THE MODERATING EFFECT OF FINANCIAL LITERACY ON THE ADOPTION OF FINTECH

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THE MODERATING EFFECT OF FINANCIAL LITERACY ON THE ADOPTION OF FINTECH

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DECLARATION OF ORIGINALITY

I, Cihan Alpay, certify that

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ABSTRACT

The Moderating Effect of Financial Literacy

on the Adoption of Fintech

The emergence of new technologies has enabled the development of new business models in the financial services industry similar to other industries. Thanks to these new technologies and business models, Fintech is now capable of competing with traditional financial service providers. In this academic work, Fintech is defined as certain companies that provide financial products and services other than traditional financial service companies. The effect of selected risk and benefit factors on the Fintech adoption intention through perceived benefit and perceived risk was investigated within the scope of this research. Moreover, to what extent the financial literacy levels of the users affect their Fintech adoption intention was examined. Finally, it was investigated if the effect of perceived benefit and risk constructs on Fintech adoption intention differs significantly for current and potential Fintech users. The survey as part of this research was reached a total number of 389 participants. The results obtained in this research are believed to attract the attention of researchers working in this field, companies operating in the financial services industry as well as existing customers and potential users of Fintech.

ÖZET

Finansal Okuryazarlığın Fintech Kabulündeki Düzenleyici Etkisi

Yeni teknolojilerin ortaya çıkması tüm sektörlerde olduğu gibi finansal hizmet sektöründe de farklı iş modellerinin belirmesine olanak sağlamıştır. Fintechler ise gelişen yeni teknoloji ve yeni iş modelleri sayesinde geleneksel finansal hizmet sağlayıcılarıyla rekabet edebilir hale gelmiştir. Bu araştırmada Fintechler, geleneksel finansal hizmet sağlayıcı şirketlerin haricinde finansal ürün ve hizmet sunan şirketler olarak tanımlanmıştır. Çalışma kapsamında seçilmiş olan çeşitli risk ve fayda unsurlarının, algılanan risk ve fayda aracılığıyla Fintech şirketlerinin kabulüne olan etkisi araştırılmıştır. Ayrıca, kullanıcıların finansal okuryazarlık düzeylerinin, Fintech'lerin sağladığı hizmet ve servislerin kabulü üzerindeki etkisinin ne düzeyde olduğu incelenmiştir. Son olarak, Fintech şirketlerinin sunduğu ürün ve hizmetleri halihazırda kullanmakta olan ve kullanmayı düşünen kişiler arasında algılanan fayda ve risk etkisi açısından kabul düzeylerinden belirgin bir farklılık olup olmadığı çalışılmıştır. Araştırma kapsamında toplam 389 katılımcıya ulaşılmıştır. Bu araştırmanın sonuçlarının, bu alanda çalışma yapan araştırmacılar, finansal hizmet sektöründe yer alan şirketler, Fintech'ler ve Fintech'lerin sunduğu hizmetlerin mevcut ve potansiyel kullanıcıları tarafından ilgi göreceği düşünülmektedir.

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To my beloved family and friends…

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CHAPTER 1

INTRODUCTION

New technologies have changed and reshaped many industries. Financial services industry is one of the most disrupted ones among them. Providing a new product, a new concept or a new service to customers does not lead those customers to adopt this new value proposition in the first place. They might show some resistance, be sceptical about benefits or even consider it as risky. Therefore, it is prominent to study how customers perceive risks and benefits attached to a certain product or a service.

Even though the term "Fintech" itself has a long history within Finance and Information Systems literature, no consensus has been reached in the definition of Fintech yet (Zavolokina, Dolata & Schwabe, 2016).

The awareness of Fintech is rising all around the world (KPMG, 2018). The proliferation of Fintech increases financial access among societies. There is a great potential Fintech holds to democratize financial industry and increase financial access so that a greater financial inclusion can be achieved.

In this study, Fintech is regarded as companies providing financial technology apart from traditional financial service providers.

1.1 Fintech ecosystem in Turkey and around the world

Total investment allocated to Fintech companies in 2018 hit a record-high $111.8 billion globally (KPMG, 2018). Those numbers indicate a very promising momentum and future for Fintech companies.

A wide range of Fintech adoption percentage can be observed among countries. The high end of this spectrum mainly consists of Asian countries such as China and India. Whereas, Peru and Chile were ranked bottom in the list. There can be various reasons such as different juridical rules, population and cultural differences.

Even though Turkey stands out as a heavily regulated financial market, Fintech ecosystem has been flourishing in recent years in accordance with the global rise of Fintech. According to a report by Fintech Istanbul, over 300 Fintech companies were listed under 13 categories and 72 subcategories as of June 2019. Those 13 categories stand out as payment, banking, financing, corporate finance, insurance, crowdfunding, investment, personal finance management, wealth management, hubs and others, asset management, big data, and crypto-fintech.

1.2 Purpose of this research

The main objective of this research is to investigate the impact of financial literacy levels of users on Fintech usage intention while using a combined benefit and risk framework.

It further examines whether potential and current Fintech users differ from each other in terms of their level of Fintech usage intention as well as the significance of designated benefit and risk items.

1.3 Significance of this research

First of all, there is a limited number of academic researches that solely investigates Fintech adoption unlike the adoption of other existing technologies such as internet banking, mobile banking, and mobile payment.

Secondly, there is a lack of research to examine what triggers this adoption decision in Turkey. Understanding Turkish Fintech context might be beneficial for various stakeholders. Similarly, Turkish users' behaviours on Fintech adoption may give a hint to understand other developing countries' Fintech ecosystems as well. This research not only focuses on actual Fintech users' behaviours but also investigates potential users' perceptions and priorities while adopting the products and services Fintech companies are offered.

It is important to note that most of the studies in this field include a very limited range of Fintech types. Those are mainly payment services, money remittance, and credit comparison and scoring. This study further explores other types of Fintech companies including mobile wallets, cryptocurrencies, insurance, and personal finance management.

Thirdly, inspecting the possible relationship between Fintech adoption and financial literacy may lead to explain how and in what extent financial literacy skills cause the adoption of Fintech services.

Last but not least, the investors and other financial and non-financial industry players can take the outcome of this research as an input while prioritizing their investment decisions and positioning themselves on the market.

CHAPTER 2

LITERATURE REVIEW

In this chapter, the academic literature regarding the adoption of new technologies particularly relevant to financial industry is explained. Furthermore, the views of several scholars on financial literacy are briefly discussed. This chapter also introduces how the adoption of new technologies differs for current and potential users. This section aims to highlight the relevance and the prominence of Fintech through different perspectives offered by scholars.

2.1 Financial literacy

Financial literacy stands out as a prominent concept both at an individual and a national level. It has been defined by the President's Advisory Council on Financial Literacy (PACFL, 2008) as follows: "The ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being". However, Hung et al. (2009) noted that scholars fail to agree on the definition and the measurement of financial literacy. For instance, Remund (2010) asserts that having financial knowledge is necessary but not sufficient when it comes to measuring financial literacy. Handling personal finance management with confidence both for short and long term financial planning also matters for such measurement.

Mandell (2007) illustrated the practical side of financial literacy and stated that financial literacy can be defined as the capability of selecting relevant financial products among all new and complex alternatives for maximizing long-term returns.

Huston (2010) highlighted the knowledge dimension and the application dimension of financial literacy and defined it as a measurement of the understanding and the usage levels of individuals' financial information.

The emergence of new technologies in the financial services industry also enables new distribution channels and thus the exposure of new segments among societies to the financial system. Digital financial literacy is highly likely to be as relevant as financial literacy since its effect on the financial well-being of the customers is expected to increase in the near future. Customers will be required to increase their financial sophistication levels to use Fintech efficiently and protecting themselves from any fraudulent acts and monetary loss derived from such events. (Morgan, Huang & Trinh, 2019). In their brief, they suggest four dimensions of digital financial literacy; (i) knowledge of digital financial products and services, (ii) awareness of digital financial risks, (iii) knowledge of digital financial risk control and (iv) knowledge of consumer rights and redress procedures.

2.2 Fintech

Fintech has become increasingly popular and gained significant importance. Yet, there is no consensus regarding how Fintech is defined and perceived among scholars. (Zavolokina, L., Dolata, M. and Schwabe, G., 2016).

According to Kim et al. (2016), Fintech is defined as an innovative service that enhances financial services with the help of new technologies. Lee and Kim (2015) describes Fintech as a blend of existing financial services and IT technology in order to enhance financial service performance including all underlying technical processes. Similarly, Maier (2016) defined Fintech as emerging businesses that

deliver value to customers by harnessing technology and challenging established financial service companies.

Fintech is shaping the perceptions of all stakeholders. Buchanan et al. (2018) discussed the effect of Fintech globally and stated that financial industry players are challenged all over the world to establish exceptional financial products and services.

Fintech is also changing the delivery of financial services operations extensively. According to Gomber et al. (2019), Fintech harnesses advanced technologies such as artificial intelligence and machine learning to execute customer management and operational risk management. Moreover, it restricts human touch on non-value added or repetitive parts of the operations with the help of machine intelligence and only allows to include where it may create additional value.

