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The symbiotic relationship and collaboration between commercial banks and fintechs in Turkey

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Fintech startups have forced traditional banks to change their business models using new IT-enabled technologies. These startups have become a potential threat to the financial industry in recent years. Therefore, traditional banks form strategic alliances with fintech startups to gain a competitive advantage and improve their technological infrastructure. This study examines which form of collaboration banks prefer with fintech firms and in which segment these firms operate. Using a hand-collected dataset, the probit model is applied to analyze 430 bank-fintech alliances in Turkey in 2021. The results indicate that in Turkey, large banks tend to collaborate with fintech startups in a product-related manner rather than investing in them. Large banks prefer to form partnerships with non-payment fintech startups rather than payment service fintechs. Lastly, young fintech startups mainly operate in payment services, and those established in Istanbul are likely to form strategic partnerships with commercial banks in this area.

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Introduction

In the last two decades, the traditional financial sector, especially the banking industry, has been significantly transformed by the rapid growth of internet-based services and digitalization. After the 2008 financial crisis, new financial innovations emerged by financial technology (fintech) companies that combine digital technologies like cellular smartphones, internet, social networking services, machine learning, artificial intelligence, and big data tools with financial services (Lee & Shin, 2018; Takeda & Ito, 2021). The Financial Stability Board introduces fintech as "technologically enabled financial innovation that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services" (Navaretti, Calzolari, Mansilla-Fernandez, & Pozzolo, 2017) (Navaretti, Calzolari, Mansilla-Fernandez, & Pozzolo, 2017). By developing and using practical new IT-supported service tools, fintech companies decrease operational costs and provide customer-centric services, user-friendly digital applications, and data-driven resolutions in the banking industry. Some of those mentioned above new financial innovations can force out several traditional business models of banks (Navaretti, Calzolari, Mansilla-Fernandez, & Pozzolo, 2017)(Navaretti, Calzolari, Mansilla-Fernandez, & Pozzolo, 2017). Therefore, with disruptive technology-driven advances, fintech companies are considered a threat to traditional financial institutions, and these institutions are forced to review their corporate frontiers (Kohtamäki, Parida, Oghazi, Gebauer, & Baines, 2019) (Kohtamäki, Parida, Oghazi, Gebauer, & Baines, 2019). A simple organizational structure and a lack of legacy infrastructure make fintech startups more flexible, agile, and adaptive to innovation quickly (Brandl & Hornuf, 2020) (Brandl & Hornuf, 2020). Conversely, traditional banks cannot quickly adapt to novel technology developments due to the high level of organizational complexity and complying with extensive regulatory obligations. Furthermore, recent innovations in the digital service industry force banks to alter their current distribution channels, thus decreasing their inducements in new distribution channels. Although fintech companies are a significant threat to banks, they offer several opportunities to traditional financial institutions, such as making strategic alliances to benefit from competitors. For instance, the key players of the Turkish bank sector İş Bankası and Yapı Kredi Bank, have mentioned in their 2021 annual report that fintech startups are becoming a threat to traditional banks. The prominent trends of İşbank in innovation are supporting common platforms, strengthening cooperation with fintechs, and reaching groups not served before. Yapı Kredi has adopted the strategy of gaining a competitive advantage by establishing new business platforms with fintechs.

Strategy and marketing literature studies have shown some general choices for incumbents' (traditional banks') strategic responses to entrants (fintech startups), such as competition, collaboration, or acquisitions. The applicable strategic response of the traditional banks depends on the nature and level of threat composed by the entrants. Divya & Murali (2019) conducted a study based on Borah and Tellis' research from 2014. They categorized the nature of threats posed by fintech as technology-centered and market-centered, respectively. Based on the levels of these threats, Fig. 1 figures out the bank's four strategic responses to the threats posed by fintech: *Hold, Make, Ally, Hold, or Exit*.

The current study examines the collaborations between traditional banks and fintech startups in light of the high level of technology-centered and low level of market-centered threat. The strategic collaboration forms, such as investment-related or product-related ones established in Turkey, are analyzed in terms of bank and fintech-specific determinants. Furthermore, the relationship between fintech segments and the determinants of strategic alliances are investigated.

