe gender inequalities and even several forms of gender-based violence (Özkazanç-Pan & Muntean, 2018).

2.2.3. The impact of cultural organizations to women's technology entrepreneurship

With some exceptions, mainstream entrepreneurship theory applied to most women entrepreneurship studies tend to overlook the social and gendered aspects of entrepreneurship, which operate differently for women. Several studies focus on the traits in opportunity recognition as the conventional entrepreneurship theory sees it as the nucleus of entrepreneurship (De Carolis & Saparito, 2006). However, understanding women's processes in opportunity recognition and exploitation requires a feminist perspective as such processes are highly influenced by the biased market perceptions, self-perceptions, and personal ambitions of the entrepreneurs. In this sense, women's self-perceptions and personal ambitions may be significantly different than that of men, as these concepts are socially constructed and gendered (De Bruin et. al., 2007). Kirkwood (2009) investigates the main drivers of men and women to become entrepreneurs as well as the impacts of these motivations on their endeavor. The study concludes that although men and women have almost the same motivations for entrepreneurship, some factors related to gender such as domestic gender roles affect the impact of these motivations. Wilson et. al. (2007) argues that women are less likely to become entrepreneurs due to their negative self-perceptions and negative attitude on own competencies which are direct consequences of gender socialization in patriarchal cultures.

Women in technology usually face stronger gender stereotypes such as glass ceilings[2], gender-based segregation and less trust in managerial and technical competencies, which hamper their advancement in their career. Increasing role models have a positive impact on diminishing stereotypes and biases. However, female role models for technology sector are quite low compared to traditional sectors (Ezzedeen & Zikic, 2012), and women are much less represented in technology sphere (Dautzenberg, 2012). This is also related to continuing discouragement of girls from science and technology fields in schools (Ezzedeen & Zikic, 2012). It is no surprise that this comes as a factor that affects women's self-confidence in this area, who usually state themselves as less competent in digital technologies compared to men (Mack et. al., 2017).

Another career impediment is found to be the resistance to women's leadership from their colleagues, within and outside the firm. In male-dominated industries such as technology, women could only get acceptance when they can prove themselves and their accomplishments

[2] A limit that is unofficial but understood which prevents someone, esp. a woman, from advancing to a top position in a company or organization (Cambridge Dictionary, 2024).

in the sector (Ezzedeen & Zikic, 2012). This could occur at organizational, industrial, and society level, including resistance from financiers, ecosystem stakeholders and clients. Women could also see resistance from social acquaintances as they do not conform with conventional gender roles which mostly require women's dedication to family and children (Ezzedeen & Zikic, 2012).

2.2.4. Institutional and social context shaping women's tech entrepreneurship

One research theme that broadly uses feminist theory in understanding entrepreneurship is culture and gender (Eden & Gupta, 2017). Several studies examined the influence of culture; in particular prejudices, gender stigmas and stereotypes; on female entrepreneurship (Shinnar et. al., 2012; Hoyt & Murphy, 2016; Robb & Watson, 2012). Domestic responsibilities also have a disproportionate effect on women entrepreneurs compared to their male counterparts (McGowan et al., 2012; Patterson & Mavin, 2009; Kirkwood & Tootell, 2008).

Women's entrepreneurship theory recognizes work – life balance as a deep challenge for women ahead of growing their ventures. The comprehensive gender-aware framework for women's entrepreneurship developed by Brush et. al. (2009) builds on the mainstream institutional theory, which considers the "3Ms", namely money, market, and management as the core concepts of entrepreneurship, by articulating two more dimensions that are central to women's entrepreneurship – motherhood and meso/macro environment. These two concepts are important in understanding women's ventures in its own right; as they bring critical societal structures into the picture: motherhood as a metaphor to symbolise women's domestic role and family responsibilities, which has a greater impact on women's entrepreneurship than that of men; and meso/macro environment to represent the legal and social institutions that shape the lives and opportunities of women such as media, policies, and culture. This study not only lights the way for further work on female entrepreneurship with a holistic view, but also emphasizes the importance of a mixed approach in such studies combining quantitative tools and qualitative practices.

Technology, being both capital- and labor-intensive, requires intense commitment of entrepreneurs particularly in start-up and growth phases. Women entrepreneurs in high-tech

sectors face pressures from their families and social circles on maintaining their work-life balance, and even on prioritizing family over business, which could be a demotivating and

limiting factor ahead of their entrepreneurial success (Ezzedeen & Zikic, 2012; Jennings & McDougald, 2007). Disproportionate domestic responsibilities means less time for women to devote to their business, and to learning more about ICT (Erumi-Esin & Heeks, 2015). Furthermore, welfare state institutions, taxation, social and family policies that constitute childcare and elderly care services, equal education opportunities, and that promote gender equality in public and private realms have an impact on women's entrepreneurship, as well as their preferences on the sector and location, growth strategy, business networks used, and use of technology to some extent (Bardasi et. al., 2011; Parker, 2009; Aidis et. al., 2010).

2.2.5. Issues of access to finance and capital for startup and growth of women-led tech businesses

In growing businesses, most women entrepreneurs need finance and supplementary capital. It is evident that women have extra difficulties in accessing venture capital and bank finance for business growth and additional investments (Marlow and Patton, 2005). Legal structure concerning women's property ownership and inheritance strongly affects their access to seed capital and growth finance (Brush et. al., 2009). Okoye (2013) and Santoni & Bart (2014) attempt to develop a feminist point of view to understand the women entrepreneurs' access to financial resources, which is hindered by the gendered institutions in the region. Poggesi et. al. (2016) also present a number of publications in peripheral economies and advanced industrialized countries analysing women's relations with banks and the gender-biased business models of financial institutions, which negatively affect women's access to credit. In the technology sector, the same trend applies broadly. Women's managerial skills and competencies are more questioned by the financiers, indicating a significant gender bias in the finance sector (Ezzedeen & Zikic, 2012) and among investing communities.

To overcome such problems, women technology entrepreneurs could prefer to found and run businesses with mixed teams of entrepreneurs, which may indicate higher management quality for financiers, investors, and clients (Dautzenberg, 2012). In that sense, women may opt for partnering with male colleagues to overcome gender bias for accessing to resources to grow their businesses (Godwin et al., 2006). For these reasons, international development organizations call for gender-inclusive technology and ICT policies and programs that address the specific needs of women entrepreneurs (Sorgner et al., 2017), combat with sexism and biases at the institutions that hamper women's advancement in technology field, and eliminate barriers that oppress women in technology.

Another factor that affects the success of technology-based firms is the firm size and scale, which influences the level of ICT adoption of sectors, and their access to financial resources. Women-led businesses tend to be smaller than men-led businesses, which negatively affects the digitalization maturity of firms (Orser et. al., 2019).

2.2.6. Access to gendered networks

The need for a theory broadened with a feminist perspective is valid while studying the impact of social networks and social capital of entrepreneurs on their entrepreneurship traits. Networks are critical to entrepreneurial success, yet they are gendered structures that require a feminist look to understand how they interact with women. Roomi (2009) and Greve and Salaff (2003) study the impact of networking in different life stages of women-owned businesses. Few studies found that women and men socialize differently; thus, they usually develop various kinds of social networks, engage in different information channels (Aidis et. al., 2008), and accumulate homosocial capital with distinctive characteristics which is critical to women's businesses (Kirkwood, 2007; Cardella et. al., 2020). The reality also varies within women and men in different contexts, depending on the region, race, and class (Cardella et. al., 2020; Sallah & Caesar, 2020).

Accessing networks and social capital is a critical factor in entrepreneurial success, especially in technology industry. Evidence points to a consistent gender gap in the use of social networks such as business incubators, accelerators, mentoring networks, etc. which suppresses women's entrepreneurship in non-traditional field due to reduced social capital (Özkazanç-Pan & Muntean, 2018). Gendering of such business organizations cannot be addressed through gender-neutral administrative policies, whilst such an environment excludes women from business networks due to taking male norms in networking as granted, and leading to gender segregation. This is critical as business networks could facilitate access of entrepreneurs to advisory, technology, information, and funding (Özkazanç-Pan & Muntean, 2018).

2.3. Women's Technology Entrepreneurship in Türkiye

There are significant gender gaps in all aspects of life in Türkiye, especially evident in labour force participation and entrepreneurship behaviour. However, women's entrepreneurship lags far behind the level of men's, due to several constructs. Only 11.3 percent of firms have majority female entrepreneurship, 9 percent of small and medium-sized enterprises are owned

by women, and women represent only 3.9 percent of top managers in Turkish firms (WFID Partnership, 2022).

The technology sector in Türkiye is marked as a field where well-educated, digitally literate, and qualified personnel are dominantly active, and where private and professional networks of people are critical for business and individual success (PAL, 2020). Thanks to its high income and turnover potential, it is a new field for women, albeit with particular challenges and obstacles ahead of them both to enter the field and to succeed in it.

There is limited academic research on women's technology entrepreneurship in Türkiye (Atalay, 2011; PAL, 2020; Şen, 2021; Atalay & Varol, 2016; Özsungur, 2019; Ármane et. al., 2021; Ballı, 2020). The Entrepreneur Information System (EIS) of the Ministry of Technology and Industry of Türkiye is an enterprise-based information system that provides data regarding the economic activity of enterprises generating commercial income in the country. The purpose of the EIS is "to provide an environment where decision makers, experts and researchers in public institutions and organizations, universities, research institutes and non-governmental organizations will be provided with accurate and reliable data for the design, implementation and effectiveness measurement of economic, sectoral and regional policies" (https://eis.sanayi.gov.tr/Home). EIS is supposed to be the pioneering database for researchers conducting studies on the enterprises registered in Türkiye, including micro and macro level data on the sector, number of employees, turnover, and government supports received. However, there is no sex-disaggregated data available at the EIS. Therefore, the database was not available to be used to explore the number of women-owned enterprises registered in Türkiye that are operating in the sectors that are classified as "medium-high technology" and "high technology" sectors by KOSGEB (2022). Similarly, the database of TÜBİTAK BIGG program beneficiaries do not provide sex-disaggregated data based on the gender of founders.

Still, there are some studies conducted mainly by non-governmental organizations in Türkiye to give us an estimate of the number of women-owned tech businesses. Only 23 percent of the members of the Union of Chambers of Turkish Engineers and Architects (TMMOB) are women (PAL, 2020). 2017 TURKSTAT data shows that only 28 and 22 percent of employers in ICT and scientific & technical sectors are women, respectively (PAL, 2020).

However, women's involvement in technology has been increasing gradually over the last decades in Türkiye. According to the reports of TÜBİSAD and Deloitte (2017, 2020 and

2022), the rate of women employees in the ICT sector increased from 27 percent to 33 percent from 2017 to 2020, and dropped back to 22 percent in 2022, with the negative effects of the pandemic on women's jobs.

2.3.1. The social and patriarchal context

Gender beliefs are one of the cultural schemes that need to be interpreted cautiously. These are translated into certain gender stereotypes shaping young men and women along with their education and careers decisions, as well as their approach to entrepreneurship. When we examine the entrepreneurial framework conditions, Global Entrepreneurship Monitor (GEM) 2021 data shows that Türkiye performs well in terms of internal market dynamics, commercial & legal infrastructure, and government entrepreneurship programs; but do not perform so well in terms of cultural and social norms, which have significant impact on women entrepreneurs in technology sector, which is highly male-oriented and is prone to gender segregation in career opportunities due to sexism and gender bias inherited in the institutions.

Domestic responsibilities traditionally attributed to women such as homecare, childcare and elderly care may have greater impacts on Turkish women's entrepreneurial success in technology than it has for men. Research by Ökten (2015) demonstrates that having small children decreases the probability of being an employer for women, while it increases the probability of being an employer for men. Being married has a similar positive effect on men's business ownership, though having no such effect on women. Ecevit et. al. (2003) also found that women's choices to work in computer programming fields are affected by their family background, and marital roles. On the other hand, having a supportive partner / spouse could be a great facilitator in women's entrepreneurship journey. Almost half of women entrepreneurs surveyed by KAGİDER (2019) address partner / spouse as the main supporter in business.

Research conducted by PAL (2020) with high-impact women entrepreneurs in Türkiye including technology and social entrepreneurs draws a picture of female tech entrepreneurs in different regions of the country. Accordingly, the majority of women entrepreneurs operating in ICT and high technology sectors are married. Half of high-tech entrepreneurs have co-founded their businesses with their husbands, which may indicate that marriage itself is not a barrier for women ahead of entrepreneurial behaviour, but rather could be a supporting factor given that the spouse is supportive of the action.

2.3.2. Entrepreneurial motivation

Women's entrepreneurship research in Türkiye has been initiated in mid-1990s and accelerated as from early 2000s, mainly focusing on the main drivers and challenges of women's entrepreneurship from a gender perspective (Ecevit, 1993; Çelebi & Sallan, 1997; Ecevit, 2000; Çelik & Özdevecioğlu, 2001; Çakıcı, 2003; Kutanis, 2006; Ecevit, 2007; Can & Karataş, 2007; Yetim, 2008; Keskin, 2014). Accordingly, women's main motivations to become entrepreneurs include income creation for family, independence, translating professional experience into entrepreneurial life, and realizing own dreams.

Research conducted by PAL (2020) with high-impact women entrepreneurs in Türkiye including technology entrepreneurs indicates similar entrepreneurship motivations, formulated as offering a solution to an economic problem, seizing a market opportunity, creating value, and making a difference. In this study, for tech entrepreneurs, previous employment experience is critical for observing the market opportunities. Half of interviewed high-impact entrepreneurs come from professional backgrounds, and have worked in managerial positions before becoming entrepreneurs, indicating the importance of leadership and managerial skills in entrepreneurship.

In her qualitative research with six women in tech sector, Şen (2021) found that women do not necessarily feel a negative impact of their gender on their career, but they specifically see gender bias in employment policies by the technology firms including in recruitment and career advancement aspects. All participants are satisfied with being in the tech business.

2.3.3. Characteristics of women-led technology businesses

Globally, women entrepreneurs tend to pursue business in a limited number of sectors that are characterized by low productivity, low technology, and low growth (World Bank, 2014). A similar trend is also observed in Türkiye, even though there is no specific study on women's tech businesses. Women entrepreneurs tend to have higher sector concentration levels than men do, with a focus on trade and services sectors, in line with the global trend (KAGİDER, 2019). One reason may be the fact that women have less market access and established networks in traditionally male-dominated industries like technology or manufacturing. Normally, such networks provide each other with valuable knowledge, experience, and guidance to better navigate the industry to be more prepared and resilient in the face of industry

challenges, but the majority of women lack such knowledge and market support. Still, PAL (2020) research results point to the importance of business networks for women tech entrepreneurs, which comes out as less of a problem for those who have work experience in corporate or multinational companies before starting a business.

The research by Atalay & Varol (2016) show that Turkish high-tech women entrepreneurs mainly operate in ICT, biotechnology, electronics, defense industry and technology consultancy. Most are founded after 2005, with an average of 8.6 employees for technology development zone (TDZ) firms and 38.9 employees for firms out of TDZs. The firms reside in TDZs are mostly R&D companies.

2.3.4. The importance of a flourishing ecosystem for women technology entrepreneurs

The ecosystem for technology entrepreneurship has been vastly evolving in Türkiye particularly from 2010s onwards, despite not yet being at the desired level (Aka & Özdemirci, 2023). A technology ecosystem is a sophisticated set of components, institutions and relations that allows the flourishment and commercialization of new technologies and technology firms (Maysami et. al., 2019).

The Turkish government has announced its "National Technology Initiative and Digital Türkiye" approach in 2019, to prepare the country for the new global era that is marked with high technology, digital transformation, and Industry 4.0. The National Technology Entrepreneurship Strategy of the Ministry of Industry and Technology (STB, 2023) sets forth the five main pillars towards building a future with significant technological evolutions and prosperity, one of which is stated as technology entrepreneurship. The Strategy addresses an accelerating and facilitating technology ecosystem as a key factor for the tech-based enterprises to survive and strive. In this regard, a "leading tech entrepreneurship ecosystem" is characterized by developed cultural base, qualified human capital, enterprise-friendly market opportunities, institutional supports and infrastructure, accessible finance, and enabling policy instruments.

The National Technology Entrepreneurship Strategy of the Ministry of Industry and Technology puts special emphasis on the promotion of women's technology entrepreneurship as part of its "equal opportunities" approach. This is aimed through downstreaming technology entrepreneurship supports and mobilizing resources for the regions outside the metropoles.

The Strategy foresees the launch of a "Women Entrepreneurship Initiative" (STB, 2023) to keep the issue in the agenda of the policymakers, and pave the way for new developments towards women's technology entrepreneurship particularly in terms of developing role models, facilitating access to finance, and expanding business networks. Still, in the current structure the policy does not provide a concrete framework for removing specific gender-based barriers that limit women's involvement and advancement in technology fields, and combatting against different forms of sexism and gender-based discriminations at private and public sector institutions in the entrepreneurial flora.

The Turkish Government and non-governmental organisations provide financial support to women entrepreneurs. KOSGEB, as the leading government entity, encourages women's entrepreneurship through training and marketing activities. It has initiated the "Support Programme for Women Entrepreneurs" with TRY 324 million worth of financial support provided to 6,781 women entrepreneurs as of July 2021. KOSGEB, which provided support to 12,811 women entrepreneurs in 2022 within the scope of entrepreneurship supports, is expected to provide 29.5 percent of the entrepreneurship supports to women in 2023. However, compared to the large loan disbursement capabilities of financial institutions, KOSGEB's financial support remains limited in terms of eliminating barriers to Turkish women's access to financial products and services.

2.3.5. Access to business development services

Women entrepreneurs ask for training and technical advisory to expand their product range, technology utilization, turnover, and profitability. 28 percent of women entrepreneurs who participated in KAGİDER study (2019) declared not to have any nonfinancial supports. Study by Atalay & Varol (2016) also found that women tech business owners look for business development supports and training services. The main training topics of interest are marketing (product and brand communication, digital marketing), leadership, sales, project and product development, and access to finance. However, a considerable portion of women lack the capital and know-how to initiate their businesses. Further, prior studies (Özdemir, 2010) demonstrate that women entrepreneurs, who received financial and business-wise assistance in starting their businesses, received most of that assistance from their families, and friends.

Data by CEID (2022) shows that women in the field of STEM (science, technology, engineering, and mathematics) in Türkiye need more support to grow. By creating a more

enabling environment for women entrepreneurs, greater participation in high productivity, high technology, and high growth sectors could be encouraged, leading to a more diverse, inclusive, and economically vibrant global entrepreneurial landscape.

The COVID-19 pandemic has led many Turkish women entrepreneurs to find new ways to do business and increase the use of digital technology as a way to continue operating and reach customers during lockdowns and other restrictions. In this context, online marketplaces enhanced access to diverse and broader markets for women entrepreneurs and enabled them to reach customers beyond conventional markets. As a result, according to TURKSTAT's research, the proportion of entrepreneurs using online stores, marketplaces, applications, and web sales platforms to sell their products increased from 55.7 percent in 2019 to 69.7 percent in 2020. It can be argued that this steady increase had a transforming impact on women entrepreneurs to enter the digital markets because digital marketplaces may offer commission discounts, discounted shipping fees and marketing support to women entrepreneurs who want to move their business operations to e-commerce.

2.3.6. Access to capital and financial resources

According to findings of the Türkiye Financial Literacy Survey by Karaca (2020), financial literacy level of women is lower than men (male: 62.4 and female: 59.1), and overall, the financial literacy index of participants is higher for urban and youth (age 25-44) populations. The same study suggests that women's access to financial services is lower than that of men according to the access to finance index (45.0 for women versus 46.9 for men). A recent WFID Partnership study (2022) reveals that 68 percent of Turkish women remain unbanked or underserved by the financial institutions, pointing out an approximately 1.16 billion USD of credit gap for women in the country. The same study addresses a 29 percent gender gap in account ownership, where 18 percent of women have saved, and 11 percent have borrowed from formal financial institutions as of 2022.

To increase women's access to financial products and services, as well as to facilitate their participation in economic and social life, "increasing women's literacy level and enhancing their knowledge and awareness about financial literacy" has been identified as one of the six prioritised strategies under Women's Empowerment Strategy and Action Plan 2018-23 of General Directorate on the Status of Women (Kadının Statüsü Genel Müdürlüğü, 2018). On the other hand, the country's transition to digitized wage payments has elevated financial

inclusion of all segments. Digitalization is a crucial facilitator of women's financial inclusion as most women in Türkiye own mobile phones (WFID Partnership, 2022).

On the other hand, access to finance is cited as the primary need of Turkish women entrepreneurs. 55 percent of women entrepreneurs do not borrow during start-up stage, and only 20 percent use a bank loan for kickstarting a business. Similarly, 55 percent of surveyed women did not borrow during the last year. Women's usage of bank loan increases as the business gets older. In the first 5 years of the business, women tend to apply for ecosystem supports such as the entrepreneurship grant by KOSGEB (KAGİDER, 2019).

According to the statistics of General Directorate of Land Registry and Cadastre, immovable property ownership rate for women in Türkiye is 40.7 percent, while it is 55.8 percent for men (TMMOB, 2023), and the rate considerably decreases going east and south-east. This is an outcome of the preferential treatment of boys over girls in partitioning family property despite a non-discriminatory legal framework. Women's property ownership is critical for accessing to finance and capital in entrepreneurial journey, as mostly banks require tangible collateral in order to extend a loan, and such assets could be used as seed capital for starting a business.

In Türkiye, most tech-based enterprises are based in the universities and technoparks, which provide critical financing sources for entrepreneurs. In 2023, there are 93 technoparks in the country, home to around eight thousand technology enterprises (STB, 2023). In addition to technoparks, there are other supporting actors including accelerators, pre-incubation and incubation centres, matchmaking platforms for investors and investees, mentoring platforms, NGOs, and the institutions for protecting intellectual property rights such as TURKPATENT.