As Fintech enters the financial industry next to traditional financial services companies, regulatory environment and demands from both entities have transformed as well. Anagnostopoulos (2018) stated that even though some regulatory standards might be binding for established banks, those standards are only partially binding for challenger banks. Additionally, as Fintech becomes an important phenomenon, lack of agreed international standards on Fintech intermediation as well as growing differences on local regulatory requirements have become obvious constantly.

Ozili (2018) draws attention to the fact that Fintech plays a critical role in financial inclusion through its digital financial services capabilities and scale advantages. Yet, for-profit Fintech's delivery to the financially disadvantaged people in the society may lead to government funding necessities in case of the emergence of systemic cost externalities.

Fintech was regarded as technology-intensive financial products and services provided by non-financial industry service companies in this academic work. In this study, Fintech includes financial products and services categorized under payment services, money remittance, credit comparison and credit scoring, mobile wallets, cryptocurrencies, insurance, and personal finance management.

CHAPTER 3

THEORETICAL MODEL AND HYPOTHESES

The valence framework has been used in this research. It is a useful model to explain the dynamics of customers' decision-making process through its two main constructs of perceived benefit and perceived risk. Perceived benefit aims to explain the main motivation behind increasing expected positive conditions, whereas perceived risk helps to identify the motivation behind reducing the expected negative conditions. (Lu, Yang, Chau & Cao, 2011)

It has been hypothesized that if the perceived benefit of certain products or services surpasses its perceived risk, those items are strong candidates for adoption in the view of users. According to Kim, Ferrin and Rao (2009), customers finalize their decisions in order to maximize net valence. Therefore, net valence is a useful framework to investigate the overall impact of various perceived risk and benefit items.

As the risk factor perceived by the users surges, it has been expected that the unwillingness to selecting this alternative increases and thus negatively relates to the usage intention of users. Therefore, the following hypotheses are proposed:

Hypothesis 1: Perceived benefit is positively related to Fintech usage intention.

Hypothesis 2: Perceived risk is negatively related to Fintech usage intention

Economic benefit, seamless transaction and convenience have been selected as relevant benefit factors as also proposed in Ryu (2018). Economic benefit can be associated with cost advantages or accessing lower-cost opportunities obtained by

specifically selecting those products or services unlike the alternatives offered in the market. Thus, users can get a monetarily benefit when picking that alternative. Saksonova and Kuzmina-Merlin (2017) suggested that Fintech provides cheaper insurance products and services to customers compared to existing companies operating in insurance industry. Similarly, Fintech enables customer to by offering certain financial products such as loans with lower costs with the help of the technology (Mackenzie, 2015).

Seamless transaction is referred to as a positive factor for technology adoption in most cases. In Fintech context, this has no exception and mainly emphasizing removing middle man between customers and service providers. Traditional financial institutions play the role of a middle man that has either little or no control in regards to value proposition. Vives (2017) illustrated that the transactions of peer-to-peer lending are completed in a way that limits financial intermediary's benefit.

Convenience in the financial services industry has become an important benefit factor that all users demand. As the rivalry among financial services providers soars, delivering the quickest possible service without any time and location limitations has become a prominent point of differentiation among companies. Teo et al. (2015) investigated the effect of perceived transactional convenience on mobile payment adoption. Similar to mobile payment adoption, convenience was found to be positively related to the adoption intention of mobile banking system adoption (Shen, Huang, Chu & Hsu, 2010). Kim et al. (2015) also pointed out that convenience is one of the most prominent and significant factor for payment-type Fintech usage next to the factor of usefulness. Hence, this resulted in developing the following three hypotheses:

Hypothesis 3: Economic benefit is positively related to perceived benefit.

Hypothesis 4: Seamless transaction is positively related to perceived benefit.

Hypothesis 5: Convenience is positively related to perceived benefit.

Not only the benefit factors but also the risk factors are affecting customers' usage intention through their perceived risk of Fintech. Financial risk refers to the potential or realized monetary losses while using Fintech. Customer may be exposed to financial risk due to financial or payment frauds. Most of the time, financial risk has a significant negative effect on customers' adoption intention to online banking (Lee, 2019) and to mobile payment (Williams, Roderick & Davies, 2017). Therefore, it creates an unwillingness for customers to use Fintech products and services.

Legal risk is mainly derived from the legal uncertainty regarding using certain technology. Potential and the current Fintech users can hardly feel themselves knowledgeable about regulations. While explaining the effects of some risk items on e-banking acceptance of customers, Shafei and Mirani (2011) described legal risk as the damage due to the missing laws addressing electronic crimes or missing information regarding the this concept while explaining e-banking acceptance. This may also be originated from the excessive number of regulations or the specificity of Fintech environment.

Security risk refers to the possible losses from fraudulent actions in forms of financial information leakages and other forms of privacy invasions. Lee (2009) showed that security risk had the strongest negative effect on the online banking adoption of customers.

Operational risk comes into existence in Fintech context in several ways. The lack of organizational response to a big operational problem or failing to take the

expected actions by the customers on time might pose a great risk for some customers. Again, the following risk factors in Ryu (2018) have been picked in the research model:

Hypothesis 6: Financial risk is positively related to perceived risk

Hypothesis 7: Legal risk is positively related to perceived risk

Hypothesis 8: Security risk is positively related to perceived risk

Hypothesis 9: Operational risk is positively related to perceived risk

While exposing to a new product, new service or new technology, users tend to be more attentive to possible risks and negative outcomes due to their low level of experience (Phonthanukitithaworn, Sellitto and Fong, 2016). In addition to that, potential users have less time and opportunity to form their opinions on risk items compared to current users (Byun and Byun, 2013). Therefore, it is expected that the effect of perceived risk on Fintech usage intention will be greater for current users. Additionally, hypotheses regarding the user type and financial literacy items were listed:

Hypothesis 10: The effect of perceived benefit on Fintech usage intention in current users is greater than potential users

Hypothesis 11: The effect of perceived risk on Fintech usage intention in current users is greater than potential users

Hypothesis 12: The effect of perceived benefit on Fintech usage intention in high basic financial literate people is greater than low basic financial literate people

Hypothesis 13: The effect of perceived risk on Fintech usage intention in low basic financial literate people is greater than high basic financial literate people

Hypothesis 14: The effect of perceived benefit on Fintech usage intention in high advanced financial literate people is greater than low advanced financial literate people

Hypothesis 15: The effect of perceived risk on Fintech usage intention in low advanced financial literate people is greater than high advanced financial literate people

After depicting all of the constructs, benefit and risk factors, the proposed theoretical model finalized as indicated in Figure 1:

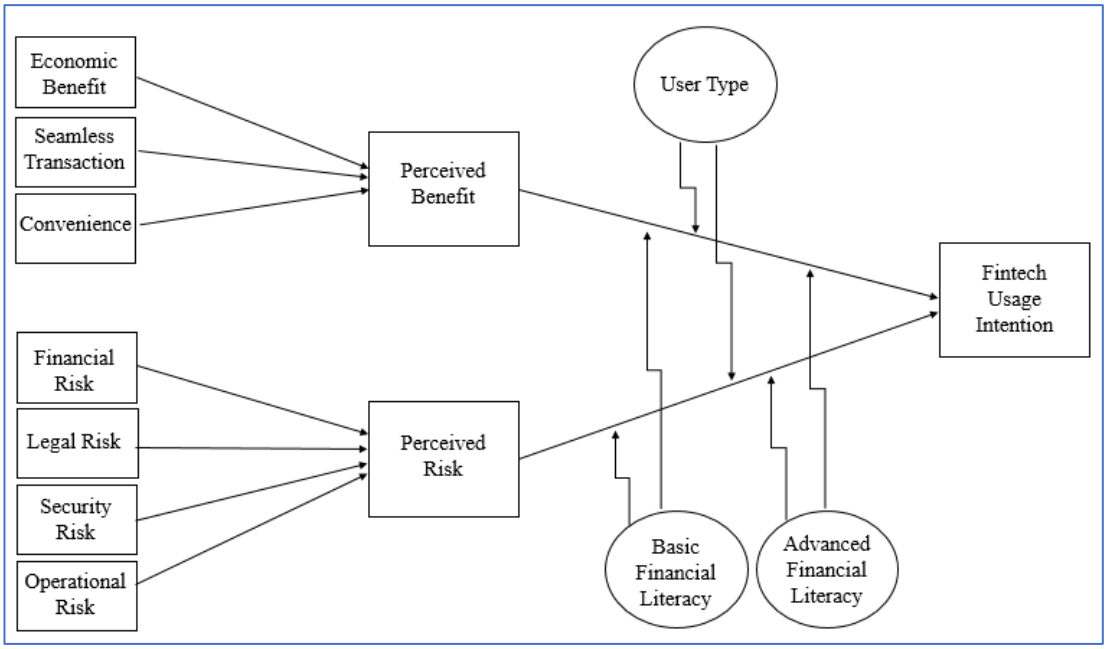

Figure 1. Proposed theoretical model

CHAPTER 4

RESEARCH METHODOLOGY

In this section, the details of the survey development process, demographic characteristics and the sample data collection method are discussed extensively to clarify the research methodology used in this study.