There are some contributions of this study to empirical literature. To the best of my knowledge, this study is the first paper that examines the type of collaboration between the banks and fintechs in Turkey. Secondly, this study contributes to the financial innovation literature regarding how fintech startups forced traditional banks to adopt new financial innovations or make strategic alliances with fintech companies. Finally, this analysis contributes to the "make, buy, or ally" literature (Borah & Tellis, 2014) (Borah & Tellis, 2014), which shows a wide scale of collaborations companies interact with others in the market regarding innovation management.

This paper comprises the following sections: In the "Literature Review and Hypotheses" section, the related articles about the bank-fintech collaboration are briefly examined, and the study's hypotheses are constructed. The "Data and Methods" section describes the data and applied methodology. The "Empirical Results and Discussion" part captures the estimation results and analytical discussion. Lastly, the "Conclusion" section provides practical implications, limitations, and remarks for future research.

Literature review and hypotheses

While there is a rapid increase in papers on fintech, a scant empirical study quantitatively captures the strategic alliances between traditional commercial banks and fintech.

Borah and Tellis (2014) studied innovation strategies for firms, including make, buy, or ally options. They constructed such hypotheses: (i) "High payoff from make or buy or ally in the prior year encourages firms to make or buy or ally, respectively"; (ii) " A high number of commercialization in the prior year encourages firms to make"; A low number of commercialization in the prior year encourages firms to make or ally."The researchers analyzed 3522 make, buy, and ally announcements for 192 firms across 108 industries from 2002 to 2007 to address this issue. Announcements that involve making or allying tend to result in positive and more lucrative outcomes than announcements that involve buying, which can lead to negative outcomes. In a related article to this study, Lars, Milan, Todor, & Armin (2021) investigated the form of collaborations between banks and fintech, which banks make strategic alliances, and how significantly they do it. Employing hand-collected data from 2007 to 2017 that includes developed economies such as France, Germany, Canada, and the United Kingdom, panel probit and cross-sectional regression methodology are applied. According to the panel probit model results, when banks hire a chief digital executive, they are keen on establishing more strategic alliances with fintech startups. Furthermore, in parallel with incomplete contract theory, banks establish product-related collaborations with larger banks. On the other hand, they are eager to invest in small fintech startups. Brandl & Hornuf (2020) investigated a bank-fintech network approach for Germany and showed that the form of relations between banks and fintechs is often product-related. Another study by Bartolacci, Cardoni, Lasak, & Sadkowski (2022) examined the features, success factors, and critical motives for forming collaborations between a cooperative small-scale bank and a fintech startup in Italy. According to the qualitative research method, several motives exist to establish strategic alliances between banks and fintech. From the point of banks' view, these motives are as follows: outsourcing, innovation, developing a business model, gaining competitive benefit, cost efficiency, advancing service quality and learning. On the other hand, fintech startups' motives include reaching customers, credits, banking licenses, economies of scale, trust, etc. Furthermore, experience, ability, professionalism, regional closeness, and

		Perceived level of Fintech entrant's technology-centered business model innovation (BMI) threat	
		Low	High
Perceived level of Fintech entrant's market-centered business model innovation (BMI) threat	Low	1: Hold	3:Ally
	High	2:Make	4: Buy or Exit

Fig. 1 The Strategic Response Matrix of Banks for Fintech Threats. Strategic response matrix for a bank (Divya & Murali, 2019).

hybridization determine a strategic alliance's success. Ntwiga (2020) examined the impact of bank-fintech collaboration on the efficiency of the banking sector, comparing the Pre-Fintech and Post-Fintech period in Kenya with 15 banks. This study employs a data envelopment analysis approach with input based on four intermediation dimension models. Empirical results show that banks collaborating with fintech companies manage better and have higher efficiency scores. Furthermore, the collaboration decreased the cost of intermediation and improved the scale of operations. Bomer & Maxin (2018) studied why fintech startups collaborate with banks in Germany. After examining 14 case studies, three main reasons were detected: First, banks provide to fintech entering the market; second, banks increase a fintech's profits; and lastly, banks support new fintech services. Another important finding shows that when making strategic alliances with banks, fintech use different labels to trade their products.

