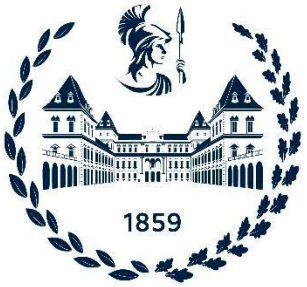

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Female Entrepreneurship and Startup Survival: A Territorial Analysis in Northwestern Italy

The Effects of Care Service Density and the Presence of Immigrant Women in Local Labour Systems

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Abstract

Female entrepreneurship is becoming increasingly important in the economic landscape, but women-led startups continue to face structural, economic and social barriers that impact their long-term growth and survival. This study aims to analyze the factors that influence the durability of women-led startups, with a focus on two key elements: the density of care services and the presence of immigrant women. The initial hypothesis is that both can have a positive impact on the survival of female-led businesses, helping to facilitate work-life balance and fostering the creation of a more inclusive business environment. The analysis focuses on the 2018-2019 biennium, a period immediately preceding the COVID-19 pandemic, characterized by a phase of transition and economic uncertainty. This allows us to observe how these factors influenced entrepreneurial dynamics without the interference of the effects of the health crisis. In addition, the study also considers male startups in order to compare the impact of the analyzed variables on different entrepreneurial realities.

The findings offer relevant insights for academia, providing a critical perspective on policies to support women's entrepreneurship. At the same time, the implications of this research are of interest for rethinking strategies to support women's startups, giving greater priority to access to finance and strengthening entrepreneurial networks, rather than focusing exclusively on welfare and social inclusion measures.

Introduction

In recent years, entrepreneurship has become a key driver of economic and social development, contributing significantly to technological innovation, job creation and economic growth, both locally and globally. In particular, innovative startups play a key role in this process, representing a meeting point between creativity, technological progress and market dynamics. However, despite progress toward greater gender equality, women still remain underrepresented in the entrepreneurial world, especially in high-tech and innovation sectors. This imbalance is the result of a combination of structural, cultural, and social barriers, including difficulties in accessing finance, managing family burdens, and lack of support services, which limit the full development of women's entrepreneurial potential (Brush et al., 2019). Women entrepreneurs face specific obstacles in the management of innovative startups, such as difficulties in obtaining financial resources, implicit discrimination in the investment market, and a persistent inequality in the distribution of family care burdens (Marlow & Swail, 2014). In many cases, these obstacles are partly mitigated by the availability of support services that include both public facilities and work done by immigrant women in low-skilled sectors, such as domestic helpers and babysitters. This type of employment plays a crucial role in freeing up time and resources for Italian women, enabling them to undertake or maintain entrepreneurial activity. In this context, this thesis aims to analyze the role of women entrepreneurs within innovative startups in Italy, with a specific focus on the Northwest of the country, particularly Lombardy and Piedmont, two areas characterized by a strong concentration of economic and entrepreneurial activities. The main objective is to understand how spatial factors, the availability of care services and the presence of female immigrant workers influence female entrepreneurship. The analysis will be conducted using Local Labor Systems (LFS) as the spatial unit, which represent a geographical unit based on real socio-economic dynamics and not on traditional administrative boundaries. This approach allows for a more in-depth exploration of the interconnections between the labor market, entrepreneurship and access to support services. The decision to focus on SLLs is motivated by the fact that these territories offer a more accurate representation of the interaction between the economic and entrepreneurial environment, allowing for an analysis of how the presence of support services (for children and elderly) and the percentage of immigrant women employed in these sectors influence the duration and characteristics of innovative startups led by women. The empirical analysis will be based

on data from various official sources, including the Business Register, ISTAT and local databases, integrating information on innovative startups, migration flows and care services. Through the use of statistical models, key relationships between spatial factors and female entrepreneurship will be identified, paying particular attention to the survival of startups in the pre-COVID-19 period (2018-2019). The paper is organized into five chapters:

Chapter 1 - Introduction: presents the research topic, rationale and objectives of the study.

Chapter 2 and 3- Literature Review: analyzes existing studies on women's startups, referring to academic research, including that of Professor Cortes, and explores the role of spatial and socio-economic factors in women's entrepreneurship.

Chapter 4 - Methodology: describes the research approach adopted, the choice of Local Labor Systems as the unit of analysis, and the regression model used to analyze the relationships between startups, spatial factors, and the presence of services.

Chapter 5 and 6 - Results of the Analysis: presents the data collected, analyzes the spatial distribution of women's startups, and delves into aspects such as social capital, legal form and business sector

Chapter 7 and 8 - Conclusions and Implications: summarizes key findings, discussing implications for policy makers and scholars, limitations of the research, and possible directions for future studies.

This research aims to make a significant contribution to the debate on women's entrepreneurship by offering an analysis based on quantitative data and proposing useful reflections for designing strategies to support women-led startups. In particular, the analysis will provide insight into whether care services and the presence of immigrant women are really determinants of the survival of women-led startups or whether other factors, such as access to finance and market structure, have greater weight.

2. Background Literature

2.1 Innovative Startup: Definition

First, to address the topic of this thesis, we need to have a deep understanding of what is meant by "startup." If we go to look up this term in the dictionary we will find the following definition: " *a small business that has just been started*" (*Cambridge Dictionary*).

What is an innovative startup? In its earliest economic meaning, startup referred to the initial stage of a new venture in the Internet or information technology; later the term became established in other fields and entered the financial dictionary. Today the term start-up is also used to refer to a early-stage enterprise with a strong innovative connotation, founded by one or more investors to develop a unique product or service aimed at bringing it to the market.

It is essential to establish a broader exception of what is meant by this term. To do this, it is important to analyze the various definitions used by researchers. Next we will also go on to analyze what are the main characteristics that define a startup.

Analyzing the contemporary literature, we can see different definitions for this term:

- *"Is a temporary organizations that create innovative products and/or services using high technology, but this type of companies are also known to be inserted in uncertain and risky scenarios."* (Cho and McLean, 2009). This first concept is related to the idea that a startup is characterized by innovation, but at the same time by risk and uncertainty.
- *"A startup is a new and temporary company that has a business model based on innovation and technology8. In addition, these types of companies have a potential for rapid growth and scalability."* (Krejci et al, 2015). This second definition highlights how a startup is not only characterized by risk, innovation, and technology, but also by growth. "It is designed to grow fast," as Graham also defined in 2013.
- *"A startup that has been established for no more than 60 months as well as having as an object social and prevalent innovative products and/or services*

with high technological value, is considered 'innovative' " (P. Paoloni & G. Modaffari, 2018)

2.2 Innovation as a Driver of Economic and Social Development

But what is meant by innovation?

Innovation is a multidimensional concept involving technological, economic and social transformations. In a concrete sense, it is defined as *"Any novelty, change, or transformation that radically alters or otherwise causes an effective de-escalation in a political or social order, in a method of production, in a technique"* (Treccani).

In particular, Schumpeter (1934) introduced the idea of innovation as the driving force behind economic development, defining it as the ability to introduce new combinations of products, production processes, markets or organizations. In the contemporary context, innovation is often associated with digitization and the transition to sustainable patterns of production and consumption.

According to the Observatory on European Innovation (2022), "innovation" can be defined as *"un processo sistemico che coinvolge la creazione, l'adozione e la diffusione di nuove idee, tecnologie e pratiche che migliorano l'efficienza e la produttività delle organizzazioni, apportando benefici tangibili alla società".* This definition emphasizes the relationship between technological advances and social impact, highlighting how innovation can help solve global challenges, for example climate change and economic inequality.

In Italy in particular, innovative startups play an important role in promoting innovation. These high-tech companies represent not only an opportunity for economic revitalization, but also a means of attracting investment and creating skilled employment. According to data from the Ministry of Business and Made in Italy (2022), innovative startups have contributed to the creation of more than 15,000 highly skilled jobs in recent years, with a significant concentration in the areas of technology, environmental sustainability and digitalization.

Innovation is not limited to the economic sphere; it also has a profound social impact, bringing benefits to our community as well. Indeed, it can contribute to reducing

inequality, improving access to essential services and promoting community well-being. According to the OECD[1] (2021), social innovation is defined as *"the implementation of new and sustainable solutions to address social needs, often in collaboration with local communities".*

[1] Organization for Economic Cooperation and Development (OECD) was established on December 14, 1960 by the Convention on the Organization for Economic Cooperation and Development. Entering into force on Sept. 30, 1961, the OECD replaced the Organization for European Economic Cooperation (OECE), created in 1948 to administer the so-called "Marshall Plan" for the postwar reconstruction of the European economy. From the initial 20 countries, including Italy, the founding country, today the OECD consists of 38 member countries (updated as of April 28, 2020)
https://www.dt.mef.gov.it/it/attivita_istituzionali/rapporti_finanziari_internazionali/organismi_internazionali/ocse/

2.3 Italian Framework

2.3.1 Regulatory Framework

It is now important to go on to analyze what are the necessary characteristics to be able to define a "startup.[2]"

The concept of innovative startup was introduced in Italy with Decree Law No. 179/2012 (so-called Growth Decree 2.0), converted into Law No. 221/2012, in order to incentivize the creation of innovative companies and support youth employment, promoting the technological and economic development of the country. In fact, in order to obtain Innovative Startup status and special registration in the Companies Register, a company must meet specific requirements set by the regulations.

All corporations, including cooperatives (S.p.A., S.r.l., simplified S.r.l.) are eligible for innovative startup status. However, partnerships are not eligible[3]. Among the main requirements, the company must:

1) Be based in Italy, an EU member state or a European Economic Area member state, with at least one production site or branch in Italy.
2) Not have distributed profits; for new companies, profits cannot be distributed for 4 years.
3) From the second year of operation, it must not exceed an annual production value of 5 million euros.
4) Must not derive from extraordinary transactions such as mergers, demergers or business disposals.
5) The main activity must be in the development, production or marketing of innovative products or services with high technological value.

In addition to having all of the above characteristics, the innovative startup must have at least one of the following additional requirements:

[2] https://www.mimit.gov.it/it/impresa/competitivita-e-nuove-imprese/start-up-innovative
[3] https://www.registroimprese.it/start-up-innovative

1) R&D expenses must represent at least 15 percent of the greater of cost or value of annual production. This includes expenses for prototyping, industrial plans, dedicated research staff, and intellectual property protection.
2) Personnel must be qualified: At least 2/3 of the team must have a master's degree, or 1/3 must be Ph.D., Ph.D. or graduate students with 3 years of certified research experience.
3) Must have possession of at least one industrial patent related to an industrial, biotechnological invention, patent or right on registered computer programs related to the startup's business.

To maintain innovative startup status, it is necessary for the company to send a Notice of Maintenance of Innovative Startup Status to the Chamber of Commerce once a year. The loss of one or more of the requirements listed above, or failure to send the Maintenance Notice, will result in the forfeiture of innovative startup status.

2.3.2 Investment incentives

Innovative startups enjoy a facilitative regime introduced by Decree-Law No. 179/2012, later supplemented by Decree-Law No. 3/2015 and Decree-Law No. 73/2022. These measures aim to support the development and attractiveness of innovative companies, encouraging investment, administrative simplification and access to credit.

The main initiatives to support innovative startups in Italy are characterized by various programs and tools. These include the *National Venture Capital Program*, which is an important measure aimed at promoting the growth of companies with high innovative potential. Fueled by public resources and managed by *Cassa Depositi e Prestiti* (CDP), this program allows for both direct and indirect investments in the venture capital of innovative startups and SMEs, focusing in particular on strategic sectors for the national economy.

The National Innovation Fund also offers support through direct investments in startups, such as the acquisition of qualified minority stakes, or indirect investments, through subscription to venture capital funds managed by third parties. Several specific funds operate through this program, including *Italia Venture I,* aimed at the best Italian startups, and *Italia Venture II - Fondo Imprese Sud*, which supports business development in the Mezzogiorno. Other funds, such as *FOF Venturitaly*, the *Accelerators Fund* and the

Technology Transfer Fund, are tasked with developing acceleration networks, promoting technological innovation and supporting the growth of the venture capital ecosystem.

A further pillar of initiatives in favor of startups is the internationalization activities taken care of by the ICE Agency (*National Institute of Foreign Trade*). The latter provides regulatory and tax assistance to innovative companies while facilitating their free participation in relevant international fairs and events. In addition, the agency organizes meetings between startups and potential investors, with the aim of facilitating access to capital in the early and expansion stages.

On the subject of personnel management, innovative startups enjoy greater flexibility in setting salaries. In addition to the fixed part, which cannot be lower than the contractual minimums, it is possible, in fact, to agree on a variable component linked to productivity, goals achieved or other performance parameters. Startups can, in addition, use tools such as stock options or the sale of company shares to incentivize staff.

From a crisis management perspective, innovative startups benefit from simplified procedures for settling economic difficulties, avoiding bankruptcy. In fact, they are subject to a special regime that allows them to deal with crisis while maintaining, where possible, business continuity.

Finally, the Smart&Start Italia facility supports the creation of innovative startups through subsidized financing, which can be partially converted into outright grants in the case of investments by qualified or regulated entities. Additional facilities are provided for women's startups, partly financed with resources from the National Recovery and Resilience Plan (NRP). This set of measures constitutes a favorable ecosystem for the birth, growth and internationalization of innovative companies in our Country.

2.3.3 Financing Methods

One of the main obstacles for a startup is the availability of the necessary capital for its startup and development. Difficulties often arise from the high need for upfront investment and the delay in acquiring revenue. Traditional funding channels, such as banks, tend to require guarantees that are difficult to obtain, forcing many startups to seek alternative sources of funding. The following chapter will look at the main modes of financing available to startups, dividing them into two categories: equity financing, which involves the entry of new shareholders into the capital stock, and debt financing, based on loans to be repaid over time.

Equity financing

Equity financing involves the entry of new investors into the startup's share capital, increasing the available financial resources but also partially diluting the original ownership. The main equity instruments include:

- **Bootstrapping:** Startups often begin with personal or founders' funds. This method is often used in the early stages, where access to outside capital is limited. Although it provides complete control over the company, self-funding can limit the ability to invest in growth and technology development.
- Family, friends and “crazy people”: the so-called **3F**s, are also among the top sources of funding for startups. This option certainly has numerous advantages including shorter time to obtain, the guarantee of maintaining ownership over the startup, flexibility, and the fact that it can be obtained without special guarantees, as investors personally know the founders of the company and have confidence in their entrepreneurial abilities. However, this option can also be risky as the mix of money invested and personal relationships can cause tension. This method of financing together with the previous one is a useful way to overcome the so-called “*valley of death*,” that is, the period when the startup still fails to generate enough revenue to cover its costs.
- **Angel Investors**: these are often managers or investors who have a lot of capital and decide to make it available to innovative small businesses in exchange for an equity stake. This type of investment is characterized by some positive aspects, such as the timing of obtaining financing and the provision of their expertise.

However, there are also some downsides, such as the loss of some corporate control and their limited investment of money. In fact, before making the investment they evaluate the 3Ts: Team , in that the idea is worthwhile, but it is much more important to evaluate who is working on it and the execution of the startup; Traction, because one has to make sure that someone is willing to pay for the product/service offered; Technology, because it is important to have a competitive advantage that few others replicate.

- **Venture Capitalists**: these are financial companies, specializing in investment, which invest larger sums in later stages than the initial ones, often in fact requiring more structured corporate governance. According to Crunchbase (2022)[4], 60 percent of startups that obtain venture capital funding succeed in reaching a sustainable growth stage. However, one of the definitely negative aspects of this type of investment is the loss of some corporate control, in particular, the greater the injection of money by venture capital, the greater the loss of control over the startup.
- **Equity Crowdfunding**: This mode allows startups to raise funds from a large number of small investors through online platforms. It is especially useful for companies with strong public appeal.
- **Private Equity**: consists of direct investments in unlisted companies with the aim of increasing their value and making a profit when they are sold in the future. These investments are generally targeted at established companies that need capital to expand, restructure, or address other strategic needs. According to Kaplan and Strömberg (2009), private equity plays a significant role in improving the governance and performance of investee companies by bringing in managerial expertise and financial resources. The Italian private equity market has experienced significant expansion in recent years. In 2023, the total value of investments reached 20.2 billion euros, up 18 percent from the previous year. The number of deals closed rose to 471, marking a year-on-year increase of 7 percent. The sectors that attracted the most investment were ICT (25 percent of the total), followed by industry and manufacturing (22 percent) and financial services (15 percent)[5] . Northern Italy confirmed its position as the main driver of the Italian private equity

[4] https://capitalventureconsulting.com/finanziare-una-startup/
[5] Private equity in Italia: situazione, analisi e dettagli di tutti i principali operatori

market, attracting more than 90 percent of the deals closed in the last six months . This trend reflects greater confidence in the market's ability to support large strategic deals.

- **Initial Coin Offering**: is an innovative method of fundraising based on blockchain technology[6], in which a company issues digital tokens to finance new projects or services. Investors purchase these tokens in the hope that their value will increase with the success of the project. However, ICOs have high regulatory and operational risks. Fisch (2019) points out that the absence of clear regulation and the possibility of fraud pose significant challenges for investors. In addition, authorities in several countries have issued warnings regarding the potential dangers associated with ICOs, emphasizing the need for thorough due diligence before participating in such ventures. It is critical for investors to carefully assess the opportunities and risks associated with each method, considering the regulatory implications and robustness of proposed projects. In Italy, ICOs have attracted interest as an alternative method of fundraising, especially in the innovative startup scene. However, their diffusion has been limited due to regulatory uncertainties and the risks associated with this tool. *Consob* has launched public consultations on the possible regulation of "initial offerings of crypto-assets," creating the conditions for the regulation of a fragmented sector . Despite these initiatives, ICOs remain a less widely used mode of financing than other more traditional forms.