4.1 Survey development

An online survey was created by adopting available scales in order to test the hypotheses explained in theoretical models and hypotheses part. It was aimed to measure the effects of the perceived risk and benefit factors on Fintech usage intention through various risks and benefits while taking financial literacy levels of current and potential users as moderating effects.

The survey consisted of four distinct parts and each of those parts was designed to test different sets of hypotheses. The initial part of the survey was included eight questions to complete. The second part of the survey was designed to evaluate the validity of the selected benefit and risk items. The third part consisted of nine questions to evaluate the financial literacy of the respondents. The fourth and the final part of the questionnaire were comprised of three questions to gather the demographics of the survey participants.

4.2 Demographic characteristics

The questions were asked to capture the demographic characteristics to understand if those characteristics significantly affect the relationships between constructs in the research model:

- Gender: Male or Female
- Age: Respondents' age with an ordinal scale of "Under 20", "20-29", "30-39", "40-49", "50 or over"
- Education Level: Respondents' last completed education level with an ordinal scale of "High school or below", "Bachelor's", "Master's" and "Doctorate"

4.3 Data collection

One of the widely used forms of non-probability sampling methods is convenience sampling or purposive sampling. As its name implies, this type of sampling includes participants that take part in a survey voluntarily and willing to spend time for that specific activity. Moreover, it is one of the most common forms of sampling among surveys distributed online. Even though using convenience sampling may restrict researchers in terms of making generalizations for the entire population, it is easier to implement and more cost-efficient compared to probability sampling (Jager, Putnick & Bornstein, 2017).

An initial questionnaire was assessed by two academicians independently in terms of wording choices, formatting and content. A pilot test was carried out as a next step. Feedbacks derived from this pilot test regarding the clarity of questions and the ambiguity in some phrases have been noted. After implementing all relevant feedbacks, the finalised version of the questionnaire was carried out. Since this research is intended to understand Turkish customers' Fintech usage adoption only,

the Turkish version of this survey was distributed. Both English and Turkish versions of this survey can be seen in Appendix A and Appendix B respectively.

The questionnaire was distributed online through an online survey development software and reached 760 participants during June 2019. Among all the participants of this study, 389 of them answered all questions and thus completed the questionnaire. This reflects that the questionnaire received a 51% response rate. An average of five minutes was required to finalise all questions.

CHAPTER 5

DATA ANALYSIS, RESULTS AND DISCUSSION

5.1 Demographics of the participants

This section briefly summarizes the demographic profile of the respondents while highlighting their gender, age and education level. The sample characteristics showed a reasonable distribution among the listed categories in Table 1 below. Female participants outnumbered male ones with 54 percentage. Most of the participants fell under the 20-29 age category followed by the ones aged between 30 and 39. The participants had the following education level distribution: 6.2 percent had an academic qualification below bachelor's degree, 59.9 percent were bachelor's degree graduates, while 30.6 percent had a master's degree and 3.3 percent held a doctorate.

Table 1. Sample Characteristics of the Survey Participants

Sample Characteristics			
		Frequency	Percent
Gender	Female	210	54.0%
	Male	179	46.0%
Age	Under 20	1	0.3%
	20-29	156	40.1%
	30-39	125	32.1%
	40-49	48	12.3%
	50 or over	59	15.2%
Education	High school or below	24	6.2%
	Bachelor's	233	59.9%
	Master's	119	30.6%
	Doctorate	13	3.3%
Total		389	100.0%

As part of the questionnaire, respondents were asked whether they use Fintech or not. As shown in Table 2, a total of 175 participants stated that they use Fintech. Among nine different Fintech types in the choice list, mobile wallet was the most used type of Fintech followed by payments, credit and money remittance. The rest of the Fintech types were used less than 10% of the respondents. Those Fintech types are crowdfunding, personal finance management and wealth/investment management.

Table 2. Sample Characteristics of Fintech Users

		Frequency	Percent
Fintech Type	Mobile wallet	125	71.4%
	Payments	104	59.4%
	Credit	90	51.4%
	Money remittance	72	41.1%
	Cryptocurrency	48	27.4%
	Insurance	38	21.7%
	Crowdfunding	10	5.7%
	Personal finance management	6	3.4%
	Wealth/Investment management	5	2.9%
Usage Period	Almost 3 months	10	5.7%
	Almost 6 months	7	4.0%
	Almost 12 months	22	12.6%
	Almost 18 months	13	7.4%
	Almost 24 months	25	14.3%
	More than 24 months	98	56.0%
Frequency	Daily	17	9.7%
	Weekly	46	26.3%
	Monthly	46	26.3%
	Every 3 month	20	11.4%
	Every 6 month	18	10.3%
	Once 1 year or less	22	12.6%
	Once 2 year or less	6	3.4%
Type of Expense	Private	155	88.6%
	Company	3	1.7%
	Both	17	9.7%
Total		175	100.0%

*Multiple selections of Fintech type were allowed so the frequency and percentage figures do not add up 175 and 100.0% respectively.

The majority of the Fintech users declared using Fintech products and services for more than two years. Most of the Fintech users preferred using Fintech weekly or monthly. As indicated in Table 3, the majority of the customers uses more than one bank to make their financial transactions and mobile ranks first in the list as the most preferred channel among other options. Only three participants do not own any bank accounts at all.

Table 3. Detailed Information about Account Owners

		Frequency	Percent
Number of Banks	1	62	16.1%
	2-4	298	77.2%
	5+	26	6.7%
Preferred Channel	Mobile	307	79.5%
	Internet Banking	57	14.8%
	Branch	17	4.4%
	Call Centre	5	1.3%
Total		386	100.0%

5.2 Results

Financial literacy is one of the main research components of this academic work. The relevant financial literacy questions were obtained and used from Van Rooij et al. (2011). In the original academic work, there were 5 questions to assess the basic financial literacy of respondents. All of those questions were used to test basic financial literacy concepts such as compounding interest and time value of money. The percentage of the correct, incorrect and "do not know" answers for basic literacy questions were depicted in Table 4. Each basic financial literacy question except the one that aimed to measure the money illusion concept was answered correctly by at least three fourth of the respondents. Almost one-tenth of participants selected "do not know" as an answer regarding the question measuring inflation.

Table 4. Answers to Basic Financial Literacy Questions

Concept	True	False	Do not Know
Numeracy	86.9%	6.2%	6.9%
Interest Compounding	79.4%	14.9%	5.7%
Inflation	82.5%	7.7%	9.8%
Time Value of Money	79.7%	11.6%	8.7%
Money Illusion	74.6%	21.6%	3.9%

Advanced financial literacy questions; on the other hand, test more complex financial products and concepts such as characteristics of different financial products and the relationship between financial indicators. The percentages of the correct, incorrect and "do not know" answers for advanced financial literacy questions were summarized in Table 5. Even though the questions regarding the function of the stock market and risk diversification were mainly answered correctly, the question measuring the relationship between interest rates and bond prices challenged respondents the most.

Table 5. Answers to Advanced Financial Literacy Questions

Construct	True	False	Do not Know
The main function of stock market	81.0%	9.3%	9.8%
Relationship between interest rate and bond price	37.3%	28.5%	34.2%
Risk levels of stocks and bonds	51.7%	8.7%	39.6%
Risk diversification	83.0%	7.7%	9.3%

The distribution for the number of correct answers differed for basic and advanced financial literacy questions. Almost half of the respondents were managed to answer all basic financial literacy questions correctly. This ratio dropped to 21.6 percent for advanced financial literacy questions. Financial literacy score, which was illustrated in Table 6, was created to reflect the success of the respondents for

answering all of the financial literacy questions regardless of basic and advanced financial literacy questions.

Table 6. Number of Correct Answers for Financial Literacy Questions

	Number of Correct Answer	Frequency	Percent
Basic Financial Literacy Questions	0	9	2.3%
	1	11	2.8%
	2	25	6.4%
	3	58	14.9%
	4	97	24.9%
	5	189	48.6%
Advanced Financial Literacy Questions	0	23	5.9%
	1	47	12.1%
	2	104	26.7%
	3	131	33.7%
	4	84	21.6%
Financial Literacy Score	0	9	2.3%
	1	1	0.3%
	2	7	1.8%
	3	16	4.1%
	4	22	5.7%
	5	41	10.5%
	6	58	14.9%
	7	91	23.4%
	8	85	21.9%
	9	59	15.2%
Total		389	100.0%

Cronbach's Alpha, Composite Reliability and Average Variance Extracted (AVE) of each construct were calculated to verify convergent validity. As figures detailed in Table 7, all AVE values were higher than 0.5. Similarly, no single construct had Cronbach's Alpha and Composite Reliability values lower than 0.7. This confirmed the convergent validity of the measurement model. In order to prove adequate discriminant validity, the numbers should be greater than the correlations between constructs. Since all of the numbers positioned in diagonal are greater than the correlations between constructs, it indicates good discriminant validity.