Based on the above literature review, the motivations of bank and fintech alliances are briefly explained. The benefits of forming an alliance with a fintech startup instead of acquiring one vary depending on the bank. Moreover, due to the scarcity of professional knowledge or lack of appropriate decision mechanisms, strategic collaborations may fail to produce notable financial performance. Investing in the wrong fintech startup can be very risky to small banks when compared with large banks, as large banks can quickly minimize such risks. The main motivations for investing in fintech startups through obtaining a minority or majority shares are adopting fintech technology quickly and taking sole control of knowledge. Thus, in parallel with Lars, Milan, Todor, & Armin (2021), such a hypothesis can be constructed:

Hypothesis 1: While large banks mainly invest in fintech startups, small banks are expected to establish product-related alliances.

This statement is consistent with an incomplete contracting theory, which has robust arguments about selecting between collaboration governed by contracts and acquiring a technology-based firm (Grossman & Hart, 1986) (Grossman & Hart, 1986). In the innovation context, the final outputs of contracts are difficult to determine ex-ante and hence can not be confirmed ex-post (Aghion & Bolton, 1992) (Aghion & Bolton, 1992). When contracting, terms between banks and fintech startups about possible innovations are unclear; ex-post implementation is impossible. Therefore, investing in a fintech startup is preferable to making product-related collaborations since it allows banks to take control of decision-making processes in the fintech company.

When analyzing Turkey's fintech ecosystem and banking sector, it is evident that the regulatory environment is innovation-friendly. The progress of the fintech and banking ecosystem in Turkey began in 2012 with cutting-edge payment devices that facilitated automated processing and storage of credit card and invoice data (Presidency of the Republic of Türkiye Finance Office, 2021)(Presidency of the Republic of Türkiye Finance Office, 2021). In 2013, enacting "6493 Payment and Securities Reconciliation Systems, Payment Services, and Electronic Money Institutions" led to the issuance of e-money and payments licenses, increasing startups' focus on e-money and payments. An equity-based crowdfunding platform was introduced, and open banking products were defined as payment services in 2019. The first platform launched in May 2021; five approved platforms are now as of December 2021. In 2019, the supervision and regulation authority over payment service providers was transferred from the Banking Regulation and Supervision Agency (BRSA) to the Central Bank of the Republic of Turkey. The pandemic highlighted the need for banking digitalization in 2020. Regulations were implemented for digital onboarding, contract signing, and TR QR code standardization. In 2021, the Digital Turkish Lira Cooperation Platform was established. New regulations now allow for video call authentication and electronic contract notarization and mandate Near Field Communication (NFC) technology, a type of wireless technology that allows devices to exchange data over short distances for ID authentication. During that year, several developments took place in the financial industry. The principles for debt-based crowdfunding were published, a definition for banking-as-a-service/digital banking was established, and the "Association of Payment and Electronic Money Institutions of Turkey" was formed. Additionally, the secondary regulation for payment services was renewed, and Payment Services Directive 2 made open banking arrangements. The regulations mentioned above have been issued to strengthen fintech companies, encourage bank digitalization, and pave the way for open banking.

Figure 2 shows that fintech startups operating in the payment service area constitute 35% of fintech companies by verticals as of 2021. These startups operating in the payment service segment are expected to be big rivals to the banking sector. Thus, it is considered that large banks establish more strategic alliances than non-payment fintech startups. Based on this statement, the next hypothesis can be built as follows:

Hypothesis 2: Large banks establish more alliances with fintechs in the payment service segment, and small banks are likely to collaborate with other field segment startups.

Data and methods

In order to test hypotheses, the quantitative methodology is applied using hand-collected data covering the details of bank-fintech alliances in Turkey, a developing economy.

