

Entrepreneurship and Innovation: The Transformative Role of Türkiye's Startup Ecosystem

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Abstract

Türkiye's dynamic economic landscape has seen a revolutionary transition as its startup ecosystem has expanded rapidly. Türkiye has embraced entrepreneurship as a crucial growth strategy, in line with global trends. In light of this, the emergence of startups has become a significant factor that fosters innovation, generates job opportunities, and strengthens the economy. Both the Small and Medium Enterprises Development Organization of Türkiye) Strategic Plan and the 12th development plan of Türkiye highlight the importance of entrepreneurship in Türkiye's social integration, economic growth, innovation, and competitiveness. Socially responsible, environmentally friendly, and well-designed inclusive business models are blooming in all corners of Türkiye. The country's advantageous geographic position, rich cultural heritage, and historical significance have all contributed to the development of a strong entrepreneurial culture over time. But given the high failure rate of technological startups, entrepreneurship is not an easy path. This article provides a thorough examination of the current situation of Türkiye's startup ecosystem while addressing the challenges, economic impact, and ways in which startups contribute to technical progress. Also, technology parks and technology transfer offices', which are important channels of building research platforms with enterprises where universities can disseminate knowledge, effects on startup ecosystem will be explored. We seek to provide insights that not only represent the current situation but also direct future plans for promoting sustainable growth and worldwide competitiveness within Türkiye's vibrant startup ecosystem by looking at success stories, governmental policies, and international comparative viewpoints.

1 Introduction

The term 'entrepreneurial' and 'entrepreneurship' have come a long way since ancient times. A wide range of social sciences, including economics, psychology, sociology, and anthropology, study entrepreneurship. Because they focus on different aspects of entrepreneurship, each of these sciences makes a significant contribution to the theory of entrepreneurship. Thus, it is impossible for a single scientific discipline to fully explain the field of entrepreneurship. This makes sociology, psychology, and economics the main fields in the literature when it comes to explaining entrepreneurship (Virtanen, 1997).

The concept of entrepreneurship has become an entrepreneurial understanding, which is realized with an understanding of fast growth and proper technologies. Hence, the term 'startup', which has definitions like 'a company that has the potential to grow from the ground up', and 'a startup', which is becoming more and more popular all over the world, including Türkiye has come into our lives. Dissemination of startup applications and encouragement and support of entrepreneurs in this regard play a vital role in the country's economic and social growth. The role of entrepreneurship in addressing the challenges of unemployment and lack of growth caused by the current global economic crisis, which is at the top of the political agenda of every nation in the world (Aşkun, Yıldırım, 2011).

Entrepreneurship has become one of the most influential factors in the economic prosperity of people and countries in today's highly competitive world, whose landscape is constantly changing. Entrepreneurship activities are of great importance for countries, especially in terms of employment creation. Many forms of entrepreneurship have begun to appear in different countries and sectors, particularly as a result of the impact of communication technologies and globalization. As a result, entrepreneurship has come to be seen as an instrument that all countries need to support strongly in order to achieve long-term economic prosperity (Ciritci, 2021). Various studies show that starting businesses in strong economies like the USA or Europe helps countries grow economically. Many projects are done to help more people start businesses in these countries (Benzing et al., 2009, p.5).

Entrepreneurship is considered in two main processes: processes that create innovations in the production of goods and services for the needs of individuals, and activities related to the establishment, management and development of companies. The concept of entrepreneurship is a concept that cannot be explained independently of concepts such as research, discovery, new business, following innovation and opportunity, risk, uncertainty management, profit seeking, value creation, and risk (Krueger et al., 2000). Figure 1 contains the main elements used to define entrepreneurship.

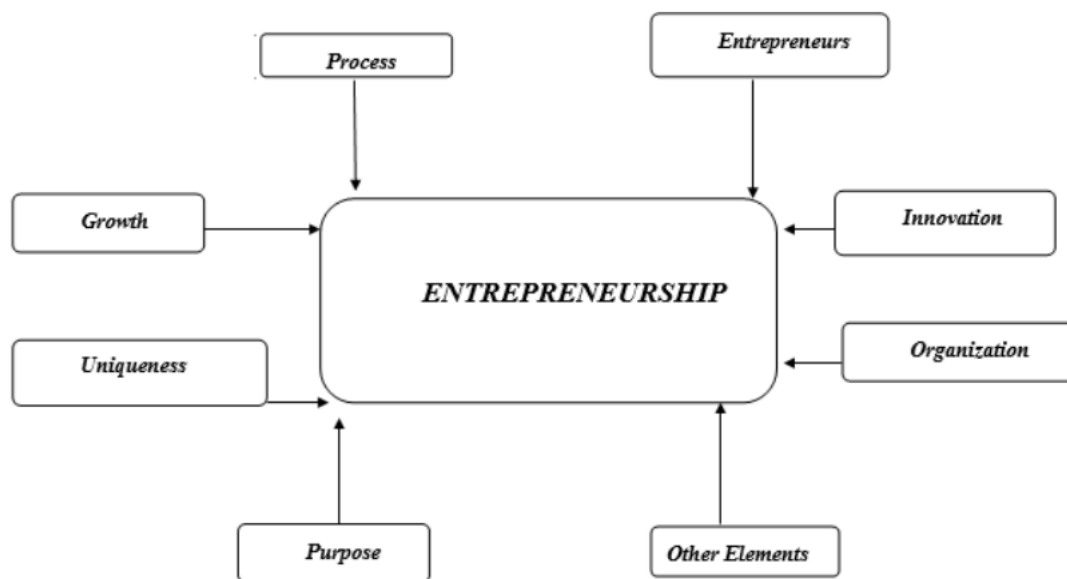


Figure 1: Basic elements of Entrepreneurship *Source:* Naktiyok, 2004, p.15

Regardless of industry or industry, every business has some basic concepts. Every entrepreneurial activity is the result of one or more entrepreneurs working with innovation-based approaches using appropriate organizational structures. In addition, entrepreneurial activity is based on the desire to grow and be unique, as well as the goals and processes related to these motives and desires (Naktiyok, 2004, p.15).