Table 7. Convergent Validity of Constructs

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	rho_A
Economic Benefit	0.864	0.917	0.787	0.872
Seamless Transaction	0.828	0.897	0.743	0.833
Convenience	0.891	0.932	0.821	0.893
Financial Risk	0.826	0.896	0.742	0.833
Legal Risk	0.858	0.903	0.700	0.869
Security Risk	0.885	0.929	0.813	0.892
Operational Risk	0.860	0.915	0.782	0.860
Perceived Benefit	0.903	0.933	0.776	0.910
Perceived Risk	0.856	0.914	0.780	0.863
Fintech Usage Intention	0.927	0.945	0.775	0.929

The diagonal of Table 8 includes the square root of AVE values of each construct which was calculated and shown in Table 9.

Table 8. The Correlation Coefficients between Constructs

	Economic Benefit	Seamless Transaction	Convenience	Financial Risk	Legal Risk	Security Risk	Operational Risk	Perceived Benefit	Perceived Risk	Fintech Usage Intention
Economic Benefit	0.887									
Seamless Transaction	0.538	0.862								
Convenience	0.675	0.674	0.906							
Financial Risk	-0.216	-0.135	-0.272	0.861						
Legal Risk	-0.235	-0.195	-0.316	0.657	0.837					
Security Risk	-0.255	-0.216	-0.266	0.617	0.575	0.902				
Operational Risk	-0.342	-0.300	-0.345	0.501	0.559	0.703	0.884			
Perceived Benefit	0.589	0.540	0.729	-0.330	-0.352	-0.346	-0.332	0.881		
Perceived Risk	-0.386	-0.396	-0.465	0.594	0.614	0.709	0.702	-0.472	0.883	
Fintech Usage Intention	0.565	0.490	0.681	-0.389	-0.384	-0.383	-0.373	0.818	-0.524	0.880

As Fornell and Larcker (1981) suggested, when the square root of the AVE of each construct is larger than all of the correlation coefficients between this construct and the remaining constructs in the model, discriminant validity can be assured.

Table 9. Average Variance Extracted Values of All Constructs

Construct	Average Variance Extracted (AVE)	Square Root of AVE
Economic Benefit	0.787	0.887
Seamless Transaction	0.743	0.862
Convenience	0.821	0.906
Financial Risk	0.742	0.861
Legal Risk	0.700	0.837
Security Risk	0.813	0.902
Operational Risk	0.782	0.884
Perceived Benefit	0.776	0.881
Perceived Risk	0.780	0.883
Fintech Usage Intention	0.775	0.880

In order to visualize all constructs and their corresponding items, the path model including all constructs and items were illustrated in Figure 2.

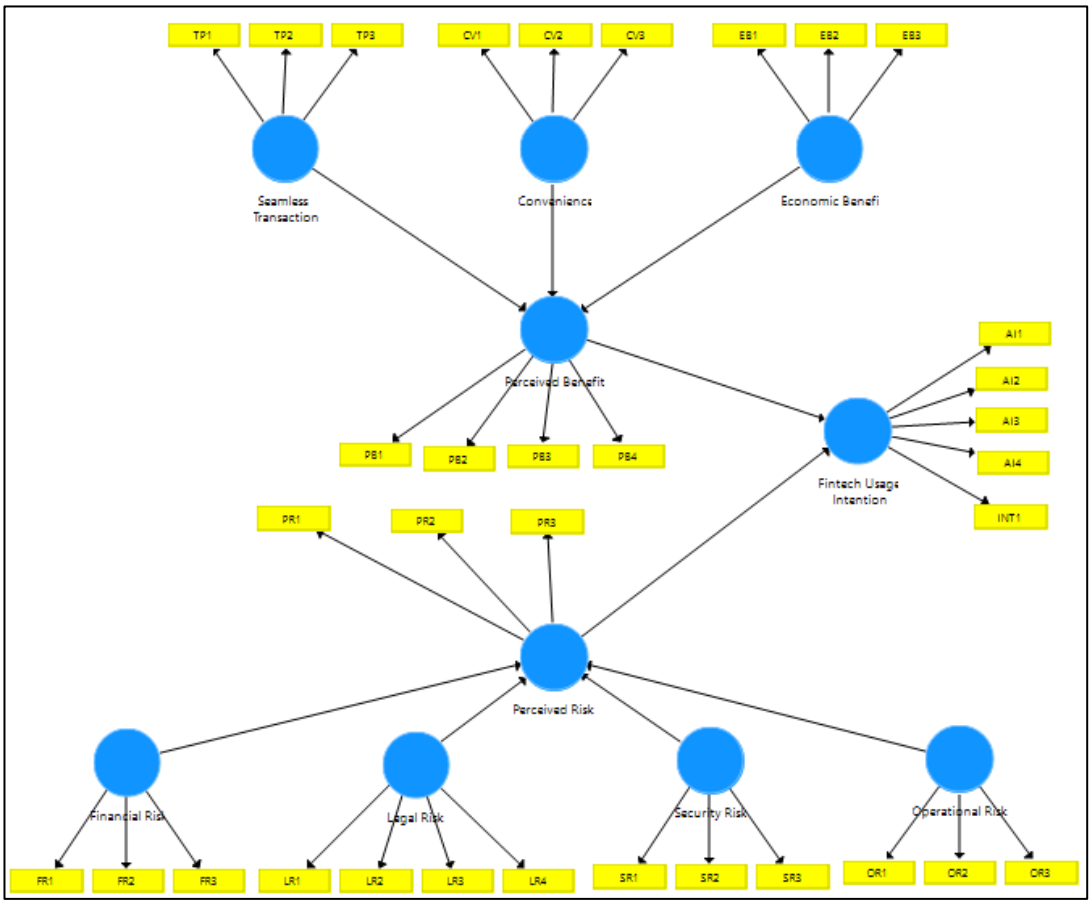

Figure 2. Path model of overall data

Cross-loading figures are expected to be the highest ones in their designated rows and columns. All figures did not violate this rule and all of the figures stood as higher than 0.8 as indicated in Table 10.

Table 10. Cross Loadings of All Constructs

Cross Loadings	Convenience	Economic Benefit	Seamless Transaction	Financial Risk	Legal Risk	Operational Risk	Security Risk	Perceived Benefit	Perceived Risk	Fintech Usage Intention
CV1	**0.897**	0.647	0.584	-0.255	-0.296	-0.322	-0.255	0.638	-0.426	0.619
CV2	**0.892**	0.57	0.615	-0.224	-0.256	-0.289	-0.213	0.652	-0.39	0.584
CV3	**0.929**	0.619	0.634	-0.261	-0.307	-0.326	-0.256	0.69	-0.447	0.649
EB1	0.56	**0.841**	0.436	-0.234	-0.284	-0.331	-0.264	0.475	-0.374	0.453
EB2	0.603	**0.919**	0.467	-0.182	-0.186	-0.267	-0.197	0.561	-0.308	0.544
EB3	0.632	**0.899**	0.527	-0.166	-0.165	-0.318	-0.224	0.526	-0.354	0.503
TP1	0.55	0.463	**0.858**	-0.093	-0.139	-0.264	-0.176	0.425	-0.339	0.364
TP2	0.62	0.49	**0.865**	-0.146	-0.197	-0.258	-0.188	0.508	-0.361	0.453
TP3	0.568	0.435	**0.863**	-0.106	-0.164	-0.255	-0.192	0.458	-0.323	0.443
FR1	-0.194	-0.203	-0.09	**0.833**	0.534	0.372	0.462	-0.237	0.472	-0.287
FR2	-0.272	-0.185	-0.167	**0.888**	0.556	0.465	0.585	-0.326	0.561	-0.344
FR3	-0.232	-0.171	-0.085	**0.862**	0.609	0.451	0.539	-0.283	0.497	-0.373
LR1	-0.289	-0.21	-0.163	0.644	**0.85**	0.524	0.589	-0.354	0.595	-0.347
LR2	-0.332	-0.234	-0.179	0.554	**0.836**	0.442	0.431	-0.336	0.505	-0.412
LR3	-0.203	-0.158	-0.179	0.514	**0.859**	0.472	0.488	-0.256	0.505	-0.249
LR4	-0.226	-0.18	-0.129	0.458	**0.8**	0.417	0.388	-0.21	0.424	-0.266
OR1	-0.348	-0.338	-0.256	0.446	0.479	**0.85**	0.575	-0.345	0.622	-0.361
OR2	-0.299	-0.305	-0.274	0.435	0.494	**0.908**	0.635	-0.291	0.612	-0.347
OR3	-0.267	-0.263	-0.266	0.446	0.509	**0.893**	0.652	-0.244	0.628	-0.282
SR1	-0.205	-0.227	-0.148	0.588	0.596	0.584	**0.865**	-0.332	0.574	-0.365
SR2	-0.28	-0.248	-0.239	0.532	0.472	0.654	**0.912**	-0.326	0.673	-0.361
SR3	-0.232	-0.214	-0.191	0.555	0.502	0.658	**0.926**	-0.282	0.665	-0.315
PB1	0.616	0.506	0.423	-0.254	-0.297	-0.21	-0.243	**0.888**	-0.357	0.712
PB2	0.698	0.549	0.518	-0.319	-0.324	-0.285	-0.286	**0.901**	-0.452	0.757
PB3	0.673	0.553	0.5	-0.338	-0.315	-0.355	-0.383	**0.919**	-0.492	0.778
PB4	0.573	0.459	0.462	-0.242	-0.306	-0.32	-0.305	**0.813**	-0.349	0.623
PR1	-0.359	-0.314	-0.294	0.597	0.576	0.663	0.7	-0.339	**0.911**	-0.424
PR2	-0.376	-0.304	-0.38	0.578	0.583	0.644	0.656	-0.409	**0.932**	-0.447
PR3	-0.508	-0.414	-0.38	0.387	0.46	0.548	0.513	-0.513	**0.8**	-0.526
Ai1	0.541	0.45	0.453	-0.3	-0.286	-0.321	-0.333	0.695	-0.387	**0.822**
Ai2	0.583	0.45	0.473	-0.405	-0.388	-0.395	-0.415	0.709	-0.481	**0.871**
Ai3	0.614	0.518	0.394	-0.388	-0.391	-0.35	-0.352	0.695	-0.494	**0.897**
Ai4	0.616	0.521	0.398	-0.285	-0.309	-0.267	-0.267	0.729	-0.444	**0.893**
iNT1	0.642	0.545	0.441	-0.337	-0.319	-0.314	-0.324	0.768	-0.497	**0.916**

