

INVESTIGATING INTERACTIONS IN AN ENTREPRENEURIAL
ECOSYSTEM: THE CASE OF INDIVIDUAL YOUNG ENTREPRENEURSHIP
(BiGG) SUPPORT PROGRAM IN TURKEY

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
THE DEPARTMENT OF SCIENCE AND TECHNOLOGY POLICY STUDIES

DECEMBER 2022

Approval of the thesis:

**INVESTIGATING INTERACTIONS IN AN ENTREPRENEURIAL
ECOSYSTEM: THE CASE OF INDIVIDUAL YOUNG
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ABSTRACT

INVESTIGATING INTERACTIONS IN AN ENTREPRENEURIAL ECOSYSTEM: THE CASE OF INDIVIDUAL YOUNG ENTREPRENEURSHIP (BiGG) SUPPORT PROGRAM IN TURKEY

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December 2022, 126 pages

Entrepreneurship is a collaborative social process that involves diverse set of actors and activities. Researchers in policy studies often describe these entrepreneurial activities involving these actors through a set of social and financial interactions. In recent years, some policy studies have begun to concentrate on particular regions or countries and focus on understanding the entrepreneurial dynamics in these contexts. To refer to these dynamics, the researchers introduced the concept of “entrepreneurial ecosystem”. This thesis investigates the interaction dynamics in the entrepreneurial ecosystem in Turkey focusing on a public support initiative: the TUBITAK Individual Young Entrepreneurship (the BiGG) Program. The thesis is built around three questions: (1) What type of interactions does the BiGG program facilitate? (2) How do various actors that conduct or participate in the program interact? (3) What kind of benefits or feedback do these interactions facilitate? By researching these questions, the thesis relies on the qualitative inductive methodology, including the review of secondary sources about the program framework and 30 in-depth interviews with the participating actors. It offers a detailed analysis, description, and documentation of the activities, actors, and interactions under the BiGG program framework. The findings

would help enrich our understanding of the entrepreneurial ecosystem in Turkey, reveal its effects and limitations, and provide a basis for policy implications.

Keywords: Entrepreneurial Ecosystem, Public Support Program, Interaction and Collaboration among Ecosystem Actors, Feedback Mechanisms

ÖZ

GİRİŞİMCİLİK EKOSİSTEMİNDEKİ ETKİLEŞİMLERİN İNCELENMESİ: TÜRKİYE'DE BİREYSEL GENÇ GİRİŞİMCİLİK (BiGG) DESTEK PROGRAMI ÖRNEĞİ

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Yüksek Lisans, Bilim ve Teknoloji Politikası Çalışmaları Bölümü

Tez Yöneticisi: Prof. Dr. İbrahim Semih AKÇOMAK

Aralık 2022, 126 sayfa

Girişimcilik, çeşitli aktörleri ve faaliyetleri içeren iş birliği içindeki sosyal bir süreçtir. Politika çalışmaları yürüten araştırmacılar genellikle girişimcilik faaliyetlerinin bu aktörler arasındaki bir dizi sosyal ve finansal etkileşim yoluyla gerçekleştiğini tanımlamaktadır. Son yıllarda bazı politika çalışmaları belirli bölgelere veya ülkelere odaklanmaya ve bu bağlamlardaki girişimcilik dinamiklerini anlamakla ilgilenmeye başlamıştır. Bu dinamiklere atıfta bulunmak için araştırmacılar “girişimcilik ekosistemi” kavramını ortaya atmışlardır. Bu tez çalışmasının amacı, Türkiye girişimcilik ekosistemindeki etkileşim dinamiklerini kamu destek girişimi olan TÜBİTAK Bireysel Genç Girişimcilik (BiGG) Programı kapsamında araştırmaktır. Bu tez çalışması üç soru etrafında şekillenmektedir: (1) BiGG programı ne tür etkileşimleri kolaylaştırıyor? (2) Programı yürüten veya programa katılan çeşitli aktörler nasıl etkileşime giriyor? (3) Bu etkileşimler ne tür faydalar ya da geri bildirimler sağlıyor? Bu soruları araştıran tez, program içeriğinin anlaşılması için ikincil kaynakların incelenmesi ve program katılımcısı aktörlerle yapılan 30 derinlemesine mülakatı içeren nitel tümevarım yöntemine dayanmaktadır. Bu sayede tez çalışması BiGG programı çerçevesindeki faaliyetlerin, aktörlerin ve etkileşimlerin

detaylı bir analizini ve anlatımını sunmaktadır. Bulgular, Türkiye'nin girişimcilik ekosistemine ilişkin anlayışımızı zenginleştirmeye, etkilerini ve sınırlılıklarını ortaya çıkarmaya ve politika uygulamaları için girdi oluşturmaya yardımcı olacaktır.

Anahtar Kelimeler: Girişimcilik Ekosistemi, Kamu Destek Programı, Ekosistem Aktörlerinin Etkileşimi ve İşbirliği, Geri Bildirim Mekanizmaları

To mom and dad

&

To my brother

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to Prof. İbrahim Semih Akçomak for his guidance, support, and patience in this long process. Without his supervision and responses to several last-minute calls, the thesis would not have come out. I am also grateful to my defense committee, Prof. Erkan Erdil and Assoc. Prof. Berna Beyhan, generously shared their expertise and feedback. The eager discussions we had with them contributed a lot to this thesis.

I am glad to be involved in the METU TEKPOL network and to meet valuable professors, staff, and classmates. I would like to mention Prof. Arsev Aydınoglu, who inspired me in his lectures and the conversations we had. Many thanks should also go to all interviewees who shared their opinions and contributions to my research.

I am also grateful to my supervisor, Emin Dedeoglu, Sefa Pamuksuz, Emre Koyuncu, Esen Çağlar, and Ömür Enes, for their encouragement to pursue my passion. Moreover, special thanks to my colleagues, Fırat Çetin, Ali Sami Seçkin, and İdil Savucu, for helping me get my head out of the thesis.

Words cannot express my gratitude to my dearest friends Serra Baykal, Ogün Çetiner, Elif Soysal, Öncü Morkoç, and Yağız Yılmaz. They constantly check my progress and relief my excitement and worries. Other than that, we shared a lot, we supported each other, and we had a lot of fun together. I am sure it will always be like this. I also would like to thank Gökberk Bilgin for their motivation and support. In addition, thanks to many others whose names I cannot fit here.

Finally, I am incredibly grateful to my parents, Çetin and Güzide. I always feel your support and respect for all my decisions. Thanks to our dearest family members, Köpük and Bıdık, for their cuteness and unconditional love. And, my brother Emek, special thanks to you for your lifetime support, encouragement, and guidance without hesitation.

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CHAPTER 1

INTRODUCTION

Entrepreneurship is a collaborative social process that involves a diverse set of actors and various activities. Researchers in policy studies often describe these entrepreneurial activities happening between these actors and through a set of social and financial interactions. On the other hand, some researchers like to explain these activities and interactions within the conceptual framework call as the “entrepreneurial ecosystem.” Analyzing and understanding how these interactions perform in practice may help reveal their effects and limitations in the ecosystem, which may provide a basis for policy implications.

The term entrepreneurial ecosystem is also commonly used in Turkey’s entrepreneurship context, particularly by public and private sector participants. Despite the widespread use of this term, detailed empirical analyses of interaction dynamics in the Turkish ecosystem are limited. The previous studies have mainly focused on the analyses of the overall ecosystem environment, analysis of the ecosystem instruments and their outcomes, and policy assessments of existing frameworks. This thesis focuses on the most prominent public support program in Turkey called TUBITAK, the Individual Young Entrepreneurship (BiGG) Program, in order to analyze and describe the activities, actors, and interactions in detail.

This thesis investigates the BiGG program’s framework and actor interactions under three research questions: (1) What type of interactions does the BiGG program facilitate? (2) How do various actors that conduct or participate in the program interact? (3) What kind of benefits or feedback do these interactions facilitate? To investigate these questions, the thesis relies on the qualitative inductive methodology. More specifically, a field study that includes the review of secondary sources about the program framework and in-depth interviews with the participating actors.

The following Chapter 2 provides the background to this study through a brief review on the description of the term “entrepreneurial ecosystem” and on the studies that emphasize the actors and interactions within various entrepreneurial contexts. This chapter identifies the research gap as interactions within the entrepreneurial ecosystems and how those interactions can help to sustain the ecosystem. Chapter 3 outlines the research elements of this thesis. This chapter starts with a brief introduction to the BiGG program and why it is selected as a field study. It continues with the description of the research questions and scope as well as the data collection and analysis methods used in the field study.

Chapter 4 reports on the findings of the field study. First, this chapter gives a brief overview of public support programs for entrepreneurship in Turkey to identify the BiGG program’s position in this context. Then, this chapter describes the BiGG program framework in terms of participants’ roles, multiple phases, and multi-program execution. Second, this chapter presents the type of interactions between TUBITAK, the implementing agencies, and entrepreneurs, which are initiated during the selection of those agencies and program implementation. Here, this chapter describes certain activities in an implementing agency selection process that facilitate interactions between TUBITAK and the implementing agencies. Following that, the chapter identifies the interactions during the program implementation in two categories: (1) formal interactions structured by the implementation framework and (2) the informal unseen interactions that the field study has revealed. It also describes in detail how these interactions are performed. The chapter finally describes the benefits of these interactions for the entrepreneurs, the implementing agency, and the ecosystem.

Finally, Chapter 5 includes summarized findings of this study as well as a discussion on the critical point of the BiGG program as an ecosystem approach. This chapter also provides policy implications for increasing (1) the impacts of the BiGG program on the ecosystem and (2) the efficiency of the BiGG program. Limitations and further studies are also presented in this section.

CHAPTER 2

BACKGROUND

Entrepreneurship has increasingly become an area of interest that various disciplines in policy studies engage with. Several studies show that entrepreneurial activity has an impact on economic development in terms of growth, job creation, innovation, total factor productivity, and market competitiveness (Toma et al., 2014; Audretsch et al., 2015; Feki & Mnif, 2016; Erken et al., 2018). To increase the economic impact of entrepreneurial activity, policymakers give much interest in how public policy and other support efforts work for creating an enabling environment that promotes different aspects of entrepreneurial activity.

In recent years, some policy studies have begun to concentrate on particular regions or countries and focus on understanding the entrepreneurial dynamics in these contexts. To refer to these dynamics, the researchers introduced the concept of an “entrepreneurial ecosystem.” The ecosystem approach provides a deep understanding of how entrepreneurial activity occurs in a particular context, the strengths and weaknesses of the ecosystem, and ultimately highlights policy implications. Thus, the broader approach of this thesis is to investigate the interaction dynamics in the entrepreneurial ecosystem in Turkey. Within this approach, my research aims to trace and reveal the activities that facilitate interactions between entrepreneurial ecosystem actors and to examine their outcomes and benefits by focusing on a particular support program in Turkey.

This chapter gives a brief background about the entrepreneurial ecosystem to pinpoint the position of this thesis in the literature. Section 2.1. describes the conceptual framework of the entrepreneurial ecosystem concept and presents definitions. Section 2.2. explains the interaction and interdependency of elements and actors within the ecosystem. Section 2.3. presents studies focusing on the entrepreneurial ecosystem

concept in emerging economies. Section 2.4. provides the importance of the governance mechanism that includes the role of public policy and entrepreneurship support organizations in the entrepreneurial ecosystem. Lastly, Section 2.5. discusses research gaps that this thesis addresses.

2.1. Entrepreneurial ecosystem

The entrepreneurial ecosystem is a relatively new concept that researchers, scholars, and policymakers show much interest. The concept of the ecosystem has been drawn from biology into policy studies. In biology, it refers to “the complex of living organisms, their physical environment, and all their interrelationships in a particular unit of space” (Britannica, 2022). Previous policy studies have adopted the ecosystem analogy in order to understand the dynamics and performance of the business environment as well as national or regional innovation systems in a particular economy. However, an entrepreneurial ecosystem is different from other system approaches because it emphasizes social, institutional, and relational characteristics of ecosystem actors (Brown & Mason, 2017; Alaassar et al., 2022), and entrepreneurs are the leading actor that shapes those characteristics by exploiting opportunities (Feld, 2012; Stam, 2015; Acs et al., 2017).

Various researchers have recently attempted to define and conceptually frame what an entrepreneurial ecosystem is. Since ecosystem approaches to entrepreneurship are defined in different ways and scales (Malecki, 2018), several studies have not yet led to a broad consensus on the definition of this concept (Stam, 2015). Nevertheless, a few general definitions in the literature have become more prominent. One of them is Stam’s (2015) definition identifying an entrepreneurial ecosystem as a group of interdependent and coordinated actors and factors that enable a productive entrepreneurship environment. Another is Audretsch & Belitski (2017) describing an ecosystem as institutional, organizational, and other systemic factors that interact and influence the identification and commercialization of entrepreneurial opportunities. Lastly, Mason & Brown's (2014) definition should be noted. According to this definition, the entrepreneurial ecosystem includes entrepreneurs, entrepreneurial organizations (venture capitalists, business angels, banks), and institutions

(universities, public initiatives) that interact with each other to connect, mediate, and govern the entrepreneurial environment.

Aside from not having a widely accepted definition, the concept of entrepreneurial ecosystem term is also under-theorized (Cao & Shi, 2021; Wurth et al., 2022). This is also because there is no one type of entrepreneurial ecosystem, meaning that the elements and actors that constitute an ecosystem often vary across different contexts. Some researchers are interested in conceptually identifying these elements and actors, and producing high-level understandings of the interrelations between these towards developing general theories. For instance, Isenberg (2011) emphasizes six domains with hundreds of specific elements to explain the entrepreneurial ecosystem. These domains are policy, finance, culture, support, human capital, and markets (Figure 1). Similarly, the World Economic Forum (2014) identifies eight pillars for the entrepreneurial ecosystem: accessible market, human capital, finance, support systems/mentors, government and regulatory framework, education and training, universities, and cultural support. Lastly, Stam & van de Ven (2021) put (1) institutional arrangements (formal institutions, culture, networks) and (2) resource endowments (infrastructure, intermediaries, finance, knowledge) as the interactive elements of the entrepreneurial ecosystem to have productive entrepreneurship. Several studies like the ones highlighted mainly concentrate on conceptually framing the ecosystem by elements and actors in order to reach a general definition. Studies describing how an entrepreneurial ecosystem in a particular geographical context works regarding the interactions and coordination among its elements and actors remain limited in the literature. This thesis aims to provide a detailed description of these interactions. Knowing that the characteristics of these interactions vary between different business cultural contexts, it also advocates for studying those characteristics within their specific contexts. This will help produce site-specific descriptions that theoretical approaches may not fully account, and therefore enrich our understanding of entrepreneurial interactions.

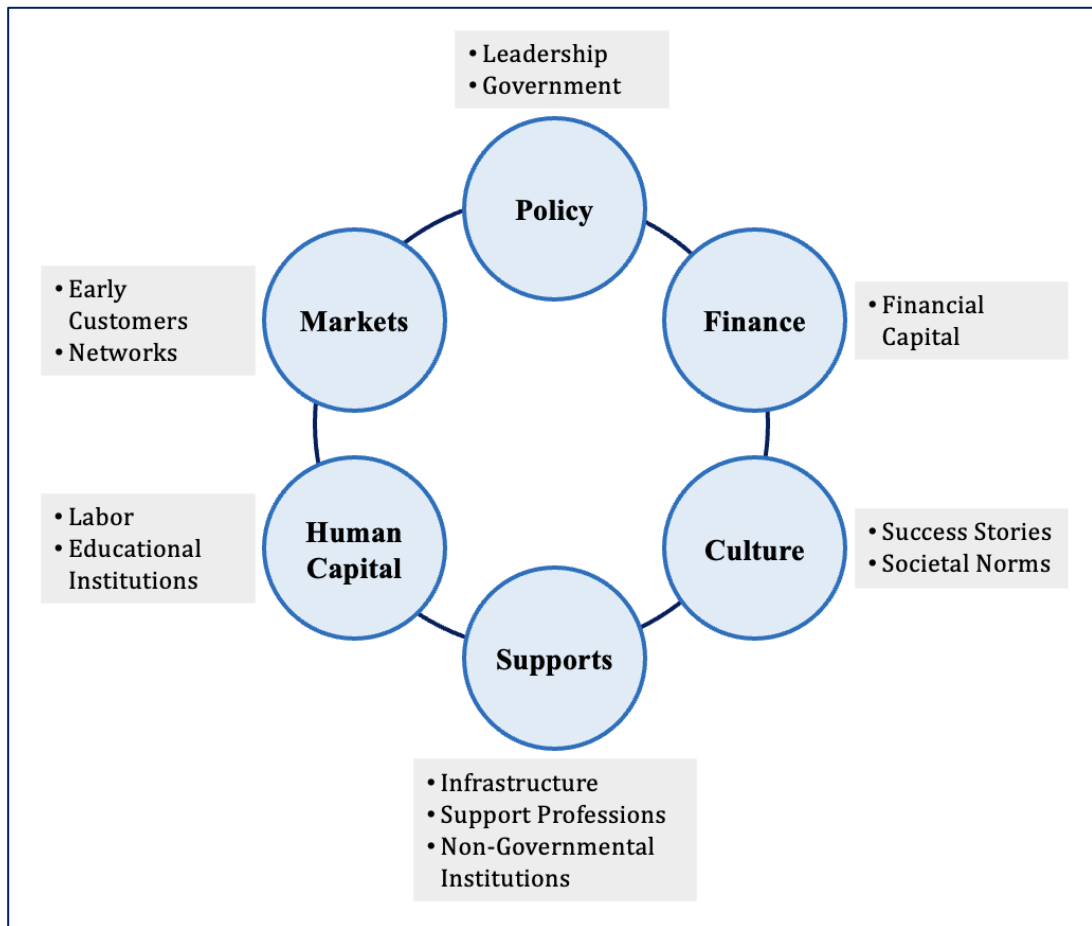


Figure 1: Domains of the entrepreneurial ecosystem by Isenberg (2011)

Source: Isenberg, 2011

Apart from conceptual frameworks, some studies have contextually and empirically framed ecosystem features, dynamics, and performance at the level of a country, region, city, university, and support program (Rice et al., 2014; Stam, 2014; Spigel, 2016; Spigel, 2017; Miller & Acs, 2017). A significant example is Spigel’s study (2017), which examined the ecosystem’s material (policies, universities, infrastructure), social (networks, investment capitals, mentors), and cultural (supportive environment) attributes (Figure 2) within two regions of Canada. Spigel (2017) revealed that (1) each attribute (ecosystem elements) supports as well as reinforces each other in the ecosystem and (2) different types of relations and interactions between the ecosystem attributes occurred in those regions. Accordingly, Stam (2018) developed an ecosystem framework for the ecosystem elements and how these elements impact the outcomes, quality, and performance of the ecosystem in 12

regions in the Netherlands. Another example is Miller & Acs's (2017) study which constructs an ecosystem framework by exploring the case of the University of Chicago to understand how value creation was produced and governed within a campus ecosystem. These studies show that investigating the dynamics of an entrepreneurial ecosystem in a particular geographical or institutional context is important because the dynamics, elements, actors, and performance within an entrepreneurial ecosystem diversify across different contexts. There is no one-size-fits-all approach to studying this concept. This thesis contributes to these efforts with a detailed study of the ecosystem elements and actors in the context of a specific entrepreneurship support program in Turkey.

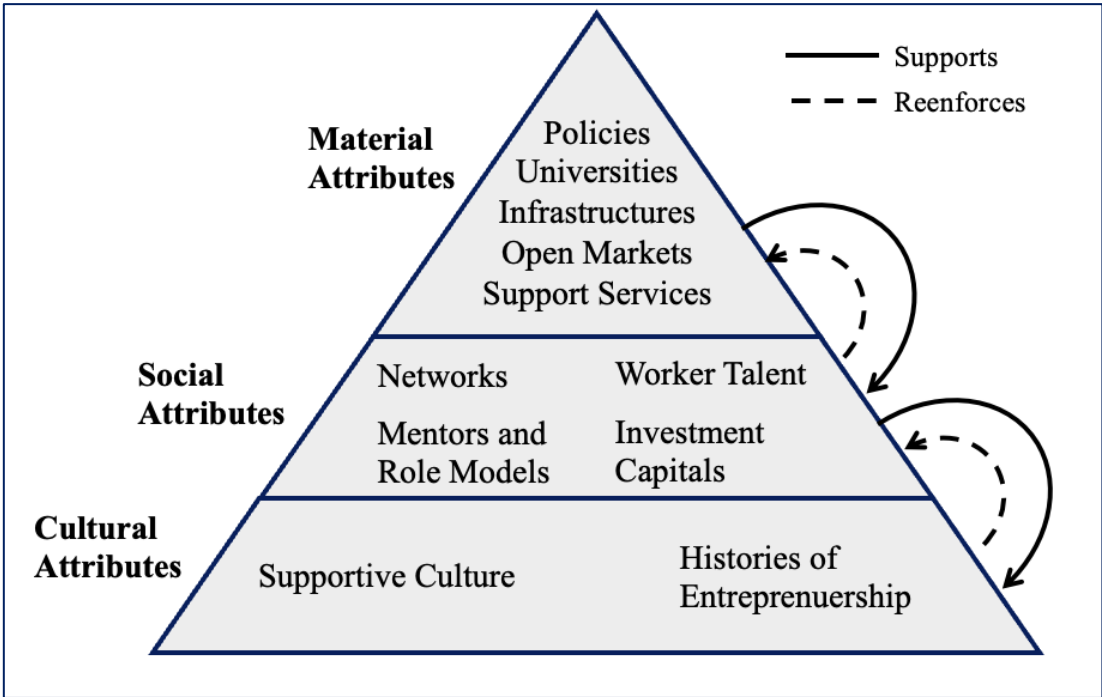


Figure 2: Relationships Among Ecosystem Attributes by Spigel (2017)

Source: Spigel, 2017

2.2. Interactions among ecosystem actors

Even though studies on the entrepreneurial ecosystem vary in different ways and scales, standard features and qualities are highlighted across various ecosystem definitions and frameworks. These are (1) multi-actor involvement, (2) the effects of

various elements, and (3) the concepts of collaboration, network, interdependency, and interaction. Instead of focusing on the actors, entrepreneurial ecosystem research has primarily focused on examining and describing the internal functions of the ecosystem and interactions among its structural elements such as finance or infrastructure. Interaction and interdependency between the different actors of a particular ecosystem have been overlooked. Yet, studying these elements is essential because the performance of the entrepreneurial ecosystem is thought to depend on the interaction and interdependencies among individuals, institutions, and organizations. Moreover, they enhance access to resources and knowledge and promote collaboration in the entrepreneurial ecosystem (Roundy et al., 2018; Cho et al., 2022; Scott et al., 2022). Thus, analyzing and explaining how the actors make and enact these interactions is crucial for understanding ecosystem dynamics and producing new frameworks and feedback for policy studies.

Studies suggest that the entrepreneurial ecosystem involves multiple actors coexisting in a social environment. The primary actors are the entrepreneurs who benefit from and exploit the opportunities to shape the system dynamics (Feld, 2012; Stam, 2015). Other than the entrepreneurs, there are other essential players such as government, universities, investors, mentors, and service providers who are regarded as "feeders" to the entrepreneurs who are regarded as "leaders" within the start-up community (Feld, 2012). As governments facilitate new environments for these communities, all these actors interact, and these interactions shape the entrepreneurial ecosystem (Feld, 2012; Stam, 2015). Similarly, Brown & Mason (2017) also highlighted the interrelationships, including the entrepreneurial actors (e.g., entrepreneurs, incubators, accelerators), resource providers (e.g., financial providers, universities), culture (e.g., role models and education), and connectors (e.g., former entrepreneurs, organizations and programs funded by industry and government) (Figure 3). This thesis relies on Mason & Brown's (2016) taxonomy on interaction or interrelation between ecosystem actors (and aspects). It investigates how interactions occurred among the entrepreneurial actors and connectors, and how these interactions facilitate resource flows (knowledge, finance, feedback).

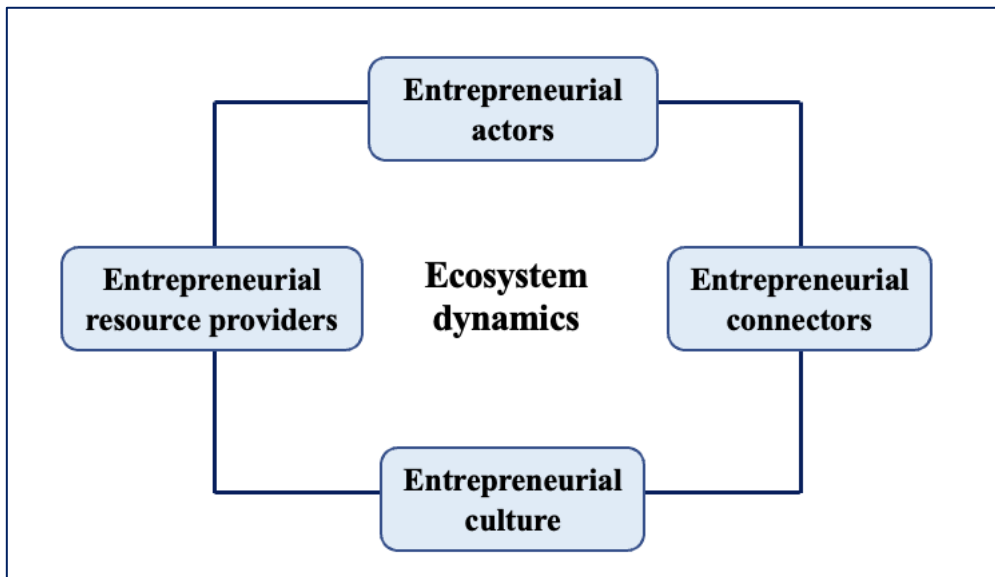


Figure 3: Main aspects of ecosystem taxonomy by Mason & Brown (2016)

Source: Mason & Brown (2016)

To understand the interactions among actors within an entrepreneurial ecosystem, some researchers rely on theoretical frameworks to examine interaction dynamics. For example, Fubah & Moos (2021) classify different theories and their relevance for entrepreneurial ecosystem research. Their study emphasizes that social capital theory, network theory, knowledge spillover theory, resource dependency theory, and stakeholder theory can be applied to understand the interaction and interdependency dynamics of the entrepreneurial ecosystem. In another study, Hernandez-Chea et al. (2021) empirically examine how intermediation activities (in incubators) shape the collaboration patterns in the entrepreneurial ecosystem through the lens of one-sided, joint, and mutual dependency-based collaborations. Another study by Theodoraki & Messeghem (2018) investigated that structural (relationships within a network), cognitive (common goals and shared culture), and relational (trust and norms) social capital dimensions enhance the functioning and sustainability of the university-based entrepreneurial ecosystem. In addition, some scholars have adopted institutional theory to examine the role of institutions and how different actors behave in the entrepreneurial ecosystem (Auschra et al., 2019; Pocek, 2022; Audretsch et al., 2021). Conversely, this thesis does not rely on a specific theoretical framework and does not formulate its research questions according to theories. Instead, a list of theoretical

concepts is employed to explain the revealed qualities or dynamics of interactions and interdependencies.

Only a few empirical studies examined the interactions among the actors that drive the entrepreneurial ecosystem. An example is Motoyama & Knowlton's (2016) analysis of the connections among entrepreneurs, support organizations, and between those in St. Louis. The authors examined (1) the government sponsorship in entrepreneurship facilitates entrepreneurs (cohort) to help each other with resources in the ecosystem and found that (2) this sponsorship enables coordination among local entrepreneurship support organizations. Another example is Alaassar et al.'s (2022) investigation of how the actors' interaction facilitates the creation of new ventures in the financial technology ecosystem of Singapore. Findings from their fieldwork are categorized as (1) interaction dynamics of the ecosystem enable both financial and knowledge transfer between various actors, (2) intermediation activities by several institutions such as incubators, or governmental platforms connect entrepreneurs to other ecosystem actors, and (3) various actors such as venture capitalists and government-led or other support organizations are open to support in terms of financing and sharing experience. As these studies show, understanding how interactions within an ecosystem facilitate local collaborations and coordination and resource sharing (knowledge and finance) among all actors helps leverage the benefit of the entrepreneurial ecosystem. Similarly, this thesis has attempted to extend these studies into the entrepreneurial ecosystem in Turkey.