Data. The sample of this study consists of 24 (twenty-four) active commercial banks as of 2021, and detailed information related to

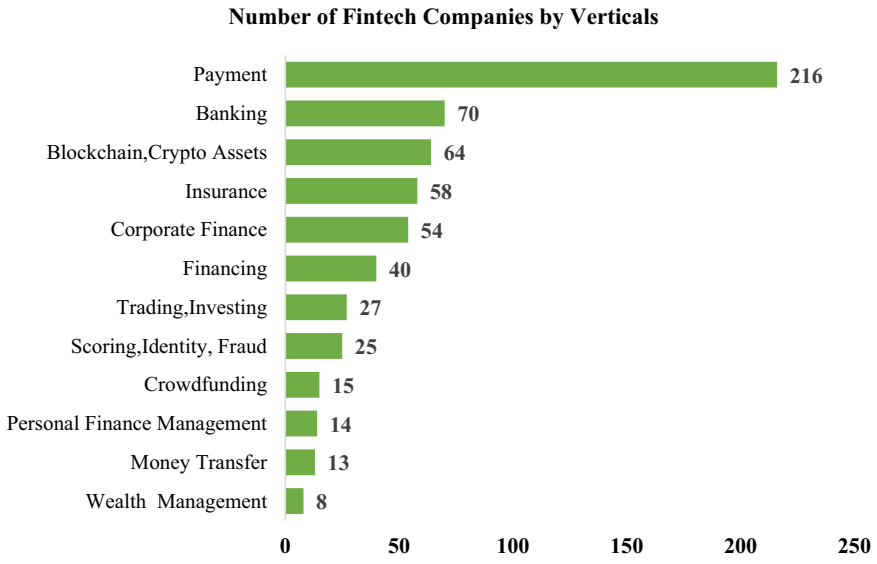


Fig. 2 The Number of Fintech Companies by Verticals. Number of Fintech companies by verticals (Presidency of the Republic of Türkiye Finance Office, 2021).

the banks is collected from The Banks Association of Turkey. A wide range of Internet search and network data from (FinTech İstanbul, 2022) is employed when collecting hand-collected data. In the first step, all banks' official websites and press announcements about collaborations with fintech are checked. Second, to determine which company is a fintech startup, the list from (Startups.watch, 2021) (Startups.watch, 2021), a Turkish startup ecosystem platform, is used. Third, fintech side information is gathered from the Google, LinkedIn, and Crunchbase databases. In this study, a collaboration is considered an investment if the bank made a minority or majority acquisition and a product collaboration if it made a contract-based corporation. Some investment-related and product-related collaboration examples reveal this assumption more solid. For example, Moka Payment and Electronic Money Institution, which offers virtual POS, mobile payment, and bill payment systems, was acquired by Türkiye İş Bankası for $3.8 million in 2021 (Kamuyu Aydınlatma Platformu, 2021) (Kamuyu Aydınlatma Platformu, 2021). Furthermore, Akbank has established a new company, "AkÖde", with a capital of 12 million TL, which it will fully own (Kamuyu Aydınlatma Platformu, 2018) (Kamuyu Aydınlatma Platformu, 2018). Odeabank added virtual POS agreements with Papara and Öde Al companies licensed by the Banking Regulation and Supervision Agency (BRSA) within the scope of the E-commerce Law no. 6493, which covers the work of fintechs. Moreover, Şekerbank partnered with Fongogo, a crowdfunding platform, to bring entrepreneurs and their target audiences together virtually. Businesses reaching 50% of their target fund could access up to 50,000 TL in cash support from Şekerbank, repayable over 36 months with a 3-month grace period. To test Hypothesis 1, the dummy variable Investment takes one value if this collaboration is in the form of investment and 0 if the collaboration is product-related. The main explanatory variables are *ln (Bank Total Assets)* and the *Fintech Employees*, respectively, proxies for bank and fintech size. Furthermore, other control variables for fintech-specific characteristics are used: *Fintech age* shows the age of fintech since its establishment. *Fintech headquarters* is a dummy variable that equals one if this fintech is located in Istanbul. For bank-specific characteristics, *ln (Bank Age)* natural logarithm of the bank's age in years, *Bank Type* dummy variable takes one value if the bank is domestic. Table 1 summarizes definitions of variables used in the regression model.