The concept of entrepreneurship in numerous ways concurring to diverse viewpoints within the advancing handle. In these classifications, which are habitually made to the application shapes and areas of movement, three essential sorts of business can be specified: entrepreneurship in terms of ownership, entrepreneurship in terms of qualifications and other types of entrepreneurships (Tikici and Aksoy, 2009, p.17). On the other hand, Renzulli et al. (2000, p.524) classified diverse sorts of business with sub-breakdowns as follows:

- Entrepreneurship in terms of ownership
 - Public entrepreneurship
 - Entrepreneurs involved in the market economy
- Opportunity entrepreneurship
- Creative entrepreneurship
- Entrepreneurship in terms of qualifications
 - Reactive entrepreneurship
 - Stagnant entrepreneurship
 - Dominant entrepreneurship
- Internal entrepreneurship
- Women entrepreneurship
- Social Entrepreneurship

In addition, the types of entrepreneurships can be explained from different perspectives (Public, Social, Opportunity, Response Based, Dominant, Intra-Organizational, Women Entrepreneurship) as follows:

Public Entrepreneurship: In resource use, political entrepreneurs prefer to use public resources and work under the direction of the government. (Çelik and Akgemici, 2010, p.21).

Social Entrepreneurship: It is a way of doing business where the main goal is to help with problems like unemployment and social issues, without making a profit. (Weerawardena and Mort, 2006, p.21). social entrepreneurship focuses on making a difference in society rather than just making money. It cares about helping people and solving social issues. (Ürper et al., 2012, p.12).

Opportunity Entrepreneurship: Opportunity entrepreneurship is a sort of enterprise that works to form utilize of critical openings recognized within the showcase with the assistance of future expectations (Tikici and Aksoy, 2009).

Response Based Entrepreneurship: This kind of entrepreneurship involves modifications to the company structure and is created in response to innovations introduced by other business owners in the same industry. It is

now feasible to discuss with rivals its low propensity for taking risks and its strategy-setting behavior (Özkul and Dulupçu, 2008, p.15).

Dominant Entrepreneurship: For Dominant entrepreneurship, entrepreneurship practices used by market leaders in their businesses. Such entrepreneurial endeavors can have a strong tendency toward risk-taking (Demirel et al., 2007, p.29).

Intra-Organizational Entrepreneurship: Within the organizations engaged in internal entrepreneurship activity, new products, services, or techniques are developed. From an alternative perspective, the innovations that they introduce into established businesses that carry on with their operations, pertaining to product, method, marketing, purchasing, and production, can be classified as internal entrepreneurship (Bygrave and Zacharakis, 2014, p.537).

Women Entrepreneurship: Entrepreneurship is the practice of women who work outside the home, have a statute in the processes of a product or service, can employ staff, and can be characterized as business owners. Particularly for developing nations, women's entrepreneurship is one of the most crucial development strategies (Yetim, 2002, p.79).

Recently, both developed and developing nations have come to place a greater emphasis on entrepreneurship. Realizing how much entrepreneurship contributes to economic growth and how important it is as a solution to the unemployment issue is the primary cause of this predicament. To tackle the issue of unemployment and boost economic development, states create policies and initiatives aimed at assisting entrepreneurs and identifying potential members of the entrepreneurial community. In university courses on entrepreneurship education, Türkiye is now included in the pertinent section. But it is evident that individuals of diverse ages, occupations, and backgrounds are drawn to entrepreneurship across a range of industries, not just university students. Examining the difficulties, economic effects, and ways that startups advance technology, this article offers a comprehensive analysis of Türkiye's startup ecosystem as it stands today. Furthermore, examined will be the effects of technology parks and technology transfer offices, which are crucial avenues for developing research platforms with businesses where academic institutions can share knowledge. Through an examination of governmental policies, international comparative perspectives, and success stories, we aim to offer insights that not only accurately depict the current state of affairs but also guide future plans for fostering sustainable growth and global competitiveness within Türkiye's rich startup ecosystem.

2 Global Trends in Entrepreneurship

Both economic growth and diversification are facilitated by entrepreneurship. Inspiring industrialization and structural change, it promotes equitable and long-term socioeconomic progress (UNIDO,2013). Entrepreneurs change the economy and produce wider effects that advance the global agenda for sustainable development as they launch and expand their businesses. For example, between 2013 and 2015, a large number of nations, including Brazil, Cameroon, the Dominican Republic, Ecuador, the Gambia, Ghana, Nigeria, Panama, the United Republic of Tanzania, and Zimbabwe, created and implemented national policy frameworks for entrepreneurship. Some of these nations even received assistance from international organizations. Additionally, angel investors are very important in promoting business funding. Regional and international angel investor associations have access to networking opportunities and mentorship. For instance, the Republic of Korea increased its tax deduction for angel investments to 50%; Indonesia adopted a sustainable finance road map to improve the skills of financial professionals; Mexico expanded its financial services in rural areas through direct subsidies and technical assistance; Türkiye approved an angel investment law offering the highest tax incentive to investors in the world, 75% (United Nations, 2016).

For the most part of the 20th century, international development discourse on entrepreneurship centered on how important it is for generating jobs and economic growth. In order to target and concentrate on people who have the ability and desire to start new businesses and engage in new economic activities, policy recommendations for entrepreneurship training and education programs were made. With time, entrepreneurship assumes greater social roles. It is then seen as a tool that can address social, humanitarian, cultural, and environmental issues in addition to economic ones as it is further expanded and abstracted. The idea of who can be an entrepreneur and for what purposes also changes, reflecting entrepreneurship's evolving relevance and scope to various social, cultural, economic, and environmental issues. By the turn of the twenty-first century, an entrepreneur was no longer the well-educated elite looking to launch new businesses and take advantage of business opportunities. Rather, a forward-thinking innovator who is focused on addressing unfulfilled needs and resolving global issues is the ideal 21st-century entrepreneur. It is not necessary for an entrepreneur to prioritize profit maximization, contrary to the perception in the discourse surrounding global development. In contrast, the development discourse portrays the "ideal entrepreneur" as someone who is more focused on addressing unfulfilled needs that have eluded previous solutions. Using trends in popular, related topics, it is investigated that how discourses around entrepreneurship in development have evolved over time (Figure Two). The dominant framework is economic, and issues of employment and economic growth are strongly related to entrepreneurship. Nonetheless, a historical review of

entrepreneurship-related subjects indicates the emergence of social and environmental frames, with entrepreneurship being perceived as having the potential to solve these issues more frequently (Lee,2023).