These studies reviewed show that macro-level concepts or elements, such as policy or finance, cannot fully explain the functioning of an entrepreneurial ecosystem. Instead, it is how these concepts are enacted through social interactions. Interaction and interdependency among entrepreneurs, intermediary organizations, universities, venture capital, and government shapes those elements such as policy, finance, infrastructure, and culture which structurally facilitates the entrepreneurial ecosystem. Thus, how such policy or finance is enacted through social interactions is critical to complement these explanations. As such, this thesis investigates the interaction between entrepreneurs, intermediary institutions (incubators), and a government-funded institution under the public entrepreneurship support program in Turkey to understand how interactions shape the elements that facilitate the ecosystem.

2.3. Entrepreneurial ecosystem in emerging economies

The conceptual and empirical studies reviewed have analyzed entrepreneurial ecosystem concepts by zooming into advanced economies or regions. However, the application of the models built based on advanced economies in emerging economies can be problematic because the diversity of opportunities, interaction dynamics, and effectiveness of the entrepreneurial ecosystem is contingent upon the country's development level as well as context-specific characteristics. In the literature, scholars emphasized three critical deficiencies to challenge adopting advanced economy models into emerging economies: resource scarcities, structural and institutional gaps (Cao & Shi, 2021; Qoriawan & Apriliyanti, 2022; Andrade et al., 2022). Moreover, resource scarcities (e.g., financial and knowledge) and structural gaps (e.g., the absence of actors or networks) are caused by the lack of interactions and interdependencies within a particular entrepreneurial ecosystem. That is why revealing the unique dynamics of an ecosystem in an emerging economy may provide policymakers with a deep understanding of the ecosystem dynamics.

The existing research on the entrepreneurial ecosystem in emerging economies has mainly investigated gaps and barriers (Qoriawan & Apriliyanti, 2022; Khokhawala & Iyer, 2021), examined the role and impact of institutional intermediaries such as incubators or accelerators (Goswami et al., 2018; Armanios et al., 2017; Dutt et al., 2016), and studied the role and effects of government and policy implications (Yusoff et al., 2018) to reveal the dynamics of the entrepreneurial ecosystem. Most of these studies have attempted to demonstrate how the ecosystem works within a particular system. Still, not many efforts focus on the interaction between ecosystem actors in emerging economies. Only a limited number of studies profoundly examine the interaction dynamics of the entrepreneurial ecosystem in emerging economies. Besides the ones highlighted, Junior et al. (2016) conducted a quantitative study examining and evaluating Brazil's entrepreneurial ecosystem dynamics. This study found that the interaction between entrepreneurs and institutions (especially universities) is poor, which is the primary bottleneck in Brazilian high-impact entrepreneurship.

Similarly, only a few studies conduct site-specific research on how the entrepreneurial ecosystem work and how interaction and interdependency among ecosystem actors and elements in Turkey. One example is the study by Belitski & Buyukbalci (2019), which builds an ecosystem model for two cities (Istanbul, Turkey, and Reading, United Kingdom) based on grounded theory and ethnography-based case studies. It describes ecosystem elements, actors, and their complementary effects of the interaction among them on the ecosystem. The study presents relevant findings for the ecosystem in Istanbul, which are (1) local institutions (universities and Technoparks) connectors play a crucial role in easier access to resources, (2) the government-backed fundings mechanisms in alliance with support programs run by universities lead to a strong connection between ecosystem actors, and (3) the type of interactions among ecosystem actors and contextual factors matters in the entrepreneurial ecosystem. Besides interaction dynamics, other studies have focused on the determinants of entrepreneurial intention (Karadeniz & Ozdemir, 2009; Turker & Selcuk, 2009; Cetindamar et al., 2012; Oner & Kunday, 2016; Beyhan & Findik, 2018; Tunali & Sener, 2019), success factors (Benzing et al., 2009), and assessment of support organizations and policies (Akcomak & Taymaz, 2007; Ozdemir & Sehitoglu, 2009; Sungur, 2015). Thus, this study aims to contribute to the literature with such an effort that analyzes the interactions among entities within a specific entrepreneurship support program in Turkey.

2.4. Governance of the entrepreneurial ecosystem

The entrepreneurial ecosystem has evolutionary nature through interaction between elements and actors over time (Cohen, 2006; Malecki, 2018; Cho et al., 2022). The evaluation can be initiated by the entrepreneurship outcomes that have a positive feedback impact on shaping ecosystem elements and institutions (Roundy et al., 2017; Stam & van de Ven, 2021). For example, Spigel (2017) argues that support organizations enable network ties with mentors or capitalists, and this ultimately reinforces ecosystem culture by creating various activities and success stories. On the other hand, there have been different governance structures of the entrepreneurial ecosystem due to their evolutionary nature. Colombelli et al. (2019) argue that the entrepreneurial ecosystem changes from hierarchical to relational governance as it evolves into birth, transition, and consolidation phases over time. This study also

suggests how anchor actors (local universities and a public institution that is a central player in fostering science and technology) evolve into ecosystem actors in the later phases of an entrepreneurial ecosystem. The interaction dynamics within the entrepreneurial ecosystem are the determinants for the evolution, maturity, and sustainability of the entrepreneurial ecosystem. This thesis identifies what a geography-specific ecosystem looks like and how interaction dynamics turn into benefits in the ecosystem.

Furthermore, the governance of the entrepreneurial ecosystem diversifies concerning how the ecosystem is created, shaped, and governed within the context. Colombo et al. (2019) claim that the entrepreneurial ecosystem is either artificial (top-down approach) or natural (bottom-up approach). In such a bottom-up approach (e.g., Silicon Valley), the entrepreneurial ecosystem builds through a natural process in which path dependency and culture are the critical factors. On the contrary, top-down approach ecosystems are systems in that resources and facilities are created and shaped by the government as the “feeder” of an ecosystem (Stam, 2015; Feld, 2012). Most emerging economies have a top-down ecosystem approach to compensating deficiencies such as resource scarcities, structural gaps, and institutional gaps, as well as to developing an efficient and sustainable entrepreneurial ecosystem. That is why public policy, and government-funded or private intermediary organizations are vital to foster an entrepreneurial ecosystem, particularly where entrepreneurial activities are scarce.

Public policy works for creating a supportive and fertile environment that promotes different aspects of entrepreneurial activity. Through public policy, the government, especially in emerging economies, is considered the primary resource provider for supporting new ventures, supplying physical structure, and sustaining the investment environment (Melaas & Zhang, 2016). In the context of the entrepreneurial ecosystem in emerging economies, public policy for entrepreneurship is generally a top-down policy decision to foster entrepreneurial activities and address deficiencies. However, top-down policy efforts may not be productive (Lucas & Fuller, 2017) or may not have much impact on system dynamics due to missing complex interactions between system elements (Autio & Levie, 2017). Instead, it could be effective when a policy is made through bottom-up feedback, stakeholder engagement, and consultation in the entrepreneurial ecosystem (Autio & Levie, 2017). An argument OECD case study of

Estonia shows that policy decisions supporting the entrepreneurial ecosystem should be made by incorporating various stakeholders (OECD, 2020). Due to the interactive dynamics of the entrepreneurial ecosystem, such feedback mechanisms from ecosystem actors and organizations to policy institutions provides more effective policies to develop or support the entrepreneurial ecosystem. However, research on the feedback mechanism from entrepreneurs and other organizations to policymakers is limited in the entrepreneurial ecosystem context. Thus, this thesis also investigates whether or how interaction enables policy feedback in a particular entrepreneurship support program in Turkey.

Asides from public policy, entrepreneurial support organizations and programs are considered important elements of the entrepreneurial ecosystem. Support organizations, such as incubators, accelerators, professional service providers, and venture capitalists, are essential for strengthening networks, interactions, and interrelations within the entrepreneurial ecosystem. In general, incubators and accelerators mainly provide office spaces, support services, mentoring, coaching, and internal and external network activities (Bergek & Norrman, 2008). Besides, those organizations play an intermediary role in conducting several activities and services bridging entrepreneurs and other ecosystem actors (Mair et al., 2012; Goswami et al., 2015; van Rijnsoever, 2022). Furthermore, these organizations help fill the “institutional voids” between ecosystem actors in emerging economies by supporting entrepreneurs to access knowledge and resources (Dutt et al., 2016; Khokhawala, 2021). For example, science parks in China are essential as entrepreneurs utilize them to improve their access to public resources (Armanios et al., 2016). Another study by Goswami et al. (2015) finds that the accelerators in Bangalore, India contribute to entrepreneurial commitment and venture creation within the entrepreneurial ecosystem by enabling the connection between entrepreneurs and other ecosystem actors (such as resource providers and mentors). Lastly, the study by Beyhan et al. (2021) examines the entrepreneur selection processes of accelerators in Turkey. They found that accelerators enable suitable signaling for investors and reduce information asymmetry by selecting high-potential entrepreneurs and providing training and guidance. This network contribution of intermediary institutions facilitates interactions

and collaborations within the ecosystem and has certain effects on reducing institutional voids.

On the other hand, entrepreneurship support programs provide more structured, purposeful, and unidirectional activities (Ratinhoa et al., 2020), whereas the ecosystems include interconnections and interactions creating these conditions. These programs that are funded by the government or initiated under intermediary organizations provide financial or non-financial support to entrepreneurs in different stages. This support, such as funding, training, and mentorship, has certain effects on entrepreneurial activity for early-stage entrepreneurs and the ones in growth and expansion processes. (Tang, 2008; Nowinski et al., 2020). Thus, these activities under support programs may facilitate a sub-system of the entrepreneurial ecosystem due to their role in creating an interactive environment where different actors and elements are involved. This thesis focuses on the interaction dynamics under a public support program for entrepreneurship in which public institutions, support organizations, and entrepreneurs are involved.

2.5. Relevance of the thesis

Most studies in the entrepreneurial ecosystem literature have focused on creating a framework for the ecosystem determinants and actors rather than analyzing the dynamics of the ecosystem and actors' interactions. These studies have attempted a high-level understanding of ecosystem elements and actors by zooming into advanced economies. However, the characteristics of an entrepreneurial ecosystem diversify across different geographical or institutional contexts. That is why the interaction dynamics within a particular context are worth investigating. Accordingly, empirical studies on the dynamics and interaction of the entrepreneurial ecosystem in emerging economies are limited. Similarly, in Turkey, the previous research on the entrepreneurial ecosystem has mainly concentrated on the determinants of entrepreneurial intention (Karadeniz & Ozdemir, 2009; Turker & Selcuk, 2009; Cetindamar et al., 2012; Oner & Kunday, 2016; Beyhan & Findik, 2018; Tunali & Sener, 2019), success factors (Benzing et al., 2009), and assessment of support organizations and policies (Akcomak & Taymaz, 2007; Ozdemir & Sehitoglu, 2009; Sungur, 2015) rather than detailed empirical analysis of the interaction dynamics in

the Turkish entrepreneurial ecosystem. Thus, this thesis aims to examine how the interaction among entrepreneurial actors occurs under public support programs in Turkey.

This thesis investigates the interaction between the ecosystem actors in a public support program in Turkey. The ecosystem seems to be self-sustaining, but the role of the government support policies in emerging economies is crucial for creating a structured ecosystem environment. Thus, a public support program, the Individual Young Entrepreneurship Support Program (BiGG), is selected due to its structure of various activities with multi-actor involvement in order to investigate the dynamics of the ecosystem and actors' interaction. This thesis investigates the BiGG program's framework and actor interactions under three research questions: (1) What type of interactions does the BiGG program facilitate? (2) How do various actors that conduct or participate in the program interact? (3) What kind of benefits or feedback mechanisms do these interactions enable?

This thesis makes several contributions to the literature and policy decisions on entrepreneurship in Turkey. First, it is the first detailed field research on investigating and describing interaction dynamics of the Turkish entrepreneurial ecosystem focusing on a public support program in Turkey. Second, this thesis produces site-specific descriptions of interactions among entities rather than the outcomes or elements, which theoretical framework may not be able to, and therefore enrich the understanding of the entrepreneurial ecosystem in Turkey. Third, investigating the interaction dynamics of an entrepreneurial ecosystem in Turkey extends the limited empirical research on ecosystem interactions in emerging economies. Fourth, revealing the formal and informal interactions and feedback mechanisms within the ecosystem provides policymakers with input to identify strengths, gaps, and intervention areas.

CHAPTER 3

RESEARCH ELEMENTS

This chapter describes the research elements used to design and conduct this study. Section 3.1. gives brief information about the field study and why the TUBITAK BiGG support program is worth investigating. Section 3.2. describes the scope of the study. Section 3.3. and 3.4. explain the data collection and analysis process of this study.

3.1. Field Study

The Entrepreneurship Young Support Program, known as the BiGG program, in Turkey was chosen for the fieldwork. It provides non-financial support and financial grants to early-stage entrepreneurs. The program is provided by The Scientific and Technological Research Council of Turkey (TUBITAK). It is a government-backed institution that initiates various support programs for entrepreneurs, industries, and academics.

The BiGG is a multi-phase program in which entrepreneurs must complete each phase to qualify. The first phase is the business idea evaluation of the entrepreneurs that provides non-financial support such as training and mentorship to develop the idea. Selected entrepreneurs also prepare a business plan in this phase. The second phase is the final evaluation of business plans and the provision of financial grants. In the third phase, entrepreneurs with advanced R&D processes are guided to apply to the TUBITAK 1507 SME R&D Startup Support Program to get additional grants (Figure 4). More details about the BiGG program and these phases will be elaborated in Chapter 4.

The field study includes three main actors involved with the BiGG program – TUBITAK (government-backed institution), implementing agencies (incubators), and

entrepreneurs. These actors are a key to entrepreneurial activity, which is emphasized in the entrepreneurial ecosystem literature (see Chapter 2). First, entrepreneurs are the main actors that interact with different actors and ecosystem elements (Feld, 2012; Stam, 2015). Second, incubators, implementing agencies in this program, play the intermediary role that connects entrepreneurs with other ecosystem actors and facilities (Hallen & Eisenhardt, 2012; Mair et al., 2012). Finally, the public initiatives, here is TUBITAK, rule and facilitate the ecosystem elements with several policies and support programs.

The actors mentioned above have various roles and responsibilities within the BiGG program (Figure 4). First, TUBITAK is the public initiative coordinating and funding the program. It is also the last resort in deciding who is eligible for the grant by conducting the final evaluation. It provides financial grants for successful entrepreneurs within the program's second phase. Second, the implementing agencies are responsible for collecting the program application, conducting initial evaluation and selection, and providing non-financial support to entrepreneurs to prepare for the program. Those agencies are mostly incubators under university Technology Transfer Offices, but a few private sector institutions could also be part of them. TUBITAK selects implementing agencies with the call-based program (TUBITAK 1601 program, elaborated in Chapter 4). Finally, entrepreneurs are the primary beneficiaries of the BiGG program. In each phase of the program, entrepreneurs undergo several evaluation processes, benefit from non-financial support, establish enterprises and get financial grants.

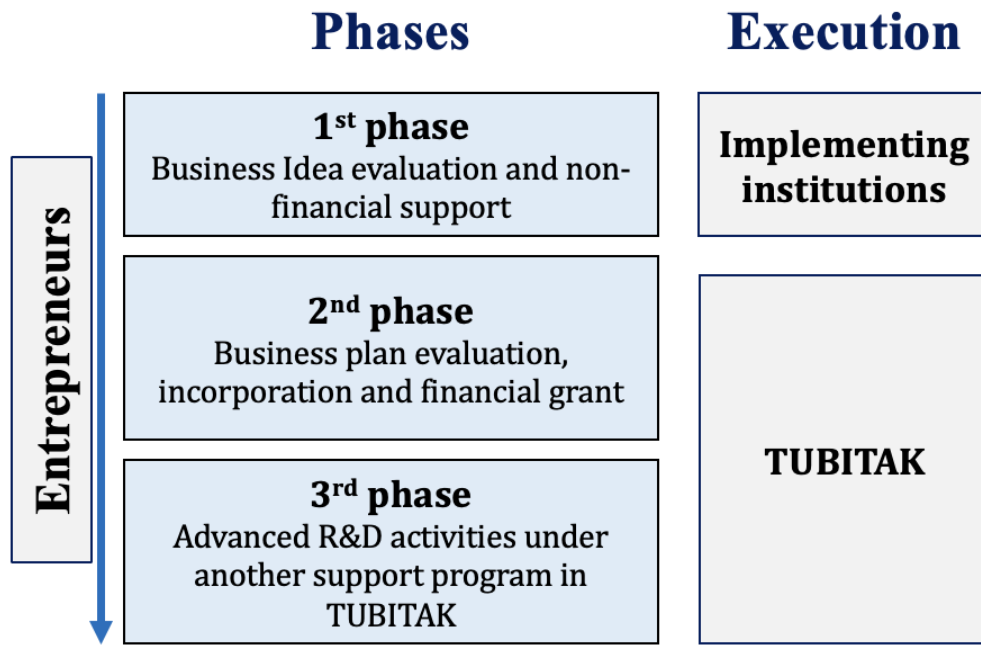


Figure 4: Summarized the BiGG processes and responsible actors

Source: TUBITAK (2022)

Investigating the interactions within the entrepreneurial ecosystem by taking the BiGG program as a field study is relevant for four reasons.

First, the BiGG program has unique features considering public support program mechanisms in Turkey. It is the only active public support program focusing on technology-based and early-stage entrepreneurs. Bergek & Norrman (2008) claim that supporting high-growth firms triggers innovation and job creation and technology-based entrepreneurs are more likely to turn into high-growth firms. The program is also a comprehensive support mechanism, including financial and non-financial support. As mentioned in Chapter 1, providing non-financial support is as vital as financial grants to increase entrepreneurial activity, and supporting technology-based entrepreneurs is critical in generating innovation and job creation (Shane, 2009; Cumming & Fischer, 2012). Because of these features, the BiGG program is chosen for the field study.

Second, the BiGG program is also a unique structure of supporting technology-based entrepreneurship with a multi-phase process and multiple actors. Each phase includes several support activities and procedures, such as entrepreneurship training,

mentorship, evaluation, elimination, and reporting. The three actors mentioned above attend or work side-by-side in each activity. In addition, the implementing agencies are selected and funded by TUBITAK with the umbrella program called the TUBITAK 1601 Capacity Building Program (elaborated in Chapter 4). Those activities and multi-actor implementation may create possible interactions and knowledge exchange between those institutions or individuals participating in the BiGG program. That is why the BiGG program is fit for investigating the actor's interaction in the entrepreneurship ecosystem.

Third, the BiGG program has been implemented since 2012 with many policy decisions and changes in practice through those years. For example, only TUBITAK and entrepreneurs were involved with the BiGG program till 2015. Then, implementing agencies are assigned to conduct the program's first phase with the TUBITAK policy decision. With its ever-changing nature, learning from the implementation could be observed within the program. There may also be feedback mechanisms between participating actors, affecting policy decisions and practical changes for the program and its activities.

Fourth, TUBITAK announces a call for the BiGG program two times a year. The number of technology-based entrepreneurs participating in the program is relatively high. Every year, about 3.000-4.000 entrepreneur candidates with technology-based ideas apply to the BiGG program via implementing agencies (TUBITAK Activity Reports, 2016-2021). Many entrepreneur applicants for the BiGG program could attend non-financial support within the program even if they are not eligible for the grant. For example, over 2.500 entrepreneurs from 4.500 applications have had non-financial support in a call for 2020 (TUBITAK Activity Reports). Moreover, over 150 entrepreneurs are entitled to financial grants from the BiGG program every year. This entrepreneur-rich environment may provide many opportunities for interaction within the entrepreneurial ecosystem.

3.2. Scope

The entrepreneurial ecosystem has been an approach that various disciplines and actors in policy studies are increasingly engaged with. Several studies mentioned in Chapter 2 have tried to frame the ecosystem elements and actors rather than analyzing how the

ecosystem works in a particular context. Yet there is no one-size-fits-all approach to the entrepreneurial ecosystem because its characteristics, features, and performance of an entrepreneurial ecosystem diversify across different geographical or institutional contexts. Moreover, some empirical studies have revealed how the ecosystem operates in a particular country, region, university, or support program (Rice et al., 2014; Stam, 2014; Spigel, 2016; Spigel, 2017; Miller & Acs, 2017), but research on the ecosystem dynamics in the emerging economies are limited. In this thesis, I investigate the interactions between the ecosystem actors aiming at early-stage and technology-based entrepreneurship by focusing on the public support program in Turkey called the BiGG program. Within these interactions, I also examine the knowledge spillovers between actors participating in the program and feedback mechanisms from beneficiaries (entrepreneurs) and intermediaries (implementing agencies) to the policymakers (the TUBITAK).

The broader approach of this study is to investigate the dynamics of interactions in the entrepreneurial ecosystem in Turkey. This study is based on three research questions within the entrepreneurship ecosystem context in Turkey: (1) What type of interactions does the BiGG program facilitate? (2) How do various actors that conduct or participate in the program interact? (3) What kind of benefits or feedback mechanisms do these interactions enable? Within the scope of research inquiry, my research aims to trace and reveal the activities that facilitate interaction between ecosystem actors within the BiGG program. Then, I also aim to examine the benefits arising from those interactions.

3.3. Methodology

This study relies on the qualitative inductive methodology focusing on the case of a public support program for entrepreneurship in Turkey. Qualitative research in this study helps investigate the implementation details of the BiGG program and the actors' interaction that the program would facilitate. I followed two research methods under the qualitative approach: (1) examining secondary sources and (2) collecting primary data from in-depth interviews.

Examining the secondary sources based on desk research helped design this research. I reviewed all public support programs for entrepreneurship in Turkey to have

preliminary information about their scope, aims, details, and history from secondary sources. Then, I chose the BiGG program as the field study because of its four features: (1) focusing on technology-based entrepreneurs, (2) a multi-phase program with multi-actor participation, (3) implemented since 2012, and (4) a high-circulation of entrepreneurs. The secondary sources also enable an understanding of how the BiGG program works and which actors are involved. Thus, I designed my research inquiry and semi-structured interview questions with the help of secondary sources. In addition, I conducted two expert interviews in the field to rethink and overview my research inquiry.

In-depth interviews provide to collect primary data to conduct this research. Gathering primary data through interviews enables a broad understanding of certain phenomena and getting opinions, behaviors, motivations, and perceptions of the people involved (Jain, 2021; Berg & Lun, 2012). Thus, in-depth interviews are suitable for exploring the interactional patterns as well as feedback mechanisms within a particular support program for entrepreneurship in Turkey. In this study, I tried to investigate these patterns through in-depth interviews with the participants' views, experiences, and behaviors.

The interviews were held with three groups of people with different roles in the BiGG program. These are (1) executives from TUBITAK, (2) managers of incubation or accelerators (as implementing agencies in the BiGG program), and (3) entrepreneurs who receive BiGG support. Additionally, I interviewed an expert group experienced in entrepreneurship in Turkey. Interviewing different groups of people enables collecting cross-opinions and catching various anecdotes about the program implementation. It also helps investigate bilateral interactions and collaboration within these groups.

I prepared three sets of semi-structured interview questionnaires for each group with the help of desk research about the BiGG program. Then, these questionnaires were overviewed by my advisor, an academic researcher on entrepreneurship and innovation, and an expert interviewed in the field study. The questionnaire includes open-ended questions with complementary ones to guide interviewees and to explore the concepts within the research purpose (see Appendices). However, additional

questions were asked during interviews. I conducted the field study during the pandemic, so all interviews were conducted online via Zoom Video Communications, Inc., and were audio-recorded for transcription.

3.4. Data Collections

I collected primary data by conducting semi-structured interviews in this study. Interviewees are the executives from TUBITAK as a coordinator of the BiGG program, managers of the incubators and accelerators as implementing agencies of the program, and entrepreneurs as the beneficiaries. Interviewees also include experts who are/were policymakers for entrepreneurship support programs or part of related public institutions in Turkey. I conducted the interviews in the order of TUBITAK, incubators, and entrepreneurs, but expert interviews were conducted independently from this order. The reason for ordering interviews is first to understand how the BiGG program is executed and implemented to find possible interaction activities within the program, then whether or how these activities facilitate interactions and possible feedback channels. For each interviewee group, I tried to investigate their experiences as well as observations about interactions, collaborations, or feedback mechanisms within the program. I conducted 30 interviews in total, which are detailed below.

TUBITAK as an executive

TUBITAK, as a public institution in Turkey, is the executive organization of the BiGG program. About six executive team members carry out the organization and coordination of the program. I interviewed three executives from TUBITAK within the scope of this study. Almost 20 open-ended questions were asked to the executives (see Appendices), and the interview duration was 70-90 minutes.

These interviews first aim to investigate the organizational and implementation details of the BiGG program. These details include the broader objective of the program, the program phases, the role of the implementing agencies and their selection processes, and policy changes made through the years. Second, it aims to find possible activities that may create formal or informal interaction and to investigate possible feedback mechanisms within the program. Quotes from the interviews are coded "Executive from TUBITAK" in the following sections.

Incubators as an implementing agency

Implementing agencies selected by TUBITAK have a vital role in the program. First, entrepreneurs apply for the program through implementing agencies. Second, those agencies prepare candidate entrepreneurs for the BiGG program by conducting non-financial support within the program. With the implementing roles, those become the intermediary institutions for entrepreneurs to access the BiGG program. As of 2022, there are 63 active implementing agencies in the program. 31 are leading implementing agencies, while the rest are called collaborating agencies in consortium with others (the consortium is explained in Chapter 4). Those agencies could be incubators or accelerators under university Technology Transfer Offices and private sector organizations. However, this study focuses on those providing incubation services under the university.

I selected the interviewee implementing agencies following three criteria. First, the incubators under universities that conduct separate entrepreneurial activities in parallel with the BiGG program are considered. Second, agencies from Ankara or Istanbul are selected because those locations have relatively high entrepreneurial activity and potential for interaction. Last, the selected agencies have a high success rate in the BiGG program - the number of entrepreneurs eligible for the program is high. Thus, successful and relatively experienced incubators that can provide a vibrant atmosphere for entrepreneurship are selected because such a setup is more likely to produce interactions which is the main topic of this thesis.

I interviewed six managers of those incubators based on these criteria to collect primary data for this study. The questionnaire included 44 open-ended questions, and each interview took about 70-90 minutes. These interviews aim to examine the activities that facilitate the interaction between implementing agencies and other actors as well as between those agencies. Besides, the role of agencies, their services, and other entrepreneurial activities, and more importantly, possible feedback mechanisms are also investigated in the interviews. I also tried to collect individual perceptions about the benefits and bottlenecks of the BiGG program and discussed how the program would improve.

Implementing agencies interviewed have different demographic features. Three incubators are in Istanbul, and the rest are in Ankara. Four of them are in private foundation universities, and two are from state universities. They have been acting as implementing agencies of the BiGG program for about seven years. All agencies except one have implemented the BiGG program in consortium with other implementing agencies.

Some agencies interviewed also have additional services apart from the BiGG program. For example, some focus only on providing services for the BiGG program as the main incubation program, while others have parallel and complementary incubation programs. The transition between the BiGG program and other separate pre-incubation programs is also common in some incubators. Moreover, most have prominent network activities with a broad mentorship network (Table 1).

Table 1: Interviewee of implementing agencies

Code Names	University Type	Implementing agencies since	Consortium within the BiGG program	Features and providing services
Implementing Agency A (Abbreviation: IA A)	State University	2015	Yes	Pre-incubation, incubation, accelerator program with other assistive support programs such as investment demo-day, network activities, and office support The transition between the BiGG and separate pre-incubation program Having an extensive mentorship network Entrepreneur rotations are relatively high
Implementing Agency B	State University	2015	Yes	Incubation program, as well as other assistive support programs for commercialization, collaboration, internationalization, and office support The transition between the BiGG and separate incubation program Having an extensive mentorship network Entrepreneur rotations are relatively high
Implementing Agency C	Private Foundation University	2016	Yes	No separate incubation programs BiGG as a pre-incubation program Entrepreneur rotations are relatively low
Implementing Agency D	Private Foundation University	2015	Yes	Separate incubation program and training, mentorship, and office support The transition between the BiGG and separate incubation program Entrepreneur rotations are relatively low
Implementing Agency E	Private Foundation University	2015	No	Incubation program for software development with intra-university applications and investment preparation program No separate incubation program; some assistive programs, including mentorship and internationalization No transition between the BiGG and separate incubation program The number of BiGG applications is limited
Implementing Agency F	Private Foundation University	2015	Yes	No separate incubation program; some assistive programs, including mentorship, internationalization, and office support BiGG as a pre-incubation program Having an extensive mentorship network

Entrepreneurs as a beneficiary

Entrepreneurs are the beneficiaries of the BiGG program. They apply for the program with a technology idea and leave with funding and established enterprises. Entrepreneurs are essential actors within the BiGG program due to attending every phase. That is why interviewing entrepreneurs for this study is significant to investigate all activities and steps in the program implementation.