Methods

To estimate the models, parallel with Lars, Milan, Todor, & Armin's (2021) study, a standard cross-sectional probit model is applied by constructing the following equations:

Model 1: Type of Alliance Forms

$$Pr\ (Investment = 1) = F\ (ln\ (Bank\ Total\ assets)_i + Fintech\ Employees_i + Bank\ Type_i + ln(Bank\ Age)_i + Fintech\ Age_i + Fintech\ Headquarters_i)$$

According to Lars, Milan, Todor, & Armin (20, 21), which is similar to the present study, there is a negative and statistically significant association between Fintech Employees and Investment. This result matches Hypothesis 1 and confirms that large banks are more likely to invest in small fintech startups. Another significant result indicates that Bank Total Asset affects Investment positively and statistically significantly, and large banks invest more in fintech startups. In the existing study, the sign of bank total asset coefficients and fintech employees are expected to be positive and negative, respectively.

Model 2: Type of Fintech Segment

$$Pr\ (Payment\ Service_i = 1) = F\ (ln\ (Bank\ Total\ assets)_i + Fintech\ Employees_i + Bank\ Type_i + ln(Bank\ Age)_i + Fintech\ Age_i + Fintech\ Headquarter_i)$$

The sign of bank total assets is expected to be positive, and large banks collaborate more with fintech startups operating in the payment service sector.

Empirical results and discussion

Descriptive statistics. Descriptive statistics of this study are presented in Table 2. According to Table 2, the study sample consists of 430 strategic collaborations between 24 commercial banks and fintech companies. It can be seen that the most significant part of alliances comes from product-related alliances, and only 7% of these alliances are investment-type collaborations. Furthermore, the average age of fintech startups is about 13 years, and these companies' headquarters are in Istanbul. Regarding fintech employee size, on average, the number of employees in these startups is between 50 and 100. Fig. 3 shows an overview of the segments in which fintech startups established strategic alliances with banks, and it figures out that most fintech firms operate in the payment service area.

Table 1 Definition of variables involved in the regression model.

Variable Name	Definition	Data Source
Dependent variables		
Investment (d)	Binary dummy variable equal to 1 if the alliance is investment-based and equal to 0 if the alliance is defined by a product-related collaboration*.	Bank Websites (Annual Reports); Google,
Payment service (d)	Binary dummy variable equal to 1 if fintech operates in the payment service segment and 0 in the other field segment.	Startups. watch
Bank characteristics		
Ln (Bank age)	Natural logarithm of the bank's age in years.	The Banks Association of Turkey
Ln (Bank total assets)	Natural logarithm of the bank's total assets	The Banks Association of Turkey
Bank type (d)	The binary dummy variable equals one if the bank is domestic and 0 if it is foreign.	The Banks Association of Turkey
Fintech-specific characteristics		
Fintech employee (rank)*	The scale of the employees of fintechs. Categories: 1–10, 11–50, 51–100, 101–1000, >1000.	Fintech Webiste; Crunchbase; Linkedin; Google; Startups.watch
Fintech age	Fintech's age in the respective year	Fintech Webiste; Crunchbase; Linkedin; Google; Startups.watch
Fintech headquarters (d)	The binary dummy variable equals one if the fintech is located in Istanbul and 0 if it is rather than in Istanbul.	Fintech Webiste; Crunchbase; Linkedin; Google; Startups.watch

"Fintek", "fintech", "Fin-Tek","FinTech", "işbirliği", iş birliği", "dijital", "finansal teknoloji", "yatırım" "ödeme sistemleri"etc words and combinations are searched in the banks' annual report.
*1–10 = 1.00; 11–50 = 2.00; 51–100 = 3.00; 101–1000 = 4.00; >1000 = 5.00.

Table 2 Summary Statistics of Bank-Fintech alliances in 2021 in Turkey.

