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# OPEN INNOVATION AND INTRAPRENEURSHIP: A TURKISH TEXTILE CASE AND POLICY CONSIDERATIONS FOR EURASIAN ECONOMIES

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## ABSTRACT

Sustainability challenges in a globalized world have driven businesses, particularly in the Eurasian textile sector, to adopt open innovation for competitive advantage. This study examines the effects of inside-out and outside-in open innovation on intrapreneurship (innovativeness, risk-taking, proactiveness, autonomy) in garment and apparel manufacturing in Erzurum, offering broader insights for Eurasian economies. Survey data from 244 participants were analyzed using Pearson correlation, multiple regression, t-test, and ANOVA. The findings reveal that outside-in open innovation enhances innovation, while inside-out open innovation has stronger effects on risk-taking, proactiveness, and autonomy. This suggests that external knowledge integration fosters creativity, while knowledge sharing strengthens entrepreneurial behavior. Beyond Erzurum, the study highlights policy implications for Türkiye, Kazakhstan, Uzbekistan, and Azerbaijan, emphasizing the need for stronger R&D collaboration, cross-border innovation networks, and supportive policies to drive innovation-led growth in the textile sector. Businesses are encouraged to adopt open innovation strategies to enhance employee creativity, competitiveness, and regional economic development.

**Keywords**: Entrepreneurship, Intrapreneurship, Open innovation, Inside-out open innovation, Outside-in open innovation, Eurasian textile sector.

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## INTRODUCTION

Businesses today have to develop innovative strategies as they aim not only to survive but also to maintain their economic sustainability. This may require businesses to invest more in innovation and continuously update their business processes. Innovation is recognized as a key tool to increase the competitiveness of businesses. It not only ensures the survival of businesses but has also become a necessity for them to grow and adapt to market conditions. In this context, producing innovative solutions by using technology effectively has become a decisive factor in the success of businesses (Kılıç, 2019). Open innovation stands out as an approach that enables businesses to benefit from the knowledge and experience of external stakeholders without relying solely on their internal resources. This model offers businesses the opportunity to reduce costs, save time and develop a culture of collaboration (Deliormanlı, 2013). Chesbrough's concept of "innovation of innovation" emphasizes that open innovation is not limited to product development but can also transform business models. Thus, this strategy is considered the key to both gaining a competitive advantage and achieving sustainable growth (Chesbrough, 2003a). Entrepreneurship is recognized as one of the cornerstones of economic growth and social development. The realization of innovative ideas can enable individuals not only to achieve individual success but also to add value to society. Intrapreneurship refers to the application of an innovative approach within the organization. This model increases organizational competitiveness by supporting employees' creative ideas and fosters a culture of innovation (Pinchot, 1985). Intrapreneurship has become a strategic priority for modern businesses, enabling organizations to adapt quickly to the changing business world (Antoncic & Hisrich, 2001).

From this point of view, this study examines how open innovation influences intrapreneurship in Erzurum's textile sector by evaluating employees' internal and external open-innovation practices in relation to innovativeness, risk-taking, proactiveness, and autonomy. The findings indicate positive associations across these dimensions. The study contributes to the limited literature by clarifying how open-innovation strategies can be deployed effectively in the textile sector and by outlining organizational structures and policies that can better support innovation.

## THEORETICAL FRAMEWORK

### Open innovation

The classical, centralized view of R&D has become inadequate, leading Chesbrough to propose an approach that integrates external knowledge with internal R&D to reduce information loss. In 2003, Chesbrough's (2003a) "innovation of innovation" was introduced in Open Innovation: The New Imperative for Creating and Profiting from Technology, defining open innovation as valuable ideas that can originate inside or outside the firm and be brought to market. He also highlighted how market mobility and venture capital support commercialization (Chesbrough, 2003b). The core aim is to expand innovative practices through internal and external information flows so firms can grow and compete; companies therefore combine external resources with the marketing of internal innovations (Schroll & Mild, 2011).

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Open innovation involves knowledge moving from inside the organization to the outside or from the outside to the inside, encompassing the ideas and technologies exchanged in this process. Chesbrough emphasized a decentralized innovation approach (Tunç & Zincir, 2019). Chesbruogh (2006), regarded as a field pioneer, initially defined open innovation as "the use of fit-for-purpose knowledge inflows and outflows to accelerate internal innovation and expand markets for external use of innovation," and later as "Innovation refers to the development and commercialization of new or improved products, processes or services, while the openness aspect is represented by knowledge flows across permeable organizational boundaries" (Chesbrough & Bogers, 2014).

Rising technological change intensifies competition and forces firms to differentiate in products, services, and management, which often raises R&D costs. To manage these costs, firms enhance innovation by drawing on both internal and external knowledge sources (Acs & Audretsch, 2005). Increasing environmental uncertainty has pushed firms toward open innovation, encouraging information sharing and access to others' technologies. With globalization, expanding markets, uncertainty, and organizational variability have made a shift from traditional innovation to open innovation has become necessary. In this context, new and strategic open-innovation practices emerge with stakeholders in the knowledge network, guided by market demand and the firm's strategic vision (Gassmann & Engel, 2004). Seeking to speed organizational innovation, firms build collaborations with customers, suppliers, research institutes, universities, and associations. Thus, open innovation functions as a broad, evolving paradigm and as a complementary, dynamic practice.