The most important ecosystem actors in finance for technology entrepreneurs are public funders including TÜBİTAK, KOSGEB, Turkish Development Fund, development agencies, and Tech-InvesTR. TÜBİTAK 1812 Entrepreneurship Support Program (also known as BIGG – Bireysel Genç Girişim / Individual Young Enterprise) shines out as a full-fledged platform that provides early-stage tech enterprises with entrepreneurship trainings, mentoring, networking, business planning, Research & Development (R&D) support, access to markets, internationalization, and access to finance. KOSGEB also offers several support programs for R&D, product development (P&D), innovation expenditures and technology investments of entrepreneurs. As of 2022, more than 1,700 tech startups were founded with the BIGG support (STB, 2023).

StartupCentrum's "Turkish Startup Ecosystem Funding Report 2023" (2024) demonstrates that 23.4 percent of the startups in Türkiye that received investment had at least one female founder or co-founder. On the other hand, in 2023, startups with at least one female co-founder received 17.5 percent of total investments. Strikingly, startups with only female co-founders accounted for only 2.1 percent of the total amount. Among 706 co-founders across 349 startups that received investments, only 13.5 percent were women, indicating an approximate 2 percentage point decrease compared to 2022 (StartupCentrum, 2024). According to the same report, it is observed that startups with women founders tend to get less amounts of investments compared to those owned by men. The number of startups with female co-founders that were invested between USD 1 million and USD 10 million diminished over the past three years, whilst the number for those with at least one female co-founder which received investment below USD 1 million has increased.

TÜBİTAK's performance analysis of its BIGG Entrepreneurship Support Program (2021) presents that the share of women-owned tech firms founded in BIGG Program was 27 percent in 2019, rising from 16 percent in 2012. In a similar trend, the share of female competitors in Turkish TEKNOFEST rose from 17 percent in 2018 to 40 percent in 2023 (STB, 2023).

In addition to the public sector, there are other financing actors for tech entrepreneurs such as angel investment networks[3], crowdfunding platforms[4], incubation investors, seed capital, venture capital and early-stage investors, and growth investors. Finally, tech entrepreneurs are offered special programs and loan products by public and private banks, subsidized credit facilities by the public banks, and credit guarantees by Credit Guarantee Fund of Türkiye (KGF) to bypass the collateral requirements of the financial sector from the entrepreneurs.

Still, access to bank loans is a challenge for all women entrepreneurs. In terms of supply side factors that affect Turkish women entrepreneurs' access to finance, we encounter a highly regulated banking sector where credit processes are vastly standardized for branch authority in particular. Loan applications from commercial clients with turnover size that remain below a predetermined volume are assessed through automated scoring systems and are suggested maximum loan amounts as per bank's individual branch authority matrix (type, amount,

[3] Angel investors provides initial seed money for startup businesses, usually in exchange for ownership equity in the company.
[4] Crowdfunding platforms are usually the websites that enable interaction between fundraisers and the crowd for collecting money from a large number of people for a specific purpose or business.

maturity and sometimes interest rate for loans to be approved with corresponding collateral). Only clients above a certain annual turnover or some others insisted for by the branch can go beyond this stage and be analysed manually by regional/head office staff. As indicated earlier, women-owned businesses are in general smaller in size that a sizeable portion of women entrepreneurs in Türkiye run micro and small-scale businesses. This may lead to women's access to fewer bank loans, or with higher interest rates. Sector of operation also can be an obstacle in accessing long-term investment loans as these loans are mostly disbursed in provision of hard collateral. Service sector companies have in general limited fixed assets compared to manufacturing businesses requiring more fixed assets to operate (i.e., factory buildings, warehouses, machinery and equipment, transportation vehicles, etc.). In Türkiye, around half of women-led SMEs operate in service sector with less capital and technology need compared to manufacturing sectors. Although their working capital requirement would be much smaller than that of SMEs involved in manufacturing, they would still find it difficult to access bank finance, to longer term loans in particular, given their limited capacity to provide tangible collateral.

Another factor that affects Turkish women entrepreneurs' access to bank finance is Turkish banks' level of gender-based knowledge and expertise. Turkish financial institutions lack programs and mechanisms to understand and respond to the unique needs of women entrepreneurs (WFID Partnership, 2022). Turkish banks have been proud of being "gender-neutral" in their credit assessment processes (WFID Partnership, 2022). On the positive side, there are recent attempts by the financial institutions towards launching products and services towards women-led businesses, thanks to the targeted development programs by the international development finance institutions (DFIs) such as the EBRD's Women in Business Programme in Türkiye. Such programs helped Turkish banks increase capacity to lend to women-led businesses with gender-informed products, services, and business models. There are similar programs of other international institutions and donors such as French Development Agency (AFD) and the World Bank with technical assistance support to financial intermediaries in gender-responsive financing. These programs are critical for enhancing the knowledge and awareness of the financial sector around the specific, gender-related challenges of women in accessing to financial resources, and for capacity development to offer gender-responsive solutions to women entrepreneurs.

In the gender-responsiveness of the financial sector, the level of female leadership is critical. In the context of Turkish banking sector, the presence of women independent board members

on the banking sector was found to be approximately 8 percent in 2021. Notably, an in-depth analysis encompassing both public and private sector banks revealed limited female representation in the boards of the public banks, highly related to the glass ceiling that women encounter in corporate organizations. In particular, looking at public banks, there are only two female members in the Board of Directors of Halkbank (2023), while there is no female representation on Ziraatbank's and Vakıfbank's Board of Directors. On the private banks side, apart from three female members of ING, there is only one female member at TKYB as of 2023 (TKYB, 2023). Underrepresentation of women in key roles within financial institutions may contribute to a lack of understanding and responsiveness to the specific financial needs of women.

Apart from the banks' approach to gender-responsive lending, post-Covid period has been a challenging one for all SMEs in Türkiye in terms of accessing finance and business growth supports. The Covid-19 pandemic hit the Turkish economy harshly due to domestic restrictions and weak external demand. Despite the government's efforts, Turkish SMEs were severely affected by the pandemic, experiencing a sharp drop in sales and revenues with logistics, food services and accommodation, transportation and storage reporting a huge decline in sales (World Bank, 2021). Around 40 percent of businesses are severely affected by the pandemic (B4G, 2021). The economic downturn in Türkiye associated with currency devaluation and high inflation since 2020 led the government to apply severe contractions in bank credits to private sector (TCMB, 2023), which hindered the SMEs' access to bank loans. As from the presidential elections in May 2022, the policy interest rates by the Central Bank have significantly increased towards a more stability oriented macroeconomic policies, leading to diminished loan demand particularly from the SMEs due to skyrocketed borrowing costs. SMEs faced further hardships due to the catastrophic twin earthquakes that shook southern Türkiye on February 6, 2023. Women entrepreneurs are disproportionately affected from the economic downturn due to additional challenges they encounter in accessing finance and other resources.

Existing literature and theoretical discussions suggest that women technology entrepreneurs are facing gender-based challenges, biases and discriminations at societal, organizational and industry level that hinder their access to financial and nonfinancial resources for starting and growing tech ventures. Technology being a heavily male-dominated sector is itself gendered, which may exacerbate women's hardships in entrepreneurial journey. On the other hand, female technology entrepreneurs differentiate from traditional women entrepreneurs globally

and in Türkiye, demonstrating higher social capital, less conformity with conventional gender roles, and greater utilization of business development opportunities. This points to significant innovation and welfare potential for women in STEM fields, which could be unlocked through the elimination of gender-specific barriers to entrepreneurship as well as direct and indirect sexism, and increasing entrepreneurial support programs and finance schemes in the industry that respond to women's diverse needs. Particularly women in tech industry need capital and finance to start businesses, cover R&D expenditures and commercialize their products in local and international markets. Whilst the technology entrepreneurship ecosystem in Türkiye is progressing over the last years, it is still far from providing a flourishing environment and financial means for technology entrepreneurs with gender-responsive banking and investment opportunities along with networking mechanisms.

On the other hand, research on female technology entrepreneurs in Türkiye is still quite limited. This thesis aims to investigate the validity of the above arguments, and discover the realities of women entrepreneurs in technology fields through focusing on their individual experiences, particularly in relation to accessing financial resources. The following chapter presents the findings and insights of the research, with an aim of advancing the existing discussions and recommendations for gender-inclusive technology and entrepreneurship programs and policies.

CHAPTER 3

INSIGHTS FROM THE STUDY: WOMEN TECHNOLOGY ENTREPRENEURS IN TÜRKİYE

This section describes and discusses the responses of interviewees to the questions given in the Appendix B, in relation to the existing literature of women technology entrepreneurship and overall entrepreneurial ecosystem in Türkiye. The questions aim to uncover the main factors and institutional mechanisms that shape women's technology entrepreneurship, and particularly in accessing finance and capital while starting and growing their businesses.

The first subsection presents the individual demography of interviewed women as well as the basic characteristics of the businesses they own, which may impact their access to financial resources. The second subsection analyses their main entrepreneurial motivation, targets, and key success definitions of women tech entrepreneurs in running business in high technology sectors. The following section explores the influence of gender structures on women's entrepreneurial career in tech industry, and specifically their access to finance and capital. These structures include social and cultural constructs such as marriage and motherhood, business environments, and institutional mechanisms that shape the entrepreneurship experience. Section 3.4 then analyses the main dynamics and challenges in women tech entrepreneurs' access to finance, investment, and capital, both during startup and growth phases, through a gender lens. Section 3.5 digs into their access to ecosystem services, growth mechanisms and networking opportunities, which are closely related with their ability to access to finance.

3.1. Demographic background and basic business characteristics

Technology is a field which is dynamic by nature, and is globally dominated by relatively young entrepreneurs. According to Working Capital Review (2019), the average age of 500 company founders of high growth firms is 40, most having around a decade of experience in

the industry. In a similar pattern, twelve of sixteen entrepreneurs interviewed are in their 20s, 30s, and 40s; while there are only three entrepreneurs who are older than 50. It could be argued that this allows us the dynamism and tech-savviness while still having at least a decade of experience in the industry and potentially in managerial roles.

The entrepreneurs demonstrate a significant previous academic and/or professional background in their tech field. In line with the global trend (Wadhwa et. al., 2008), all women interviewed are well-educated, almost all in STEM areas. Except for two of them, all hold graduate degrees, and three have a PhD in engineering. Most of them have more than ten years of professional experience in the field. This is in line with the previous findings of Cansiz & Tekneci (2018) studying Turkish women entrepreneurs in technoparks that previous work experience is positively associated with business success. This finding is not surprising, as women's technical knowledge and experience is highly related with their ability to become a competent entrepreneur in this field. It is also known that most knowledge used for innovation and decision making are in the form of tacit knowledge; and therefore, working experience, managerial skills and previous entrepreneurship experience are factors that enhance social capital of entrepreneurs (Demet, 2017). Moreover, innovation and creativity are accepted to be inherent characteristics of successful entrepreneurs, and are defined as recognition of opportunities to develop products and services through a business venture (Mylonas et. al., 2017). It could be argued that spending previous years in the relevant industry may help the entrepreneurs see the opportunities or gaps that exist, to be addressed with a new enterprise.

On the other hand, two previous research on high tech women entrepreneurs in Türkiye suggest that academic entrepreneurs cannot realize successful business performance due to their ongoing academic work and the unsuitability of academic habitus to entrepreneurial context (Cansız, 2016; Cansız & Tekneci, 2018). This is not confirmed by my research. Seven of the researched entrepreneurs have academic experience in the field, and except one all of them have completed the startup phase of their businesses successfully, and in a growth trend, one being one of the largest firms in its own industry. We could argue that unlike traditional entrepreneurship, high technology entrepreneurship significantly benefits from academic experience, university resources and networks as it includes an elevated level of R&D activities, which itself requires great level of university-industry partnership.

Except for one entrepreneur, all women interviewed run micro, small or medium sized enterprises. This is in line with the country-wide and global trend that women tend to run

smaller businesses. Around half of them are the solo founders and owners of their businesses, while the other half are co-founders of firms with multiple shareholders. As evidenced in the literature, my sample also represents aggregate corporations with mixed teams of male and female shareholders. Except one who joined the family company later, all entrepreneurs are the founders of their businesses.

In terms of the sector of operation of women that are interviewed, information and communication technologies (ICT) comes forth, followed by biotechnology and health technologies. It is likely that ICT is the choice of women as it can provide flexible business environment for balancing work and private life, and it could be less capital intensive compared to other tech related fields. Biotechnology entrepreneurship could be related to the comparatively high number of women educated in the health and medical sciences over the last decades.

3.2. Entrepreneurial motivation

Societal expectations and gender stereotypes can influence women's career choices and entrepreneurial pursuits. GEM (2019) uncovers the main motivations for women's entrepreneurship as "necessity" and "opportunity". For Turkish women entrepreneurs, entrepreneurship is strongly linked to "courage," "strength," and "independence" (KAGİDER, 2019). Main motivations of Turkish women to start business are declared as "making money," "doing the loved job," "being my own boss," and "creating something new." 91 percent of women entrepreneurs participated in KAGİDER study in 2019 state that they are proud of themselves for being an entrepreneur.

The below table demonstrates the entrepreneurial motivations, targets and definition of success stated by the women entrepreneurs participated in the study.

In a recent study (2023), European Institute of Innovation and Technology (EIT) found that women-founded tech scale-ups in Europe are significantly more likely to focus on sustainability and impact creation. We see a similar picture in my study: Half of the entrepreneurs interviewed state social impact as the main entrepreneurial motivation. These include empowering women and youth, being a role model for women and youth, making people's lives easier, leading to a world with less carbon emission, and create positive impact on the Turkish economy.

Table 2: Entrepreneurial motivation, targets and pre-entrepreneurial background

Participant	Pre-entrepreneurship background	Entrepreneurial motivation	Entrepreneurial targets	Eagerness to work in tech	Definition of success
WE1	Started the firm when she was still a graduate student. Previous professional experience as intern in the field	To R&D and export home-based technologies with young, female, confident engineers, and academics To help local medical/food firms produce high quality and healthy products through elevated biotechnology	100% domestic production of biosensors and biomedical devices Develop the first orphan vaccine for children's brain cancer and get a Nobel	Childhood dream of working in the field of medicine, which turned into starting the first biosensor firm of Türkiye	Exporting high technology and promoting healthy production
WE2	Previous professional experience in the field	Social impact in the field – promoting young and female sailors' digital competencies	Promoting young and female sailors' digital competencies towards producing unmanned and autonomous watercraft	Built on her long-lasting childhood interest in marine and technology	Being the first startup in Türkiye in the marine industry Empowering young and female sailors
WE3	Previous professional and academic experience in the field	Being the first high-tech unicorn of Türkiye	Being the first high-tech unicorn of Türkiye, always continuing sustainable growth	Childhood interest in computers	Always maintaining sustainable growth
WE4	Previous professional and academic experience in the field	Leading the way for young and female entrepreneurs, promoting women entrepreneurs	Exiting through selling the firm to a bigger brand to grow	Interest in innovations and learning	Being happy
WE5	Previous professional experience related to the field	Growing and sustainable business A more livable world through less carbon emission	Revenue growth	More interested in the business itself	Annual turnover of USD 100 million in 5 years

Participant	Pre-entrepreneurship background	Entrepreneurial motivation	Entrepreneurial targets	Eagerness to work in tech	Definition of success
WE6	Previous professional experience in the field	Seeing the opportunity in the market	A growing firm with minimum 15 offices across Europe	Its high capacity to build opportunities and its dynamism	Growing and expanding
WE7	Previous professional experience in the field	Doing product development and R&D	Metric targets on user numbers in her platform	Childhood interest in scientific research in biology and evolution	Advancing academic research on her field
WE8	Previous academic experience in the field, no previous professional experience	Have impact on people's lives and change user behaviour	Growing the product scale, exporting	Childhood interest in computers and technology	Have impact on people's lives and change user behaviour
WE9	Previous professional and academic experience in the field	Do whatever I want to do in business life	Growing the business in numbers, and make impact	Technology gives space to freedom and self-realization	Doing what I aspire to do at the moment, and create an impact
WE10	Previous professional experience in the field	Create an impact on Turkish economy and youth by being a role model	Inheriting the business to young generation	Childhood interest in computers and technology	Growing Turkish tech ecosystem and making it a flourishing environment for next generation
WE11	Previous professional experience in the field	Institutionalization of the firm, diverging from being a family company	Transforming, growing and expanding the company through own R&D	Not a choice – but rather involved in family business after long professional career	Product development through R&D and strategic production in Türkiye
WE12	Previous professional experience in the field	Make people's lives easier through technology		Always new challenges and opportunities to learn	
WE13	Previous academic experience in the field	Building an R&D business on health technologies	Building an R&D business on health technologies with an internationally recognized brand	Childhood interest in medical science	Building an R&D business on health technologies with an internationally recognized brand

Participant	Pre-entrepreneurship background	Entrepreneurial motivation	Entrepreneurial targets	Eagerness to work in tech	Definition of success
WE14	Previous academic and professional experience in the field	Reducing time and money required to architectural documentation in archeological excavation	Digitalization of architectural documentation and drawing in archeological projects	Childhood interest in technology and design	Developing the fastest system in the world in this field
WE15	Previous academic experience in the field	Developing encapsulation system for cosmetics, food and pharmacy sectors	Establishing a facility abroad using my encapsulation technology in collaboration with a recognized pharmacy firm	Interest in cosmetic formulations during the undergraduate studies	Commercialization of the technology and scaling up to global competitors' level
WE16	Previous professional experience in the field	Growing the firm and inheriting to her son	Grow exponentially through exports	Technology gives great space to production and realization of ideas	Sustainability of growth

As an individual, I am working on inventing the first orphan vaccine for children's brain cancer and offering it for free – without tagging a price for children's lives. Our R&D is progressing in this area. – WE1

My motivation is not money, but building a system to create social impact. I had a social venture before, but it needed financial resources to survive. For this reason, I invest some of my business profit in promoting young and female sailors' digital competencies and creating employment areas for them in the field of digital marine technologies and autonomous watercrafts. – WE2

After having a kid, I attached more importance to having a livable world. My business helps with a 25 percent reduction in carbon emissions in our products. – WE5

This is a critical finding to support the argument that government policies towards technology development and sustainability should specifically target to uplift women that drive innovation, green transition, and social equity. This could be done through inclusive programs that focus on talent, ideas and equal opportunity provision. As will be discussed later in detail, impact investment platforms and angel investor networks are of substantial importance to provide women with financial and nonfinancial resources, and promote impact-oriented business models over high profit and high return investments. Some of my interviewees expressed this in the following way:

As a woman, an entrepreneur, and a mother, I aim at developing projects, growing the tech ecosystem, and preparing it for the young generation. We need to make sure the next generation produces things, instead of just complaining about them. – WE10

Our technology makes the lives of blue-collar staff much easier, and is better for their health and workplace safety. This gives me great satisfaction. – WE12

On the other hand, even though motivations comprise impact, all entrepreneurs are driven by quite ambitious targets related to growth, expansion, exporting, and producing something new. Half of the interviewees mention specific, measurable targets as main entrepreneurial targets and definition of success.

I wanted to be the first high-tech unicorn of Türkiye. – WE3

I want to build a production platform where health technologies are being developed under global branding. I want to build trust, as the health sector is always built on trust. – WE13

Developing and offering new and distinctive technologies comes forth as a dominant entrepreneurial target. More than half of the interviewees are targeting R&D and product development for unique technologies, as well as expanding to wider markets through strategic production. This is somewhat in contrast to literature findings in Türkiye on mainstream

women entrepreneurship, no entrepreneur mentioned making money, independence, or being own boss as the main motivation. This could be considered as a distinctive feature of high technology entrepreneurs to make significant scientific development, technology production, crossing the borders through export and foreign investment, and contribute to overall economic growth. In the words of some of the interviewees:

My biggest target is to establish a large facility abroad with a recognized pharmacy firm where I can apply the encapsulation technology that I developed. This technology could be used in very few medicines. I want to increase the impact of technology. – WE15

I aimed to develop the fastest system in the world in this field. After starting the business, I was involved in every aspect of business, working day and night for three years. Once I saw that the MVP (minimum valuable product) was working, it was an immense success moment for me. Our product was unique in the world in terms of speed and accuracy. I also got its patent. – WE14

I want my firm to be the Tesla of Middle East. – WE6

All businesses led by women interviewed are conducting research and development (R&D) activities, which requires great amount of startup capital, even though some of them are also generating income to their businesses by consultancy and trade activities. Around half of entrepreneurs are exporting products and services, and all have plans and ambitions to open to foreign markets and expand operations in other countries. This high appetite of technology development could be related to the fact that most women entrepreneurs hold not only professional but also academic background in the field of operation, and therefore their academic interest prevails in their business decisions and operations.

When the entrepreneurs were asked about the reason to work in technology field, half of them state their childhood interest in the respective field as the main driver. Some are interested in the business area, and they use technology as a means to offer a solution to a problem or need in the field of interest. The others report maintaining a childhood interest in the technology itself, which attracted them to the STEM areas in their undergraduate and graduate studies. On the other hand, around half of interviewed women indicate the dynamism, flexibility, freedom, and innovations that technology offers as the main reason for engaging in high tech industry, which enables them to realize their ideas. One interviewee mentioned it was not the technology that attracted her, but rather she was involved in the family business for varied reasons.

Assessing the relation between creativity and innovation makes sense in exploring women's entrepreneurial intentions in tech business. Mylonas et. al. (2017) investigate the impact of creativity on entrepreneurship intention through a gender lens, and finds that creativity is a

predictor of women's entrepreneurial intention. There are differences between entrepreneurial personal traits of men and women. Moreover, female entrepreneurs exhibit higher creativity than men during the establishment of businesses (Buttner, 2001), which behavior could be associated with artistry, design, empathy, originality, and meaning (Mylonas et. al., 2017). Therefore, we could expect that women's interpretation of technology could differ from men in entrepreneurship. My study supports and extends previous research that women rely on creativity to generate meaning and impact through business venture, and see technology as an important tool to develop products and services that lead to the impact targeted. It could also be argued that such vocational or entrepreneurial aspirations and accomplishments are considered by women to be part of their self-perception and identities.