Debt Financing

Debt financing involves obtaining financial resources through loans that must be repaid over time with the addition of interest. This type of financing makes it possible to raise funds without giving up shares in the company, but it carries the burden of repayment and interest payments. The main forms of debt financing are:

- **Minibonds**: represent bonds issued by SMEs to obtain funds without resorting to banks, thus reducing dependence on bank credit. (Bertoni, Colombo & Quas, 2019). This form of financing was introduced by the Development Decree (Decree

[6] "Blockchain (literally "blockchain") leverages the characteristics of a computer network of nodes (i.e., computers in the network having a copy of the Blockchain ledger) and allows a ledger containing data and information to be managed and updated in an open, shared and distributed manner in a unique and secure manner without the need for a central control and verification entity."*https://blog.osservatori.net/it_it/blockchain-spiegazione-significato-applicazioni*

Law No. 83/2012, Art. 32 paragraph 26), converted with amendments by Law No. 134/2012, and subsequently supplemented by further legislation, thus expanding the financing possibilities for Italian SMEs. Companies with a turnover of more than two million euros, at least 10 employees and, in the case of limited liability companies (S.r.l.), bylaws that provide for the possibility of issuing debt securities, with financial statements certified by an external auditor, can issue these securities.

- **Convertible bonds**: represent debt instruments that can be converted into equity shares when certain conditions are met. This instrument allows companies to obtain initial financing in the form of debt, with the possibility for investors to become shareholders in the future. In the Italian legal system, the issuance of convertible bonds by S.r.l. is restricted, requiring subscription by institutional investors, as provided by Article 2483 of the Civil Code. Convertible notes, on the other hand, are financial instruments that originated mainly in the U.S. venture capital market and find no direct correspondent in Italian law. These are bonds that provide for the possibility of repayment of the invested capital or conversion into shares or units of the company upon the occurrence of specific conditions.
- **Mezzanine debt**: represents an intermediate form of financing between traditional debt and venture capital (equity). This instrument is used to finance growth or restructuring operations, offering higher returns than traditional debt, but also involving greater risk.
- **Lending-Based Crowfunding**: also known as social lending, it consists of the provision of loans to businesses or individuals through online platforms, with payment of interest and repayment of the capital lent. In Italy, this form of financing is regulated by the Bank of Italy, which has issued specific regulations for social lending platforms, ensuring transparency and protection for investors. The basis of the lending crowdfunding model is Article 1813 of the Civil Code, which expressly states, *"the contract in which one party delivers to the other a specified quantity of money or other fungible things and the other party undertakes to return as many things of the same kind or quality,"* with the addition of interest, as stated in Art. 1815 of the Civil Code if the contract provides for it. Another regulatory reference governing lending crowdfunding is Resolution No. 586 of 2016 issued by the Bank of Italy with the Regulation on how non-bank entities can

collect savings. In it, lending crowdfunding is defined as social lending and represents *"an instrument through which a plurality of individuals can apply to a plurality of potential lenders, through online platforms, for reimbursable funds for personal use or to finance a project."*[7]

- **Invoice Trading**: represents the transfer of trade invoices to investors through online platforms and to obtain immediate liquidity in return. This tool allows companies to improve working capital management without resorting to traditional bank factoring. In Italy, invoice trading has developed thanks to the spread of fintech platforms[8] that facilitate the matching of supply and demand for liquidity.
- **Direct Lending**: is a form of financing that represents the direct provision of funding by non-bank entities, such as alternative investment funds, to businesses or individuals. In Italy, direct lending was regulated by Decree Law 18/2016, which established the operating procedures for lending by Italian and foreign AIFs. This form of financing offers businesses an alternative to traditional bank credit, expanding the possibilities of access to capital.

[7] https://www.rendimentoetico.it/p/lending-crowdfunding

[8] This term refers to "financial innovation made possible by technological innovation, which can materialize in new business models, processes or products, producing a decisive effect on financial markets, institutions, or service offerings." http://www.fsb.org/2017/05/fintech-credit-market-structure-business-models-and-financial-stabilityimplications/

	Bootstrap Pre-Seed	Seed	Start UP/early stage	Early Growth	Sustained Growth	Exit
Who	You, family, friends and fools	3F Business Angel Banks and Public Funding	Business Angel VC Crowfunding Banks and Public Funding	VC Crowfunding Banks and Public Funding	VC Crowfunding Banks and Public Funding	
How	0-10k Eur	100-500k Eur	100-500k Eur	Serie A: 500-10M Eur Serie B: 10-100M Eur Serie C,D E: 100M Eur or more		
What to spend on	Validate the idea and the market	- Validate the market - Develop a MVP	- Refine the MVP and find product-market fit - Create a Business Model - Acquire customers Hire STAFF	- Refine the Business Model - Hire STAFF - Develop a market plan, commercial strategy, develop products, new markets…		

Figura 1: Summary on financing methods for innovative startups during different stages of startup life

2.3.4 Incubators and Accelerators

There are also other forms of financing that we can include in this list, different from those previously mentioned, debt and equity. In fact, we can mention **Public Financing**: The Italian government offers tools such as the *National Fund* for Innovation and the previously mentioned *Smart&Start Italia* program, which offer subsidized financing and grants. **Incubators**, which are not really a method of funding a startup, however are included in this list as they are a useful method of accessing investment. **Accelerators**, which unlike the method just mentioned, invest directly in the startup.

Certified Incubators in Italy

Certified incubators are a key way to support the development of an innovative startup, offering strategic support and contributing to the country's economic development. Their certification, regulated by the *Ministry of Economic Development* (MISE), ensures high standards of support and services to startups. A certified incubator is a facility that provides startups with a range of services essential to their development, including:

- **Physical space**: provision of offices, laboratories, and infrastructure needed for startups' operational activities.

- **Consulting services**: assistance in areas such as business management, marketing, legal and tax aspects.

- **Access to funding**: support in seeking capital through investor networks and participation in public calls for proposals.

- **Networking**: making connections with other companies, academic institutions and research centers.

The MISE certification certifies that the incubator has the skills and resources necessary to offer effective support to startups, meeting specific criteria such as:

- **Proven experience**: demonstration of solid experience in supporting innovative businesses.

- **Adequate facilities**: availability of space and infrastructure suitable for the needs of startups.

- **Qualified services**: provision of specialized services in line with the needs of incubated businesses.

Academic studies have highlighted the importance of certified incubators in supporting the startup ecosystem. According to an analysis published in "The Journal of Technology Transfer," incubated companies show higher survival rates and faster growth than non-incubated ones. In addition, the research points out that the quality of services offered by certified incubators is directly related to the success of startups. An emblematic example of a certified incubator in Italy is *VEGA - Science and Technology Park of Venice*. Founded in 1993 in Porto Marghera, VEGA was created with the aim of converting a declining industrial area into a technological innovation hub. In 2012, the business incubator VEGAinCUBE was established, which received certification from the MISE in 2013. Currently, VEGAinCUBE is the home of numerous startups operating in areas such as information and communication technologies (ICT) and the green economy.

The strategic importance of these elements lies in the fact that they foster economic growth through:

- **Reduced failure rate**: by providing support and resources, startups increase the likelihood of success.
- **Job creation**: startups generate employment, contributing to local development.
- **Diffusion of innovation**: they promote the spread of new technologies and business models.
- **Attraction of investment**: a vibrant ecosystem attracts national and international capital.

According to a report updated in March 2025 by the *Ministry of Business and Made in Italy*, there are 64 certified incubators in Italy, distributed as in the graph below, from which it can be seen that most of the incubators are located in northwestern Italy, particularly in Lombardy there are 13 and in Piedmont 5, representing 30 percent of the national total. According to the Sel Social Innovation Monitor (SIM) report of 2023, incubators and accelerators in Italy supported a total of more than 3,600 startups[9]. This aggregate figure indicates that, on average, each incubator assisted about 15-16 startups. It is important to highlight that these figures can vary significantly depending on the capacity and resources of each incubator.

[9] https://www.techcompany360.it/tendenze/acceleratori-di-impresa-cosa-sono-e-come-funzionano/

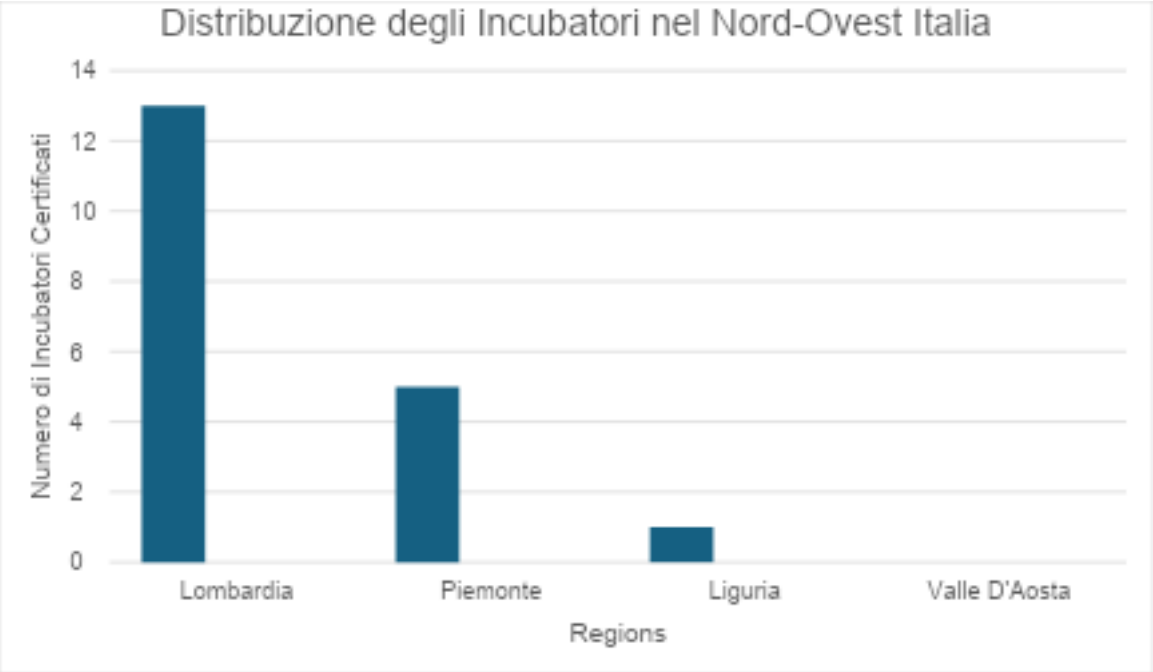

Figura 2:Distribution of incubators in Northwest Italy

Accelerators

In contrast to incubators, they invest directly in startups by participating in the capital with a stake usually between 5 percent and 15 percent. Participating in an accelerator program could be the way to obtain financial and technical support, particularly in the seed (i.e., early stage) phase of the startup. They are of limited duration (normally three to six months), in which startups receive funding, support, and networking (with the aim of accelerating the startup's maturation process), culminating then in a final phase called "*Demo Day*," during which startups present their progress to potential investors. In addition, it must be considered that not all acceleration programs are the same: one must evaluate the performance and results achieved by other startups that have participated.

Thus, we can define a startup accelerator as a structured program that provides startups with:

- **Mentorship**: access to a network of experienced mentors offering strategic and operational advice;
- **Training**: workshops and training sessions on various aspects of the business, such as marketing, finance and product development;

- **Initial funding**: seed investment in exchange for a minority equity stake;
- **Workspaces**: shared offices and infrastructure to facilitate collaboration and growth;
- **Networking**: connections with investors, companies and other stakeholders in the ecosystem.

Looking specifically at the Italian context, according to recent data, more than 200 incubators and accelerators are active, with significant growth from previous years. This expansion, demonstrating an ever-growing interest in innovation in our country. Among the best-known accelerators on the Italian scene are:

- ***LUISS EnLabs***: born from a collaboration between LVenture Group and LUISS Guido Carli University, it offers acceleration programs for digital startups.
- ***H-FARM***: located near Venice, it is one of the leading innovation hubs in Europe, combining investment in startups, acceleration programs and training.
- ***PoliHub***: the incubator and accelerator of the Milan Polytechnic, focusing on technology and innovative startups.

2.3.5 Key factors for Startup Survival

When deciding to start a startup, it is important to be able to recognize and be aware of possible failure. The survival of a startup is influenced by a number of internal and external factors. The former are factors directly chosen by the startup, such as the team, business model, and marketing strategies. External factors, on the other hand, include market conditions, regulations and competition. To have a successful startup, it is definitely important to optimize internal factors and be able to adapt to external ones. *CB insight*[10],

[10] CB Insights is a private company with a business analytics platform and global database that provides market intelligence on private companies and investor activities.

which through its own software collects data and processes statistics regarding the startup world, presented reports in 2022 regarding the main causes of failure.
Among the main internal factors are:

- **Market fit:** the ability to develop a product or service that meets a real market need. CB insight highlights how 42 percent of the cases analyzed fail because there is no real market demand for their proposed product.

- **Financial management and access to capital:** effective financial planning and access to adequate funding sources are critical to sustain operations. Sufficient funding is essential to get through the critical stages of development. According to a Harvard Business Review study (2021), startups that diversify funding sources (venture capital, debt, and public funds) are 20 percent more likely to survive .

- **Team composition and expertise**: The success of a startup depends heavily on the skills of the founding team. Prior experience, leadership skills, and a shared vision are critical factors. A diverse team in terms of skills and background is correlated with greater business resilience (Forbes, 2021) . 23% of startups, in fact, fail because of an unsuitable or too weak team.

- **Competition and market positioning**: in some cases startups do not take into account that once a new product is introduced to the market, there will be many who will want to copy or imitate the idea or service offered.
- **Pricing strategy and cost control**: some failures can be caused by the difficulty of defining a cost that is adequate to cover operating costs, but at the same time low enough to attract customers and be competitive.

- **Marketing and visibility**: it is crucial to be able to acquire new customers or users through a timely and appropriate marketing strategy.

- **Customer focus**: the ability to respond to customer needs and feedback is an indicator of resilience and adaptability, but they are also important points for so-called customer loyalty.

External factors, on the other hand, include:

- **Competition and market positioning**: these two factors can cause a startup not to be recognized in the marketplace

- **Timing**: it is crucial to understand when to release a product to the market, in fact, if released too late you risk losing your time window, if on the contrary, it is released too early you do not have an accurate analysis on consumer behavior.

- **Legal issues**: local and international regulations, as well as possible legal disputes, can be significant obstacles.

- **Market conditions**: economic fluctuations, access to capital, and industry trends often affect growth prospects.

- **Entrepreneurial ecosystem**: the availability of local accelerators, incubators, and entrepreneurial networks can influence the development of startups.

2.3.6 Enterprises Demographics in Italy

To carry out our analysis in the Italian context, we used the ISTAT[11] website, which through its databases allows us to compare data on startups with respect to the business landscape. Regarding the geographic distribution by business sectors, we can denote that 78.77 percent of innovative startups provide business services, 13.49 percent operate in manufacturing; finally, 2.81 percent operate in commerce.

[11] The National Statistical Institute is a public research organization. It has been present in the country since 1926 and is the main producer of official statistics to support citizens and public decision makers.

In some sectors, the incidence of innovative startups in the total number of new corporations (less than five years old and less than €5 million in annual turnover) appears significant. An innovative startup is 8.61 percent of all new companies operating in business services; for manufacturing, the same percentage stands at 5.52 percent. Moreover, in some specific sectors, as defined by the Ateco 2007 classification, the presence of innovative companies is particularly high: 66.06 percent of all new companies in the research and development sector, 45.68 percent of those in software production, and 40.82 percent of new companies for computer manufacturing are innovative startups.

For the purpose of our thesis, it is also relevant to go and analyze the social composition, in particular to go and observe the data regarding the presence of women. Innovative startups with a female majority-that is, in which the ownership shares and administrative positions are held by a majority of women-are 1,828, 14.23 percent of the total: a lower incidence than the 19.70 percent observed when taking the entire universe of female-dominated startups into consideration. There are 5,792 innovative startups in which at least one woman is on the board (innovative startups with a female presence), 45.10 percent of the total.

Analyzing their geographical distribution, Lombardy turns out to be the region with the highest number of innovative startups: 3,436, accounting for 26.76 percent of the national total. In particular, Milan is the province with the highest number of innovative startups in Italy: at the end of the third quarter of 2024 there were 2,506, 19.51 percent of the national total. Turin (518, 4.03 percent) and Bari (312, 2.43 percent) followed. The top-10 is completed by Bologna, Catania, Brescia, Salerno and Palermo. The last 10 provinces on the list, however, have fewer than 16 startups. The negative record belongs to Verbano Cusio Ossola, followed by Vercelli, where only 2 and 3 innovative startups are located, respectively.

2.3.7 The impact of Covid-19 on Startups

Given the nature of the study analyzed in this thesis, it is important to go to consider an important event present during the years analyzed, namely the COVID-19 pandemic. It had an unprecedented impact on the global economy, particularly affecting the entrepreneurial fabric and market dynamics. **Startups**, characterized by high innovation and flexibility, experienced this crisis in different ways: on the one hand, many suffered from reduced demand and financing difficulties; on the other hand, some were able to seize new

opportunities due to digitization and changes in consumption patterns. Thus, one can analyze the impact of the pandemic on startups, highlighting not only what were the main challenges, but also adaptation strategies and future prospects. Among the main effects due to the pandemic can be identified:

- Reduced investment and access to funding: many venture capital funds have adopted a more cautious attitude, reducing new deals and focusing on existing deals. This situation has therefore made it more difficult for early-stage startups to access the funding they need to grow and develop their businesses.

- The impact on demand and business models: consumer behavior during this period changed, favoring some sectors but penalizing others. The biggest growth sectors have been digital health, e-commerce, and smart working, while sectors in crisis include tourism, hospitality, entertainment, and mobility.

The most resilient startups were able to adapt quickly, rethinking their business models and developing new revenue strategies.

- Accelerating digitization: has sfacilitated the growth of startups specializing in innovative technology solutions.

Faced with the difficulties that the pandemic has brought, many startups have adopted adaptive strategies to survive and thrive in a changing environment. Among the main ones are:

- Accelerated digitization: many companies have rapidly implemented e-commerce, automation and smart working solutions.
- Resource reorganization: the shift to hybrid or fully remote working models has reduced operating costs and improved productivity.
- Collaborations and strategic alliances: some startups have formed partnerships with established companies to strengthen their market position.

The pandemic crisis has had a major impact on women-founded startups due to several factors:

- Difficulty in accessing finance: female entrepreneurs have faced greater obstacles in raising investment than their male counterparts

- Increased family burden: with schools closing and the need for home care, many women have had to balance work with additional family responsibilities
- Most affected sectors: many female-led startups operate in sectors such as retail and tourism, which have been particularly impacted by the crisis

To mitigate the impact of the crisis on startups, the Italian government and international bodies have implemented several support measures, including:

- *SME Guarantee Fund*: extension of loan guarantees to facilitate access to credit.
- *National Innovation Fund* (CDP Venture Capital): strengthening investments in startups.
- *Smart&Start Italia*: incentives for innovative startups with grants and subsidized financing.
- European digitization measures: financing programs for the digital transition of emerging businesses.