**Importance and characteristics of open innovation**

Firms that adopt open innovation are highly active in their markets, which helps them capture opportunities and avoid adverse moves (Ağca, 2005). Such practices create competitive advantage, support innovative approaches, and reduce R&D costs while raising outputs. By combining R&D-derived knowledge with open-innovation mechanisms, firms generate new value. The purposeful externalization of intellectual property to create profit is likewise part of open innovation (Chesbrough & Garman, 2009). Open innovation accelerates both internal and external innovation and widens interfirm knowledge exchange as markets grow (Chesbrough et al., 2006). It relaxes organizational boundaries to enable inside-out, outside-in, and two-way flows, fostering collaboration and access to new markets. These open innovation processes include:

**Open innovation from the inside out:** Firms bring internally developed ideas to market to secure economic and time advantages, channeling technological outputs into new or existing markets. They transfer ideas and knowledge outside the firm, with or without monetary exchange, including by outsourcing intellectual property so external actors can use it (Osterwalder & Pigneur, 2010). Gassmann & Enkel (2004) describe this as replicating technology via market entry, licensing, or selling IP to other firms in pursuit of profit. The emphasis is on commercializing knowledge across sectors to capture faster and greater returns.

**Open innovation from the outside in:** Firms tap external sources such as customers and suppliers to strengthen internal activities. Through purchasing or sourcing, external knowledge enters the firm and complements internal R&D. With inputs from external actors, who process ideas, materials, and solutions,

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open innovation is implemented from the outside into the enterprise. Gassmann & Enkel (2004) define this as combining suppliers, customers, and external knowledge bases to enrich the firm and expand its innovation capacity.

**Two-way open innovation:** When internal and external open-innovation activities operate together, firms engage in joint R&D while also moving to commercialize resulting innovations. Information flows both into and out of the enterprise. According to Gassmann & Enkel (2004), this is cooperation among firms formed by integrating outside-in and inside-out information flows.

Open innovation, with its dynamic structure, draws on internal and external ideas to generate new ideas, knowledge, products, services, and processes (Saguy & Taoukis, 2017). At the same time, firms build common interests through these contributions from both inside and outside (Lenart-Gansiniec, 2016). The core idea of borderless open innovation is to minimize costs for firms' future positioning under prevailing market conditions. In doing so, firms cooperate to deliver new products, services, and processes more cheaply and quickly for both themselves and their customers beyond organizational boundaries.

**Comparison of open innovation and closed innovation**

Closed innovation, or traditional innovation, assumes that the desired applications are best developed and executed entirely within the firm. It relies on internal resources and information flows, emphasizes managerial control over innovative activities, and seeks advantage by generating ideas in-house and bringing them to market first. Firms protect boundaries, keep R&D proprietary, and aim for market leadership through internally originated ideas. Toward the late twentieth century, rapid technological change and rising needs for external R&D made it difficult for some firms to sustain this model, prompting outsourcing and external collaboration (Chesbrough, 2004). As knowledge became more universalized, partnerships emerged to create new products and services and to enter new markets. Open innovation expands the knowledge base through shared intellectual property, such as patents and licenses, and through access to other firms' resources. It is a bidirectional process that generates economic and social benefits via inside-out and outside-in knowledge flows.

**Intrapreneurship**

In today's intense global competition, firms need "continuous innovation" as a core capability. Many scholars recommend "intrapreneurship" because it grants employees greater autonomy, freedom, and resource access, enabling them to channel creative energy into innovation (Ağca & Kurt, 2007). By supporting idea generation and implementation, intrapreneurship strengthens an organization's innovative capacity and helps firms adapt more quickly to changing markets. The term first appeared in 1978 in Elizabeth and Gifford Pinchot's "Intra-Corporate Entrepreneurship," which examined how companies develop innovative projects internally and encourage employees' entrepreneurial behavior within the organization (Pinchot, 1985). Intrapreneurship invites employees to act innovatively and proactively within existing structures and can also nurture new ventures inside established firms. It can be defined as a process aimed at renewing an organization's core thinking and transforming its structure through entrepreneurial activities carried out within the existing organization.

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The intrapreneur:

- Kierulff (1979) describes an entrepreneur who scans for new market opportunities within the firm, secures resources to pursue attractive options, and stimulates production and sales.
- Maranville (1992) states that an intrapreneur develops a product that addresses new or existing market needs in a different way.
- Diedre et al. (1997) define intrapreneurs as employees who, through entrepreneurial and creative thinking, produce outcomes that change or challenge generally accepted ideas.
- Luchsinger and Bagby (1987) mention intrapreneurship as entrepreneurship connected to relationships embedded in operating businesses.
- Vesper (1990) states that intrapreneurship concerns doing new things and pursuing the unconventional.

Historical work on intrapreneurship expanded in the 1990s. Distinct from entrepreneurship, it captures the roles of individuals, entrepreneurs, and managers inside firms. It also covers advancing new technologies and improving management techniques to achieve competitive advantage (Feyzbakhsh et al., 2008). The focus is not only on launching new ventures but also on developing new production methods, services, technologies, and techniques with an innovation orientation.

Intrapreneurship refers to entrepreneurial activities carried out within firm boundaries to alter or renew competitive conditions. Terms such as corporate entrepreneurship and intrafirm entrepreneurship are often used interchangeably. It is an internal form of initiative that includes new products, services, strategies, technologies, and competitive approaches, and it is not limited by firm size or by narrow internal activities (Antoncic & Hisrich, 2001). Carrier (1994) defines intrapreneurship as "the process by which an individual working under the control of an organization takes responsibility for an innovation"; Sharma and Chrisman (1999) define it as "the process by which an individual or a group creates a new organization, innovates or produces innovation within an established organization" (Sayın, 2019).

Intrapreneurship is also described as "entrepreneurial activities that lead to the creation of a new venture within an existing organization, aiming to renew the main idea of the organization and transform the organization" (Yıldırım et al., 2019). It can be seen as a process in which employees use their talents to interpret environmental changes and introduce innovation into their organization. These innovations may transform products, services, technologies, methods, or management techniques. For success, the organization should value employees' ideas, provide support, and create opportunities for project implementation (Koçoğlu, 2012). This approach encourages creativity and paves the way for continuous improvement and adaptation.