3.3. Influence of gender structures on entrepreneurial career in tech industry

3.3.1. Influence of marriage and motherhood

Getting married and having children are the obvious paths for women across the social strata in Türkiye. The society and families may expect young women in Türkiye to prioritize plans for marriage over obtaining a higher education degree and having a job or becoming an entrepreneur. This cultural programming and social order often put pressure on women's willingness to work or become entrepreneurs themselves, which lowers their inclusion in the labour force and business environment. In the research of Kalaycioglu and Carkoglu (2013), more than 58 percent of the respondents stated that pre-school child development is negatively affected in the case of working mothers. Most respondents believe that starting a family and raising children are the primary desires of women, which serves to the reproduction of gender roles that oppress women through invisible work.

Various restrictive cultural and gender-based social norms put women in subordinate roles in their relationships within their households or social networks, and in engaging and transacting with the financial institutions, business partners or investors. These norms tend to diminish women's self-confidence or inhibit certain types of behaviour. For instance, there exists several norms and forms of oppression that influence women's everyday lives, constrain their entrepreneurship and self-improvement possibilities such as restrictions on women's mobility and safety, intra-household decision-making, unpaid work, and perceptions of appropriate roles for women in the community. These worsen gender inequality in domestic and public spheres and obstruct efforts that target women's economic empowerment and access to financial resources.

My study investigated if the social dynamics change for the tech entrepreneurs in Türkiye, given that they are more educated, and come from higher socioeconomic and sociocultural segments of the society, which may influence their self-perception around womanhood, wifehood, and motherhood as well as their response to the social pressure and promoted gender norms. It is critical to investigate women's marriage and motherhood experience as they may have profound impact on their entrepreneurial career. In a previous study, Atalay & Varol (2016) found that 62.5 percent of women business owners in high tech industries in Türkiye are married, majority report no conflict between family and business life and can manage both at the same time. The ones who report some level of contradiction between private and work life state that family life is overweighted by the requirements of business life. Table 3 summarizes the responses of women entrepreneurs interviewed on their experience with being a woman in the high technology industry as well as the impact of the domestic roles such as being wife and mother on their business venture.

A similar picture to the findings of Atalay & Varol emerges in the current study. The majority (10) of interviewees are married or divorced, and half of them have children. Of the married or divorced interviewees, six report that marriage had positive impact on their entrepreneurial career, as they feel support from their husbands to their business, work responsibilities, and they reportedly share domestic chores. More than half of women who report positive impact of marriage also state that their husbands take role in the business activities either as company partner or as outside supporter. Three of these women admit that they ask their husbands' involvement in money collection activities as they often face challenge in being taken seriously by the clients when they call them to ask for payment. As they put it:

> *I was heavily pregnant when we started the firm. It was challenging as you need to strategize everything. But I was very lucky to have a supporting and motivating husband. I want to be a role model to my kid, and not postpone my dreams. – WE8*

> *Being a woman could bring difficulties in managing business as I cannot always be myself. If I have to make a client do something, I may ask my partner to talk to him. Especially men may not take me seriously due to my gender. – WE15*

In this sense, we can argue that marriage does not necessarily create an impediment for women's entrepreneurship in tech field considering the domestic responsibilities that women disproportionately carry. Rather, having a supportive spouse has a positive impact on entrepreneurship, both financially and morally. Some interviewees also declare that having a supportive husband is critical for their access to bank loans, as husband's approval is needed as collateral for the women to obtain a loan from the banks.

Table 3: Experience with being a woman in high tech industry

Participant	Experience related to becoming woman in tech business	Support from family	Influence of marriage	Influence of motherhood
WE1	Evident negative gender & age bias On the positive side, less expectations and more tolerance to mistakes due to being young. Desire to promote young entrepreneur by several investors No gender specific challenge as long as you prove yourself and your business ideas	Full moral support	NA Single – preferring to be involved in a long-distance relationship due to lack of work / life balance	NA
WE2	Often negative gender bias Occasionally feel supported for being female	Full moral and financial support	NA	NA
WE3	No substantial gender bias and challenges experienced Occasionally feel supported for being female	Full moral support	Positive – balanced share of domestic responsibilities	Challenging – Requires more effort to balance work and motherhood
WE4	Evident negative gender bias	No support / negative reaction from the first husband and her parents due to high risk of entrepreneurship as well as challenged gender roles	Negative – pushed to prioritize family and husband over business Ex-husband felt threatened by the challenged gender roles	Negative – imbalanced share of care responsibilities
WE5	Often negative gender bias Felt subject to serving pink washing efforts of investors	Full moral and networking support	Positive	Positive – improved my empathy and people management skills
WE6	Both positive and negative gender bias and stereotyping by the clients & business partners	Full moral and financial support	Positive – support in business activities as well as moral support	Negative – Requires more effort to balance work and motherhood

Participant	Experience related to becoming woman in tech business	Support from family	Influence of marriage	Influence of motherhood
	Difficulty in collecting money due to not being taking seriously as a woman Affirmative action / positive discrimination in her network for being woman but also being honest and trustworthy			Pushed to prioritize family and motherhood responsibilities over business
WE7	Negative gender bias and stereotyping by the clients & business partners Negative gender bias by investors Exposed to harassment from male bank representative	Hesitant to entrepreneurship idea, but not a barrier	Challenging – Requires more effort to balance work and life	NA
WE8	Often negative gender bias, but not leading to substantial challenges due to own experience and skills	Full moral support	Positive – support in business activities as company partner, as well as moral support	Challenging – Requires more effort to balance work and motherhood
WE9	Mostly negative, sometimes positive gender bias, but not leading to substantial challenges due to own experience and skills Positive impact of accumulated social capital and experience	Full moral and financial support	NA	NA
WE10	Mostly negative, sometimes positive gender bias, but not leading to substantial challenges due to own experience and skills	Full moral and financial support	Positive – support in business activities, as well as moral support	Negative – it requires less engagement to work, but doesn't regret it
WE11	Occasionally negative bias due to being woman and being the "daughter of the boss"	Full moral and financial support	Positive – fully supportive to business success	Positive – learned to delegate, prioritize, and know yourself better, which is key to leadership
WE12	Mostly positive gender bias	Full moral support	NA	NA

Participant	Experience related to becoming woman in tech business	Support from family	Influence of marriage	Influence of motherhood
WE13	Mostly negative gender bias Negative comments and discrimination from social spheres	No support / negative reaction from the first husband and her own parents due to challenged gender roles in marriage	Negative – pushed to prioritize family and husband over business Ex-husband felt threatened by the challenged gender roles	NA
WE14	Limited negative gender bias but not leading to substantial challenges	Full moral support	NA	NA
WE15	Limited negative, mostly positive gender & age bias Difficulty in collecting money due to not being taking seriously as a woman	Full moral and financial support	NA	NA
WE16	Occasionally negative gender bias	Hesitant to entrepreneurship idea, but not a barrier	Challenging – Requires more effort to balance work and life	Negative – creates gender bias at employer & client due to envisaged responsibilities of women which may lead to less attention to work

Four women remark the challenges brought about with the marriage, mainly related to balancing work and family life. Half of these women have no children. The ones with children state motherhood as the main component of household responsibilities. However, the other half of women mention the main barrier ahead of their entrepreneurial success as being forced to prioritize family and husband over business. Both women were divorced, and they felt during their marriage that their husband felt threatened by the challenged gender roles and her active role in business life as an entrepreneur.

> *During my marriage, I was pursuing my academic work, and designing my venture. My husband questioned 'what I am asking more', and asked me to prioritize housework over business as he was earning money so I should have been a better stay-at-home spouse. I feel like women are expected to focus on their individual success only until marriage, and afterwards not to have big dreams. This is also coming from my own family, except for my father. For this reason, I am now very hesitant to emotionally engage with someone, or get married again. - WE13*

Motherhood experience is more complicated for technology entrepreneurs than marriage itself. Half of the interviewees have children. Six of the eight mothers who participated in the study remarked that motherhood mostly brought challenges and negative impact on their entrepreneurship. As in marriage, the main challenge is related to work & life balance, as well as to the necessity of making too many decisions and handling many things simultaneously. Women interviewed, as compatible with the general trend (Drew & Humbert, 2012), must take most of the decisions related to their children. This reportedly caused interruptions in their professional and entrepreneurial journey, particularly during the pregnancy and maternity period, as well as limiting their time devoted to business due to the necessity of allocating time to childcare. The literature also shows that women that provide childcare tend to work less or decrease paid work (Ehrlich et. al., 2020). In cultural contexts where gender inequality is not prominent and men can take parental leaves to support their partners' career, women's entrepreneurship is less hampered by the additional responsibilities brought by motherhood (Naldi et. al., 2021). In Türkiye, however, where welfare institutions and public policies are not adequately supportive of female employees and entrepreneurs, there is no extended paternal leave granted to fathers by the labour law, and it is also not culturally common to take unpaid parental leave due to persisting gender norms that see primary childcare as the responsibility of women.

The mainstream literature argues that even though the modern century has brought progress in gender equality in the public domain, within household there is less change when it comes to gender-based domestic roles and responsibilities (Naldi et. al., 2021). We see in the current study that even though the women entrepreneurs are well-educated from the top universities

in the country, they still shoulder most of childcare work at home. Moreover, few women mention the social pressure they face from close acquaintance when they prioritize work over family. One participant with graduate degree in engineering from the top university in Türkiye who runs a successful high-growth tech firm put these challenges in the following way:

Marrying children is a barrier to women's entrepreneurial career. There is too much social pressure on mothers. I am a hardworking person, and whenever I stay overtime at work, I was always criticized by asking "what kind of mother you are?" This is something horrible to say to someone, and fathers are never exposed to such pressure. I wish they would rather say "how can we help you in your such busy times?." Someone else could easily have a burnout due to all this psychological burden. I have not yet, as I am a strong person, and I can manage. – WE6

Motherhood is an incredibly challenging process. I know that if you are in pregnancy period, your employer or clients believe that you will leave the company soon, and this affects their decisions on your promotion or recruitment. It should not be this way. – WE16

The challenges of motherhood as far as entrepreneurship is concerned can indirectly affect women's access to finance. When women have less time devoted to business due to invisible work, they can be less likely to grow the firm, and accumulate financial resources and records for the firm which are critical to receive bank loans. Similarly, access to investments and venture capital requires a great amount of time and energy for product development, attending investment tours and pitching presentations, and conducting networking activities. An unequal share of care work, particularly in the first years of a child, can significantly hamper such access to finance activities.

On the other hand, only two women mentioned the positive aspects of motherhood on entrepreneurship, stating that being a mother increased their abilities such as delegating work, multitasking, self-recognition, empathy, and people management. In their words:

I had a child during my entrepreneurial career. I had difficulty in focusing on work, but in general it has been quite a positive experience. I learned to delegate, see the larger picture, and make big decisions more correctly. Being a mother gives you the chance to look inside yourself, and get to know yourself better. This is key to leadership and self-improvement. On the other hand, there is the challenge of being a multitasker. Sometimes while making multiple million decisions, I also need to decide whether my kid will eat spinach or leek for dinner. – WE11

It is understood that motherhood could contribute to the entrepreneurial skills of women as long as it does not become an impediment to allocating time, effort and emotional dedication to the venture. This would require feminist policies and programs to provide women with accessible childcare services, as well as gender-equal parenting policies to eliminate disproportionate burden of childcare on women. Employment of a gender lens and gender budgeting in the design of technology programs and technology development zones would be

functional in order to attract more women entrepreneurs with higher domestic responsibilities and allow them to utilize time and energy they need in starting, growing and financing high-tech ventures.

3.3.2. The influence of family dynamics related to entrepreneurship decisions

The study also investigates the reactions from the family when women decided to start a tech business. The majority (12) of them received fully positive moral and financial support from their families. Two women state that their families were hesitant to entrepreneurship idea as it was perceived risky, particularly when women already have jobs with guaranteed and satisfying conditions, but still the families were not a significant barrier or did not have strong objections to start a business. Two women, however, faced negative reaction from their families due to considerable risk of entrepreneurship as well as challenged gender roles as entrepreneurship of women may shake the position of the husband as the primary breadwinner. Having family support is critical for a successful start and growth of the firm, as the families not only offer emotional strength to the entrepreneur but also allocate financial resources wherever needed.

> *My parents never believed that I could succeed in entrepreneurship. They provided me with education, but I understood that their main motivation was to prepare me for a better marriage and motherhood, or for a so-called princess life. – WE13*

On another note, having positive role models in the family is a critical factor in women's entrepreneurship. Several studies (Cansiz, 2016; Delmar & Gunnarsson, 2000) suggest that the existence of entrepreneurs in close family raises the tendency of children to become entrepreneurs themselves. Demet (2017) also found in the study with Turkish high-tech entrepreneurs that a working mother and a successful entrepreneur in the family positively affects entrepreneurial success. The impact of this familial advantage is also expressed by the women in my study:

> *Entrepreneurship requires courage. But I was lucky as my mother was also an entrepreneur. She was a key role model to me, and made me believe that I could succeed too. – WE8*

> *I have great, strong women role models in my family with discipline, success, and authority. I feel that I inherited their power, and am carrying it. – WE12*

In specific, it is argued that having a working mother in a high-status job enhances the social capital in the family and increases the education quality that children receive. This shows itself

in some of the participants, four of which state having strong role models in entrepreneurship or business life inspired them to start a venture.

As one participant importantly mentioned, social capital and accomplishments of parents in business life could affect women's high value entrepreneurship. According to Bourdieu and Passeron (2015), social and cultural capital includes the agents' demographic conditions, family resources, and parents' education and occupations. Families' financial and nonfinancial resources determine the motivations, qualifications, and tendencies of children. Therefore, social roots of entrepreneurs could enable them to identify their route and do the right things at the right time (Demet, 2017).

Women's entrepreneurship and access to capital is a complicated issue, and not a one-generational matter. In most of the families, women are in business life for maximum three generations, while it is far higher for men. Therefore, young women cannot inherit any market or business knowledge or intelligence from their mothers. We are inheriting other sorts of knowledge or guidance, mostly related to being a good wife or mother. As a result, we are starting the game far behind men, having limited knowledge of playing around and managing capital and power. You can still survive and progress with your hard work and knowledge, but it will require much more energy and effort from your side compared to men. For this reason, you need to change your way of thinking, and liberate yourself. – WE9

I am a beautiful woman, and this was rather a barrier to me. People, including my professors at university, tried to convince me to 'let these things (entrepreneurship) go' and rely on my husband's wealth. I was shocked to hear that. And in fact, I was in need of money, because I was in a divorce process. – WE13

Cansiz & Tekneci (2018) also suggest that the education level of mother and father are positively correlated with entrepreneurial success valid for both sexes. In Türkiye, where the industrial revolution started much later than the western economies, women's participation in the job market also lagged, partially also due to the heavily patriarchal culture even in the modern republic. Therefore, contemporary women entrepreneurs could only witness at most two or three older generations of women joining business life. This limits the transfer of knowledge and experience to young women by their mothers or grandmothers related to business, market intelligence, fiscal management, and venture development, which are quite critical in developing capital and accessing finance mechanisms for business expansion.

3.3.3. The impact of broader gender dynamics in the ecosystem on entrepreneurial journey

The study investigates the experiences that technology entrepreneurs face in the ecosystem as a woman, which directly or indirectly affect their access to financial means. The results draw

a diverse and sophisticated picture, uncovering both positive and negative experiences. Accordingly, many women interviewed encounter either limited or substantial level of negative gender bias and sexism in such a male dominated industry. On the other hand, less than half of interviewees report occasionally affirmative action from the business or ecosystem partners due to their gender. Half of women who report negative gender bias also add that they do not feel a substantial impact of such discrimination on their business success as long as they can show their capabilities and products, even though it requires much greater effort than men to attract customers or investors.

Being woman is the same as every other space of life. People have less faith in you. It eventually makes you have less faith in yourself. You should never fall into this trap, as it may cause you to fail even though you are capable of doing it, and after a point it turns into a struggle with your own prejudices against yourself. – WE7

I was usually the only woman in the classrooms, and sometimes men did not say hello to me. It was also the case I faced abroad. At first, I was really demotivated, and I doubted myself. But then I realized that we are all on our own, and even though they have this bias against me, they have to see me and my accomplishments. – WE8

People can be very demotivating regardless of the reality. I decided to start up my firm during my PhD studies, and people kept telling me that I cannot get TÜBİTAK support due to my gender, or my field. I still decided to go on. Then people recommended me to put on a wedding ring during my pitching presentation at TÜBİTAK even though I was single. I took it as an insult. Luckily, I had no such unpleasant experience on the pitch, and was awarded with the grant. I see that such horror stories prevent you from even trying. – WE13

Being a woman in tech sector has both advantages and disadvantages. We have a mixed team in terms of gender, which brings us diverse perspectives and synergies. Culturally it takes time for men to respect women's perspective in business world. Women must allocate more effort than men to prove themselves. I need to prove to my colleagues that I am also an electronics engineer, so I can discuss the work with them. – WE16

This is substantially related to the creative work precarity that exist in the technology sphere to a large extent. In the creative industries such as technology, even though women entrepreneurs care about income security to feel confident, precarity and exhausting work is somehow normalized as the essential feature of entrepreneurship. All these exploitative conditions, including the gender-based discriminations and inequalities that women entrepreneurs are exposed to, are taken for granted as the fundamental conditions of the creative entrepreneurial market, which is argued to push women to take the full responsibility for their own success and the hardships they face along the way.

I always say: if you are still not facing challenges due to being a woman, then you have not yet peaked in business life. You will eventually hit that ceiling. Because also in international projects, women are always assigned with most of the drudgery, mainly because we cannot say no, and are always apologetic. I learned to manage it due to my extensive experience in this sphere. – WE9

Even though entrepreneurial space is more egalitarian compared to marine industry which is heavily male-dominated, I may witness evident gender bias at entrepreneurship events when a woman entrepreneur comes to stage to pitch her ideas. First, she is judged by her physical appearance before her business ideas. I sometimes feel some clients are mocking my wisdom. I am however so used to it due to having worked in the marine industry for many years. People could not believe that the port captain was a woman. Some sailors were rejecting to get order from me due to my gender, not only in Türkiye but also in Europe. I think entrepreneurship ecosystem is much better. – WE2

Women also feel that they are expected to behave in a certain way conforming with gender roles such as being more polite and humble, do most of the work that requires administrative tasks, even in entrepreneurial environments. As one interviewee puts it:

Women are nowadays trying to break this men's world. I faced many discriminations when I was younger. We were bidding for tenders in the medical sector. Over time, you see that all the work with more burden and less money are granted to women, whilst all profitable ones were given to men. I realized that men know how to show things bigger than they are. Women, on the other hand, are always thought to be humble, and show less. This is the main challenge in business life. – WE4

The encountered sexism, reductionist approach and low level of trust in women could significantly decrease women's self-confidence, which is crucial for business success especially in technology industry and entrepreneurship. Studies show that women's self-confidence and emotional resilience are positively correlated with their entrepreneurial success (Swanson et. al., 2018; Usha Rani & Menezes, 2016). In a patriarchal context such as Türkiye where women are historically socialized in a way to remain modest, not have big dreams and make bold to be significant, confidence is a unique asset for women to thrive in the male-dominated high-tech industry. Studies also show that female perfectionism could lead to self-doubting behaviour, as women are raised as more afraid to make mistakes, and motivated with "perfect women" myths (Ferraz & Gama, 2019).

I usually have difficulties collecting money. If I call the clients, they sometimes do not take me seriously, as they probably think "what is the worst thing she could do?". Even though I am the owner of the firm, I usually ask my husband or brother to call the clients to ask about the payment. Or the clients ask about the closing price to my husband, even though I am the decision maker. It is so absurd. – WE6

The fact that having mixed teams with male and female shareholders and managers helps the business performance due to diversity of skills and opinions are mentioned by several women entrepreneurs interviewed. It is claimed to provide different perspectives to business decisions, and ensure job division among senior managers in line with the competencies of the partners. Cansız and Tekneci (2018) also found that for high value women entrepreneurs, having three or more partners contribute to business performance of the venture, as it leads to accumulated social capital, synergies, and greater experience. Particularly for cultures where gender norms

are substantially dominant, accumulating experience through partnerships could alleviate limitations and barriers caused by cultural dynamics related to gender.

The results indicate that intersecting disadvantages must be considered carefully to understand the unique reality of women entrepreneurs in their own context. Social and other characteristics intersect to impact the entrepreneurial journey and success.

> *Before my gender, I had to struggle with the tag of 'daughter of the boss' as the second generation entrepreneur, as I needed to prove that I will bring in something new and significant. It is more difficult to do as a woman. You have to conflict more with people, and assert yourself. However, I managed to say my word, bring my own vision and create a different story. Even some clients tend to see you rather as "daddy's girl", and it takes a lot of effort to change it. – WE11*

> *Since I was usually in business networks in the USA and Europe, I was facing discrimination due to being from an emerging market rather than gender-based discrimination. My gender even mitigated that market/origin-based discrimination. This is a known phenomenon; a black friend told me that black women are usually less discriminated than black men in business life. – WE9*

Originating in Black feminism (hooks, 1981), intersectionality explores how social, political and other identities interact and create a unique form of oppression in a given context. Accordingly, exclusionary categories, and the social inequalities they trigger, are interdependent and mutually constitutive (Bradley and Healy, 2008). Various research uncovers that the intersection of the oppressive structures of patriarchy and society influences women's entrepreneurship (Lassalle & Shaw, 2021; James & Ibukun, 2023). In my sample, it is also understood that gender-based discrimination and challenges could be offset or exacerbated due to other factors such as age, family relations, academic or professional experience, and ethnicity. Interviewees under 35 mention the negative bias they faced from clients or investors due to being a young woman entrepreneur, such as low trust, harassment, and not being taken seriously.