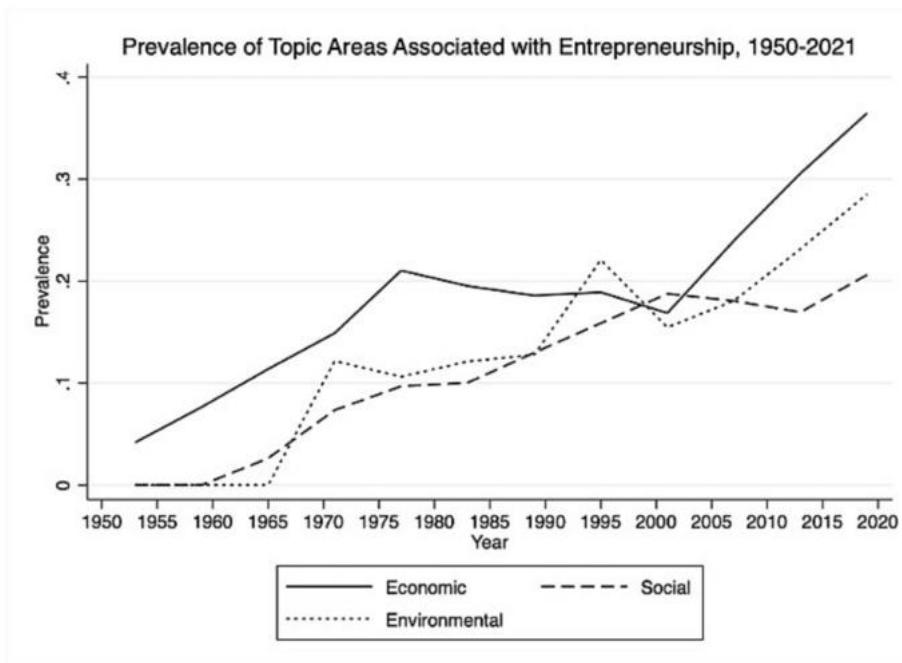


Figure 2: Prevalence of thematic areas associated with entrepreneurship over time Source: Lee, 2023, p.7

New businesses are important, and not just to the individuals who created and launched them. Entrepreneurs' ideas are transformed into tangible goods and services that consumers and other businesses want to purchase by new businesses, which also introduce innovative products and technologies to the market. By drawing resources away from industries that create goods and services that consumers no longer want and toward products and services in emerging sectors, entrepreneurs accelerate structural changes in the economy. These kinds of structural adjustments boost productivity, which in turn raises living standards throughout the economy. One important element in the process of economic development is entrepreneurial activity entrepreneurs play a critical role in driving social change by developing innovative solutions to address important societal issues, like improving access to business credit in less wealthy countries and reducing plastic pollution in waterways (oceans etc.) . As a result, promoting entrepreneurship is a top priority for governments, as they understand the importance of new businesses in creating jobs and fueling economic growth. The formation of new businesses not only reflects a vibrant economy but also serves as a catalyst for innovation and progress (World Economic Forum GEM Report, 2024).

The hegemonic cultural norms of the latter half of the 20th century, when deliberate individual action became increasingly important for comprehending social life and processes, are reflected in this shift in the discourse around entrepreneurship for development (Lerch et al., 2022). How entrepreneurship is discussed within international development discourse over time, as reflected in documents published by UNESCO and the World Bank from 1950 to 2021 is traced in Figure 3. Entrepreneurship for development undergoes a discursive shift from the 1950s to the 2010s.

Entrepreneurship in the 20 th century	Entrepreneurship in the 21 st century
Profit-seeking, personal gain	Meeting a need and serving a greater purpose
Focus on job creation and economic growth	Solving (global)social and economic challenges
For individuals with potential and education	A skill that all people should attain

Figure 3: Shift in the role and purposes of entrepreneurship as reflected in international development discourse from the 20th to the 21st century Source: Lee, 2023, p.11

According to Forbes researchers in 2023, there some emerging entrepreneurship trends worth considering like Globalized businesses (operate from different areas of the globe), Freelance business services (typically hired for a specific period or a specific project), Mission-based businesses (Green, sustainable, or community-based businesses are other names for purpose-driven businesses. These are for social entrepreneurs), Subscription-based

business (create a consistent revenue stream, better engagement, and brand loyalty. They're based on the idea that it's easier to sell to an existing customer than acquire a new customer.), Social commerce (create a consistent revenue stream, better engagement, and brand loyalty. They're based on the idea that it's easier to sell to an existing customer than acquire a new customer.). Also, they categorized five type of entrepreneurs are:

1. Social entrepreneurs.
2. Scalable or startup entrepreneurs.
3. Small business owners.
4. Large business entrepreneurs.
5. Innovative entrepreneurs (Forbes, 2023).

Additionally, the vital importance of education and the development of human capital has long been highlighted in development studies. In the grand scheme of things, economic development would come from upgrading the skills of the labor force and training young people for employment. A more prosperous, equitable, and peaceful world would arise from education preparing young people for adulthood and enabling them to find respectable employment and make a living. Even though improving the quality and accessibility of education is a priority, efforts to reform and develop the field of education have been mainly ineffective, particularly when it comes to helping young people make the transition from school to the workforce (Unesco,2022).