I contacted interviewee entrepreneurs through the implementing agencies interviewed in this study. I selected interviewees based on two conditions. First, all entrepreneurs complete the BiGG program or at least establish their enterprises with a grant. Second, several entrepreneurs attend pre-incubation or incubation programs besides the BiGG program.

I interviewed 17 entrepreneurs to investigate the program through the lens of entrepreneurs. In the interviews, 27 open-ended questions were asked of the entrepreneurs, and the interview duration was 30-60 minutes. The interviews aim to examine the experiences of entrepreneurs in interacting with other actors as well as gains and achievements from the BiGG program. Furthermore, I investigated feedback mechanisms so that entrepreneurs could give their opinions about the overall program and what needs to be done to improve the benefits of the program.

The interviewed entrepreneurs are mainly from three implementing agencies interviewed (IA A, IA B, and IA E) because some implementing agencies had difficulty reaching out to entrepreneurs. However, some entrepreneurs also did not want to attend interviews. The interviewed entrepreneurs are mostly from software-related sectors but in different fields. All of them applied to the BiGG program after 2020. Twelve entrepreneurs went through the pre-incubation or incubation program alongside the BiGG. Three of them participated in separate programs in institutions different from the ones they participated in the BiGG program. Nine entrepreneurs applied for other public support programs in Turkey (Table 2).

Table 2: Interviewee of entrepreneurs

Code names	From which implementing agency	Sector	Year for the BiGG	Founding year	Separate pre-incubation or incubation program	Application of public support programs other than the BiGG
Entrepreneur A	IA B	Biotechnology	2020	2020	Under IA B	Yes
Entrepreneur B	IA B	Software (Design)	2019	2020	Under IA B	No
Entrepreneur C	IA B	Biotechnology	2021	2021	Different institution	Yes
Entrepreneur D	IA B	Biotechnology	2020	2020	Under IA B	Yes
Entrepreneur E	IA A	Software (Design)	2021	2021	Under IA A	No
Entrepreneur F	IA A	Medical	2020	2021	Under IA A	No
Entrepreneur G	IA A	Software (Energy)	2021	2021	Under IA A	Yes
Entrepreneur H	IA A	Software (Education)	2021	2021	Under IA A	Yes
Entrepreneur I	IA A	Software and Hardware	2021	2021	Under IA A	Yes
Entrepreneur J	IA A	Software and Hardware	2021	2021	Under IA A	No
Entrepreneur K	IA A	Medical	2021	2021	No	Yes
Entrepreneur L	IA C	Machinery	2021	2021	No	Yes
Entrepreneur M	IA F	Hardware	2022	2022	No	No
Entrepreneur N	IA E	Software (Education)	2021	2021	Different institution	Yes
Entrepreneur O	IA E	Software (Aerospace)	2021	2021	Under different agencies	No
Entrepreneur P	IA E	Software (Marketing)	2021	2021	No	No
Entrepreneur R	IA E	Biotechnology	2021	2021	No	No

Experts

I conducted interviews with the experts in parallel to the interviews mentioned above. The experts took place in either policymaking or implementing entrepreneurship support programs in Turkey. In this realm, I interviewed four experts. One expert interviewed is a former executive at the TUBITAK BiGG program, while another is a senior manager at the Ministry of Industry and Technology which is the parent organization for entrepreneurship support programs in Turkey. The Other two experts have vast experience in executing incubation and support programs for entrepreneurship in Turkey (Table 3).

The purpose of those interviews is to examine the public entrepreneurship support program in Turkey from a broader perspective. Specifically, I investigate the designing process of public entrepreneurship support programs in Turkey, the contribution of those programs to entrepreneurial activity, and the bottlenecks and development areas of those programs. Furthermore, I collected anecdotes about the interaction between TUBITAK as a policy-making institution and implementing agencies providing entrepreneurship support programs.

Table 3: Interviewee of experts

Code names	Information
Expert A	A former executive of the TUBITAK BiGG program, also an academic; knows the history of the BiGG program and its impact on entrepreneurial activity in Turkey.
Expert B	A senior manager at the Ministry of Industry and Technology; has attended designing many public support programs for entrepreneurship in Turkey
Expert C	A former manager at one of the biggest Technoparks in Turkey, also an academic; has experience with the BiGG program and other entrepreneurship support programs in Turkey
Expert D	Co-founder at a private incubation center working as an implementing agency; has experience with many incubation programs for entrepreneurs and attended designing many support programs for entrepreneurship in Turkey

3.4. Analysis

This study employed a qualitative data analysis method to understand the data gathered during interviews. Before all, I transcribed all audio recordings of interviews to text without any changes by listening to them. In the end, the 407-pages transcription of the interviews was ready for analysis.

The analysis includes iterative processes of two-step coding: open and axial coding (Corbin & Strauss, 2014; Patton, 2015; Gioia et al., 2012). I read all transcription to search the themes, activities, experiences, and behaviors within the research context. In this step, I encoded the transcription from a generic point of view so that 215 open codes were generated from the interviews (1st order concepts). First-order concepts were coded separately according to the interviewee groups. After that, I reviewed the transcriptions one more time to merge those open codes into thematic categories, so end up with 35 codes (2nd order themes). The first- and second-order codes are listed in Appendix B. I used the MAXQDA program to encode the transcription of the interviews. In parallel to my analysis, the advisor of this study also read and coded the interviews separately. Then, we shared our findings and discussed our interpretations.

After analysis, I generated the activities that facilitate or enable the interaction between the actors within the BiGG program (Table 4). First, I identified two high-level activities because they are separate programs conducted in different periods: (1) selection of implementing agencies and (2) program implementation. Under high-level categories, several activities facilitate interactions and collaborations. Second, I categorized the interaction concept into (1) formal interactions (structured by the implementation framework) and (2) informal interactions (unseen by-product interactions that the field study has revealed). Thus, the interaction patterns within the three main actors, as well as others, were revealed by the analysis. In the following section, I elaborate on all activities and interaction patterns within the BiGG program.

Table 4: Formal and informal activities that facilitate interaction within the BiGG

High-level categories	Type of interaction	Activities	Actors involved in the interaction
Selection of implementing agencies	Formal	<ol style="list-style-type: none"> 1. Selection of implementing agencies 2. Evaluation of the agencies 3. Consortium model (co-execution) 	<ol style="list-style-type: none"> 1-2. Implementing agency – TUBITAK 3. Between implementing agencies
Implementation of the BiGG program	Formal	<i>The first phase of the program</i> <ol style="list-style-type: none"> 1. Training and mentorship 2. Idea validation 3. Selection and evaluation of entrepreneur 	<ol style="list-style-type: none"> 1-3. Entrepreneurs – Implementing agency 1. Entrepreneurs – Trainers and mentors 2. Entrepreneurs – Private sector companies
		<i>The second phase of the program</i> <ol style="list-style-type: none"> 1. Panel presentation and final evaluation 2. Financial grants and reporting 	<ol style="list-style-type: none"> 1. Entrepreneurs – TUBITAK 2. Entrepreneurs – Referees (assigned by TUBITAK)
	Informal	<ol style="list-style-type: none"> 1. Ongoing relationship and guidance 2. Helping each other 3. Knowledge- or experience-sharing 	<ol style="list-style-type: none"> 1. Entrepreneurs – implementing agency 2. Entrepreneurs – Entrepreneurs 3. Between implementing agencies
		Feedback mechanisms (from-to)	Entrepreneurs – implementing agency Implementing agency – TUBITAK Entrepreneurs – TUBITAK (via implementing agencies)

CHAPTER 4

FINDINGS

This chapter documents the findings of the field study. Section 4.1. identifies the BiGG program position in the context of public support programs for entrepreneurship in Turkey. Then, Section 4.2. describes the BiGG program framework in terms of its participants' role, multi-phase structure, and multi-program execution. Section 4.3. reports the type of interactions between TUBITAK, the implementing agencies, and entrepreneurs enacted during the selection of the implementing agencies and the program implementation. This chapter also describes the process and activities that facilitate those interactions. It first describes certain activities in an implementing agency selection process that facilitates interactions between TUBITAK and the implementing agencies. Then it explains interactions during the program implementation in two categories: (1) formal interactions structured by the implementation framework and (2) second the informal unseen by-product interactions that the field study has revealed. It also describes in detail how these interactions are performed. Finally, the contributions of the interaction within the program to the entrepreneur, the implementing agency, and the ecosystem are discussed.

4.1. Overview of Public Support Programs for Entrepreneurship in Turkey

In Turkey, public support programs can be clustered in terms of (1) the entities they support and (2) the type of support they provide. Some of these programs provide direct support to entrepreneurs, and the type of support is financial funding or non-financial elements such as training or mentorship. At the same time, some others offer indirect support to fund the interface institutions conducting the entrepreneurial activity. Public support mechanisms in Turkey are summarized in Table 5.

Direct public support to entrepreneurs was not a priority in Turkey in the early 2000s. However, some steps were taken in the same years to support the interface institutions. For instance, public institutions started to provide funds and incentives via public support programs to create interface institutions as well as increase these institutions' capacities for entrepreneurial activity (Demirhan et al., 2018). Technology Development Centers, Business Development Centers, and Technoparks have been established. These institutions are still offering support for pre-incubation, incubation, and post-incubation processes, such as training, research and development (R&D) project incentives, mentoring, and physical infrastructure for pre-start and early-stage entrepreneurs (KOSGEB, 2022).

Direct support to entrepreneurs only began in 2008 with the launch of the Techno-Entrepreneurship Capital Support Program by TUBITAK (Demirhan et al., 2018). Until it ended in 2014, this program offered financial support and tax incentives to early-stage entrepreneurs who worked on technology-based ideas to establish enterprises (Law on Supporting Research and Development Activities, Official Gazette 26814 (12 Mart 2008), Legislation No. 5746). The program is significant in the brief history of such programs in Turkey because it was the first example of a public initiative providing direct financial support to entrepreneurs instead of indirect support via the interface institutions. In addition, TUBITAK started to conduct a similar program called as the Entrepreneurship Stage Support Program in 2012 (Figure 5). This program has later transformed into Techno-Entrepreneurship Capital Support Program under TUBITAK, then continued with the name of the Individual Young Entrepreneur (The BiGG Program) Support Program (Ministry of Industry and Technology of Turkey, 2021).

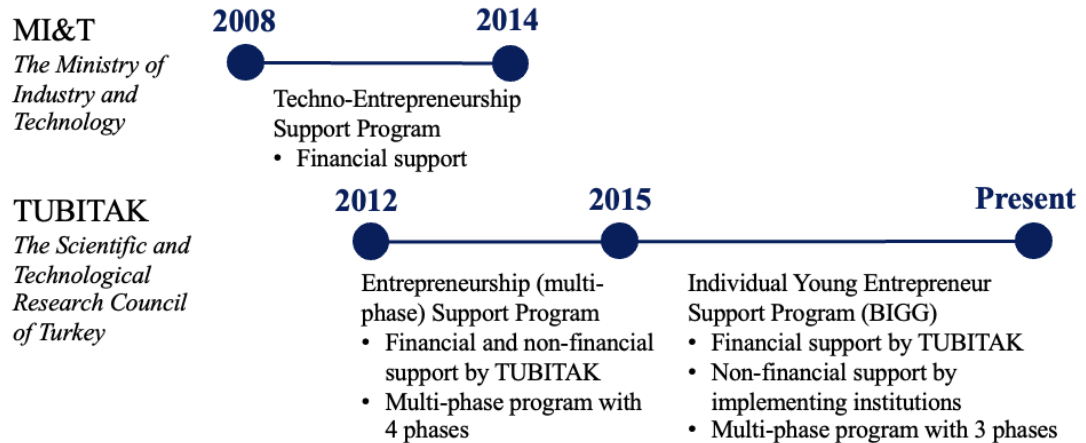


Figure 5: The evolution of the BiGG program from past to present

Source: Author’s own depiction from the field study and TUBITAK (2014), Ministry of Science and Technology of Turkey (2021)

In terms of the type of support, public support programs have concentrated more on financial support or physical facilities in the past 30 years. However, non-financial support, such as entrepreneurship training and mentorship, has been relatively new and limited. Only one active public support program, KOSGEB Applied Entrepreneurship Training Program, directly provides non-financial support to entrepreneurs. However, the target group does not specify a specific sector or technology level; any entrepreneur who wants to start a business could apply (KOSGEB, 2017, Section 4 Article 6). Aside from that, the interface institutions supported by the public initiatives offer non-financial support such as training and mentorship under their services.

Within the context of public support mechanisms in Turkey, the TUBITAK 1512 Individual Young Entrepreneur (the BiGG Program) Support Program¹ was introduced in 2012 as an essential program involving financial and non-financial support to technology-based entrepreneurs. The program's objective has been to support early-stage entrepreneurs with technology-based ideas to transform their business ideas into enterprises (TUBITAK 1512 BiGG Implementation Principles, Article 1). The

¹ According to TUBITAK 1512 Entrepreneurship Support Program Implementation Principles, the official name of the program is "TUBITAK Entrepreneurship Support Program." However, it is also used as the "Individual Young Entrepreneurship (BiGG) Program" or the "BiGG Program" in official correspondence or all kinds of content prepared for the program in media. I prefer to use the “BiGG program” in this study.

program supports entrepreneurs through several activities and procedures from the idea stage to market entry. For that, the program has been offering a combination of financial grants and non-financial support, such as training and mentorship.

Table 5: Public Support Mechanisms for Entrepreneurship in Turkey since 1991

Interface Institutions Supporting Entrepreneurs			
Year	Supported Interface Institutions	Type of Support (to entrepreneurs)	Responsible Organization
1991 – 2013	Technology Development Centers	<ul style="list-style-type: none"> • Incubation services • R&D project cost • Tax incentives 	KOSGEB
Since 1997	Business Development Centers	<ul style="list-style-type: none"> • Office space • Marketing and business development 	KOSGEB
Since 2001	Technoparks	<ul style="list-style-type: none"> • Office space and infrastructure • Tax incentives • Business and mentoring services 	MI&T
Since 2011	Incubation Centers	<ul style="list-style-type: none"> • Office space and infrastructure • Tax incentives • Business and mentoring services 	MI&T
Public Support Program for Entrepreneurship			
Year	Public Support Program	Type of Support (to entrepreneurs)	Responsible Organization
2008-2014	Techno Entrepreneurship Support Program	<ul style="list-style-type: none"> • R&D project cost 	MI&T
Since 2010	Applied Entrepreneurship Training Program	<ul style="list-style-type: none"> • Training 	KOSGEB
Since 2010	Business Plan Prize for Entrepreneurs	<ul style="list-style-type: none"> • Prize 	KOSGEB
Since 2012	Individual Young Entrepreneur Support (BIGG) Program	<ul style="list-style-type: none"> • Training and mentoring services • R&D project cost 	TUBITAK
Since 2018	Tech-InvesTR	<ul style="list-style-type: none"> • Equity 	TUBITAK
Since 2019	BiGG+ Support for Mentorship Mediators	<ul style="list-style-type: none"> • Supporting interface institutions to provide mentoring services 	TUBITAK

Source: Adapted from Demirhan et al. (2019)

4.2. The Individual Young Entrepreneurship (BiGG) Program

The Individual Young Entrepreneurship Program, known as the BiGG program, is a call-based support program that TUBITAK announces two times a year. This program includes several support activities and procedures spread over an implementation period. The BiGG program and its implementation involve three unique features in the entrepreneurship support ecosystem in Turkey: (1) multiple actor participation, (2) a multi-phase structure, and (3) a multi-program execution.

Multiple actor participation

Three main actors – TUBITAK, implementing agencies, and entrepreneurs – take place in the BiGG program with different roles and responsibilities (Figure 6).

TUBITAK is the executive institution and financial provider of the BiGG program. It is an autonomous institution² providing various support mechanisms for promoting innovation and R&D activities in academia and the industry. The support program for technology-based entrepreneurship is also a mechanism within that scope. For the BiGG program, an administrative team at TUBITAK coordinates and manages the implementation, and TUBITAK is the last resort for deciding qualifiers for the financial grants.

The implementing agencies, mostly incubators under universities³, are the collaborative institutions that jointly work with TUBITAK in the BiGG program. Those agencies are responsible for collecting the application, conducting initial evaluation and selection, and providing non-financial support for entrepreneurs within the program. The implementing agency concept was introduced in 2015, following a policy change on the decentralization of the BiGG program by TUBITAK.

Entrepreneurs are the primary beneficiaries of the BiGG program. Students or graduates with an associate or higher education degree could apply to the program with

² It is the organization of the Ministry of Industry and Technology but governed by a Scientific Board composed of participants from the university, industry, and research institutions.

³ Implementing agencies are mostly incubators under universities, but a few private sector institutions are involved as an implementer.

an entrepreneurship idea. Those who apply to the program benefit from financial and non-financial support if successful.

Multi-phase structure and multi-program support

The BiGG is a multi-phase program, and each phase includes several support activities and procedures. Entrepreneurs should complete each phase to qualify for the program. The BiGG program has three main phases the implementing agencies conduct the first phase, and TUBITAK carries out the remaining phases (Figure 6).

The first phase is the business idea evaluation and provision of non-financial support activities such as training, mentorship, and idea validation. Entrepreneurs in this phase go through several evaluation processes and non-financial support activities conducted by the implementing agencies. Moreover, throughout the phase, entrepreneurs should prepare a business plan and presentation for the final evaluation of TUBITAK. This phase is completed within two months.

The second phase consists of the business plan evaluation and provision of the financial grants organized by TUBITAK. This phase includes a panel presentation to evaluate the business plans by panelists from the ecosystem, and TUBITAK decides who is eligible for the grants. Then, successful entrepreneurs are asked to establish their start-ups to have %40 of the grant. Another %40 is given to them in the sixth month with the submission of a Business Plan Progress Report.⁴ The rest is provided by evaluating those reports on the due date specified in the business plan.⁵ The total grant will be 450,000⁶ TL by 2022.

The third phase is an application of another TUBITAK program called the 1507 SME R&D Start-up Support Program.⁷ TUBITAK 1507 program is usually a call-based

⁴ For more information in Turkish, see <https://www.tubitak.gov.tr/tr/icerik-formlar-5>

⁵ The due date generally covers a 12-month period in the BiGG program.

⁶ The grant was 200,000 TL at the time of this study.

⁷ The program mainly aims to grant small and medium-sized enterprises (SMEs) to encourage advanced research and development (R&D) and innovative activities. The 1507 program provides %75 of the R&D project budget as a grant (maximum project budget is 500,000 TL). For more information in Turkish, please see https://tubitak.gov.tr/sites/default/files/1507_34_YK_Islenmis_Hali.pdf

program; however, entrepreneurs who have completed the BiGG program could directly apply without waiting for the call. This phase is optional within the program for those who have advanced R&D projects.

1 st phase	2 nd phase	3 rd phase
Business Idea evaluation and non-financial support <ul style="list-style-type: none"> • Collecting and evaluating business idea application (elimination) • Providing non-financial support such as training, mentorship, physical environment, idea validation, etc. • Preparing a business plan • Business plan evaluation (elimination) 	Business plan evaluation, incorporation and financial grant <ul style="list-style-type: none"> • Final evaluation of business plan in panel presentations or by video recording • Providing financial grants; %40 with incorporation, %40 with a development progress report in 6th month, %20 grant after finish date in business plan 	Advanced R&D under another support program in TUBITAK <ul style="list-style-type: none"> • Application to TUBITAK 1507 SME R&D Startup Support Program within 24 months without waiting for the call
Implementing institutions	TUBITAK	TUBITAK
Entrepreneurs		

Figure 6: The phases of the BiGG program and the role of the main actors

Source: Author’s own depiction from the field study and TUBITAK Entrepreneurship Support Program Implementation Principles

Aside from the multi-phase structure, the BiGG program implementation includes two other TUBITAK support programs. One is the 1507 SME R&D Start-up Support Program offering additional financial support to entrepreneurs in the program's third phase. Another is an umbrella program called the TUBITAK 1601 Capacity Building Program.⁸ Under this program, the implementing agencies within the BiGG program have been determined and funded by TUBITAK.

The BiGG program, with the multi-actor involvement, multi-phase implementation, and multi-program execution, brings bilateral interactions and relations between the actors from the entrepreneurial ecosystem (Figure 7). Within the entrepreneurial ecosystem context, TUBITAK as the government-backed institution, incubators as the interface institutions, and entrepreneurs are involved in the BiGG program framework. First, the interactions between the parties are investigated in selecting the implementing agencies under the TUBITAK 1601 Capacity Building Program.

⁸ TUBITAK opens various call-based programs under this program aiming at increasing the capacity of firms, universities, and NGOs in entrepreneurship and innovation. One call is used for selecting the implementing agencies determining within the scope of the BiGG program.

Second, the interactions are examined in the two phases of the BiGG program, which includes several activities and procedures in the program framework. The third phase, optional for entrepreneurs, is not detailed in this study.⁹ Moreover, the BiGG program facilitates informal interactions and possible feedback mechanisms beyond its scope. The following section elaborates on those interactions as well as the activities. Then, it describes how the parties from the entrepreneurial ecosystem benefit from these interactions.



Figure 7: The structure of BiGG execution

Source: Author’s own depiction from the field study and desk research

4.3. Actors’ Interaction within the BiGG program

This section documents the interaction and collaboration between the actors within the BiGG program revealed from the field study. First, the section explains the activities in an implementing agency selection process that facilitates interactions between TUBITAK and the implementing agencies. Second, it elaborates on interactions during the program implementation in two categories: (1) formal and (2) informal interaction.

⁹ The third phase is to support entrepreneurs with another TUBITAK program called the 1507 SME R&D Start-up Support Program. It is not detailed within the interaction context of this study because it is optional for those willing to conduct advanced R&D activities.

4.3.1. Selection of the Implementing Agencies

Part of the interactions in the BIGG entrepreneurship support network occurs while TUBITAK is selecting the implementing agencies. This selection process is conducted by an umbrella program called the TUBITAK 1601 Capacity Building Program and involves two major processes: (1) selection and (2) performance evaluation. In this section, I describe how certain activities as part of these processes and their results facilitate the interactions between TUBITAK and the implementing agencies. Two policy changes in 2020, one that has brought a consortium model between the implementing agencies and another that transformed the pre-implementation funding mechanism into a post-implementation performance-based reward system, have taken place. This section also discusses how these changes have impacted the interaction between implementing agencies.

The selection process includes a one-sided interaction in which TUBITAK conveys its tasks and directives to the candidates. The selection process is conducted by the call-based tender under the 1601 program.¹⁰ With this call, TUBITAK guides the implementing agencies about the expected tasks and support that need to be carried out within the BiGG program. However, how these tasks and the support are fulfilled is left to the implementing agencies. Thus, implementing agencies are independent in conducting these tasks, except for the procedures and bureaucratic needs. That is why the implementing agencies prepare a proposal on how they will perform the tasks and support they provide to entrepreneur candidates within the BiGG program.

The independence in designing the BiGG process initiates a collaborative relationship more than a one-sided interaction. Within this relationship, TUBITAK expects the implementing agencies to conduct an early selection and evaluation of business ideas and improve these by providing training and mentorship to candidates. For example, the field study showed that the implementing agencies could create their training curricula, and some even outsource their training due to a lack of capacity. Furthermore, some agencies put more weight on the training activity, whereas some put more on the mentorship based on their experiences in entrepreneurship support.

¹⁰ According to interviews, the selection of new implementing agencies has conducted in 2015, 2016, 2018, and 2020. The recent call will be held in 2022.

Thus, TUBITAK expects well-prepared and successful entrepreneurs from the implementing agencies, and the agencies work to meet these expectations, which defines a multi-party collaborative environment.

TUBITAK manages the process but leaves the curriculum formation in the first phase entirely to the implementing agencies. TUBITAK only looks at the results, which is a bit of the right thing. So yes, they are free, as long as they have a high success rate. (Expert A)

TUBITAK says that you can design the content yourself, but what I expect from you is to provide these services. It says, "Bring me a business plan and do it however you want to do it." This is good. We build the process in this way. (Implementing Agency A)

The evaluation process of the implementing agencies includes quantitative and qualitative indicators that help TUBITAK to monitor the operations, activities, and performance in the field. TUBITAK evaluates each implementing agency when the granted entrepreneurs are announced, i.e., every six months. This evaluation generally consists of quantitative indicators such as the number of applications, number of entrepreneur candidates to be supported, and success rate.¹¹ In addition, the implementing agencies submit periodic activity reports to TUBITAK. These reports mainly include all services and activities that implementing agencies provide to entrepreneurs within the scope of the BiGG program (Figure 8). The quantitative outcomes and the periodic reports allow TUBITAK to form an idea of how the program would be improved in the field and to monitor the successful program's decentralized phase.

¹¹ The number of entrepreneur candidates granted by TUBITAK over the number of the candidates approved by the implementing agency for the second phase.

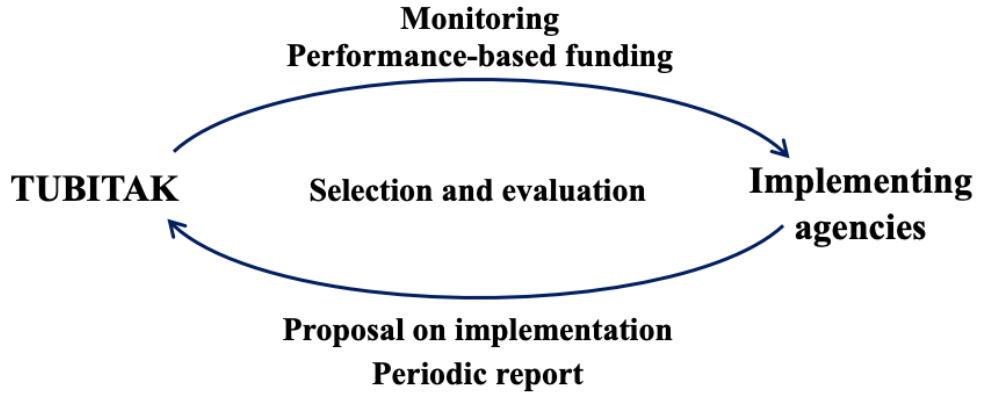


Figure 8: Interactions in the selection and evaluation of the implementing agencies
Source: Author’s own depiction

In 2020, TUBITAK made two policy changes related to the evaluation process, which have indirectly affected the interaction between the implementing agencies within the BiGG program. The first policy change brought a consortium model in which the underperforming implementing agencies could continue the BiGG program by collaborating with the high-performing ones.¹² Before this model, underperforming agencies were eliminated during the evaluation process. The second policy change transformed the funding implementing agencies under the TUBITAK 1601 program into a performance-based reward system. Those agencies started to be rewarded according to quantitative indicators, such as eligible entrepreneurs for the BiGG grants.¹³

The consortium model has brought collaboration between the implementing agencies under the BiGG program. These agencies have started to carry out tasks and activities together and act as one institution. The underperforming agencies¹⁴ carry out the tasks

¹² TUBITAK divides implementing agencies into three groups by their performance indicators. The first group is the most successful ones they could continue as implementing agencies. The second group is a less successful group that could collaborate with the ones in the first group. The third and the least successful group are eliminated from the program as it used to be.

¹³ The reward was 15,000 TL per eligible entrepreneur for the BiGG program. If they are in a consortium with other implementing agencies, the award increases to 25,000 TL per entrepreneur. These values changed with the call for 2022. The reward per eligible entrepreneur becomes 25,000 TL, the reward will be 50.000 TL per eligible entrepreneur if in a consortium.

¹⁴ In the consortium, high-performing institutions are called implementing agencies, while underperforming ones are called collaborating agencies.

similarly, but they send business plans to the implementing agencies instead of TUBITAK. The implementing agencies are the final decision maker regarding whether these ideas are ready for the BiGG program. These interactions in the interviews also validate the effect of the consortium model. The interviews revealed that the implementing agencies within the consortium periodically meet to coordinate the BiGG program before each call. This coordination potentially allows a knowledge spillover from high-performing to underperforming agencies (Figure 9).