Age is a critical factor for the success of entrepreneurs as well as their ability to access finance for several reasons. First, the tech entrepreneurs who are older than mid-30s hold at least ten years of academic or professional experience in the field, as observed in the sample of middle-aged entrepreneurs. This enables them to accumulate some level of professional, managerial and business intelligence, and observe the opportunities and gaps in the market to be tapped with the new venture. Moreover, older entrepreneurs tend to have larger networks due to long years spent in the industry, and could be more confident in client and investor relations thanks to their experience and knowledge. On the other hand, they are more likely than young entrepreneurs to have accumulated savings or assets that could be used as seed capital, or as

collateral for a bank loan. Furthermore, banks in Türkiye usually check the personal credit score of the entrepreneurs if there are not enough financial statements of the new venture, in which case older entrepreneurs are more advantageous than young ones as they have established a certain level of personal credit history. All these point to the positive implications of age on entrepreneurial success.

Your gender and age are a significant disadvantage in the high-tech industry. People would not believe that I did what I did until I showed my awards from tech competitions. Still, there are many people who try to humiliate you even though they know nothing about stuff in your field. They expect you to be more stupid and naive, and when they see that you are not, they may try to oppress and humiliate you relying on their seniority and title. – WE1

As a young woman, you must think twice about every step, as people may attempt to take advantage of your lack of experience. I was invited to a face-to-face meeting by an investor during the pandemic, and he was furious when I asked to have the first meeting online. I did not want to have a one-to-one meeting at a man's place if I do not know him, as in the media we see significant slut shaming in such cases, and I am a 23-year-old woman. Whom would people believe if something bad happens – to me or to a powerful man? But he was terribly angry and rejected to be a juror for my firm in a tech competition. It was very upsetting also because you must deal with such security concerns in business-related issues when you are a woman, while a male entrepreneur would never have to worry about it. – WE1

In my first years as an engineer, I was assigned to deliver technical training in a factory. I was dressed up, but then realized that the workers at the factory was laughing at me, and humiliating me as I was a young woman. I learned in time how to combat such situations. It is still a challenge for women to be in tech business. We also see an imbalanced gender distribution among interns. For this reason, I always try to recruit around half of my interns from female applicants, to promote their involvement in the sector. – WE10

Technology is a dynamic sector where youth entrepreneurs are more interested, as indicated previously. Half of the interviewees in my study are younger than 39 years. Gender and social stigmas as well as the institutional context in Türkiye create additional barriers to youth entrepreneurs in the way of starting and running a business (Yetim, 2014). Young entrepreneurs are one of the disadvantageous groups in the business ecosystem simply because they have less experience in the business world. Understanding the key elements of businesses, access to know-how and markets, and establishing collaborations can be quite challenging for them. Limited access to capital and finance is one of the key concerns that young entrepreneurs face due to their limited financial literacy and credit history as well as collateral ownership to be submitted to the banks for a loan. Despite having a vibrant youth population, the entrepreneurship ecosystem in Türkiye is not advanced enough to provide a flourishing environment for young entrepreneurs to access finance and business advice they need (Hale, 2020). They have less experience in business management and governance, which may impact the risk appetite of investors and banks when it comes to investing in youth-led technology businesses.

On the other hand, youth can provide many advantages to entrepreneurship. Young people, as in my sample of entrepreneurs under 30, are more likely to be single and have no kids, which can unlock more time and energy to be devoted to the business. Youth also tend to be more innovative, digitally literate, and open to new ideas and approaches (Hale, 2020).

As seen above, young entrepreneurs interviewed state that they experienced intersecting gender and age bias in their relations with customers, investors, and bank officials. Some reported that this has negative implications on their access to finance and business opportunities, while all report that those biases could only be overcome by proving your business potential and competences in the respective field, which usually requires additional energy and time. Further, it may constitute additional stress factors for young women entrepreneurs which is usually not the case for their male counterparts.

Other people give you more tolerance for being young when you make mistakes. – WE1

On the business side, I did not face any negative impact of my gender if I can demonstrate our work. There are many stakeholders who would like to cooperate with us. – WE14

As seen above, some entrepreneurs witnessed positive age bias from business collaborators, who are eager to promote youth and women entrepreneurs. These entrepreneurs were located in university technoparks, and saw great support from their professors. This signals the benefits of technoparks particularly for young women as a suitable place to incubate and grow. Introduction of gender-responsive technology development programs and recruitment practices at technology development zones that consider and address the intersecting factors, such as age, could foster the flourishing of women-led tech businesses through increased access to opportunities in line with women's needs and demands.

3.4. Challenges in accessing finance

Women's financial inclusion includes basic financial services (credit, deposits and saving accounts, payment services and money transfers, insurance, and mobile banking) provided by financial institutions (banks or micro-finance institutions) that are readily available, accessible, and affordable. Women's financial exclusion refers to obstacles that hinder their access to these financial services. Some examples of obstacles include distance to financial institutions, costs of financial services, lack of general knowledge of available services, lack of collateral and other assets that inhibit access to credit, and the inadequacy of regulatory and

institutional infrastructure. Low levels of knowledge and training in business planning and financial planning can be a barrier in terms of determining mid-term financial needs, and eventually to entrepreneurial success.

Historically, women entrepreneurs in Türkiye, as well as most of the small and medium sized enterprises have been facing challenges in accessing finance. Women may suffer from additional gender-related challenges in receiving investment, bank loans and other forms of finance as previously elaborated. My study investigates the main dynamics in accessing finance by women in high-tech industries both during start-up and growth levels, the challenges they face in receiving credit and investment, along with the main reasons. The study also explores the credit and financing gaps in women's technology entrepreneurship, and aims to develop policy and program recommendations for enabling accessible and effective mechanisms for the technology ecosystem in Türkiye that include women through gender-responsive measures.

Table 4 delivers the responses of women entrepreneurs interviewed related to their experience with accessing finance in different lifecycles of businesses, particularly through a gender lens.

3.4.1. Financing through own equity and business income

Personal savings are quite pivotal for women entrepreneurs in starting their businesses. Gundry and Welsch (2001) found that high-growth women entrepreneurs tend to use their personal accumulated money at start-up. This is also valid for my sample: It is observed that during start-up phase, the main source of finance is the own funds of the entrepreneurs interviewed, mostly accumulated during previous employment. Some entrepreneurs also received financial support from their close families. Cansız and Ulusoy (2017) demonstrate a positive relation between entrepreneurial success and receiving financial support from the family. This is also significantly related to women's accumulation of income from previous professional work where a 40 percent gender pay gap still exists in Türkiye (Dierks, 2023), women's access to hard and soft assets through inheritance, severe glass ceiling ahead of women at large corporations, and women's level of financial literacy which may enable better investment decisions prior to startup. Global research also suggests that women are more conservative in investment activities (Watson & McNaughton, 2007), possibly due to higher level of fear of making mistakes and feeling insecure (Wagner, 2007); and they make less income than men for several structural reasons (Kremel & Yazdanfar, 2015).

Table 4: Experience in accessing finance

Participant	Access to finance at startup phase	Access to finance at growth phase	Gender related challenges in accessing finance
WE1	- Own funds - Monetary awards from entrepreneurship competitions - TÜBİTAK support program - KOSGEB support program - Export support from the Ministry of Trade - Angel investor No bank loan	- Angel investors - EU HORIZON grant - R&D support & tax exemptions due to being involved in a technopark No bank loan due to financial security concerns	Evident gender-based bias in tech entrepreneurship competition by male jury No specific challenge in accessing finance
WE2	- Acceleration program abroad - Own funds - Own generated income of business No investor No bank loans due to high interest rates Not benefitted from TÜBİTAK supports due to lack of support to marine industry	- Own generated income of business	No specific challenge in accessing finance No significant bias witnessed from investors / financiers Access to financiers through women associations in the industry High tax burden in Türkiye – which pushes entrepreneur to invest abroad
WE3	In her first company: - Own funds - Retail bank loans - Foreign investor No VC or angel investing due to their absence in Türkiye back in the startup years In the startup of her second (current) firm - Own funds	- Investors - Bank loans – particularly export credits due to special terms Shrinking foreign investment to Turkish firms due to national ratings	No specific gender related challenge in accessing finance But witnessing other women entrepreneurs who retrain from asking additional finance & investment

Participant	Access to finance at startup phase	Access to finance at growth phase	Gender related challenges in accessing finance
	- Angel investor - Corporate investors		
WE4	- Own funds - Foreign investor - Sponsorships - Own generated income of business - State supports for marketing & fairs	- Own generated income of business No bank loans due to mismatch between business flow and repayment schedule Limited access to new investment to grow	Evident negative gender bias in accessing to finance & investment Limited access to new investment to grow
WE5	- Own funds - Own generated income of business - Grant in acceleration program	- Own generated income of business - Angel investors - Foreign investor	Evident negative gender bias in accessing to finance & investment
WE6	- Own funds - Own generated income of business - Little amount of bank loan	- Own generated income of business Bank loans are hard to access and afford Not willing to receive investment as she does not want to give share	No specific gender related challenge in accessing finance
WE7	- Own funds - TÜBİTAK support program - KOSGEB support program	- Own generated income of business	Evident negative gender bias in accessing to investment
WE8	- Own funds - TÜBİTAK support programs - KOSGEB support program - EU funds - Bank loan	- Own generated income of business - Bank loan No investment yet	No specific gender related challenge in accessing finance
WE9	- Own funds - Investment	- International fund - Own generated income of business - Bank loan	No specific gender related challenge in accessing finance
WE10	- Own funds - KOSGEB support program - Technopark incentives	- Own generated income of business - TÜBİTAK fund - Bank loans	No specific gender related challenge in accessing finance

Participant	Access to finance at startup phase	Access to finance at growth phase	Gender related challenges in accessing finance
WE11	She was not at the firm during startup phase	- Own generated income of business - Bank loans	No specific gender related challenge in accessing finance
WE12	- Own funds - Technopark incentives - Private sector partnership - TÜBİTAK support programs - KOSGEB support program	- Own generated income of business - Investment - Bank loan	No specific gender related challenge in accessing finance
WE13	- TÜBİTAK BIGG - Own funds - Technopark incentives - University collaboration	- Own generated income of business - Acceleration program at technopark	Occasionally gender-based harassment in investor meetings
WE14	- Own funds - Incubation program at university - TUBITAK support - KOSGEB support	- Own generated income of business - Bank loan	No specific gender related challenge in accessing finance
WE15	- Own funds - KOSGEB support - Angel investors - Technopark offerings and incentives	- Own generated income of business - TÜBİTAK support - Angel investors - Private sector collaboration	No specific gender related challenge in accessing finance
WE16	- Own funds - TÜBİTAK support - Bank loan with KGF guarantee	- Own generated income of business - Bank loan	No specific gender related challenge in accessing finance

The firms who have shorter R&D phase can start generating business turnover through the commercialized products and services even during the startup phase. However, this is quite limited in my sample: only four women entrepreneurs could start generating business income during startup, mostly through additional consulting services and trade activities. After the firms start stabilizing and getting mature, the main source of financing for new R&D and marketing efforts is the own generated income of business. It is observed that the generated business income is critical for women to determine to receive credit or investment at the stabilization and maturity phase. Most of them first wait to see and ensure the sustainability of the business, reach a certain level of turnover, and take solid but slow steps before engaging in expansion activities via external finance, in order to manage not only the business growth but also their stress level and mental strength.

Most women reinvest the business income into novel business activities to finance R&D and marketing operations. Some interviewees also addressed that they had to give up their own comfort, luxury expenditures, and other living costs to sustain the business. Family support also comes forth as a critical success factor here: some of the single entrepreneurs stated that they moved back to their parents' apartment after starting the business to diminish their living costs and unlock more resources for their ventures.

3.4.2. Access to state supports and other ecosystem mechanisms

The second most common start up financing source is the state supports including TÜBİTAK programs, KOSGEB entrepreneurship grants, and the thematic programs by the Ministry of Industry and Technology as well as the Ministry of Trade. Particularly TÜBİTAK is observed to be the lifeline support for technology entrepreneurs who will employ a research and development process before launching a commercial product. Most of the interviewees state that the R&D process before the commercialization of a viable product is financially the most challenging part of entrepreneurship, during which period the firm mostly has expenditures and limited income. In this process, TÜBİTAK and KOSGEB programs could provide the necessary capital to startups, but not without complications. First, the entrepreneurs mention the long and highly bureaucratic application processes that are likely to demotivate the entrepreneurs. Second, in most TÜBİTAK programs, payments are made against invoices and other expenditure proofs, which requires bridge financing to cover the expenses until the payment is received from TÜBİTAK. Most entrepreneurs use their own funds, investments and seldomly bank loans to finance the personnel costs and overheads in the meantime. The

ones whose firms could already generate some level of income during startup phase are comparatively advantageous in financial terms.

At TEKNOFEST, our project was ranked 30th by a male juror with a long beard even though we got 99 points out of 100. It was the first project in TEKNOFEST which got such a high score. They gave no explanation. It was an evident misogyny. – WE1

My first project was rejected by KOSGEB with the argument that 'if this was a scalable idea, people would have already done it so far.' It was ridiculous and very demotivating. The same project ranked first in another competition. On the other hand, at TÜBİTAK and other competitions, I felt that being a woman entrepreneur rather caused good impact. – WE15

TÜBİTAK, KOSGEB and other state programs encourage women tech entrepreneurs to apply for the supports through specific quotas and additional subsidies. Most women interviewed did not report any gender-based challenges in accessing state entrepreneurship supports. Two women however mentioned negative experience showing evident gender bias and direct sexism in the program juries during or after the pitching presentation. This could indicate that the granting process could be gender-biased depending on the individual attitude of external juries assigned to the project, even though it is not an institutional attitude. Still, measures should be taken to make the processes more transparent, inclusive, and fair for all entrepreneurs in order not to leave women behind and avoid direct and indirect sexism.

Except for the state supports, other available ecosystem mechanisms and programs such as grants, entrepreneurship competitions, technopark offerings and technology centers are widely benefitted by women entrepreneurs. Particularly technoparks provide significant tax exemption, networking, and R&D opportunities for technology ventures. Entrepreneurs who are collaborating with universities state that they can use the means of universities (laboratories, human resource, consumables) required for the product development process, which substantially decreases the R&D costs and investment expenditures of entrepreneurs.

Residing in the university technopark is a great advantage, as the biotechnology sector requires substantial R&D investments. We can use the university labs and consumables free of charge. We can get advisory from the academics at R&D phase, which reduces the consumables significantly and optimizes the R&D process. We achieved a marketable model only at our third prototype. – WE1

No gender-based challenges are addressed in accessing to ecosystem supports and services, even though globally women are underrepresented in business incubators, accelerators, and venture investors portfolios (Kovaleva et. al., 2023). It is pointed out by some interviewees that entrepreneurship competitions provide networking platforms for entrepreneurs to exchange experience, find clients and investors. Moreover, the grants and awards received

serve as “epaulets” of successful business ideas which may help attract investors, venture capital firms and bankers for financing the venture.

3.4.3. Access to investments and capital

Although receiving external investment could offer great financial resources for tech businesses at startup and growth phases, it is revealed in the study that most women entrepreneurs approach to the investment option with caution. There are few investor networks in Türkiye including gender lens investing platforms such as Arya Women. Still, only five women out of sixteen received investment at the startup phase, and five at growth phase.

> *We met with investors, but we need long term investors who can bring us network and access to markets. Turkish investors are seeking short term returns, which is not aligning with our business dynamics. We are taking calculated steps, and waiting for the right time to receive a big investment. – WE16*

> *We had no specific challenge in accessing finance. Angel investors are not the right fit for us, we need strategic investors, who can bring us not only resources but also network and clients. I am trying to take calculated steps, and progress slowly but soundly. – WE14*

> *I am attending investor meetings, but I am hesitant to get an investment. The entrepreneur should choose the investor as well. The investor should not only bring money, but also network and vision. Otherwise, it could be quite devastating for the venture. – WE12*

There are several reasons mentioned for hesitate to get investment. First, investors in Türkiye are considered to be short sighted who usually seek quicker returns while tech businesses with R&D processes may offer longer return on investment (RoI) times. This puts enormous pressure on entrepreneurs, which often impacts their mental resilience negatively. Second, foreign investors have less appetite to invest in Türkiye due to the lowered risk rating of the country over the last decade, which decreases the funding opportunities available in the market. Third, women globally tend to be calculated risk takers (Manzanera-Román & Brändle, 2016), who are eager to take smaller but solid steps in the growth phase, and keep the full control of the firm without involving too many investors who ask for shares from the firm. Moreover, women’s expectation from the investors is not merely money, but equally importantly providing vision and network that can connect the firm with new clients and B2B opportunities. For these reasons, most women take their time to evaluate the investor options and see the future of the firm clear.

The interviewees who received investment report good relations with their investors. Impact investors and angel investors are usually preferable for women as they seek not only profit but

also social impact, and therefore devote more attention to understanding the business itself. Still, the number of angel investors are quite low in the country.

On the other hand, considerable number of interviewees has negative experiences during the investment tours indicating direct sexism, where they occasionally felt harassed, not taken seriously, or are pushed to prove themselves more than men. This is a long-lasting phenomenon even in the world's most advanced technology hubs such as Silicon Valley, where women have been receiving a little portion of total investments, after a more challenging process than that men undergo. The same environment also involves a great deal of misogyny, gender-based hiring and firing, sexist jokes, harassment, and gender-biased financial system (Burleigh, 2015).

One-to-one investor meetings are usually disturbing for me. You can sense that some men are checking what you can give them as a woman beyond the business opportunities. I had to leave some meetings due to such a harassing attitude. But some other investor meetings were so professional. The main challenge at the end is to balance everything with a greater effort. It is so unfair to be exposed to such stress while trying to find money for your business. You already have a lot on your plate. – WE13

I believe gender discrimination is less evident in corporate life than in entrepreneurial life. Investors don't want to give women the control of massive amounts of capital. But for sure, we speak with certain references. What I say might be true for investments of 1-2 million USD, but around a couple of hundred million, it could be totally different, as I hear from other friends. As the volume of capital grows, there could be other determining factors such as gender, ethnicity, religion, etc. – WE9

At some client or investor meetings, some conservative people do not even look at me in the eye. I do not understand if they are ashamed, or if they do not really take me seriously. In such cases, I prefer my husband (who is also my business partner) to attend those meetings instead of me to avoid gender conflict. It is quite usual in Türkiye, as everyone is raised in a different social context, so I understand it. – WE8

Women still have extra barriers ahead of them. Speaking with my experience in this ecosystem, even angel investors are hesitant to invest in women's businesses, as they doubt if women can sustain it. Recently in our Women's Power summit, people argue that worthiness is more important than having female quota in the boards. This is absurd. Men's worthiness is not questioned this much before offering them a seat on the board. This is a world where men are assumed to have all the skills by default, whilst women have to prove that they are competent. This is the same when it comes to accessing finance. This is still a men's world. Women sometimes cannot convince even themselves that they deserve better. – WE4

In Türkiye, there is evident gender bias in receiving investment. Women entrepreneurs are asked different questions than those are asked to men. Women are asked about foreseen challenges in their ventures whereas men are asked about the potential of the business. The former is negative, and the latter is positive. Women are always obliged to prove themselves first. In the USA, the investors try to ask the exact same questions to all pitchers. In Türkiye, I was in touch with an investment group. I then realized that the documents they ask from me are far more than they ask from male entrepreneurs. Investors somehow do not trust women's capability of using the invested money right. – WE5

All these sorts of discrimination are stated to be affecting women's access to investments and venture capital, as well as their self-confidence and entrepreneurial motivation. For this reason, several women mention the importance of gender lens investing platforms as they aim to promote women and eliminate the gender bias in the ecosystem.

The last comments from the interviewees given in this section are pointing to a mainstream phenomenon in entrepreneurship literature. Kanze et. al. (2017) show that the majority of questions asked to male entrepreneurs were promotion oriented, while 66 percent of those asked to women entrepreneurs were prevention oriented, which reproduces the stigma that women-led business ventures are more likely to fail, and causes the most investment to be directed to male entrepreneurs. Research conducted with high-technology women entrepreneurs across Europe also demonstrates that women experienced biased attitudes, disrespect, and additional challenges in getting investments due to their gender (Kovaleva et. al., 2023).

3.4.4. Access to bank financing

Globally, women face larger difficulty in accessing bank finance, and for this reason they are more reluctant to approach banks for credit (Poggesi et al., 2016). In my sample, the picture is remarkably similar: bank loans seem less of an option for female high-tech entrepreneurs especially during startup phase. Only four interviewees used bank loans at startup, two of them being retail loans in very small amounts. On the other hand, half of the interviewees used bank loans during the growth phase. It could be argued that bank loans are more accessible for mature firms with established financials, balance sheets and client contracts.

Having previous professional experience helped us access bank loans. We were advantageous compared to young entrepreneurs. – WE16

Having an established business with a long financial and credit history makes it much easier to access bank finance. We have no issues in receiving a bank loan. If needed, we can mobilize our financial network. – WE11

The interviewees find accessing to bank loan challenging due to the factors that are mostly valid for all small and medium sized enterprises in Türkiye, and the majority state that they do not experience gender-based challenges in accessing credit and other forms of banking products. The main hardships are high interest rates, long credit disbursement processes that are not in line with the business requirements, and lack of banking products and services that are relevant to the needs of technology firms and startups.