When it comes to Türkiye, it has a large population of low-productive micro-firms, the MSME (micro small medium enterprises) sector contributing to 74% of employment and 53% of value added (OECD average, 68% and 59%)

3 Türkiye's Government Initiatives and Policies for Entrepreneurship

From 2012 to 2017, the Turkish startup scene had a fruitful period of learning. Numerous laws promoting the ecosystem were put into place, and stakeholders in the ecosystem kept growing. After 2017—when venture capitalists began setting up their second funds, several startups produced globalization success stories, and the first unicorns appeared—the Turkish startup ecosystem reached a new height. The pandemic significantly sped up the digital transformation across all industries. The Turkish startup ecosystem was able to make significant investments during the pandemic because of the country's large financial resources and the momentum generated by its years of gaming experience. However, thanks to the significant increase in local VC funds in Türkiye due to the regulatory change in 2020 and the launch of several equity-based crowdfunding platforms, we can say that Türkiye was largely unaffected by the economic downturn in terms of investment at the seed stage. Türkiye proved this by ranking fourth in Europe in terms of seed investments in Q3 2023. The gaming vertical continued to produce global champions despite many global setbacks. In addition, fintech startups broke out of their shell creating local champions and have recently started to take serious steps toward creating global champions by acquiring startups from abroad (Invest in Türkiye, 2023).

Setting up economic and technological independence is the only way for Türkiye to become a powerful regional and international force. Our country has developed a multifaceted policy to position itself as a leading global producer of advanced technologies and strategic industrial products. This is known as the National Technology Initiative (NTI) vision, which we power for this purpose. Our primary objectives are to provide competitive high-tech goods and services, design and innovate innovative products to increase the effectiveness of global value chains and develop all essential products and technologies using domestic and national resources. Our 2023 Industry and Technology Strategy was created in accordance with the NTI's vision, and entrepreneurship is a major part of it. Our success will depend critically on the rise in Turkish entrepreneurs who can drive global innovation and change. Our primary force is technological entrepreneurship in a century where technology is a major factor in the creation of social and economic value. Over this time, technology-driven businesses have assimilated into every sphere of society, from trade to healthcare to education (Türkiye National Startup Strategy Report, 2023).

The Turkish government passed a law in 2012 to promote the growth of the business angel sector. In 2013, a secondary piece of legislation was implemented. The primary aim of both the primary legislation and the ancillary measures was to create a legal structure and offer substantial tax advantages to accredited angel investors. A funds of funds law was introduced by the government in 2014, allowing the Ministry of Treasury and Finance to transfer capital to a fund of funds subject to specific requirements. This law was amended in 2017 to allow the Ministry of Treasury and Finance to invest in venture capital funds in addition to funds of funds. On June 5, 2018, the Direct Investment in Venture Capital Funds Secondary Legislation went into effect. The primary organization in Türkiye for carrying out SME policies is KOSGEB. It offers thirteen distinct support programs and covers the costs of ancillary services for SMEs with a broad reach across Türkiye (OECD, 2022). Small and Medium Enterprises Development Organization in Türkiye (KOSGEB) is a government organization which aims to increase the shares of SMEs and entrepreneurs in economic and social development to achieve a better entrepreneurship ecosystem.

The regulation on the SME definition entered into force on 18 November 2005 and was amended on 24 June 2018. According to that regulation, an SME is an economic entity employing less than 250 persons and having an

annual turnover or an annual balance sheet that does not exceed TRY 125 million. The characteristics of micro, small and medium enterprises are illustrated in table 1 below.

	Micro Enterprise	Small Enterprise	Medium enterprise
Employees	<10	<50	<250
Annual turnover	3 million TRY	25 million TRY	125 million TRY
Annual balance sheet	3 million TRY	25 million TRY	125 million TRY

Table 1: Definition of SMEs used in Türkiye's scoreboard, Source: Url-1, 2022

In 2023, Türkiye transformed its BiGG grant into a pre-seed fund* to be managed by the Türkiye Development Fund as "TÜBİTAK BiGG Fund". Considering that nearly 300 startups will be invested in at the idea stage every year, Türkiye will be the country with the highest number of pre-seed investments in Europe in 2024 (startups.watch, 2024). The global money shortage was the biggest factor of declining investment volumes even in Türkiye even the amount of investment in SaaS, Artificial Intelligence and Gaming verticals was remarkable. 2023 Top 10 funded verticals are given in Fig. 4.

	2018	2019	2020	2021	2022	2023
Grocery delivery	\$1.2M	\$38.1M	\$0M	\$984.4M	\$768.2M	\$500.3M
SaaS	\$13.1M	\$5.8M	\$54.2M	\$9.7M	\$148.4M	\$40.9M
Artificial intelligence	\$9.5M	\$5.4M	\$43.3M	\$19.1M	\$151.9M	\$36.1M
Gaming	\$1.8M	\$8.4M	\$14.7M	\$520M	\$108.3M	\$31.1M
Retailtech	\$2.7M	\$2.5M	\$8M	\$5.9M	\$17M	\$30.1M
Fintech	\$16.5M	\$4.3M	\$25.9M	\$68.9M	\$91.2M	\$27.9M
Restaurant	\$2.2M	\$2.7M	\$4M	\$7.2M	\$11.1M	\$20.1M
Image process	\$1.1M	\$1M	\$2.7M	\$7.8M	\$4.5M	\$19.5M
Energy	\$1.6M	\$0.9M	\$2.5M	\$4.6M	\$11.6M	\$18.7M
Ecommerce	\$8.1M	\$1.4M	\$8M	\$29.3M	\$33.9M	\$18.2M

Figure 4: Top 10 funded verticals in 2023 (Deal Size) Angel and VC deals Source: startups.watch, 2024