The interaction between the consortium has, of course, increased. I honestly did not know what XX or XX was doing. I experienced it with them ... At the moment, all our programs, training, and mentorships are systematized. We are working on training and mentoring, we share how we are progressing this semester, and we have weekly meetings with all consortium stakeholders one by one. Then we manage how this process is going, how it should progress, etc., through meetings. So, yes, a consensus has been formed, and it is proceeding in that way. But I do not know if everyone shares information. (Implementing Agency B)

We meet once a week, and if there is an incident or another case, we meet more often ... if there is a problem specific to the entrepreneur, we solve it. We have a WhatsApp group where we talk constantly ... We have evaluation emails at the beginning and end of the call. At the beginning of the call, we have e-mails saying things that happened in the previous call, now let's give training like this, let's hold meetings like this, and let's tell entrepreneurs the following. Secondly, we provide the training internally, prepare and share the training content, and get ideas from each other. (Implementing Agency C)

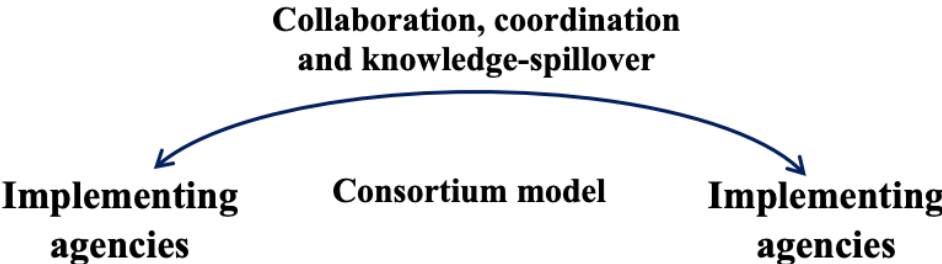


Figure 9: Interactions within the consortium

Source: Author’s own depiction

Although the consortium model fosters collaboration, it is a bit forced due to its top-down character. This policy requires underperforming agencies to cooperate to maintain their status as implementing agencies. Similarly, TUBITAK gives higher rewards, as an incentive, to the agencies if they become consortium members. For

instance, IA E from the field claim that “*The consortium model is not a model that we, implementing agencies, are willingly involved in; it is a model that we have to be involved in.*” Besides, the interviews captured only a few natural and effective collaborations in the field. In one example mentioned in the interviews, two agencies in the high-performing group have formed a partnership within a consortium. In another example, an agency started to open multiple BiGG program applications according to the thematic area that each consortium member is good at. The consortium model is critical for collaboration within an ecosystem, but it is a bit early to investigate or monitor which activities or tasks are divided or jointly carried out and how well the implementing agencies are coordinated.

These collaborations were a bit forced. We need to examine how they cooperate. For example, in what field did they cooperate? For example, two universities collaborated, but what did they collaborate on? We need to look at that. Because maybe they said, "I will only take the applications, and you do the training," or they said, "You take the applications and training in the region, but let's send them jointly," or someone else said, "Use my mentors and let your team do market research," so we need to look at how they cooperated. (Executive from TUBITAK)

Outside the consortium, the interaction between the implementing agencies is weak because of the transformation into a performance-based reward. The field study has revealed that the performance-based reward has made the implementing agencies more competitive, and that led to limiting the interaction between the agencies. Each implementing agency wants to benefit from the award as much as possible by taking more entrepreneurs into the BiGG program. Thus, increasing competition among the agencies causes the interaction to remain isolated within the consortium. Within these circumstances, interaction is occasionally initiated via personal efforts or networks in the same region. For example, an agency from the field made contact with other agencies in the same region for knowledge exchange, and another is in contact with others at the level of the Technology Transfer Office but not at the level of the implementing agencies. Other than similar personal efforts, any form of interaction is almost non-existent.

Of course, there is such competition. Each implementing agency is trying to recruit entrepreneurs with various extra benefits around the main value proposition of 200,000 TL. Of course, everyone may want to support more entrepreneurship on the one hand. After all, when we look at it from one side, there is a reward mechanism in the current system, so implementing agencies may also try to make maximum use of these rewards. (Implementing Agency E)

To summarize, the selection of the implementing agencies for the BiGG program enables a certain degree of interaction and collaboration within the BIGG entrepreneurship support network. First, the activities within the selection and evaluation process allow TUBITAK to guide and monitor the implementing agencies within the BiGG program. These activities also ensure that both sides know the expected tasks as well as the planned and executed modalities. This leads to stronger coordination in the program implementation. Second, the recent consortium model supports several partnerships and coordination between the implementing agencies. However, the performance-based reward policy limits the potential collaboration outside the consortium because it increases the competition among those agencies.

4.3.2. Implementation of the BiGG Program

Aside from the interactions during the selection of implementing agencies, the BIGG entrepreneurship support network also involves interactions during the program's implementation. In this study, I group these interactions as (1) formal and (2) informal interactions. Formal interactions refer to more structured interactions between the actors framed by the program phases and the procedures. In a way, they are anticipated to happen under the program's framework. Whereas the informal interactions are the unseen interactions that I reveal from the interviews. They are not necessarily anticipated to happen under the framework. In this section, I first outline the formal interactions that occur within the first and second phases of BiGG implementation. Then I identify and describe the informal interactions in four different categories: (1) between implementing agencies and entrepreneurs, (2) between entrepreneurs, (3) between implementing agencies, and (4) feedback mechanisms between all actors.

4.3.2.1. Formal interaction

The BiGG implementation involves two phases and several activities that tie the different actors of the entrepreneurial ecosystem under each phase.¹⁵ The first phase includes three major activities: (1) training and mentorship, (2) idea validation, and (3) a three-step selection process. Entrepreneurs and implementing agencies get involved in this phase. The second phase contains two activities: (1) business plan presentation

¹⁵ There is also a third phase which is another TUBITAK program that entrepreneurs could apply on an optional basis. This study does not cover the details of the third phase.

and (2) periodic progress reporting. This phase brings entrepreneurs and TUBITAK together. These activities connect the three main actors and external entities, such as academics, mentors, and industry representatives.

First phase

The objective of the first phase is to transform an entrepreneur's technology-based ideas into a business model and, finally, a business plan. This business plan is outlined via a pre-determined template by TUBITAK, which mainly covers seven items: the business idea, technical or R&D processes, personnel information, market analysis, market plan, financial plan, and estimated cost items.¹⁶ The business plan is a key for entrepreneurs to qualify for the BiGG program. That is why the implementing agencies in the first phase provide several activities for entrepreneurs to learn, practice and develop the seven items mentioned. These activities are grouped under (1) training and mentorship, (2) idea validation, and (3) a three-step selection process. The outcome of this whole effort is a prepared business plan and presentation evaluated in the second phase.

At the beginning of the first phase, the implementing agency designs intensive desk training to assist entrepreneurs in transforming their technology-based ideas into a business model and business plan. This training focuses more on the skills entrepreneurs need in the BiGG processes. The scope of this training diversifies across the agencies because each agency is independent in its exercise. However, it generally covers three major areas: (1) general information about the entrepreneurship processes, (2) business plan preparation, and (3) presentation techniques.

In addition to desk training, the implementing agency also provides mentorship services to entrepreneurs. Two types of mentorship activity exist in the field: (1) periodic mentorship and (2) need-based mentorship. First, the implementing agencies assign a mentor to each entrepreneur, and two actors meet weekly or every two weeks. Through these periodic meetings, the entrepreneur and mentor work together to improve the business model and plan. In some implementing agencies, trainers and mentors would be the same person. Apart from the periodic mentorship, the

¹⁶ For more detail in Turkish, see <https://tubitak.gov.tr/sites/default/files/1512-asama2-basvuru-kilavuzu.pdf>

implementing agencies also refer additional mentors from their network to the entrepreneurs if they need technical or market guidance.

Training and mentorship activities in the first phase bring trainers and mentors from the entrepreneurial ecosystem into the BiGG entrepreneurship support network. Some implementing agencies interviewed employ these trainers from the same university where they are also based in. Whereas some others outsource all or part of these activities due to a lack of capacity. Similarly, mentors could be academic experts or industry representatives from the implementing agencies' network.¹⁷ However, some agencies also provide this mentorship through their administrative units to keep these meetings periodically. Thus, the trainer assists entrepreneurs in improving their business models, especially business plans and presentation skills. In addition to training, mentorship activities facilitate one-to-one engagements where entrepreneurs could get coaching and guidance to improve their business plan throughout the first phase (Figure 10).

The training and mentorship activities design is interactive between the entrepreneurs, trainers, and mentors. Most implementing agencies in the field follow an assignment and feedback mechanism in the first phase. Entrepreneurs first attend a series of training with several assignments. Following these, they perform the assignments about writing their business plan components such as business model, market research, or financial table. In return, the mentors and trainers give feedback on the entrepreneurs' filled business plan for each assignment. Moreover, trainers and mentors provide several tips on how to write a business plan or what to consider when writing a business plan within the BiGG framework.

It was usually like half homework. Okay, we have covered this, now fill in parts A, B, and C, send it to us and let's go over it. This was both after the training, and there were also sessions where we received one-on-one mentoring. (Entrepreneur E)

We go through a rigorous training and mentoring process, and in between, we ask for homework on the main lines of the business plan. In other words, we do not just give you the business plan file and say, 'Come on, write this', but we give you the things that will be useful for them while filling out the business plan file, section by section, as homework. (Implementing Agency B)

¹⁷ Trainers also act as mentors for periodic mentorship in some cases.

After the entry process, we proceed in the form of a training-homework mechanism for the jury. (Implementing Agency D)

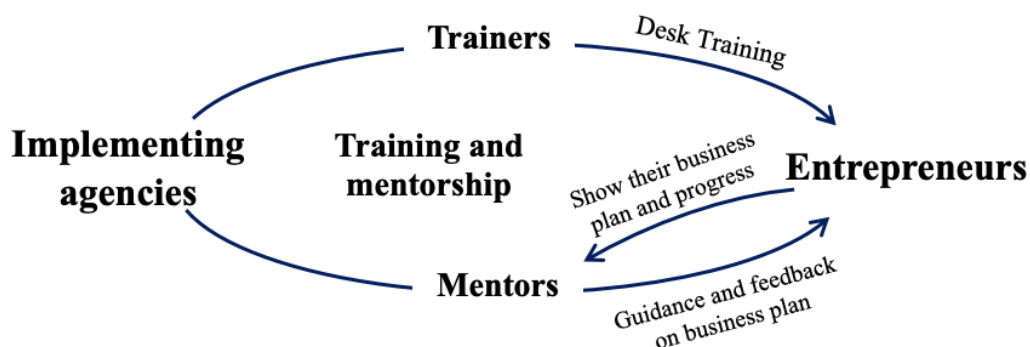


Figure 10: Interactions in the training and mentorship activities

Source: Author’s own depiction

Other than training and mentorship, the first phase also involves idea validation. For idea validation, entrepreneurs engage with the relevant private sector companies and share their business models and plan with them. They are also required to get a letter of intent¹⁸ from those companies, which is mandatory for the BiGG program. Even though this document is not binding, it helps entrepreneurs to test their business models and business plans in the market. Many entrepreneurs reach out to those companies through their own efforts. However, the interviews revealed that some implementing agencies open their networks to entrepreneurs to meet these private sector companies. Entrepreneurs could also reach out to those companies through agencies’ mentorship pool and other incubation activities such as demo day or pitch deck presentation (Figure 11). Besides the letter of intent, entrepreneurs could receive feedback and advice via those interviews to improve their business plans.

They wanted the letter of intent during the BIGG process together with the business plan. Since we actually communicate with mentors because of the incubation, we can actually communicate with game companies there. We talked to the mentors there and attempted to get such a letter of intent. (Entrepreneur E)

They were individual efforts. IA E gave us some advice on how to reach people, how to talk to people. We also tried to reach out, but we did it ourselves. (Entrepreneur O)

¹⁸ “A letter of intent is a non-legally binding document between two parties that intend to enter a business transaction with each other” (indeed.com, for details see <https://www.indeed.com/career-advice/career-development/letter-of-intent-for-business>)

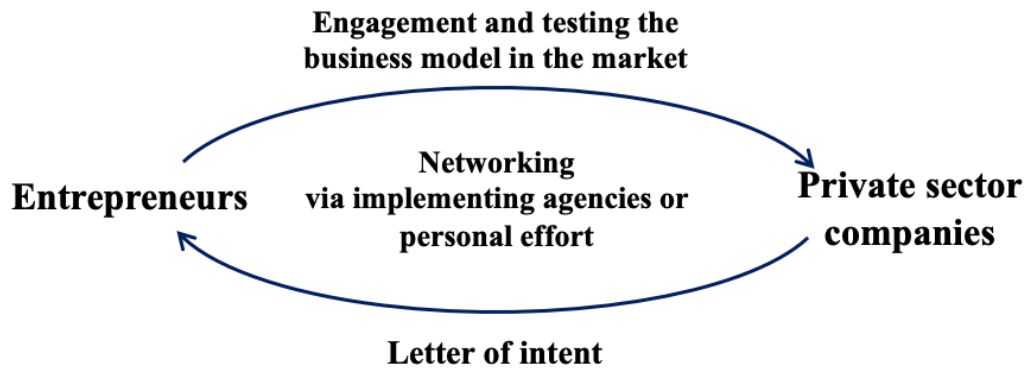


Figure 11: Interactions in idea validation activities

Source: Author's own depiction

Lastly, the first phase includes a three-step selection process. The entrepreneurs undergo three elimination rounds run by the implementing agencies. In the first round, the agencies accept the entrepreneurs' applications for the first phase after evaluating their business ideas based on TUBITAK's guidance.¹⁹ In the second round, the implementing agencies conduct a panel presentation for the entrepreneurs after the training and mentorship activities. This presentation is like a simulation of the one conducted in the second phase. Finally, in the third round, implementing agencies select the most promising and prepared candidates for the final evaluation by TUBITAK, and the rest wait for the later call or voluntarily drop out.

The simulation of the panel presentation in the first phase accommodates bilateral interactions between the implementing agencies and entrepreneurs. In this activity, the implementing agency convenes a jury to evaluate the business plan. The jury could consist of people from the implementing agency or their own networks. The entrepreneurs give a presentation of their business plan to the jury. After evaluating this presentation, the implementing agency selects promising entrepreneurs that will continue to the second phase. Furthermore, entrepreneurs chosen, besides others, also get comprehensive feedback about business plans and presentations, which helps them prepare for the second phase (Figure 12).

¹⁹ TUBITAK set three criteria for the evaluation of entrepreneurial projects. These are a level of innovation and technology, commercialization potential, and applicability. However, the implementing agency can be flexible in their own acceptance mechanism based on those criteria.

In our final jury evaluation, entrepreneurs present their business plans. TUBITAK does the same thing, in fact it is called panel evaluations. In those panel evaluations, the entrepreneur has 5 minutes and makes a presentation in front of the jury. We set up the same thing so that the entrepreneur can first see it with us, and when they meet the same panel, they can do the same thing and become a little more experienced. (Implementing Agency F)

We form a jury of 8 people. Entrepreneurs whom we decided to send to TUBITAK make 5-minute presentations to this jury. Then, comments and ratings come from the jury. We put them through a filter, evaluate each of them separately and select the entrepreneurs we think we can now send to TUBITAK. At least 50% of them are eliminated. (Implementing Agency C)

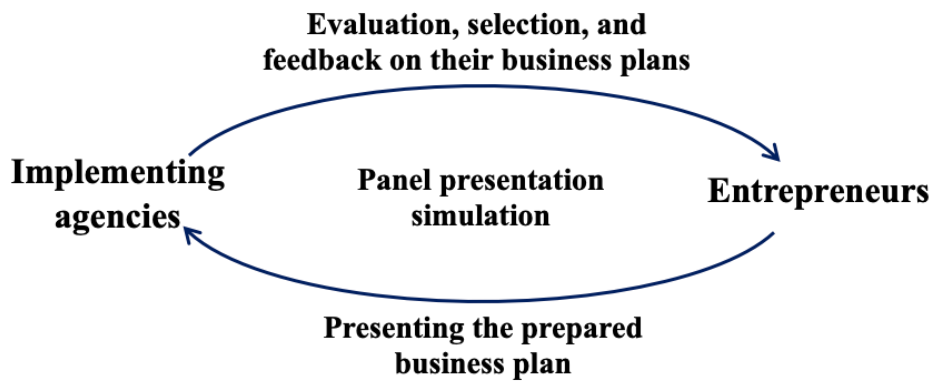


Figure 12: Interactions in panel presentation simulation

Source: Author’s own depiction

Once training and mentorship, idea validation, and selection are complete, the implementing agencies review the entrepreneurs’ business plans and other documents needed for the BiGG program. After the final revision, the implementing agencies deliver the entrepreneurs' documents to TUBITAK via the online system.²⁰ With that, the entrepreneurs are ready to enter the second phase.

Second phase

In the second phase, TUBITAK identifies the entrepreneurs qualified for the BiGG program grants. For that, TUBITAK evaluates these entrepreneurs’ business plans and presentations in the panel format. This business plan is more than just a written plan. At this time, entrepreneurs should establish their companies and follow their planned

²⁰ TUBITAK Project Evaluation and Monitoring System (PRODIS)

activities. The progress needs to be reported to TUBITAK at the sixth month after establishment. The two main activities, (1) business plan presentation and (2) sixth-month progress reporting, make up the second phase. This phase is the first-time that entrepreneurs and TUBITAK interact.

A panel presentation format is used to evaluate the entrepreneurs' business plans. This effort starts with TUBITAK executives grouping the business plans into thematic areas.²¹ The executives then set five panelists for each thematic group, and they organize presentation schedules. Panelists are mainly selected from a pool of academic experts and industry representatives previously involved in the BiGG process.

The panel presentation for the business plan evaluation is the first time TUBITAK and entrepreneurs directly encounter. Entrepreneurs present their business plans to the five selected panelists. Afterward, the selected panelists evaluate the business plan, grade the entrepreneurs, and report their evaluation to TUBITAK.²² Based on the panelists' evaluation, TUBITAK identifies the qualified group for the financial grants.²³ The eligible groups are then asked to establish an enterprise to access the grants (Figure 13).

The panel presentations are usually conducted in person. However, during the Covid-19 pandemic, the candidates had to video-record their presentations, and the implementing agencies submitted these to TUBITAK via an online system.²⁴ It was an unexpected disruption to the in-person panel interaction between TUBITAK and the entrepreneurs. At the time of the fieldwork during the Pandemic, there was still no clarity on whether this activity would ever be in-person again.

²¹ Six thematic areas: (1) Smart transportation, (2) smart production systems, (3) energy and clean technologies, (4) communication and digital transformation, (5) health and well-being, and (6) sustainable agriculture and nutrition.

²² The grade criteria are mainly the level of innovation and technology, commercialization, and applicability determined by TUBITAK. For more details in Turkish, see <https://www.tubitak.gov.tr/tr/destekler/sanayi/ulusal-destek-programlari/1512/icerik-formlar>

²³ TUBITAK determines a threshold score for each thematic area to avoid sectoral superiority. Entrepreneurs that are above the threshold value are eligible for financial support.

²⁴ TUBITAK Project Evaluation and Monitoring System (PRODIS)

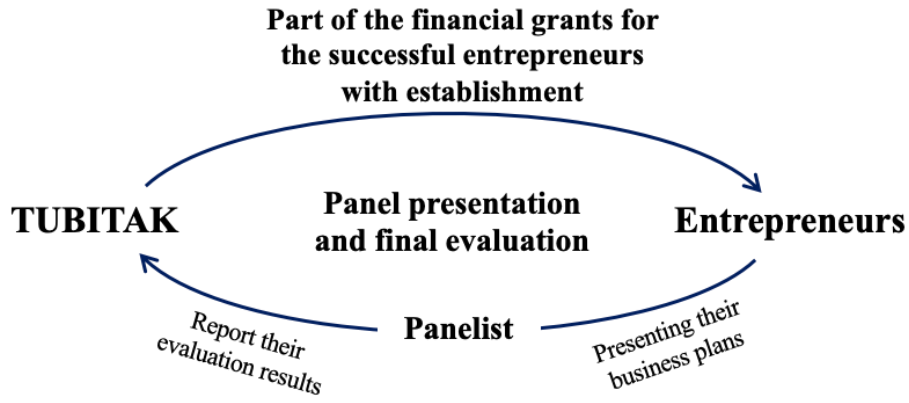


Figure 13: Interactions in the final evaluation of the BiGG program

Source: Author's own depiction

The qualified entrepreneurs follow three steps for the financial grants as the grants within BiGG are provided in installments to the groups. Each entrepreneur group gets %40 of the grant while establishing an enterprise.²⁵ After the enterprise establishment is complete, TUBITAK assigns a referee, who could be from the panelists or an academic within its network, to each entrepreneur. Then, each entrepreneur works on to complete and submit a Business Plan Progress Report²⁶ within the next six months. The assigned referee evaluates this report and prepares the Periodic Monitoring Report²⁷ for TUBITAK. At this point, another %40 of the grant is given to the entrepreneur, regardless of the referee evaluation. If TUBITAK finds the progress report viable, the remaining %20 is awarded to each group on a date proposed in the business plan (Figure 14).

²⁵ The total grant as of 2022 is 450,000 TL. However, it was 200,000 TL at the time of the study.

²⁶ For more information in Turkish, see <https://www.tubitak.gov.tr/tr/icerik-formlar-5>

²⁷ Ibid.

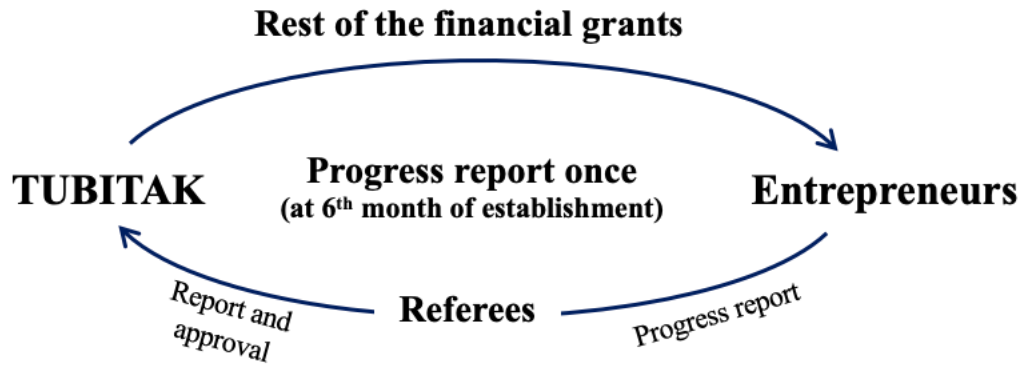


Figure 14: Interactions in progress reporting to TUBITAK

Source: Author's own depiction

4.3.2.2. Informal interactions

Aside from these formal interactions, the BiGG implementation also involves a series of informal interactions across the ecosystem actors. These interactions are not necessarily created by the BiGG program implementation steps, instead, these are created and shaped by the actors. In this section, informal interaction within the program presents as an actor-oriented format since multiple activities and interaction occurs. First, this section includes informal relationships and further interactions between implementing agencies and entrepreneurs. Then, it presents the interactions among the entrepreneurs as well as the implementing agencies. Lastly, this section exhibits feedback mechanisms for improving the processes and activities within the BiGG program.

Between the implementing agency and the entrepreneur

The transaction between implementing agencies and entrepreneurs officially ends at the end of the first phase. But it informally extends into the second phase and onwards. Every entrepreneur interviewed in the field study approved that the implementing agencies have guided and supported them further in the second phase. The guidance was seen in the company establishment processes needed in the second phase. Two additional supports after the first phase were also seen in the field: (1) admitting the entrepreneur into complementary incubation programs and (2) providing physical facilities for the program winners. The guidance and additional supports enable a new

degree of interaction between the two actors extending the interactions in the first phase.

The implementing agency assists entrepreneurs in conducting company establishment processes and other procedures in the second phase. Company establishment, which includes a lot of paperwork and bureaucratic operation, is a complex process for those who conduct the first time. The field study revealed that implementing agencies guide entrepreneurs on the procedural needs for the establishment, and entrepreneurs could ask for assistance if they need it. For example, two cases from the field showed that implementing agencies refer entrepreneurs to financial advisors from their network. Another example is that IA A and IA D held a joint meeting or seminar with the entrepreneurs, just before the company was set up, about company establishment, financial management, and the upcoming process. Aside from these, several cases in the field were seen where entrepreneurs asked for help with procedural questions and problems from the implementing agencies. (Figure 15).

Of course, we didn't have much knowledge about how to find a financial advisor, the stages of establishing a company, and how these things can happen. They provided us with both networking and mentorship on those issues. (Entrepreneur E)

There were referrals, they had already made us meet with the accountants in the implementing agency training before, saying that you can contact them in the future processes, you can ask them directly. (Entrepreneur R)

After acceptance, there is a period in which a warm relationship continues, and they try to help as much as they can within that period. (Entrepreneur G)

The result has just been announced, we are now in the process of establishing a company. We organized training for them; the process of establishing a company, how they will report afterward, and so on. You know, some people ask for an accountant, some people ask for a lawyer, there are places we work with, we can also get support from them. Or we bring them together with other former entrepreneurs. They recommend places they are satisfied with. (Implementing Agency D)

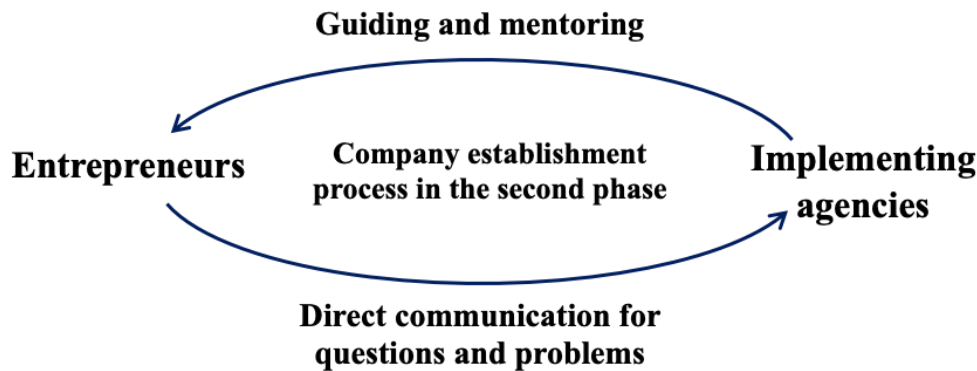


Figure 15: Guidance and mentoring in the company formation process

Source: Author's own depiction

Besides guidance in the establishment process, some implementing agencies lead the entrepreneurs into their incubation or pre-incubation programs to provide additional support for the post-BiGG processes. Such programs complement the BiGG program to support entrepreneurs for the post-establishment process focusing more on the market and investment stages. In the field, IA A and IA B conduct a 1-year incubation program parallel to the BiGG. Whereas others consider the BiGG program as their main incubation program but provide some short-term assistive programs. For example, almost all interviewed entrepreneurs in IA A and IA B have gone through the separate incubation program in addition to the BiGG program. With the parallel incubation program in IA A and IA B, some entrepreneurs have a chance to present their ideas to the investors and industry representatives in the pitch deck format if they succeed in the program (Figure 16). Thus, the parallel incubation program facilitates ongoing support and relationship between implementing agencies and entrepreneurs as well as networking with the investors.

Many of our entrepreneurs who receive BIGG apply to the pre-incubation program after they have already received support and become a company. They also go through that process. He also receives 7 weeks of more detailed training. We can say 50% and above. So many of them come. I mean, they realize what it will add to them in this process ... Either he realizes it himself, or we are constantly scanning everyone who comes as a team. We are constantly researching for that transition, whether those who come to pre-incubation are suitable for BIGG or those who come to BIGG are suitable for pre-incubation. (Implementing Agency A)

In other words, we like to accelerate companies established with BIGG with another support program in the implementing agency. (Implementing Agency B)

Some implementing agencies also offer physical facilities to BiGG program winners after the establishment (Figure 16). For example, IA A, IA B, IA D, and IA F offer office space, if available, to entrepreneurs for 6 months to 1 year after the establishment process of the BiGG program. Although all implementing agencies do not have physical facilities, it is still possible that entrepreneurs could register their addresses within those agencies. Almost all entrepreneurs interviewed usually set up their companies in the implementing agencies they receive BiGG support. In some cases, entrepreneurs have office space within the scope of the parallel incubation program mentioned above. Office support or establishment in an incubator enables further interaction and connection between entrepreneurs and implementing agencies in the post-establishment process, even after the BiGG program.