As a comprehensive set of entrepreneurial and innovation activities within an existing organization, intrapreneurship enables the application of entrepreneurial thinking internally. Employees are encouraged to behave like classic entrepreneurs and to contribute through innovative projects. Often called intrapreneurship, this model seeks to mobilize the organization through risk-taking, inno-

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vativeness, and competitive behavior. As noted by Naktiyok and Kök (2006), intrapreneurship focuses on opening new venture domains and transforming the organization by renewing its existing structure. This approach allows firms to adapt rapidly to market change and to gain a competitive advantage.

These definitions converge on the innovative and transformative role of intrapreneurship. It is the process by which employees initiate projects or ventures within an existing organization and thereby contribute to the organization's core functioning and idea base. Such activities aim both to revitalize the organization's central concept and to reshape its overall structure, with the potential to increase innovation, flexibility, and competitive advantage.

**Elements of intrapreneurship**

Intrapreneurship supports innovation within organizations and enables employees to develop their individual talents and entrepreneurial skills. The concept of intrapreneurship contributes to changing or developing employees' own projects or innovative ideas within the organization.

The characteristics of intrapreneurship have been defined by various research and academic studies. Intrapreneurship has been conceptualized as seven dimensions (Antoncic & Hisrich, 2003). These dimensions are:

i. Innovativeness

ii. Launching a New Business Venture

iii. Process RenewaSl

iv. Risk Taking

v. Autonomy

vi. Proactivity

vii. Competitive Initiative

As the core strategies of intrapreneurship. In this study, the four dimensions of intrapreneurship, which are innovativeness, risk-taking, proactivity and autonomy, will be discussed.

Innovativeness is considered one of the most fundamental elements in intrapreneurship and refers to the process of transforming knowledge into a new resource, product, process, service, management technique, or technology with commercial value. Innovativeness, which is seen as the fundamental point of intrapreneurship, has been defined as "the process of developing new products and new markets" (Pearce & Carland, 1996).

Risk-taking is one of the key dimensions of intrapreneurship and plays an important role in seizing opportunities and making decisions in uncertain situations. In businesses, intrapreneurs are the people who generate ideas and take risks transforming an innovative idea into a product (Manion, 2001).

Proactiveness is a key element of intrapreneurship, characterized by the willingness to anticipate new opportunities, pursue them actively, and create deliberate change through strategic prioritization. This approach goes beyond maintaining the status quo and aims to recognize and act on future possibilities and gain advantage by seizing opportunities (Braunerhjelm, 2010).

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Autonomy is needed for the implementation of projects. In the decision-making process, it is effective in the free development of entrepreneurial ideas of enterprises. Burgelman (1983) emphasized the importance of autonomy for business employees in intrapreneurship and emphasized its importance in the success of the projects.

**The Role of open innovation in economic development in Turkic countries**

Open innovation, characterized by the integration of external ideas and technologies into internal processes, has become a pivotal strategy for economic development. In Turkic-speaking Eurasian countries, this approach fosters collaboration, accelerates technological advancement, and enhances competitiveness on a global scale.

**Collaborative frameworks and regional integration**

The establishment of the Organization of Turkic States (OTS) exemplifies a commitment to regional cooperation. Founded to strengthen ties among Turkic-speaking nations, the OTS focuses on various sectors, including economic development and innovation. By promoting collaborative projects and shared technological initiatives, the OTS facilitates the adoption of open innovation practices across member states. This collective effort not only streamlines resources but also harmonizes policies, creating a conducive environment for innovation-driven growth (Çetinkaya & Demirel, 2023).

**National initiatives promoting open innovation**

Individual countries within the Turkic-speaking region have launched national programs to embed open innovation into their economic strategies:

Türkiye: Since 2003, Türkiye has actively participated in EU research and innovation programs, notably launching the Turkish Research Area (TARAL) in 2004. Modeled after the European Research Area, TARAL emphasizes e-infrastructures, open data, and gender mainstreaming in research. This initiative underscores Türkiye's dedication to integrating open innovation into its national research agenda, thereby enhancing its scientific and technological capabilities (European Commission, 2024).

Kazakhstan: The "Kazakhstan 2050 Strategy" outlines a vision to transform the nation into a knowledge-based economy by 2050. A key component of this strategy is the promotion of open innovation through the development of new high-tech sectors, including mobile technology, nanotechnology, and alternative energy. By fostering collaboration between research institutes, universities, and the private sector, Kazakhstan aims to create an ecosystem conducive to innovation and economic diversification (OECD, 2023).

**Impact on economic development**

Open innovation has significantly contributed to the economic development of Turkic-speaking Eurasian countries by enhancing industrial productivity, fostering cross-border collaboration, and accelerating the transition to knowledge-based economies. In Türkiye, initiatives such as the Turkish Research Area (TARAL) have strengthened R&D capabilities, integrating national research efforts with global innovation ecosystems (European Commission, 2024). Similarly, Kazakhstan's 2050 Strategy emphasizes open innovation as a means to

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diversify the economy beyond natural resources, fostering technological entrepreneurship and digital transformation (OECD, 2023). Uzbekistan and Azerbaijan, historically reliant on energy exports, have increasingly invested in innovation-driven industrial policies, particularly in textile manufacturing, ICT, and agribusiness, positioning themselves as regional hubs for technological adoption and high-value exports (World Bank, 2023). In Azerbaijan, large-scale innovation and investment projects, particularly in liberated territories, have drawn foreign investors from both neighboring and distant countries. These projects not only stimulate local economies but also position Azerbaijan as a hub for technological advancement and international collaboration (Yuzbashiyeva et al., 2024).