In September 2023, The Medium Term Program (MTP) (2024-2026) prepared in line with the general framework of the 12th Development Plan (2024-2028), aims to strengthen macroeconomic and financial stability, promote high value-added production, achieve growth through increased productivity and exports with a focus on green and digital transformation and a permanent improvement in the current account balance, reduce inflation to single digits in the medium term, improve the business and investment environment, and establish a policy framework based on maintaining fiscal discipline while considering disasters preparedness and management. Monetary, fiscal, and income policies will be implemented in concert, and reforms in these areas will be staged to ensure growth that supports investment, jobs, production, and exports. Therefore, by enhancing Türkiye's business and investment climate and creating a more supportive framework for sustainable growth, potential growth will be enhanced. In this case, a high-value-added export-oriented growth strategy that takes the balance of domestic and foreign demand into account will be implemented. Policies to ensure technological transformation in the industry will be implemented by strengthening technological infrastructure, human capital, entrepreneurship, research, innovation and design capacity. According to MTP these are the highlights for entrepreneurs:

- In order to add more entrepreneurs to the ecosystem, the infrastructure and incubation centers of Technology Development Zones will be supported and expanded. Additionally, R&D, design and innovation capacity will be strengthened.
- Within the framework of supporting the entrepreneurship ecosystem, a qualified accredited consultant and mentor pool will be created, and its active use will be ensured, and one-on-one consultancy mechanisms will be developed through consultancy centers and platforms, especially in priority sectors.
- Development Zones will be expanded in order to include more entrepreneurs in the ecosystem, and R&D, innovation and design capacity will be strengthened.
- The access to credit for the entrepreneurial ecosystem and SMEs will be eased, and the use of alternative financing schemes will be developed and expanded.
- Special programs will be developed to ensure the full, equal, secure and effective participation of women in the labor market changing with digital and green transformation, and programs in areas such as entrepreneurship, financial literacy, and cooperatives will be expanded to increase women's participation in the labor force.

- To support investment-oriented entrepreneurship and additional investment opportunities, venture capital funding sources will be diversified and strengthened, and scaling of start-up firms will be ensured through follow-up support.
- It will be facilitated for financial institutions to provide financial support to technology-based start-ups through practices such as acquiring entrepreneur shares, and pledging patents as collateral in banks.
- Programs in areas such as entrepreneurship, financial literacy, and cooperatives will be expanded to increase women's participation in the workforce, and the number of accessible day-care centers will be increased.
- The conditions for the entrepreneurship ecosystem and SMEs to access credit will be eased; the opportunities for corporate and individual venture capital, crowd funding, and angel investing, as well as other innovative and alternative financing options will be increased and popularized.
- A qualified accredited consultant and mentor pool will be established, and one-on-one consultancy mechanisms will be developed through consultancy centers and platforms, particularly in priority sectors.
- The employment of qualified personnel by startup companies will be facilitated, and entrepreneurship programs, especially for women, will be expanded (MTP, 2023).

Türkiye provides fertile ground for startups to flourish. Investment incentives, incubators, and accelerators offer essential support, nurturing a culture of innovation and risk-taking. We've witnessed the first wave of venture backed large Turkish startup exits between 2010 and 2020, and the vast majority of these companies had B2C revenue models, leveraging on the purchasing power of an 80 million and growing dynamic population. Through these successful exits and a growing venture capital interest we've observed a spike from 31 to 331 venture deal counts in Türkiye between 2012 and 2022, portraying a growing vibrancy of this ecosystem. Prominent milestones for government support in Turkish startup ecosystem can be summarized in given figure below.



Figure 5: Prominent milestones for government support in Turkish startup ecosystem **Source:** Invest in Türkiye Report, 2023

4 Türkiye's embrace of Entrepreneurship

The economic impact of trade volumes, cross-border activities, and technology-focused company valuations is evident. In this regard, our goal in the 2023 Industry and Technology Strategy was to develop 10 Turkish unicorns, or businesses that could be valued as much as \$1 billion by 2023. Six Turkish unicorns, or Turcorns as we like to call them, were swiftly identified; two of them were valued at more than \$10 billion. Furthermore, over 300 Turkish startups prospered last year, receiving over \$1.05 billion in investments (Türkiye National Startup Strategy Report, 2023). According to startups.watch annual report in 2024, Turkish Startup Ecosystem's most striking properties are as follows:

- In 2023, \$722M were invested across 325 deals in seed, early and later vc stages.
- The deal size fell by 47% and deal count by 7% YoY.
- In 2023, Türkiye ranked 5th in Europe and 1st in MENA in terms of deal count despite a decline in the deal size compared to the previous year.
- According to Startup Genome's 2023 report, Istanbul ranked 1st in the list of strong starters due to high activity in seed and Series A deals.
- Türkiye Development Fund, which manages the Tübitak BiGG Fund, may break a record with over 140+ investments in the first quarter of 2024. Türkiye could become the country with the highest number of pre-seed investments in Europe by 2024.

- In the Artificial Intelligence and Gaming verticals, there were both a remarkable number of deal count and more than 50% more deals than the previous year.
- In 2023, almost one in every 2 investments had a VCIF (GSYF) among the investors.
- In 2023, startups raised \$20.6M in 59 equity-based crowdfunding campaigns. There was a 95% increase in deal size and a 28% increase in the number of deals compared to the previous year.
- In 2023, only 31 out of 325 deals had foreign investors.
- In 2023, 124 out of 325 investments had a corporate or a CVC among the investors.
- Türkiye ranked 5th in Europe after the UK, France, Switzerland and Sweden in terms of the gaming deal size, and 1st in terms of the gaming deal count.
- In the last 3 years, a total of 276 funds and \$1.3B fund size have been reached.
- 2023 was a year in which fintech startups made overseas acquisitions to enter new markets.
- In 2023, 70 out of 325 investments were made to startups with female founders (startups.watch, 2024).