I never used a bank loan in start-up or growth phase. My mentors also suggested me so. Instead, the idea was to generate income and revenue. – WE5

Currently it is very difficult to access bank credit. Credit with one year maturity has no benefit for the entrepreneur. You take the credit, use it for developing a business, but it takes a minimum of 6 months to get its turnover. On the other hand, the bank expects you to start repaying in the first month. There is a mismatch. Thus, I do not prefer to use bank loans. – WE4

Providing collateral for getting a bank loan is a challenge. The banks ask for a letter of guarantee. How can a startup provide collateral or guarantee? The credit programs should be tailored to the needs of startups and entrepreneurs. – WE15

Accessing finance is a bleeding wound of entrepreneurs at the moment in Türkiye. The banks are doing everything not to lend any credit. I had to provide my small house as collateral. I retrained from collateralizing my own residence, as I do not want to put my children's future at risk. The banks want your credit score to expand, but the entrepreneurs need the finance the most at the growth phase. It is hard to provide what they ask from us at the growth phase. – WE6

I never considered a bank loan due to very high interest rates. Bank loans stress me out. – WE2

Bank loans are mentally very burdening for early-stage entrepreneurs. It can even be suicidal for some. – WE1

Some women point to the fact that banks require hard collateral for loan disbursement in the absence of long credit history of firms, and industry firms usually provide tangible assets and machinery as collateral. However, the tech firms operating in information and communication technologies cannot provide tangible assets, and the bank representatives at branch often do not understand the business model of the firm, which limits banks' appetite to lend to the entrepreneur. It is likely that this is perpetuated by additional challenges women face in accessing collateral as previously mentioned. Moreover, due to the recent regulations in the Turkish banking sector, the repayment maturity of corporate loans has shortened significantly, which puts additional pressure on women on whether they will be able to repay the loan on time. For these reasons, entrepreneurs retrain from applying for bank loans, but rather prefer to manage the cash flow through the generated income of business as well as their own funds.

Entrepreneurship banking is rising in Türkiye, which is a good sign. There was nothing during my first startup. Now we can observe several banking products for startups. But still there is a long way to go. – WE3

I received women entrepreneur loan from a state bank. Our repayment performance brought new loans. It is critical to be a good repayor. Receiving TUBITAK and KOSGEB grants regularly to the account is also a good sign for banks to see you creditworthy. – WE8

Over the last years, a concept of "entrepreneurship banking" has emerged in Türkiye at the leading commercial banks, where the entrepreneurs are supported in incubation centres that

belong to the bank, and are dedicated special credit officers who have better understanding of the financial needs of startups and technology entrepreneurs. There are some entrepreneurs who could access bank loans through entrepreneurship banking or through bank programs that support women entrepreneurs. Still, the number of these women remain limited. Such practices including startup and technology banking must be expanded and improved to address the specific needs and demands of tech entrepreneurs, possibly through the credit guarantee programs initiated by government which could mitigate the banks' risks in lending to startups, and easing the collateral requirements of entrepreneurs which lack tangible assets.

Whether you will face gender-based discrimination at a bank entirely depends on your customer representative. When I first visited the state bank branch to get credit, the bank representative asked the job of my father. I do not know why this was relevant. – WE15

Recently my bank suddenly froze my accounts without notifying me. It was understood that there was a misunderstanding. They called me only once, but I was breastfeeding and could not respond. Afterwards the branch representative said that I could have been reachable if I was not a woman anyway. It was totally sexist and discriminatory. And this is one of the banks in the country who praise itself for being gender responsive. – WE5

If I were a man, I would have less difficulty in communicating with investors. People in general seem to not want to see me as the owner of the firm. The bank accountant, or the tax advisor, always question if I am really the owner. When I talk about the school I graduated from, it makes sense to them. My previous bank representative was trying to get intimate with me, invited me to yoga. It was not professional at all. I left my banker. – WE7

Few entrepreneurs have experienced evident sexism at banks, mainly related to not being taken seriously, or lack of faith in the entrepreneur. Such practices may adversely affect women's access to loans, as well as their relationships with and faith in the banks, that may prevent them from even trying to receive a loan.

3.5. Business related challenges

The enormous potential carried by women-led tech businesses is increasingly recognised by national and international organizations. The study conducted by the European Institute of Technology (2023) reveals that technology ventures founded by women grew 1.2 times faster than their competitors over the past five years, pointing to the degree of potential European countries could realize if women entrepreneurs are supported with inclusive business development and finance programs.

On the other hand, creative labour precarity has been a long discussed topic in the academic literature. It could be argued that modern capitalism ideologically pushes for

entrepreneurialism, which is a demand for entrepreneurial mindset, to encourage the individuals to remain active, take responsibility for their own subsistence, and do lifelong learning to remain competitive in neoliberal markets. However, this is done not by dictating the demand to the citizens, but rather by ensuring that individuals internalize the responsibility and internal entrepreneurship (Ikonen, 2013). This could also be called as self-subordination (Vähämäki, 2009), as the entrepreneurs feel the responsibility to handle precarity, uncertainty in the labour markets and changing trajectories, and even discriminations that they are exposed to, including gender based discriminations and sexism. This kind of creative labour precarity is valid for all forms of work, not necessarily differentiating for entrepreneurship and wage employment. Even though entrepreneurship unlocks opportunities for people to exploit new markets, these opportunities are only available to a certain group with necessary social capital, where one cannot necessarily talk about a fair competition (Ikonen, 2013), particularly when gender dynamics such as women's disproportionate paid and unpaid work, and gender based oppression that exist in the society and institutions are considered as an additional layer to the picture.

Women face several challenges particularly in growing and scaling up their businesses, some being valid only for women. Literature demonstrates that lack of business advisory services and a supportive business ecosystem can lead the startups and tech ventures to fail (Reynolds, 2007; Watson, 2007; Davidsson & Honig, 2003). Hardships in access to financial resources can exacerbate such challenges, and make it more difficult for women tech entrepreneurs to thrive and succeed.

My study examined the particular business-related challenges in the process of firm's growth and sustainability, as well as their access to business development and other ecosystem services such as training, incubation and acceleration. Table 5 summarizes the responses of sixteen tech entrepreneurs.

3.5.1. Challenges in growing business

The responses of interviewees as the main challenges they encounter in growing their businesses in the technology field vary greatly, and are categorized under the following headings relevant to entrepreneurship. Access to finance and capital, high tax burden, lack of financial and business management skills, hardships in task delegation and management, finding skilled human resources, industry specific challenges, volatilities in economic situation.

Table 5: Experience in accessing business development and other ecosystem services

Participant	Main challenges during the growth	Access to business networks	Benefitting from tech and entrepreneurship ecosystem mechanisms
WE1	Delegating work through solid organization Dealing with every aspect of business Planning / prioritizing R&D process very wisely to avoid high consumables and loss of work Financial management	Through entrepreneurial competitions and tech programs Through technopark for accessing academic networks	- Support from technopark in the start-up phase R&D activities - University – industry partnerships - State supports such as TÜBİTAK and KOSGEB programs - Entrepreneurship competitions - Angel investors - Mentoring by angel investing network
WE2	Delegating work through solid organization Dealing with every aspect of business – limited human resource due to high personnel costs	Through industrial women associations and women networks	- Acceleration program abroad - Mentoring via business networks Not benefitted from TÜBİTAK or alike supports due to lack of support to marine industry
WE3	Shrinking foreign investment to Turkish firms due to national ratings	No specific challenge due to long years of experience in the industry	- Angel investors. Not benefitted from state programs. The supports are yet not sufficient in Türkiye especially for startups and early-stage entrepreneurs.
WE4	Low risk appetite of investors	No specific challenge due to long years of experience in the industry	Extremely limited benefitting from entrepreneurship ecosystem State support for marketing & fairs
WE5	Negative effect of pandemic on business volume	Through incubation program abroad	- Incubation program abroad - Mentoring and networking program - KOSGEB entrepreneurship support
WE6	Delegating work through solid organization Dealing with every aspect of business	Large network in the industry due to previous work experience	Not benefitted from entrepreneurship ecosystem due to lack of time and human capacity

Participant	Main challenges during the growth	Access to business networks	Benefitting from tech and entrepreneurship ecosystem mechanisms
	Cash management due to hardships in collecting money from clients on time	Positive influence of gender – easier to meet with new clients and business contacts, and is respected by clients as a hardworking woman	
WE7	Lack of transparency and fair competition in state tenders as state is the main buyer of services produced Lack of domestic production of high-quality inputs Low skilled human resource in the field	Through technopark	- KOSGEB entrepreneurship support - TÜBİTAK programs and trainings - Technoparks
WE8	Entering market due to low marketing skills gained during academic background Access to finance due to bureaucratic project application processes Difficulty to find skilled and affordable human resource in the field	Through technopark	- KOSGEB support - TÜBİTAK programs and trainings - Technopark - EU funds
WE9	Lack of role models in the field Lack of qualified human resource in the field Lack of partnership culture in Türkiye	Through own education and business ecosystem	- International grants - Mentoring - Conferences - Trainings - All other ecosystem supports
WE10	Access to finance and relevant, long-term investors	Through technopark and business ecosystem	- KOSGEB support - TÜBİTAK programs and trainings - Technopark - Acceleration program
WE11	Limited background in technology, which requires confidence to admit and look for information and insides from right sources	Large network in the industry due to previous work experience	- TÜBİTAK investment support - Consultancy

Participant	Main challenges during the growth	Access to business networks	Benefitting from tech and entrepreneurship ecosystem mechanisms
			Low benefitting from ecosystem supports due to lack of time
WE12	Financial management due to hardships in collecting money from clients on time Challenge of producing hardware in a completely different market	Through technopark and business ecosystem	- Technopark - TÜBİTAK support - KOSGEB support - Mentoring - Private sector partnership
WE13	Lack of finance leading to inadequate staff recruitment Access to funding to scale up and marketing/commercialization High bureaucracy and paperwork to access ecosystem supports	Through technopark, university and business ecosystem	- Technopark - TUBITAK support - University collaboration - Investment platform
WE14	Dealing with every aspect of business Commercialization of products with completed R&D	Through incubation program, academic network	- Incubation program at university - TÜBİTAK support - KOSGEB support
WE15	Challenge in establishing private sector collaborations Dealing with every aspect of business Access to bank finance	Through angel investing platforms - Through academic network	- TÜBİTAK support - KOSGEB support - University collaboration & technopark - Gender lens investing platforms - Trainings - Mentoring
WE16	Difference between corporate management and SME management	Academic network Professional network	- University collaboration & technopark - Incubation program - Mentoring - TÜBİTAK support - Clusters

The tech entrepreneurship ecosystem is still quite immature in Türkiye. Risk perception is low. Even angel investors and venture capitalists prefer investing in less risky ventures. There is little financing for early-stage businesses. – WE3

Türkiye never had a flourishing entrepreneurship ecosystem that support startups. Taxes are too high, allowing you almost no income at the end of the day. Access to affordable bank loans is limited. Until the pandemic, the interest rates were modest, but now they are incredibly high. – WE4

There are many supports in the ecosystem, but the bureaucracy is too burdensome. It needs to be simplified and become more accessible. – WE11

It is getting harder to find foreign investors due to lowering credibility of Türkiye and shrinking valuation of Turkish firms. It is better for Turkish investors as there are new funds. But in Türkiye we don't have financial mechanisms such as debt financing and revenue financing. – WE3

Access to finance and capital is the most cited challenge for women tech entrepreneurs to scale up their businesses. Half of entrepreneurs rate it as the biggest challenge. This includes hardships in accessing bank finance due to long bureaucracy, high interest rates, hard collateral requirements, and short maturity periods that is not compatible with business cycles. Entrepreneurs also address the lower investment appetites of local and international investors. Particularly due to the economic downturn in Türkiye over the last few years, it is stated that foreign investments are shrinking to Turkish market, and the local investors are looking for short term returns, without attempting to understand and grow the firm with network and vision. Lastly, some financial supports by state agencies are mentioned to be too bureaucratic and burdensome in terms of application process, which limits women's access to such grants and subsidized loans. This is particularly critical for women entrepreneurs who find it hard to delegate the business and domestic responsibilities, and are "destined" to be multitaskers. Few interviewees mention that they could not find time to explore and apply for TÜBİTAK or KOSGEB supports as they require too much paperwork.

Turkish ecosystem puts the startups in great struggles. Due to the law on protecting Turkish Lira, I had to convert the foreign investment to TRY. This looked like an income, and I lost 20 percent of my investment as tax. – WE5

High tax burden on entrepreneurs is another topic that is underlined by several interviewees, who have already migrated or are planning to relocate to startup friendly markets such as United Kingdom and Dubai to avoid tax burdens and benefit from exemptions given to newly founded high impact firms.

If you're producing high-tech products, you take a long time to research and develop the product with no income. Therefore, R&D firms like us have to carry on through receiving investments. You cannot develop the technology and then stop – you have to improve it continuously which leads to non-stop R&D expenditures. – WE3

Financial and business management is mentioned as another common challenge among women tech entrepreneurs in scaling up. Six women stated difficulties related to strategic monetary management of R&D processes as well as cash flow management. This could be related to the limited financial background of technology entrepreneurs as they are mostly trained in technical topics rather than in business management. Low level of competencies in marketing, business and client management are also among the issues being faced. Lack of skills in financial and business management are important factors that affect women's access to additional capital and credit, particularly from banks and private investors, as the firm financials and business plans are determining factors of eligibility for credit and investment.

> *I have a team of 15, but at the end I am taking care of every single aspect of work – from human resources to payments and legal issues. I do not have any time to apply for the entrepreneurship support programs. – WE6*

Women interviewed also suffer from hardships in task delegation and management. This is observed to be interrelated with their domestic workload. Five entrepreneurs point to the difficulty of being obliged to dealing with every aspect of work and family life, particularly in the first years of business. This is also mainly because of rising personnel costs, which are hard to cover during the startup and stabilization period of the venture, and thus the entrepreneurs need to put a great deal of their labour into all aspects of business, along with carrying out private life responsibilities. This is stated to be mentally and physically overwhelming, where family support makes enormous difference for the success and sustainability of the business.

Finding skilled human resources in the technology fields where interviewed women operate is another challenge cited by four entrepreneurs. The issue is two-fold: first, women in the study usually work in emerging high technology fields such as visual processing, Artificial Intelligence (AI), biotechnology, and advanced information and communication technologies, where it could be relatively difficult to find well-trained personnel competent in the field. Second, women cite the issue of affordability of scarce qualified people. Given the rising employee costs of personnel working in the technology area after the pandemic (Capital, 2023), it could be financially troublesome for the tech start-ups and businesses to hire and retain technical personnel. Entrepreneurs in the ICT and AI sectors cite being in the technology development zones and university technoparks as a mitigating factor for this challenge, where they can hire and raise interns and junior staff at lower costs. Some interviewees underline the importance of receiving investment, rather than credit, to expand the technical team to invest in new R&D activities for growth.

In the commercialization phase, you need customers to purchase your product. In my sector, state itself is the largest buyer. However, the state tenders were lacking transparency. I know many times that our bids were never evaluated. Then I gave up producing lab materials. – WE7

As seen in the example of interviewees, even though entrepreneurship provides women with flexibility and freedom in their career, this from time to time may turn into "flexploitation" (Morgan et. al., 2013) that is associated with uncertain regular income, inequal market conditions that is related to gender segregation, exhaustive work, social inequality and discrimination.

Moreover, four entrepreneurs refer to industry specific challenges ahead of their growth, such as difficulties in establishing private sector collaborations and partnerships, and lack of successful role models in the industry that prevent peer learning and experience sharing. One entrepreneur emphasized lack of transparency and fair competition in state tenders, particularly for the sectors where state is the main buyer and client. In such cases, business networks and acquaintances are critical in acquiring contracts from the clients, in which women are usually in a disadvantaged position due to their narrower networks.

Lack of domestic production of high-quality inputs and heavy dependence on imported intermediate goods are other challenges for entrepreneurs given the increasing volatility of Turkish lira over the last years. Depreciation of TRY and shrinking economy and business volume due to pandemic and following economic downturn have an adverse impact on the financial health of all small businesses in Türkiye, but is argued to have a disproportionate effect on women-led tech businesses with large external trade volumes, who have comparatively limited financial resources to cover the increasing debts due to depreciation of local currency, decreasing turnover and increasing staff costs.

3.5.2. Access to business development and ecosystem services

The study conducted by Demet (2017) with technology entrepreneurs in Türkiye reveals that economic capital of entrepreneurs does not have an impact as strong as the social and cultural capital on the success of entrepreneurship that relies on R&D and innovation. While economic capital can offer critical opportunities, it is not enough for success without a solid vision, business knowledge, and mental transformation.

Business advisory services are crucial for entrepreneurs as all other technology ventures, women-led tech businesses can benefit from comprehensive support systems which can bring

unique perspectives and ideas that lead to greater profitability and sustainable growth. Such supporting and inclusive ecosystems can help the entrepreneurs access to necessary information and knowledge to drive their business forward, opportunities to open to new markets and find business partners, advice on obtaining state and private funding, and connections to the best innovation services in the private industry as well as offered by the academia.

Studies show that women technology entrepreneurs use more and different business advisory services than men entrepreneurs, mainly due to the differences in startup capital, firm size, and sector of operation (Kremel & Yazdanfar, 2015). The same study argues that women sought more business advice as women are more likely to start sole proprietorship than limited liability companies, and this involves great risks which they aim to mitigate by receiving further business guidance. This is of limited relevancy for my sample, where less than half of entrepreneurs are the sole owners of their firms. As indicated previously, technology firms tend to have more shareholders with mixed teams, also because they are more likely to receive investments, which is also some sort of business advisory resource for the founders.

As previously mentioned, there are a great number of public and private sector initiated business support programs for entrepreneurs in tech industry. Among governmental programs, KOSGEB and TÜBİTAK initiatives are the largest, which encourage the participation of women with additional incentives. KOSGEB has supported women entrepreneurs' business development through training and educational activities. Since 2010 until 2021, around 720,000 women have been provided with entrepreneurship training by KOSGEB (KOSGEB, 2021). However, these activities were not enough to build strong business development skills among Turkish women entrepreneurs. This may be a result of former legislation that regulated KOSGEB activities to only deal with manufacturing enterprises, narrowing the opportunities for women significantly. This was modified in May 2009 and companies involved in trade & services and - most importantly - small artisans and tradespeople, have become eligible for KOSGEB support.

In the current study, state supports from TÜBİTAK and KOSGEB are the prominent mechanisms used by twelve women tech entrepreneurs. Most of the R&D activities by the interviewed entrepreneurs are financed by the seed capital provided by TÜBİTAK and KOSGEB. A few entrepreneurs have received public incentives for participating in conferences and fairs. This addresses the importance of such programs, as well as of the

inclusion and transparency efforts that must be employed in the execution of these programs to make sure women entrepreneurs can widely benefit from them.

Five entrepreneurs, on the other hand, point to reasons that refrained them from benefitting from the public entrepreneurship supports. These reasons include burdensome application processes which require substantial time and human resource. Given that women-led tech ventures tend to be smaller, and women are more likely to have time limitations due to double responsibilities at home and work. Thus, such processes should be simplified so as to make them more inclusive of and attractive for female entrepreneurs. It is also indicated that it can be challenging to find relevant programs for the sector or business cycle of the firm, as the programs are often not growth focused, and several sectors are not eligible to apply.

The ecosystem offers startup supports but not much growth supports. Further, we need more thematic programs, rather than gender-based support programs. – WE14

State programs are followed by the incentives provided by technology development zones and university technoparks. Ten interviewees, nine of which are based in technoparks, are broadly benefiting from university – industry collaboration. Study by Atalay & Varol (2016) with women technology entrepreneurs in Ankara reveals the main reasons of female-led ventures to reside within technology development zones / technoparks as tax incentives and exemptions, university-industry collaboration, KOSGEB support provided, the prestige that it offers to the firm, and networking. In addition, firms find it easier to build B2B collaborations, recruit qualified staff, laboratory infrastructure, keeping up with sectoral trends, and business advisory services such as trainings, seminars, and consultancy that the technopark managements offer.

We see great support from our professors and academics involved in our projects. Being young and female is not always a disadvantage, as there are also great people who'd like to support and promote you. – WE1

My main challenge is to scale up, and it requires investment and more funding. I am afraid of using bank loans, due to lack of trust in banks. I have to find another source of funding. University collaboration is a great source of network and opportunities. – WE13

These are also cited by the participants of current study, where women state that they benefit from start-up phase R&D activities, incubation and acceleration programs, clusters, university – industry collaboration through projects, mentoring and trainings provided by technoparks. Given that women's access to networks and business information could be more limited due to additional domestic workload and gender stigmas that limit women's public presence, the

existence of technoparks with targeted services for business ventures are of great importance for the growth and sustainability of women tech entrepreneurs. As previously mentioned, the availability of laboratories and other means of universities for new product development gives profound financial advantage to startups by reducing their R&D expenditures.

Private support mechanisms such as coaching, training and mentoring are also widely used by women tech entrepreneurs. Seven of them stated that they significantly benefitted from such services particularly in the initial phases of entrepreneurship where their financial and business knowledge is limited. The networking events and entrepreneurship competitions are proven to be useful for the entrepreneurs to stand out in the eyes of investors, meet with potential clients, and reduce unintended gender bias that may lead to doubting the competencies of women entrepreneurs.