Several hypotheses were formed while forming this proposed research model. Partial Least Square (PLS) method was selected in order to test those hypotheses. All nine paths expect the one between seamless transaction and perceived benefit were validated at 0.05 and 0.01 level. The path between Financial Risk and

Perceived Risk was validated at 0.05 level. The rest of the paths in the model were validated at 0.01 level.

As presented in Table 11, perceived benefit showed a strong positive relationship with Fintech Usage Intention with a β equal to 0.734. This result validated Hypothesis 1 (H1). As perceived risk has a negative sign, it had a negative relationship with Fintech usage intention with a β equal to - 0.178 meaning that it leads to an aversion using Fintech. Therefore, Hypothesis 2 (H2) were also validated. Both H1 and H2 were supported at 0.01 significance level. Evaluating those β values pointed out that the perceived benefits outweighed perceived risks. This can be translated as participants showed some tendency to use products and service provided by Fintech in Turkey.

In order to test Hypothesis 3 (H3), Hypothesis 4 (H4) and Hypothesis 5 (H5), path coefficients of relevant constructs and their corresponding t values were evaluated. Apart from the relationship between seamless transaction and perceived benefit, all other benefit factors namely convenience and economic benefit showed a positive relationship with the perceived benefit construct. The β values resulted as 0.572 and 0.168 respectively. This can be interpreted as economic benefit had a lower impact compared to convenience. Overall, it can be summarized that both H3 and H5 were supported 0.01 significance level by looking at their t-values. H4 which explains the causal relationship between seamless transaction and perceived benefit; on the other hand, was not supported even at 0.10 level.

Hypothesis 6 (H6), Hypothesis 7 (H7) and Hypothesis 8 (H8), Hypothesis 9 (H9) were proposed in relation with financial risk, legal risk, security risk and operational risk respectively. The β values associated with those risks occurred as 0.135, 0.170, 0.333 and 0.294 with the same order as abovementioned risks. All

hypotheses related to risk constructs were supported at 0.01 level except H6 which was supported at 0.05 significance level only. Among other risk factors, operational risk showed the strongest causal relationship with perceived risk.

Table 11. Path Coefficients and Their Related Statistics for All Respondents

Path	Path Coefficient	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.734	20.652	0.000
Perceived Risk -> Fintech Usage Intention	-0.178	4.085	0.000
Convenience -> Perceived Benefit	0.572	10.214	0.000
Economic Benefit -> Perceived Benefit	0.168	2.924	0.004
Seamless Transaction -> Perceived Benefit	0.064	1.172	0.242
Financial Risk -> Perceived Risk	0.135	2.386	0.017
Legal Risk -> Perceived Risk	0.170	2.914	0.004
Operational Risk -> Perceived Risk	0.333	5.270	0.000
Security Risk -> Perceived Risk	0.294	5.049	0.000

R square serves as a measure for the predictive accuracy of the research model. As it approximates to 1, the predictive accuracy of the research model increases as well. Suggested research model in this study explains 69.3% of the variance associated with Fintech usage intention which was illustrated in Table 12. As new constructs are added to the research model, R square values tend to increase. Therefore, it is important to measure adjusted R square values as well. Similarly, Adjusted R square values for all constructs in this model are substantially high and almost equal with their corresponding R square values.

Table 12. R Square and Adjusted R Square Values for Main Constructs

Construct	R Square	R Square Adjusted
Fintech Usage Intention	0.693	0.692
Perceived Benefit	0.551	0.547
Perceived Risk	0.627	0.623

Perceived benefit's effect on Fintech usage intention for potential users was significant with a β of 0.694 at 0.01 level. The same effect was valid for current users

with a β of 0.734 at 0.01 level. Perceived risk's effect on Fintech usage intention for potential users was significant with a β of -0.217 at 0.01 level. A similar effect holds valid for current users with a β of 0.734 at 0.05 level. Since the effect of the perceived risk was lower than the effect of the perceived benefit, the participants had more motivation to use Fintech products and services overall.

The seamless transaction is the only insignificant one among all benefit constructs for current Fintech users. As indicated in Table 13, convenience has the strongest impact which is followed by the economic benefit. All of the risk items were found significant except the financial risk. Legal risk has the strongest impact on perceived risk among all risk items for current Fintech users. It is followed by security risk and operation risk respectively.

Table 13. Path Coefficients and Their Related Statistics for Current Fintech Users

	Current Users		
Path	Path Coefficients	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.734	16.265	0
Perceived Risk -> Fintech Usage Intention	-0.107	1.986	0.047
Convenience -> Perceived Benefit	0.624	9.493	0
Economic Benefit -> Perceived Benefit	0.204	2.785	0.005
Seamless Transaction -> Perceived Benefit	-0.018	0.27	0.787
Financial Risk -> Perceived Risk	0.05	0.638	0.524
Legal Risk -> Perceived Risk	0.305	4.099	0
Operational Risk -> Perceived Risk	0.278	3.356	0.001
Security Risk -> Perceived Risk	0.287	3.472	0.001

Among all benefit constructs, the economic benefit is the only insignificant item for potential Fintech users. The effect of the convenience is bigger than that of the seamless transaction on the perceived benefit. Unlike to the result obtained for current Fintech users, legal risk is the only insignificant risk item for potential Fintech users. Financial risk, security risk and operational risk legal were found

significant as illustrated in Table 14. Operational risk has the greatest impact on perceived risk, which is followed by security risk and financial risk. In order to compare the Fintech continuance intentions of Turkish Fintech users with Korean Fintech users' Fintech continuance intentions detailed in Ryu (2018), seamless transaction and financial transaction were found insignificant for Turkish Fintech users where those factors were significant for Korean Fintech users.

Table 14. Path Coefficients and Their Related Statistics for Potential Fintech Users

	Potential Users		
Path	Path Coefficients	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.694	11.406	0
Perceived Risk -> Fintech Usage Intention	-0.217	3.322	0.001
Convenience -> Perceived Benefit	0.375	3.697	0
Economic Benefit -> Perceived Benefit	0.115	1.283	0.2
Seamless Transaction -> Perceived Benefit	0.246	2.359	0.019
Financial Risk -> Perceived Risk	0.163	1.947	0.052
Legal Risk -> Perceived Risk	0.049	0.577	0.564
Operational Risk -> Perceived Risk	0.39	4.467	0
Security Risk -> Perceived Risk	0.321	3.425	0.001

Multi-Group Analysis has been conducted between current and potential Fintech users. The results were illustrated in Table 15. The significance of the difference between current and potential Fintech users were found only in convenience, seamless transaction and legal risk items at 0.05 level. Therefore, Hypothesis 10 (H10) and Hypothesis 11 (H11) were not supported.

By looking at an index called The World Justice Project Rule of Law Index, which was designated to interpret the public opinion regarding how the rule of law is practiced and understood among countries worldwide, the possible difference in legal risk construct between Turkey and South Korea can be further interpreted. In the World Justice Project's 2019 report, South Korea stood out as eighteenth with an

overall score of 0.73, whereas Turkey was listed as 109th with a calculated index score of 0.42 among 126 participant countries. This remarkable difference among those two countries might reflect why legal risk was the most remarkable risk factor in South Korea while it comes third biggest risk factors only after operational risk and security risk in Turkey.

Table 15. Path Coefficient Difference for Current vs. Potential Fintech Users

Path	Path coefficient difference	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.04	0.508	0.612
Perceived Risk -> Fintech Usage Intention	0.109	1.26	0.208
Convenience -> Perceived Benefit	0.249	1.962	0.05
Economic Benefit -> Perceived Benefit	0.088	0.742	0.458
Seamless Transaction -> Perceived Benefit	0.264	2.029	0.043
Financial Risk -> Perceived Risk	0.113	0.972	0.332
Legal Risk -> Perceived Risk	0.256	2.22	0.027
Operational Risk -> Perceived Risk	0.112	0.916	0.36
Security Risk -> Perceived Risk	0.034	0.267	0.789

Legislations have a notable impact on how Fintech operates within the financial services industry South Korea has been leading the way especially in payment services with its remarkable number of users (EY, 2019). Stricter and less developed regulations in the field of Fintech are effective in Turkey compared to South Korea. For instance, peer-to-peer lending can only be operated by traditional financial companies owning banking license and therefore they are subject to the legislation in Turkey dictated by Banking Regulation and Supervision Agency (BRSA).