Also according to startups.watch 2024 report, of yearly angel and venture capital (VC) deals in Türkiye are given in Figure below. Here are the highlights:

- In 2023, \$722M were invested across 325 deals in seed, early and later vc stages. The deal size fell by 47% and deal count by 7% YoY.
- Adding \$157M convertible note deals and \$11M crypto token deals, the total investment in 2023 reached \$889M.
- Total investment amounted to \$222M, excluding the Getir deal.
- Even excluding the Getir deal, total deal size in 2023 was well above pre-pandemic deal sizes.

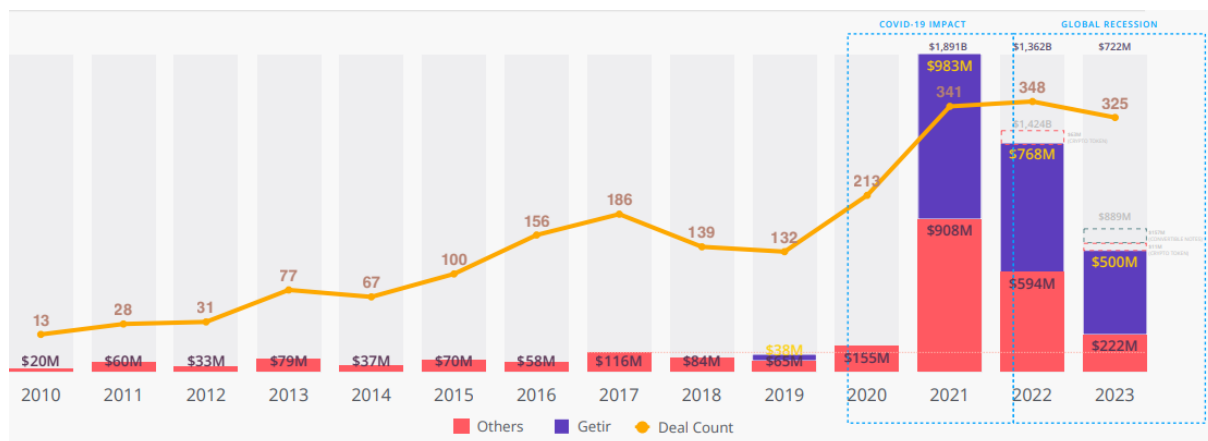


Figure 6: Yearly Angel and VC deals **Source:** startups.watch, 2024

Türkiye also has made notable advancements in the ever-changing field of technology with the creation of Technology Development Zones, or "Technoparks." With a single goal of raising Türkiye's industry to a level of global competitiveness while emphasizing innovation and export-oriented growth, these zones constitute a synergistic ecosystem where academic institutions, research centers, and industrial organizations come together. Technology Development Zones (commonly referred to as "Technoparks") are ecosystems where universities, research institutes, and industrial organizations come together with the aim of rendering the country's industry internationally competitive and geared toward exports. The Technopark Regulations were first introduced in Law No., although they have experienced significant modifications over time. 26 Point 06, Date: "4691". This law was passed in 2001 with the intention of promoting cooperation between businesses funded for research and development (R&D) as well as between these businesses and university faculty and students. The ultimate goal is to create more innovative and competitive products. To that end, businesses established in Technoparks have benefited from significant tax benefits in order to achieve the goal of producing high-value-added R&D products; however, there are obligations associated with housing companies that are solely involved in R&D (Url2, 2023).

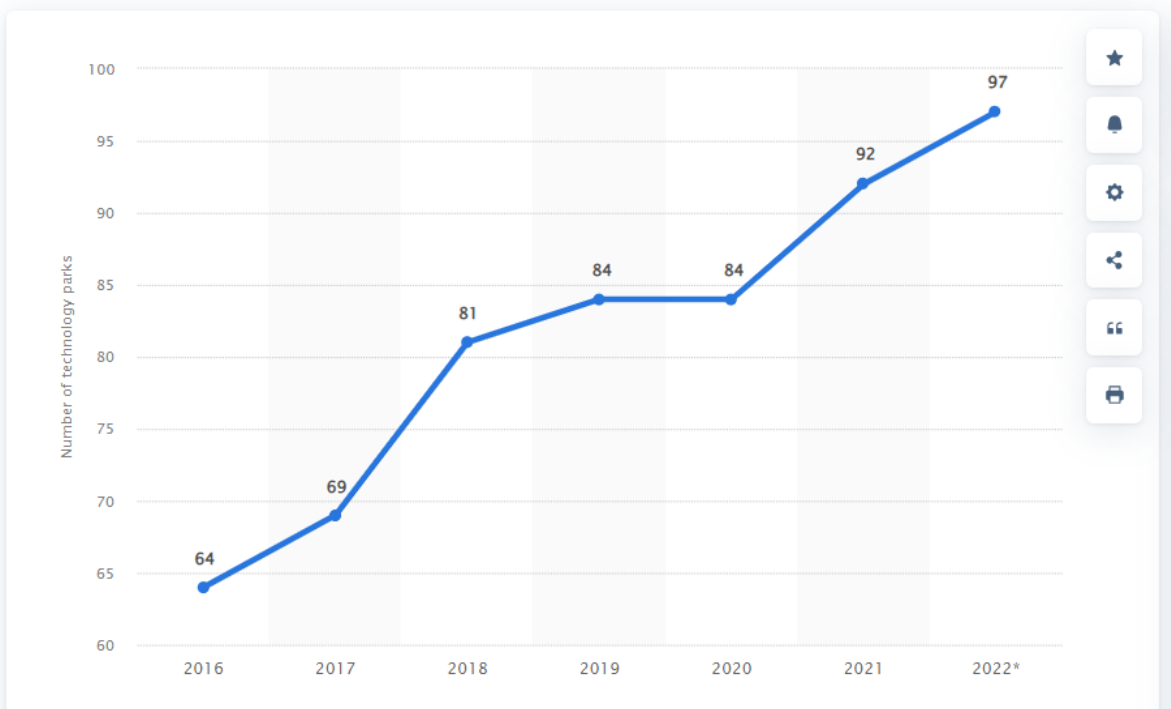


Figure 7: Total number of technology parks in Türkiye from 2016 to 2022 **Source:** Url-3, 2023

On the other hand, OECD stated that only 16% SMEs in Türkiye have been able to access and combine government support (as compared to 33.6% in the OECD). Repayable forms of support have been the most popular (12% of SMEs). And Entrepreneurship regulatory framework is given in following figure.