The impact of COVID-19 on startups has been complex and differentiated: many companies have suffered severe difficulties, while others have been able to turn the crisis into an opportunity for growth. This research in particular aims to go and analyze how female-led startups have survived or not survived this crisis by going to analyze what are the values between the year 2018 and 2019. In general, from the research conducted, startups that have invested in digitization, operational flexibility and innovation have proven to be more resilient.

A survey conducted by *Unioncamere* in October (2020)[12] on a sample of 2,000 manufacturing and service companies aimed at understanding the impact and responses of companies to the crisis by COVID-19 shows that more than half of the companies -without gender differences- (55-56 percent for both female and male companies) declare a reduction in turnover in 2020. Moreover, the data also affirm that in the April-September 2020 semester (which we could call the COVID semester), compared to the same semester in 2019 (NO-COVID), female business registrations decreased by almost 7 percentage

[12] https://www.osservatori.net/report/startup-thinking/startup-emergenza-covid-19-report/

points more than non-female businesses (-26.6%, or -11,543 in absolute values, versus -20.0%).

3. Context Analysis

3.1 Female entrepreneurship: Academic References

The starting point for this analysis is the studies of Professor Cortes, who, in the context of gender studies, has identified and systematized the main difficulties women entrepreneurs face in managing and developing their businesses.

A further contribution is made by Neil et al, whose research shows that the combination of perceived opportunity and a well-developed entrepreneurial mindset significantly increases the likelihood of successfully starting a new venture.

For the purpose of this thesis, we also analyzed the perspective proposed by Welsh et al. (2016), who studied the influence of different stages of economic development (SEDs) on the birth and growth of women's startups in various countries, including Canada, China, Morocco, Poland, South Korea and Turkey. Their analysis highlights the role of family support and personal problems in the evolution of women-led businesses, providing useful insights for the development of targeted policies to support women's startups. The findings from this study are essential to understanding what the main barriers of women's entrepreneurship are and what strategies can be adopted to foster its growth. A key aspect concerns the entrepreneur's ability to build strategic relationship networks, a key determinant of startup success.

In particular, one of the main issues is the conflict of interest between career and family life. Several studies (Emslie and Hunt, 2009; Kelan, 2010; Wood and Newton, 2006; McDonald et al., 2005; Ezzedeen and Ritchey, 2009) analyze the dynamics that influence the reconciliation of the roles of entrepreneur, mother and partner, highlighting how:

- A woman's career cycle often coincides with her biological cycle, leading to greater difficulty in balancing professional and family commitments
- The period when a company selects its managers and leaders often coincides with the age when many women decide to have children, making them more vulnerable to mental and physical stress and forcing them to sacrifice opportunities for professional growth

- Organizational dynamics and social expectations can create additional obstacles for women entrepreneurs, limiting their ability to scale their business

These considerations lead to a broader reflection on the inclusion and support policies needed to reduce the gender gap and foster a more equitable and sustainable business environment.

3.2 Low skilled migrations and economic dynamics

Having analyzed the aforementioned sources, it is important to go and take a deeper look at what are the entrepreneurial dynamics of women, in fact from Professor Cortes' gender studies, they identify, schematize, and deepen the main problems that entrepreneurs have to face in carrying out their businesses. In particular, a first key finding to analyze is the impact of migrant women. These studies highlight that migrant domestic workers represent a significant component of the global workforce, with more than 12 million people, predominantly women. They constitute 17.2 percent of female migrants and 15 percent of all global domestic workers. This category is unevenly distributed, with a strong presence in East Asia and the Pacific (35.7 percent), Europe (22.8 percent) and Arab states (19 percent). The concentration in the domestic service sector underscores how these workers often replace unpaid female labor, indirectly contributing to increasing the labor market participation of native-born women. The studies analyze the U.S. context, demonstrating a positive impact on high-skilled women, with an increase in the number of hours worked and the likelihood of obtaining higher-paid positions, also contributing to the reduction of the gender pay gap in labor-intensive sectors. The results show that an increase in migration flows from 1980 to 2010 increased the weekly hours worked by high-skilled women by about 15 minutes and increased the probability of them working more than 50 hours per week by 1.3 percent. In addition, these flows reduced gender gaps not only in hours worked but also in wages.

3.3 Occupational Gender Segregation

A second important point to analyze in the context of gender inequality is the phenomenon of occupational gender segregation (i.e., the tendency of men and women to work in different occupations). This contributes significantly to the gender wage gap, since differences in occupation and industry are the main explanation for the gender wage gap. Occupational segregation is measured through Duncan and Duncan's (1955) index, an

indicator of the percentage of men and women who would have to change jobs to achieve an equal distribution of occupations. A value of 0 indicates complete gender integration, while equal to 1 indicates total segregation. In the paper *"When Time Binds: Returns to Working Long Hours and the Gender Wage Gap among the Highly Skilled"* of Patricia Cortés e Jessica Pan (2015) analyzes the movement of this index in the United States and Spain over the years noting how between 1990 and 2009 this index declined. The reduction in occupational segregation has been driven primarily by the entry of women into men's occupations rather than the movement of men into women's occupations. Gender differences in occupation and industry are the main explanations for wage inequality. In 1980, occupation and industry explained 20 percent of the gender pay gap. By 2011, these variables explained more than 50 percent of the wage gap, becoming the dominant factor in explaining the gender pay gap. Goldin's (2014) model suggests that the gender pay gap is influenced by the structure of working hours: in fact, some occupations disproportionately reward those who are willing to work long hours without flexibility, penalizing women who often seek a better work-life balance. Among the main causes of inequality are primarily those related to differences in psychological preferences and traits, flexibility needs, and social norms. Women tend to be more risk-averse and less likely to compete than men, influencing their employment choice.

Laboratory studies show that women are less likely to choose highly competitive environments than men (Flory et al., 2014), also are attracted to jobs that involve social interactions, empathy and social contribution, while men are more oriented to those roles that offer high earnings and social status. It should also be pointed out that women are more inclined to seek flexibility in working hours because of the greater family responsibilities they often have to manage. In order to reduce occupational segregation and the gender pay gap, there are several strategies that can be adopted, first and foremost, guidance and school education, promoting women in STEM right from school. Another important factor is labor reforms, through which work flexibility must be incentivized without penalizing career progression, strengthening equal pay policies and quotas in male-dominated sectors. Inclusion policies and labor market reforms can contribute to greater equity, but cultural and social changes play an equally crucial role in reducing gender differences in employment choices.

3.4 Italian Framework

3.4.1 Female immigration in Italian context

For the purpose of this thesis we need to go specifically to the Italian context. We can affirm that migrant women employed in care services (domestic helpers, caregivers, babysitters) play a crucial role in supporting Italian families and, indirectly, the work continuity of female entrepreneurs. This phenomenon is particularly relevant in the Northwest, where the demand for care services is high. Female entrepreneurship in Italy has experienced significant growth in recent years, representing a key component of the national economic fabric. In 2021, as shown by Unioncamere's entrepreneurship reports, there were more than 1.3 million businesses led by women, accounting for 22 percent of total Italian businesses. This growth has been accompanied by increased participation of immigrant women in the entrepreneurial landscape, with a major impact on the survival and success of women-led startups.

Through data available on ISTAT's website, a greater concentration of foreign nationals can be observed in central and northern Italy. As of December 31, 2023, Lombardy was home to 25.8 percent of foreigners with residence permits, with only the province of Milan hosting 13 percent. This was followed by Lazio (11.3 percent) and Emilia-Romagna (11.0 percent). In the South, the non-EU presence was decidedly more limited, accounting for only 16.1 percent of the total number of valid permits at the end of the year. In particular, considering that women make up about 52 percent of the resident foreign population, it is estimated that approximately 936,000 foreign women reside in the Northwest. Although specific data for the 18-65 age group are not available in the sources consulted, it is

reasonable to assume that most immigrant women fall into this category, given the typical demographic structure of migrant populations, as denoted by *Figure No. 3* below.

Tabella 1:Source Istat, Registrations and cancellations by transfer of residence (2023, provisional data)

ANNI	Trasferimenti interni			Immigrazioni			Emigrazioni		
	Italiani	Stranieri	Totale	Italiani	Stranieri	Totale	Italiani	Stranieri	Totale
2014	1.073.757	239.419	1.313.176	29.271	248.360	277.631	88.859	47.469	136.328
2015	1.081.744	202.457	1.284.201	30.052	250.026	280.078	102.259	44.696	146.955
2016	1.101.791	229.589	1.331.380	37.894	262.929	300.823	114.512	42.553	157.065
2017	1.101.319	233.203	1.334.522	42.369	301.071	343.440	114.559	40.551	155.110
2018	1.113.581	244.851	1.358.432	46.824	285.500	332.324	116.732	40.228	156.960
2019	1.201.080	284.217	1.485.297	68.207	264.571	332.778	122.020	57.485	179.505
2020	1.098.379	235.301	1.333.680	55.760	191.766	247.526	120.950	38.934	159.884
2021	1.167.034	256.167	1.423.201	74.759	243.607	318.366	94.219	64.093	158.312
2022	1.227.381	243.989	1.471.370	74.490	336.495	410.985	99.510	50.679	150.189
2023	1.171.039	273.158	1.444.197	55.472	360.084	415.556	107.806	33.941	141.747

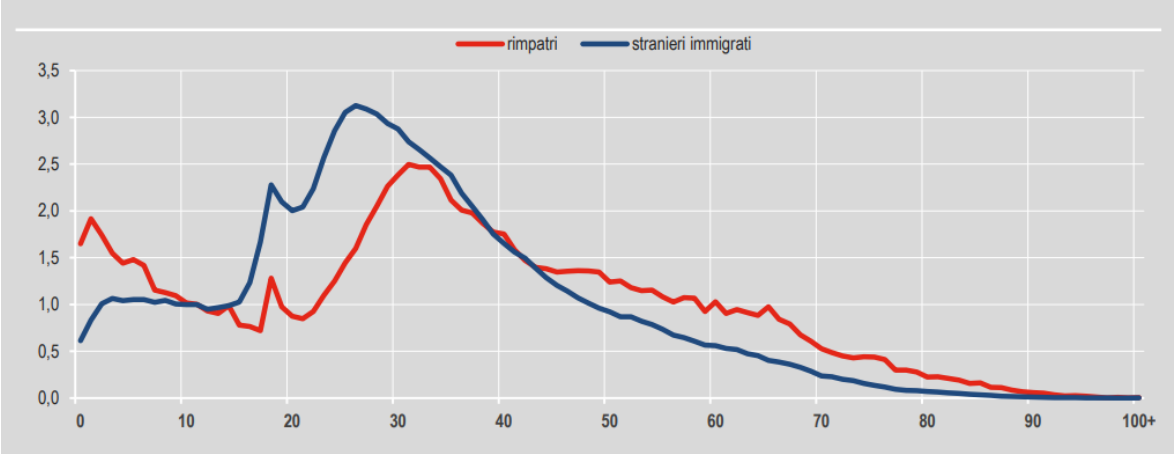

Figura 3 : Source Istat, Immigration by age and citizenship (Italian/foreign) Year 2022-2023

3.4.2 Occupational Structure of Female Entrepreneurs in Italy

As analyzed by the previous chapters, in recent years, research has highlighted the persistent gender gap present in the workplace, underscoring the Italian economic system's problem in ensuring equal opportunities for women. Today, the focus is on a crucial aspect of this disparity: women's labor participation. In 2012, the participation rate of women in the labor market in Italy was 53.2 percent, or 20 percent lower than that of men. Over the past decade, this figure has increased by 3.3 percentage points, an increase double that of men, reaching 57.3 percent in the first quarter of 2023, the highest level ever recorded.

This growth is linked to the gradual improvement of women's human capital. For at least two decades, women have accounted for about 56 percent of graduates each year, and in 2022, the number of female graduates in science and technology disciplines increased by 20 percent compared to 2012. Another important progress concerns the presence of women on the boards of listed companies[13], which has increased from 7.4 percent in 2011 to 43 percent in 2022, thanks to the implementation of the *Gulf-Moscow Law*, a law that we will elaborate on in the following chapters as we go on to discuss measures to decrease gender inequality. Despite these improvements, the female labor participation rate in Italy remains among the lowest in Europe, with a gap of nearly 13 percentage points compared to the EU average.

The increase in female labor participation over the past decade has been driven mainly by women over 50, partly as a result of pension reforms. However, for women between the ages of 25 and 34, a crucial stage for entering the workforce and building a family, participation has remained stable at 66 percent, also representing one of the lowest levels in Europe. The gender gap is particularly evident in the South, where female participation is more than 25 percentage points lower than male participation (compared to a 14-point difference in the North-Center).

Another critical issue concerns the wage gap: women earn on average about 10 percent less than men, a figure only slightly lower than in 2012. Moreover, their careers tend to be slower and more discontinuous, and the increase in women's presence in listed companies has not led to significant changes in the composition of top management.

Women entrepreneurs in Italy are characterized by a different employment structure than their male counterparts. About one million women run businesses without employees, accounting for 64.8 percent compared to 62.4 percent of men. 14.8 percent of women entrepreneurs have only one employee (compared to 14.3 percent of men), while 16.6 percent manage between two and nine employees (compared to 18.5 percent of men) and only 3.8 percent have more than 10 employees (compared to 4.7 percent of men).

[13] These are companies whose shares have a price determined by the stock exchange (this is technically called a “listing”), which is the result of the combination of supply and demand through the intermediation of authorized brokers (BROCARDI.IT)

One relevant aspect concerns the gender composition of the workforce in women-led companies. On average, 54.2 percent of employees in women-owned businesses are female, which is significantly higher than that of male entrepreneurs (38.5 percent). This phenomenon is mainly found in services (62.2 percent vs. 47.8 percent), but it is also present in the industrial sector, where women-led firms have 34.2 percent female employees (vs. 27.5 percent of male-led firms).

Analyzing the technology-intensive and technology-intensive sectors, according to the *Eurostat/OECD*[14] classification:

- In low-tech manufacturing, female entrepreneurs have 48.1% female employees compared to 38.7% of men.
- In high-tech manufacturing, 41.5% of female entrepreneurs have female employees, compared to 36% of male entrepreneurs.
- In knowledge-intensive services, 64.1% of female entrepreneurs have female employees, compared with 56.9% of male entrepreneurs.

This data confirms a strong gender segmentation in women's businesses, which tend to hire more female staff, particularly in the knowledge and innovation sectors.

Another important point to analyze and take into account in this analysis is the progress in the number of female graduates in STEM disciplines. Despite the increase, women graduating in STEM subjects account for only 15 percent of the total number of female graduates (compared to 33 percent among men), a sign that there is still ample room for improvement in this area.

In general, however, analyzing the data on educational qualification shows that, in line with the general population, women entrepreneurs also tend to have higher educational qualifications than men. A tertiary degree is held by 34.5 percent of female entrepreneurs compared to 23.4 percent of men. In the segment of entrepreneurs with tertiary degrees,

[14] The OECD is an international economic studies organization for member countries, developed countries having in common a democratic-type system of government and a market economy. The organization mainly plays the role of a consultative assembly, which allows an opportunity to compare policy experiences, for the resolution of common problems, identification of business practices and coordination of local and international policies of member countries.

women account for 38.8 percent[15]. The highest percentage of female entrepreneurs with a high degree is found among freelancers (76.4 percent compared to 68.2 percent of their colleagues). Women entrepreneurs have higher educational qualifications than men in all age groups and sectors of economic activity. The size of the gender gap varies widely: for female entrepreneurs aged 50 and older, the difference is 4.5 percentage points (27.6 percent of female college graduates compared to 23.1 percent of entrepreneurs with a college degree); it rises to 16-17 points among 35-49 year olds and 25-34 year olds.

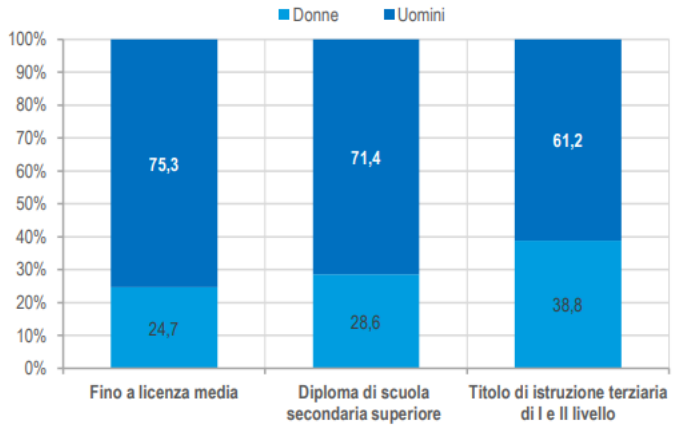

Figura 4: Entrepreneurs by gender and educational qualifications, year 2021 per 100 people with the same qualification. Source: Istat, Elaborations on data from Business Register and SILO_I 2021

3.4.3 Women-Led Startups: Barriers and Opportunities

Despite growth in numbers, women's enterprises face significant challenges in terms of survival. The 5-year survival rate of female-owned enterprises is 65.5 percent, more than 6 percentage points lower than that of non-female-owned enterprises. However, female-dominated **innovative startups** show a high survival rate, with more than 90 percent of businesses still active after five years. This positive finding could be attributed to greater resilience and adaptability of women entrepreneurs in the innovation sector. In Northwest Italy, immigrant women play a significant role in the female startup ecosystem. Their participation contributes to the diversification of skills and perspectives, enriching the local entrepreneurial fabric.

[15] https://www.istat.it/comunicato-stampa/donne-imprenditrici-piu-giovani-e-piu-istruite/

Women-led startups represent a small percentage of the total, despite their role being increasingly recognized. However, from academic references and current knowledge we can understand how Italian women entrepreneurs face particular challenges, including:

- Difficulties in accessing finance, often due to lower capital availability
- Presence of cultural barriers and gender stereotypes, which affect business growth opportunities
- Disproportionate load of domestic responsibilities, which tends to limit the time and resources women entrepreneurs can devote to their business

On the other hand, women's startups tend to have a greater focus on social and environmental impact, offering an innovative leadership model. Supporting policies, such as dedicated tax breaks, and funds from the *National Recovery and Resilience Plan* (NRP), provide an opportunity to promote women's entrepreneurship.[16]

The analysis of women's startups is a complex topic, in which there are not only structural challenges but also cultural and social aspects. However, the growing focus on social impact-oriented entrepreneurship, supported by targeted policies and inclusive leadership models, can help reduce inequality and promote a more dynamic and sustainable economic system.

