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FACTORS EFFECTING FEMALE STARTUPPERS IN HUNGARY

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ABSTRACT. The present paper focuses on female startup founders in Hungary. Numerous studies examine female entrepreneurship, but the topic of female startups is a less explored area. The research was carried out in two stages: at first in 2019 through an online survey and in-depth interviews, and then in May 2021 with in-depth interviews due to the delays caused by the COVID-19 pandemic. Mixed research methodology was used and comprised of an online questionnaire administered in startup-themed closed social media groups (n=113) and in-depth interviews among experts and members of the ecosystem (n=7+7). The aim was to conclude how potential female startup founders could be encouraged and what form of support should be given to them, as well as to explore the effects of the Covid-19 pandemic on female startup entrepreneurs. The results show that 70 percent of respondents have their own business, these were set up by both sexes between the ages of 24 and 35. The respondents mostly use equity when starting their businesses. Although the proportion of women among startup founders is very low, a positive entrepreneurial attitude can be observed among them. The startup ecosystem is centralised in Hungary; it is only emerging in some major university cities outside the capital. The strengthening role of startup communities and social media is unquestionable. Furthermore, the results reveal limiting factors, especially complex ones hindering female start-ups, which can typically be traced back to family and social reasons. To overcome these obstacles governments should continue facilitating startup development. The pandemic was considered as an opportunity to promote new ideas and features, concentrate on design and fine-tune their startup businesses.

JEL Classification: J16

Keywords: female start-uppers, entrepreneurship, Hungarian start-up ecosystem, inhibitory and encouraging factors, impact of COVID-19

Introduction

The present paper focuses on the role and position of female startup founders in Hungary. Our aim is to fill a gap in the literature related to female startup entrepreneurs and to explore how potential female startup founders could be encouraged, what form of support

should be given to them and identify the effects of the Covid-19 pandemic on female startup entrepreneurs.

Entrepreneurship is one of the most important features of today's economy. The revolutionary changes in industry, technology and society in the 21st century mean that entrepreneurship is a viable way of life for women in many parts of the world, enabling them to achieve their personal goals, to maintain a high quality of life, to meet their needs and to efficiently utilise their skills and competences. Female entrepreneurs represent the fastest growing group within the entrepreneurship camp. Female entrepreneurs contribute to the output of national economies, largely by creating jobs and benefits, introducing innovations, and stimulating the markets.

As a result, in the first decade of the 21st century scientific interest in female entrepreneurship rose significantly, both in research and education. Although more and more women start their own businesses, most of them are undervalued according to Kariv (2013). Kariv (2013) contributes greatly to revealing the contemporary reality of female entrepreneurs by outlining the areas of female enterprises and the factors effecting aspects of female entrepreneurial life. She states that in the public eye the ideal entrepreneur is always a male, e.g., Bill Gates of Microsoft, Steve Jobs of Apple, Mark Zuckerberg of Facebook or William Edward Boeing of the Boeing Company. Schumpeter (1934, 1989) depicted entrepreneurship traditionally as a male domain, with the entrepreneur being described as the 'captain of industry'.

The method used in the present research was twofold: first, research relying on secondary sources was done in the area of female startups, and second, the primary research focused on an analysis based on a national survey, which included a questionnaire-based survey followed by in-depth interviews involving startup experts and startup entrepreneurs. Interviews were conducted firstly in 2019 and secondly in May 2021 to explore the impact of the Covid-19 pandemic on female startup entrepreneurs.

This study consists of the following parts: a literature review on startups, specifically female startups; an explanation of the twofold method used, namely the survey and interviews; and the third part presents the findings of the research and the conclusions.

The results presented in this study can contribute to the body of knowledge and help researchers, actors and decision-makers in the startup environment and in education.