Open innovation has also played a crucial role in strengthening SMEs, enabling them to integrate into global supply chains, leverage external R&D collaborations, and access new markets (UNDP, 2022). By fostering an ecosystem that promotes interdisciplinary research, cross-sectoral knowledge-sharing, and technology transfer, open innovation is accelerating the economic convergence of Turkic-speaking nations with global innovation leaders. By adopting open innovation models, Turkic-speaking countries can better integrate into global value chains. Collaborative efforts in research and development lead to the creation of innovative products and services, thereby increasing the competitiveness of these nations on the world stage.

**Challenges and future directions**

Despite its potential, open innovation in Turkic-speaking Eurasian economies faces several challenges, including limited R&D investment, weak intellectual property (IP) protections, and insufficient innovation infrastructure (OECD, 2023). Many firms, particularly SMEs, struggle with the high costs of technology adoption and lack access to venture capital and government funding (World Bank, 2023). Additionally, bureaucratic hurdles and regulatory inconsistencies across the region create barriers to cross-border collaboration and foreign investment in high-tech industries (European Commission, 2023). To overcome these obstacles, policymakers must prioritize innovation-friendly regulations, strengthen university-industry linkages, and promote public-private partnerships that encourage technology commercialization and startup growth. Investing in digital infrastructure, AI-driven industrial solutions, and open science platforms will also be essential to closing the innovation gap with advanced economies. Regional cooperation through mechanisms like the Organization of Turkic States (OTS) and joint R&D funding programs can further harmonize innovation policies and foster a more integrated Eurasian innovation ecosystem. Looking ahead, the success of open innovation in Turkic-speaking nations will depend on their ability to cultivate a culture of entrepreneurship, reduce barriers to technology transfer, and leverage their strategic position between Europe and Asia as a hub for innovation-driven economic growth. Thus, a more integrated regional strategy, including joint research initiatives, cross-border innovation networks, and harmonized textile industry policies, could enhance the role of open innovation in driving the sector's long-term competitiveness and sustainability in Eurasia.

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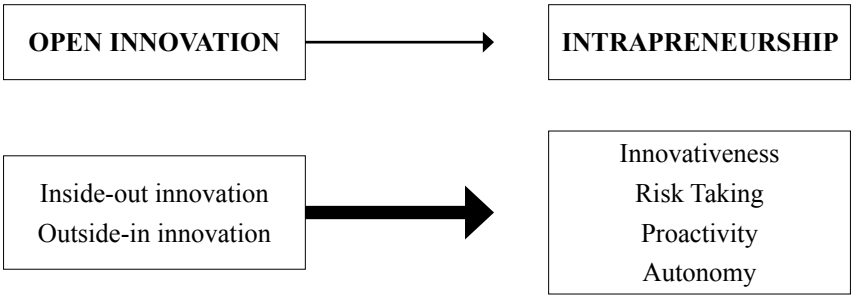
## RESEARCH METHODOLOGY

### Research model

Open innovation and intrapreneurship are two important strategies that complement each other in developing the innovative capacity of businesses and increasing their competitive advantage. These two approaches enable businesses to draw inspiration and contribution from the outside world, not only from their own resources. At the same time, by encouraging employees to develop innovative projects, it contributes to the formation of a dynamic innovation ecosystem that feeds on all internal and external elements. To summarize, the relationship between open innovation and intrapreneurship allows businesses to gain an innovative, flexible and sustainable structure by feeding from both internal and external sources. Open innovation offers businesses the opportunity to expand their boundaries and capitalize on the know-how of external stakeholders, while intrapreneurship encourages employee creativity. Integrating these two approaches contributes to sustainable growth by increasing the competitiveness of businesses.

**Figure 1**
*Open innovation and intrapreneurship research model*




*Source:* Author's own data

In this section of the research, the purpose and scope of the research, the research model, the relationship between open innovation and intrapreneurship: the hypotheses of the research, the sample of the research and the data collection method and the scales of the research will be included.

### Hypotheses of the study

Research on internal and external innovation and intrapreneurship has revealed remarkable findings on the development and maintenance of innovation strategies of enterprises. Internal-external innovation involves the sharing of ideas and technologies developed internally by businesses with other organizations by introducing them to external markets. As noted in Chesbrough's work, the inside-out innovation model not only provides businesses with a competitive advantage in the market but also enables them to create additional sources of income by transferring their innovative solutions to other sectors. This strategy provides businesses with the opportunity to utilize their technologies or ideas in other areas, enabling growth that is not limited to their core business. In sum, the inside-out innovation model contributes to the creation of value in different markets by expanding the innovation capacity of businesses (Chesbrough, 2003b).

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Intrapreneurship, which reflects the totality of entrepreneurial and innovation activities within an organization, encourages individuals in an existing organization to act as entrepreneurs (Parker, 2009). Intrapreneurship aims to restructure and continuously improve organizational attributes in order to acquire capabilities and skills to support innovation processes (Hornsby et al., 2002).

Internal-external innovation and proactivity strategies are vital for businesses to gain a competitive advantage and adapt quickly to market conditions. Covin and Slevin (1989) consider proactiveness as a capability that enables businesses to succeed, especially in dynamic and uncertain markets, while Lumpkin and Dess (1996) state that proactive businesses have a strategic importance in gaining competitive advantage. Salavou (2005) has shown that proactive behavior increases innovation performance, especially in small and medium-sized enterprises. This finding reveals how important a proactive approach is for SMEs to seize growth opportunities in rapidly changing markets (Kula, 2022).

Open innovation refers to businesses strengthening their innovation potential by incorporating knowledge, technology and innovative ideas from the external environment into their processes. According to Chesbrough's (2003) open innovation model, rather than relying solely on internal resources, incorporating contributions from external stakeholders into innovation processes is a factor that increases the efficiency of innovation. This strategy allows businesses to integrate knowledge and experience from customers, suppliers, academia and other external stakeholders into their business processes (West & Gallagher, 2006). Laursen and Salter (2006) also emphasize that the flow of knowledge from external sources helps businesses to create a competitive advantage in the product development phase by increasing their innovation capacity.