Academic research confirms that the success of women's startups depends not only on economic factors, but also on the ability to create support networks, overcome conflicts of interest between private and professional life, and access appropriate financial instruments, which can go a long way toward influencing women's entrepreneurship in the long term.

3.4.4 Measures to Reduce Gender Disparities

The Italian regulatory and institutional system has introduced several measures in recent years to promote gender equality and support female entrepreneurship. However, the gap between men and women in employment and entrepreneurship remains significant. The full realization of gender equality in the economic sphere is not only a matter of social justice, but also represents an opportunity to increase the competitiveness and innovation

[16] https://www.mimit.gov.it/it/incentivi/fondo-impresa-femminile

of the Italian production system. This chapter analyzes the legislative framework, the main supporting tools and the initiatives implemented in Italy to reduce the gender gap, with a focus on policies related to the labor market and access to finance for women entrepreneurs.

In recent years, Italy has adopted a number of specific measures to promote gender equality, including:

- **Equal Opportunities Code (Legislative Decree 198/2006)**: introduces the principle of equal treatment between men and women in the workplace and enshrines the prohibition of gender discrimination

- **National Gender Equality Plan (2021-2026)**: defines strategic goals to close the gender gap in the world of work, improve work-life balance, and increase women's participation in strategic sectors

- **Gulf-Moscow Law (2011)**: imposes gender quotas on the boards of directors of publicly traded companies, contributing to a greater presence of women in top positions

- **Equal pay and gender certification (Law 162/2021)**: introduces a certification system for companies that adopt equal pay and women's inclusion policies

Despite these measures women's businesses account for only 22 percent of total Italian businesses, their survival rate is also lower than men's due to difficulties in accessing financing and cultural barriers. In addition as analyzed in previous chapters women entrepreneurs tend to work in traditional sectors such as services, trade and tourism, covering a marginal position in what are technological and innovative sectors.

3.4.5 Women-Led Startups in Italy

In this section, there will be an illustration of the numerics concerning the phenomenon of female startups in Italy, starting from the database, made available, upon request, from the Register of Companies held at the Chambers of Commerce of Italy.These dataset shows the number of startups present in the national territory and highlights how many of these are “pink”.startups (WSU) and their type of relevance.

Tabella 2: Composition for geographical macroarea of women startups(WSU) and their type of relevance (2018, fonte Unioncamere)

Geographical Macro-Area	Number of Italian Startups	Number of "Pink" startups in Italy	Relevance Exlusive	Relevance Strong	Relevance Majority
N/W	2834	324	86	159	79
N/E	2163	258	97	110	51
C	1977	286	103	124	59
S	2047	323	112	161	50
Total	9021	1191	398	554	239

The data show that of 9021 Italian startups, only 1191 belong to the female sex, that is, only 13.20% of the total.

Further data that emerge and deserve to be analyzed are the geographical distribution of female startups compared to the totality of Italian startups. In fact, unlike that of the considered startups overall, the geographical distribution of those female startups is nearly homogeneous in the whole national territory. In the Northwest of Italy there are 324 units, followed by the area of Southern Italy with 323 units (only one less than the largest area), in reversal of the emerging data for startups overall; then, there is the area of Central Italy with 286 units, and finally the Northeast of Italy with 258 units. The graph below clearly shows the distribution: What that makes us think is that women have a fairer distribution throughout the country, in addition to the fact that the WSU do not follow the same general distribution of startups. In fact, while the distribution of Italian startups noted the maximum record in the N/W with 2834 units and the lowest record in C with 1977, creating a differential of 857 units (9.50% of the total), the presence of female startups goes from the maximum record in the N/W with 324 units to the lowest one in the N/E with 258 units, creating a spread of only 66 units (5.54% of the total), which represents a differential of almost 4 percentage points with the evidence on Italian startups overall.

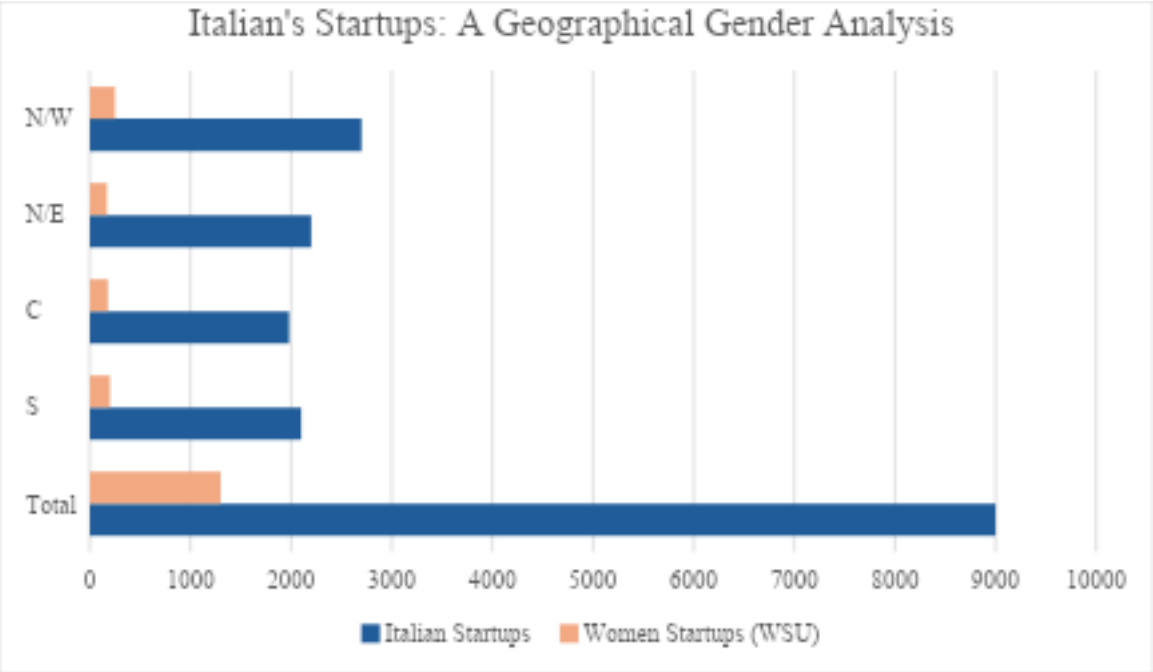

Figura 5 : Distribution and the geographical location of Italina Women Startups (WSU) in the s.q. 2018 (Unioncamere)

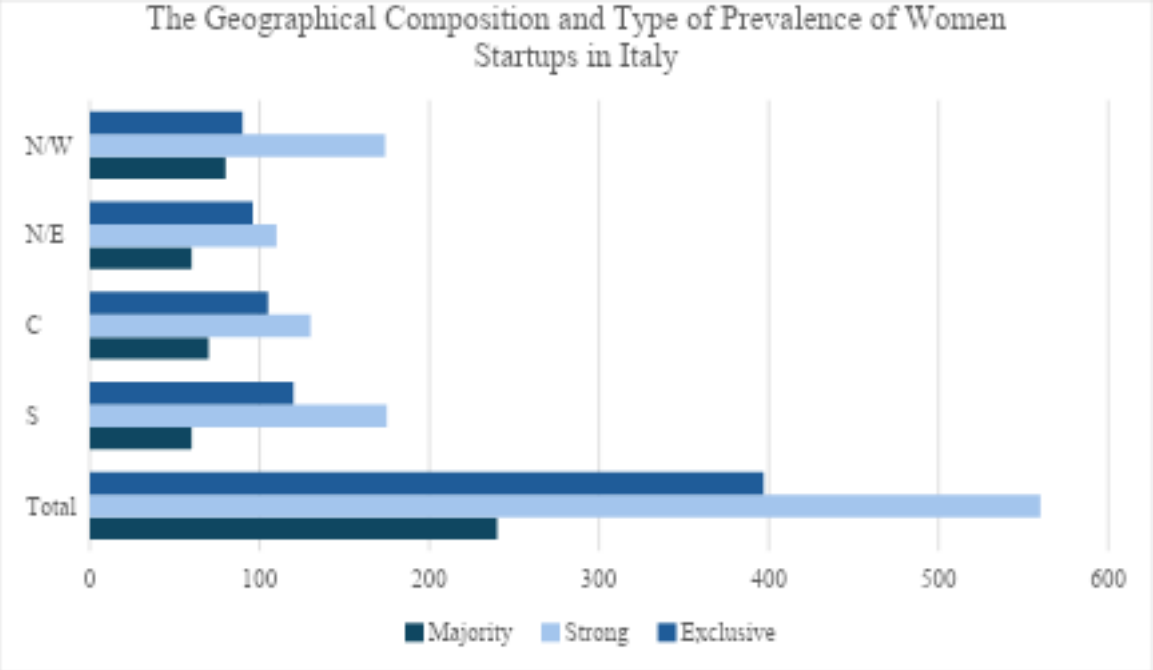

Figura 6:Composition, distribution and type of relevance of women Startups (WSU) in Italy (s.q. 2018)

3.4.6 The Northwestern Italian Context

This chapter is useful to analyze more specifically what will be the geographical context protagonist of this thesis, namely the Northwest, since as previously seen from the data it has been found to represent one of the most dynamic and productive areas of the country, due to the presence of advanced infrastructure and diversified businesses. To analyze this chapter, statistics reported on the business register were taken into consideration, in particular, data from the latest report of Q3 2024 were considered[17].

Tabella 3:Summary on companies registered in the innovative startup registry, as of October 1, 2024 (source: Unioncamere)

Region	Number of companies
Abruzzo	193
Basilicata	102
Calabria	256
Campania	1498
Emilia-Romagna	875
Friuli-Venezia-Giulia	202
Lazio	1412
Liguria	248
Lombardia	3321
Marche	338
Molise	69
Piemonte	672
Puglia	573
Sardegna	143
Sicilia	578
Toscana	514
Trentino-Alto-Adige	230
Umbria	146
Valle D'Aosta	15
Veneto	748
ITALIA	12133

The Northwest hosts a significant share of Italian enterprises, with particular concentration in metropolitan cities such as Milan and Turin. According to Unioncamere data (2024), 35

[17] https://startup.registroimprese.it/isin/static/startup/index.html?slideJump=32

percent of Italian innovative startups are based in these regions, with a high incidence of companies operating in the technology, sustainable energy and advanced services sectors.

After downloading the dataset from the business registry, we cleaned the data using STATA, a statistical software widely used in academic research as it can perform a variety of functions, including: database management, statistical-econometric analysis, and graphical analysis.

For the cleaning of this data, in particular, only those startups registered in the business registry with a date after 2020 were considered, furthermore, we then filtered the database by municipality in order to have them sorted and have an accurate number, as the data analysis that will be carried out later will be on a SLL basis.

For the filtering part for the data, I used STATA, specifically chose to consider only those startups that have in the named column of the variable "date of registration with the Business Registry" a date after 31/12/2019. Then the new clean file was saved in another excel file. To clean up the dataset and consider only the municipalities in the northwest, specifically those belonging to the Piedmont and Lombardy Regions, as for this analysis we are going to consider only these two Regions, which represent the largest number of presences of innovative startups. We find from this data 3561 startups out of a total of 10315, accounting for 35 percent of the total.

Having the data cleaned up by municipality and considering only those startups with a date of registration with the Registry of Companies after 12/31/2019, so as to consider only those companies that are still within the possible 5 years of existence. An analysis was done on how many women-led businesses there are, and in particular it was calculated how many are sole proprietorships, how many are majority-owned, how many are strong, and how many startups, on the other hand, do not have women involved. To indentify this data, the criteria used is represented in the table below.

Tabella 4: Criteria for defining female prevalence in startups

Prevalenza Femminile	Descrizione
NO	(%capitale sociale + %amministratori)/2≤50%
Maggioritaria	(%capitale sociale + %amministratori)/2 >50%
Forte	(%capitale sociale + %amministratori)/2 >66%
Esclusiva	(%capitale sociale + %amministratori)/2=100%

	Non disponibile

Going to analyze the data obtained from the dataset denoted an “exclusive” presence for 124 startups out of 3561 found, or 3.5 percent of the total number of startups present in the municipalities of Piedmont and Lombardy. “Strong": 205 out of 3561, representing 5.8% of the total considered. “Majority": 85 out of 3561, 2.4 percent of the total. While for 2892 startups out of 3561, or 81% of the total, the presence of women turns out to be less than 50%. For 255 out of 3561, 7.2% of the total, it identifies those startups for which the value is not available.

4. EMPIRICAL APPLICATIONS

4.1 Brief introduction to empirical methods

This chapter will provide an introduction to the econometric theory on which the statistical model that will be developed is based. Through the application of linear regression, the model will be used to examine the possible positive relationship between the presence of low-skilled immigrant women in the northwest of Italy, particularly in the Piedmont and Lombardy regions, the availability of childcare in the same area, and the survival rate of startups led by highly skilled local women. The goal is to translate the theories discussed in the previous paragraphs into empirical evidence, allowing real data to be collected and accurate predictions to be made. In particular, linear regression will be used for the following analysis. It is a statistical methodology widely used to analyze the relationship between a dependent variable Y and one or more independent variables X. Its goal is to identify a functional relationship between these variables and model it by means of a mathematical function to make predictions or understand the influence of certain factors on a phenomenon of interest. In the present case, the model will go on to include multiple independent variables to explain the variability of the dependent variable, consequently we can define the use of **multiple linear regression**.

Evaluation of model quality

To assess the validity and goodness of our model, we will also examine several statistical indicators that allow us to understand how well the regression succeeds in explaining the duration of startups and which variables have a significant effect.

R^2 tells us how much of the variation in the duration of startups is explained by our model. A value close to 1 means that the model explains the data well, while a low value indicates that many other factors, not included in the model, influence the duration of startups. However, adding more variables always tends to increase R2, even when the new variables are not really useful. For this reason, we also consider the adjusted R2, which corrects for this effect and tells us whether the added variables really improve the model or are superfluous.

The *F-test* allows us to see whether the model is significant overall, that is, whether at least one of the independent variables has a real effect on the duration of startups. If the p-value

associated with the F-test is less than 0.05, it means that the model is statistically valid and is not just describing random variations in the data.

Significance of variables: each coefficient in the regression is associated with a t-test, which indicates whether that variable has a significant impact on the duration of startups. If the p-value of a variable is less than 0.05, we can say with good certainty that that variable has a real effect and is not just the result of random fluctuations in the data.

4.2 Database explanation

This section analyzes and describes the datasets used, selected and constructed to conduct the data analysis and develop the final dataset needed to test the research hypotheses. The data used mainly concern four specific areas: the **startups** present in the areas of interest; the **control variables**, which include relevant economic and demographic factors; the presence of **low-skilled immigrant women** in the area analyzed; and the supply of **child and family care services** in the same areas. It is important to mention that the present analysis goes to consider **SLLs (Local Labor Systems)**, a concept developed by ISTAT to define geographic areas characterized by strong integration between residence and place of work. SLLs represent functional territorial units that transcend traditional administrative boundaries, allowing economic and employment phenomena to be analyzed more realistically than division by provinces or regions. Their identification is based on data on work-related travel and commuting flows, ensuring a more effective delimitation of homogeneous economic areas (ISTAT, 2015). The adoption of SLLs in this research is motivated by the need to consider the economic and labor context in which startups operate, as well as the desire to analyze the interaction between the presence of immigrant women, available care services and the survival of women's businesses. In particular, the study focuses on SLLs located in the regions of Piedmont and Lombardy, two economically significant areas and, as seen in the previous chapters, characterized by a strong presence of startups and a high level of migration flows. Among the available years of the analyzed datasets, **2018** and **2019** were selected as the reference period. This choice is motivated by the desire to observe the trend of startups present and analyzed, immediately before the outbreak of the Covid-19 pandemic. Considering that 2020 marked a drastic change in economic and labor dynamics.

4.2.1 Database of Italian Innovative Startups

The Dataset on Innovative Startups present in Italy comes from the Register of Innovative Startups, managed by the Ministry of Business and Made in Italy. This registry includes all startups present in Italy that meet the requirements defined earlier in Chapter 2.1, "Innovative Startups: Definition." In Italy, an innovative startup maintains this status for a maximum of five years. After that period, if the company is still active, it is transformed into an enterprise by leaving the Innovative Startup Registry and entering AIDA, an online database that collects financial, master and business information on about 500,000 companies operating in Italy. To ensure continuous tracking of the life cycle of startups, the Innovative Startup Registry is linked to AIDA, allowing the evolution of startups to be monitored even after they lose their innovative startup status. The database is structured in a panel format, which means that it tracks the same startups over multiple years, allowing longitudinal analysis of their evolution. This format makes it possible to observe changes over time for each startup. Specifically, the database features observations arranged by rows and variables arranged by columns. There are a total of 28 variables, and below is the detail and a brief description for each of them, in fact the horizontal construction shows for each startup:

- *Id*: is the identification code for each company, which allows the company to be uniquely identified;
- *Anno osservazione*: indicates the year in which the variables are identified;
- *Anno costituzione*: indicates the year the startup was founded;
- *Comune*: represents the location where the startup is present in the Italian territory;
- *Codice istat comune*: is the code assigned by ISTAT to go to uniquely identify the startup;
- *Provincia*: indicates the location where the startup is present on the Italian territory;
- *Codice_istat_provincia*: is the code attributed by ISTAT to go to uniquely identify the province on the Italian territory;
- *Regione*: represents the region in which the startup is located. For the purposes of this thesis, only those startups were then selected that had the entries "Piedmont" or "Lombardy" as the Region variable.