1. Literature review

This literature review examines studies that focused on startups and female entrepreneurs. Several studies focus on female entrepreneurs (e. g. Bird & Brush, 2002; Kariv, 2013; Ranga & Etzkowitz, 2010; Lechman, 2019). Additionally, studies that looked at these two topics internationally (Potjanajaruwit, 2018; Start-up Genome, 2020; Kantis et al., 2020), in the European Union (Kollmann et al., 2015; Kollmann et al., 2016, 2017; Belás et al., 2015; Mauer-Steigertahl, 2018; Atomico, 2018; Durda & Ključnikov, 2019; Kozubikova et al., 2019; Dvorský et al., 2021) and regionally, like the Visegrad countries (V4) (Beauchamp & Skala, 2017; Beauchamp et al., 2018; Skala, 2019, 2020; Kézai, et al., 2020), were also explored. In regard to Hungary, only a small number of studies have researched the Hungarian startup environment. One of the very first international reports is from Kállay et al., (2016). Additionally, a case study was developed about the most well-known Hungarian Startup: Prezi (Mulloth et al., 2016). Further studies by Szerb et al., (2018), Jáki et. al, (2019), Molnár (2019), Jafarov (2020), Csákné Filep et al., (2020), Goreczky (2021) were analysed as well. Moreover, studies exclusively on female startups are scarce.

The Global Entrepreneurship Monitor (GEM) has been researching enterprises and publishing their findings since 1999 with detailed data collection and analysis. The 2012

GEM report estimated that approximately 126 million females started or restarted some kind of enterprises in 67 countries examined by the report. According to the GEM 2018/2019 report, for every 10 male enterprises there were 6 enterprises started by women (Bosma & Kelley, 2019). The fact that since 2016 GEM has been compiling a report exclusively for women's startups (Women's Entrepreneurship) underlines the importance of these enterprises. National and regional differences between female and male enterprises, as well as economic factors effecting differences and similarities between these enterprises is featured in the GEM Women's Entrepreneurship 2018/2019 report. The report defines the countries and regions where gender differences are significant, or less significant. The report also examines structural factors, such as demographics (age, education), location of the industry, segregation, average national income and the way that all of these have an effect on the economic environment for entrepreneurs and for investors. The report, featuring 59 countries, makes it possible to compare national and regional correlations.

Kariv (2013) who relies on several prior studies (Verheul et al., 2005; Gatewood et al., 2009) clearly states that women represent the fastest growing group among entrepreneurs, and even though they achieve important economic results, there is still very little literature on them. Kariv's goal was to reveal the unique aspects of female enterprises and to show how women fit into the process of creating an enterprise.

Research in the field of female entrepreneurship is limited in its focus. Basically, there are two main research topics: comparative studies aiming to eliminate differences between female and male enterprises, and research aimed at revealing the unique features of women's entrepreneurship.

1.1. Comparative studies (female and male startups)

Comparative studies are those studies that specifically aim to reveal the differences and similarities between female and male entrepreneurship. The earliest and, according to Web of Science, most cited paper is by Fairlie & Robb (2009). They investigated the performance of female-owned businesses, making comparisons to male-owned businesses in the USA. They found that "female-owned businesses are less successful than male-owned businesses because they have less startup capital, less business human capital acquired through prior work experience in a similar business, and less prior work experience in a family business" (Fairlie & Robb, 2009, p. 375).

Pisoni and Bielli (2015) studied innovative Italian and American tech startups. They wanted to establish the different characteristics between female and male founders and CEOs of tech startups. Their findings showed that female CEOs of tech startups are characterised by the same features as their male counterparts in that both sexes think that the groups they work with are important and both stressed the importance of leadership skills. The findings also presented significant differences in the area of funding. Female CEOs are more likely to use support from close friends, colleagues and family when starting their own companies. In the pre-seed stage all-female teams show very low negotiation skills, while mixed-gender startups were better at raising capital, especially from their own founders. Further differences between female and male startup entrepreneurs can be seen in the area of raising financial resources, where males exceed females.

A recent study (Johnson et al., 2018) concluded, based on prior researches, that female entrepreneurs are disadvantaged when compared to male entrepreneurs in regard to funding. Drawing on the Stereotype Content Theory, they developed a model of funder psychological biases and stereotype judgments that underlie crowdfunding decisions. "Their findings contribute to the gender gap literature in entrepreneurship because they demonstrate an alternative pathway for women entrepreneurs that may allow them to overcome the negative

aspects of gender bias and increase their odds of funding success. Because funding is a critical component for early-stage survival, the results should be seen as encouraging” (Johnson et al., 2018, p. 828).

Kuschel et al., (2018) compiled an online survey in Latin America to examine the characteristics of new top tech startups led by females and males. Their research question was whether female-led companies create new workplaces. Their findings confirm that both male-led (73 percent) and female-led (55 percent) startups create jobs. Their findings show that female founders increase expectations and the strategic vision of their companies in a similar way to males when they are in a similar business phase as their male counterparts. Analysis shows that the fundamental difference between groups led by females and males is the method they use to build their teams, both in terms of group size and diversity of genders. The fact remains that both types of startups create workplaces.