I was involved in a gender lens investing platform in Türkiye. At first, they didn't invest in me, but the network and the mentoring they provided was invaluable to me. Then my mentor invested in my firm. Such collaborations are usually coming from other women, which is very supportive. – WE15

Marine industry is very conservative and tough for women, and it may be difficult to get into business networks that are usually held among men. For this reason, we have women sailors' associations all over the world to access to such networks and develop business. This is very helpful. – WE2

I learned the ecosystem utilization in entrepreneurship at very early stages. Thus I try to use all ecosystem resources before using my own resources. – WE9

Turkish ecosystem has several angel investing and gender lens investing platforms for new and promising technology ventures. Women who are looking for investments are engaged with such platforms. Four entrepreneurs have benefitted from the advisory and networking opportunities offered by investment platforms. Among those platforms, Arya Women Investment Platform comes out as the first and only women-focused investment platform. Some of the interviewees received investment through Arya, and some others have access to clients and information through the network that Arya provided them with. Most entrepreneurs emphasize the importance of having such inclusion- and impact-oriented investment platforms, which may reduce the gender bias in the ecosystem and unlock opportunities for women with limited access to capital.

We are not interested in receiving investment, as Turkish investor ecosystem is not quite promising. There is some level of nepotism, and investors want to get some of your control over firm. – WE10

Even though there are social and environmental impact-oriented angel investment platforms available for technology and social entrepreneurs, the investment flora in Türkiye is not stated

to be quite favourable for women entrepreneurs. As also indicated in the previous chapter, women address several discriminatory and sexist processes in the entrepreneurship competitions and investment tours that hinder their access to capital.

It is observed that women entrepreneurs interviewed are also following the international support programs available to their industries. Four interviewees have benefitted from global incubation and acceleration programs, EU funds and grants, and mentoring services offered by international organizations.

3.5.3. Access to networks and markets

Networking is a way for entrepreneurs to access resources outside their control and to reduce the risk of failure; and it has positive impact on business performance (Kremel & Yazdanfar, 2015). While the ability to discover and take advantage of business opportunities is directly related to knowledge, previous education, and work experience, of equal importance is the ability to mobilize social contacts and resources to develop one's business. Particularly for young entrepreneurs and for the ones with limited industry background, benefiting from the experiences and know-how of others could significantly help with business management and strategic decision making. This is particularly valid for small and medium sized enterprises which often have narrower clientele and less access to markets. Since women usually run smaller businesses, we can argue that access to networks and markets are significant for the success of women-led high growth businesses.

In general, women rely more on gendered informal social networks, including existing customers as a network source whereas men's social network is more business-centric. This means men have better opportunities to turn contacts into customers. In addition, men have more flexibility to attend conferences, seminars, and industry fairs due to gender-based segregation of domestic responsibilities against women. There could be limitations in cross-gender relationships that involve one-on-one contacts due to the anxiety and hesitation of beneficiaries in these informal interactions (Fowler et. al., 2007).

Bursa Social Security Office coordinated a field survey on the needs and characteristics of Women SMEs and Entrepreneurs in Türkiye, Hungary, Bulgaria, and Italy with the participation of 223 women entrepreneurs and 191 women-led SMEs. According to the survey, the most preferred networking channels are identified as direct contact, internet/social media and fairs & conferences.

On the other hand, study by Özkazanç-Pan & Muntean (2017) found that women technology entrepreneurs exhibit different networking styles than men. Accordingly, they mainly use bonding strategies, which promote "social capital through communal-focused, internal engagement within a collectivity in contrast to bridging, which describes the use of external links to develop social capital". On the other hand, men hold more transactional relationships, which is somehow taken as the norm in the entrepreneurial ecosystem. The same study also argues that women are less informed about incubation and acceleration opportunities offered by the ecosystem, as these institutions have gendered recruitment practices, even though they are defended to be "gender neutral".

Being located in a technopark gives you a great networking and learning platform. Even though we have our own atelier, we prefer working in this open office to collaborate and share experience with other entrepreneurs at different business cycles. – WE12

Networks are critical in the survival of your business. I couldn't have survived if I didn't attend the programs and tech competitions. Business networks can open many doors for you. That is why you must dare, and venture, sometimes without thinking about the ending. If you don't believe in yourself and hesitate about your own competence, the investors also won't believe in you. – WE1

In our sample, women with long professional experience in the field report having already established business network of suppliers, clients, and investors. They also state that they take advantage of their previous success in corporate life in order to convince investors and clients to cooperate. Ecosystem mechanisms such as investment platforms, mentoring and training programs, and incubation centres provide additional resources for the entrepreneurs.

Academic entrepreneurs tend to rely mostly on their academic networks, as well as networks provided through the ecosystem programs. On the other hand, particularly younger women with limited professional experience find the university technoparks and technology development zones such as Teknopark Istanbul or *Bilişim Vadisi* as the primary sources of networking, as similar high-growth entrepreneurs could engage easily. Such networking channels are reported to bring substantial opportunities for accessing finance and capital as well as for business expansion.

It is understood from the study that traditional gender norms do not emerge as prominent barriers for women tech venturers to network. Very few women mention that it is culturally challenging for them to participate in business meetings to build networks due to restrictive gender-based pressures. This could be related to the modern and global dynamics of

technology and startup ecosystem in Türkiye compared to traditional sectors, as well as the relatively high education level of women tech entrepreneurs.

These insights and findings point to the importance of inclusive financing and business advisory mechanisms that must avail to women entrepreneurs in order to elevate their high technology entrepreneurship and unlock the immense potential they have both socially and economically. Women entrepreneurs in the technology field encompass great innovation potential due to their high social capital and enthusiasm to produce technology, yet they face significant gender based challenges that prevent them from accessing financial resources and capital to grow their ventures. Elaborated gender arrangements and stereotypes in the society and institutions that are posited in the technology entrepreneurship ecosystem may create additional barriers to women from acquiring capital, finance and business information. The next chapter presents several institutional and policy recommendations for the elimination of gender biases and gender-specific barriers to promote women's tech business ownership.

CHAPTER 4

DISCUSSION AND CONCLUSIONS

Existing literature and theoretical discussions indicate that women technology entrepreneurs are facing gender-based challenges, direct and indirect sexism, biases and discriminations at societal, organizational and industry level that hinder their access to financial and nonfinancial resources for starting and growing tech ventures. Technology being a heavily male-dominated sector is itself gendered, which may exacerbate women's hardships in entrepreneurial journey. On the other hand, female technology entrepreneurs differentiate from traditional women entrepreneurs globally and in Türkiye, demonstrating higher social capital, less conformity with conventional gender roles, and greater utilization of business development opportunities.

This thesis investigates the dynamics determining high tech women entrepreneurs' access to finance and capital in Türkiye, with special focus on the influence of gender norms and roles. In all, this thesis contributes to understanding the issues and obstacles faced by women tech entrepreneurs with regard to the gender-related factors impacting their access to financial resources as well as financial inclusion and resilience in business world. The thesis adopts a feminist research approach, where the institutions and mechanisms that shape the journeys of techn entrepreneurs are critically assessed via a gender lens. It problematizes Turkish women tech entrepreneurs' diverse situations as well as gendered institutions in the entrepreneurial sphere, and it attempts to examine the issues to realize justice for women and men in its own context. Last but not least, the research aims to suggest new ideas, future research and policy recommendations to remove barriers and oppressive structures as well as direct and indirect sexism for women entrepreneurs operating in the technology field (Gringeri et. al., 2010). In this chapter, I outline the main conclusions of the study, provide recommendations for a gender-inclusive ecosystem with programs to promote women's technology entrepreneurship, and offer thoughts for future scholarship on gender and technology entrepreneurship.

In line with the extant literature, the findings of this study confirm that women technology entrepreneurs in Türkiye exhibit a young, urbanized entrepreneur profile, with a strong

educational background in STEM fields. The analysis of the results indicate a strong relationship between successful technology entrepreneurship and previous experience in the field, either academic or professional. This finding has not come about as a surprise: past professional experience enables women to see and exploit opportunities in technology fields, as well as to create extensive networks and benefit from these networks in the process of starting and growing a business. Moreover, previous work experiences are critical in increasing the social capital of entrepreneurs and boosting their entrepreneurial success as they provide them with the skills to manage both customers and people they work with. Unlike the previous literature, it has been found out that entrepreneurs who have previously carried out graduate academic studies in technology fields are more likely to carry out R&D activities in the companies they have established. This can be attributed to the fact that unlike traditional entrepreneurship, high-tech entrepreneurship can be substantially nourished by academic studies, university facilities and university-industry collaboration. In addition, academic entrepreneurs are more familiar with the application processes for major prestigious publicly funding programs, most notably TÜBİTAK or KOSGEB projects, which are seen as the lifeblood of technology-based startups.

The majority of women technology entrepreneurs in Türkiye still manage micro, small and medium sized companies. Limited companies and gender-mixed founder teams are more common in technology fields than in traditional startups. The contribution of gender-mixed management teams to business success is broadly emphasized by the literature and the interviewees, as this is functional in bringing in diverse competencies and perspectives to the business and people management. This is likely to positively affect their access to finance and investments.

Moreover, female technology entrepreneurs have different entrepreneurial motivations than those of traditional women entrepreneurs. Women technology entrepreneurs are vastly impact-oriented in running tech businesses, including social, economic and environmental impacts. We could argue that such vocational or entrepreneurial aspirations and accomplishments are considered by women to be part of their self-perception and identities, to the extent that they overlook or accept the gender based discriminations and precarious conditions that they need to tackle in order to survive in the environment. This indicates to the policymakers that economic, social, and environmental development programs should include gender sensitive entrepreneurial support mechanisms and technology policies as women entrepreneurs tend to prioritize impact while running business operations. Governments must tap into the potential embraced by women entrepreneur segment in order to promote green and sustainable

technologies and business models. On the other hand, the innovation programs must be structured in a way to diminish precarity in the creative industries to eliminate the gendered patterns of disadvantage and exclusion which deepen the persistent inequalities faced by women.

When women technology entrepreneurs are asked about their reasons for working in the field of technology, more than half cite "childhood dreams and interests." Some women aim at progressing in the field they are enthusiastically interested in, such as health and biotechnology, and at engaging in uses of technology as a tool for these areas. Other entrepreneurs are attracted by the technology itself, referring to the dynamism, flexibility and innovation that technology provides enabling to realize their ideas. This finding once again reveals the importance of education policies to encourage girls to pursue education in STEM fields in line with their competencies, which is highly relevant to developing the technology performance of the country.

However, although their entrepreneurial motivations are based on impact, women tech entrepreneurs set specific, measurable and ambitious targets for themselves and for their companies based on turnover, R&D operations, exports, and growth. Completely different from traditional entrepreneurial women, the main business goals of technology entrepreneurs are to produce, commercialize and internationalize innovative, advanced technologies. This finding could also be related to women's academic backgrounds, as their technical knowledge allows them to be directly involved in product development and R&D studies and manage processes. This is an indication that technology development policies should pay special attention to improving skills and financial inclusion of existing and potential women entrepreneurs, and create platforms to involve women tech professionals and academics in university-industry partnerships.

As confirmed in several studies in Türkiye, regardless of their educational attainment, women are commonly expected to get married and have children valid for all sociocultural segments. The thesis study has also inquired into the extent to which prevailing gender norms associating women with the family affect the entrepreneurial journeys of women in technology. In view of their high education level as well as the specific socioeconomic and sociocultural context they are involved in, their views on motherhood, wifehood and gender were expected to display significant differences. It is revealed that marriage has a positive impact on women’s ventures as long as they have the support of their spouses, either by balancing the domestic workload or supporting business operations. In this context, contrary to the traditional

entrepreneurship literature, marriage does not necessarily constitute an obstacle to women's entrepreneurship, and on the contrary, a supportive marriage and partnership model contributes significantly to women's entrepreneurship and their access to financial resources. Still, marriage could also pose risks on tech entrepreneurship of women in some cases, based on gendered role expectations; perceived threats to traditional masculinity is likely to force women to consider their home responsibilities above their careers and work. At this point, a supportive family structure emerges as highly relevant to women's success in tech business. In this study, a significant portion of the participants felt that their decision to start a business was welcomed by their families, and supported financially and morally. A limited number of participants received negative reactions on the grounds that their role as a spouse would be overshadowed by the demands of work. In this sense, entrepreneurship stands out as a critical means for women to combat gender-based domestic oppression provided that the gendered patterns, sexism and exclusion in the entrepreneurial ecosystem are eliminated.

Women's motherhood experiences and responsibilities still create complications for entrepreneurs and being a mother is reported to pose risks on entrepreneurial success due to challenges of maintaining home-work balance, great level of multitasking, and making multiple decisions at the same time. Some participants also report accusatory and destructive social pressure on their motherhood for feeling guilt when they had to prioritize their work. It could be discussed that even highly educated women face similar difficulties faced by traditional women entrepreneurs when it comes to motherhood. Short or long breaks from work after having a child, or decrease in the time devoted to work for a certain period of time can deteriorate the financials and operations of companies, which can make it more difficult for the company to access finance and accumulate capital. This points to the importance of institutional structures and policies that support women in business with children, such as paternity leaves, affordable and accessible childcare opportunities particularly at technology development zones and universities, grace periods for bank payments during pregnancy and maternity period subsidized by government, and awareness programs.

It is proven by various global studies that having successful and entrepreneurial mothers and female role models at home increases women's entrepreneurial potential and self-confidence. On the one hand, women's social capital is a critical element in entrepreneurial success. Demographic characteristics, education, family resources, and education level of parents are likely to impact people's choices in education, jobs, and career. From gender perspective, women's participation to business life is relatively new in economies such as Türkiye where the industrial revolution has been lagged, and where most women have paid work in gender-

segregated employment market. On the other hand, entrepreneurship, in its simplest terms, is a game of creating, growing and managing capital. The business intelligence, market knowledge and capital management competence that women could inherit from their mothers are very limited. This is coupled with gender roles that teach women to be more submissive, domesticated, and modest, as well as women's limited access to property and financial resources. All these factors result in women entrepreneurs holding lower social capital in Türkiye compared to men, which may lead to diminished business success and access to finance. Women try to compensate this by working harder than their male counterparts to prove themselves, noting that this is broadly exhausting and frustrating. Such disadvantages due to lack of necessary social capital are hindered by the gender stereotypes and biases by the investor community and other technology stakeholders.

The study reveals significant gender discrimination women face in technology industry, including sexist, reductionist and condescending attitudes, not believing that women can succeed, questioning their competencies more, and sexual harassment. Women also feel the expectation to behave in accordance with gender roles, such as being modest and contented. However, an entrepreneur's self-confidence and emotional resilience are among the most important factors affecting success in entrepreneurship. Many studies show that character traits such as self-doubt, fear of making mistakes, and a propensity for perfectionism are more common among women due to gender socialization in patriarchal cultures. Such discriminatory are likely to erode women's self-confidence, weaken their self-belief, and limit their initiatives and motivation to get access to opportunities, including finance and capital.

The results indicate that intersecting disadvantages must be considered carefully to understand the unique reality of women entrepreneurs in their own context. Being young particularly adds an additional layer of disadvantage. As stated, most technology entrepreneurs are young in the country. Although less so among those with prior professional experience, many young female entrepreneurs experience the challenges of lack of sufficient experience, business network, financial literacy and credit history. However, although there are many advantages that being young provides to entrepreneurs, including high creativity capacity and digital skills, and openness to new ideas and approaches, most young entrepreneurs experience age and gender-based discrimination in the entrepreneurship ecosystem. Their ideas and work are less trusted, and that they have to devote additional efforts to prove themselves.

It is important here to note that in the creative industries such as technology, even though women entrepreneurs care about income security to feel confident, precarity and exhausting

work is somehow normalized as the essential feature of entrepreneurship. All these exploitative conditions, including the gender-based discriminations and inequalities that women entrepreneurs are exposed to, are taken for granted as the fundamental conditions of the creative entrepreneurial market, which is argued to push women to take the full responsibility for their own success and the hardships they face along the way.

These results point out that institutions in the entrepreneurship ecosystem should introduce zero-tolerance policies to gender-based discrimination and harassment as well as effectively functioning grievance and reporting mechanisms for women, should employ additional transparency measures in the recruitment and award procedures, and, equally importantly, launch gender awareness programs to eliminate unintended gender bias. Additionally, there is need for technology and innovation programs by the government to eliminate precarity which poses further disadvantages on women by the boundary-crossing (for instance, balancing home and work responsibilities) and pressures around self-presentation, as well as hardships caused by direct and indirect sexism.

The most common challenge raised up by women entrepreneurs interviewed in the study during the time they were developing their businesses is access to finance and capital, perpetuated by the economic bottleneck experienced in the country in recent years. It is understood from the research that existing gender norms and direct and indirect discriminatory behaviors against women tech entrepreneurs hinder their access to finance and capital, both at startup and growth phases, although it is less of a challenge for mature businesses. Most women technology entrepreneurs finance the establishment of their companies with equity capital. Some receive financial support from their families, which is critical for the startup period. As discussed in the study, in addition to problems in women's equal access to inheritance, and the glass ceilings that exist in the corporate world preventing women to obtain high-paying jobs, there is a significant gender wage gap of up to 40 percent in Türkiye, which is rather the case for white-collar employees who are paid above minimum salary. Thus, it can be inferred that aspiring women entrepreneurs are at a disadvantaged position vis-a-vis males in their families in accumulating startup capital. In addition, women can be more conservative in their investment activities, feel more insecure in financial matters and be afraid of making any mistakes, which also impacts on their capacity and prospects of capital accumulation for their future ventures.

As the research findings have made it clear, in Türkiye public funding supports, particularly TÜBİTAK and KOSGEB programs, constitute the main source of startup and growth enabling

the financing of women-led tech firms after equity capital. Nevertheless, these processes could also turn out to be very bureaucratic and thus challenging for entrepreneurs; in some cases these affect accessibility for women entrepreneurs who have not sufficient time and the required human resource to carry out and follow up the lengthy application procedures. In addition, since TÜBİTAK supports are generally disbursed against invoices, bridge financing is required to finance the expenditures until the support is received. Most entrepreneurs use their own savings and seek for investments in this process, whilst very few apply to banks. It is important to note that TÜBİTAK and KOSGEB programs encourage the applications from female technology entrepreneurs with various subsidies and gender-based quotas. However, as mentioned in this research by the interviewees, gender-based discrimination and direct or indirect sexism by the evaluation committees work against women during the application processes. Although these are likely to be exceptional cases and do not reflect an institutional culture, selection and grant practices must be made transparent in order to prevent gender-based discrimination and promote equal opportunities for female tech entrepreneurs.

In addition to government supports, women tech entrepreneurs widely benefit from the facilities offered by the ecosystem such as technology development zones, technoparks, entrepreneurship competitions, incubation centers and accelerators. Especially the tax advantages provided by technoparks, access to R&D and networking opportunities, and university-industry cooperation schemes are attractive for entrepreneurs. Women emphasize that the awards they win in entrepreneurship competitions, as well as the approval of TÜBİTAK projects, play an important role in gaining the trust of customers and investors and help overcome gender-based prejudices. Entrepreneurs based in technoparks can also utilize universities' laboratories, consumables and academic workforce through joint projects, thus providing in-kind financing for R&D expenses. Technoparks and incubation centers substantially pave the way for women and expand their access to networks. Thus, such programs should be more accessible for women, and employ inclusive promotion and recruitment practices to ensure women’s broader benefit from the facilities in line with their specific entrepreneurial needs.

One of the major findings of this study related to the impact of seemingly gender-neutral but essentially gendered dynamics faced by women technology entrepreneurs is that women tend to approach investors very cautiously until the business stabilizes. It is mainly because the investor profile in Türkiye expects short-term returns, which is not always compatible for technology startups given the long R&D processes, and therefore creating a lot of stress for entrepreneurs. Also, the majority of women seeking investment struggle with gender-based

discrimination and bias. Women often experience not being taken seriously during investment tours and investor meetings, incur sexist jokes and even abusive behavior and demands, or the expectation of proving themselves more than their male counterparts. As evident in the global sphere, the questions posed to women by investors in Türkiye are also found to be different from those asked to men, including biased assumptions holding that female technology startups are more prone to failure. Some female entrepreneurs experience the prejudice by the investors and customers that they will be able to devote less time to their business after getting married and having children, and therefore they are approach for cooperation cautiously. All of these behaviors complicate aspirant women's access to capital and investments for female technology entrepreneurs. Nevertheless, there are limited number of impact investment platforms in Türkiye, including Arya Women's Investment Platform as the only gender-lens investment facility which prioritizes impact and inclusion while making investments in businesses. The availability of such gender-responsive platforms is likely to facilitate women's access to inclusive and scaling investments.

Regarding the access to financial institutions, women technology entrepreneurs in Türkiye tend to hold reservations about the banks particularly in the early stages of their businesses. It is stated that banks do not fully grasp the business model of startups and tech businesses; the demand for collateral is high which is a disproportionate challenge for women vis-a-vis men, and since entrepreneurship banking is less common, there are very few loan products in the market suitable for early-stage businesses. In addition, high interest rates reduce the appetite of companies that cannot foresee the future in its first years. Bank financing is more accessible for mature businesses with established financials and assets that could be collateralized. Women tech entrepreneurs with previous professional background can also access limited bank financing as they can provide personal credit score. However, bank loans can turn into a horror story for young entrepreneurs with no accumulated assets or credit history. The general credit contraction in Türkiye after the pandemic and economic downturn affect all SMEs' access to bank finance, but these difficulties are more challenging for women and early-stage technology entrepreneurs. Several female entrepreneurs still report gender-based discriminatory discourses at banks. All this suggests that banks are not perceived as a reliable source of financing for women technology entrepreneurs in Türkiye.

Female technology entrepreneurs reportedly lack sufficient knowledge on topics such as business management, financial management, marketing, and sales, and are open to receiving business consultancy. They follow and benefit from business advisory opportunities offered by the ecosystem stakeholders, which have been increasing over the last years with several

gender inclusive programs. Therefore, elevated business skills and knowledge could significantly enhance women's access to financial resources and ability to seize such opportunities.