- *Stato giuridico*: is the indicator on the legal status of the startup, determined by how it was established and registered with the authorities. The legal statuses a startup may be in are “Active” indicator that the startup is operational, “Ceased” meaning the startup has ended its activities , in “Liquidation” the startup is in the process of closing;
- *Ateco_2007*: is the code assigned by ISTAT to identify the economic activity sector of the startup;
- *Dipendenti*: indicates the number of people working for each startup;
- *Tot_immob_immateriali*: refers to those non-tangible assets owned by the startup that constitute capitalizable costs;
- *Tot_immob_materiali*: refers to the durable physical assets belonging to the company, with economic utility beyond one fiscal year;
- *Totale_attivo*: is the total value of assets owned by the startup;
- *Capitale sociale*: is the amount invested in the startup by its members;
- *Ricavi*: is the total revenue from the sale of goods or services in the reporting year;
- *Risultato operativo*: is the indicator of the difference between revenues and operating expenses, it represents the profitability of the company in its main activities;
- *Valore aggiunto*: index of the difference between the value of production and the value of intermediate goods purchased, represents the economic contribution of the company;
- *Utile*: an index of the difference between revenues and total expenses incurred by the startup. If positive we speak of Profit if negative of Loss
- *EBITDA*: Earning before interests, taxes, depreciation and amortization, an indicator of corporate profitability that excludes financial costs, taxes, and depreciation and amortization for a more direct assessment of the core business
- *Diritti brevetto industriale*: an index of the number of patents registered by the startup;
- *Data_iscrizione_sezione _startup*: indicates the date on which the considered startup was officially registered in the Innovative Startup Registry;
- *Date_uscita_sezione_startup*: indicates the date on which the considered startup loses the status of innovative startup and exits the Innovative Startup Registry;

- *Data_cessazione*: indicates the date on which the considered startup ceases to exist as a legal entity and is removed from the Register of Companies;
- *Prevalenza_femminile_complessiva*: indicates the percentage of women involved in the startup as both shareholder and manager. This variable can change over time and the values it can take are “NO”, “Majority”, “Strong”, and “Exclusive” and are a function of the arithmetic average of the sum of the percentages of composition of the share capital and of the composition of the Board of Director (or sole Director) of the startup.
    - NO: ≤ 50%
    - Majority:> 50%
    - Strong: >66%
    - Exclusive: =100%
- *Prevalenza_femminile_amministrativa:* indicates the percentage of women in the role of administrators. This like the previous one is also a time variable that can vary and the values it can take are “NO,” “Majority,” “Strong,” and “Exclusive” and are a function of the arithmetic average of the sum of the percentages of composition of the share capital and of the composition of the Board of Director (or sole Director) of the startup.
- NO: ≤ 50%
- Majority:> 50%
- Strong: >66%
- Exclusive: =100%

4.2.2 Database of Immigrant Women in Piedmont and Lombardy

This dataset is also crucial to our analysis, as also previously explained in the opening chapters the presence of immigrant women is an important variable that can influence the durability of women-led startups. In order to construct this dataset we used the ISTAT website, which provides data on the foreign population residing in Italy, broken down by gender, age and citizenship. In particular, the path followed: "Population and Households" section → 'Foreigners and Immigrants' → "Resident Foreigners as of January 1 - Citizenship." The following filters were then set: Gender: female; Citizenship: world (all nationalities); Age: 18-65 (age considered for the working population); Years: 2019-2024 (these were all available years for this view). The minimum age of 18 was chosen because many people complete part of their education within this age range. The maximum age of 65 is the limit commonly associated with retirement age. It is also important to point out that data available on the ISTAT website cover the period 2019-2024 because as of 2018 the balance of the resident foreign population takes into account the results of the permanent census[18]. Subsequently through the use of *STATA*, a statistical analysis and data management software widely used in economic and social research, which allows to process complex datasets, perform statistical analysis and merge data from different sources. For more effective temporal and spatial analysis, the data were reorganized into panel format (longitudinal structure), which allows the same units (municipalities) to be observed over several years. The dataset containing the total population for each municipality and year was also downloaded from the ISTAT website. Using STATA's Merge function, the immigrant women dataset was merged with the total population dataset, allowing for a complete database with data for each year and municipality, making it possible to compare the immigrant population with the total population.

The original dataset only covered the period 2019-2024, so it was necessary to supplement the data for the years 2016-2018. This was done by consulting the *Demo of ISTAT (demographics in figures)*[19]*,* only municipalities in the 2019-2024 dataset were selected to ensure homogeneity of the analysis. The data were then sorted by year and municipality. But for the years 2016-2018 the detail of the age of immigrant women was not present,

[18] "L'obiettivo primario del Censimento permanente consiste nel mantenere sia il dettaglio territoriale sia la rilevazione di un insieme di variabili demografiche, sociali ed economiche, aumentando la frequenza temporale della restituzione dei dati, annuale anziché decennale, e assicurando la tempestività della diffusione degli stessi" (ISTAT , 2020, definizione censimento permanente)

[19] https://demo.istat.it/app/?i=RCS&I=it

consequently a calculation was made based on the proportion observed in the recent years 2019 to 2024 previously analyzed. Indeed, the analysis showed that in the years 2019-2024, the proportion of immigrant women of working age was consistently around 74 percent of total immigrant women. By also applying this proportion to the 2016-2018 data, it was possible to estimate the number of immigrant women of working age for those years with good accuracy. Through this analysis, a dataset was thus obtained containing data on immigrant women of working age (18-65) for municipalities in Piedmont and Lombardy for the period 2016-2024. Through the combined use of Excel, the ISTAT site, and STATA, it was possible to build a consistent database ready for subsequent analysis. Like the dataset on Innovative Startups previously analyzed, here too the data are distributed in panel format, useful for longitudinal analysis over time. Specifically, the variables present are described below:

- *Anno*: indicates the year of observation of the variables;
- *Comune*: indicates the municipality to which the analyzed data refer;
- *Codice_ISTAT*: index of the unique code assigned by the ISTAT website to the relevant Italian municipality;
- *Stato_di_nascita*: indicates the birth status of the immigrant population analyzed;
- *Codice_Stato*: is the unique code assigned by the ISTAT website to the relevant foreign state;
- *Continente*: is the continent to which the reference *Stato_di_nascita* belongs;
- *Maschi*: is the total male immigrant component referred to the respective *Anno* and *Comune*;
- *Femmine*: is the total female immigrant component referred to the respective *Anno* and *Comune* of reference;
- *Totale*: is the total given by the sum of the male component *Maschi* and the female component *Femmine*;
- *Donne_immigrate*: is an additional variable in which of the total immigrant women only the component considered to be of working age, that is, those women between the ages of 18 and 65.

4.2.3 Database of care services

For the purpose of the following analysis, it is important to also go to analyze what are the care services present in the territory considered, the objective of this analysis is to evaluate the supply of educational and care services for preschool children, both in the public and private sectors. To download this Dataset we used, as with previous data, the ISTAT website, following the following path: “Assistance and Welfare”→“Social Services”→“Early Childhood Social-Educational Services”→"Services on the Territory by Province and Municipality.” The analysis of the availability of child care services in the municipalities of interest for the purposes of this thesis, downloaded from the ISTAT website cover the period 2013-2022. In order to obtain a complete dataset functionally structured for the analysis, specific filters were applied: Territory selection: Piedmont and Lombardy (Northwest); Inclusion of all active care services, both public and private.

The dataset collects information on the main early childhood care services available on the Italian territory, distinguishing between educational, care and supplementary facilities. In particular, the following are considered:

Nurseries and Corporate Nurseries

Daycare centers are educational services for children aged 0-3 years, aimed at promoting socialization and cognitive development. They can be public or private and offer day care with professional educators. Corporate daycare centers are a subcategory of daycare centers, established and operated directly by companies to provide a service for employees' children, thus contributing to the reconciliation of work and family life.

Spring Sections

Spring sections are educational services intended for children between 24 and 36 months, placed within preschools. These services were created to provide a transition between nursery and kindergarten, ensuring educational continuity.

Early Childhood Supplemental Services

This category includes different types of support for children's growth by providing spaces for gathering and socialization: *Play Spaces*: structured play environments for the socialization and development of children's motor and cognitive skills. *Domiciliary Context Services*: forms of care that provide for the care of the child within a private home,

such as *tagesmutter* (home-based child care assistant) services. *Child-Parent Centers*: educational facilities that involve both children and their parents, fostering parenting support and family involvement in educational pathways.

Available information includes: Total number of active services for each year; Authorized places per facility; Authorized places per 100 children aged 0-2 years.

Tabella 5: Aggregate data for the Northwest (active services by year) (ISTAT)

Anno	**Servizi Attivi**
2016	2824
2017	2820
2018	2814
2019	2928
2020	2869
2021	2822
2022	3101

To make the dataset ready for analysis, the following steps were performed: initially the two datasets (Piedmont and Lombardy) were merged using STATA to obtain a single file with all municipalities. Next, the column "Type of Socioeducational Service" was removed, since for this analysis the total number of available services (public and private) is considered. Thus obtaining a dataset containing three variables described below:

- *Comune*: indicates the considered municipality to which the variables refer;
- *Anno*: Observation year index for the variables considered;
- *Tot_servizi_attivi*: is the total sum of the above-mentioned active services for each *Comune* and corresponding *Anno*.

4.2.4 Database of control variables

To obtain a final Dataset that is as complete as possible, control variables must be included. As explained earlier in the brief introduction to empirical methods[20], control variables are all the variables that can influence the phenomenon studied and must be included in the analysis to better isolate the effects of the main variable of interest. Since no single pre-existing database was available, a custom dataset had to be constructed by searching each variable separately on the ISTAT website. Some variables were available at the municipal level, while others were available only at the Local Labor Systems (LTS) level. However, all variables were subsequently traced back to SLLs to ensure consistency with the rest of the analysis.

The variables were obtained by accessing the ISTAT portal, selecting the datasets on population, economy and labor market: *"Labor and Wages," 'Business Competitiveness,' and "Population and Households"*. Next, the data were processed and unified using STATA. The control variables selected and downloaded from the ISTAT website are as follows:

- *Working Population* (Working Age Population): Index of the total number of people of working age present, that is, all those people of an age considered "potentially working," between 20 and 65, independent of whether they are actually employed or looking for work. The path followed on the ISTAT website is as follows: "Population and Households" → "Resident population by municipality." Data by age group were available only at the provincial level, so it was necessary to download data for each individual municipality. The dataset contained the number of residents by single age, and only those between the ages of 20 and 65 were selected. Then, using Excel, a new "working_population" column was created, calculated as the sum of the columns for the selected ages.The data were then imported into STATA, where the dataset was reorganized to have a standard format with the columns: Municipality; Year; Working-age population;
- *Residenti Laureati:* indicates the number of residents with at least a master's degree. Data on the ISTAT website were available for the years 2018-2022;

[20] 4.1 "Brief introduction to Empirical Methods"

permanent population censuses were used to download these data[21]. The number of master's degree graduates was selected, while being aware that the concept of "graduates" could include different titles (bachelor's, master's, and single-cycle). Data were extracted and reorganized by municipality and year;

- *Number_of_firms:* indicates the total number of active enterprises in the considered territories. The path followed on the ISTAT website: "Enterprises" → "Structure of Enterprises." Data in this case are available only at the SLL level and not by individual municipality;
- *In_cerca_di_occupazione:* index of the total number of people who are seeking employment;
- *Occupati_SLL:* indicates the total number of people with jobs;
- *Labour_force:* indicates all those persons who are employed or unemployed (i.e., actively seeking work), regardless of their age. Includes includes: Employed: People who are in employment (including self-employed and employees). Unemployed: Persons who are not working but are available and actively seeking employment. Excludes inactive persons (students, retirees, housewives, etc.), even if they are of working age.
- *Unemployment_rate:* indicates the percentage of the labor force that is unemployed and looking for work. "Labor and Wages" → "Employment and Vacancies." Unemployment data are available only at the SLL level and cover the period 2006-2022. The Unemployment_rate could also be calculated as: *(People seeking employment in the municipality / Labour force in the municipality) × 100)*
- *Employment_rate:* indicates the percentage of the labor force that is employed. "Labor and Wages" → "Employment and Vacancies." Unemployment data are available only at the SLL level and cover the period 2006-2022;
- *Value_added:* indicates the total wealth produced for the corresponding territory considered. The path followed to find this value: "Enterprises" → "Competitiveness" → "Performance Indicators" → " Economic performance of enterprises: Value added." The data are present for the years 2016-2022;
- *Tot_popolazione:* index of the total number of population available for the corresponding considered territory. Population data were obtained from the section "Population and Households" → "Residents as of January 1."

[21] http://dati-censimentipermanenti.istat.it/

- *Value_added_per_abitante:* index representing the wealth produced per inhabitant in a given territory. The value of this variable was obtained using the formula: (*Value_added)*/(*Tot_popolazione)*;
- *Area_Km2:* index of Area expansion for each territory considered.

4.2.5 Database of the Italian Local Labour System

Since our analysis is done at the level of SLL, it is essential to understand what is meant by this concept and to be aware of what are the municipalities belonging to each SLL. A Sistema Locale del Lavoro (SLL) is a territorial area characterized by a strong interconnection between place of residence and place of work of the working population. In other words, a SLL represents an area in which most people live and work, regardless of the administrative boundaries of municipalities or provinces. ISTAT defines SLLs based on an analysis of commuting flows, using data on home-to-work movements collected through the *Census of Population and Housing*. The last official revision of Local Labor Systems was carried out in 2011 based on the *2001 Census* and subsequently updated with available data from 2019. The Local Labor Systems are usually used for spatial, economic and demographic analyses, as they offer a closer representation of economic reality than the administrative boundaries of provinces and regions. Information on Local Labor Systems can be found on the ISTAT website[22], this section includes the definition of the methodology adopted for the construction of LFSs, an updated list of Italian LFSs, data on the employed, labor force and unemployed for each corresponding LFS (as previously described in the chapter on *"Datasets on Control Variables"*). To ensure proper aggregation of data at the territorial level, it was necessary to identify the affiliation of each municipality to its respective SLL. Therefore, the ISTAT list of Local Labor Systems, which divides the Italian territory into 611 areas, was consulted and each municipality was associated with its SLL based on the official mapping provided by ISTAT. Finally, the variables of interest for each SLL were unified, reconstructing the dataset in a manner consistent with the other control variables. Available data for each Local Labor System, updated through 2022, were extracted from the ISTAT website. This information includes:

[22] https://www.istat.it/statistiche-per-temi/focus/informazioni-territoriali-e-cartografiche/statistiche-sul-territorio/sistemi-locali-del-lavoro-e-distretti-industriali/

Total population per SLL; Labor force (persons employed or seeking employment); Number of employed residents; Persons seeking employment; Activity rate (percentage of the active population to the total working-age population); Employment rate (percentage of the employed to the total working-age population); Unemployment rate (percentage of the unemployed to the labor force). For this analysis, only the SLLs belonging to the regions of Piedmont and Lombardy were also considered.

After downloading the data, it was necessary to reorganize them to ensure consistency with the other datasets, following the steps below:

- Union of information on municipalities and SLLs to reconstruct spatial structure;
- Aggregation of data of interest at the SLL level;
- Importing to STATA, where merging with other control variables was performed.

4.2.6 Final Database

The final Database is given by the union of all the previously described databases, integrating all the information needed for analysis. Unlike the intermediate databases, which were organized in panel format, the final database is structured in wide format. The wide format, which is a type of data structure in which each observation (unit of analysis) is represented by a single row, while the variables associated with that observation are arranged in columns. Specifically, there is one observation per row that identifies each startup by a unique ID and occupies only one row in the dataset; the variables, on the other hand, are distributed in columns, i.e., each column represents a variable associated with the startup, such as year founded, number of employees, value added, presence of care services in the area, etc. The wide format is more intuitive for visualization making it more compact and useful for descriptive analysis, but less practical for temporal or longitudinal analysis. In the panel format, on the other hand, an observation can occupy multiple rows (e.g., a repeated startup for each year with associated variables). The final database includes the following information for each startup:

- *SLL*: indicates the local labor system in which the innovative startup is present;
- Id: indicates the unique code that is associated by ISTAT to identify the SLL under consideration;
- *Anno_osservazione*: indicates the year in which data is observed regarding the Startups analyzed;
- *Anno_costituzione*: indicates the year in which the present Startup was established, especially for the purpose of this analysis only the years corresponding to 2018 and 2019 were considered;
- *Comune*: indicates the municipality in which the startup is located;
- *Codice_istat_comune*: indicates the unique code assigned by ISTAT to identify the municipality under consideration;
- *Provincia*: indicates the province to which the startup belongs;
- *Codice_istat_provincia*: indicates the unique code assigned by ISTAT to the considered Province;
- *Regione*: indicates the region to which the startup belongs;
- *Stato_giuridico*: indicates the state the Startup is in at the corresponding observation year, in the final Database obtained the entries under this variable are: Active, Active (with insolvency proceedings), Ceased, Ceased (in liquidation), Ceased (Merger), In liquidation;
- *Ateco_2007*: code assigned by ISTAT to identify the economic sector of the enterprise;
- *Dipendenti*: indicates the number of people working for each startup;
- *Tot_immob_immateriali*: refers to those non-tangible assets owned by the startup that constitute capitalizable costs;
- *Tot_immob_materiali*: refers to durable physical assets belonging to the company, with economic utility exceeding one fiscal year;
- *Totale_attivo*: Is the total value of assets owned by startups;
- *Capitale sociale*: Is the amount invested in the startup by its partners;
- *Ricavi:* Are the total revenue from the sale of goods or services in the reporting year;
- *Risultato_operativo*: is the indicator of the difference between revenues and operating expenses, represents the profitability of the company in its main activities;

- *Valore_aggiunto*: index of the difference between the value of production and the value of purchased intermediate goods, represents the economic contribution of the company;
- *Utile*: index of the difference between the total revenue and total expenses incurred by the startup. If positive we speak of Profit if negative of Loss
- *EBITDA*: Earning before interests, taxes, depreciation and amortization, an indicator of corporate profitability that excludes financial costs, taxes, and depreciation for a more direct assessment of the core business
- *Diritti_brevetto_industriale:* index of the number of patents registered by the startup;
- *Data_iscrizione_sezione _startup*: indicates the date on which the considered startup was officially registered in the Innovative Startup Registry;
- *Data_uscita_sezione_startup*: indicates the date on which the considered startup loses its innovative startup status and exits the Innovative Startup Registry;
- *Data_cessazione*: indicates the date on which the startup under consideration ceases to exist as a legal entity and is removed from the Companies Registry;
- *Prevalenza_femminile_complessiva*: indicates the percentage of women involved in the startup either as shareholder or manager. This variable can change over time, and the values it can take are: "*NO*", "*Majority*", "*Strong*", and "*Exclusive*" ;
- *Prevalenza_femminile_amministrativa*: indicates the percentage of women in the role of administrators. This like the previous one is also a time variable that can vary and the values it can take are: "*NO*", "*Majority*", "*Strong*", and "*Exclusive*" ;
- *Tot_population*: indicates the total population present at the Anno_di_Costituzione of the Startup considered and the SLL to which it belongs;
- *Working_population*: indicates the total working population present in the corresponding SLL and the respective Anno_costituzione;
- *Residenti_laureati*: indicates the total number of residents with a bachelor's degree present at the considered SLL and Year of Establishment;
- *Value_added*: is the added value of the Local Labor System to which the startup belongs;
- *Value_added_per_habitant*: is given by the formula Value_added/Tot_population;
- *Area_km2*: indicates the total area of the Sll considered;

- *Occupati_per_SLL*: indicates the total employed population present in the SLL under consideration. These are people in employment, including the self-employed and employees;
- *In_cerca_di_occupazione*: indicates the total number of people who are seeking employment present in the SLL;
- *Labour_force:* indicates all those people who are employed or unemployed (i.e., actively seeking work), regardless of their age. Includes *Occupati, Disoccupati*: People who are not working but are available and actively seeking employment. Excludes inactive persons (students, retirees, housewives, etc.), even if they are of working age;
- *Unemployment_rate:* indicates the percentage of the labor force that is unemployed and looking for work;
- *Employment_rate:* indicates the percentage of the labor force that is employed;
- *Donne_immigrate:* indicates the total number of immigrant women between the ages of 18 and 65 in the corresponding SLL;
- *Tot_servizi:* indicates the total number of services (both private and public) in the SLL under consideration;
- *Duration:* indicates the duration of each corresponding Startup.