It is well known that there is a significant gender gap in high-growth entrepreneurship. Gompers & Wang (2017) examined the patterns of labour market participation by women and ethnic minorities in venture capital firms and as founders of venture capital-backed start-ups in the USA between 1990-2016. They found that in the United States only 10-15 percent of start-ups were founded by women. Similarly, Kollmann et al. (2016) examined in the second Startup Monitor that in Europe 14.5 percent of start-ups were founded by women. Several potential explanations have been proposed including gender differences in technical training or risk preferences (Bonin et al., 2007; Croson & Gneezy, 2009; Bertrand, 2011; Ewens & Townsend, 2019). Ewens & Townsend (2019) examined whether female entrepreneurs are at a disadvantage in raising capital due to their gender and if so, why. They discovered that the male-led start-ups in which male investors expressed interest in do not outperform the female-led start-ups they also expressed interest in – in fact they underperformed. In short, the evidence is consistent with gender biases.

Guzman & Kacperczyk (2019) examined in the USA the way in which a start-up’s attributes influence subsequent access to external funding. Their findings showed that women are much less likely than men to start new ventures. “They also detect a significant residual difference and provide evidence that, at least some of the gap, reflects investors’ biases and stereotypes about gender. Further, among comparable female- and male-founded ventures, this gap in funding diminishes significantly with a stronger growth orientation of a new venture” (Guzman & Kacperczyk, 2019, p. 1667).

1.2. Regional studies revealing characteristics of female startup entrepreneurs

There are a certain number of studies that aim to reveal characteristics of female startup entrepreneurs in a given region (e.g., Itani et al., 2011). They investigated female-entrepreneurship in the United Arab Emirates based on structured interviews. They drew a “profile of typical UAE women entrepreneurs, identified some barriers that women face at the start-up stage, and in addition to their entrepreneurial motivations and driving forces, satisfactions and frustrations” (Itani et al., 2011, p. 409).

Welsh et al., (2016) examined whether stages of economic development (SEDs) influence women entrepreneurs similarly in Canada, China, Egypt, Morocco, Poland, South Korea, and Turkey. “Findings show that the relationship between SEDs and family instrumental support (financial and organisational) presents an S shape, whereas that between SEDs and family moral support is an inverted S shape. Evidence confirms that the relationship between SEDs and personal problems follows an inverted U-shape, with personal problems increasing with SEDs to an optimal point, above or below which personal problems decrease. This study exemplifies the need for joined theory and practice to influence public policy worldwide” (Welsh et al, 2016, p. 4934).

Demartini (2018) examined start-ups in Italy, specifically whether the spur of innovative startups has provided an unprecedented opportunity for female entrepreneurship. They found that, as far as financial performance is concerned, innovative female-led startups do not lag behind male ones in terms of dimension, company profitability, efficiency, and financial management. However, findings confirmed that female businesses raise, on average, a lower amount of financial resources in comparison to men.

Antunes et al., (2020) research identifies traits or characteristics of the female management of start-ups' entrepreneurs. The specific objectives are: (i) to identify the trajectory of women up to their arrival to the project; (ii) to identify the leadership style and characteristics of entrepreneurs; and (iii) to present the barriers and limitations of performance.

Lipták & Veszélovits (2020) analysed the entrepreneurial willingness of women in Hungary using in-depth interviews. They found that women in Hungary have less of a desire to start a business than men, which is driven by individual factors and lower self-confidence and due to the regulatory environment and excessive bureaucracy.

The present study intends to reveal the characteristics and factors effecting female startupperers in Hungary.

2. Research method

The goal of this paper is to find the factors that have an effect on Hungarian startups, especially women startup entrepreneurs. It is an exploratory research. When selecting the research method, the authors of this study were aware of the limitations of certain methods. The aim was to eliminate, neutralise or minimise, as much as possible, any distortions related to different research methods, and to gain a wider view of the topic. Mixed-method approaches usually include research that use both qualitative and quantitative data (Babbie, 2021; Ghauri & Gronhaug, 2011). Consequently, the present study uses mixed-method research; in addition to analysing the literature, quantitative (surveys) and qualitative (in-depth interviews) research was conducted.