Another significant finding which has gendered consequences impacting women entrpereneurs as mentioned by the participants in the study relates to the challenge of delegating business-related work and juggling many tasks at once. Technology entrepreneurs are fully involved in both the technical as well as operational and managerial processes of the business. Creative entrepreneurship precarity usually involves an employment type so-called "owner manager of incorporated enterprise" where the entrepreneur is both the employer and the employee. It requires full time, precarious work where the entrepreneur/employee is responsible from all responsibility of the work where the demanded labour conditions are quite limited due to the entrepreneurial role involved. We see a similar case in women technology entrepreneurs participated in the study. Due to the high personnel costs particularly in tech fields, most entrepreneurs with limited financial resources attempt to run the business on their own or with limited human support. Given the usually unbalanced distribution of domestic responsibilities in their family life, women entrepreneurs face serious difficulties in managing their time and sustaining business. Time limitation and exhaustion due to paid and unpaid work also limit women's opportunities to search for alternative financing schemes, attend investment tours, or take time to screen and apply for governmental entrepreneurship and/or sectoral grants.

It has also been found out that women technology entrepreneurs tend to have less difficulty in accessing networks than traditional entrepreneurs. The technology ecosystem provides ample networking opportunities for tech entrepreneurs through incubators, accelerators, technology development zones, investment and venture capital platforms, and fairs and competitions. The literature shows that women's networking practices and methods differ from that of men, focusing mostly on bonding and collaborating rather than masculine way of transaction. In addition, most women's networks consist of people they have gained from their previous work and academic experiences. Still, networks are critical in reaching both investors, customers, and other financiers, especially in technology entrepreneurship. In this study, a small number of female entrepreneurs indicate that traditional gender roles prevent them from participating in one-on-one business meetings. Therefore, the networking systems provided by the entrepreneurship ecosystem should be structured to address women's way of networking, as well as gender dynamics that influence their opportunities to access to wider business partners and clients.

Finding skilled human resources in the technology fields is another challenge faced by female tech entrepreneurs. Given the high personnel costs especially in ICT fields, this is again a financial problem to a great extent, where women-led firms could be in a disadvantaged position due to less access to bank finance and investments to expand teams to do R&D and marketing. It can be contended that the involvement of women tech entrepreneurs in technoparks could mitigate the issue by matching them with young talent pools in academic spheres that they can hire and train.

Finally, in view of these obstacles and gendered dynamics, at a more general level, as this study also highlighted the current downturn in Turkish economy that led to decreasing investments, rising interest rates and operation expenditures, greater volatility in Turkish Lira, narrowing talent pool, and heavy dependence on imported intermediate goods have an enormous adverse impact on all startups, SMEs and tech ventures. However, those impacts are disproportionately harmful for women-led businesses as the resilience to economic shocks require accumulated financial resources, which are scarcer and harder to access when it comes to women.

Recommendations

The study is expected to enlighten the decision makers and other ecosystem actors who plan and develop entrepreneurship supports for technology industry in Türkiye with an aim of boosting technology development and inclusive growth simultaneously. To ensure sustainable and inclusive social and economic development, Türkiye needs to promote high technology industries and eliminate gender gap in entrepreneurship. Encouraging more women to start new businesses in high-tech sectors, and helping the entrepreneurs with gender-responsive financing, advisory and networking mechanisms could elevate the performance of technology firms. As reported by previous studies, cultural norms such as role conflicts between their family and professional life and gender-based discrimination emerge as significant barriers facing women entrepreneurs. Promoting successful women entrepreneurs in the tech industry might reverse this perception. Equally importantly, innovation and creative industry policies must consider appropriate mechanisms to prevent precariousness and informality in the labour markets both for employees and entrepreneurs, which are hard to differentiate when it comes to contemporary creative labour. Such policies should take the gendered patterns of disadvantage and exclusion into account which perpetuates the precarity that is often brought about by creative work.

Accordingly, decision makers first must consider collecting, tracking and evaluating gender-disaggregated data for all relevant programs and institutions. It is uncovered during the study that most of the public institutions including Ministry of Industry and Technology do not collect and record gender disaggregated data in their programs. The availability of such data allows the institutions to monitor the current picture with regards to women's technological entrepreneurship motivation, behaviour, challenges, needs and opportunities in place, and develop programs and policies to address the specific needs. This would also enable the organizations to carry out gender-based impact assessments after the programs end.

Moreover, as state programs are critical for growth and sustainability of women-led technology firms, the grants and financing programs must be made more inclusive and accessible for women from different backgrounds. The application and award processes must be made transparent with relevant grievance mechanisms in order to eliminate gender bias and discrimination at all stages.

On the other hand, supporting access to finance for women in tech via gender-responsive banking is not a nice-to-have or only a moral imperative, but constitutes a strategic and financial materiality considering the opportunities it prevails for banks. By implementing gender-responsive banking, banks can make a substantial difference both in terms of improving their internal capacity and awareness on gender equality, as well as promoting innovative lending approaches serving women immediately. By acting on gender-responsive financial and non-financial services, banks not only contribute to the societal well-being of women-led SMEs but also stand to gain in terms of improved accountability, financial development, innovation, market opportunities, capacity development and long-term sustainability. This approach aligns with the evolving expectations of customers, employees, and regulators who increasingly value businesses that actively support social causes. Moreover, entrepreneurship banking practices must be expanded through dedicated teams at banks who understand the main challenges and needs of technology entrepreneurs at start-up phases. The risk appetite of the banks should be increased by introducing subsidized loans and credit guarantee programs by the government to promote gender-inclusive development of technology entrepreneurship.

Gender lens investment platforms offer unique opportunities for women in tech to find not only additional financial resources but also business knowledge and wisdom by impact-oriented investors that can widen their access to clients and partners. Programs must be

introduced to expand the impact funds and angel investor networks, as well as to enhance the gender awareness of the existing investing and venture capital networks to eliminate unintentional gender and age bias.

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APPENDICES

A. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE

B. IN-DEPTH INTERVIEW QUESTIONNAIRE (IN TURKISH)

TEZ GÖRÜŞME FORMU

Cinsiyet: kadın

Yaş:

Eğitim düzeyi:

Medeni hal:

Çocuğu varsa:

Alanda ve toplam profesyonel deneyim (yıl):

Girişimcilik deneyimi (yıl):

Firmanın faaliyet gösterdiği sektör:

Ortaklık yapısı ve (varsa) ortaklarının cinsiyeti:

1. Girişimcilik

1.1. İşletmeniz için koyduğunuz hedefler nelerdir? Girişimcilik yolculuğunuzda kendiniz ve işletmeniz için başarıyı nasıl tarif ediyorsunuz?

1.2. Neden teknoloji sektöründe çalışmayı seçtiniz?

2. Toplumsal Cinsiyet ve Girişimcilik & Kadın Girişimciliği

2.1. Teknoloji sektöründe bir kadın girişimci olmayı nasıl deneyimlediniz? Cinsiyetinizin, firmanızı büyütme sürecinize herhangi bir olumlu veya olumsuz etkisi oldu mu? Nasıl?

Alt sorular:

2.1.1. Teknoloji sektöründe işinizi kurarken veya büyütürken yakın çevrenizden nasıl bir destek veya tepki gördünüz? Bunun işinizi büyütme sürecine etkisi nasıl oldu?

2.1.2. Teknoloji sektöründe işinizi büyütürken evli olmayı nasıl deneyimlediniz?

2.1.3. Teknoloji sektöründe işinizi büyütürken anne olmayı nasıl deneyimlediniz?

3. Girişimcilik & İşi Büyütme Süreci

3.1. Start-up (kurulum) aşamasında işinizi nasıl finanse ettiniz?

3.2. İşletmenizi büyütme sürecinde yaşadığınız başlıca zorluklar nelerdir?

3.3. İşletmenizi büyütme sürecinde sermaye ve finansmana erişme deneyiminiz nasıl oldu? (banka kredisi, yatırım kredisi, risk sermayesi, hibeler, özkaynak, vs.)

Alt sorular:

3.3.1. İşinizi büyütmek için teknolojiye erişim, teknoloji kullanımı ve teknolojik geliştirmeleri sağlamak için gerekli sermaye ve finansmana nasıl eriştiniz / erişiyorsunuz? Deneyiminiz nedir?

3.3.2. İşinizi büyütme sürecinde ürün geliştirme, prototipleme, ticarileştirme için gerekli sermaye ve finansmana nasıl eriştiniz / erişiyorsunuz? Deneyiminiz nedir?

3.4. Firmanızı büyütme sürecinde sermaye ve finansmana erişirken cinsiyetinizden kaynaklı bir engel veya fırsat deneyimlediniz mi? Nasıl?

3.5. Firmanızı büyütme sürecinde sermaye ve finansmana erişmek için iş ve teknoloji ekosisteminden & kümelerden destek bulabiliyor musunuz? Nasıl?

Kapanış: Çalışmaya katkı sağlayabileceğini düşündüğünüz ilave bir bilgi veya görüş eklemek ister misiniz?

Teşekkürler.

C. TURKISH SUMMARY / TÜRKÇE ÖZET

Bu çalışmanın amacı, Türkiye'de teknoloji sektöründe faaliyet gösteren kadınların girişimcilik deneyimlerini anlamak ve toplumsal cinsiyet kalıplarının kadınların teknoloji girişimciliğini özellikle finansmana erişim yönünden nasıl etkilediğini araştırmaktır. Araştırma; cinsiyete dayalı engel ve zorlukların, Türkiye'deki kadın teknoloji girişimcilerinin girişimlerini büyütmek için finansal kaynaklara, banka kredilerine, yatırıma ve sermayeye erişmelerini ciddi anlamda engellediğini savunmaktadır. Sosyal yaşamda var olan ve teknoloji girişimciliği ekosistemindeki kurumlarca yeniden üretilen cinsiyet rolleri ve kalıpları, kadın girişimcilerin sermaye, finans ve iş bilgisi edinmelerinin önünde ek engeller oluşturabilmektedir. Bu engeller, yaş ve etnik köken gibi kesişen dezavantajlar ve ayrımcılıklar nedeniyle derinleşebilmektedir.

Tez, feminist bir yaklaşımla, temelde kadınların bireysel deneyimleri ve o deneyimlere atfettikleri anlama odaklanan fenomenolojik araştırma yöntemi kullanmaktadır. Bu kapsamda, Türkiye'deki on altı kadın teknoloji girişimcisiyle derinlemesine görüşmeler yapılarak onların öznel deneyimleri ve dahil oldukları bağlamın keşfedilmesi amaçlanmıştır. Bu tez, Türkiye'de kadınların teknoloji girişimciliğini ve finansmana erişimlerini şekillendiren unsurları, cinsiyet karşılaştırmalarına girmeksizin kadınların doğrudan kişisel deneyimlerine odaklanarak araştıran az sayıda çalışmadan biri olması sebebiyle literatüre katkı sağlamaktadır.

Temel bulgular

Literatür bulgularının yanı sıra tez çalışması da Türkiye'deki kadın teknoloji girişimcilerinin genç, STEM (Bilim, Teknoloji, Mühendislik ve Matematik) alanlarında iyi eğitimli, şehirli bir girişimci profili sergilediğini doğrulamaktadır. Sonuçlar, başarılı teknoloji girişimciliği ile bu alandaki akademik veya profesyonel deneyimler arasındaki ilişkiyi göstermektedir. Geçmiş mesleki deneyim, kadınların teknoloji alanlarındaki fırsatları görmesine ve bunlardan faydalanmasına, aynı zamanda bir iş kurma ve büyütme sürecinde kapsamlı ağlar oluşturmasına ve bu ağlardan faydalanmasına olanak tanımaktadır. Üstelik önceki iş deneyimleri, girişimcilere hem müşterileri hem de birlikte çalıştıkları kişileri yönetme becerisi kazandırdığından, girişimcilerin sosyal sermayelerini yükseltme ve girişimcilik başarılarını

artırma açısından kritik öneme sahiptir. Önceki literatürden farklı olarak daha önce teknoloji alanlarında lisansüstü akademik çalışmalar yapmış girişimcilerin kurdukları şirketlerde Ar-Ge faaliyeti yürütme olasılıklarının daha yüksek olduğu ortaya çıkmaktadır. Bunun nedeni muhtemelen geleneksel girişimcilikten farklı olarak ileri teknoloji girişimciliğinin büyük ölçüde akademik çalışmalar, üniversite olanakları ve üniversite-sanayi işbirliklerinden beslenebilmesidir. Ayrıca akademik girişimciler, teknoloji tabanlı girişimlerin can damarı olarak görülen TÜBİTAK veya KOSGEB projelerine başvuru süreçlerine daha aşinadır.

Türkiye'deki kadın teknoloji girişimcilerinin çoğunluğu hâlâ mikro, küçük ve orta ölçekli şirketleri yönetmektedir. Limited şirketler ve cinsiyet açısından karma kurucu ekipler, teknoloji alanlarında geleneksel startup'lara göre daha yaygındır. Cinsiyetten oluşan karma yönetim ekiplerinin iş başarısına katkısı, iş ve insan yönetimine farklı yetkinlikler ve bakış açıları kazandırmaları ve finansmana erişimi olumlu yönde etkilemeleri sebebiyle çalışma genelinde vurgulanmıştır.

Kadın teknoloji girişimcileri, geleneksel kadın girişimcilerden farklı girişimcilik motivasyonlarına sahiptir. Kadın teknoloji girişimcileri, teknoloji işlerini yürütürken sosyal, ekonomik ve çevresel etkiler başta olmak üzere büyük ölçüde etki odaklıdır. Bu, politika yapıcılara ekonomik, sosyal ve çevresel kalkınma programlarının toplumsal cinsiyete duyarlı girişimcilik destek mekanizmalarını ve teknoloji politikalarını içermesi gerektiğini, zira kadın girişimcilerin iş faaliyetlerini yürütürken etkiyi önceliklendirme eğiliminde olduklarını göstermektedir. Hükümetler, yeşil ve sürdürülebilir teknolojileri ve iş modellerini teşvik etmek için kadın girişimci segmentinin benimsediği potansiyelden faydalanmalıdır.

Kadın teknoloji girişimcilerine teknoloji alanında çalışma nedenleri sorulduğunda yarıdan fazlası "çocukluk hayalleri ve ilgi alanları" cevabını vermiştir. Bazı kadınlar sağlık ve biyoteknoloji gibi ilgi duydukları alanda ilerlemeyi hedeflemiş ve bu ilerleme için teknolojiyi araç olarak kullanmıştır. Diğer girişimciler, teknolojinin fikirlerini hayata geçirmelerine olanak tanıyan dinamizm, esneklik ve yenilikçilik özelliğine atıfta bulunarak teknolojinin kendisine bizzat ilgi duyduğunu ifade etmiştir. Bu bulgu, kız çocuklarının STEM alanlarında kendi yeterlilikleri doğrultusunda eğitim almalarını teşvik edecek eğitim politikalarının önemini bir kez daha ortaya koymaktadır; nitekim bu husus ülkenin teknoloji performansının geliştirilmesi açısından son derece önemlidir.

Öte yandan girişimcilik motivasyonları etki odaklı olsa da kadın teknoloji girişimcileri ciro, Ar-Ge faaliyetleri, ihracat, büyüme gibi konularda kendilerine ve şirketlerine spesifik,

ölçülebilir ve iddialı hedefler koymaktadır. Geleneksel girişimci kadınlardan tamamen farklı olarak teknoloji girişimcilerinin temel iş hedefleri yenilikçi, ileri teknolojileri üretmek, ticarileştirmek ve uluslararası hale getirmektir. Bu durumun kadınların akademik geçmişleriyle de ilgili olduğu savunulabilir. Çünkü teknik bilgileri onların ürün geliştirme ve Ar-Ge çalışmalarına doğrudan dahil olmalarına ve süreçleri yönetmelerine olanak sağlamaktadır. Bu, teknoloji geliştirme politikalarının mevcut ve potansiyel kadın girişimcilerin becerilerinin ve finansal katılımlarının geliştirilmesine özel önem vermesi ve kadın teknoloji profesyonellerini ve akademisyenleri üniversite-sanayi ortaklıklarına dahil edecek platformlar yaratması gerektiğinin bir göstergesidir.

Türkiye'de farklı sosyokültürel kesimler için yapılan birçok araştırmada da teyit edildiği gibi, kadınların birincil olarak evlenmesi ve çocuk sahibi olması beklenmektedir. Çalışma, kadınların yüksek eğitim düzeylerinin yanı sıra içinde bulundukları sosyoekonomik ve sosyokültürel bağlamın onların annelik, eş olma ve cinsiyete ilişkin görüşlerini etkileyebileceğini göz önünde bulundurarak, cinsiyet normlarının kadınların teknoloji alanındaki girişimcilik yolculuklarını ne ölçüde etkilediğini araştırmaktadır. Bu kapsamda çalışma, ev içi iş yükünün dengelenmesinde ve iş operasyonlarında eşlerinin desteğini aldıkları sürece, evliliğin kadınların girişimlerini olumlu yönde etkilediğini ortaya çıkarmıştır. Bu bağlamda, geleneksel girişimcilik literatürünün aksine evlilik, girişimciliğe mutlaka bir engel oluşturmamakta, tam tersine destekleyici bir evlilik ve birliktelik modeli, kadınların girişimciliğine ve finansal kaynaklara erişimlerine önemli ölçüde katkı sağlamaktadır. Yine de çalışmada evli olmanın bazı durumlarda kadınların teknolojik girişimciliğine risk oluşturabildiği gözlenmiştir; bunun başlıca nedeni, erkek olan eşin maskülenliğini tehdit altında hissetmesi ve kadınların evdeki sorumluluklarını işin üstünde tutmaya zorlanmasıdır. Aile desteğinin kadınların teknoloji işindeki başarısıyla son derece bağlantılı olduğu görülmüştür. Katılımcıların önemli bir kısmı, iş kurma kararlarının aileleri tarafından memnuniyetle karşılandığını, maddi ve manevi olarak desteklendiğini ifade etmektedir. Sınırlı sayıda katılımcı ise eş rollerinin gölgede kalacağı iddiasıyla olumsuz tepkiler aldığını belirtmiştir. Bu anlamda girişimcilik, kadınların toplumsal cinsiyete dayalı aile içi baskıyla mücadelesinde kritik bir güçlenme aracı olarak öne çıkmaktadır.

Öte yandan annelik, girişimciler için ciddi engeller yaratmakta ve ev-iş dengesini koruma, yüksek düzeyde çoklu görev (*multitasking*) yapma ve aynı anda birden fazla karar verme zorlukları nedeniyle girişimcilik başarısı üzerinde risk oluşturabilmektedir. Bazı katılımcılar, işlerine öncelik vermek zorunda kaldıklarında anneliklerine yönelik suçlayıcı ve yıkıcı sosyal baskıdan söz etmektedir. Bu anlamda yüksek eğitimli kadınların dahi annelik konusunda

geleneksel girişimcilere benzer zorluklarla karşılaştıkları görülmektedir. Çocuk sahibi olduktan sonra kısa ya da uzun süreli işe ara verilmesi ya da belirli bir süre işe ayrılan sürenin azalması, şirketlerin finansal pozisyonlarını ve operasyonlarını bozabilmekte, bu da şirketin finansmana erişimini ve sermaye birikimini zorlaştırabilmektedir. Bu durum, babalık izinleri, özellikle teknoloji geliştirme bölgeleri ve üniversitelerde uygun fiyatlı ve erişilebilir çocuk bakım olanakları, annelik izni sırasında banka ödemelerinde devlet tarafından sağlanan sübvansiyon ve ödemesiz dönemler, ve farkındalık programları gibi çocuklu girişimcileri destekleyen kurumsal yapı ve politikaların önemine işaret etmektedir.

Evde başarılı ve girişimci annelere ve kadın rol modellerine sahip olmanın kadınların girişimcilik potansiyelini ve özgüvenini artırdığı çeşitli küresel çalışmalarla kanıtlanmıştır. Öte yandan kadınların sosyal sermayesi girişimcilik başarısında kritik bir unsurdur. Demografik özellikler, eğitim, aile kaynakları ve ebeveynlerin eğitim düzeyi; insanların eğitim, iş ve kariyer seçimlerini etkileyebilir. Türkiye gibi sanayi devriminin geç başladığı ve kadınların çoğunun ücretli çalıştığı ekonomilerde kadınların iş hayatına katılımı nispeten yenidir. Girişimcilik ise en basit anlamıyla bir sermaye yaratma, büyütme ve yönetme oyunudur. Kadınların kendi annelerinden bu anlamda miras alabildiği iş zekası, pazar bilgisi ve sermaye yönetme yetkinliği oldukça sınırlıdır. Buna bir de kadınlara daha çok baskılayıcı, evcimen ve "mütevazı" olmayı öğütleyen cinsiyet rolleri aktarılması ve kadınların uzun yıllardır fiziksel olarak da mülke ve finansal kaynaklara sınırlı erişimleri eklendiğinde, Türkiye'de kadın girişimcilerin sosyal sermayelerinin erkeklere nazaran düşük olması sonucu doğmuştur. Çalışmaya katılan teknoloji girişimcisi kadınlar bu eksiklikleri devamlı çok daha fazla çalışmakla ve kendilerini daha fazla kanıtlamakla kapatmaya çalıştıklarını, ancak bunun oldukça yorucu ve hırpalayıcı olduğunu vurgulamaktadır. Bu durum, yatırımcı topluluğu ve diğer teknoloji paydaşlarının yeniden ürettiği toplumsal cinsiyet kalıpları ve cinsiyete dayalı önyargıları tarafından derinleşebilmektedir.