Variable	#Obs	Mean	Std. dev.	Min	Max
Dependent variables					
Investment	430	0.07	0.25	0	1
Payment service	430	0.45	0.50	0	1
Explanatory variables					
Fintech age	430	13.28	8.68	0	41
Fintech headquarter	430	0.82	0.39	0	1
Fintech employees	430	2.94	1.11	1	5
Ln (Bank total assets)	430	26.12	1.21	24	28
Ln (Bank age)	430	3.69	0.82	2	5
Bank type	430	0.47	0.50	0	1

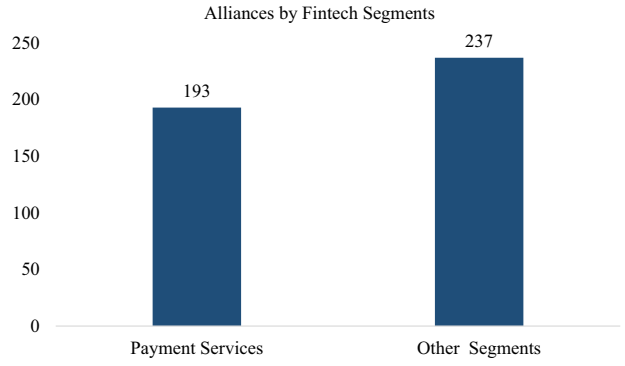


Fig. 3 The Distribution of Strategic Alliances by Fintech Segments. Distribution of alliances by fintech segments.

Regression results. The estimated results of the first model are summarized in Table 3. According to Table 3, only the coefficient of *ln (Bank Total Assets)* is statistically significant at the 1% level and negatively affects this regression model. In other words, a 1% percent change in banks' total assets decreases the probability of investments by 0.1%. Unlike Lars, Milan, Todor, & Armin (2021), existing empirical results prove that large banks collaborated product-related with fintechs rather than investing in startups in Turkey. This result aligns with the Brandl & Hornuf (2020) study, which analyzes bank-fintech network analysis in Germany. Another primary control variable, *Fintech Employees*, has a positive and statistically insignificant effect in this model.

Table 4 presents the estimated results of our second model when *Payment Service* is used as the dependent variable. Firstly, the *ln(Bank Total Assets)* has a negative and statistically significant impact on Payment Service at a 5% level. This result indicates that large banks make more strategic alliances with fintech firms that operate in the nonpayment service area. Secondly, a negative and statistically significant association exists between the *Fintech Age* and *Payment Services*. It reveals that older fintech startups mainly collaborate with banks in the payment segment. Lastly, the coefficient of *Fintech headquarters* is positive and statistically significant at the 1% level. It implies that fintech startups located in Istanbul increase the probability of collaborations with banks in the payment service sector.

Discussion

Following the global financial crisis of 2008, many fintech startups have been created with the rise of novel financial technologies. These startups have reshaped the financial industry, establishing new products, services, and business models. Using these new IT-enabled technologies effectively, fintech startups forced traditional banks to change their business models, and these startups became a potential threat to banks in the financial industry. Due to these reasons, traditional banks make strategic alliances with fintech startups, gaining a competitive advantage over the competitors and minimizing their lack of technological infrastructure. This strategic response aligns with the study of Borah & Tellis (2014), which emphasizes alternate routes of firms to innovation.

Using hand-collected data covering 430 bank-fintech alliances in 2021 in Turkey, the form of alliances chosen by banks and in which fintech segments banks prefer to collaborate are examined. According to the dataset, it can be seen that most of the bank-fintech alliances are product-related collaborations that banks do not have any control over in the fintech's service and product development process. The empirical results suggest that large banks mainly establish product-related collaborations with fintech startups rather than invest in them in Turkey. It shows that banks widen their service and product portfolio and apply different distribution channels to get new clients through product-

Table 3 Estimation results for investment versus product-related collaboration.

Dependent variable:	Investment (d)				
Explanatory variables	**Coefficient**	**Std. Err.**	***P*-value**	**[95% Conf.**	**Interval]**
Fintech age	−0.012	0.012	0.323	−0.036	0.012
Fintech headquarter (d)	0.200	0.282	0.478	−0.352	0.752
Fintech employees	0.147	0.100	0.140	−0.048	0.343
Ln (Bank total assets)	−0.104***	0.026	0.000	−0.155	−0.052
Ln (Bank age)	0.207	0.156	0.184	−0.098	0.512
Bank type (d)	−0.076	0.216	0.726	−0.498	0.347
Number of obs.	430				
Wald χ^2	251.21				
Prob > χ^2	0.000				

The table represents the estimated results of cross-sectional probit regression. *** denote significance level at 1%. (d) indicates a dummy variable.