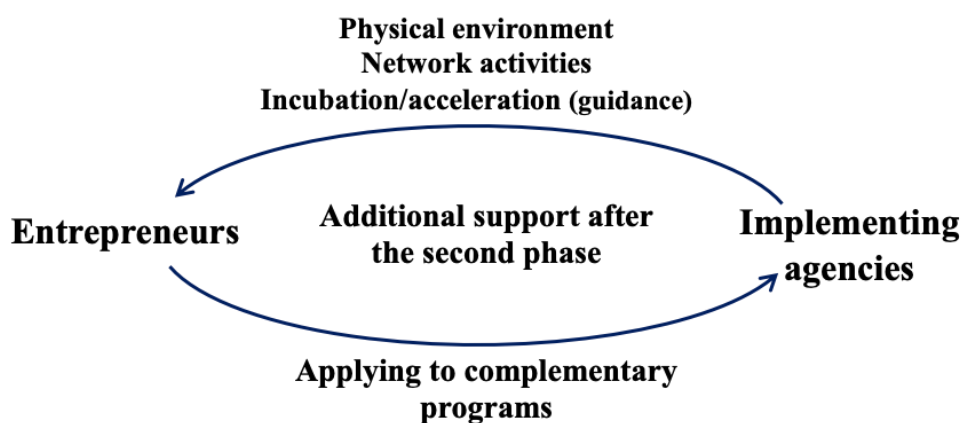


Figure 16: Additional support to entrepreneurs after the BiGG

Source: Author's own depiction

Between entrepreneurs

Each call for the BiGG creates a new cohort that undergoes several procedures and activities together. These activities, especially in the implementing agencies, bring entrepreneurs to the same environment face-to-face or online. The field study has revealed that being in the same environment facilitates interaction between entrepreneurs in the same cohort or the previous. However, most entrepreneurs interviewed were attending those activities online due to Covid-19 pandemic.

Although online activities limit in a way, two types of interaction are still observed in the field; (1) entrepreneur initiatives in the online chat platform and (2) implementing agency brings entrepreneurs from different cohorts together.

Most implementing agencies in the field set up an online chat group to keep entrepreneurs updated about the BiGG processes and facilitate quick interaction. The implementing agencies' administrative units respond to questions and issues via online channels. Meanwhile, within this chat group, entrepreneurs also help each other with the BiGG process and procedures as well as other topics. Moreover, a case from the field showed that one agency has also set up a separate online group to bring the previous BiGG entrepreneurs with the current ones, which enables further experience-sharing between the entrepreneurs within different cohorts.

They invited people who had gone through the process successfully before. We had the opportunity to talk to them online. He told us about his experiences, and we asked questions. In other words, there was a mutual transfer of information about the things we had in mind. (Entrepreneur O)

One of them is that we have a WhatsApp group formed by those who applied to BiGG in the same period and received incentives, and these are generally in parallel with the process at the same time. This is a nice advantage. There is also a WhatsApp group where ones who have won 1512 so far have always gathered. This is much more crowded. You know, I benefited from both of them. I asked both of them, and when I got similar answers, I was already sure. (Entrepreneur F)

Two cases from the field showed that some implementing agencies organize seminar-type activities or one-to-one guidance, which bring entrepreneurs from different cohorts together for experience sharing (Figure 17). Two entrepreneurs in the same implementing agency benefit from the previous BiGG entrepreneurs' experiences with the BiGG program. Entrepreneur G said, *"They invited those who had successfully carried out the process to an online meeting. They told us about his experiences, we asked questions. There was a mutual exchange of information."*

Furthermore, Entrepreneur E made a contact with another entrepreneur referred by the implementing agencies to find a solution for the problem. She claims, *"We faced a bureaucratic problem due to my foreign nationality. Incubators introduced us to an entrepreneur who had experienced the same problem before. We had one-to-one communication with them, and they helped us on how to move forward in the process."*

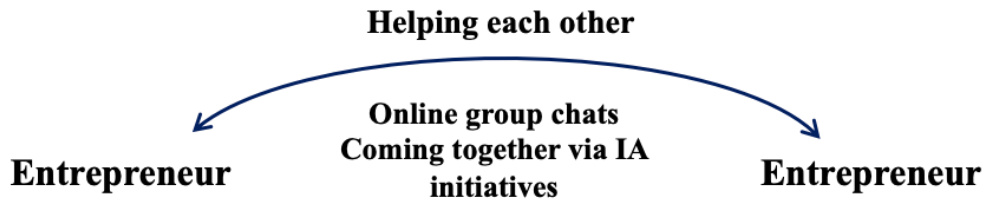


Figure 17: Mutual assistance between entrepreneurs

Source: Author's own depiction

Between implementing agencies

The informal interactions between implementing agencies are pretty weak, but occasionally occurs within the BiGG program. Most implementing agencies interviewed in the field study state that informal interaction is non-existent between the agencies other than the formal interactions in the consortium (mentioned in section 4.3.1). Moreover, the performance-reward system increases the competition between implementing agencies, which limits close relationship and experience-sharing. However, a few cases from the field have revealed that two initiatives, (1) personal communication and network and (2) post-program meetings organized by TUBITAK, bring occasional interactions to some extent between implementing agencies.

Interaction is occasionally initiated via personal efforts or networks in the same region. Two agencies from the field took the initiative to connect with other implementing agencies to learn about their activities and benefit from their experiences (Figure 18). For example, IA C contacted IA A to learn about their experience in a specific activity. IA C claims, "*We try to be in close contact with implementing agencies in our region. For example, we wanted to do something new for entrepreneurs in the gaming sector. We knew that IA E had done it before, and we contacted them. We talked openly about how they did it, what their experiences are, what we should not do.*" Furthermore, the policy changes of the 1601 program mentioned in section 4.3.1 limit those informal interactions because that change has increased the competition between those agencies.

Implementing agencies could come together in TUBITAK’s post-program events. In these events, they have up-to-date information on how other agencies conduct the BiGG program, how many entrepreneurs completed the program in each agency, and the results of successful ones. Moreover, the field study showed that successful implementing agencies could present their experience to others and TUBITAK in those events. Even some interviewees' observations revealed that some informal meetings and conversations take place at these events. This presentation facilitates the experience-sharing between implementing agencies, and particularly new and small agencies can benefit from those experiences (Figure 18). However, those events have become online due to the pandemic, which is seen as inefficient in the field.

So, there is not much (interaction). If TUBITAK organizes a panel or an event, we can come together. Other than that, unfortunately, we do not have much communication with other implementing agencies. ... At TUBITAK events, for example, we could see the data, such as how many entrepreneurs from X agencies completed the program ... The selected implementing agencies could make presentations there, which was a good resource for everyone. Everyone could observe what others were doing, and it was a good observation place for smaller implementing agencies. Therefore, those have become just online events, where everyone turns off their cameras. (Implementing Agency F)

I mean, I can see that the implementing agencies have a network among themselves on a personal level, but not on an institutional basis. ... they may be talking among themselves that we are doing this, and you are doing that, but unfortunately, I do not have much information. But we can understand that they talk among themselves about some of the things we receive. (Executive from TUBITAK)

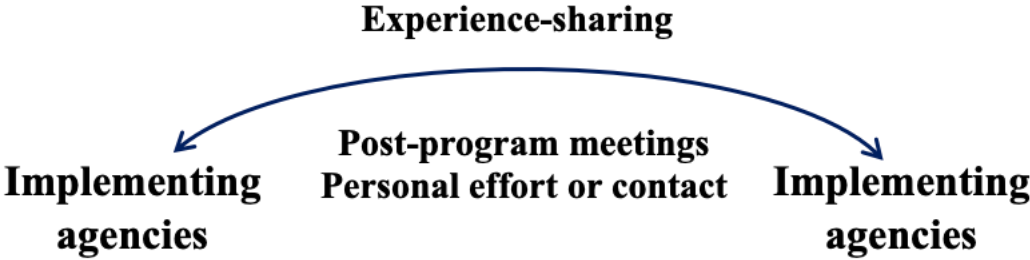


Figure 18: Informal interaction between implementing agencies

Source: Author’s own depiction

Feedback mechanisms

(1) Implementing agencies - TUBITAK

A few initiatives from TUBITAK and implementing agencies enable the feedback flow between them. The feedback mechanism here is mainly from the implementing agencies to TUBITAK. This mechanism has occurred via two initiatives that the field study has revealed: (1) a post-program meeting by TUBITAK and (2) personal contact channels. However, a case from the field shows that there is a one-way feedback mechanism from the implementing agency to TUBITAK because agencies are unaware of policy changes in advance.

The post-program meetings allow implementing agencies to provide feedback about the BiGG program. An executive from TUBITAK stated that “*TUBITAK is trying to get feedback from implementing agencies in the meetings such as what is missing and what needs to be done to improve processes.*” On the other side, most implementing agencies approved that they could share their feedback on the program implementation as well as the needs to be done for improvement. For example, IA F claims that many implementing agencies, including her own, gave feedback on the insufficient amount of financial grants at these meetings. Another example is that IA D observed that one agency raised the issue of delays in the program schedule at the meetings. However, feedback from TUBITAK to implementing agencies could not be identified in the field. TUBITAK only informs agencies about the program's outcomes and top-down policy decisions in these meetings.

TUBITAK asks us for feedback from the field through various channels. Although we have not been able to do it much lately, but before the pandemic, we used to have at least one, sometimes two meetings a year We gather all the implementing agencies together and there they share information, share outputs, make new announcements, and receive feedback from us. (Implementing Agency A)

After each call, TUBITAK actually held meetings with all interface organizations until before the pandemic. Then, after the pandemic, meetings were held online, attended by the president, again attended by both interfaces and entrepreneurs. TUBITAK ensures the exchange of information. What is missing? What are their opinions? What would be better to do to improve processes? TUBITAK is trying to get their feedback. However, this has actually decreased a little bit with the pandemic, or maybe its effect has decreased a little bit because one-to-one meetings were more useful, they were going better. (Executive from TUBITAK)

These post-call meetings are no longer conducted periodically for two reasons emphasized in the field study. The first is opening one call after another to complete the unopened calls during a pandemic, so there was no time to conduct such meetings. Another reason is the high workload of the BiGG program together with few human resources on TUBITAK side. Moreover, some online sessions have been conducted, but interviewees do not find online meetings as efficient as the ones conducted face-to-face.

Apart from the meetings, implementing agencies have one-on-one contact with experts at TUBITAK for advisory about the program. All agencies from the field agreed they could always reach administrative units at TUBITAK via phone or e-mails when needed. In this one-on-one contact with TUBITAK, those agencies mainly reflect their field experiences, problems, and observations about the BiGG implementation. Another feedback flow is personal contact. An expert at TUBITAK claims that he had called approximately 16 implementing agencies to get their opinions about the BiGG program. He said, *“If I remember correctly, there was a request from our senior management. I had meetings with 15-16 implementing agencies in the form of “How can we improve the processes?”. I remember very clearly that I took notes and reported them upstairs, but nothing came out.”* It is seen that administrative units at TUBITAK have open communication channels with officials in the implementing agencies (Figure 19). However, whether the feedbacks of implementing agencies have led to significant improvement of the program is questionable.

We do not have such a systematic thing with TUBITAK, but we actually meet with them at the beginning or end of the call, that is, when the call is opened and when the call is closed. You may have heard that there is “name of the executive at TUBITAK”. We meet with him and evaluate the process. Alternatively, when we consult him when there is something extra, he always responds, and he is always interested. We have no problems with the TUBITAK channel, we can reach them at any time we want, and we get answers to our questions. (Implementing Agency C)

TUBITAK, in other words, we are often in contact with them ourselves, without waiting for these events, all of them are already open to us, and we are actively in contact with them. These problems are communicated. (Implementing Agency F)

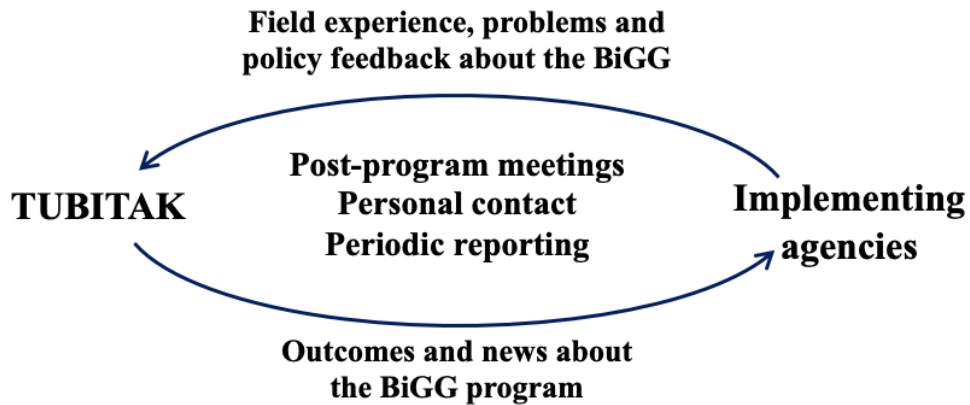


Figure 19: Feedback mechanisms from implementing agency to TUBITAK

Source: Author’s own depiction

The field study showed that implementing agencies are unaware of the sudden policy changes within the BiGG program. TUBITAK has decided on several recent policy changes in the BiGG program, such as opening an additional BiGG call for green growth, consortium model, and performance-based reward mentioned in section 4.3.1. About the policy changes, an expert at TUBITAK claims that *“We take their opinions before making changes, and sometimes we do not, sometimes we do it urgently.”* On the contrary, the field study has revealed that these changes are top-down policies implementing agencies must adapt. For example, IA D emphasized that they did not hear beforehand about the additional call for green growth and did not have time to prepare. Only some expectations and gossip about this call occurred in the implementing agencies. For that issue, IA E states, *“We do not know how the new model will be announced, and frankly we are looking forward to it. In this year, TUBITAK will issue a call for the authorization of the implementing agencies. We do not know how that will happen. IA F also claims that “TUBITAK made these changes, but we do not know what the next move will be.”*

(2) Entrepreneur - implementing agencies

Formal and informal interactions between entrepreneurs and implementing agencies occur during the program activities and after the program, as described in previous sections. It facilitates informal feedback environments or channels investigated in the field study. As mentioned above, entrepreneurs getting feedback from those agencies

were already seen in the formal activities and informal support. However, the mechanism described here is from the entrepreneur to the implementing agencies to point out the problems and development areas in the BiGG processes. Two findings from the field, (1) a survey for entrepreneurs, and (2) direct communication via face-to-face or online, making this mechanism available.

Many implementing agencies in the field study have conducted end-of-term surveys on their services within the BiGG program. In these surveys, implementing agencies have been trying to measure how satisfied entrepreneurs are with support and activities. However, through this survey, entrepreneurs could provide their opinion and feedback on what is missing in their processes and how to make services more effective in the BiGG program. For example, Entrepreneur F claims that *“I mean, in the form I filled out, there were questions like, I told you a little bit of what was there, I wrote similar things there. For example, did you find the duration of the training sufficient? Or did you get the support you expected from “other agencies name” in this process? If not, what were you expecting? Such feedback-oriented questions were asked.”* Similarly, Entrepreneur H said that *“They send us forms and you can fill them out, you know, we wrote down the things we found missing about the low number of mentors”*

In the BiGG process, the implementing agency and the entrepreneur come together online or face-to-face, leading to specific feedback through direct communication. The field study revealed that entrepreneurs could directly provide their opinions about benefits and development areas of the processes to the administrative unit of the implementing agencies. This direct communication has occurred through face-to-face or online platforms. For example, Entrepreneur J claims that *“There is an open office. The working team, you know, they do not have a closed room or a place. I mean, we all get tea from the same place. When we eat cookies there, we all eat them together. So, there is something very nice, there is an interactive environment.”* Some cohorts did not even come together once during the pandemic, but such interactions have somewhat continued via online platforms (Figure 20).

I think such feedback is actually informal. After all, this is how we do it with a phone call, in WhatsApp groups, in some joint committee things, we also talk among ourselves. (Entrepreneur D)

When we met them, they also asked us verbally. How did you find it, how was it, and so on. (Entrepreneur L)

There is a question and answer at the end of each training. They said that your opinion is valuable for us, but it was online there anyway. (Entrepreneur H)

Apart from that, they also wanted to meet me one-on-one. I also gave feedback face-to-face on what was good and what should be improved ... (Entrepreneur P)

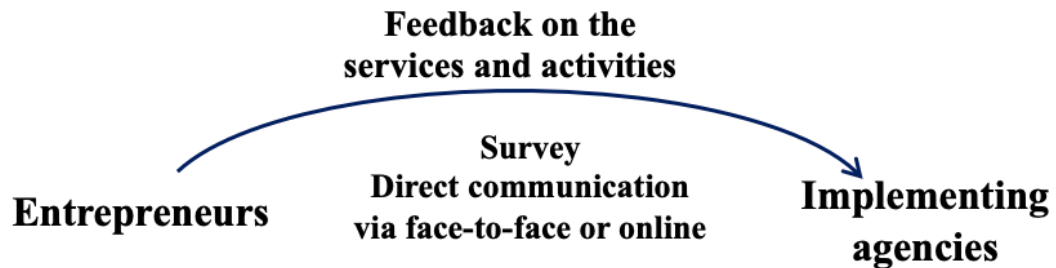


Figure 20: Feedback mechanisms from entrepreneur to implementing agency

Source: Author's own depiction

(3) Entrepreneur – TUBITAK

A direct feedback mechanism from entrepreneurs to TUBITAK is almost non-existent. Some communication occurred between both sides through contact addresses mostly for getting bureaucratic information and problem-solving. On the other hand, the strong interaction and one-on-one relationship between the entrepreneurs and implementing agencies facilitate indirect feedback from entrepreneurs to TUBITAK via those agencies. A few examples from the field supports this mechanism. Aside from the lack of a feedback mechanism, entrepreneurs do not tend to give feedback to TUBITAK via implementing agencies because the perception is that feedback will not be evaluated, and entrepreneurs accept the rules of the game.

No, nothing has happened with TUBITAK so far. We contacted a person from TUBITAK only once when we had financial problems. (Entrepreneur O)

Zero, zero interaction, I mean just e-mails. (Entrepreneur N)

For us, TUBITAK is just a stage where we upload the company information and business plan to the system, and then we follow some processes through the system. (Entrepreneur K)

Believe me, there is none with TUBITAK. I mean, I probably start contacting TUBITAK when the support comes out, not even when the support comes out, but when I see the money in the account. Until then, maybe, but it could also be their decision because there are so many applications, they have divided it into incubation centers. However, we have never had any interaction with TUBITAK. (Entrepreneur F)

The transaction between entrepreneurs and the implementing agencies, mentioned in section 4.3.2.1., is solid in the first phase of the program. In this transaction, entrepreneurs also convey their problems, demands, and criticisms about the BiGG process to the implementing agencies. For example, most entrepreneurs provide feedback on bureaucratic and financial issues such as insufficient financial support in the current period, delayed payments, delay in the program schedule, etc. The field study revealed that entrepreneurs' feedback was reflected through the activities, meetings, and online chat platforms to the implementing agencies. Furthermore, some entrepreneurs believe that the agencies communicate with TUBITAK about the problems and bottlenecks of the program, including those they highlight, but some do not believe so. After all, implementing agencies interviewed have also raised the same issues the entrepreneurs highlighted (Figure 21).

I did not attempt anything like that, but there was a serious tendency in the group at the beginning for early payment. It was paid at the end of December, and the companies waited two months without money. (Entrepreneur P)

We criticize TUBITAK at the implementing agency stage, but we do not have direct communication with TUBITAK. (Entrepreneur I)

I think TUBITAK takes it through implementing agencies and collects the data. I think it seems that we are not taken into consideration too much because we are the last link of a program. Maybe we forward it to implementing agency and they unite among themselves and forward it there. They have already made a system a bit like that. (Entrepreneur D)

You know, my understanding is that they are already in constant contact and meetings with TUBITAK and they seem to be conveying this type of feedback. But it does not seem like they can take much action from TUBITAK. Let me put it like that. It is as if implementing agencies say it, but it does not translate into action. (Entrepreneur C)

Yes. I do not know how it is in reality, but in my eyes, I think that those who carry out our BiGG process (implementing agencies) are constantly meeting with experts there (TUBITAK). (Entrepreneur J)

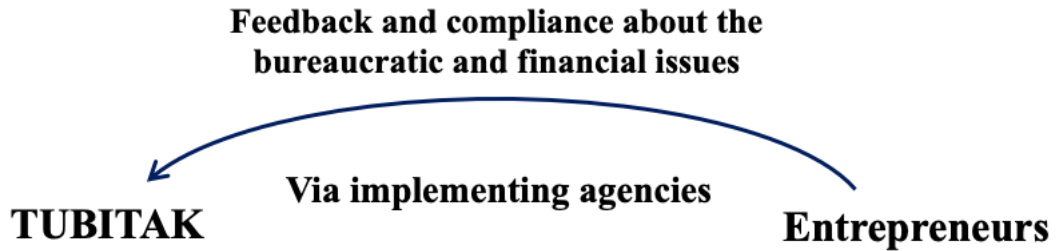


Figure 21: Feedback mechanisms from entrepreneur to TUBITAK

Source: Author's own depiction

Furthermore, some of the issues raised by entrepreneurs are shorter program duration, the possibility of financial coaching, grants according to the thematic area and postponement of company establishment. However, entrepreneurs do not prefer to give feedback on the program's implementation to TUBITAK. Besides the non-existent direct feedback mechanism, two further issues are the reason why entrepreneurs do not intend to provide feedback to TUBITAK. First, entrepreneurs feel that feedback is ignored and disregarded by TUBITAK. This may be because bureaucratic changes are made less frequently, and there is no follow-up mechanism. Second, the entrepreneurs interviewed think that the procedures in the BiGG program are written in stone because it is a public support program. An entrepreneur from the field summarized this mindset well: "*We enter the program by accepting the rules in advance.*"

Such a thing (feedback) is never discussed in the group (Whatsapp group) because everyone actually knows how much the state has, the rules, everything, so we enter this game on purpose ... There are some unchangeable rules on the TUBITAK side, we already accept it, that is, TUBITAK does not say that I will give you 200,000 in advance, for example, we do not talk about it. (Entrepreneur D)

I mean, we complain, but we have never gone and done anything, to be honest, I mean, we have an accepted situation in such a thing. Because we did not feel much, I mean, we did not feel like there would be a big change if I go to the administrative and said these things. (Entrepreneur B)

I think it is being said, but I do not think TUBITAK cares much about it. (Entrepreneur H)

All feedback mechanisms within the BiGG program are summarized in Figure 22 below. Some feedback has occurred from entrepreneurs to university-based incubators

(implementing agencies) and from these incubators to policy institutions (TUBITAK). On the contrary, there is limited interaction as well as weak feedback transfer from entrepreneurs to policy institution. Some feedback mechanisms between them have happened via implementing agencies within the BiGG program.

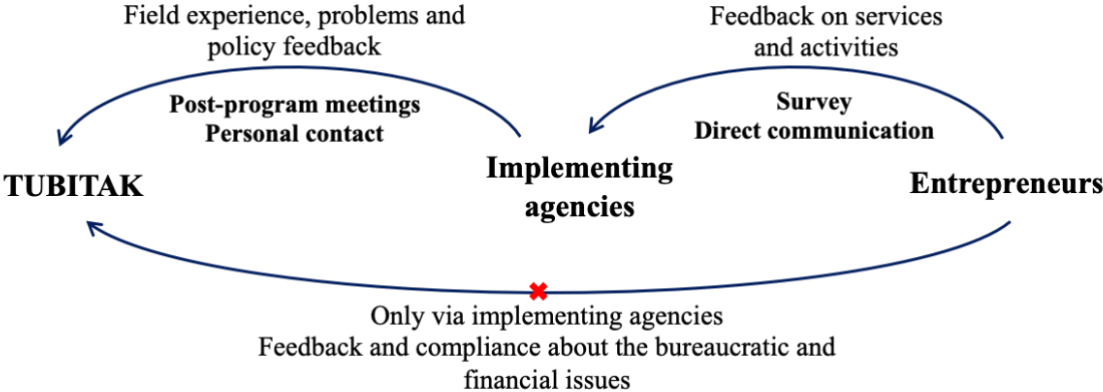


Figure 22: Summary of feedback mechanisms within the BiGG program

Source: Author’s own depiction

4.4. Contributions of interaction to the Entrepreneurial Ecosystem

4.4.1. Entrepreneurs

Several activities within the BiGG program phases facilitate formal and informal interactions between the actors described above. Those activities provide non-financial support to entrepreneurs from the idea stage to company formation. Besides, the BiGG program offers financial grants. Both financial and non-financial support contribute to the entrepreneurs in their entrepreneurial processes. They gain many opportunities and achievements through those interactions. For entrepreneurs, three achievements of the BiGG program are: (1) gaining basic entrepreneurship knowledge and skills, (2) accessing early-stage finance, and (3) creating new opportunities as BiGG is also a label, a brand.

As the activities benefited the most from the BiGG program, entrepreneurs interviewed highlighted training on the business plan, ongoing feedback from mentorship activities, conducting market research, and meeting potential customers at an early

stage. First, the BiGG entrepreneurs have gained basic entrepreneurship knowledge and capabilities, such as preparing a business plan, financial plan, business strategy, market strategy, etc., through training and mentorship activities. This enables them to transform their business idea into start-up companies. Second, the entrepreneurs emphasized that they could better explain their business to third parties thanks to presentations in the form of pitch talks and customer interviews within the program.

Moreover, several entrepreneurs from STEM²⁸ education backgrounds claim they could gain multi-faceted thinking about entrepreneurship. They emphasized that they understand the importance of customer and market, company management, team formation, and network besides from the R&D or product development. Even if all entrepreneurs in the BiGG program do not make it to financial grants, they have a chance to continue in the ecosystem in other opportunities by acquiring mentioned knowledge and capabilities.

Access to finance for early-stage entrepreneurs is significant for market entry and development of R&D products. The BiGG program is the only active entrepreneurship program providing financial grants to early-stage tech-based entrepreneurs. The field study also approved the importance of that financial grants even if it is seen as insufficient in the current economic conjuncture. However, entrepreneurs see the program as more than just support for setting up a company. Most interviewed entrepreneurs stated they would not have attempted entrepreneurship or could not start an enterprise without the BiGG program. While others proposed it would be difficult and painful.

Being a BiGG program winner is valued in the ecosystem and creates new opportunities; it acts like a brand. Entrepreneurs within the BiGG program tend to apply complementary support programs and contact investment networks to seek additional ventures or support. Obtaining a BiGG grant is an asset in the entrepreneurial ecosystem. For example, Entrepreneur I said, "*Having received a grant from TUBITAK ... gives us an element of confidence in the eyes of customers, investors and partners, and of course paves the way for us to receive other secondary and tertiary grants such as KOSGEB.*" Entrepreneur N also claims, "*I mean, if I need to*

²⁸ Abbreviation of Science, Technology, Engineering, and Mathematics

give a spot title, it is good as a label. When you say that you applied for the BiGG, the way you are looked at is something. You know, it even contributes to investment or recruitment process.”

4.4.2. Implementing agencies

The BiGG framework also provides benefits to the implementing agencies. The framework encourages these agencies to conduct several entrepreneurship activities. It also allows them to interact with the other ecosystem actors. These activities and interactions lead implementing agencies to increase the capacity building of entrepreneurial activities. This increase in capacity building is through (1) learning by conducting support activities (i.e., running the big program) and (2) learning by dealing with various entrepreneurial cases.

As previously described, the BiGG implementation involves a list of activities such as business idea collection and evaluation, training, mentorship, and network activities. Over the years, these activities have become helpful learning resources for less experienced agencies. In other words, this is a type of learning-by-doing practice. Thanks to the extensive scope of the program, this practice is becoming widespread in implementing institutions operating in different regions of Turkey. Aside from this practice, the BiGG implementation also enables the implementing agencies to engage with a diverse range of entrepreneurial cases from various sectors and technology levels. With the help of this engagement, the implementing agencies expand their knowledge and experience.