Görüşülen teknoloji girişimcisi kadınların büyük çoğunluğu, teknoloji gibi erkek egemen bir sektörde çalışırken önemli düzeyde cinsiyet ayrımcılığına uğradığını ifade etmektedir. Bahsedilen ayrımcı davranışlar arasında indirgemeci ve küçümsemeci tutum, kadının başarabileceğine inanmama, yetkinliklerinin daha fazla sorgulanması ve cinsel taciz gibi tutumlar yer almaktadır. Kadınlar ayrıca girişimcilik ekosisteminde dahi kendilerinin mütevazı ve kanaatkar olma gibi kadınlara atfedilen cinsiyet rollerine uygun davranmaları beklendiğini hissetmiştir. Öte yandan girişimcinin kendine olan güveni ve duygusal dayanıklılığı, girişimcilikte başarıyı etkileyen en önemli faktörler arasında yer almaktadır. Pek çok çalışma, ataerkil kültürlerde yetiştiriliş sebebiyle kendinden şüphe etme, hata yapma

korkusu ve mükemmeliyetçilik gibi karakter özelliklerinin kadınlarda daha yaygın olduğunu göstermektedir. Bahsedilen ayrımcı tutumların yaygınlığı, kadınların özgüvenlerini zedeleyebilmekte, en başta kendilerine inançlarını sarsabilmekte, finans ve sermaye dahil fırsatlara erişmek için girişimlerini ve motivasyonlarını sınırlayabilmektedir.

Sonuçlar, kadın girişimcilerin benzersiz gerçekliğini kendi bağlamlarında anlamak için kesişen dezavantajların dikkatle değerlendirilmesi gerektiğini göstermektedir. Özellikle genç olmanın ilave bir dezavantaj katmanı eklediği anlaşılmaktadır. Belirtildiği gibi ülkedeki teknoloji girişimcilerinin çoğu gençtir. Daha önce mesleki deneyime sahip olanlar arasında daha az olmakla birlikte, birçok genç kadın girişimci deneyim, iş ağı, finansal okuryazarlık ve kredi geçmişi eksikliği gibi zorluklarla karşılaşmaktadır. Öte yandan gençliğin girişimcilere sağladığı, yüksek yaratıcılık kapasitesi ve dijital beceriler, yeni fikir ve yaklaşımlara açıklık gibi pek çok avantaj bulunmaktadır. Genç girişimcilerin çoğu, girişimcilik ekosisteminde yaş ve cinsiyete dayalı ayrımcılık yaşadığını, fikirlerine ve çalışmalarına daha az güvenildiğini, kendilerini kanıtlamak için ilave çaba sarf etmek zorunda olduklarını belirtmektedir. Bu sonuçlar, bilinçli ya da bilinçsiz cinsiyet ayrımcılığını ortadan kaldırmak amacıyla girişimcilik ekosistemindeki kurumlar tarafından cinsiyete dayalı ayrımcılık ve tacize karşı sıfır tolerans politikalarının yanı sıra kadınlara yönelik şikayet ve raporlama mekanizmalarının işler hale getirilmesi, işe alım ve ödüllendirme prosedürlerinde ek şeffaflık önlemleri alınması ve toplumsal cinsiyet farkındalığı programları başlatılmasının önemine işaret etmektedir.

Kadınların işlerini büyütürken bahsettiği en yaygın zorluk, ülkede son yıllarda yaşanan ekonomik darboğazın da etkisiyle bankalardaki kredi sıkılaştırma politikalarından kaynaklanan finansman ve sermayeye erişimdir. Araştırmadan, kadın teknoloji girişimcilerine yönelik mevcut cinsiyet normlarının ve ayrımcı davranışların, olgun işletmeler için daha az zorluk teşkil etmesine rağmen, başlangıç ve büyüme aşamasındaki işletmelerin finansman ve sermayeye erişimlerini sınırladığı anlaşılmaktadır. Görüşülen kadın teknoloji girişimcilerinin çoğu şirketlerinin kurulumunu özsermayeyle finanse etmektedir. Bazıları ailelerinden finansal destek almaktadır, bu startup dönemi için oldukça kritiktir. Miras süreçlerindeki dengesizliklere ek olarak Türkiye'de ücretli işlerdeki cinsiyete dayalı ücret farklarının hala yüzde 40 seviyelerinde olduğu düşünüldüğünde, kadınların startup sermayesini biriktirmede dezavantajlı konumda olduğu düşünülebilir. Ayrıca bazı çalışmalar kadınların yatırım faaliyetlerinde daha muhafazakar olduğunu, finansal konularda daha güvensiz hissettiklerini ve hata yapmaktan korktuklarını, tüm bunların da sermaye birikimlerine olumsuz yansıdığını göstermektedir.

Teknoloji girişimcisi kadınlar, özsermayeden sonra temel kurulum finansmanını başta TÜBİTAK ve KOSGEB programları olmak üzere devlet desteklerinden sağlamaktadır. Bununla birlikte, bu süreçler girişimciler için oldukça bürokratik ve zorlayıcı olabilmekte, bazı durumlarda uzun prosedürleri yürütecek zamanı ve insan kaynağı olmayan kadın girişimcilerin bu desteklere erişimini kısıtlayabilmektedir. Ayrıca TÜBİTAK destekleri genellikle fatura karşılığında verildiğinden, destek alınana kadar yapılan harcamaların finansmanı için köprü finansmanına ihtiyaç duyulmaktadır. Çoğu girişimci bu süreçte kendi birikimlerini kullanmakta, yatırım almakta, çok azı ise bankalara başvurmaktadır. TÜBİTAK ve KOSGEB programları, kadın teknoloji girişimcilerinin başvurularını çeşitli destekler ve cinsiyet bazlı kotalarla teşvik etmektedir. Ancak bazı kadınlar başvuru süreçlerinde cinsiyet temelli ayrımcılıkla karşılaştıklarını belirtmektedir. Bunlar kişilere bağlı istisnai durumlar gibi görülmekle ve kurumların kurumsal duruşlarını yansıtmamakla birlikte, cinsiyete dayalı ayrımcılığın önlenmesi ve kadın teknoloji girişimcilerine fırsat eşitliğinin sağlanması için seçim ve hibe uygulamalarının şeffaflaştırılması gerekmektedir.

Devlet desteklerinin yanında ekosistemin sunduğu başlıca destekler teknoloji girişim bölgeleri, teknoparklar, girişimcilik yarışmaları, kuluçka merkezleri ve hızlandırıcılardır. Kadın girişimciler bunlardan da yaygın şekilde yararlanmaktadır. Özellikle teknoparkların sağladığı vergi avantajları, Ar-Ge ve ağ oluşturma fırsatlarına erişim, üniversite-sanayi işbirliği imkanları girişimciler için oldukça cezbedicidir. Kadınlar, TÜBİTAK projelerinin onaylanmasının yanı sıra girişimcilik yarışmalarında kazandıkları ödüllerin, müşterilerin ve yatırımcıların güvenini kazanmada önemli rol oynadığını, cinsiyete dayalı önyargıları aşmada yardımcı olduğunu vurgulamaktadır. Teknopark içinde olan girişimciler ayrıca ortak projelerle üniversitelerin laboratuvarlarını, sarf malzemelerini ve akademik işgücünü kullanabilmekte, bu sayede ar-ge harcamalarına ayni finansman sağlayabilmektedir. Teknopark ve kuluçka merkezleri bu anlamda kadınların yolunu ciddi anlamda açmakta, onların iş ağlarına erişimini de genişletmektedir. Bu nedenle, bu tür programların kadınlar için daha erişilebilir olması ve kadınların belirli girişimcilik ihtiyaçları doğrultusunda kurumlardan daha geniş bir şekilde yararlanmasını sağlamak için kapsayıcı destek ve programa kabul uygulamalarına yer verilmesi gerekmektedir.

Teknoloji girişimcisi kadınların işletme olgunlaşana kadar yatırımcılara oldukça temkinli yaklaştığı görülmektedir. Bunların temel sebebi olarak Türkiye'deki yatırımcı profilinin çok kısa vadeli dönüşler beklemesi ve bunun Ar-Ge süreçleri düşünüldüğünde teknoloji girişimlerine her zaman uygun olmaması ve dolayısıyla girişimcilerde hayli stres yaratması öne çıkmaktadır. Yatırım arayışında olan kadınların çoğunluğu ise cinsiyete dayalı ayrımcılık

ve önyargılarla mücadele etmektedir. Kadınlar, yatırım turları ve yatırımcı görüşmeleri esnasında ciddiye alınmama, cinsiyetçi şakalarla ve taciz içeren davranış ve taleplerle karşılaşma, ya da kendilerini erkek girişimcilere göre daha fazla kanıtlama beklentisini sıklıkla yaşadıklarını belirtmektedir. Bu durum Türkiye'ye has değildir; dünyanın en gelişmiş teknoloji hublarından olan Silikon Vadisi'nde dahi kadın girişimlerinin teknoloji yatırımlarının çok azını alabildiği, bu süreçte cinsiyetçilikle karşılaştığı bilinmektedir. Türkiye'de ve dünyada yatırımcılar tarafından kadınlara sorulan soruların erkeklerden farklı olduğu tespit edilmiştir. Erkeklere daha çok önlerindeki büyüme fırsatları sorulurken, kadınlardan yoğunlukla riskleri nasıl yönetecekleri, zorluklarla nasıl baş edeceklerini anlatmaları beklenmektedir. İlki pozitifken ikincisi negatif sorulardır ve kadın teknoloji girişimlerinin başarısız olmaya daha meyilli olduğu önyargısını içermektedir. Bazı kadın girişimciler, yatırımcı ve müşterilerinin evlendikten ve çocuk sahibi olduktan sonra işlerine daha az zaman ayırabilecekleri önyargısı taşıdığı ve bu yüzden işbirliğine temkinli yaklaştığını ifade etmiştir. Tüm bunlar, kadın teknoloji girişimcilerinin sermaye ve yatırımlara erişimini güçleştirmektedir. Öte yandan Türkiye'de sınırlı sayıda etki yatırımı platformu vardır. Bunların başını Arya Kadın Yatırım Platformu çekmektedir. Bu tarz platformların varlığı, kadınların destekleyici ve büyütücü yatırımlara erişmesini kolaylaştırmaktadır.

Türkiye'deki teknoloji girişimcisi kadınlar, ilk dönemlerde bankalara oldukça mesafeli durmaktadır. Özellikle startup döneminde bankaların işletmelerin iş modelini anlamadığı, teminat isteğinin yüksek olduğu, girişim bankacılığının az yaygın olması sebebiyle erken dönem işletmelere uygun ürünler bulunmadığı ifade edilmektedir. Ayrıca yüksek kredi faizleri de ilk dönemler önünü göremeyen firmaların iştahı azaltmaktadır. Banka finansmanı, yerleşik mali tabloları ve teminat altına alınabilecek varlıkları olan olgun işletmeler için daha erişilebilirdir. Öncesinde profesyonel geçmişi olan startup sahibi kadınlar da, bireysel kredi skoru sağlayabildikleri noktada sınırlı banka finansmanına erişebilmektedir. Ancak genç girişimciler için banka kredisi adeta bir korku hikayesine dönüşebilmektedir. Banka finansmanına erişimin sınırlı olmasında, pandemi sonrası genel kredi daralması ve tüm KOBİ'lerin çektiği zorluklar elbette etkilidir, ancak bu zorlukların kadınlar ve erken dönem teknoloji girişimcileri için daha zorlayıcı olduğu gözlenmektedir. Sınırlı sayıda kadın girişimci ise hala banka şubelerinde cinsiyete dayalı ayrımcı söylemlerle karşılaştığını ifade etmektedir. Genel itibariyle bankaların teknoloji girişimcisi kadınlar için ön sıralarda bir finansman kaynağı olarak algılanmadığı anlaşılmaktadır.

Görüşülen kadın teknoloji girişimcilerinin işletme yönetimi, finansal yönetim, pazarlama ve satış gibi konularda her zaman yeterli bilgiye sahip olmadıkları ve iş danışmanlığı almaya açık

oldukları görülmüştür. Kadın girişimciler, ekosistem paydaşlarının sunduğu kapsayıcı programlarla son yıllarda artan iş danışmanlığı fırsatlarını takip etmekte ve bunlardan faydalanmaktadır. Yüksek iş becerileri ve bilgisi, kadınların mali kaynaklara erişimini ve bu tür fırsatlardan yararlanma kapasitesini önemli ölçüde artırabilir.

Öte yandan, araştırmaya katılan kadınlar genel olarak iş delege edememe ve birçok görevi aynı anda yürütme zorluğuyla karşı karşıyadır. Teknoloji girişimcilerinin, işin hem teknik hem de operasyonel ve yönetimsel süreçlerine tamamen dahil oldukları görülmektedir. Özellikle teknoloji alanlarındaki yüksek personel maliyetleri nedeniyle, mali kaynakları sınırlı olan çoğu girişimci, işi kendi başına veya sınırlı insan desteğiyle yürütmeye çalışmaktadır. Ev içi sorumlulukların genellikle dengesiz dağılımı düşünüldüğünde, kadın girişimciler zamanlarını yönetme ve işlerini sürdürme konusunda ciddi zorluklarla karşılaşmaktadır. Biri ev biri işte olmak üzere iki tam zamanlı iş yürütmek zorunda olan girişimcilerin yaşadığı zaman darlığı; alternatif finansman planları arama, yatırım turlarına katılma veya devlet destekleri ve/veya sektörel hibeleri inceleme ve başvuru için zaman ayırma fırsatlarını da sınırlamaktadır.

Kadın teknoloji girişimcilerinin iş ağlarına erişimde geleneksel girişimcilere göre daha az zorluk yaşadıkları anlaşılmaktadır. Teknoloji ekosistemi, kuluçka merkezleri, hızlandırıcılar, teknoloji geliştirme bölgeleri, yatırım ve risk sermayesi platformları, fuarlar ve yarışmalar aracılığıyla teknoloji girişimcilerine geniş ağ oluşturma fırsatları sağlanmaktadır. Literatür, kadınların ağ kurma uygulama ve yöntemlerinin erkeklerinkinden farklı olduğunu, çoğunlukla maskülen iletişim kurma yöntemlerinden ziyade bağ kurma ve işbirliğine odaklandığını göstermektedir. Ayrıca kadın ağlarının çoğu, önceki iş ve akademik deneyimlerinden edindikleri kişilerden oluşmaktadır. Yine de ağlar, teknoloji girişimciliğinde yatırımcılara, müşterilere ve diğer finansörlere ulaşmada kritik öneme sahiptir. Az sayıda kadın girişimci, geleneksel cinsiyet rollerinin kendilerini birebir iş toplantılarına katılmaktan alıkoyduğunu belirtmiştir. Girişimcilik ekosisteminin sağladığı ağ oluşturma sistemleri, kadınların ağ kurma biçimlerinin yanı sıra daha geniş iş ortaklarına ve müşterilere erişim fırsatlarını etkileyen cinsiyet dinamiklerini de göz önünde bulunduracak şekilde yapılandırılmalıdır.

Teknoloji alanlarında nitelikli insan kaynağı bulmak, kadın teknoloji girişimcilerinin karşılaştığı bir diğer zorluktur. Özellikle bilişim teknolojileri alanlarındaki yüksek personel maliyetleri göz önüne alındığında, bu yine büyük ölçüde finansal bir sorun olarak karşımıza çıkmaktadır; kadınların liderliğindeki firmalar, banka finansmanına ve Ar-Ge ve pazarlama yapacak ekipleri genişletmeye yönelik yatırımlara daha az erişim nedeniyle dezavantajlı bir konumda olabilir. Kadın teknoloji girişimcilerinin teknoparklara katılımı, onları işe

alabilecekleri ve eğitebilecekleri akademik yetenek havuzlarıyla eşleştirerek sorunu hafifletebilmektedir.

Genel olarak, Türkiye ekonomisinde yaşanan mevcut darboğazın yatırımların azalmasına, faiz oranlarının ve işletme giderlerinin artmasına, Türk Lirası'nda daha fazla oynaklığa, yetenek havuzunun daralmasına ve ithal ara mallara aşırı bağımlılığa yol açarak tüm startup'lar, KOBİ'ler ve teknoloji girişimleri üzerinde büyük olumsuz etkiye sahip olduğu ileri sürülmektedir. Bununla birlikte, ekonomik şoklara dayanıklılık birikmiş finansal kaynaklar gerektirdiğinden, bu etkiler kadınların liderliğindeki işletmeler için orantısız derecede riskli ve yıkıcı olabilmektedir.

Öneriler

Çalışma, teknoloji gelişimini ve kapsayıcı büyümeyi birlikte artırmaya imkan sağlamak için Türkiye'de teknoloji sektörüne yönelik girişimcilik desteklerini planlayan ve geliştiren karar vericilere ve diğer ekosistem aktörlerine ışık tutmayı amaçlamaktadır. Sürdürülebilir ve kapsayıcı sosyal ve ekonomik kalkınmayı sağlamak için Türkiye'nin yüksek teknolojili endüstrileri teşvik etmesi ve girişimcilikteki cinsiyet eşitsizliğini ortadan kaldırması gerekmektedir. Daha fazla kadını yüksek teknoloji sektörlerinde yeni iş kurmaya teşvik etmek ve girişimcilere cinsiyete duyarlı finansman, danışmanlık ve ağ oluşturma mekanizmalarıyla yardımcı olmak, teknoloji firmalarının performansını artırabilir. Bunun yanı sıra, hak temelli kalkınma ve politika tasarımının bir parçası olarak, kadınların cinsiyet eşitsizliğinden gelen fırsat ve kaynaklara erişim kısıtları ortadan kaldırılmalı, ekonomik güçlenmelerinin önü açılarak cinsiyete dayalı baskı ve şiddetle mücadeleleri kurumsal araçlarla desteklenmelidir. Daha önce yapılan çalışmalarda da belirtildiği gibi, aile ve iş yaşamı arasındaki rol çatışmaları ve cinsiyete dayalı ayrımcılık gibi kültürel normlar, kadın girişimcilerin karşılaştığı önemli engeller olarak ortaya çıkmaktadır. Başarılı kadın girişimcilerin teknoloji sektöründe desteklenmesi bu algıyı tersine çevirebilir ve kadınların finansal ve finansal olmayan kaynaklara erişimi artırılabilir.

Bu doğrultuda karar vericilerin öncelikle ilgili tüm program ve kurumlara ilişkin cinsiyete göre ayrıştırılmış verileri toplamayı, izlemeyi ve değerlendirmeyi önceliklendirmesi gerekmektedir. Araştırma esnasında, T.C. Sanayi ve Teknoloji Bakanlığı dahil pek çok kamu kurumunun programlarında cinsiyete göre ayrıştırılmış verileri toplamadığı ve izlemediği ortaya çıkmıştır. Bu tür verilerin varlığı, kurumların kadınların teknolojik girişimcilik motivasyonu, davranışları, karşılaştığı zorluklar, ihtiyaçlar ve mevcut fırsatlara ilişkin mevcut

tabloyu izlemesine ve belirli ihtiyaçlara yönelik programlar ve politikalar geliştirmesine olanak tanımaktadır. Bu aynı zamanda kuruluşların programlar sona erdikten sonra cinsiyet temelli etki değerlendirmeleri yapmasına da imkan sağlayacaktır.

Bunun yanında, devlet programları kadınların liderliğindeki teknoloji firmalarının büyümesi ve sürdürülebilirliği açısından kritik öneme sahip olduğundan, hibe ve finansman programlarının farklı ihtiyaçlar ve dezavantajlara sahip kadınlar için daha kapsayıcı ve erişilebilir hale getirilmesi gerekmektedir. Cinsiyet ayrımcılığı ve yanlılığının her aşamada ortadan kaldırılması için başvuru ve ödül süreçlerinin ilgili şikayet mekanizmalarıyla şeffaf hale getirilmesi önerilmektedir.

Öte yandan teknoloji sektöründeki kadınların cinsiyete duyarlı bankacılık yoluyla finansmana erişiminin desteklenmesi sadece doğru ve adil bir uygulama olmayıp, bankalar için mevcut fırsatlar göz önüne alındığında stratejik ve finansal bir öncelik teşkil etmektedir. Bankalar, toplumsal cinsiyete duyarlı bankacılığı hayata geçirerek, hem kendi iç kapasitelerini ve toplumsal cinsiyet eşitliği konusundaki farkındalıklarını geliştirmek hem de kadınlara anında hizmet veren yenilikçi kredilendirme yaklaşımlarını teşvik etmek açısından önemli bir fark yaratabilir. Cinsiyete duyarlı finansal ve finansal olmayan hizmetler sunarak, bankalar yalnızca kadınların liderliğindeki KOBİ'lerin toplumsal refahına katkıda bulunmakla kalmaz, aynı zamanda kendilerine pazar ve kapasite geliştirme olanağı sunarak finansal gelişim, yenilikçilik ve uzun dönemli vadeli sürdürülebilirliğin önünü açar. Bu yaklaşım, toplumsal faydayı aktif olarak destekleyen kurumlara giderek daha fazla değer veren müşterilerin, çalışanların ve düzenleyicilerin gelişen beklentileriyle uyumludur. Ayrıca, girişimcilik bankacılığı uygulamaları, teknoloji girişimcilerinin başlangıç aşamalarındaki temel zorluklarını ve ihtiyaçlarını anlayan özel bankacılık ekipleriyle uygulanmalıdır. Teknoloji girişimciliğinin kapsayıcı gelişimini teşvik etmek amacıyla devlet tarafından sübvansiyonlu krediler ve kredi garanti programları başlatılarak bankaların bu işletmelere yönelik risk iştahı artırılmalıdır.

Cinsiyet odaklı yatırım platformları, teknoloji sektöründeki kadınlara yalnızca ek finansal kaynaklar değil, aynı zamanda müşterilere ve ortaklara erişimlerini genişletebilecek etki odaklı yatırımcılar tarafından iş bilgisi ve ağları bulmaları için benzersiz fırsatlar sunmaktadır. Son olarak, etki odaklı fonların ve melek yatırımcı ağlarının genişletilmesinin yanı sıra, kasıtsız cinsiyet ve yaş önyargısını ortadan kaldırmak amacıyla mevcut yatırım ve risk sermayesi ağlarının toplumsal cinsiyet farkındalığını artırmaya yönelik programlar hayata geçirilmelidir.

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