The research aims to support four hypotheses. These hypotheses are formulated in *Table 1*.

Table 1. Hypotheses of the research

	Hypothesis	Method
H.1	Following European trends, the age of Hungarian female startupperers is 25-34 in the starting phase.	Survey analysis
H.2	Entrepreneurial attitudes can clearly be identified in startups.	Survey analysis and in-depth interviews
H.3	The factors that present obstacles to female start-upperers are complex and are typically related to family and society.	Survey analysis and in-depth interviews
H.4	In addition to the clear negative impact, the COVID-19 pandemic has also had a number of positive effects on female startup entrepreneurs.	In-depth interviews

Source: *own compilation*

2.1. Online survey methodology based on questionnaires

A pilot survey was administered to startup entrepreneurs and mentors on 7 February 2019 at a startup event (Startup Szerda, organised by StarITup Győr). The survey consisted of 15 questions in all, with 8 closed-ended questions and 7 partially open-ended questions. Open-ended questions were employed in cases when it was not certain whether enough opportunities for answers were provided for the interviewees and deeper, more detailed information was required. The first 9 questions were for everyone interested in startups, the remaining questions were posed only to those already having a startup. The goal here was to separate those that showed interest in startups but were prevented from starting their own companies, from those that had already had previous experience in this area.

Based on the pilot survey a final online version survey was developed. The survey was conducted among startup entrepreneurs and members of closed Facebook groups of Hungarians interested in startups. The following closed Facebook groups were involved in the research: StartITupGyőr, an organisation for start-up enterprises that is involved in advertising, promotion, organising events and trainings; women start-up entrepreneurs that provide support to enter international markets; startup job seekers; and a group for startup jobs.

The finalised online survey was administered on 15 February - 1 March 2019 (113 people, 19 males and 94 females). In addition to analysing the findings of the survey, the following factors were also considered: demographic background; startup related information channels; and the proportion of female startupper, their age and work experience. Entrepreneurial attitudes, the obstacles and opportunities a startupper is presented with were also explored. In summary, this quantitative research was national but not representative. This can be seen from the fact that although males are over-represented in the sector, in this survey females were over-represented, which can be attributed to the topic and the venue where the interviewees were recruited. Since the number of respondents satisfies requirements for a mathematical-statistical analysis, substantive findings can be gained from this sample.

2.2. In-depth interviews methodology and sample

In order to gain a better understanding of the Hungarian situation, 7 (in 2019) and 7 (in 2021) semi-structured, personal, in-depth interviews were conducted, using the methodology of Babbie (2021) and Kvale (2007). Data collection occurred during experts interviews based on a syllabus. The syllabus did not prevent real interaction between the researcher and the respondent during these personal meetings. All 14 interviews aimed to explore and understand the respondents' knowledge, views, opinions and feelings, but at the same time it provided an opportunity for new, unanticipated points, which is important with regard to the novelty of the topic. Validity is the strength of qualitative research, making certain aspects and nuances tangible that remain hidden when using a survey.

2.2.1. Sample of the in-depth interviews conducted in 2019

The respondents were experts and members of the Hungarian startup environment. The research purposefully aimed to narrow the regional spectrum; Western Transdanubia was chosen for network reasons. Candidate selection relied on personal introductions at local startup events. The main criterion was to find actors of the startup environment from the widest possible circle. Table 2 summarizes the respondents of the 2019 interviews and their characteristics.

Table 2. Respondents of the in-depth-interviews in 2019

Expert	Gender	Position	Location	Sectoral Classification of Economic Activities (Hungarian Sectoral Classification of Economic Activities, TEÁOR'08)
1	Female	Representative of the chamber of commerce and industry	Győr	Chamber of Commerce and Industry
2	Male	Startup Network Founder	Győr	Enterprise development foundation
3	Male	Business Angel	Győr	Business Angel
4	Male	Startup Advisor	Budapest	Business Consulting
5	Female	Founder	Szombathely	5320 Other postal and courier activities
6	Female	Founder	Budapest	1089 Manufacture of other food products
7	Male	Founder	Győr	5829 Other software publishing

Source: *own compilation*

The first group of respondents represent those experts who are supporters of the startup environment. These experts are key figures in the local startup environment, who have backgrounds in organising trainings and events related to startups and they are also expert supporters of these events. The second group of respondents are members of the startup ecosystem, startup entrepreneurs. In total, four experts (one female, three males) and three startupper (two females and one male) participated. The interviews were aimed at giving a better understanding of the environment, problems, obstacles and motivations that female entrepreneurs encounter.