Figure 8: Government Liquidity Support **Source:** OECD, 2021

In many different ways, Türkiye's startups are advancing technology. Financial technology is one of the major areas of innovation. Recent years have seen the emergence of several fintech companies in Türkiye, providing cutting-edge solutions in fields like peer-to-peer lending, blockchain technology, and mobile payments. Further industries like e-commerce, healthcare, and transportation are seeing a surge in innovation thanks to startups. Examples of new technologies that startups are creating to enhance the online shopping experience include virtual try-on services and personalized recommendations in the e-commerce space (Url-4, 2023).

5 Impact of Technology Parks and Transfer Offices

In many countries, policymakers support science and technology parks, also known as technoparks, due to their potential to foster the emergence and expansion of creative technology-based businesses and the transfer of knowledge from academic and research institutions to commercial enterprises, both of which eventually contribute to the advancement of technological innovation and economic development. Because of their uplifting success stories in affluent nations, technoparks have gained global recognition and have seen a noticeable increase in population over time (Lecluyse et al,2019). According to Link and Scott (2011, p.8), Technoparks are "high-tech bridging institutions," which support the development of creative technology-based businesses and advance industry-university collaboration, ultimately bolstering the economic growth of their respective states and regions. For Koh et al, "A science park is generally defined as a place to function as business support and technology

transfer mechanism that encourage and support the startup, incubation, and development of innovation, and development of innovation-led, high-growth, knowledge-based businesses”. (Koh et al,2005)

The belief that science parks, the first examples of which were encountered in the 1950s, stimulate economic growth led to the spread of different forms in developed countries, especially in the 1970s and 1980s. Science parks, which have been increasing in number around the world since the 1990s and are expressed in different ways such as technopark, technopol, technology park, technology development zone, innovation park, are very important tools in ensuring cooperation between university-industry-state in the process of transforming innovative information and technologies into innovation. In addition to providing support to newly established companies in commercialization, infrastructure service, meeting with target customers and the market, obtaining patents, it also offers additional incentives and supports beyond the governmental supports. In addition, they have critical importance for the regional and national development of the regions and countries in which they operate. They help revitalize the industry in which they operate; contribute to the solution of social problems such as employment and brain drain. Science parks first emerged in Türkiye in the 2000s as Technology Development Zones, or commonly as “technoparks”. As of February 2022, more than 7,500 companies operate in technoparks all over Türkiye and more than 78,000 personnel are employed in those firms. (Akgün and Güner, 2022).

Türkiye's science and technology policies have been shaped since 1963 by a series of five-year development plans (DPs) created by the State Planning Organization (SPO), which was replaced in 2011 by the Ministry of Development. The evolution of Turkish TPs has been linked to the agenda set through development plans (DPs) and science and technology policies in Türkiye (Saritas et al., 2007). (SPO, 2019, p 109). The 11th DP, the last DP in force, gave primacy to the establishment of the effective and “efficient R&D ecosystem,” which enables the production of “high value-added products and services”, and aimed at reinforcing the roles of universities in this ecosystem. 11th DP (2019-2023)’s main themes were: “Technological transformation in priority sectors”, “high-value added production”, “enhancing physical and human capital”, “Digital Transformation”, “Critical Technologies”, “Priority Sectors” “enhancing R&D and innovation capacity” “new support programs”.

Turkish technoparks’ business model is based on coordinated activities made possible by resources they own or incorporate from important partners, who are stakeholders in the ecosystem. This ecosystem is referred to as the Turkish National Innovation System (NIS) in the model. Through the agency of technopark management committees (TMC), the actors in the ecosystem integrate their resources into a technopark’s business model, and they are connected by institutional arrangements made possible by the Turkish NIS system. TMCs and their service providers such as technology transfer offices(TTO), and incubation centers (ICs), while TUBITAK is one of the key actors of the NIS in; technoparks create high value-added services, or value propositions, and their creation depends critically on how well they use key resources and how well they execute key activities. The dynamics of business model of Turkish TPs given in figure below (Polat, 2020).