In light of these findings, various suggestions were presented and recommendations were developed to guide researchers and managers. Thus, the study is intended to both contribute to theoretical knowledge and provide guidance in practice.

In line with the studies and related explanations given above, the hypotheses of the study are as follows:

**$H_1$:** Open innovation has a significant and positive effect on intrapreneurship.

**$H_2$:** Outside-in innovation has a significant and positive effect on intrapreneurship.

**$H_3$:** Inside-out innovation has a significant and positive effect on intrapreneurship.

**$H_4$:** Outside-in innovation has a significant and positive effect on innovativeness

**$H_5$:** Inside-out innovation has a significant and positive effect on innovativeness

**$H_6$:** Outside-in innovation has a significant and positive effect on risk-taking

**$H_7$:** Inside-out innovation has a significant and positive effect on risk-taking

**$H_8$:** Outside-in innovation has a significant and positive effect on proactiveness

**$H_9$:** Inside-out innovation has a significant and positive effect on proactiveness

**$H_{10}$:** Outside-in innovation has a significant and positive effect on autonomy

**$H_{11}$:** Inside-out innovation has a significant and positive effect on autonomy

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**Sample, data collection, and scales**

The research population consists of 640 employees who work in the textile sector (ready-to-wear and apparel manufacturing plants) in Erzurum. Convenience sampling method was utilized in the research. The sample size selected to represent the research universe was calculated as 240 textile employees within the 95% reliability limits, assuming a 5% margin of error (Creative Research Systems, n.d.). A total of 500 questionnaires were distributed to the factories, taking into account the working intensity of the factory employees, the length of the questionnaire form, and the time they would devote to the survey. Due to the intensity of the production systems in the factories and the inability of the employees to spare much time, a total of 244 fully completed questionnaires were evaluated after the incomplete, faulty, and damaged questionnaire forms were removed.

In the study, open innovation is analyzed in two dimensions as open innovation from outside to inside and open innovation from inside to outside. The scales developed by Sisodiya et al. (2013) were utilized in the open innovation scale from outside to inside and Cheng and Shiu (2015) in the open innovation scale from inside to outside.

"Intrapreneurship Scale" was used to determine the approaches of the textile factory employees to intrapreneurship. The intrapreneurship scale developed by Naktiyok (2004) has been proven in terms of validity and reliability. The scale consists of 4 dimensions (as innovation, proactivity, risk taking and autonomy) and 21 questions.

**Findings**

In this study, SPSS 21.0 and AMOS 22.0 statistical software were used to analyze the data. Exploratory factor analysis (EFA), confirmatory factor analysis (CFA), item-total correlation, and Cronbach's Alpha methods were used in the validity and reliability studies of the scales. Of the 244 employees participating in the research, 5.3% work in the administrative affairs department, 4.1% in HRM, 4.1% in accounting, 13.1% in production management, 6.1% in planning, 4.9% in quality assurance, 4.1% in R&D, 13.9% in slaughterhouse, 5.7% in quality control/ironing package, 7.8% in accessories/warehouse, and 30.7% in other departments. 4.1% of the participants are managers, 4.5% are assistant managers, 7.8% are specialists, 6.6% are team leaders/supervisors, 18.9% are assistants, 58.2% are in other positions. 12.7% of the participants have less than 1 year of service, 73.8% have 1-10 years of service, 7.4% have 11-20 years of service, and 6.1% have 21-30 years of service. 71.7% of the participants are 18-30 years old, 23% are 31-44 years old, 5.3% are 45 years old and above. 75.8% of the participants were female and 24.2% were male. 3.7% of the participants had primary education, 51.6% had high school education, 35.7% had undergraduate education (formal education), and 9% had open education undergraduate education.

**Validity and reliability of findings**

It is understood that the KMO (0.862) value examined for the suitability of the data obtained from 244 participants reached for the Open Innovation Scale in terms of explanatory factor analysis is quite high; Bartlett's Sphericity test sta-

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tistic (Bartlett's $X^2$=1287.48; p<0.05) is statistically significant and the research sample is sufficient.

It is understood that the KMO (0.774) value examined for the suitability of the data obtained from 244 participants reached for the Intrapreneurship Scale in terms of explanatory factor analysis is high; Bartlett's Sphericity test statistic (Bartlett's $X^2$=1947.254; p<0.05) is statistically significant and the research sample is sufficient.

**Findings on the relationship between open innovation and intrapreneurship**

Table 1 presents the results of Pearson correlation analysis of the relationship between open innovation and intrapreneurship.

**Table 1**
*The relationship between open innovation and intrapreneurship*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1- OPEN INNOVATION | 1 | | | | | | | |
| 2- External-in open innovation | 0.84** | 1 | | | | | | |
| 3- Inside-out open innovation | 0.81** | 0.37** | 1 | | | | | |
| 4- INTRAPRENEURSHİP | 0.42** | 0.20** | 0.50** | 1 | | | | |
| 5- Innovativeness | 0.30** | 0.34** | 0.15* | 0.37** | 1 | | | |
| 6- Risk Taking | 0.34** | 0.16** | 0.41** | 0.71** | 0.31** | 1 | | |
| 7- Proactivity | 0.18** | 0.06 | 0.25** | 0.76** | 0.07 | 0.32** | 1 | |
| 8- Autonomy | 0.28** | 0.06 | 0.42** | 0.56** | -0.09 | 0.22** | 0.17** | 1 |

*p<0.05 **p<0.01

*Source:* Author's own data

According to Table 1, there is a positive and significant relationship between open innovation and intrapreneurship (r=0.42; p<0.05). Similarly, a positive and significant relationship was found between open innovation and innovation (r=0.30; p<0.05), risk taking (r=0.34; p<0.05), proactiveness (r=0.18; p<0.05), autonomy (r=0.28; p<0.05).