The relevant literature states that qualitative research can yield less reliable results because of the researchers own biases and distortions (Babbie, 2021; Ghauri & Gronhaug, 2011), so it was important that quantitative research be used in order to counteract these effects.

2.2.2. Sample and background of the in-depth interviews conducted in May 2021

The World Health Organisation announced that COVID-19 is a global pandemic on March 11, 2020 (WHO, 2020). “Much public attention since then is paid to the dangers of the economic and social crises, which we are facing as the result of the pandemic.” (Sady, 2020, p. 49)

On 11 March 2020, the European Commission launched a call for immediate funding of 164 million EUR for start-ups and innovative SMEs dealing with technologies and innovations to help combat, manage and test the Covid-19 epidemic (EC, 2020).

In Hungary, the National Office for Research, Development and Innovation with the support of the Ministry of Innovation and Technology, announced an online idea and startup competition called COVIDEA on 24 April 2020. The competition was open to all ideas and solutions that could help cope with new challenges in the difficult epidemiological, health and social situation regardless of industry/field (NKFI, 2020). All this proved how significant and timely the support and development of startup companies is (Kézai, 2020).

The impact of the pandemic on startups was examined in the Startup Crisis Report of Design Terminal (2020), which looked at 240 startups in 22 countries.

The focus of the present research is on Hungarian female startup entrepreneurs, so we conducted a survey in May 2021 in connection with the crisis. In the semi-structured interviews, we sought to find answers on how the crisis effected women’s startups. The

interviewees were members of the Hungarian startup ecosystem. When selecting our interviewees, we aimed to involve startup entrepreneurs working in different sectors. For selecting the appropriate interviewees, we relied on the network at online startup events and the snowball method. Table 3 summarizes the interviewees and their characteristics.

Table 3. Respondents of the in–depth interviews in May 2021

Expert	Gender	Position	Location	Hungarian Sectoral Classification of Economic Activities (TEÁOR'08)
1	Female	Founder	Mosonmagyaróvár	1624 Storage manufacture of wood products
2	Female	Co-worker	Budapest	6203 Computer operation
3	Female	Founder	Győr	7112 Engineering activities
4	Female	Founder	Pécs	6311 Data processing, web-hosting services
5	Female	Founder	Balatonszárszó	2571 Cutlery supply
6	Female	Founder	Budapest	5829 Other software publishing
7	Female	Startup Network Founder	Győr	Enterprise development foundation

Source: *own compilation*

3. Research and results

The following gives an overview of the findings of the survey and the in-depth interviews.

3.1. Findings of the online survey

84 percent of the respondents were women, and 16 percent were men. Since the research explored female startappers, it was important to get feedback from many female startappers, and for this reason the survey was distributed in national startup themed groups and female entrepreneurs were encouraged to participate. 53 percent of respondents were members of Generation Y (aged 23-38 in 2019), 43 percent of Generation X (aged 39-53 in 2019). 71 percent had university degrees. Based on their income levels, 60 percent were self-employed and 21 percent were employees. 91 percent use social media (Facebook, Twitter, Pinterest, etc.) as their primary source of information on startups, which is not surprising considering the fact that members of Generation Y are also called the first wave of the digital generation. 69.9 percent of the respondents have their own enterprises, funded typically between the ages of 24-35 by both females and males (this Hungarian trend is identical to the European trend). Many (40 percent of females, 35 percent of males) worked as employees at SMEs before starting their own businesses. The entrepreneurial attitude can be seen from the fact that 72 percent of males and 38.5 percent of women respondents said they would start a new business should their enterprise fail.

The constraining factors that effect women and men who consider starting a new business were also examined: next to lack of capital, familial and social factors were found. (48 percent of respondents without a business named lack of capital, while 25.8 percent said that lack of entrepreneurial knowledge prevented them from starting a business.)

Opportunities were also explored: 40 percent of females have a positive entrepreneurial example in their families, which helped them in their decisions to start an

enterprise. 26 percent of females described the startup community as helpful at the start. In Hungary 86 percent used own capital and 29 percent were supported by family and friends financially in starting their businesses. Other sources of financial help (e.g., business investors, state subsidies, capital from other investors) were not significant among respondents.