Table 4 Estimation results for payment service versus other fintech segments.

Dependent variable:	Payment service (d)				
Explanatory variables	**Coefficient**	**Std. Err.**	***P*-value**	**[95% Conf.**	**Interval]**
Fintech age	−0.032***	0.008	0.000	−0.048	−0.016
Fintech headquarter (d)	0.510***	0.170	0.003	0.177	0.842
Fintech employee size	0.079	0.064	0.216	−0.046	0.205
Ln (Bank total assets)	−0.033**	0.016	0.033	−0.064	−0.003
Ln (Bank age)	0.122	0.095	0.196	−0.063	0.308
Bank type (d)	0.127	0.138	0.356	−0.143	0.398
Number of obs.	430				
Wald χ^2	31.42				
Prob > χ^2	0.000				

The table represents the estimated results of cross-sectional probit regression. ** and *** denote significance level at 5% and 1%, respectively. (d) indicates a dummy variable.

related collaborations. Furthermore, it seems that the Turkish fintech ecosystem is limited to investment opportunities, and this sector still needs to grow to become a potential competitor to the traditional financial industry. Another finding shows that while the payment service field is the most common segment, large banks prefer to establish alliances with non-payment fintech startups. It can be explained that almost all banks have already adopted and internalized their payment service technology infrastructure. Furthermore, our result shows that recently established fintech startups primarily operate in the payment service segment, verified by "The State of Fintech Ecosystem in Turkey" report (Presidency of the Republic of Türkiye Finance Office, 2021) (Presidency of the Republic of Türkiye Finance Office, 2021). Finally, fintech startups established in Istanbul are more likely to make alliances with banks in payment service segments. In The State of Fintech Ecosystem in Turkey (2021) report, one of the main goals of the National Fintech Strategy Document is to help Turkey become a globally competitive actor in the fintech sector. In order to reach this goal, the Istanbul Finance and Technology Base, which aims to support the growth of fintech companies and invest in high-potential startups, will be established. Thus, our result is consistent with the goal of the National Fintech Strategy that Istanbul will be a global fintech hub.

Conclusion

This study has practical implications for fintech investors, banks, and policymakers. Collaboration is essential for fintech entrepreneurs who need capital and want to become independent in the industry. This study's results suggest collaboration between small banks and fintech investors who need capital may be more successful. On the other hand, approaching large banks through product-related collaboration will be the appropriate decision for fintech entrepreneurs who need to get new customers and stay independent in the industry. Another practical implication is for policymakers who want to reshape the financial industry by intensively applying financial technologies. In order to provide bank services (e.g., taking deposits, giving loans), fintech needs to get a bank license from supervisory authorities. However, these policymakers' restrictive granting of bank licenses minimizes the growth opportunities of such fintech. This approach leads to making more alliances in the fintech ecosystem. Thus, there will be a need for close monitoring by supervisory authorities.

Taking not into account the duration of bank-fintech alliances is the fundamental limitation of this study. Some alliances could be terminated mainly through banks since they improved their technical solutions. Another reason is that a competitor can acquire fintech startups, or the agreement expires.

Future research could examine which factors determine the success of bank-fintech alliances and whether this strategy is successful for traditional banks in the financial sector. Furthermore, in this study, bank-fintech alliances are taken from the banks' point of view. An opposite study could investigate the viewpoint of fintech startups' incentives to make strategic alliances with incumbents. This research might disclose that while the primary motivation for forming alliances with banks for fintech startups is to reach banks' huge client base rather than new technologies, developing specific digital services by fintech is more advantageous than by large banks.

Data availability

The datasets generated during and analyzed during the current study are available upon reasonable request.

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Author contributions

A.B.N. carried out the first phase of the research design, the literature survey, the data collection, the statistical analyses, and the first draft of the manuscript. G.O. participated in the research design and interpretation of empirical results and helped draft the manuscript.

Competing interests

The authors declare no competing interests.

Ethical approval

This article contains no studies with human participants performed by any authors.

Informed consent

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Additional information

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