To obtain the final Database just described we first created the databases for the respective years 2018 and 2019, cleaning up all the information that was not present or not needed for our purposes. Then through the use of STATA, using the "*append*" command we merged the two databases, so that we had a final database containing all the necessary information for both Startups with *Anno_di_Costituzione* 2018 and 2019. To conclude through the "*merge*" command, this dataset was linked with a previously found dataset in which the *duration* variables of each corresponding enterprise were contained.

5. Methodology and Analitical Framework

5.1 Hypothesis Formulation and Model Construction

The central objective of this research is to analyze how the survival rate of innovative startups varies over time, while also paying attention to the effects of the COVID-19 pandemic. The analysis focuses on the years 2018 and 2019 and is conducted at the level of Local Labor Systems (LSS) in the regions of Piedmont and Lombardy. The survey aims to investigate whether certain socio-economic factors, such as the presence of immigrant women employed in low-skilled jobs and the availability of care services (e.g., daycare centers and early childhood services), have a greater influence on the survival of female innovative startups than male innovative startups.

The basic hypothesis suggests that the presence of immigrant women in low-skilled, caregiving occupations in a given area may allow female entrepreneurs to devote more time to their professional careers, improving business performance and, consequently, increasing the probability of survival of innovative startups. This effect is expected to be more pronounced for female-led startups than for male-led startups, due to the historical allocation of caretaking roles to the female component of society, as also analyzed in previous chapters at the literature and data level. In addition, the study also wants to consider the impact of the COVID-19 pandemic, assessing whether the economic and social crisis had differential effects on the survival of startups based on gender and the presence of support mechanisms, such as care services.

Research Hypothesis

The hypotheses that will be tested are as follows:

- H1: “The survival rate of female-led innovative startups in Piedmont and Lombardy increases as the number of immigrant women employed in low-skilled occupations and care services available in their respective Local Labor Systems (LSSs) increases.”

- H2: “The impact of the presence of immigrant women in low-skilled occupations and care services on startup survival is stronger for female-led startups than for male-led startups in the years 2018 and 2019.”

Empirical Model Construction

Adopting these two model formulations allows us to assess whether and to what extent the presence of immigrant women and caregivers affects the duration of female versus male innovative startups.

To test these hypotheses, a multiple linear regression model will be constructed, in which the dependent variable is the survival duration of innovative startups, while the independent variables include:

- The number of immigrant women employed in low-skilled jobs present in the LFS in year t
- The number of care services available in the SLL in year t
- Control variables related to socioeconomic conditions in the area

The equation of the model is as follows:

$$durata\_startup_{ijt}=\beta_0+\beta_1 donne\_immigrate_{jt}+\beta_2 servizi\_cura_{jt}+ x\mu variabili\_controllo_{ijt}+u_{ijt}$$

Where:

- $durata\_startup_{ijt}$: represents the duration of startup i in SLL j at year t (measured in years);
- β_0 is the intercept;
- $donne\_immigrate_{jt}$ is the total number of female immigrants in low-skilled jobs in SLL j at year t;
- $servizi\_cura_{jt}$ is the total number of care services available in SLL j at year t;
- β_1 e β_2 are the coefficients measuring the impact of the independent variables on the duration of the startup;
- $x\mu_{ijt}$ represents a vector of control variables entered at the firm and region level, a set of additional factors that can influence the survival of startups, such as industry sector and labor market conditions;
- u_{ijt} is the error term, which captures the unobserved factors.

Model Enhancement: Relevant Indicators

To improve the accuracy of the analysis and take into account structural differences among Local Labor Systems, the model is reformulated using relative indicators, as follows:

$durata\_startup_{ijt}=\beta_0+\beta_1 tasso\_donne\_immigrate_{jt}+\beta 2 densita\_servizi\_cura_{jt}+x\mu$ $variabili\_controllo_{ijt}+u_{ijt}$

Where:

- $immigration\_rate_{jt}= donne\_immigrate_{jt} / tot\_population_{jt}$: represents the proportion of immigrant women to the total population of the SLL;
- $densita\_servizi_{jt} = tot\_servizi_{jt} / area\_km2_{jt}$: measures the availability of care services per km² in the SLL.

5.2 Variables Description

Below in this chapter the variables used in this research will be analyzed in detail.

Dependent Variables

The dependent variable represents the value to be predicted within the model and is defined as such because its variation is affected by the values assumed by the other independent variables. In the context of this research, the dependent variable under analysis is the *duration* of a female-led innovative startup, which is the period of time the startup remains active in the market. According to Italian law, an innovative startup can maintain this status for up to 5 years; after this period, if it is still operating, it is registered as a firm and moves from the register of innovative startups to the business register.

However, not all startups manage to survive the entire 5-year period and consolidate as enterprises. Therefore, in the absence of an official closing date, the termination of a startup is estimated by considering the last year for which financial statements are available and adding one year. This methodological choice is based on the assumption that if a company recorded revenues in a given year, it means that it was still operating and that its eventual closure occurred in the following year.

The startup duration variable is then calculated by subtracting the startup's founding date from the termination date. In addition, the same variable will also be analyzed by considering startups that have passed the initial 5-year stage, i.e., those that have managed to scale up and transform into established companies.

This methodology provides a more realistic measure of startup survival, distinguishing between those that manage to stabilize in the long run and those that cease operations before reaching the critical five-year threshold.

Independent Variables

The independent variable is the one that is measured to determine whether it is affected by the independent variable. It is the effect in the cause-effect relationship. In the context of this research, the independent variables considered are: *donne immigrate* indicating the total number of women between the ages of 18 and 65 residing in Italy with citizenship other than Italian. This age range was chosen as it is considered to be of working age, thus at an age they can work as domestic helpers or caregivers, supporting women in family dynamics and helping them to maintain and sustain their businesses. The assumption is made that this independent variable positively impacts the dependent variable *duration*, i.e., the greater the number of immigrant women the longer the duration of startups in the same SLL, in particular this positive effect is assumed to be more visible on female startups than on others.

A second independent variable considered is the *tot_servizi*, indicator of the total number of active services, both private and public, present in the considered SLL. Again as in the analysis previously done, we make the assumption that there is a positive correlation between the presence of active services and the duration of women's startups.

Among the independent variables we also go on to consider *immigration_rate* which indicates the amount of immigrant women of working age relative to the total population in the same SLL analyzed and the *tasso_servizi* Index of the amount of services present per area_km2 of the respective SLL.

Control Variables

Control variables as described in the previous chapter[23] are essential to ensure that the observed effect on the dependent variable is due solely to the independent variable and not to extraneous factors.

Different control variables were included within the linear regression analyzed, such as some related to the economic and financial structure of the firm *tot_patrimonio_netto*, to demographics and spatial context *tot_population, working_population, residenti_laureati, UnemploymentrateSLL, area_km2.* In addition, some variables that identify the economic competitiveness of an enterprise were included, such as *value_added_per_habitant* , *occupatiperSLL.*

Tot_patrimonio_netto this variable was included because it is expected that a higher value might indicate greater financial stability and durability capacity;

Working_population: an area with a larger working population could increase the likelihood of a startup's durability;

UnemploymentrateSLL: a high unemployment rate may reflect economic difficulties that affect the durability of an enterprise;

Area_km2: the size of the territory could be related to geographical dispersion of projects and thus to their duration;

value_added_per_habitant: is the added value of the corresponding area that is analyzed as it could influence on the durability of a startup;

OccupatiperSLL: could be an indication of the competitive pressure present in the considered SLL in which the Startup is present.

[23] 4.2.4 “Database of Control Variables”

5.3 Statistics Description

In this chapter we are going to analyze the descriptive statistics of the main variables used to construct the linear regression, this is a key step in understanding the characteristics of the data, ensuring the reliability of the model results. Descriptive statistics provide summary information about the data, facilitating the understanding of their properties. Analysis of the descriptive statistics of the variables is a crucial step in building a robust and reliable linear regression model.

Anno costituzione

anno_costituzione	Freq.	Percent	Cum.
2018	935	47.80	47.80
2019	1,021	52.20	100.00
Total	1,956	100.00	

anno_costituzione

Percentiles		Smallest		
1%	2018	2018		
5%	2018	2018		
10%	2018	2018	Obs	1,956
25%	2018	2018	Sum of Wgt.	1,956
50%	2019		Mean	2018.522
		Largest	Std. Dev.	.4996442
75%	2019	2019		
90%	2019	2019	Variance	.2496443
95%	2019	2019	Skewness	-.0880197
99%	2019	2019	Kurtosis	1.007747

Figura 7: Variable descriptive statistics anno_costituzione

The analysis of descriptive statistics of *anno_costituzione* shows that most startups in the dataset were founded in 2019, with very little variation between years. In fact, the median and 75th percentile coincide with 2019, while the minimum value and 25th percentile correspond to 2018. The mean (2018.52) and very low standard deviation (0.50) confirm that the dataset covers a narrow time range. This distribution suggests that 2019 may have been a particularly favorable year for startups, perhaps due to economic incentives or

public policy. However, the low variability of the variable is a limitation for the analysis, because it does not allow us to study the effect of startups' longevity on their duration.

SLL

sll	Freq.	Percent	Cum.
alba	16	0.82	0.82
albino	5	0.26	1.08
alessandria	5	0.26	1.33
asola	4	0.20	1.54
asti	1	0.05	1.59
bergamo	120	6.15	7.74
biella	14	0.72	8.45
borgomanero	5	0.26	8.71
borgosesia	4	0.20	8.91
bra	9	0.46	9.38
breno	1	0.05	9.43
brescia	86	4.41	13.83
bustoarsizio	26	1.33	15.16
canelli	1	0.05	15.22
casalemonferrato	6	0.31	15.52
casalmaggiore	3	0.15	15.68
castiglionedellestiviere	1	0.05	15.73
chiari	16	0.82	16.55
chieri	1	0.05	16.60
clusone	1	0.05	16.65
como	38	1.95	18.60
crema	12	0.61	19.21
cremona	4	0.20	19.42
cuneo	15	0.77	20.18
darfoboarioterme	2	0.10	20.29
desenzanodelgarda	6	0.31	20.59
domodossola	1	0.05	20.65
grumellodelmonte	7	0.36	21.00
ivrea	4	0.20	21.21
lecco	14	0.72	21.93
lodi	12	0.61	22.54
lumezzane	4	0.20	22.75
manerbio	1	0.05	22.80
mantova	11	0.56	23.36
milano	1,186	60.76	84.12

mondovì	4	0.20	84.32
montichiari	3	0.15	84.48
morbegno	4	0.20	84.68
novara	20	1.02	85.71
noviligure	3	0.15	85.86
orzinuovi	1	0.05	85.91
ovada	3	0.15	86.07
pavia	23	1.18	87.24
pinerolo	4	0.20	87.45
pontedilegno	1	0.05	87.50
rivarolocanavese	1	0.05	87.55
saluzzo	5	0.26	87.81
salò	2	0.10	87.91
savigliano	7	0.36	88.27
sondrio	3	0.15	88.42
stradella	2	0.10	88.52
tirano	1	0.05	88.58
torino	187	9.58	98.16
tortona	2	0.10	98.26
valenza	2	0.10	98.36
varese	15	0.77	99.13
verbania	3	0.15	99.28
vercelli	2	0.10	99.39
vestone	1	0.05	99.44
viadana	1	0.05	99.49
vigevano	9	0.46	99.95
zogno	1	0.05	100.00
Total	1,952	100.00	

Figura 8:Descriptive statistics SLL variable.

From the data reported here for the *Local Labor System* (SLL) shows a strong concentration in large cities, with Milan dominating the entrepreneurial landscape by hosting more than 60 percent of the startups in the dataset. This is followed by Turin (9.58 percent) and Bergamo (6.15 percent), while all other areas have a much smaller presence, often less than 1 percent. This concentration suggests that startups find a more favorable environment in large urban centers, probably as also seen in previous chapters, due to better funding opportunities, infrastructure and access to skilled talent. In contrast, entrepreneurship is more limited in less urbanized areas, probably due to fewer resources and support networks. This distribution might influence the analysis on the duration of startups: if most businesses are in highly developed settings, the effect of factors such as

care services and the presence of immigrant women might be different than in less populated areas.

Duration

duration	Freq.	Percent	Cum.
0	4	0.20	0.20
1	84	4.29	4.50
2	161	8.23	12.73
3	182	9.30	22.03
4	842	43.05	65.08
5	683	34.92	100.00
Total	1,956	100.00	

Figura 9:Variable descriptive statistics Duration.

Analysis of the distribution of the duration variable shows that the duration of startups in the dataset is concentrated mainly in two values: 4 years (43.05%) and 5 years (34.92%), which together account for almost 80% of the observations. Shorter durations are much less frequent: only 4 startups (0.20%) have a duration of 0, while 9.30% of startups last 3 years and less than 5% survive for only 1 year. This distribution suggests that most startups in the sample have relatively long durations, with few companies closing in the early years.

Donne_immigrate

donne_immigrate_età_lavorativa

	Percentiles	Smallest		
1%	903	84.36		
5%	3267	157		
10%	7628	157	Obs	1,944
25%	68444	286	Sum of Wgt.	1,944
50%	161692		Mean	186208.8
		Largest	Std. Dev.	145189
75%	390380.3	390380.3		
90%	390380.3	390380.3	Variance	2.11e+10
95%	390380.3	390380.3	Skewness	.3843865
99%	390380.3	390380.3	Kurtosis	1.68582

Figura 10:Descriptive statistics variable donne_immigrate.

Analysis of this variable shows a highly skewed distribution, with great variability among observations. The mean (186,208.8) is shifted upward from the median (161,692), suggesting the presence of extremely high values that influence the mean figure. In fact, while the 25th percentile indicates values around 68,444, the 75th percentile stands at 390,380.3, showing a strong concentration in some areas. The high standard deviation confirms this wide dispersion, while the positive skewness (0.38) indicates a long tail to the right, a sign that some areas have a much higher than average presence of immigrant women of working age. This distribution could pose a problem in statistical analyses, since the differences between areas are very pronounced.

Tot_servizi

servizi_attivi

	Percentiles	Smallest		
1%	11	2		
5%	22	4		
10%	123	4	Obs	1,952
25%	684	4	Sum of Wgt.	1,952
50%	1866		Mean	1322.339
		Largest	Std. Dev.	743.1433
75%	1919	1919		
90%	1919	1919	Variance	552262
95%	1919	1919	Skewness	-.6806643
99%	1919	1919	Kurtosis	1.715039

Figura 11:Variable descriptive statistics. tot_servizi

It can be seen from the above data that the mean (1,322.3) is lower than the median (1,866), indicating that there are some observations with few services that lower the mean value. In addition, the distribution is slightly skewed to the left (negative skewness), with some areas having significantly lower service availability than most of the sample. This distribution suggests that, in most cases, the number of active services is high, but there are some areas with less availability, the case thus being very similar to what was previously seen for the distribution of immigrant women

Area_km2

area_km2

	Percentiles	Smallest		
1%	179.2952	63.2505		
5%	489.0505	84.7521		
10%	536.0703	84.7521	Obs	1,952
25%	931.5239	84.7521	Sum of Wgt.	1,952
50%	1739.692		Mean	1528.187
		Largest	Std. Dev.	613.619
75%	1837.626	2472.547		
90%	2467.019	2472.547	Variance	376528.3
95%	2467.019	2472.547	Skewness	-.6234932
99%	2467.02	2472.547	Kurtosis	2.372923

Figura 12:Variable descriptive statistics. area_km2

Analysis of the area_km2 variable shows a slightly unbalanced distribution, with some areas much smaller than the average. The median (1,739.7 km²) is higher than the mean (1,528.2 km²), suggesting the presence of smaller areas that lower the mean value. Most observations are concentrated between 931 km² and 1,837 km², while the largest areas reach a common maximum around 2,467 km². The high standard deviation (613.6 km²) indicates strong variability among the areas analyzed.

Immigration_rate

immigration_rate

	Percentiles	Smallest		
1%	.0216641	.0008776		
5%	.0325574	.0008776		
10%	.0395437	.0008776	Obs	1,944
25%	.0412405	.0008776	Sum of Wgt.	1,944
50%	.0426653		Mean	.0704531
		Largest	Std. Dev.	.0412332
75%	.1017743	.2197202		
90%	.1025995	.2200286	Variance	.0017002
95%	.1065721	.2200286	Skewness	3.348465
99%	.1953115	.7760462	Kurtosis	47.02417

Figura 13: Variable descriptive statistics immigration_rate

This variable represents the presence of working-age immigrant women between the ages of 18 and 65 in the total population. A strongly skewed distribution is inferred from the statistics found, with most observations concentrated on low values and a few areas with very high immigration rates. The median (0.0427) is lower than the mean (0.0705), signaling the presence of some extremely high values that are moving the mean value upward. Most of the data lie between 0.041 and 0.101, but the 99th percentile reaches 0.776, indicating that there are some areas with significantly higher immigration rates than the rest of the sample.