3.2. Findings of the in-depth interviews 2019

Experts of the in-depth interviews in 2019 agreed that the startup ecosystem in Hungary is centralised in Budapest, “where there are startup events and trainings everywhere, but the countryside has a long way to go” (Expert 1). The main hub in the countryside is Debrecen. In Győr, as in other regions of Hungary, startup communities are forming. “There is no startup ecosystem to speak of in Győr at the moment, but we are working on it” (Expert 2). Hubs are centred on innovation (e.g., universities) and a supportive business climate (e.g., chamber commerce and industry, coworking offices, incubator houses, business angels). Respondents unanimously agree that ongoing trends and efforts will result in a more developed startup culture with innovative females starting their own successful businesses in national and international markets.

The respondents also agreed that the proportion of women in the Hungarian startup environment is very low. “This is backed by the fact that the Chamber of Commerce and Industry in Győr-Moson-Sopron county’s Startup Club has only 1 female member” (Expert 1). “We consciously try to address women, we present a female success story at all our events” (Expert 2). The low representation of women in these enterprises can be explained by the fact that the main profile of most Hungarian startups is IT services. “In IT there are few women; there are very few female computer scientists. Thus, 14 percent is not surprising, I personally think it is too high” (Expert 4). “Those startups that can quickly enter the market using very little capital and rapidly become successful are typically from the IT sector. And this is due to male privilege” (Expert 6).

All respondents agree that in terms of opportunities and obstacles, there is no difference between those females and males who want to start their own businesses. “I don’t see any differences between women and men in starting their own companies. Everybody has to work hard for success, and gender makes no difference” (Expert 7).

Experts 3 and 6 see familial and social factors as potential obstacles for females: the importance and difficulty of starting a family, and finding the balance of work and family. Additionally, female risk aversion was also mentioned as an obstacle. “Women tend to play it safe; boldness and risk-taking is more characteristic of men. Startups are high-risk affairs, there is no seeing where you are headed, where the end is” (Expert 4). To conclude: the obstacles for female startupperes are complex, and typically are of a familial and social nature.

Education was named as the key factor in encouraging more women to start their own businesses. Children and young people have to attain economic and entrepreneurial skills in school. “Kids should get an inside view of what it means to be an entrepreneur or an employee, so that when they grow up, they can decide for themselves what it is they want to do” (Expert 2). Respondents also stressed the importance of presenting positive female examples. “If you want more women in this innovative sector, give us more positive female stories” (Expert 3). “These stories can reassure women that they don’t have to choose between the roles of a homemaker or female entrepreneur” (Expert 5).

Communication channels are important in the operation of organisations whose role is to support the starting of new business ventures, because if they cannot reach the target audience through traditional channels, then all trainings and events in the topic are of little use. The communication channels used by generations X, Y and Z differ markedly from

traditional channels (radio, TV, printed press). The young people of today live in a virtual space, so in order to be heard the proper channels have to be used, e.g., Facebook, Pinterest, and Twitter. “Supporting organisations can only succeed if they can get through to their audience” (Expert 1).

3.3. Findings of the in-depth interviews 2021

A report by Design Terminal (2020) reported that only 25 percent of respondents experienced a pandemic as an opportunity (Table 4), while the result of this research is that interviewees unanimously regarded a pandemic as an opportunity.

Table 4. The effects of COVID-19 pandemic on startups

Negatively	Positively
Loss of sales, orders are cancelled	More time to plan the product
Lack of personal meetings affect sales	More time and opportunities to pivot new ideas, features, etc.
Lack of new contracts, no new leads is sales	Time to concentrate on design
Drop in monthly recurring revenue	Possibility to fine-tune the roadmap

Source: own compilation based on Design Terminal (2020)

Similar to Design Terminal (2020), Kuckertz (2020) also stated that although the COVID-19 pandemic clearly caused rising levels of uncertainty worldwide for societies, economies and entrepreneurial activities, female entrepreneurs considered the positive and negative effects of crises.