In addition, according to Table 1, there is a positive and significant relationship between outside-in innovation and intrapreneurship (r=0.20; p<0.05). Similarly, a positive and significant relationship was found between open innovation and innovation (r=0.34; p<0.05) and risk taking (r=0.16; p<0.05). There was no significant relationship (p>0.05) between outside-in innovation and proactiveness and autonomy. On the other hand, a positive and significant relationship was found between insider-outsider innovation and intrapreneurship (r=0.50; p<0.05). Finally, a similarly positive and significant relationship was found between insider-outsider innovation and innovation (r=0.15; p<0.05), risk taking (r=0.41; p<0.05), proactiveness (r=0.25; p<0.05), autonomy (r=0.42; p<0.05).

Table 2 presents the results of the multiple regression analysis of the effect of open innovation on intrapreneurship.

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**Table 2**
*The impact of open innovation on intrapreneurship*

| H | Independent Variable | Dependent Variable | B | SHB | β | t | p | Tolerance | VIF |
|---|---|---|---|---|---|---|---|---|---|
| | Fixed | | 2.245 | 0.161 | | 13.950 | 0.000 | | |
| $H_1$ | Open innovation | Intrapreneurship | 0.316 | 0.044 | 0.417 | 7.146 | **0.000** | | |
| | $R^2$=0.174 $\Delta R^2$=0.171 | $F_{(1; 242)}$=51.059 p=**0.000** | | | | | | | |
| | Fixed | | 2.287 | 0.154 | | 14.836 | 0.000 | | |
| $H_2$ | Outside-in open innovation | Intrapreneurship | 0.014 | 0.036 | 0.023 | 0.380 | 0.704 | 0.864 | 1.158 |
| $H_3$ | Inside-out open innovation | | 0.318 | 0.039 | 0.489 | 8.143 | **0.000** | 0.864 | 1.158 |
| | $R^2$=0.248 $\Delta R^2$=0.242 | $F_{((2; 242)}$=39.797 p=**0.000** | | | | | | | |
| | Fixed | | -1.618 | 0.064 | | -25.215 | 0.000 | | |
| $H_4$ | Outside-in open innovation | Innovativeness | 0.077 | 0.015 | 0.330 | 5.066 | **0.000** | 0.864 | 1.158 |
| $H_5$ | Inside-out open innovation | | 0.008 | 0.016 | 0.033 | 0.509 | 0.612 | 0.864 | 1.158 |
| | $R^2$=0.118 $\Delta R^2$=0.111 | $F_{(2; 242)}$=16.109 p=**0.000** | | | | | | | |
| | Fixed | | -1.887 | 0.076 | | -24.934 | 0.000 | | |
| $H_6$ | Outside-in open innovation | Risk Taking | 0.004 | 0.018 | 0.014 | 0.227 | 0.820 | 0.864 | 1.158 |
| $H_7$ | Inside-out open innovation | | 0.124 | 0.019 | 0.407 | 6.444 | 0.000 | 0.864 | 1.158 |
| | $R^2$=0.170 $\Delta R^2$=0.163 | $F_{(2; 242)}$=24.702 p=**0.000** | | | | | | | |
| **H** | **Independent Variable** | **Dependent Variable** | **B** | **SHB** | **β** | **t** | **p** | **Tolerance** | **VIF** |
| | Fixed | | 2.430 | 0.379 | | 6.407 | 0.000 | | |
| $H_8$ | Outside-in open innovation | Proactivity | -0.051 | 0.089 | -0.038 | -0.568 | 0.571 | 0.864 | 1.158 |
| $H_9$ | Inside-out open innovation | | 0.378 | 0.096 | 0.264 | **3.940** | 0.000 | 0.864 | 1.158 |
| | $R^2$=0.064 $\Delta R^2$=0.056 | $F_{((2; 242)}$=8.217 p=**0.000** | | | | | | | |
| | Fixed | | 0.761 | 0.267 | | 2.848 | 0.005 | | |
| $H_{10}$ | Outside-in open innovation | Autonomy | -0.107 | 0.063 | -0.106 | -1.699 | 0.091 | 0.864 | 1.158 |
| $H_{11}$ | Inside-out open innovation | | 0.496 | 0.068 | 0.459 | **7.334** | 0.000 | 0.864 | 1.158 |
| | $R^2$=0.186 $\Delta R^2$=0.179 | $F_{(2; 242)}$=27.482 p=**0.000** | | | | | | | |

*Source:* Author's own data

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In light of the findings shown in Table 2, the hypotheses of the research and their detailed explanations are as follows:

**$H_1$:** Open innovation has a significant and positive effect on intrapreneurship.

The model for the effect of open innovation on intrapreneurship was found to be appropriate ($F_{(1; 242)}$=51,06; p<0,05). Open innovation of the organizations explain about 17% of the variance in intrapreneurship of the employees ($\Delta R^2$=0,171). According to the regression coefficients and t-test results regarding the significance of the coefficients, the open innovation of the business has a positive and significant effect on the intrapreneurship of the employees (β=0,47; t=7,15; p<0,05). As the open innovation behaviors of the enterprises increase, the intrapreneurship behaviors of the employees also increase.