Densita_servizi

densita_servizi

Percentiles		Smallest		
1%	.0182239	.0067879		
5%	.0636116	.0105353		
10%	.1656271	.0146232	Obs	1,952
25%	.3725143	.01504	Sum of Wgt.	1,952
50%	1.044282		Mean	.7982829
		Largest	Std. Dev.	.3651221
75%	1.072604	1.072604		
90%	1.072604	1.072604	Variance	.1333142
95%	1.072604	1.072604	Skewness	-.9723407
99%	1.072604	1.072604	Kurtosis	2.331998

Figura 14:Variable descriptive statistics densita_servizi

Analysis of the density_services variable shows a distribution with a strong concentration of values at the top. The mean (0.798) is lower than the median (1.044), suggesting that a portion of the observations have lower values that lower the mean value. In addition, the negative skewness (-0.97) indicates a slight skewness to the left, with some areas characterized by a lower density of services than the mean.

Female_startup

female_startup

Percentiles		Smallest		
1%	0	0		
5%	0	0		
10%	0	0	Obs	1,616
25%	0	0	Sum of Wgt.	1,616
50%	0		Mean	.3483911
		Largest	Std. Dev.	.4766081
75%	1	1		
90%	1	1	Variance	.2271553
95%	1	1	Skewness	.6363964
99%	1	1	Kurtosis	1.405

Figura 15:Variable descriptive statistics female_startup

This variable is a binary variable, which is intended to distinguish female startups from male startups, in fact it takes a value of 1 only in the case where the component of women is *Exclusive, Strong or Majority*. This analysis indicates the mean (0.348) about 35 percent of startups in the dataset are founded by women, while the median is 0, indicating that most observations belong to the category startups not founded by women. The positive skewness (0.63) indicates a slight skewness, due to the fact that there are more male startups.

Value_added_per_habitant

value_added_per_habitant

	Percentiles	Smallest		
1%	10.77165	7.875963		
5%	13.69279	8.048076		
10%	15.48676	8.048076	Obs	1,952
25%	18.25732	8.048076	Sum of Wgt.	1,952
50%	29.38215		Mean	24.84293
		Largest	Std. Dev.	6.36116
75%	30.00763	30.00763		
90%	30.00763	30.00763	Variance	40.46436
95%	30.00763	30.00763	Skewness	-.7377085
99%	30.00763	30.00763	Kurtosis	1.93744

Figura 16:Variable descriptive statistics value_added_per_habitant

Analysis of the value_added_per_habitant variable shows that most of the values are fairly evenly distributed up to a certain point, but then focus on a maximum value. The average (24.84) is lower than the median (29.38), which means that there are some areas with lower value_added_per_habitant that lower the overall average. However, in the higher values, many observations stop at 30.00, suggesting a possible limitation in the data. The standard deviation (6.36) indicates some variability, but the fact that many values stall at the maximum reduces the differences between observations. In addition, the distribution is slightly skewed to the left, with some areas having value added per capita significantly lower than average.

Residenti_laureati

residenti_laureati

	Percentiles	Smallest		
1%	1166	223		
5%	3605	247		
10%	10961	435	Obs	1,857
25%	112491	600	Sum of Wgt.	1,857
50%	621063		Mean	426944.3
		Largest	Std. Dev.	270492.9
75%	635697	635697		
90%	635697	635697	Variance	7.32e+10
95%	635697	635697	Skewness	-.6287525
99%	635697	635697	Kurtosis	1.465085

Figura 17:Variable descriptive statistics resident_laureati

Analysis of the resident_graduates variable shows a strong concentration of values at the high end, with many observations peaking at 635,697 graduates. The mean (426,944) is lower than the median (621,063), indicating that some areas with few graduates lower the mean value. There is a big difference between areas with few graduates (minimum of 223) and those with the highest recorded. In fact, the distribution is slightly skewed to the left, with some observations much lower than average. This variable is useful for assessing educational attainment, but its distribution could affect statistical analyses. Using it in regression, a logarithmic transformation will be made to balance the data and improve the interpretation of the results.

UnemploymentrateSLL

UnemploymentrateSLL

	Percentiles	Smallest		
1%	4.667	3.708		
5%	4.999	3.708		
10%	5.239	4.11	Obs	1,952
25%	5.888	4.11	Sum of Wgt.	1,952
50%	5.9		Mean	6.286301
		Largest	Std. Dev.	1.065484
75%	6.276	9.3		
90%	8.646	9.3	Variance	1.135255
95%	8.948	9.3	Skewness	1.556469
99%	9.3	9.724	Kurtosis	5.132823

Figura 18:Variable descriptive statistics unemploymentrateSLL

Analysis of the UnemploymentrateSLL variable shows that most observations cluster around an unemployment rate of 6 percent, with a mean of 6.29 percent and a median of 5.9 percent. The distribution is slightly skewed to the right, with some areas showing higher values up to a maximum of 9.3 percent. The positive skewness indicates that most areas have relatively low unemployment rates, while a few have very high values.

Dipendenti

dipendenti

	Percentiles	Smallest		
1%	0	0		
5%	0	0		
10%	0	0	Obs	1,368
25%	0	0	Sum of Wgt.	1,368
50%	0		Mean	.5423977
		Largest	Std. Dev.	1.806989
75%	0	17		
90%	2	20	Variance	3.265209
95%	3	22	Skewness	7.127542
99%	8	25	Kurtosis	70.96649

Figura 19:Variable descriptive statistics dipendenti

This analysis shows that most of the startups in the dataset have no employees, with a median of 0 and the 75th percentile still at 0, indicating that at least 75 percent of the observations involve companies with no employees. Only a minority of companies have employees, with a maximum of 25 and a very low median (0.54), influenced by a few higher values. The high skewness (7.13) and extremely high kurtosis (70.97) confirm that the distribution is highly skewed, with few startups employing staff and most without registered workers.

Tot_patrimonio_netto

tot_patrimonio_netto

Percentiles		Smallest		
1%	-51	-418		
5%	-8	-286		
10%	0	-226	Obs	1,434
25%	6	-189	Sum of Wgt.	1,434
50%	11		Mean	75.85844
		Largest	Std. Dev.	277.5145
75%	46	2350		
90%	156	2905	Variance	77014.31
95%	336	4393	Skewness	9.699019
99%	1241	5000	Kurtosis	132.6716

Figura 20:Variable descriptive statistics tot_patrimonio_netto

This analysis shows an extremely unbalanced distribution, with a strong presence of negative values and great variability among observations. The median is 11, much lower than the mean (75.86), signaling that a few very high values are pushing the mean value upward. In fact, while the 25th percentile is 6, the 99th percentile reaches 1,241 and the highest value goes up to 5,000, showing huge differences among startups. The high skewness (9.69) and very high kurtosis (132.67) confirm the presence of a few extremely high values that skew the distribution. It will therefore also be in this case as in many previous ones to perform a logarithmic transformation for the analysis that will be carried out.

6. Findings Analysis

This chapter will observe and analyze the results obtained from the analysis carried out to go and observe how the presence of immigrant women of working age and care services impact the duration of startups in the Local Labor Systems of Piedmont and Lombardy, between the years 2018 and 2019. To perform this analysis, a linear regression was conducted, in which the duration of startups and how the independent variables impact female startups differently from male startups. In addition, being aware of an important historical phenomenon, the Covid-19 pandemic, it can also be considered that the durations of startups were also affected by this phenomenon.

Multiple linear regression without control variables

$duration_i = \beta_0 + \beta_1 donne\_immigrate_i + \beta_2 tot\_servizi_i + \varepsilon_i$

Source	SS	df	MS	Number of obs	=	1,944
				F(2, 1941)	=	140.15
Model	291.81826	2	145.90913	Prob > F	=	0.0000
Residual	2020.72289	1,941	1.0410731	R-squared	=	0.1262
				Adj R-squared	=	0.1253
Total	2312.54115	1,943	1.19019102	Root MSE	=	1.0203

duration	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
donne_immigrate	4.07e-06	2.44e-07	16.72	0.000	3.59e-06	4.55e-06
tot_servizi	-.0005752	.0000477	-12.05	0.000	-.0006688	-.0004815
_cons	3.963009	.0475641	83.32	0.000	3.869727	4.056291

Figura 21:Results of multiple regression without control variables' model

This regression analyzes the effect of the number of immigrant women and total available services on the duration of startups. The model is found to be statistically significant ($F = 140.15$, $p < 0.000$), meaning that at least one of the variables affects the duration of startups. However, the R^2 is only 12.6%, indicating that these two factors explain only a small part of the observed variability. This suggests that there are many other elements that determine the duration of startups and are not considered in the model.

Looking at the variables *donne_immigrate, tot_servizi, _cons*, we see that the number of immigrant women has a positive effect on the duration of startups. The coefficient is very small (4.07e-06), but statistically significant ($p < 0.000$), suggesting that an increase in this variable is associated with longer duration of startups. However, the actual impact seems to be negligible, as the coefficient value is very low. On the other hand, the total number of available services has a negative effect on the duration of startups. The coefficient (-0.0005752) indicates that as the number of services in an area increases, the duration of startups tends to decrease. Although both variables are statistically significant, their effect on startup duration is minimal. In addition, the model explains only a small part of the variability in the duration of startups, suggesting that other factors, such as economic, sectoral or strategic aspects, may play a more determining role. To improve the analysis, it might be useful to test interactions between variables or use logarithmic transformations to see additional iterations in the data.

Multiple linear regression with bynary variable

In this regression we introduce a binary variable *female_startup* that wants to distinguish between female and nonfemale startups in order to test Hp 2. Some control variables are also included and the independent variables are transformed into two ratios. As also described in the previous chapters, this choice is driven by the desire to minimize variability between sll from different areas and thus avoid bias in the final data, allowing the analysis to be more robust and avoiding problems of heterogeneity across geographic

$$\text{Duration}_i=\beta_0+\beta_1\text{immigration\_rate}_i+\beta_2\text{densita\_servizi}_i+\beta_3\text{anno\_costituzione}_i +\beta 4\text{value\_added\_per\_habitant}_i+\beta_5\text{female\_startup}_i+\varepsilon_i$$

Source	SS	df	MS	Number of obs	=	1,605
				F(5, 1599)	=	113.53
Model	353.814488	5	70.7628976	Prob > F	=	0.0000
Residual	996.671493	1,599	.623309252	R-squared	=	0.2620
				Adj R-squared	=	0.2597
Total	1350.48598	1,604	.841948866	Root MSE	=	.7895

duration	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
immigration_rate	.0171284	1.023962	0.02	0.987	-1.991321	2.025577
densita_servizi	.0872343	.1664911	0.52	0.600	-.2393295	.413798
anno_costituzione 2019	-.9375307	.0764282	-12.27	0.000	-1.087441	-.7876208
value_added_per_habitant	-.0026419	.0093723	-0.28	0.778	-.0210253	.0157415
female_startup	-.0769223	.0414741	-1.85	0.064	-.1582716	.0044271
_cons	4.679006	.1775233	26.36	0.000	4.330803	5.027209

Figura 22:Results of multiple regression with control variables' model

This regression aims to analyze the factors that influence the duration of startups, taking into consideration immigration rate, density of services, year of business establishment, value added per inhabitant and the presence of female startups. The model is found to be statistically significant overall, with a very high F-test (113.53) and a p-value of 0.000, indicating that at least one of the variables has an effect on the duration of startups. However, the value of R^2 (26.2%) shows that only a portion of the variability in startup duration is explained by these factors, suggesting that other elements not included in the model may have an important weight. Looking at the variables in detail, we see that immigration rate and service density do not have a significant impact on the duration of startups. Their effect is close to zero and the p-values are very high, indicating that there is no statistically significant relationship between these factors and business survival.

This result could be due to the fact that, by themselves, these two indicators are not sufficient to explain the durability of a startup and should be analyzed in combination with other economic and structural variables. The only factor that has a clear and significant impact is the year of establishment. The negative coefficient associated with startups born in 2019 indicates that these companies tend to last less than those founded in other years. This could reflect special economic conditions, difficulties in accessing funding, or other events that negatively affected their survival, such as especially the presence of the Covid-19 pandemic from the year 2020. An interesting result concerns female startups, whose

effect is negative and close to the threshold of statistical significance. This might suggest that, all things being equal, female-dominated startups have a slightly shorter duration, although the result is not strong enough to draw firm conclusions. Finally, the low value of R^2 indicates that there are many other variables influencing the duration of startups that were not considered in this model.

Multiple linear regression with control variables

In this part we test the same hypothesis, but we also look at the interactions between

female_startup and continuous variables, i.e., how immigration rate and service density affect the duration of startups differently depending on whether the startup is female or not.

$$\ln\_duration_i=\beta_0+\beta_1 immigration\_rate_i+\beta_2 densita\_servizi_i+\beta_3 female\_startup_i+\beta_4 (immigration\_rate_i\times female\_startup_i)+\beta_5(densita\_servizi_i\times female\_startup_i)+\beta_6 anno\_costituzione_i+\beta_7 value\_added\_per\_habitant_i+\varepsilon_i$$

In addition, it may be noted that for some variables it was decided to adopt a logarithmic transformation in order to improve their distribution and reduce the presence of extreme values. In fact, many economic and demographic variables, as noted in the previous chapter, have strongly skewed distributions, with a few extremely high values that can distort the regression results. The logarithmic transformation reduces the distance between high and lower values, making the distribution more symmetrical. In addition, in a model with logarithmic variables, coefficients can be interpreted in terms of percentage changes, which facilitates economic analysis of the results.

The main logarithm-transformed variables are:

- *log_value_added*: value added, which has a highly skewed distribution with some extremely high values.
- *ln_laureati:* the number of residents with college degrees, which varies significantly among areas.
- *ln_unemploymentrate*: the unemployment rate, which shows a slightly unbalanced distribution with some particularly high values.

- *ln_patrimonionetto*: net worth of firms, which has a very high variance and extreme values that could distort the regression.
- *ln_occupati*: the number of people employed in an area, transformed to handle the strong heterogeneity in the data.

Source	SS	df	MS	Number of obs	=	953
				F(31, 921)	=	14.33
Model	223.89109	31	7.22229323	Prob > F	=	0.0000
Residual	464.228532	921	.504048352	R-squared	=	0.3254
				Adj R-squared	=	0.3027
Total	688.119622	952	.722814729	Root MSE	=	.70996

Figura 23: Results of Model's fit

The overall model is statistically significant ($F = 14.33$, $p < 0.000$), which means that at least one of the variables considered has a significant effect on the duration of startups. However, the value of R^2 is 32.5%, indicating that only about one-third of the variability in startup duration is explained by the variables included in the model.

The Adjusted R^2 (30.27%) shows that after accounting for the number of variables in the model, the explanatory power still remains limited. This suggests that there are other factors not included in the regression that influence the duration of startups, such as aspects related to the specific industry, quality of management or access to funding.

The standard error of the regression (Root MSE = 0.70996) indicates that, on average, the estimated duration of startups deviates from the actual duration by about 0.71 units. This value suggests that although the model has some predictive power, there is still considerable variability in the data that the model fails to capture.

duration	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
immigration_rate	-1.73201	1.545814	-1.12	0.263	-4.765736	1.301716
densita_servizi	-.0450633	.3590365	-0.13	0.900	-.7496878	.6595613
1.female_startup	.0709547	.1447494	0.49	0.624	-.2131221	.3550316
female_startup#c.immigration_rate						
1	-1.230851	1.412276	-0.87	0.384	-4.002502	1.540801
female_startup#c.densita_servizi						
1	-.0844566	.1474896	-0.57	0.567	-.3739112	.204998
anno_costituzione						
2019	-1.084278	.1168264	-9.28	0.000	-1.313555	-.8550013
log_value_added	.1222123	.357809	0.34	0.733	-.5800033	.8244279
codice_istat_provincia						
3	.0100887	.2796254	0.04	0.971	-.5386882	.5588656
4	-.3828717	.3367537	-1.14	0.256	-1.043765	.2780218
5	.3057208	.7503565	0.41	0.684	-1.166886	1.778328
6	-.0844023	.3447145	-0.24	0.807	-.7609194	.5921149
12	.2053833	.2918937	0.70	0.482	-.3674707	.7782373
13	-.0324592	.2995342	-0.11	0.914	-.620308	.5553896
14	-.0927221	.4790065	-0.19	0.847	-1.032793	.8473488
15	-.1566992	.2838347	-0.55	0.581	-.7137371	.4003387
16	-.1087037	.3512501	-0.31	0.757	-.7980471	.5806397
17	.0888941	.3057541	0.29	0.771	-.5111614	.6889497
18	-.5937642	.3606207	-1.65	0.100	-1.301498	.1139695
19	.1111305	.348144	0.32	0.750	-.5721171	.7943781
20	.3228949	.4262777	0.76	0.449	-.5136935	1.159483
96	.4087168	.3624143	1.13	0.260	-.3025368	1.11997
97	.087909	.382938	0.23	0.818	-.6636232	.8394413
98	-.0372043	.3576289	-0.10	0.917	-.7390664	.6646577
103	-1.671895	.570757	-2.93	0.003	-2.79203	-.5517599
108	.0462037	.3203733	0.14	0.885	-.5825428	.6749501
ln_laureati	.1450174	.1167461	1.24	0.214	-.0841018	.3741366
ln_unemploymentrate	-.6748855	.5451618	-1.24	0.216	-1.744789	.395018
dipendenti	.0104193	.0132008	0.79	0.430	-.0154878	.0363264
ateco_2007_	2.16e-07	1.47e-07	1.47	0.142	-7.24e-08	5.04e-07
ln_patrimonionetto	.0350104	.0150977	2.32	0.021	.0053805	.0646403
ln_occupati	-.1529698	.1807777	-0.85	0.398	-.5077539	.2018143
_cons	5.956841	1.675616	3.56	0.000	2.668373	9.245309

Figura 24: Analysis of regression coefficients

Immigration_rate: The negative coefficient (-1.732-1.732-1.732) suggests that an increase in immigration rate could reduce the longevity of startups, but the high p-value (0.263) indicates that this relationship is not statistically significant. This could mean that the level of immigration in an area does not directly affect the longevity of startups, or that its effect depends on other factors not considered in the model.