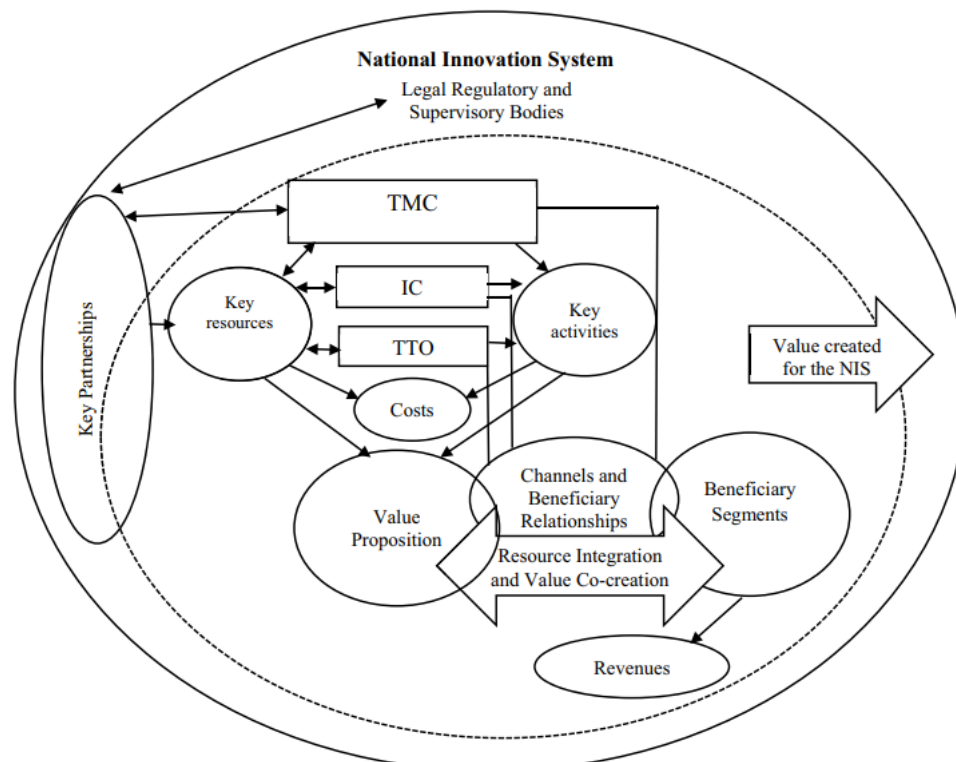


Figure 9: The dynamics of business model of Turkish Technoparks **Source:** Polat, 2020

According to the fifth article of the Technology Development Zones Implementing Regulation (2002) numbered 24790, the benefits of technoparks in Türkiye are:

- Producing technological information,
- Developing innovation in product and production methods,
- Raising the product quality or standard,
- Improving the design quality,
- Increasing efficiency,
- Decreasing production costs,
- Commercializing technological knowledge,
- Supporting technology-intensive production and entrepreneurship,
- Creating investment opportunities in technology-intensive areas,
- Creating job opportunities for researchers and skilled people,
- Assist in technology transfer,
- Providing the necessary technological infrastructure for international companies with R&D capability.

The High Council of Science and Technology decided that the main goals of technoparks are to support technology-intensive production and entrepreneurship, commercialize technological knowledge, develop innovation in products and production methods, improve product quality or standards, increase productivity, lower production costs, and adapt small and medium-sized businesses to new and advanced technologies. Considering the infrastructure of technology which will facilitate the inflow of foreign capital into the nation, generating investment prospects in technology-driven industries, generating employment opportunities for experts and researchers, facilitating technology transfer, and offering cutting-edge technology (Url-5,2024).

6 Conclusion

Türkiye, bridging Europe and Asia, offers a rich blend of cultures and insights. This duality powers our startups, equipping them with multifaceted perspectives, allowing them to craft globally resonant solutions. Importantly, with a significant young and female population, and a high percentage of STEM education, Türkiye presents tremendous early-stage deep tech investment opportunities. In recent years, Türkiye's startup ecosystem has grown significantly, transforming into a thriving center of innovation and entrepreneurship. Entrepreneurial spirit, combined with innovative business concepts, can flourish in Türkiye when provided with the necessary resources for scaling.

There are various obstacles that Türkiye startups must overcome if they hope to succeed. Funding access is one of the main obstacles. Though venture capital has become more accessible in Türkiye, startups may still find it challenging to obtain funding, especially in their early phases of growth. The difficulty of finding talent is another. While there is a large pool of technical talent in Türkiye, startups frequently find it difficult to draw in and keep talented workers, especially when competing with international startups and larger corporations. Türkiye's startup scene has made a substantial economic contribution despite these obstacles. According to a report by Startups.Watch, Up from \$7.3 billion in 2020, the combined valuation of Türkiye's top 100 startups reached \$10.03 billion in 2021. In Türkiye, startups have also been crucial to the growth of the labor force. The top 100 Turkish startups, according to the same report, increased employment from 11,000 in 2020 to over 15,000 in 2021 (startups.watch, 2023).

On the other hand, Technoparks play a major role in the implementation of science and technology policies within the National Technology Initiative framework by providing infrastructure and financing opportunities to companies. Technoparks and technology transfer offices in Türkiye have started to increase rapidly in recent years. Their triple helix understanding strengthens the connections between universities, industry, and the public. As of February 2024, there are over 70 Technopark zones now in operation nationwide, with the number steadily increasing. These zones offer a supportive environment for businesses to thrive, leading to economic growth and tax benefits. In exchange, the Technopark zones aim to foster the development of cutting-edge technologies that bring high value to the market.

Additionally, it is worth to mention that recent regulations support startup and entrepreneurship ecosystems and aims to make it easy for startups to navigate the legal landscape. The Turkish government is a very active and strong supporter of the startup ecosystem in Türkiye, offering a variety of programs and policies to help startups become established and grow. Beginning in 2012, governmental agencies enabled and supported the development of local startup mentors, accelerator programs, angel networks, business internationalization programs, venture capital funds, and crowdfunding platforms. The Scientific and Technological Research Council of Türkiye (TÜBİTAK) has provided grant support to 2,140 startups at the idea stage through the TÜBİTAK BiGG program since 2012, and this incentive program will continue as Pre-Seed investment starting in 2023. The Small and

Medium Industry Development Organization (KOSGEB) has also been providing grants for many years at many levels, from the idea stage to the R&D stage (Invest in Türkiye, 2023). Legal reforms have streamlined the once-complicated processes for businesses, allowing startups to concentrate more on innovation. Additionally, various investment channels are injecting much-needed capital into these ventures, with a keen eye on governance and regulatory compliance. The Turkish government has been increasingly proactive in nurturing the fintech sector, recognizing its potential to revolutionize financial services and contribute to economic growth. Through various incentives, the state aims to create a conducive environment for fintech startups to thrive.

Access to talent, capital, and regulatory barriers are some of the challenges that Türkiye's startup ecosystem faces. Nonetheless, Türkiye's startups have had a big economic impact, bringing in new hires and fostering innovation in important industries like fintech, e-commerce, and healthcare. Türkiye's startup ecosystem has the potential to grow and prosper in the years to come with the correct infrastructure and support. Türkiye has emerged as a dynamic hub for startups, championing innovation and entrepreneurship. The Turkish startup ecosystem is defined by its vibrancy, adaptability, and determination to redefine traditional industries. Given the series of advancements observed over the preceding years, it is unquestionably clear that the entrepreneurial framework of Türkiye has undergone significant maturation and fortification.

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