I think it enlarges the ecosystem, by adding more entrepreneurs. Plus, I criticized it just now, it may not be very meaningful to support more incubation centers from a commercial point of view, that is, in the short term. But in the medium or long term, many incubation centers started to do entrepreneurial processes because of the program. Afterward, some of them may be BiGG-specific, but there are also good incubation centers that started or grew with the BiGG. (Implementing Agency A)

Because the contribution of interfaces is very important in this ecosystem. And I think that the development of the interfaces is a precursor to the development of this BiGG program, here is the phased, here is the first phase, and I think this is very effective. (Executive from TUBITAK)

After selecting the right implementing agency, you both improve the competence of that agency and create more impact locally, I think this is the right model. (Expert B)

4.4.3. TUBITAK

TUBITAK, as the coordinating institution, gains benefit from interaction with implementing agencies and entrepreneurs within the BiGG program implementation. The program has had an ever-changing structure in that many policy changes and improvements have been implemented since 2012. Those changes are often top-down, but some feedback from interacting with the field is implemented with the help of interaction context. Thus, the benefits of TUBITAK are found in the field. TUBITAK could respond to the program's shortcomings through (1) learning from implementation and (2) feedback from the field.

The interaction within the program also creates a learning environment in that TUBITAK forms an idea of the deficiencies of the program as well as the entrepreneurial ecosystem. TUBITAK made several top-down policies improving the efficacy of the BiGG program with the help of implementation in the field. A progressive policy change in the BiGG program is the decentralization of activities in the first phase to be implemented through implementing agencies (discussed in Section 4.2). Regarding this change, an executive from TUBITAK stated that they did not find it effective for TUBITAK to carry out acceleration activities under the program.

TUBITAK had been conducting non-financial activities in the BiGG program for a while. However, we realized this was a work of expertise, so we tried to procure a service and prepared videos with lecturers. However, we thought it could be done better, and who could do it? Of course, the essential stakeholder here is the Technology Transfer Offices of universities, and private sector organizations that are experts in this ecosystem. So, we created a different program, the TUBITAK 1601 program, and TUBITAK handed over the first phase to implementing agencies. (Executive from TUBITAK)

Every year, there was a feedback mechanism to correct the deficiencies in implementation. Although it may seem like a structure that changes regulations and legislation every year, this was actually an approach to further improve the ecosystem, that is, this support. (Expert D)

TUBITAK also follows the operation and result of the program in the field by receiving reports from entrepreneurs and implementing agencies (mentioned in Section 4.3.) and attending the entrepreneur's evaluation. They also know how successful this program is. With that, further examples of minor top-down policy changes insight from implementation are observed. For example, TUBITAK opened a

new program called BiGG Plus²⁹ to support mentorship in the interface institutions because they recognized the need for capacity-building in mentorship activities, especially for the marketing stage. Another example of learning from implementation is to include investors and industry representatives to the jury who evaluate the program candidates. While there are some examples of learning from practice, the accuracy and effectiveness of these policy changes need to be further examined.

A panel jury at first included only academics. Then we saw that the academics were always looking at the R&D content. Then we started to involve investors, but this time the investors started to say, "It is too early, too early for them." Then, we started to invite industry representatives and entrepreneurs. The most useful ones were former BiGG program graduates. (Expert A)

The feedback mechanism within the program also gives room for TUBITAK to improve the program implementation and its impacts on the entrepreneurs. For example, the financial grant in this program increased two times, once in 2018 and the second in 2022. Besides, all implementing agencies interviewed stated that the biggest problem is the insufficient financial grant, and they emphasized that they had conveyed this to TUBITAK. The IA X state about this policy changes that “In the past, for example, this grant was 150,000 TL, and then it was increased to 200,000 TL, so this was something that was already communicated by the implementing agencies, but I guess they were thinking about it themselves.” While this study was being conducted in 2022, TUBITAK announced that it had increased the financial grant from 200,000 TL to 450,000 TL, which could be viewed as an improvement in the light of feedback from the field.

4.4.4. Ecosystem benefit

Aside from the actors’ benefit, the BiGG program implementation has increased formal and informal interactions in the entrepreneurial ecosystem and brought new perspectives on policy implications. Two contributions to the entrepreneurial ecosystem stand out in the field study: (1) bringing various external actors into the program and (2) extending entrepreneurship awareness through this interaction. In

²⁹ The full name of the program “BiGG+ Mentor Interface”. The aim is to support a qualified mentoring mechanism to increase the competitiveness of SMEs by bringing their innovative products to the market. For more details in Turkish, see https://tubitak.gov.tr/sites/default/files/18842/bigc_cagri_dokumani_30_kobi_sorumlu_rev.pdf

addition, policy changes by learning from implementation and feedback from the field set a model for other policy implications in the ecosystem.

The program, with its implementation, enforces the interactions between various actors in the entrepreneurial ecosystem. Within the implementation framework, the incubators under universities or private sector companies as the implementing agency interact with entrepreneurs through provided services and activities within the program framework. In the universities, academic experts also involve in those interactions as mentors or trainers. Further interactions are seen when entrepreneurs engage with the private sector companies (both as customers and funders).

In addition, some external entities, such as investors, are interested in entrepreneurs under the program and various support organizations, such as mentoring associations and financial advisory companies, have been established and involved in the program. For example, an Executive from TUBITAK claimed, *“The most popular clients of venture capital companies or investment funds are BiGG entrepreneurs... they follow them.”* Following this argument, IA A provided a case, *“The one that came with the BiGG application and was very successful in pre-incubation and received an investment of 25 million dollars.”* Furthermore, Expert A stated that some training service providers and mentorship associations are established to enter the BiGG ecosystem. Thus, the BiGG program has similarities to an entrepreneurial ecosystem with various interactions between actors and activities.

These interactions in the ecosystem actors also extend the entrepreneurial activity in Turkey due to the program implementation at the regional level. TUBITAK has taken action to increase the number and regional scope of the implementing agencies to extend the program's impact. According to this decision, the number of implementing agencies that have a crucial role in the program has gradually increased from 10 in 2015 to 60 in 2022.³⁰ This increase also brings regional expansion. Although the resources and capacities are unequal as emphasized in the field, those agencies especially in the less developed regions conduct entrepreneurial activities within the program framework. Thus, regional expansion of the program helps to emerge

³⁰ As a reminder that the selection of the implementing agency through the 1601 Capacity Building Program mentioned in 4.3.1. TUBITAK opens a call for this program in 2016, 2018, and 2020 to increase the number of implementing agencies.

technology-based ideas from those regions and develop these ideas at least in the idea stage. About this expansion, interviewees also indicated that the entrepreneurship concept has become widespread and popular, and the awareness of entrepreneurship has increased in Turkey.

I think this program is an important structure in terms of supporting early-stage entrepreneurs in Turkey. It is important for entrepreneurship to reach entrepreneurship services in different regions of Turkey and for technological initiatives to emerge from there. (Implementing Agency E)

I think its biggest contribution is that it has created its own ecosystem and I find it successful, and the implementing agencies are successful, even though there are many of them. They also ensure the promotion and dissemination of the program. (Executive from TUBITAK)

The BiGG program is setting a model for other policy tools with an ever-changing structure to address implementation shortcomings. In this study, some top-down policy approaches, learning from implementation, and feedback from the field turning into action were observed in the context of interaction (Discussed in Section 4.4.3). Interaction and feedback mechanisms in the BiGG program creates knowledge in policy design and help TUBITAK to see the needs, shortcomings, and development areas of the entrepreneurial ecosystem. Furthermore, accumulated knowledge on policy design and implementation may enable the production of more effective policy tools which may contribute to developing the entrepreneurial ecosystem in Turkey.

CHAPTER 5

CONCLUSION

The entrepreneurship process involves a diverse set of actors and complex social and financial interactions. This complex set of interactions and activities has recently been labeled as an “entrepreneurial ecosystem” (Isenberg, 2011; Mason and Brown, 2014; Stam, 2015; Spigel, 2016; Audretsch and Belitski, 2017). The term entrepreneurial ecosystem, by definition, emphasizes (1) multi-actor involvement such as entrepreneurs, universities, and support organizations, (2) the effects of various elements such as infrastructure, finance, and culture, and (3) the concepts of collaboration, network, interdependency, and interaction. Due to the complex structure, there is no one type of entrepreneurial ecosystem, meaning that the elements and actors that constitute an ecosystem often vary across different contexts. That is why most studies have attempted to build a conceptual framework of ecosystem elements and actors in the context of a country, region, city, university, and support program (Isenberg, 2011; Rice et al., 2014; Stam, 2014; Spigel, 2016; Spigel, 2017; Miller and Acs, 2017; Stam & van de Ven, 2021). These studies have mainly focused on examining the functioning of the ecosystem and interactions among structural elements. However, site-specific research on the interaction and interdependency between the different actors of a particular ecosystem are limited (Motoyama and Knowlton, 2016; Theodoraki and Messeghem, 2018; Hernandez-Chea et al., 2021; Alaassar et al., 2022).

Moreover, only a limited number of studies profoundly examine the interaction dynamics of the entrepreneurial ecosystem in emerging economies (Junior et al. 2016). Similarly in Turkey, the entrepreneurial ecosystem concept is commonly used by the public and private sector actors as well as in media and official documents (Presidency of Strategy and Budget in Turkey, 2019; KOSGEB, 2016). However, the previous

research on the entrepreneurial ecosystem has mainly concentrated on the determinants of entrepreneurial intention, orientation, and motivation (Karadeniz and Ozdemir, 2009; Turker and Selcuk, 2009; Cetindamar et al., 2012; Oner and Kunday, 2016; Beyhan and Findik, 2018; Tunalı and Sener, 2019) and success factors (Benzing et al. 2009), and assessment of support organizations and policies (Akcomak and Taymaz, 2007; Ozdemir and Sehitoglu, 2009; Sungur, 2015) rather than detailed empirical analysis of the interaction dynamics in the Turkish entrepreneurial ecosystem. In this thesis, I describe the ecosystem activities and interaction dynamics between the actors in detail by focusing on a policy tool that supports technology-based entrepreneurs, the BiGG program.

This thesis makes several contributions to the entrepreneurial ecosystem literature and provides inputs for policymakers in Turkey. First, it is the first detailed field research on investigating and describing interaction dynamics of the Turkish entrepreneurial ecosystem focusing on a public support program. Second, this thesis produces site-specific descriptions of interactions among entities rather than the outcomes or elements, which theoretical framework may not be able to, and therefore enrich the understanding of the entrepreneurial ecosystem in Turkey. Third, investigating the interaction dynamics of an entrepreneurial ecosystem in Turkey extends the limited empirical research on ecosystem interactions in emerging economies. Fourth, revealing the formal and informal interactions and feedback mechanisms within the ecosystem provides policymakers with input to identify strengths, gaps, and intervention areas.

The BiGG program implementation enables understanding of the interaction dynamics in the entrepreneurial ecosystem for two reasons: (1) the program involves a diverse set of actors, and (2) the program includes several entrepreneurial activities that involve actors' interactions and collaboration. In this regard, it provides a natural environment to investigate the extent of interactions that is, so to say, "produced" or formed as a by-product by implementing a policy tool.

The main actors involved in the program are TUBITAK as a government-backed institution, incubators as implementing agencies, and entrepreneurs as beneficiaries. Several activities within or outside the program framework facilitate the interaction

and interdependency of these actors as well as others such as trainers, mentors, and private sector companies. Thus, this thesis has revealed two high-level activities of the program: (1) the selection of implementing agencies and (2) the implementation of the program, which facilitates several interactions and interdependencies between the ecosystem actors (Table 6).

The selection of implementing agencies enables TUBITAK to assign program implementing agencies with its directives and expectations. However, the implementation is left to those institutions' proposed services and models. Thus the implementing institutions enjoy a certain degree of freedom. Within this activity, TUBITAK monitors the agencies' activities and provides funds by evaluating them for the number of successful entrepreneurs under the program. TUBITAK only expects well-prepared and successful entrepreneurs from the implementing agencies, and the agencies work to meet these expectations, which defines a multi-party collaborative environment.

Furthermore, two policy changes in 2020, one that has brought a consortium model between the implementing agencies and another that transformed the pre-implementation funding mechanism into a post-implementation performance-based reward system, have impacted the interaction between implementing agencies. The program has also allowed underperforming agencies to work jointly with high-performing ones since 2020. These agencies conduct the program's tasks in a coordinated manner, and some come together many times to share what kind of activities or support provides to entrepreneurs. This coordination potentially allows knowledge spillovers, but limited, from high performing to underperforming agencies. Outside the consortium, any form of coordination or knowledge-sharing among these agencies is almost nonexistent, but only a few personal initiatives enable it in a limited way. Transforming into the performance-based reward system also limits the interactions among agencies outside consortiums due to increasing competition between agencies.

Second, the program implementation facilitates several interactions between the actors in the ecosystem, categorized under (1) formal interactions and (2) informal interactions (Table 6). Formal interactions refer to more structured interactions

between the actors framed by the program phases and the procedures. Whereas the informal interactions are the unseen by-product interactions that I reveal from the interviews.

Formal interaction involves several activities: (1) training and mentorship, (2) idea validation, (3) selection of entrepreneurs for the first phase and (4) panel presentation final evaluation, and (5) progress reporting in the second phase. In the first phase, implementing agencies provide training, mentorship, and idea validation activities to entrepreneurs to transform the business idea into a business model and plan. So that trainers, mentors, and private sector companies are involved in the program through the implementing agencies' capacity or network. Entrepreneurs have periodic one-to-one engagements with trainers and mentors to get guidance and feedback to improve their business plan throughout the first phase. Apart from periodic engagement, entrepreneurs could receive technical or market advice by finding additional mentors from the implementing agencies' network. Furthermore, they also meet private sector companies via agencies network in the early stage to validate their business model in the market. With this effort, implementing agencies facilitate interaction by building bridges between entrepreneurs and other ecosystem actors, and lead to extend the interaction beyond program boundaries.

The second phase includes more like a procedure that entrepreneurs should complete. The only activity is that TUBITAK evaluates the entrepreneurs' business ideas by conducting a panel presentation. In this phase, entrepreneurs interact with a panel presentation jury of academics and industry representatives rather than the experts at TUBITAK. In the end, entrepreneurs are entitled to 450,000 TL grants if they are completed those procedures. Thus, the program encourages early-stage entrepreneurs to interact with many ecosystem actors and provides non-financial services in the first phase, while entrepreneurs are eligible for financial grants in the second phase.

Beyond formal interaction in the framework of the BiGG program, the field study revealed that the program facilitates unseen informal interactions between (1) implementing agency and entrepreneur, (2) entrepreneurs, and (3) implementing agencies. Formal interactions also include informal feedback mechanisms between the main actors to improve the program implementation. These mechanisms are found

hierarchically (1) from entrepreneur to implementing agencies and (2) from implementing agencies to TUBITAK (Table 6).

First, the relationship between the implementing agency and the entrepreneur goes beyond the program's scope by (1) taking them into complementary incubation programs and (2) providing physical facilities for the program winners. Thus, the complementary services provide ongoing support and interaction between implementing agencies and entrepreneurs. Ultimately, it enables entrepreneurs to stay in the ecosystem and develop networks with other ecosystem actors via implementing agencies.

Second, the BiGG program is a cohort-based program where entrepreneurs go through the same processes and face similar problems. Entrepreneurs within the BiGG program are open to interacting face-to-face in the same environment and via online chat groups that implementing agencies set up. They help each other with program procedures, additional needs, and building new networks. Furthermore, entrepreneurs often have access to the network of the previous cohort with the help of chat groups or implementing institutions. Most of such interactions are for problem-solving and seldom lead to collaboration.

Third, informal interactions and collaboration of implementing institutions seem weak other than the interactions in the consortium. Some personal efforts and nonperiodic post-program meetings of TUBITAK facilitate some knowledge- and experience-sharing. This knowledge flow is minimal and generally about how successful other agencies are and what kind of activities they provide within the program. One reason is that implementing agencies in the ecosystem are competitive in recruiting entrepreneurs into their networks. Another reason is that transforming the funding mechanism into a performance-based reward system increases competition between agencies, which may weaken interaction building and knowledge sharing. Moreover, the post-program events are conducted only sometimes after the pandemic. Some online meetings have been conducted but are seen as inefficient in the field.

Finally, this thesis has revealed informal feedback mechanisms between the main actors to improve the program implementation. The mechanism described is (1) from implementing agencies to TUBITAK (service providers to policy institution) and (2)

from entrepreneurs to implementing agencies or TUBITAK (service providers and policy institution). First, a non-periodic post-program meeting by TUBITAK and personal contact channels enable feedback mechanisms between service providers and policy institutions. With these efforts, implementing agencies often reflect their field experiences, problems, and observations to TUBITAK. Second, implementing agencies are open to getting feedback from entrepreneurs about their issues and experience as well as program activities and implementation. Two findings from the field, a survey for entrepreneurs, and direct communication via face-to-face or online make this mechanism available. Lastly, the direct feedback mechanism from entrepreneurs to TUBITAK is almost nonexistent. Nevertheless, they often provide their feedback through implementing agencies. However, entrepreneurs do not prefer to give feedback to TUBITAK because (1) they feel that feedback is ignored and disregarded, and (2) they think that program procedures are written in stone because the program is a public initiative. The feedback mechanism among actors within the program is limited because it is based on rare non-periodic meetings and personal communication efforts. However, this mechanism may have provided input for policy institutions to revisit and improve the policy tool.

The interaction within the BiGG program has several contributions to the actors involved. First, entrepreneurs gain basic entrepreneurship knowledge and skills from training and mentorship, and access to early-stage finance thanks to the program framework. A further contribution is to create new opportunities for entrepreneurs because they attend several network activities via implementing agencies, and success in the BiGG program is seen as a signaling label in the ecosystem. Second, implementing agencies conduct various support and network activities, and attend multiple interactions with other ecosystem actors. It leads to increasing their capacities through learning by conducting entrepreneurial activities and dealing with various entrepreneurial cases. Lastly, TUBITAK has potentially learned from the program implementation and the feedback mechanism. However, it can be said that learning from the field is limited because only a few examples were seen in the program framework. One example is the decentralization of non-financial activities in the first phase to be implemented through incubators by learning from the implementation, and

another is increasing the amount of financial grants in response to feedback from the field.

The site-specific findings of the thesis provide an in-depth understanding of the interaction dynamics in the entrepreneurial ecosystem, insights into how the ecosystem works, and the program's contributions. So, what do the interactions under the BiGG program say about Turkey's entrepreneurial ecosystem?

Public policy tools (the BiGG program) facilitate interactions and knowledge-transfer among actors in Turkey's entrepreneurial ecosystem. First, the BiGG program enables a collaborative relationship between a government-backed institution and incubators beyond the funding mechanisms. Most public support programs for promoting interface institutions in Turkey provide financial support rather than creating a collaborative relationship. Instead, incubators as an implementing agencies in the BiGG program get several entrepreneurial ideas from various sectors and regions and provide non-financial support and network activities. While doing that, they cooperate and coordinate with the government-backed institution. Furthermore, entrepreneurs have interacted with the incubators within the program framework, and the interaction among them goes beyond the program scope with complementary services and network activities. These activities conducted by the incubators also enables different types of interaction and network by bringing various external actors into the program framework.

These interactions within the program have significantly contributed to Turkey's entrepreneurial ecosystem. For example, implementing agency model, including collaborative interactions, helps to extend entrepreneurship awareness in different regions funded by government-backed institutions, attract technology-based ideas from those regions, and to deliver early-stage finance and non-financial support to them. However, the thesis is limited in assessing the quality of these activities, and future studies may investigate the content of entrepreneurial activities and evaluate their quality in less developed regions.

Besides, the implementation of the BiGG program acts as an isolated ecosystem with several entrepreneurial activities involving actors' interactions and collaboration. In emerging economies, incubators and accelerators play an intermediary role in bridging

entrepreneurs and other ecosystem actors (Mair et al., 2012; Goswami et al., 2015; van Rijnsoever, 2022). Similarly, university-based incubators under the BiGG program expand the isolated structure of the program to a certain extent. These organizations grow the program boundaries through other entrepreneurial activities and connecting entrepreneurs with mentors, private sector companies, and investors. Thus, incubators with this effort increase the interaction dynamics within the BiGG program as well as the overall ecosystem. Still, this thesis cannot answer whether this network is available for less developed regions. Further studies would aim to research on interaction and network of entrepreneurship support organizations in the less developed regions of Turkey.

On the other hand, the thesis reveals limited interactions, coordination, and knowledge transfer between incubators in the entrepreneurial ecosystem because they compete in attracting entrepreneurs from the ecosystem. On the other hand, Motoyama and Knowlton's (2016) study finds that government sponsorship enables coordination among local entrepreneurship support organizations in St. Louis. Another study by Alaassar et al. (2022) argues that interaction dynamics of the ecosystem enable both financial and knowledge transfer between various actors in Singapore. Similarly, the BiGG program facilitates a certain level of interaction and coordination among incubators from different regions and creates limited knowledge sharing between them. However, competition between incubators seems to have isolated this knowledge sharing within the consortium of the BiGG program instead of spreading it throughout the ecosystem. Thus, the knowledge spillover from high-capacity to low-capacity incubators or universities is not substantial in Turkey's entrepreneurial ecosystem.

Public policy tools (the BiGG program) help the intention of creating sub-ecosystems. The interaction among government-backed institutions and university-based incubators within the BiGG program enables the intention of creating sub-ecosystems in various regions. The thesis suggests that implementing agencies especially from less developed regions have improved their capacities within the program scope. Because the program encourages them to conduct entrepreneurial support activities, deal with various entrepreneurial cases, and limited knowledge-sharing from other incubators. Moreover, this intention relies on the top-down ecosystem approach in that resources

and facilities are created and shaped by the government as the “feeder” of an ecosystem (Feld, 2012; Stam, 2015; Colombo et al., 2019). Government-backed institution and incubators within the support program are anchor actors to promote the formation of sub-ecosystems in Turkey’s entrepreneurial ecosystem (Colombelli et al., 2019). However, this thesis is limited in investigating these sub-ecosystems due to focusing on high-capacity incubators. Only some expert opinions about these sub-systems were revealed from the field study. Further studies may examine how the ecosystem works in the less developed regions and how well these sub-ecosystems can interact with other ecosystem actors and facilities in Turkey.

The BiGG program behaves as an ecosystem due to including several entrepreneurial activities and a certain level of interaction among various actors from the ecosystem. Several studies emphasize the evolutionary nature of the ecosystem through the interaction between elements and actors over time (Cohen, 2006; Malecki, 2018; Cho et al., 2022). Colombelli et al. (2019) argue that the entrepreneurial ecosystem changes from hierarchical to relational governance as it evolves into birth, transition, and consolidation phases. The program implementation has also experienced many transformations since 2012, and the actors have evolved and expanded. In the early implementation of the BiGG program, TUBITAK is an anchor actor that only provides financial support to entrepreneurs. Then, university-based incubators have been involved in the program framework for providing non-financial support and other entrepreneurial activities. These incubators also expand the isolated ecosystem by bridging various actors from an overall ecosystem in Turkey. Thus, the interaction dynamics within the BiGG, as it is now, have been closing to relational governance than hierarchical governance. This type of interaction shows that the BiGG program has been starting to become a more established and stated ecosystem with the implementing agencies from some developed regions in Turkey. In addition, the evolution, development, and sustainability of the entrepreneurial ecosystem in Turkey may be investigated in future studies.

Feedback channels for entrepreneurship policies are not sufficient to shape ecosystem policies. The policy decisions could be more effective when a policy decision is made through bottom-up feedback, stakeholder engagement, and consultation in the entrepreneurial ecosystem (Autio and Levie, 2017). The thesis reveals that a few policy

decisions for the BiGG program have top-down approaches to impact the entrepreneurial activity and interaction dynamics in the ecosystem. For example, the consortium model enables a certain level of collaboration and knowledge-sharing among incubators, whereas performance-based funding limits these interactions by increasing the competition. Although some feedback mechanisms exist between actors involved in the program, government-backed institutions cannot respond rapidly to feedback from the field due to bureaucratic responsibilities. The deficiency of the feedback mechanisms may build a barrier to effective policy-making and potential benefits for the entrepreneurial ecosystem.

Table 6: All activities that BiGG program enables actors' interaction in detailed

High-level categories	Type of interaction	Activities	Actors involved in the interaction	Mechanisms of interaction
Selection of implementing agencies	Formal but separate from implementation	<ol style="list-style-type: none"> 1. Selection of implementing agencies 2. Evaluation of the agencies 3. Consortium model (co-execute) 	<ol style="list-style-type: none"> 1-2. Implementing agency - TUBITAK 3. Between implementing agencies 	<ol style="list-style-type: none"> 1-2. Multi-party collaborative environment in joint implementation of the program 3. Coordination and knowledge transfer within a consortium
	Formal	<p>First phase of the program</p> <ol style="list-style-type: none"> 1. Training and mentorship 2. Idea validation 3. Selection and evaluation of entrepreneur <p>Second phase of the program</p> <ol style="list-style-type: none"> 1. Panel presentation and final evaluation 2. Grants and reporting 	<ol style="list-style-type: none"> 1-3. Entrepreneurs - Implementing agency 1. Entrepreneurs - Trainers and mentors 2. Entrepreneurs - Private sector 	<ol style="list-style-type: none"> 1-3. Selection, guidance, and assistance in the first phase 1. Providing entrepreneurship training and ongoing mentorship to form a business plan 2. Meeting private sector companies and getting a letter of intent via agencies' guidance or network
Implementation of the BiGG program	Formal	<ol style="list-style-type: none"> 1. Ongoing relationship 2. Helping environment 3. Personal efforts contacting others 	<ol style="list-style-type: none"> 1. Entrepreneurs - implementing agency 2. Entrepreneurs - Entrepreneurs 3. Between implementing agencies 	<ol style="list-style-type: none"> 1. Evaluation process and provision of partial financial grants 2. Progress report once to TUBITAK, via referees' evaluation, for the rest of the grants
	Informal	<p>Feedback mechanisms on the program process (from-to) (requests, bottlenecks, development areas)</p>	<ol style="list-style-type: none"> 1. Entrepreneurs - implementing agency 2. Implementing agency - TUBITAK 3. Entrepreneurs - TUBITAK (via implementing agencies) 	<ol style="list-style-type: none"> 1. Additional guidance, providing physical facilities and complementary incubation or acceleration programs to entrepreneurs after the program 2. Helping each other (same or previous cohort) through online platforms or face-to-face due to being in the same facility and having similar problems 3. A few personal efforts on knowledge- or experience-sharing

Source: Author's own depiction

5.1. Policy Recommendation

This section includes five policy implications for increasing the contribution of the BiGG program to the entrepreneurial ecosystem and four policy recommendations for increasing the efficiency of the BiGG program. Policy implications based on the findings of this thesis may give insight into improving the entrepreneurial ecosystem in Turkey as well as be helpful for TUBITAK and other policy institutions.

Policy implications for increasing impacts on the ecosystem

Developing complementary programs for the market stage: The field study has revealed that entrepreneurs initiate or are guided by implementing agencies to attend other incubation or acceleration programs in the implementing agencies after the BiGG program. In these programs, the training, mentorship, and networking activities for market and investment processes were seen as critical and complementary in preparing for post-BiGG processes. They are also seeking additional public financial grants for later stages. Furthermore, the public support program providing non-financial training and mentorship for the ones in the market stage is limited in Turkey's entrepreneurial ecosystem. At this point, it would be critical for policymakers to conduct specific programs that promote non-financial support and network activities for the market stage or encourage to development of equivalent programs under implementing agencies. In this way, entrepreneurs are expected to be more successful at the market stage.

Strengthening the feedback mechanisms within the program as well as the overall ecosystem: A hierarchical feedback mechanism from the field to TUBITAK is investigated in this thesis. However, the feedback mechanisms within the program are irregular and rely on individual networks. Implementing agencies could convey their field experiences, entrepreneurs' demands, and the bottlenecks of the ecosystem on TUBITAK through personal communication channels and non-periodic meetings. Meanwhile, the mechanism that TUBITAK gives feedback to the implementing agencies to improve their entrepreneurial activities is non-existent. To this end, it is significant that policy institutions, such as TUBITAK, improve regular feedback channels and organize activities for learning from the field. It would reinforce the

impact and contribution of the policy-implementing tools and provide input into developing new policies that respond to the needs of entrepreneurs.