Table 16. Path Coefficients and Their Related Statistics for Low Basic Financial Literacy

Path	Path Coefficients (Low Basic Financial Literacy)	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.759	14.259	0
Perceived Risk -> Fintech Usage Intention	-0.154	2.773	0.006
Convenience -> Perceived Benefit	0.513	5.162	0
Economic Benefit -> Perceived Benefit	0.051	0.649	0.517
Seamless Transaction -> Perceived Benefit	0.198	2.019	0.044
Financial Risk -> Perceived Risk	0.039	0.494	0.621
Legal Risk -> Perceived Risk	0.145	1.658	0.098
Operational Risk -> Perceived Risk	0.4	4.79	0
Security Risk -> Perceived Risk	0.347	3.785	0

Basic literacy scores were calculated by counting each correct answer as 1 and each wrong answer as 0. Afterwards, the average of this score has been calculated for each respondent. The average results obtained from Basic Financial Literacy score have become an indicator to group all participants into two distinct groups. The participants that fell into the second quartile or below were regarded as low basic financial literacy skilled individuals.

Respondents with high basic financial literacy scored in the third and the fourth quartiles. All other paths were significant except seamless transaction and perceived benefit. The effect of perceived benefit and the perceived risk on Fintech usage intention were significant and perceived benefit had a higher coefficient than perceived risk. Convenience has the highest impact on perceived benefit followed by

economic benefit for the ones having high basic financial literacy score. All risk factors for those respondents were significant, where security risk has the strongest impact and was followed by operational, legal and financial risks.

Table 17. Path Coefficients and Their Related Statistics for High Basic Financial Literacy

Path	Path Coefficients (High Basic Financial Literacy)	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.696	15.467	0
Perceived Risk -> Fintech Usage Intention	-0.215	3.555	0
Convenience -> Perceived Benefit	0.596	9.018	0
Economic Benefit -> Perceived Benefit	0.286	3.904	0
Seamless Transaction -> Perceived Benefit	-0.019	0.331	0.741
Financial Risk -> Perceived Risk	0.197	2.323	0.02
Legal Risk -> Perceived Risk	0.227	3.076	0.002
Operational Risk -> Perceived Risk	0.248	2.874	0.004
Security Risk -> Perceived Risk	0.26	2.897	0.004

Multi-Group Analysis has been conducted between low basic financial literacy skilled and high basic financial literacy skilled participants and the results were illustrated in Table 18. Only the path difference of economic benefit and perceived benefit as well as the path of seamless transaction and perceived benefit among high and low basic financial literacy skilled individuals were significant. The difference for other paths was insignificant. Therefore, Hypothesis 12 (H12) and Hypothesis 13 (H13) were not supported.

Table 18. Path Coefficient Difference for Basic Financial Literacy

Path	Path Coefficients Difference	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.062	0.889	0.374
Perceived Risk -> Fintech Usage Intention	0.061	0.739	0.46
Convenience -> Perceived Benefit	0.083	0.691	0.49
Economic Benefit -> Perceived Benefit	0.235	2.197	0.029
Seamless Transaction -> Perceived Benefit	0.217	1.879	0.061
Financial Risk -> Perceived Risk	0.158	1.362	0.174
Legal Risk -> Perceived Risk	0.082	0.716	0.474
Operational Risk -> Perceived Risk	0.152	1.269	0.205
Security Risk -> Perceived Risk	0.087	0.678	0.498

Kaiser-Meyer-Olkin (KMO) test was completed to check if the data derived from the questionnaire fit for factor analysis. Since all of KMO values were higher than 0.6, data derived from the questionnaire used further for factor analysis.

Table 19. KMO values of Basic Financial Literacy Items

Variable	KMO
Numeracy	0.7195
Interest Compounding	0.6980
Inflation	0.7351
Time Value of Money	0.7036
Money Illusion	0.7290
Overall	0.7156

Matrix elements of the basic financial literacy items were detailed in Table 20.

Table 20. Rotation Components Matrix of Principal Component Analysis (PCA)

Principal components/correlation	Number of observations =389
	Number of comp. =1
	Trace =5
Rotation: orthogonal varimax (Kaiser off)	Rho = 0.4017

Initial five components were reduced to only one component which can explain only 40.17 percent of the total variance as shown in Table 21.

Table 21. Total Variance Explained

Component	Variance	Difference	Proportion	Cumulative
Comp1	2.00855	N/A	0.4017	0.4017

As illustrated in Table 22, all of KMO values for advanced financial literacy items were higher than 0.6. Therefore, factor analysis was performed.

Table 22. KMO values of Advanced Financial Literacy Items

Variable	KMO
ad_1_ch_d1	0.6191
ad_1_ch_d2	0.6670
ad_2_ch_d1	0.7284
ad_2_ch_d2	0.7799
ad_3_ch_d1	0.6684
ad_3_ch_d2	0.6765
ad_4_ch_d1	0.6324
ad_4_ch_d2	0.6355
Overall	0.6736

Perceived benefit's effect on Fintech usage intention for high advanced financial literacy skilled participants was significant with a β of 0.679. The same effect was valid for low advanced financial literacy skilled participants with a β of 0.887 at 0.01 level.

Perceived risk's effect on Fintech usage intention for high advanced financial literacy skilled participants was significant with a β of -0.231 at 0.01 level. However, a similar effect does not hold valid for low advanced financial literacy skilled

participants. It appeared insignificant with a β of 0.015. Since the effect of the perceived risk was lower than the effect of the perceived benefit, the participants were inclined to use Fintech products and services overall.

The seamless transaction is the only insignificant one among all benefit constructs for high advanced financial literacy skilled participants. As indicated in Table 23, convenience has the strongest impact which is followed by the economic benefit. All of the risk items were found significant. Operational risk has the strongest impact among all risk items for high advanced financial literacy skilled participants. It is followed by security risk, legal risk and financial risk respectively.

Table 23. Path Coefficients for High Advanced Financial Literacy

Path	Path Coefficients High Advanced Financial Literacy	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.679	17.891	0
Perceived Risk -> Fintech Usage Intention	-0.231	5.211	0
Convenience -> Perceived Benefit	0.591	9.763	0
Economic Benefit -> Perceived Benefit	0.185	3.008	0.003
Seamless Transaction -> Perceived Benefit	0.061	1.108	0.268
Financial Risk -> Perceived Risk	0.162	2.723	0.007
Legal Risk -> Perceived Risk	0.174	2.785	0.005
Operational Risk -> Perceived Risk	0.309	4.606	0
Security Risk -> Perceived Risk	0.292	4.188	0

Among all benefit constructs, convenience is the only significant item for low advanced financial literacy skilled participants. Similar to the result obtained for high advanced financial literacy skilled participants, operational risk has the strongest

effect for low advanced financial literacy skilled participants which is followed by the security risk. Financial risk and legal risk were found insignificant as illustrated in Table 24.

Table 24. Path Coefficients for Low Advanced Financial Literacy

Path	Path Coefficients Low Advanced Financial Literacy	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.887	18.462	0
Perceived Risk -> Fintech Usage Intention	0.015	0.19	0.849
Convenience -> Perceived Benefit	0.491	3.113	0.002
Economic Benefit -> Perceived Benefit	0.063	0.339	0.734
Seamless Transaction -> Perceived Benefit	0.057	0.334	0.738
Financial Risk -> Perceived Risk	0	0.001	1
Legal Risk -> Perceived Risk	0.25	1.407	0.16
Operational Risk -> Perceived Risk	0.445	2.656	0.008
Security Risk -> Perceived Risk	0.245	2.409	0.016

Multi-Group Analysis has been conducted between low advanced financial literacy skilled respondents and high advanced financial literacy skilled respondents. The results were illustrated in Table 25. The significance of the difference between the two groups was found only in perceived benefit and perceived risk items. Therefore, Hypothesis 14 (H14) and Hypothesis 15 (H15) were supported.

All hypotheses proposed in this research were supported except Hypothesis 4 (H4), Hypothesis 10 (H10), Hypothesis 11 (H11), Hypothesis 12 (H12) and Hypothesis 13 (H13).

Table 25. Path Coefficient Difference for Advanced Financial Literacy

Path	Path Coefficients Difference	t-Values	p-Values
Perceived Benefit -> Fintech Usage Intention	0.207	2.467	0.014
Perceived Risk -> Fintech Usage Intention	0.245	2.43	0.016
Convenience -> Perceived Benefit	0.1	0.673	0.501
Economic Benefit -> Perceived Benefit	0.122	0.777	0.438
Seamless Transaction -> Perceived Benefit	0.004	0.03	0.976
Financial Risk -> Perceived Risk	0.162	1.103	0.271
Legal Risk -> Perceived Risk	0.076	0.485	0.628
Operational Risk -> Perceived Risk	0.136	0.836	0.404
Security Risk -> Perceived Risk	0.047	0.3	0.764

5.3 Limitations and future research

Since convenience sampling method was used to collect the survey data, the sample might not be fully representative of the overall population in terms of age, gender, and socioeconomic status. Conducting this research by applying probabilistic sampling method and reaching a greater sample size will help to make a more powerful generalization.