Densita_servizi: The coefficient close to zero suggests that service density does not have a systematic impact on the durability of startups. This could indicate that the availability of

services in an area is not a key factor for business survival, or that the relationship is more complex and depends on the specific sector of the startup.

Female_startup: The positive coefficient suggests a potential positive impact, but the p-value (0.49) indicates that this effect is not statistically significant. This means that, taking other factors into account, the duration of female startups does not differ significantly from that of other startups.

Interactions between female startups and socioeconomic variables

Interaction between female startups and immigration rate (p=0.384): The negative coefficient (-1.230-1.230-1.230) suggests that for female startups, increasing immigration rate could further reduce their duration, but the p-value does not confirm this relationship significantly.

Interaction between female startups and service density (p=0.567): The coefficient is also negative, but not significant, indicating that the presence of services does not significantly change the duration of female startups compared to non-female startups.

In summary, the inclusion of interactions shows that the effect of immigration and density of services does not vary significantly between female and non-female startups. This might suggest that the gender of the startup is not a key element in determining the impact of these factors on business duration.

Effects of Economic and Geographical Variables

Anno_costituzione (2019 vs. 2018) : turns out to be significant (p<0.000).

The negative coefficient (-1.084-1.084-1.084) indicates that startups founded in 2019 tend to last significantly less than those in other years. This could reflect the economic and social conditions brought by the Covid-19 pandemic in the following years, which made it more difficult for companies founded in that year to survive.

Log_value_added: Not significant (p=0.733). The positive coefficient suggests that an increase in value added might be associated with longer duration of startups, but the p-value does not support this relationship in a statistically significant way. This could indicate that value added has an indirect effect on firm duration, perhaps through other variables such as capital or access to credit.

Ln_patrimonio_netto: Significant (p=0.021). The positive coefficient (0.035) indicates that startups with higher net worth tend to last longer. This result is intuitive: companies with more financial resources have a greater ability to withstand economic difficulties and invest in their own development.

Codice_istat_provinzia: Generally not significant, except for some areas.

Most provincial codes show no significant effects, except for ISTAT code 103 (Verbano-Cusio-Ossola), which has a negative and significant coefficient (p=0.003), indicating that startups tend to last less in some provinces.

Other variables

Ln_occupati; Ln_laureati: Not significant. None of these variables show a statistically significant effect on the duration of startups. This might suggest that factors such as education and unemployment rate do not have a direct impact on business survival, or that their effect depends on other variables not considered in the model.

7.Research Limitations

The objective of this research was to analyze the effect of care service density and immigration rate on the duration of female-led startups, specifically showing a greater impact on female-led startups than on other startups. However, the results of the different regressions do not support the initial hypothesis .

In particular:

Immigration rate and *service density* do not show a significant impact on the duration of startups, either in the general model or in the model in which female-led startups go explicit.

Startups founded in 2019 tend to last less, probably due to external factors such as economic difficulties or market instability.

The patrimonio_netto is one of the few variables with a positive effect on the durability of companies, suggesting that financial stability is a key factor for survival.

Female startups do not appear to have a significant advantage or disadvantage over male startups, and the interaction with immigration rates and service density does not change this relationship. These results indicate that care services and the presence of immigrant women, while relevant in other economic and social contexts, are not determinants of the survival of female startups.

Methodological limitations

The results obtained must be interpreted in light of some methodological and theoretical limitations:

Immigration rates and service density may not accurately capture actual access to crucial resources for women's startups. A more detailed analysis, with data on specific public incentives or the degree of accessibility to services for women entrepreneurs, might provide clearer results.

Indeed, the study focuses on the duration of startups as a measure of success, but other indicators, such as revenue growth or access to funding, might provide a different perspective on the difficulties faced by women entrepreneurs.

The impact of service density and immigration rate may not be linear. For example, there may be thresholds beyond which the effect becomes significant, or there may be indirect effects that are not captured by the current model.

Limitation of Datasets

Dataset tot_population: data from 2016 to 2018 are the result of a statistical reconstruction based on censuses and population flows recorded from 2001 to 2018. Therefore they may have slight differences from the official data published in those years.

Residents with a bachelor's degree: for the years 2018 to 2022, the istat website for past permanent censuses was consulted, and the total number of people with a master's degree was selected. One problem with this data could be the identification of the word “people with a bachelor's degree,” one could do a more in-depth analysis and differentiate between those who are bachelor's graduates, master's graduates, or single-cycle graduates. Inasmuch as in this dataset we made do with data found from the ISTAT website archive.

Control variables: to find some Control variables, estimates for SLL on labor force (2016 average) for SLL 2011 were consulted. For specific periods from 2016 to 2022, it may be necessary to consult the time series available in the databases of the respective regions or ISTAT for more certain data.

Interpretations from the literature

The results obtained from the regressions can be better understood through academic evidence on the relationship between women's entrepreneurship, social inclusion and the economic environment. One of the main reasons why care services and the presence of immigrant women do not affect the duration of women's startups relates to the type of entrepreneurial activity started by women.

Research shows that female-led startups are more socially oriented than technology and environmentally sustainable (Colombelli et al., 2024). This means that many female entrepreneurs focus on business models that are not directly dependent on access to care services or the demographic makeup of the area, but rather on the social mission of the business itself.

In addition, many female startups arise in low-scalability sectors such as personal services, welfare, and crafts (Brush et al., 2019). However, these sectors often have low profit

margins and limited growth opportunities, which may explain why their durability does not benefit from the presence of immigrant women. If the market is saturated or the demand for these services is limited, increased competition may lead to greater vulnerability of women's startups, rather than fostering their growth.

An assumption of the analysis was that increased access to care services would promote the durability of women's startups by facilitating work-life balance. However, academic research on work-life balance and entrepreneurship (Díaz-García & Welter, 2013) suggests that:

- Women entrepreneurs adopt flexible time management strategies, such as customized schedules and remote work, thus reducing their dependence on institutional care services.
- Family and social networks often compensate for the lack of public services, with many women relying on relatives and friends rather than formal facilities.

If women's startups do not directly use care services to support their business, the density of these services does not translate into a tangible advantage in terms of business longevity.

Moreover, an increased presence of care services may not only not help women entrepreneurs, but also increase competition. If many women's startups operate in areas related to welfare or education, a higher density of public services might reduce demand for startups, increasing the risk of failure.

According to Acs et al. (2017), market saturation is one of the main factors limiting the growth of startups: in a market with many players, only companies with innovative and sustainable business models can survive in the long run.

We also need to consider an additional factor: female startups have more difficulty in obtaining funding than male startups. According to Brush et al. (2019), women entrepreneurs receive less investment from venture capital and banks, which limits the growth and survival of their companies.

If the critical factor for the longevity of a startup is the availability of capital, then it is understandable why the density of services and the presence of immigrants are not key determinants of business longevity.

8. Conclusions and future improvements

The results suggest that the survival of women's businesses depends more on economic and financial factors than on contextual elements related to social inclusion or the availability of territorial services. Despite the expectation that the presence of care services and immigration rates could favor the durability of women's startups, the results show that these factors do not have a significant impact on their survival. Rather, financial strength, access to finance and economic stability appear to be much stronger determinants.

To overcome the limitations of this study and to further investigate the dynamics influencing the survival of women's startups, it would be useful to expand the analysis to include other socioeconomic variables, such as data on women's startup support policies, access to credit, and women's labor market conditions. These factors could play a crucial role in indicating how the economic environment and institutional support affect the durability of startups.

Another key aspect to explore is social capital and entrepreneurial networks. Relationships and networking among women entrepreneurs could prove to be more influential than simply the availability of care services or the presence of immigrant women. Professional networks offer women entrepreneurs support, resources and opportunities that might be more crucial to the success of their businesses than other factors.

In addition, it would be interesting to examine the role of the economic sector in which startups operate. The effect of variables such as care services might be more pronounced in specific sectors. For example, startups in healthcare or education might benefit from greater availability of care services than those in the technology sector, where other variables, such as access to capital and innovation, might be more relevant.

Finally, it would be useful to consider alternative measures of startup success. In addition to venture duration, other measures such as revenue growth, team expansion, or access to finance could provide a more complete picture of the success and resilience of women's startups. These indicators could provide crucial information about how women's businesses develop over time and how socioeconomic factors influence their growth, not just their survival.

In conclusion, this study offers significant insights for the debate on women's entrepreneurship and policies to support startups, underscoring the importance of targeted

strategies that can promote the sustainability and success of women-led businesses. Addressing economic challenges, improving access to capital, and enhancing support networks are key steps to foster an inclusive and successful entrepreneurial ecosystem for women.

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- Cortes, Patricia. (2022). “Immigration, Household Services, and Women’s Economic Opportunities”. Boston University, United States.
- Dipartimento per gli affari europei, (2020). “Start-up (o startup)”. Governo italiano https://www.affarieuropei.gov.it/it/comunicazione/europarole/start-up-o-startup/
- Unioncamere, (2024). “Report con dati strutturali, startup innovative. 3 trimestre 2024”
- Cho, Y. & McLean, G. (2009). Successful IT start-ups? HRD practices: Four cases in South Korea. Journal of European Industrial Training, 33(2), 125-141
- Krejci, M., Strielkowski, W. & Cabelkova I. (2015). “Factors that influence the success of small and medium enterprises in ICT: A case study from the Czech Republic. Business: Theory and Practice”. 16(2), 304-315
- Paoloni P. & Modaffari G. (2018). “Female owned Innovative Startups in Italy: status quo and implications”. Administrative sciences, 8(4),66
- Senato della Repubblica, camera dei deputati, (2024). “Promozione e sviluppo delle start-up e delle piccole e medie imprese innovative mediante agevolazioni fiscali e incentivi agli investimenti” https://documenti.camera.it/leg19/dossier/pdf/FI0049a.pdf
- Patricia Cortes, “Immigration, Household Services, and Women’s Economic Opportunities”, Boston University, United States
- Maurzio Carucci, (2024). “Così start up e incubatori creano lavoro” https://www.avvenire.it/economia/pagine/cosi-start-up-e-incubatori-creano-lavoro
- Schumpeter, J. A. (1934). “The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle.”
- Osservatorio sull’Innovazione Europea (2022) - Report annuale che analizza il ruolo dell’innovazione come processo sistemico nell’economia e nella società, disponibile sui portali istituzionali dell’Unione Europea.

- Ministero delle Imprese e del Made in Italy (2022) - Rapporti ufficiali sul contributo delle startup innovative in Italia, consultabili sul sito istituzionale del MIMIT.
- Baldridge R., Curry B. «What Is A Startup?». Forbes Advisor, 2021
- Barrette A. «Business Startup Funding: A beginner's guide». Foundr, 2020
- Bbva, «What is a business angel?». Bbva, 2021
- Blank S. «Steve Blank: The 6 Types of Startup». The Wall Street Journal, 2013
- CB Insights, «The Top 12 Reasons Startup Fail»
- Cremades A. « The Pros And Cons Of Bootstrapping Startup». Forbes, 2019
- Hathaway I. «What Startup Accelerators Really Do». Harvard Business Review, 2016
- Lee Yohn D. «Why Startup Fail». Forbes, 2019
- Commisione Europea. (2015). *"Il crowfunding. Che cos'è? Una guida per le piccole e medie imprese. Ufficio delle pubblicazioni dell' UE."*
- Corigliano R. (2001). "*Il venture capital finanziamento dell'innovazione, capitale di rischio e nuovi mercati finanziari"* Bancaria Editrice
- Esposito L. (2019). *"Il crowdfunding, uno strumento alternativo di finanziamento".* Rivista Bancaria-Minerva Bancaria.
- University of Cambridge. (2018). The global Alternative Finance Market Banchmarking Report.
- Kotha, R., & George, G. (2012). Friends, family, or fools: Entrepreneur experience and its implications for equity distribution and resource mobilization. *Journal of Business Venturing, 27*(5), 525-543.
- Bruton, G., Khavul, S., Siegel, D., & Wright, M. (2015). New financial alternatives in seeding entrepreneurship: Microfinance, crowdfunding, and peer-to-peer innovations. *Entrepreneurship Theory and Practice, 39*(1), 9-26.

- Ahlers, G. K., Cumming, D., Günther, C., & Schweizer, D. (2015). Signaling in Equity Crowdfunding. *Entrepreneurship Theory and Practice, 39*(4), 955-980.

- Bertoni, F., Colombo, M. G., & Quas, A. (2019). The role of government venture capital in the venture capital ecosystem: An organizational ecology perspective. *Entrepreneurship Theory and Practice, 43*(1), 61-85.

- Mills, K., & McCarthy, B. (2017). *The state of small business lending: Innovation and technology and the implications for regulation.* Harvard Business School.

- Brush, C. G., de Bruin, A., Gatewood, E. J., & Henry, C. (2010). *"Women Entrepreneurs and the Global Environment for Growth."* Edward Elgar Publishing.

- Financial Stability Board, "Fintech credit Market structure: business models and financial stability implications", 22 May 2017

- Fisch, C. (2019). Initial coin offerings (ICOs) to finance new ventures: An exploratory study. *Journal of Business Venturing, 34*(1), 1-22.

- Mason, C., & Harrison, R. (2008). Measuring business angel investment activity in the United Kingdom: A review of potential data sources. *Venture Capital, 10*(4), 309-330.

- Mills, K., & McCarthy, B. (2017). The state of small business lending: Innovation and technology and the implications for regulation. *Harvard Business School Working Paper, 17-042*.

- Schifilliti, V., & La Rocca, E. T. (2024). Board gender diversity in innovative SMEs:an investigation across industrial sectors. European Journal of InnovationManagement,27(9), 461–486.

- Redi N., Di Minin A., De Marco C. E., (2015) Ecosistemi di innovazione: misure di sviluppo

- Auricchio M., Cantamessa M., Colombelli A., Cullino R.,Orame A. e Paolucci E., (2014) Questioni di Economia e Finanza: Gli incubatori d'impresa in Italia

- A. Urso (2024), "Relazione annuale al parlamento 2024: sullo stato di attuazione e le polizze a sostegno di Startup e Pmi innovative". Ministero delle Imprese e del Made in Italy (MIMT) https://www.mimit.gov.it/images/stories/documenti/2024.01.19_-_Relazione_annuale_DEF_2.pdf

- Acs, Z. J., Audretsch, D. B., & Lehmann, E. E. (2017). The knowledge spillover theory of entrepreneurship. *Small Business Economics*.

- Brush, C. G., Greene, P. G., Balachandra, L., & Davis, A. E. (2019). The gender gap in venture capital: Progress, problems, and perspectives. *Venture Capital Journal*.

- Colombelli, A., D'Ambrosio, A., & Ravetti, F. (2024). Women in Innovative Start-ups and Regional Inclusiveness.

- Díaz-García, C., & Welter, F. (2013). Gender identities and practices: Interpreting women entrepreneurs' narratives. *Entrepreneurship & Regional Development*.

- Kloosterman, R., & Rath, J. (2018). "*Immigrant entrepreneurship: Venturing abroad in the age of globalization."* Oxford University Press.

- Marlow, S., & Swail, J. (2014). *"Gender, Risk and Finance: Why Can't a Woman Be More Like a Man? Entrepreneurship & Regional Development"*, 26(1-2), 80-9

- Unioncamere, (2023). "Incubatori e acceleratori di Startup in Italia: cosa sono e come intervengono" . https://sni.unioncamere.it/notizie/incubatori-e-acceleratori-di-start-italia-cosa-sono-e-come-intervengono

- Gonzalez (2017). "What Factors Are Causal to Survival of a Startup?", University of South Florida

- Politecnico di Torino (2020), "Diversità è eccellenza".

- ISTAT, (2022). “Statistiche report: *Iscrizioni e cancellazioni anagrafiche | ANN0 2020”*. https://www.istat.it/it/files/2022/02/REPORT_MIGRAZIONI_2020.pdf
- ISTAT, (2024). *“*Statistiche report: *Migrazioni interne e internazionali della popolazione residente | ANNI 2022-2023”* https://www.istat.it/it/files/2024/05/Migrazioni-interne-e-internazionali-della-popolazione-residente.pdf
- ISTAT, (2024). *“Donne imprenditrici, più giovani e più istruite”* https://www.istat.it/wp-content/uploads/2024/03/STATISTICATODAY_IMPRENDITRICI.pdf
- Centro Studi Guglielmo Tagliacarne - Si.Camera, (2022), “*V Rapporto nazionale imprenditoria femminile”*, Unioncamere https://www.unioncamere.gov.it/osservatori-economici/rapporti-imprenditoria-femminile/rapporti-nazionali-imprenditoria-femminile
- Insight Report, (2024). *“Global gender Gap”.* World economic forum https://www3.weforum.org/docs/WEF_GGGR_2024.pdf
- https://www.economyup.it/startup/decreto-rilancio-ecco-le-misure-per-startup-pmi-innovative-ed-ecosistema-dellinnovazione/
- https://www.mef.gov.it/covid-19/Sostegno-alle-imprese-e-alleconomia-00001/
- "L'impatto del Covid-19 sulle startup: l'ecosistema ha tenuto ma serve liquidità" – Il Sole 24 Ore
- M.P. Nanni, (2019). *“Rapporto Immigrazione e Imprenditoria Aggiornamento Statistico 2019”* https://welforum.it/wp-content/uploads/2020/03/Rapporto-Immigrazione-e-Imprenditoria_Agg.-Stat-2019.pdf
- Unioncamere, (2020). *“Rapporto imprenditoriale femminile”* https://www.camera.it/temiap/2021/02/26/OCD177-4840.pdf
- A. Urso, (2022). *“RELAZIONE ANNUALE AL PARLAMENTO sullo stato di attuazione e l’impatto delle policy a sostegno di startup e PMI innovative”*. (Ministero delle imprese e del Made in Italy) https://www.mimit.gov.it/images/stories/documenti/Relazione_annuale_del_Ministro_al_Parlamento_Startup_e_PMI_innovative_2022.pdf

- Gujarati, D. N., & Porter, D. C. (2009). "*Basic Econometrics (5ª ed.)".* McGraw-Hill.
- Stock, J. H., & Watson, M. W. (2019). *"Introduction to Econometrics (4ª ed.)".* Pearson