Encouraging experience-sharing among university-based incubators: The field study has showed that knowledge- and experience-sharing between the implementing agencies is very limited outside the consortium. In addition, the performance-based reward mechanism in the program increased competition between implementing agencies, leading to further reduced knowledge sharing. Besides, the field study also revealed the competition among these organizations in the same region to attract entrepreneurs. Thus, establishing platforms or organizing regular activities where successful support organizations could share their experiences may help low-capacity organizations improve more effective and efficient support activities. This would contribute to the BiGG program implementation and increase the quality of the entrepreneurial support mechanisms in the incubators under universities.

Bringing back the funding mechanism for underperforming implementing agencies: Last five years, TUBITAK has involved many institutions as an implementing agency in different regions of Turkey, aiming to expand the program's impact and reach entrepreneurs from all regions. At the same time, those agencies have been funded in the pre-implementation process by TUBITAK until 2020. Then, TUBITAK made the policy change transforming the funding mechanisms into a performance-based reward system. The field study emphasized that this policy change led implementing agencies to use internal capacity. Still, not all implementing agencies have the same performance, and the same range or quality of services makes it challenging to achieve this aim. Bringing back the funding mechanism for underperforming agencies would make entrepreneurial activities and support tools more quality, diverse and influential in those regions.

Involving venture capitalists in the BiGG process: The BiGG program enables early-stage entrepreneurs to interact, formally or informally, with various ecosystem actors, such as incubation centers, mentors, private sector companies, etc. However, the mechanism involving venture capitalists, investment funds, or angel investors in the BiGG processes is non-existent except for the informal networking activities within the implementing agencies. TUBITAK once tried to address this by involving

investors as a panelist in entrepreneurs' evaluations, but it was found ineffective because BiGG entrepreneurs are seen early for the investment stages. However, the field study showed that some entrepreneurs could meet investors at the early stage through implementing agencies and even receive investments. Considering that the program continues for 12 months, it may be helpful to establish a network platform where investors and entrepreneurs meet or mechanisms that enable the most successful BiGG entrepreneurs to meet with investors in pitch-deck format. This way, early-stage entrepreneurs may be discovered, followed, and scaled faster.

Policy implications for increasing the efficiency of the BiGG Program

Avoiding top-down policy changes without informing the implementing agencies:

This study investigates two top-down policy changes in 2020 concerning implementing agencies (consortium model and performance-based reward system mentioned in 4.3.1.). Most implementing agencies interviewed stated that top-down decisions were sudden and without briefing. Furthermore, in the same year, TUBITAK announced additional calls for the BiGG during the Pandemic and also opened the call for the green economy. Some agencies stated that they found it challenging to adapt additional calls immediately. Therefore, TUBITAK and other policy institutions could make major policy changes by informing the other ecosystem actors for the sake of coordination. It may even be more effective if this information sharing becomes obtaining feedback from the field regarding a possible policy change.

Postponing the obligation of company formation to a later stage: The fieldwork showed that it is not realistic for most entrepreneurs to make sales immediately after BiGG support. Entrepreneurs interviewed also stated that it was too early to start a company, giving them financial burdens. Postponing company formation within the BiGG program is critical for entrepreneurs. However, there needs to be an official company so that public initiatives can make financial transactions, which creates a paradox here. Considering the financial grant is provided in installments, TUBITAK may provide a part of the grant with repayment conditions.

Revisiting the amount of the financial grant concerning the entrepreneur's field:

The BiGG program accepts entrepreneurs from various fields but with a certain level of innovation and technology. Furthermore, entrepreneurs within the BiGG program

could pursue software or hardware development and advanced R&D processes. However, this diversity brings different financial needs. For example, some hardware development needs to import tools and equipment, which brings more financial burden than software development. However, the financial grants of the BiGG are constant for all entrepreneurs regardless of their field. Diversifying the financial grant following the needs of different areas would maintain its structure that addresses all sectors and its broad impact.

Establishing a structure where the implementing agency decides the entrepreneur's final evaluation: This thesis has revealed that the interaction between TUBITAK and entrepreneurs is limited in the final evaluation phases. These limited interactions also only bring a little benefit to entrepreneurs, except that it creates more procedures. Moreover, the implementation agencies conducted a large part of the program activities, but TUBITAK made the final evaluation and decision of the program winners. However, the final evaluation of the BiGG may be left to the implementing agencies without changing the selection method (panel presentation). Almost all implementing agencies interviewed conducted the same selection process to simulate the final evaluation. More prominent and experienced agencies could be selected for this assignment, and even this can be organized as a separate TUBITAK program where such agencies receive extra funding.

5.2. Limitations and future studies

The implementing agencies under the BiGG program, i.e., incubators, have operated in different regions and offer different types and quality of support. This study investigates the ecosystem dynamics by selecting high-performing agencies from two major cities in Turkey. It may be possible to better understand the ecosystem dynamics by examining implementing agencies in different regions and with various capacities. Furthermore, this study did not aim to explore the details of entrepreneurial activities of incubators outside the scope of BiGG. It may conduct a more extended and comprehensive study investigating all activities in the Turkish entrepreneurial ecosystem.

Within the scope of this thesis, entrepreneurs interviewed were reached through implementing agency arrangements. However, not every entrepreneur from each

agency could be interviewed; in two of them, only one entrepreneur was interviewed. A further study may take the early-stage entrepreneurial processes of entrepreneurs in the ecosystem to examine different actors, support mechanisms, and entrepreneurial activities outside the BiGG program. This would provide a more comprehensive picture of the ecosystem in Turkey.

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APPENDICES

A. SEMI-STRUCTURED INTERVIEW FORMS

A.1. EXECUTIVES AT TUBITAK

- **About the TUBITAK BiGG Program**

1. What processes do entrepreneurs go through in the Techno-Entrepreneurship Capital Program (BiGG) from the idea stage of the entrepreneur to the end of the support program?
2. According to which criteria are thematic calls determined? For example, trends in the world or in Turkey. Could you tell me about this decision process?
3. How many people can we talk about a core team in the BiGG program (TEYDEB)?
 - a. What are the roles and responsibilities of this core team in running the program?
4. In the third phase of the program, entrepreneurs are evaluated by TUBITAK and are eligible for BiGG support. Could you tell me about this selection process?
 - a. Which criteria are used to select the entrepreneurs?
 - b. Who evaluates them? Is it always the same team?
5. Implementing agencies offer certain trainings/competitions/mentoring services to entrepreneurs. In the third phase of the BiGG program, could entrepreneurs receive non-financial services such as certain trainings and/or mentorship by TUBITAK under other programs? Can you elaborate on these supports?
6. Do you think that the financial support in the BiGG program (200,000 Turkish Lira) is sufficient? Does TUBITAK receive feedback on this? Is it discussed in TUBITAK?

- **Role of implementing agencies**

7. The BiGG program is a rare example that the public institution transfers one stage of the support program to private sector-university support organizations. What do you think about this decision and its consequences?

8. Under which TUBITAK program, for how long and according to which criteria are the implementing agencies selected?
9. To what extent is the implementing agency free to design and implement the processes under the program?
10. What is the relationship between the implementing agencies and TUBITAK? Such as periodic reporting, meetings, etc. Is there a coordination or direction? Can you give examples of formal and informal interactions between TUBITAK and implementing agencies?
11. According to your observations, to what extent is the interaction and experience sharing among implementing agencies in Turkey? Do you, as TUBITAK, conduct activities to encourage this interaction?
12. Do you receive feedback on the program design and development areas from the entrepreneurs supported under the BiGG program (i.e., any direct or indirect information transfer through all kinds of formal or informal interaction)? Could you give an example?
13. Well, do you receive feedback from the implementing agencies on program design and deficiencies (through all formal and informal interactions)? Could you give an example?
14. In your opinion, what are the most important contributions of the BIGG program to the entrepreneurial ecosystem in Turkey? How would these contributions be sustainable?
15. What are your thoughts on the BiGG program future?
 - a. In which areas do you think it is open to change or develop? Do you think there are things that need to change?
 - b. Is it possible for TUBITAK to have a model in which all processes are only left to implementing agencies and TUBITAK only act as a funder?

A.2. FOR THE MANAGER OF IMPLEMENTING AGENCY

- **About the implementing agency**

1. Could you briefly tell us about the institution (*name of the institution*)?
 - a. What is the year of foundation?
 - b. What kind of organization model did it follow? (e.g., university/academia, independent investor, public or private sector funded)?
 - c. How would you describe the institution in terms of capital structure? For-profit, non-profit, under university, etc.
 - d. How many people in your organization work for the incubation or acceleration programs?

- e. From which sectors do more entrepreneurs participate in your program?
Do you notice any clustering? Do you give priority on certain sectors?
2. Which services do you provide? Are there particular services that are emphasized or focused?
3. Is the acceleration or incubation program on a strict schedule? How flexible is it?
4. Do you outsource non-financial support to entrepreneurs or are all provided by human resources from the institutions?
5. Does your support program have a written curriculum? Are support activities also delivered online? Are these still accessible afterwards?
6. Could you tell me about your mentoring network?
 - a. How many active mentors do you have?
 - b. How often do they provide support to entrepreneurs?
7. Do you observe any competition in your program applications?
 - a. On average, how many entrepreneurs apply to your support program?
 - b. On average, how many of them do you accept?
 - c. On average, how many entrepreneurs do you graduate per year?
 - d. Has this trend been increasing in recent years?
8. Do you offer alternatives to entrepreneurs who are rejected from the program? If so, what kind of alternatives?
9. What are the opportunities you provide to entrepreneurs outside the BiGG Program?
10. Are there any services, support, etc. you would like to add?
- **TUBITAK BiGG program and implementing agencies**
11. How long have you been an implementing agency in the BiGG program? What is the aim of being an implementing agency?
12. Have you guided entrepreneurs to the BiGG program before you became an agency?
13. Could you tell me about the services you provided at your institution during the program? What do you think about the role of implementing agencies in the BiGG program? Why are implementing agencies important for this process? Do you think they play a key role?
14. On average, how many entrepreneur candidates apply to the BiGG program per year via your institution?

15. Do you guide entrepreneurs, who are already in other programs, to BiGG? If so, why?
16. Do you think the application process for the TÜBİTAK BiGG program is competitive? What is your reflection on more or less competitive compared to the acceleration or incubation application process?
17. On average, what percentage of the applicants to the BiGG program do you accept?
18. Do you think your institution provide distinctive services when you consider other implementing agencies?
 - a. Can you give examples of distinctive services?
 - b. Do you think that these distinctive features help the entrepreneurs in your program one step ahead in the TÜBİTAK BiGG process?
19. To what extent do you follow other implementing agencies? How often do you communicate with them and for what purposes? To what extent do you think there is interaction and experience sharing between implementing agencies?
20. Do you think there is competition between implementing agencies to attract entrepreneurs from the ecosystem?
21. What kind of knowledge or skills does entrepreneurs have when they go through your program within the BiGG scope?
 - a. Do you think entrepreneurs from your program is ready to start a company? Should they go through additional program?
22. Let's think of the incubation or acceleration program and the BiGG program as two separate processes. Do you think there are overlapping or repeating processes (training, support, network relations, etc.) in these two? If so, could you give an example?
23. Based on your own experience, if you could change one thing in the BiGG program, what would it be? What should be done differently to make the BiGG process more efficient and effective?
24. Do you think they are overcrowded or redundant processes in the BiGG program framework?
25. Do you think the interaction between the implementing agency and TÜBİTAK is beneficial for those who design and run the BiGG program?
 - a. Could you give specific examples of what policy makers have learned from this interaction?
 - b. Could policy suggestion or feedback from implementing agency and entrepreneur, share with TÜBİTAK officials?

- c. Have such suggestion or feedback impacted on changing BiGG implementation? Can you give an example?
 - d. Is it possible for the program to be sustained without public support and to be beneficial for innovation-based initiatives? What do you think is needed for sustainability?
26. Could you share your thoughts on the effectiveness and widespread impact of the BiGG program?

A.3. ENTREPRENEURS

- **About the BiGG program**

1. Have you applied for any public support program other than BiGG program? Which ones did you apply for, and which ones did you receive?
2. As an entrepreneur, have you participated in any pre-incubation, incubation, or acceleration programs? If so, under which institution did you participate in the program?
 - a. When did you enter the program? (Before/after the BiGG program, during the company establishment phase of the BiGG program)
 - b. How long did the program take?
 - c. What type of support did you receive? What kind of activities did you participate in during the program?
 - d. What are the three services you benefited the most from the pre-incubation, incubation, or acceleration program?
 - e. What are the most important contributions of the program to your entrepreneurship process? (Integration into business networks, market preparation, investor relations, etc.)
3. What support did you receive during the BiGG process (e.g., training, mentoring, etc.)?
4. What are the three most important supports you benefited from during the BiGG process?
5. What kind of knowledge and skills do you think an entrepreneur who has received BiGG support - if he/she has participated in a pre-incubation, incubation, or accelerator program - would have?
6. Do you think an entrepreneur who has received the BiGG support - if he/she has participated in a pre-incubation, incubation, or accelerator program - is ready to start a company? Are they ready for the market stage?

7. What are the most important contributions of BiGG program to your entrepreneurship process?
8. Did your relationship with the incubators continue during the company establishment phase of the BiGG program, and how? Did this relationship continue after the BiGG program?
9. How do you think your entrepreneurship process would have been if you had not received BiGG support?
10. Did you face any negative or undesirable situation for your entrepreneurship process in the BiGG program?
11. During the BiGG program process, do entrepreneurs give feedback to incubator staff about the BiGG program? If yes, could you give an example? (Any direct or indirect information transfer through all kinds of formal or informal interaction)
12. During the program process, do entrepreneurs give feedback to executives at TUBITAK about the BiGG program? If yes, could you give an example? (Any direct or indirect information transfer through all kinds of formal or informal interaction)
13. Based on your own experience, if you could change one thing in the BiGG program, what would it be? What should be done differently to make the BiGG process more efficient and effective?
14. When you think about the BiGG program activities (training, financial support, network activities, etc.), do you think that there are overcrowded or redundant activities?

- **About the entrepreneurs**

15. Could you briefly describe what your startup does?
 - a. What year did you found your startup?
 - b. In which sector does your startup operate?
 - c. Is your startup based in Turkey?
 - d. How many co-founders? (Gender, field of education, professional or work experience)?
 - e. Excluding the co-founders, how many people work in your company?
 - f. Have you made sales? If yes, how long after the establishment did you make the first sale?
 - g. Has your startup received investment? How many times and what was the amount? If you received investment, through which channel did you find the investment?

A.4. EXPERTS

1. How are technology-based entrepreneur training programs in general (TUBITAK-BiGG in particular) designed in Turkey? Where does the intervention idea and framework come from?
 - a. What is the level of interaction and coordination between policy institutions (TUBITAK, KOSGEB, Ministry of Industry and Technology, and others) in designing technology-based entrepreneurship programs?
2. Do you think there are enough support programs for technology-based entrepreneurship in Turkey? Do you agree that these programs provide support for the entire entrepreneurship process (i.e., from idea to market stages)?
3. Let's think about the TUBITAK BiGG program. The government-backed institution transfers a phase of the support program to private sector or university-based implementing agencies. What is your opinion or reflection about the implementing agency model? What do you think about this decision and its consequences?
4. In your opinion, how is the interaction and experience sharing among implementing agencies? Could you give examples and anecdotes that reflect the level of interaction? Are activities organized to encourage this interaction and experience sharing?
5. How is the interaction between ecosystem stakeholders (entrepreneurs, accelerators, experts, investors, etc.) and policy institutions? How do these stakeholders influence policy decisions? Could you give examples and anecdotes that reflect the level of interaction?
6. In your opinion, what are the most important contributions of the BiGG program to the entrepreneurial ecosystem in Turkey? How would these contributions be sustainable?
7. What are your thoughts on the BiGG program future?
 - a. In which areas do you think it is open to change or develop? Do you think there are things that need to change?
 - b. Is it possible for TUBITAK to have a model in which all processes are only left to implementing agencies and TUBITAK only act as a funder?

B. CODEBOOK

B.1. Implementing Agency (IA)

Ecosystem
Overview of the ecosystem
Contributions of the program
Overview of the IA model in the BiGG
Competition in applications to other IA programs
Entrepreneurs' transition between IA programs
Overview of the consortium model in the program
Collaboration
Among IA within consortium
Among entrepreneur within IA
Interaction
Not being aware of TUBITAK's decisions
Getting feedback from entrepreneurs
Among IAs
Between IA and TUBITAK
IA activities in the BiGG process
Suggesting alternatives other than the BiGG
Target-oriented trainings
BIGG and pre-incubation together (critical)
Selection criteria for BIGG
Incorporation and accounting trainings
Performance of BiGG entrepreneurs in the market
Knowledge and skills of BiGG entrepreneurs
Readiness of BiGG entrepreneurs for establishment
Relationship between IA and entrepreneurs after the BiGG
IA network activities
BIGG mentoring
BIGG training
Independent on training content
Competition in the BIGG application
Intra-IA elimination in BIGG process
BiGG application process
BiGG success rates of the IA
IA other programs and services

Acceptance rate in other UK programs
Sectoral agglomeration
IA non-financial support (training)
IA mentorship activities
Other services (physical space, networking etc.)
Program schedules
Outsourcing
Entrepreneurs' rotation
Distinctive services of IAs
Entrepreneur's motivation for the BIGG
Providing advantages in other support mechanisms
For financial support
For reputation
Program bottlenecks and development areas
Long process for ready ones
Competition between IAs
Too much bureaucracy for entrepreneur
Inflexibility of the program
Evaluation of IA is problematic
IA need to specialize thematic areas
Results of transition to a reward system
Difficulty in finding qualified applicants
Reasons of dropping applications
Too many calls for the program
Insufficient financial grant
Opinion on TUBITAK as funder, IA as executors
Insufficient time of the training
Too many IAs
Uncertain schedule and delays
Solutions to speed up the process
IAs need to be self-sustaining
IAs need to be funded
Need to be contacted between entrepreneurs and TUBITAK
Need to follow-up BIGG entrepreneurs
Need to open thematic calls
Company formation postponement
IA demography
Number of employees
Organizational structure

B.2. TUBITAK

Interaction
Between TUBITAK and IA
Among IAs
Between TUBITAK and entrepreneur
Encouragement of interaction among IAs
Cooperation
Differences small and large city entrepreneur
Increasing entrepreneurial activity in least developed cities
Competition over cooperation among IAs
Consortium; know-how transfer between IAs
Promoting ecosystem collaboration
Feedback anecdotes
Feedback channels for IAs
Post-program meetings
No channels for entrepreneurs
Getting ideas from the ecosystem for policy change
Criticisms on bureaucracy
Widespread of the program
Objective of program dissemination
Number of IAs
Diffusion of knowledge from large to other IAs
Business plans starting to look alike
Ecosystem
IA's learning and establishing a funding system
Creating an ecosystem by the BiGG program
Contribution of the program to the ecosystem
Entrepreneur's motivation for choosing BiGG
For financial support
For reputation
Reasons of dropping applications
BiGG- preparation for establishment and market
Not ready for investment
Readiness for the market
Readiness for the establishment
BiGG plus: market-oriented mentor support
Need to test market fitness
IA model (decentralization)

Too many IAs
Success of the IAs
Specialization of IAs versus outsourcing
The bottleneck in human resources of the IAs
Turning into internal resources with a reward system
IA need to specialize for thematic areas
Selection of IAs
Selection criteria
Evaluation of IAs
Entrepreneur selection and evaluation processes
BIGG process, execution, and implementation
Processes in each phase
Decentralization of the program
TUBITAK's guidance to other supports after BIGG
Too many calls during the year
Performance evaluation of IAs
Elimination of underperforming IAs
Panel presentation
Face-to-face presentation before
Investors participating in the panel
Industry representatives participating in the panel
IA continues to support in 2 nd phase
Post-panel company establishment
Policy changes; performance-based fund and consortium
They cannot form consortia on their own
Opening call for thematic areas
Program acceptance rate
BiGG development areas
Need to reduce number of IAs
Need to increase the financial grant
Need to reduce competition
BIGG as a field of experimentation
Opinion on TUBITAK as funder, IA as executors
Fewer entrepreneurs for increased support
Human resources (TUBITAK)
Number of executives for the program
No time for policy design due to workload

B.3. ENTREPRENEUR

Interaction among entrepreneurs
Meeting together previous cohorts
Consultation from IA to meet entrepreneurs
Being in the same environment
Online chat groups
Cooperation/assistance among entrepreneurs for problem-solving
Contribution of the BiGG program
Grant only pre-seeded
Readiness for establishment + parallel programs
Knowledge and skills + parallel programs
Readiness for the market + parallel programs
Interaction between entrepreneurs and TUBITAK (weak)
Interaction between entrepreneurs and implementing agency
Activities, close relationship, problem solving
Relationship with IA after the BiGG
Informal interaction via online chat groups
Online activities restricting interaction
IA getting feedback by surveying entrepreneurs
Direct feedback via personal communications
No preferring to give feedback
Does the UK communicate entrepreneur feedback?
Weak follow-up mechanism after the program
BiGG program activities and its contributions
BiGG process under IA
BiGG training and mentorship
Other activities within the IA
Qualifiers within the UK
Three most important contributions
UK parallel activities and programs
Participation in a parallel incubation/acceleration program
Three services benefiting from these programs
Parallel program activities
Program bottlenecks and development areas
Bureaucracy and too much paperwork
Long duration of the process
Company formation postponement

Financial burden of establishment after BiGG
Improving network/visibility activities
Company processes / financial coach opportunity
Insufficient time of the training
Insufficient financial grant
Challenge of providing gradual granting
Increasing financial management
Uncertain schedule and delayed payments
Close contact environment for more feedback channels
Development of PRODIS system
Need to provide grant according to thematic area
Accountant in the market is problematic
Failure of referee appointment
Improving networking activities needs for the market
Clear explanation of the BiGG process
Entrepreneur Demography

B.4. EXPERT

Program bottlenecks and development areas
Too many IAs
Insufficient financial grant
Need to focus on market and customer
Panelists need to have commercial perspective
Uncertain schedule and delays
Opinion on TUBITAK as funder, IA as executors
Need to follow-up BIGG entrepreneurs
Interaction
Between IA and entrepreneurs
Among IAs
Between IA and TUBITAK
Among all ecosystem actors
Contribution of the BiGG program to ecosystem
Overview of the UK model
Overview of the consortium model
Awareness and popularity of entrepreneurship
Government policy fill the financial gap
Widespread of support through government policy
Increasing capacity of IA in different regions
Delivering various supports to entrepreneurs via IAs
Specialization of IAs

Providing non-financial support
Need mechanism for the sustainability
Increasing interaction within the ecosystem
Entrepreneur's motivation for choosing BIGG
Opinions on IA model
IA in the independent curriculum
Selection and filter of entrepreneurs
BiGG program and additional incubation
Guiding other facilities via IAs
Human resource circulation in the IAs
Increasing the network of the program via IAs
Content and transformation of the BiGG
History of the BIGG program
Decentralization of the program
Performance-based reward to IAs
Panel participants (academics, investors, industrialists)
Applying for a second time
State of the technology-based entrepreneurship support
Importance of government intervention
Support program for different entrepreneurship stage
High intervention in entrepreneurship support
The potential of the ecosystem is high
Need to study identifying ecosystem deficiencies
Getting feedback from the ecosystem
Designing entrepreneurship policy
National strategies into policy through consultation
BIGG process includes high feedback

C. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE

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26 Temmuz 2021

Konu : Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi : İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın İbrahim Semih AKÇOMAK

Danışmanlığımı Yürüttüğünüz Şeyhmus Ekin ERDOLU'nun "Teknogirişim Sermaye Destek Programı (BIGG) ve Hızlandırma Faaliyetleri nasıl etkileşime geçiyor?" başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülmüş ve 322-ODTU-2021 protokol numarası ile onaylanmıştır.

Saygılarımızla bilgilerinize sunarız.

Prof. Dr. Mine MISIRLISOY
İAEK Başkan

D. TURKISH SUMMARY / TÜRKÇE ÖZET

Girişimcilik, çeşitli aktörlerin karmaşık sosyal ve finansal etkileşimlerini içeren bir süreç olarak tanımlanabilir. Bu karmaşık etkileşimler ve faaliyetler kümesi son zamanlarda "girişimcilik ekosistemi" olarak adlandırılmaktadır (Isenberg, 2011; Mason ve Brown, 2014; Stam, 2015; Spigel, 2016; Audretsch ve Belitski, 2017). Girişimcilik ekosistemi tanım gereği (1) girişimciler, üniversiteler ve destek kuruluşları gibi çok aktörlü katılımını, (2) altyapı, finans ve kültür gibi çeşitli unsurların etkilerini ve (3) işbirliği, karşılıklı bağımlılık, network ve etkileşim kavramlarını öne çıkarmaktadır. Bu yapıyla tek tip bir girişimcilik ekosistemi olmamakla birlikte bir ekosistemi oluşturan unsurlar ve aktörler genellikle farklı bağlamlarda çeşitlilik göstermektedir. Dolayısıyla geçmiş çalışmalar ülke, bölge, şehir, üniversite ve destek programı bağlamında ekosistem dinamiklerini incelemiş, unsurları ve aktörlerine ilişkin kavramsal bir çerçeve oluşturmaya odaklanmıştır (Isenberg, 2011; Rice vd., 2014; Stam, 2014; Spigel, 2016; Spigel, 2017; Miller ve Acs, 2017; Stam ve van de Ven, 2021). Ekosistemin farklı aktörleri arasındaki etkileşim üzerine saha araştırmaları ise girişimcilik literatüründe sınırlı kalmaktadır. (Motoyama ve Knowlton, 2016; Theodoraki ve Messeghem, 2018; Hernandez-Chea vd., 2021; Alaassar ve diğerleri, 2022). Bu çalışmalar, belirli bir bağlamda girişimcilik ekosisteminin dinamiklerini araştırmanın önemli olduğunu göstermektedir. Bu tez, Türkiye'deki belirli bir destek programı bağlamında ekosistem unsurlarının ve aktörlerinin detaylı bir şekilde incelenmesiyle bu çabalara katkıda bulunmaktadır.

Girişimcilik ekosistemi üzerine yapılan araştırmaların çoğu gelişmiş ekonomilere odaklanmıştır. Ancak, gelişmiş ekonomilere dayanan çerçeve gelişmekte olan ekonomilerdeki ekosistemi açıklamakta eksik kalmaktadır. Öte yandan, gelişmekte olan ekonomilerde girişimcilik ekosisteminin etkileşim dinamiklerini derinlemesine inceleyen sınırlı sayıda çalışma bulunmaktadır (Junior vd. 2016). Türkiye'deki girişimcilik ekosistemi üzerine yapılan önceki araştırmalar ise ekosistemdeki etkileşim dinamiklerinin ayrıntılı ampirik analizinden ziyade, girişimcilik aktivitelerinin belirleyicileri (Türker ve Selçuk, 2009; Tunalı ve Şener, 2019) ve başarı faktörleri (Benzing vd. 2009) ile destek kuruluşları ve politikalarının değerlendirilmesi (Akcomak ve Taymaz, 2007; Özdemir ve Şehitoğlu, 2009; Sungur, 2015) üzerine

yoğunlaşmıştır. Bu tezde, teknoloji tabanlı girişimcileri destekleyen önemli bir politika aracı olan TÜBİTAK BiGG programına odaklanarak ekosistem faaliyetlerini ve aktörler arasındaki etkileşim dinamiklerini detaylı açıklamaktadır.