The survey data was collected only in Turkey. Turkey can be considered as a developing economy. Individuals living in developed economies and thus gaining access to more matured financial markets and sophisticated financial technologies

may have different behaviours when it comes to considering Fintech products and services. Therefore, the findings derived from this research might not be valid or significant for other countries other than Turkey since they may have different significance levels for selected constructs. For that reason, conducting cross-country research on Fintech usage intention might reveal the important nuances between each country.

APPENDIX A

SURVEY QUESTIONS

Economic Benefit
Using Fintech is cheaper than using traditional financial services.
I can save money when I use Fintech.
I can use various financial services with low cost when I use Fintech.
Convenience
I can use financial services very fast when I use Fintech.
I can use financial services anytime anywhere when I use Fintech.
I can use financial services easily when I use Fintech.
Seamless Transaction
I can control my money without middle man when I use Fintech.
I can use various financial services at the same time (e.g., one stop processing) when I use Fintech.
I can have the peer-to-peer transactions between providers and users without middle man when I use Fintech.
Financial Risk
Financial losses are likely when I use Fintech.
Financial fraud or payment frauds are likely when I use Fintech.
Financial losses due to lack of the interoperability with other services are likely when I use Fintech.
Legal Risk
Using Fintech is uncertain due to many regulations.
It is not easy to use a Fintech due to the government regulation.
There is a legal uncertainty for Fintech users.
It is difficult to use various Fintech like other countries due to the government regulation.
Security Risk

I worry about the abuse of my financial information (e.g., transaction and private information) when I use Fintech.
My financial information is not secure when I use Fintech.
I worry that someone can afford to access my financial information when I use Fintech.
Operational Risk
Fintech companies are not willing to solve the issues when financial losses or financial information leakage happen.
The organizational responses of Fintech companies are too slow when financial losses or financial information leakage happen.
I worry about the way of Fintech companies respond to financial loss or financial information leakage.
Perceived Benefit
Using Fintech has many advantages.
I can easily and quickly use Fintech.
Using Fintech is useful for me.
Using Fintech yields a more superior outcome quality than traditional financial services.
Perceived Risk
Using Fintech is associated with a high level of risk.
There is a high level of uncertainty using Fintech.
Overall, I think that there is little benefit to use Fintech compared to traditional financial services.
Fintech Usage Intention
I would positively consider Fintech in my choice set.
I would prefer Fintech.
I would intend to continue to use Fintech.
I will use Fintech in the future.
Given that I have access to the mobile payment system, I predict that I would use it.

Basic Financial Literacy
Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? 1 More than $102 2 Exactly $102 3 Less than $102 4 I don't know
Suppose you had $100 in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have in this account in total? 1 More than $200 2 Exactly $200 3 Less than $200 4 I don't know
Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? 1 More than today 2 Exactly the same 3 Less than today 4 I don't know
Assume a friend inherits $10,000 today and his sibling inherits $10,000 three years from now. Who is richer because of the inheritance? 1 My friend 2 His sibling 3 They are equally rich 4 I don't know
Suppose that in the year 2010, your income has doubled and prices of all goods have doubled too. In 2010, how much will you be able to buy with your income? 1 More than today 2 The same 3 Less than today 4 I don't know
Advanced Financial Literacy
Which of the following statements describes the main function of the stock market? (i) The stock market helps to predict stock earnings; (ii) The stock market results in an increase in the price of stocks; (iii) The stock market brings people who want to buy stocks together with those who want to sell stocks; (iv) None of the above; (v) I don't know
If the interest rate falls, what should happen to bond prices? (i) Rise; (ii) Fall; (iii) Stay the same; (iv) None of the above; (v) I don't know
True or false? Stocks are normally riskier than bonds. (i) True; (ii) False; (iii) I don't know
When an investor spreads his money among different assets, does the risk of losing money: (i) Increase, (ii) Decrease (iii) Stay the same; (iv) I don't know

APPENDIX B

SURVEY QUESTIONS (TURKISH)

Finansal Okuryazarlık ve Fintek

Değerli Katılımcı,

Bu araştırma Fintek şirketlerinin sunduğu hizmetlerin Türkiye'deki kullanımı ve Finansal Okuryazarlık düzeyi arasında ilişkiyi incelemek amacıyla yapılmaktadır. Bu akademik bir araştırma olup Boğaziçi Üniversitesi Yönetim Bilişim Sistemleri Bölümü Yüksek Lisans Programı öğrencisi Cihan Alpay'ın, Prof. Dr. Ceylan Onay Şahin danışmanlığında yürüttüğü lisansüstü tezi kapsamında gerçekleştirilmektedir.

Fintekler, bu araştırmada teknolojiye dayalı finansal hizmet sunan banka dışı üçüncü parti şirketlerdir. Bu şirketlerin başlıca faaliyet alanları Para Transferleri, Ödemeler, Mobil Cüzdan, Kredi Aracılık Faaliyetleri, Sigorta Aracılık Faaliyetleri, Yatırım Danışmanlığı ve Kripto Varlık yatırımlarıdır.

Türkiye'deki en bilinen Fintek şirketlerinden bazıları **BKM Express, Findeks, Western Union, Sigortam.Net, Enuygun.com, PayCell, Vodafone Cep Cüzdan, Iyzico, PayU, GönderAl, Fongogo** ve **BTCTurk** vb.dir.

Ankette kimlik ve iletişim bilgileriniz istenmeyecek ve yanıtlarınız gizli tutulacaktır. Araştırmanın başarısı açısından tüm soruları cevaplamanız çok önemlidir. Anketi tamamlamak yaklaşık 5 dakika sürmektedir. Değerli zamanınızı ayırdığınız ve bu araştırmaya destek verdiğiniz için çok teşekkür ederiz.

Anketle ilgili soru ve görüşleriniz için Cihan Alpay (cihan.alpay@yahoo.com) ile iletişime geçebilirsiniz. Saygılarımızla.

Tamam

* 1. Herhangi bir bankada hesabınız var mı?

- ◯ Evet
- ◯ Hayır

* 2. Kaç adet bankayla çalışıyorsunuz?

- ◯ 1
- ◯ 2-4
- ◯ 5 veya daha fazla

* 3. Finansal işlemlerinizi gerçekleştirirken öncelikli kanal tercihiniz hangisidir?

- ◯ Mobil Uygulama
- ◯ İnternet Sitesi
- ◯ Şube
- ◯ Telefon Bankacılığı

* 4. Daha önce Fintek şirketlerinin hizmetlerini kullandınız mı?

- ◯ Evet
- ◯ Hayır

* 5. Lütfen kullandığınız Fintek türünü/türlerini belirtiniz. (Birden fazla yanıt verebilirsiniz.)

- ☐ **Ödemeler** - Hepsipay, Iyzico, PayU vb. -
- ☐ **Para Transferleri** - Gönderal, Ria, WesternUnion, Transferwise, UPT vb. -
- ☐ **Mobil/Dijital Cüzdan** - BKM Express, Paycell, Vodafone Cep Cüzdan vb. -
- ☐ **Kredi Aracılık Faaliyetleri (Kredi Skoru, Kredi Karşılaştırma ve Takibi vb.)** - Findeks, Enuygun, Hangikredi vb. -
- ☐ **Sigorta Aracılık Faaliyetleri (Sigorta Karşılaştırma ve Poliçe Yönetimi vb.)** - Sigortam.net, SigortaCini, Sigortayeri vb. -
- ☐ **Kitlesel Fonlama** - Fongogo, Fonlabeni, Buluşum vb. -
- ☐ **Kişisel Finans Yönetimi** - Artıpara, GiderimVar, Familup vb. -
- ☐ **Varlık/Yatırım Yönetimi** - Digifin, Ludens, AkıllıBES vb. -
- ☐ **Kripto Varlık Yatırımları** - BTCTurk, Paribu, Evercoin vb. -

* 6. Ne kadar süredir Fintek şirketlerinin hizmetlerini kullanıyorsunuz?

- ◯ Yaklaşık 3 aydır
- ◯ Yaklaşık 6 aydır
- ◯ Yaklaşık 12 aydır
- ◯ Yaklaşık 18 aydır
- ◯ Yaklaşık 24 aydır
- ◯ 24 aydan daha fazladır

* 7. Bu hizmetleri kullanım sıklığınız:

- ◯ Günlük
- ◯ Haftada bir
- ◯ Ayda bir
- ◯ 3 ayda bir
- ◯ 6 ayda bir
- ◯ Yılda bir kez ya da daha seyrek
- ◯ 2 yılda bir kez ya da daha seyrek

* 8. Fintek harcamalarınızı kişisel harcamalarınız için mi, şirket harcamalarınız için mi gerçekleştiriyorsunuz?

- ◯ Kişisel harcamalarım için kullanıyorum
- ◯ Şirket harcamalarım için kullanıyorum
- ◯ Her ikisi için de kullanıyorum

* 9. Lütfen aşağıdaki ifadelerin her birine katılım derecenizi belirtiniz.