**$H_2$:** Outside-in innovation has a significant and positive effect on intrapreneurship.

**$H_3$:** Inside-out innovation has a positive effect on intrapreneurship.

It has been determined that the model for the effect of open innovation on intrapreneurship is appropriate ($F_{(2; 241)}$=39,80; p<0,05) and there is no multicollinearity problem among independent variables (VIF<10; Tolerance>0,20). Open innovation from the inside out and open innovation from the outside in explain about 24% of the variance in intrapreneurship ($\Delta R^2$=0,242). According to the regression coefficients and t-test results regarding the significance of the coefficients, it was determined that the external open innovation of the enterprises did not have a significant effect on the intrapreneurship of the employees (p>0.05), whereas the internal open innovation of the enterprise had a positive and significant effect on the intrapreneurship of the employees (β=0,49; t=8,14; p<0,05). As the internal-external innovation behaviors of the enterprises increase, the intrapreneurship behaviors of the employees also increase.

**$H_4$:** Outside-in innovation has a significant and positive effect on innovativeness.

**$H_5$:** Inside-out innovation has a positive effect on innovativeness.

It was found that the model for the effect of innovation on innovation is appropriate ($F_{(2; 241)}$=16,11; p<0,05) and there is no multicollinearity problem among independent variables (VIF<10; Tolerance>0,20). Internal and external open innovation explain approximately 11% of the variance in innovation ($\Delta R^2$=0,111). According to the regression coefficients and t-test results regarding the significance of the coefficients, it is found that the outwardly open innovation has a positive and significant effect on the innovation behavior of the employees (β=0,33; t=5,07; p<0,05), whereas it was determined that the open innovation of the enterprises from the inside out did not have a significant effect on the innovation behavior of the employees (p>0,05). As the open innovation behaviors of the enterprises from the outside in increase, the innovation behaviors of the employees also increase.

**$H_6$:** Outside-in innovation has a significant and positive effect on risk-taking.

**$H_7$:** Inside-out innovation has a positive effect on risk-taking.

It has been determined that the model for the effect of open innovation on risk-taking is appropriate ($F_{(2; 241)}$=24,70; p<0,05) and there is no multicollinearity problem among independent variables (VIF<10; Tolerance>0,20). Open innovation from the inside-out and open innovation from the outside-in explain

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approximately 16% of the variance in risk-taking behavior ($\Delta R^2$=0,163). According to the regression coefficients and t-test results regarding the significance of the coefficients, it was determined that the external open innovation of the enterprises did not have a significant effect on the risk-taking behavior of the employees (p>0.05), whereas the internal open innovation of the enterprise had a positive and significant effect on the risk-taking behavior of the employees (β=0,41; t=6,44; p<0,05). As the inside-out innovation behaviors of the enterprises increase, the risk-taking behaviors of the employees also increase.

**$H_8$:** Outside-in innovation has a significant and positive effect on proactiveness.

**$H_9$:** Inside-out innovation has a significant and positive effect on proactiveness.

It has been determined that the model for the effect of open innovation on proactiveness is appropriate ($F_{(2; 241)}$=8,22; p<0,05) and there is no multicollinearity problem among independent variables (VIF<10; Tolerance>0,20). Open innovation from inside-out and open innovation from outside-in explain approximately 6% of the variance in proactive behavior ($\Delta R^2$=0,056). According to the regression coefficients and t-test results regarding the significance of the coefficients, it was determined that the external open innovation of the enterprises did not have a significant effect on the proactive behavior of the employees (p>0.05), whereas the internal open innovation of the enterprise had a positive and significant effect on the proactive behavior of the employees (β=0,26; t=3,94; p<0,05). The more the inside-out innovation behaviors of the enterprises increase, the more proactive the behaviors of the employees increase.

## CONCLUSION

This study was conducted to examine the relationship between open innovation and intrapreneurship in textile garment and apparel manufacturing enterprises. The results of the analysis reveal that open innovation practices positively affect the intrapreneurial behaviors of employees, demonstrating a significant impact on innovativeness, risk-taking, and proactiveness. These findings highlight the crucial role of open innovation in fostering a culture of creativity and entrepreneurship within organizations. By enabling businesses to collaborate externally, integrate new knowledge, and commercialize internally developed ideas, open innovation provides a strategic advantage for firms in dynamic and competitive industries.

From a broader Eurasian perspective, the textile industry plays a vital economic role in countries such as Türkiye, Uzbekistan, Kazakhstan, and Azerbaijan, where it contributes significantly to exports, employment, and industrial transformation (World Bank, 2023). As these countries seek to modernize their manufacturing sectors and integrate into global value chains, the adoption of open innovation practices becomes increasingly essential. This study's findings are particularly relevant for Eurasian economies aiming to leverage innovation-driven growth and enhance their global competitiveness. The Organization of Turkic States (OTS) has already recognized the need for regional cooperation in industrial innovation, and open innovation strategies could serve as a key enabler for sustainable economic development across Turkic-speaking countries (OECD, 2023).

The study found that inside-out open innovation, where businesses actively share their innovations with external stakeholders, has a strong and significant

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effect on intrapreneurship and its dimensions. This suggests that allowing employees to contribute to external innovation networks and knowledge exchanges enhances their entrepreneurial tendencies. Employees feel more empowered to take calculated risks, act proactively, and introduce innovative ideas when they engage in external collaborations (Gassmann & Enkel, 2004). The success of Turkish textile firms in adopting open innovation through partnerships with European and Asian research institutions provides a valuable model for other Eurasian economies (European Commission, 2023). However, the study also revealed that outside-in open innovation, where businesses integrate external knowledge into their internal processes, exhibits a weaker relationship with intrapreneurship. This may be due to organizational barriers, insufficient knowledge absorption mechanisms, and the passive use of external information (Laursen & Salter, 2006).

For Eurasian economies, this finding underscores the need to develop stronger internal mechanisms to transform externally acquired knowledge into actionable entrepreneurial initiatives. Many textile firms in Uzbekistan and Kazakhstan face similar challenges, as limited R&D funding, weak intellectual property protections, and insufficient industry-academia linkages hinder the effective implementation of open innovation strategies (OECD, 2023). Policymakers in these countries must focus on strengthening technology transfer offices, fostering innovation hubs, and providing financial incentives for firms to engage in cross-border innovation collaborations.