According to the present study, interviewees highlighted, as an important positive impact, that they had more time to design, refine, rethink, and possibly reposition their product. “More time left for fine-tuning” (Expert 4). “We now have the time and focus to renew our design” (Expert 1). “We thought through our business model and our product” (Expert 3). “Without the epidemic, demand would have been too sudden, too much, and we would not have had time to develop our product/services. We would have lost a lot of orders, and in the contrary, we had time to improve” (Expert 5). “I see the pandemic inspiring people; everyone was looking for creative solutions despite their increased online presence” (Expert 7).

The impact of the pandemic can also be seen as positive impact namely the epidemic cleaned-up a large number of startup ideas. Viable startups survived and were assisted by venture capitalists, while non-viable startups did not receive post-financing” (Expert 3).

Interviewees also agreed with the world trend that women were more affected by the pandemic (Wenham et al, 2020). One reason for this is, according to Pratty (2020), women are more likely to have set up start-ups in industries more affected by the pandemic, such as retail, hospitality, and leisure. The other reason is that “invisible work” was largely the responsibility of the women, staying/working at home, e.g., maintaining the cohesiveness of the family and overseeing digital education.

Interviewees also agreed that the impact of the pandemic on domestic and international startups varied by sector. They also agreed that the winners of the epidemic were IT startups, healthcare (medtech and healthtech) startups, e-commerce and logistics, and digital education startups in connection with working from home. The big losers were the tourism and hospitality sectors, Expert 6 stated, "But if they reacted in time, they could have survived".

Furthermore, the interviewees were asked to give a message to future startup entrepreneurs. Responses to this included, “female startup entrepreneurship is a way of life” (Expert 2); “there is no weekend and working hours never expire” (Expert 3); “You just have to do it, and if something fails, you have to stand back up!” (Expert 1); and Expert 5 summed it up with "Many times a lot of the work behind the results is not visible!"

4. Discussion

Based on the answers of the survey and the opinions of interviewees, all four hypotheses were verified (*Table 5*).

Table 5. Results of hypothesis testing

	Hypothesis	Verification method	Result
H1	Following European trends, Hungarian female startappers are aged between 25-34 in the start of their businesses.	Survey analysis	Verified
H2	Entrepreneurial attitudes are identifiable in startups.	Survey analysis and in-depth interviews 2019	Verified
H3	The obstacles for female startappers are complex, typically of a familial and social nature.	Survey analysis and in-depth interviews 2019	Verified
H4	In addition to the clear negative impact, the COVID-19 pandemic has also had a number of positive effects on female startup entrepreneurs.	In-depth interviews 2021	Verified

Source: *own compilation*

The first hypothesis proposed that, similar to European trends, the age of Hungarian female startappers falls between 25-34 years. The data drawn from the survey supported this claim that 50 percent of the respondents belong to this cohort, the early adult age that is specified by a focus on work and career. As the European Startup Monitor (Kollmann et al., 2016) states: “The startup founders featured in the European Startup Monitor began their operations between the ages of 24-35”. As result of the study, it can be established that the first hypothesis was verified in the sample provided.

The second hypothesis proposed a correlation between entrepreneurial attitudes and startups. This hypothesis is verified by the answers in the survey and the in-depth interviews 2019. For item 15 on the survey, “What would you do in the event of the startup’s bankruptcy?”, the answer, “I would try it again with a new startup”, was given by 72 percent of males and 38.5 percent of females. The 2017 German Startup Monitor (Kollmann et al., 2017) posed the question: “What would you do in the event of your current startup’s failure?”, 2 out of 3 respondents said they would begin a new startup (63 percent would start a new business; 20 percent would continue as an employee; 12.2 percent would continue work as a freelancer; 3 percent would continue as business angels or investors; 1.1 percent would not continue working). The in-depth interviews also corroborated the finding that startups require an entrepreneurial attitude in order to be successful. This leads to the verification of the second hypothesis, the identification of entrepreneurial attitudes in startups.

The third hypothesis proposed that the obstacles for female startupperes are complex, typically of a familial and social nature. This hypothesis was verified by the sample provided by the survey and the answers given in the in-depth interviews. The obstacles are complex and it starts with money (insufficient capital and fear of risking family savings) and it is compounded by both familial and social reasons (the fear of not having support of their families, friends and spouses); furthermore these obstacles apply to both genders at the start of their businesses.