Bu tez, Türkiye'nin girişimcilik ekosistemindeki aktörler arasındaki etkileşimleri incelemektedir. Bunu kapsamda, Türkiye'nin en önemli kamu destek programı olan TÜBİTAK'ın Bireysel Genç Girişimcilik (BiGG) Programı'na odaklanmaktadır. TÜBİTAK BiGG programı uygulanmasının iki nedenden ötürü Türkiye girişimcilik ekosistemi etkileşim dinamiklerinin anlaşılmasına katkı sağlamaktadır: (1) programda farklı aktörler yer almakta ve (2) program, aktörlerin etkileşimini ve işbirliğini teşvik eden çeşitli girişimcilik faaliyetlerini içermektedir. Bu bağlamda, bu politika aracı, aktör etkileşiminin boyutunu araştırmak için doğal bir ortam sunmaktadır. Programda yer alan ana aktörler; devlet destekli bir kurum olarak TÜBİTAK, uygulayıcı kuruluşlar olarak üniversite kuluçka merkezleri ve program yararlanıcısı olan girişimcilerdir. Program çerçevesi içinde veya dışındaki çeşitli faaliyetler, bu aktörlerin yanı sıra eğitmenler, mentorlar ve özel sektör firmaları gibi diğer aktörlerin etkileşimini de kolaylaştırmaktadır.

Araştırma üç ana soru etrafında şekillenmektedir: (1) BiGG programı ne tür etkileşimleri kolaylaştırmaktadır? (2) Programı yürüten veya programa katılan çeşitli aktörler nasıl etkileşime girmektedir? (3) Bu etkileşimler ne tür faydalar ya da geri bildirimler sağlıyor? Bu tez, bu soruları araştırarak BiGG programı çerçevesinde gerçekleşen faaliyetlerin, aktörlerin ve etkileşimlerin detaylı bir analizini, anlatımını ve dokümantasyonunu sunmaktadır. Bu etkileşimlerin nasıl gerçekleştiğini anlamak Türkiye girişimcilik ekosistemine etkilerini ve limitlerini ortaya çıkarmaya yardımcı olmaktadır. Bu etkiler ve limitler doğrultusunda bu tez, politika çıkarımları için de bir temel sağlamaktadır.

Tezin bulguları, girişimcilik ekosistemi literatürüne katkıların yanı sıra Türkiye'deki politika yapıcılar için önemli girdiler sağlamaktadır. İlk olarak bu tez Türkiye'de kamu destek programına odaklanarak girişimcilik ekosisteminin etkileşim dinamiklerini araştıran ve tanımlayan ilk detaylı saha araştırmasıdır. İkincisi, bu tez, kantatif sonuçlardan ziyade aktörler arasındaki etkileşimlerin sahaya özgü tanımlarını üretmekte ve dolayısıyla Türkiye'deki girişimcilik ekosisteminin anlaşılmasını zenginleştirmektedir. Üçüncü olarak, Türkiye'deki bir girişimcilik ekosisteminin

etkileşim dinamiklerinin araştırılması, gelişmekte olan ekonomilerdeki ekosistem üzerine yapılan sınırlı ampirik araştırmalara katkı sağlamaktadır. Dördüncüsü, ekosistem içindeki resmi ve gayri resmi etkileşimlerin ve geri bildirim mekanizmalarının ortaya çıkarılması, politika yapıcılara ekosistemin güçlü yönleri, eksiklikleri ve müdahale alanlarını belirlemek için girdi oluşturmaktadır.

Çalışmanın bulguları iki aşamalıdır. İlk olarak, aktörlerin TÜBİTAK BiGG programı kapsamındaki etkileşimleri ayrıntılı olarak anlatılmaktadır. Bu etkileşimler program süresince gerçekleşen iki üst düzey faaliyet altında ortaya çıkmaktadır: (1) uygulayıcı kuruluşların seçimi ve (2) farklı girişimcilik aktivitelerini içeren programın uygulanması. Ayrıca, saha çalışmasıyla ortaya çıkarılan, analiz edilen ve belgelenen tüm bu etkileşimler iki kategori altında gruplandırılmıştır: (1) resmi ve (2) gayri resmi etkileşim. Resmi etkileşimler, program aşamaları ve prosedürleri aracılığıyla çerçevelenen aktörler arasındaki etkileşimleri ifade etmektedir. Gayri resmi etkileşimler ise sahadan ortaya çıkarılan, görünmeyen ve yan ürün niteliğindeki etkileşimlerdir. İkinci olarak, bu etkileşimlerin girişimcilere, uygulayıcı kuruluşlara, TÜBİTAK'a ve genel ekosisteme katkılarını tartışılmaktadır. Tüm bu bulgular ışında bu tez programa ve Türkiye girişimcilik ekosistemine ilişkin politika önerileri sunulmaktadır.

Uygulayıcı kuruluşların seçimi, TÜBİTAK'ın program uygulayıcı kuruluşlarını kendi direktifleri ve beklentileriyle görevlendirmesine olanak tanımaktadır. Ancak uygulama, bu kuruluşların önerdiği hizmet ve modellere bırakılmakta, böylece uygulayıcı kuruluşlar belirli bir serbestliğe sahip olmaktadır. Bu faaliyet kapsamında TÜBİTAK, ajansların faaliyetlerini izlemekte ve program kapsamında başarılı girişimci sayısına göre değerlendirerek fonlamaktadır. TÜBİTAK'ın uygulayıcı kuruluşlardan beklentisi iyi hazırlanmış ve başarılı girişimciler, uygulayıcı kuruluşlar ise bu beklentileri karşılamak için çalışmakta, bu da çok taraflı bir işbirliği ortamını tanımlamaktadır.

Öte yandan, 2020 yılında uygulanan iki politika değişikliği, uygulayıcı kuruluşlar arasındaki etkileşimi etkilediği görülmektedir: (1) uygulayıcı kuruluşlar arası konsorsiyum ve (2) uygulama öncesi fonlama mekanizmasının performansa dayalı fon sistemine dönüşmesi. 2020 yılı itibarıyla TÜBİTAK BiGG programı düşük performanslı ajansların yüksek performanslı ajanslarla ortak çalışmasına izin

vermiştir. Bu ajanslar programın görevlerini koordineli bir şekilde yürütmekte ve bazıları ne tür faaliyetler veya destekler sağladıklarını paylaşmak üzere bir araya gelmektedir. Bu koordinasyon, yüksek performans gösteren ajanslardan düşük performans gösteren ajanslara sınırlı da olsa bilgi aktarımını mümkün kılmaktadır. Konsorsiyum dışında ise birkaç kişisel girişim dışında söz konusu kuruluşlar arasında herhangi bir koordinasyon veya bilgi paylaşımı neredeyse hiç bulunmamaktadır. Tam tersine, performansa dayalı fon sisteminin ise uygulayıcı kuruluşlar arasında rekabeti artırdığı ve konsorsiyum dışındaki etkileşimi daha da sınırlı hale getirdiği görülmektedir.

Programın uygulanma süreci ise ekosistemdeki aktörler arasında (1) resmi ve (2) gayri resmi olmak üzere çeşitli etkileşimleri kolaylaştırmaktadır. Resmi etkileşimler çeşitli faaliyetleri içermektedir. İlk aşamada; (1) eğitim ve mentorluk, (2) fikir doğrulama, (3) girişimcilerin seçimi ve ikinci aşamada (4) panel sunumu ve nihai değerlendirme ve (5) gelişme raporu teslimi. Programın birinci aşamasında İlk aşamada uygulayıcı kuruluşlar; eğitim, mentorluk ve fikir doğrulama gibi faaliyetler düzenleyerek girişimcilerin iş fikirlerini uygulanabilir bir iş modeli ve planına dönüştürmelerine yardımcı olmaktadır. Böylece ekosistemdeki çeşitli eğitimler, mentorlar ve özel sektör şirketleri, uygulayıcı kuruluşların kapasitesi veya dış bağlantıları aracılığıyla programa dahil olmaktadır. Girişimciler, ilk aşama boyunca iş planlarını geliştirmek için rehberlik ve geri bildirim almak üzere eğitimler ve mentorlarla periyodik olarak birer bir görüşmeler yapmaktadır. Periyodik görüşmelerin yanı sıra girişimciler, uygulayıcı kuruluşların ağından ek mentorlar bularak teknik veya pazar tavsiyelerini karşılayabilmektedir. Ayrıca, iş modellerini piyasada doğrulamak için erken bir aşamada ajanslar ağı aracılığıyla özel sektör şirketleriyle de tanışırlar. Bu aktiviteler aracılığıyla uygulayıcı kuruluşlar, girişimciler ve diğer ekosistem aktörleri arasında köprü görevi görerek etkileşimi kolaylaştırmakta ve etkileşimi program sınırlarının ötesine taşımaktadır.

İkinci aşama aktiviteleri ise daha çok girişimcilerin başarıyla tamamlaması gereken bir dizi prosedürü içermektedir. Önemli olabilecek faaliyet ise TÜBİTAK'ın bir panel sunumu düzenleyerek girişimcilerin iş fikirlerini değerlendirmesidir. Bu aşamada girişimciler, TÜBİTAK'ın atadığı akademisyenler ve sektör temsilcilerinden oluşan bir panel sunum jürisi ile etkileşime girmektedir. Bu süreçlerin sonunda girişimciler

450.000 TL hibe almaya hak kazanıyor. Özetle program ilk aşamada erken aşama girişimcilerin pek çok ekosistem aktörüyle etkileşime girmelerini teşvik etmekte ve finansal olmayan hizmetler sağlarken ikinci aşamada girişimciler finansal hibeye hak kazanmaktadır.

Çalışma kapsamında saha çalışması, BiGG programı çerçevesinin ötesinde bu programın aktörler arasında görünmeyen gayri resmi etkileşimleri kolaylaştırdığını ortaya koymuştur. Bu etkileşimler (1) uygulayıcı kurum ile girişimci, (2) girişimciler ve (3) uygulayıcı kurumlar arasında görülmektedir. Ayrıca, resmi etkileşimler, program uygulamasını iyileştirmek için ana aktörler arasındaki gayri resmi geri bildirim mekanizmalarını da tetiklemektedir. Bu mekanizmalar hiyerarşik olarak (1) girişimciden uygulayıcı kuruluşlara ve (2) uygulayıcı kuruluşlardan TÜBİTAK'a kadar uzanmaktadır.

İlk olarak, uygulayıcı kurum ile girişimci arasındaki ilişki, (1) girişimcileri tamamlayıcı kuluçka programlarına alarak ve (2) program kazananları için fiziksel olanaklar sağlayarak programın kapsamının ötesine geçmektedir. Tamamlayıcı hizmetler, uygulayıcı kuruluşlar ve girişimciler arasında devam eden destek ve etkileşimi mümkün kılmaktadır. Nihayetinde, girişimcilerin ekosistemde kalmalarını ve uygulayıcı kurumlar aracılığıyla diğer ekosistem aktörleriyle bağlantılar kurmalarına imkan sağlamaktadır.

İkinci olarak, BiGG programı girişimcilerin aynı süreçlerden geçtiği ve benzer sorunlarla karşılaştığı kohort tabanlı bir programdır. BiGG programındaki girişimcilerin, uygulayıcı kuruluşların kurduğu çevrimiçi sohbet gruplarında ve aynı ortamda yüz yüze etkileşime açık olduğu saha çalışmasında görülmektedir. Bu etkileşim ile girişimciler program prosedürleri, ek ihtiyaçlar ve yeni ağlar kurma konusunda birbirlerine yardımcı olmaktadır. Ayrıca saha çalışması, girişimcilerin sohbet grupları aracılığıyla veya uygulayıcı kurumların yönlendirmesiyle önceki BiGG girişimcilerine eriştiğini göstermektedir. Bu tür etkileşimlerin çoğu sorun çözmeye yönelik olup nadiren işbirliğine teşvik etmektedir.

Üçüncü olarak, konsorsiyum dışında uygulayıcı kurumlar arası gayri resmi etkileşimler ve işbirlikleri zayıftır. TÜBİTAK'ın periyodik olmayan program sonrası toplantıları ve bazı kişisel çabaları sınırlı derecede bilgi ve deneyim paylaşımını kolaylaştırmaktadır. Bu bilgi akışı asgari düzeyde olup genellikle diğer kurumların ne

kadar başarılı oldukları ve program kapsamında ne tür faaliyetler sağladıkları ile ilgilidir. Bunun bir nedeni, ekosistemdeki uygulayıcı kuruluşların girişimcileri kendi ağlarına katma konusunda rekabetçi olmalarıdır. Bir diğer neden ise fonlama mekanizmasının performansa dayalı bir ödül sistemine dönüştürülmesinin söz konusu kuruluşlar arasındaki bu rekabeti artırmasıdır. Ayrıca, program sonrası etkinlikler pandemi sonrasında periyodik olarak gerçekleşmemiş, bazı çevrimiçi toplantılar sahada verimsiz olarak görülmektedir.

Son olarak bu tez, program uygulamasını iyileştirmeye yönelik aktörler arasındaki gayri resmi geri bildirim mekanizmalarını ortaya çıkarmıştır. Bu geribildirimler (1) uygulayıcı kurumlardan TÜBİTAK'a (hizmet sağlayıcılardan politika kurumuna) ve (2) girişimcilerden uygulayıcı kurumlara veya TÜBİTAK'a (hizmet sağlayıcılar ve politika kurumu) şeklindedir. Birincisi, TÜBİTAK tarafından program sonrası toplantı (periyodik olmayan) ve kişisel iletişim kanalları, hizmet sağlayıcılar ve politika kurumları arasında geri bildirim mekanizmalarını mümkün kılmaktadır. Bu sayede uygulayıcı kuruluşlar saha deneyimlerini, sorunlarını ve gözlemlerini bir bakıma TÜBİTAK'a yansıtabilmektedir. Öte yandan uygulayıcı kuruluşlar, girişimcilerden kendi sorunları ve deneyimlerinin yanı sıra program faaliyetleri ve uygulamaları hakkında geri bildirim almaya açıktır. Sahadan elde edilen bulgular, girişimcilere yönelik anketler ve yüz yüze/çevrimiçi olarak doğrudan iletişim aracılığıyla bu geribildirim mekanizmanın var olduğunu kanıtlamaktadır. Son olarak, girişimcilerden TÜBİTAK'a doğrudan geri bildirim mekanizması neredeyse yok denecek kadar azdır. Fakat girişimciler olası geri bildirimlerini genellikle uygulayıcı kuruluşlar aracılığıyla TÜBİTAK'a iletebilmektedir. Ancak girişimciler TÜBİTAK'a geri bildirimde bulunmamayı tercih etmektedir. Bunun iki nedeni saha çalışmasından ortaya çıkmıştır. Birincisi, girişimcilerin geri bildirimlerin göz ardı edildiğini ve dikkate alınmadığını hissetmeleri, ikincisi ise kamu destek programı olması nedeniyle prosedürlerin değişmeyeceğini düşünmeleridir. Program içindeki aktörler arasındaki geri bildirim mekanizmaları, periyodik olmayan nadir toplantılara ve kişisel iletişim çabalarına dayandığı için sınırlıdır. Ancak bu mekanizma, politika yapıcı kuruluşların, kamu destek programlarını ve politikalarını yeniden gözden geçirmesi ve iyileştirmesi açısından kritiktir.

Tezin bulguları BiGG programı kapsamındaki etkileşimlerin ilgili aktörlere çeşitli katkılar sağladığını ortaya koymaktadır. İlk olarak, girişimciler eğitim ve mentorluk sayesinde temel girişimcilik bilgi ve becerileri kazanmakta, program sayesinde erken aşama finansmana erişebilmektedir. Bir diğer katkı ise, uygulayıcı kurumlar aracılığıyla çeşitli network faaliyetlerine katılmaları ve programda elde edilen başarının ekosistemde bir etiket olarak görülmesi nedeniyle girişimciler için yeni fırsatlar yaratmasıdır. İkinci olarak, uygulayıcı kuruluşlar çeşitli destek aktiviteleri düzenlemekte, network faaliyetleri yürütmekte ve diğer ekosistem aktörleriyle çeşitli etkileşimlere katılmaktadır. Uygulayıcı kuruluşlar bu faaliyetler aracılığıyla ve farklı girişimcilik vakalarından öğrenme yoluyla kapasitelerini artırabilmektedir. Son olarak TÜBİTAK, program uygulamasından çıkarımla ve sahadan gelen geri bildirimlerle belirli bir know-how elde edebilmektedir. Ancak program çerçevesinde sadece birkaç örnek görüldüğü için sahadan öğrenmenin sınırlı olduğu söylenebilir. Bunlardan biri, uygulamadan dersler çıkararak ilk aşamada finansal olmayan destek faaliyetlerini kuluçka merkezlerine devrederek süreci merkeziyetsiz bir yapıya dönüştürmesidir. Diğer örnek ise sahadan gelen geri bildirimlere yanıt olarak mali hibe miktarının artırılmasıdır.

Tezin sahaya özgü bulguları, girişimcilik ekosistemindeki etkileşim dinamiklerinin derinlemesine anlaşılmasına, ekosisteminin nasıl işlediğine ve programın katkılarına dair içgörü sağlamaktadır. Peki, TÜBİTAK BiGG programı kapsamındaki etkileşimler Türkiye girişimcilik ekosistemini hakkında ne söylüyor?

Kamu politikası araçları (yani BiGG programı) Türkiye'nin girişimcilik ekosistemindeki aktörler arası etkileşimi ve bilgi aktarımını kolaylaştırmaktadır. İlk olarak BiGG programı, devlet destekli bir kurum ile kuluçka merkezleri arasında finansman mekanizmalarının ötesinde bir işbirliği oluşturmaktadır. Türkiye'de arayüz kuruluşlarını teşvik etmeye yönelik kamu destek programlarının birçoğu, işbirliğine dayalı bir ilişki oluşturmaktan ziyade finansal destek sağlamaktadır. Öte yandan, BiGG programında uygulayıcı bir kuruluş olarak kuluçka merkezleri, çeşitli sektörlerden ve bölgelerden girişimci fikirleri toplamakta, finansal olmayan destek sağlamakta ve onları iyi hazırlanmış şekilde kamu kaynaklarına ulaştırmaktadır. Bunu, devlet destekli kurumlarla işbirliği ve koordinasyon halinde yürütmektedir. Ayrıca, girişimciler program kapsamında kuluçka merkezleri sıkı ilişkiler kurmakta, bu sayede

tamamlayıcı hizmetler ve network faaliyetleri ile program kapsamının ötesine geçmektedir. Kuluçka merkezleri tarafından yürütülen bu faaliyetler, çeşitli dış aktörleri program çerçevesine dahil ederek farklı etkileşim ve ağ türlerini de mümkün kılmaktadır.

Program kapsamındaki bu etkileşimler Türkiye'nin girişimcilik ekosistemine önemli katkılar sağlamıştır. Örneğin, işbirliği yoluyla uygulayıcı kuruluş modelinin uygulanması, devlet destekli kuruluşların farklı bölgelerde girişimcilik bilincinin yaygınlaştırılmasına, bu bölgelerden teknoloji tabanlı fikirlerin toplanmasına ve bu fikirlere erken aşama destekler sağlanmasına yardımcı olmaktadır. Fakat bu tez söz konusu faaliyetlerin kalitesini değerlendirmekte sınırlı kalmaktadır. Sonraki çalışmalar girişimcilik faaliyetlerinin içeriğini araştırarak az gelişmiş bölgelerdeki girişimcilik faaliyetlerinin kalitesine ilişkin bulgular sunması kritiktir.

BiGG programı, aktörlerin etkileşimlerini ve işbirliğini içeren çeşitli girişimcilik faaliyetlerini içeren izole bir ekosistem yapısındadır. Gelişmekte olan ekonomilerde kuluçka merkezleri ve benzeri yapılar girişimciler ve diğer ekosistem aktörleri arasında köprü kurmada aracı bir rol oynamaktadır (Mair vd., 2012; Goswami vd., 2015; van Rijnsoever, 2022). Benzer şekilde, BiGG programı kapsamındaki üniversite temelli kuluçka merkezleri, programın izole yapısını bir ölçüde genişletebilmektedir. Bu kuruluşlar farklı network faaliyetleriyle girişimcileri mentorlar, özel sektör şirketleri ve yatırımcılarla buluşturarak programın çeperini genişletmektedir. Dolayısıyla, kuluçka merkezi gibi yapıların hem BiGG programı içindeki hem de genel ekosistemdeki etkileşim dinamiklerini arttırdığı söylenebilir. Yine de bu tez, bu ağın daha az gelişmiş bölgeler için mevcut olup olmadığına cevap verememektedir. İleride yapılacak çalışmalar, Türkiye'nin az gelişmiş bölgelerindeki girişimcilik destek kuruluşlarının etkileşimini ve ağını araştırmayı amaçlamaktadır.

Öte yandan tez, girişimcilik ekosistemindeki kuluçka merkezleri arasında sınırlı etkileşim, koordinasyon ve bilgi transferi olduğunu ortaya çıkarmaktadır. Bunun sebeplerinden biri kuluçka merkezlerinin girişimcileri çekme konusunda rekabet halinde olmalarıdır. Öte yandan, Motoyama ve Knowlton'ın (2016) çalışması, devlet sponsorluğunun St. Louis'deki yerel girişimcilik destek kuruluşları arasında koordinasyonu tetiklediğini ortaya koymaktadır. Alaassar ve diğerleri (2022) tarafından yapılan bir başka çalışma ise ekosistemin etkileşim dinamiklerinin

Singapur'daki çeşitli aktörler arasında hem finansal hem de bilgi transferini mümkün kıldığını savunmaktadır. Benzer şekilde, BiGG programı da farklı bölgelerdeki kuluçka merkezleri arasında sınırlı da olsa bir etkileşimi, koordinasyonu ve bilgi paylaşımını tetiklediği görülmektedir. Fakat kuluçka merkezleri arasındaki rekabetin bu bilgi aktarımının ekosistemde yaygınlaşması yerine program kapsamındaki konsorsiyum içine izole ettiği görülmektedir. Dolayısıyla, Türkiye ekosisteminde yüksek kapasiteli kuluçka merkezlerinden düşük kapasiteye bilgi aktarımı kayda değer düzeyde değildir.

Kamu politikası araçları (BiGG programı) farklı bölgelerde üniversiteler altında alt ekosistemler oluşturma niyetine yardımcı olmaktadır. BiGG programı kapsamında devlet destekli kurumlar ve üniversite tabanlı kuluçka merkezleri arasındaki etkileşim, çeşitli bölgelerde bir alt ekosistem oluşturma niyetini mümkün kılmaktadır. Bu alt ekosistemler, kaynakların ekosistemin "besleyicisi" olan devlet tarafından oluşturulduğu ve şekillendirildiği yukarıdan aşağıya ekosistem yaklaşımına dayanmaktadır (Feld, 2012; Stam, 2015; Colombo vd., 2019). Ayrıca, devlet destekli kurumlar ve kuluçka merkezleri, Türkiye'nin girişimcilik ekosisteminde bu niyeti teşvik eden çapa aktörlerdir (Colombelli vd., 2019). Ayrıca bu tez, söz konusu bölgelerdeki uygulayıcı kuruluşların girişimcilik destek faaliyetleri düzenleyerek, çeşitli girişimcilik vakalarıyla ilgilenerek ve program kapsamında sınırlı bilgi paylaşımı yaparak kapasitelerini geliştirdiklerini öne sürmektedir. Ancak yüksek kapasiteli kuluçka merkezlerine odaklanıldığından bu tez az gelişmiş bölgelerdeki alt ekosistemleri irdeleyememektedir. İleride yapılacak çalışmalar, ekosistemin az gelişmiş bölgelerde nasıl işlediğini ve bu alt ekosistemlerin Türkiye'deki diğer ekosistem aktörleri ve tesisleriyle ne kadar iyi etkileşim kurabildiğini inceleyebilir.

BiGG programı, çeşitli girişimcilik faaliyetlerini içermesi ve ekosistemdeki çeşitli aktörler arasında belirli bir düzeyde etkileşim olması nedeniyle bir ekosistem gibi davranmaktadır. Çeşitli çalışmalar, zaman içinde unsurlar ve aktörler arasındaki etkileşim yoluyla ekosistemin evrimsel doğasını vurgulamaktadır (Cohen, 2006; Malecki, 2018; Cho vd., 2022). Örneğin; Colombelli ve diğerleri (2019) tarafından yapılan çalışma, girişimcilik ekosisteminin zaman içinde doğum, geçiş ve konsolidasyon aşamalarına evrilirken hiyerarşik yönetişimden ilişkisel yönetişime doğru değiştiğini savunmaktadır. Program uygulaması da 2012'den bu yana birçok

gelişme ve dönüşüm yaşamış, dahil olan aktörler gelişip genişlemiş, bu da program dinamiklerini ve etkileşim dinamiklerini etkilemiştir. BiGG programının ilk uygulamasında TÜBİTAK, girişimcilere yalnızca mali destek sağlayan bir çapa aktördür. Daha sonra, üniversite tabanlı kuluçka merkezleri, finansal olmayan destek ve diğer girişimcilik faaliyetlerini sağlamak için program çerçevesine dahil olmuştur. Bu kuluçka merkezleri aynı zamanda Türkiye'deki genel ekosistemden çeşitli aktörler arasında köprü kurarak izole ekosistemi genişletmiştir. Dolayısıyla, BiGG içindeki etkileşim dinamikleri, şu anki haliyle, hiyerarşik yönetişimden ziyade ilişkisel yönetişime yaklaşmıştır. Bu tür bir etkileşim, BiGG programının Türkiye'deki bazı gelişmiş bölgelerde daha yerleşik ve belirgin bir ekosistem haline gelmeye başladığını göstermektedir. Buna ek olarak, Türkiye'deki girişimcilik ekosisteminin evrimi, gelişimi ve sürdürülebilirliğinin gelecekteki çalışmalarda araştırılması önemli olacaktır.

Girişimcilik politikalarına yönelik geri bildirim kanalları, Türkiye'nin girişimcilik ekosisteminde ekosistem politikalarını şekillendirmek için yeterli değildir. Girişimcilik ekosisteminde aşağıdan yukarıya geri bildirim, paydaş katılımı ve istişare yoluyla politika kararı alınmasının daha etkili ve verimli olacağı öne sürülmüştür (Autio ve Levie, 2017). Bu tez, BiGG programı için alınan birkaç politika kararının yukarıdan aşağıya yaklaşımlara sahip olduğunu ve ekosistemdeki girişimcilik faaliyetlerini ve etkileşim dinamiklerini etkilediğini ortaya koymaktadır. Örneğin, konsorsiyum modeli kuluçka merkezleri arasında belirli bir düzeyde işbirliği ve bilgi paylaşımına olanak sağlarken, performansa dayalı finansman rekabeti artırarak bu etkileşimleri sınırlamaktadır. Ek olarak, programa dahil olan aktörler arasında bazı geri bildirim mekanizmaları bulunsa da devlet destekli kurumlar bürokratik sorumluluklar nedeniyle sahadan gelen geri bildirimlere hızlı yanıt verememektedir. Politika kararları için geri bildirim mekanizmalarının eksikliği, etkili politika oluşturma ve girişimcilik ekosistemi için potansiyel faydalar önünde bir engel oluşturduğu söylenebilir.

Bu bulgular ışında, programın katkılarını artırmaya yönelik beş politika önerisi ve programın etkinliğini artırmaya yönelik ise dört politika önerisi sunulmaktadır. Bu tezin bulgularına dayanan politika önerileri, Türkiye'deki girişimcilik ekosisteminin

iyileştirilmesi konusunda fikir verebileceği gibi TÜBİTAK ve diğer politika kurumları için de faydalı olacaktır.

Ekosistem üzerindeki etkilerin artmasına yönelik politika çıkarımları

- Girişimcilik pazar aşaması için tamamlayıcı destek programların geliştirilmesi
- Program kapsamında ve ekosistemdeki geri bildirim mekanizmalarının güçlendirilmesi
- Üniversite tabanlı kuluçka merkezleri arasında deneyim paylaşımının teşvik edilmesi
- Düşük performans gösteren uygulayıcı kuruluşlar için program kapsamındaki finansman mekanizmasının geri getirilmesi
- Yatırımcıların BiGG programı sürecine dahil edilmesi

BiGG programının etkinliğinin artırılmasına yönelik politika çıkarımları

- Yukarıdan aşağıya politika değişikliklerinden kaçınılması
- Şirket kurma yükümlülüğünün programın daha ileri bir aşamasına ertelenmesi
- Girişimcinin sektörüne göre mali hibe miktarının yeniden gözden geçirilmesi
- Girişimcinin program kapsamındaki nihai değerlendirmesine uygulayıcı kuruluşun karar verdiği bir yapı oluşturulması

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TEZİN ADI / TITLE OF THE THESIS (İngilizce / English): Investigating Interactions in an Entrepreneurial Ecosystem: The Case of Individual Young Entrepreneurship (BiGG) Support Program in Turkey

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