When analyzing the impact of open innovation on the sub-dimensions of intrapreneurship, the study found that open innovation has a positive effect on innovation, particularly through outside-in open innovation. Employees who engage with external partners and research institutions are more likely to develop and implement innovative ideas, thanks to the flexible and collaborative environment fostered by open innovation strategies (Gül, 2017). This observation aligns with Türkiye's experience, where EU-funded R&D programs and industry-led innovation clusters have played a critical role in advancing the textile sector's technological capabilities (European Commission, 2023). For other Eurasian economies, this highlights the importance of participating in international research programs and fostering cross-industry partnerships to enhance innovation capacity.

The study also observed that inside-out open innovation significantly influences risk-taking and autonomy. Employees working in organizations that actively commercialize their innovations externally exhibit higher confidence in pursuing new ideas and are more inclined to take risks (Gassmann & Enkel, 2004). However, outside-in open innovation does not exhibit the same impact on risk-taking behaviors, likely because external information is perceived as less uncertain, reducing the perceived need for risk-taking (Şen, 2017). This pattern is particularly relevant for Eurasian textile firms, where cultural and structural factors may influence employees' willingness to take innovation-driven risks. To encourage risk-taking behaviors, firms in the region must cultivate an organizational culture that rewards entrepreneurial experimentation and supports intrapreneurs in testing new ideas.

Another key finding is that inside-out open innovation positively impacts proactiveness, employees take greater initiative when they are directly involved

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in external collaborations and knowledge-sharing networks (Lee et al., 2012; Daştan & Mola, 2020). However, outside-in open innovation does not have a significant impact on proactive behaviors, likely because external knowledge is passively received rather than actively integrated into organizational processes. This finding suggests that Eurasian economies should prioritize leadership-driven initiatives that encourage employees to actively participate in external innovation networks, rather than simply absorbing external information without clear application strategies.

In terms of autonomy, inside-out open innovation was found to enhance employees' sense of independence, as they are given more flexibility to develop and implement their ideas externally (Duman, 2015). However, outside-in open innovation does not contribute significantly to autonomy, likely because externally acquired knowledge is often controlled at the organizational level rather than being distributed for individual experimentation. This presents an opportunity for Eurasian economies to rethink organizational structures, ensuring that external knowledge flows empower employees at all levels rather than being centralized in management-controlled silos.

**Implications for Eurasian economies and policy recommendations**

The findings of this study offer valuable lessons for Eurasian economies seeking to transition towards innovation-driven textile industries. While Türkiye has demonstrated strong progress in integrating open innovation strategies, other countries in the region, particularly Kazakhstan, Uzbekistan, and Azerbaijan, must strengthen their institutional frameworks to fully leverage the benefits of open innovation. This includes:

*Enhancing R&D and Innovation Funding*: Governments should increase financial incentives for textile firms to adopt open innovation models and collaborate with international research institutions.

*Improving Intellectual Property Protections:* Stronger legal frameworks are needed to encourage cross-border innovation partnerships without the risk of IP theft or mismanagement.

*Developing Industry-Academia Linkages*: Universities and research centers should play a more active role in facilitating knowledge transfer between academia and textile manufacturers.

*Encouraging Regional Collaboration*: The Organization of Turkic States (OTS) and the Economic Cooperation Organization (ECO) should develop joint R&D funding programs and establish a pan-Eurasian innovation network to foster cross-border knowledge sharing.

*Building Innovation Clusters*: Establishing textile-focused innovation hubs in major industrial zones can help firms access cutting-edge technology and industry expertise.

*Empowering Workforce Development:* Training programs that promote entrepreneurial thinking and technological skills should be prioritized to ensure that employees can fully utilize open innovation processes.

Finally, this study provides critical insights into how open innovation influences intrapreneurship in the textile industry, offering key lessons for Eurasian econ-

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omies. While inside-out open innovation significantly enhances entrepreneurial traits, the effectiveness of outside-in open innovation remains limited due to structural and organizational barriers. For Eurasian textile industries to fully capitalize on the benefits of open innovation, firms and policymakers must implement strategic reforms, foster regional cooperation, and invest in building an innovation-friendly ecosystem. By doing so, Turkic-speaking Eurasian economies can transform their textile sectors into globally competitive, innovation-driven industries, ensuring long-term economic resilience and growth.

**Limitations of the research**

The evidence comes from a single industry and location, namely textile and apparel factories in Erzurum, Türkiye, which constrains external validity beyond this setting. The study relies on a convenience sample with 244 usable surveys from 500 distributed, which can introduce selection and nonresponse bias. The analyses use cross-sectional, self-reported data examined via Pearson correlations and multiple regression, so associations should not be interpreted causally and common-method variance cannot be ruled out. Finally, measurement focuses on a subset of intrapreneurship dimensions drawn from a specific scale, which suggests value in multi-source, longitudinal, and multi-region replications. Review feedback also cautions against broad generalization from a single-city case, reinforcing these limitations.

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**Ethical Commission Approval**

In accordance with the legislation of Erzurum Technical University Institute of Social Sciences, before the survey forms of the study were distributed to individuals, an application was made to the Erzurum Technical University Scientific Research and Publication Ethics Committee, and ethical approval was obtained and ethical approval was obtained at Meeting No. 9, Decision No. 16, dated July 25, 2024.

**Conflict of Interest Statement**

There is no conflict of interest with any institution or person within the scope of this study.

**Statement**

A part of this study was produced from the master's thesis titled «The Effect of Open Innovation on Intrapreneurship: A Research in the Textile Sector» prepared by Gül Buket Aktepe under the supervision of Assoc. Prof. Dr. Mehmet Emirhan Kula at Erzurum Technical University, Institute of Social Sciences."

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