The fourth hypothesis, based on the Design Terminal (2020) study, that the pandemic, despite its many negative effects (e.g., the loss of orders and the loss of travel opportunities), also had a number of positive effects was verified, as well. While only 30 percent of respondents in the questionnaire perceived a positive impact as a result of the pandemic, interviewees unanimously agreed that the “lockdown” caused by the Covid pandemic on the one hand was primarily an opportunity for them to rethink and refine their products and services. On the other hand, they mentioned a further benefit that there was a cleansing in the market.

Conclusion

This aim of this study was to present the status of female startupperes and to explore the contemporary Hungarian startup ecosystem and the effects of the Covid-19 pandemic. This study tries to fill a gap in the Hungarian literature that was created by a shortage of findings in connection with women’s startups. This paper sets forth a picture of the Hungarian startup ecosystem and provides a chance to understand the factors effecting female startupperes.

The proportion of women within the Hungarian startup ecosystem is very low. The respondents of the in-depth interviews explained that this phenomenon is because most startups are in the Hungarian IT service sector and the majority of the actors in it are male; thus women are heavily underrepresented. The respondents all agree that there are almost no differences between female and males with regard to opportunities and barriers when starting a new business. The only differences mentioned were the social and familial reasons related to female roles. Therefore, the role of education and positive role models were emphasised as factors that can encourage women in their choice of becoming a homemaker and a startup entrepreneur at the same time. Startup Hungary (2020) highlighted this as well when they stated, “The key lies in the lack of positive examples and a global focus on the ‘WHY NOTS.’” (Startup Hungary, 2020, p.14)

The findings of this study are consistent with the results of the Global Gender Gap Report of 2020, according to which the key to female startups is the availability of opportunities, a high-quality education and participation in the economy. In addition, more women studying technical subjects and IT could mean a real breakthrough. The Crunchbase database (2020) shows that Hungarian startups are most active in the IT sector. Another similarity in the findings of Global Gender Gap Report and in this study is that in their traditional roles (e.g., caring for ill or elderly family members) women are faced with an inadequate healthcare structure. Along with Gregor and Kováts (2018), this study found that the factor most likely to obstruct life choices of females is the tension between care and work.

Both the Global Gender Gap Report and an Italian research (Pisoni & Bielli, 2015) found significant differences between male and female CEOs’ opportunities for raising capital. The present research also gives evidence that female CEOs at the start of their businesses tend to utilise their own capital and the financial help of family and friends in lieu of venture capital.

Analysis of the literature and the findings of this study both show a gender inequality in Hungary and in Europe with 80 percent male and 20 percent female participation in

startups. According to Startup Hungary (2020), only 29 percent of startups have a female founder while only 12 percent have a female CEO.

In conclusion, stakeholders and important organisations in the startup field have a definitive role in supporting startup communities and operating the communication channels through which the target audience members of Generations X, Y and Z can be reached and where positive examples can be shown. In addition, political decision makers and a nationwide educational policy (supporting the introduction of entrepreneurial studies, increasing the number of science subjects, and orienting girls to towards IT and technical subjects) play an important role along with business support programmes that help enterprises; and they will be responsible for changing the persisting male stereotype of what is a successful entrepreneur (Eddleston et al., 2016). Governments should be interested in formulating policies that encourage women to take a more active part in economic life (Kharlamova & Stavtyskyy, 2020; Stavtyskyy et al., 2020).

Startups are considered key actors of the economy in Hungary, as well as internationally. They are engines of change that encourage multinational corporations to begin their own startups. Although the European Startup Monitor was only first published in 2015, the need for global, regional (e.g., V4) and national databases is growing rapidly, which could facilitate scientific research at a scale this topic deserves.

Although the research in this study provides a nationwide sample, the experts of the in-depth interviews in 2019 and 2021 are all tied to Central- and Western Hungary, a fact that imposes certain limits on this study. The research sample thus cannot be taken as representative, rather it can be seen as regional. On the basis of the aforementioned similarities the questions, opportunities and barriers are not to be taken as regional phenomena only. For this reason, the findings of this study can be useful in other regions or countries. However, caution should be exercised in making any further conclusions due to the low number of sample size.

These limitations signal a growing need for further research in Hungarian female startups if they are to be understood in detail. This topic could facilitate interesting branches of research in the future. On the one hand, the unique features of women's startups could be explored, and on the other hand the different financing opportunities employed by female startups (e.g., community financing), along with regional differences and their causes.

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