	1. Kesinlikle Katılmıyorum	2. Katılmıyorum	3. Kısmen Katılmıyorum	4. Ne Katılıyorum Ne Katılmıyorum	5. Kısmen Katılıyorum	6. Katılıyorum	7. Kesinlikle Katılıyorum
Fintek şirketlerinin hizmetlerini kullanmak geleneksel finansal hizmet sağlayıcılarının hizmetlerini kullanmaktan daha ucuzdur.	◯	◯	◯	◯	◯	◯	◯

Fintek şirketlerinin hizmetlerini kullandığımda tasarruf edebilirim.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda birden çok finansal hizmeti düşük maliyet ile kullanabilirim.	○	○	○	○	○	○	○
Fintek şirketlerinin ürünlerini ve hizmetlerini kullanmak oldukça hızlıdır.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda finansal hizmetlere her zaman ve her yerde erişebilirim.	○	○	○	○	○	○	○
Fintek şirketlerinin sunduğu hizmetler, finansal hizmetleri kullanmamı kolaylaştırır.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda paramı aracı kurum ve kişi olmadan yönetebilirim.	○	○	○	○	○	○	○

Fintek şirketlerinin hizmetlerini kullandığımda birden çok finansal hizmete aynı anda tek kaynaktan erişebilirim.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda hizmet sağlayıcılar ve kullanıcılar arasında aracı olmadan uçtan uca işlemler gerçekleştirebilirim.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda finansal kayıplar olması muhtemeldir.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda finansal ya da ödeme kaynaklı dolandırıcılık olması muhtemeldir.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerinin diğer geleneksel hizmet sağlayıcılar ile uyumlu çalışamamasından dolayı mali kayıplar olması muhtemeldir.	○	○	○	○	○	○	○

Fintek şirketlerinin hizmetlerini kullandığımda birden çok finansal hizmete aynı anda tek kaynaktan erişebilirim.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda hizmet sağlayıcılar ve kullanıcılar arasında aracı olmadan uçtan uca işlemler gerçekleştirebilirim.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda finansal kayıplar olması muhtemeldir.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda finansal ya da ödeme kaynaklı dolandırıcılık olması muhtemeldir.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerinin diğer geleneksel hizmet sağlayıcılar ile uyumlu çalışamamasından dolayı mali kayıplar olması muhtemeldir.	○	○	○	○	○	○	○

Mevzuatlar ve yasal düzenlemelerdeki belirsizlik nedeniyle Fintek şirketlerinin hizmetlerini kullanmak risklidir.	○	○	○	○	○	○	○
Resmi düzenlemelerden dolayı Fintek şirketlerinin hizmetlerini kullanmak kolay değildir.	○	○	○	○	○	○	○
Fintek hizmetlerinin kullanıcıları için yasal belirsizlikler mevcuttur.	○	○	○	○	○	○	○
Resmi kısıtlamalardan dolayı çeşitli Fintek hizmetlerini kullanmak zordur.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda finansal bilgilerimin (örn. işlemlerimin ve kişisel bilgilerimin) kötüye kullanılmasından endişe ederim.	○	○	○	○	○	○	○

* 10. Lütfen aşağıdaki ifadelerin her birine katılım derecenizi belirtiniz.

	1. Kesinlikle Katılmıyorum	2. Katılmıyorum	3. Kısmen Katılmıyorum	4. Ne Katılıyorum Ne Katılmıyorum	5. Kısmen Katılıyorum	6. Katılıyorum	7. Kesinlikle Katılıyorum
Fintek şirketlerinin hizmetleri kullandığımda finansal bilgilerim güvende değildir.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullandığımda herhangi birinin finansal bilgilerime erişebileceğinden endişe ederim.	○	○	○	○	○	○	○
Finansal kayıplar veya finansal bilgi sızıntısı meydana geldiğinde Fintek şirketleri sorunları çözmeye istekli değildir.	○	○	○	○	○	○	○
Finansal kayıplar veya finansal bilgi sızıntısı meydana geldiğinde Fintek şirketlerinin müşteriye cevap süreleri çok yavaştır.	○	○	○	○	○	○	○
Fintek şirketlerinin finansal kayıplara veya finansal bilgi sızıntısına cevap verme şeklinden endişe duyuyorum.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullanmanın birçok avantajı vardır.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kolayca ve hızlı bir şekilde kullanabilirim.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullanmak benim için faydalıdır	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullanmak, geleneksel finansal hizmetlerden daha üstün bir hizmet kalitesi sağlar.	○	○	○	○	○	○	○

Fintek şirketlerinin hizmetlerini kullanmak yüksek risk içerir.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullanmak büyük belirsizlik içerir.	○	○	○	○	○	○	○
Genel olarak, Fintek şirketlerinin hizmetlerini kullanmanın geleneksel finansal hizmetlere göre daha az faydası olduğunu düşünüyorum.	○	○	○	○	○	○	○
Finansal Hizmet sağlayıcı seçimlerimde Fintek şirketlerine olumlu bakardım.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini tercih ederdim.	○	○	○	○	○	○	○
Fintek şirketlerini kullanmaya devam etmek niyetindeyim.	○	○	○	○	○	○	○
Gelecekte Fintek şirketlerini kullanacağım.	○	○	○	○	○	○	○
Fintek şirketlerinin hizmetlerini kullanmayı düşünüyorum.	○	○	○	○	○	○	○

Finansal Okuryazarlık

* 11. Bir tasarruf hesabınızda 100 TL olduğunu ve faiz oranının yılda %2 olduğunu varsayalım. Tasarrufunuza dokunmazsanız 5 yıl sonra tasarruf hesabınızda ne kadar para birikmiş olacağını düşünüyorsunuz?

- ○ 102 TL'den fazla
- ○ Tam 102 TL
- ○ 102 TL'den az
- ○ Bilmiyorum

* 12. Bir tasarruf hesabınızda 100 TL bulunduğunu ve faiz oranının yıllık %20 olduğunu ve bu tasarruf hesabınızdan anapara ve faiz gelirinizi çekmediğinizi varsayalım. 5 yıl sonra, bu hesaptaki toplam birikiminiz ne kadar olurdu?

- ○ 200 TL'den fazla
- ○ Tam olarak 200 TL
- ○ 200 TL'den az
- ○ Bilmiyorum

* 13. Tasarruf hesabınızdaki faiz oranının yılda %1 ve enflasyonun yılda %2 olduğunu hayal edin. 1 yıl sonra, bu hesaptaki paranın alım gücü ne olacaktır ?

- ◯ Bugünden daha fazla
- ◯ Kesinlikle aynı
- ◯ Bugünden daha az
- ◯ Bilmiyorum

* 14. Bir arkadaşınıza bugün itibariyle 10.000 TL miras kaldığını, arkadaşınızın kardeşine ise üç yıl sonra 10.000 TL miras kalacağını varsayalım. Miras nedeniyle kim daha zengindir?

- ◯ Arkadaşım
- ◯ Arkadaşımın kardeşi
- ◯ Eşit derecede zenginlerdir
- ◯ Bilmiyorum

* 15. 2020 yılında gelirinizin iki katına çıktığını ve tüm malların fiyatlarının da iki katına çıktığını varsayalım. 2020 yılında gelirinizle ne kadar alabileceksiniz?

- ◯ Bugünden daha fazla
- ◯ Aynı
- ◯ Bugünden daha az
- ◯ Bilmiyorum / Fikrim yok

* 16. Aşağıdaki ifadelerden hangisi borsanın ana işlevini açıklamaktadır?

- ◯ Hisse kazançlarını tahmin etmeye yardımcı olur
- ◯ Hisse senedi fiyatlarında artışa neden olur
- ◯ Hisse senedi almak isteyenleri, hisse senedi satmak isteyenlerle bir araya getirir
- ◯ Yukarıdakilerin hiçbiri
- ◯ Bilmiyorum / Fikrim yok

* 17. Eğer faiz oranı düşerse, tahvil fiyatları nasıl etkilenir?

- ◯ Yükselir
- ◯ Düşer
- ◯ Aynı kalır
- ◯ Yukarıdakilerin hiçbiri
- ◯ Bilmiyorum

* 18. Hisse senetleri genellikle tahvillerden daha risklidir.

- ◯ Doğru
- ◯ Yanlış
- ◯ Bilmiyorum / Fikrim yok

* 19. Bir yatırımcı parasını farklı yatırım araçları arasında dağıtırsa, para kaybetme riski:

- ◯ Artar
- ◯ Azalır
- ◯ Aynı kalır
- ◯ Bilmiyorum / Fikrim yok

Demografik Sorular

* 20. Cinsiyetiniz:

- ◯ Kadın
- ◯ Erkek

* 21. Yaşınız:

- ◯ 20 Yaşından küçük
- ◯ 20-29
- ◯ 30-39
- ◯ 40-49
- ◯ 50+

* 22. Eğitim durumunuz (mezun olduğunuz en son okul itibariyle) :

- ◯ Lise ve altı
- ◯ Üniversite
- ◯ Yüksek Lisans
- ◯ Doktora

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