



# Financial Literacy and Cash Holdings in Turkey

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# Financial Literacy and Cash Holdings in Turkey

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## Abstract

This paper examines the effect of financial literacy level on cash holdings in Turkey. Utilizing the Methods of Payment Survey, which includes both financial literacy and cash-related data, we first investigate the fundamentals of financial literacy in Turkey. Based on the performance on financial literacy questions, we categorize respondents into three groups. Subsequently, we analyze how cash holding behavior differs among financial literacy groups. Our results reveal that financially literate respondents tend to hold less cash on hand and store more cash elsewhere. Moreover, card ownership increases through financial literacy and the change in payment behavior of financially literate respondents is more significant during Covid-19 pandemic. The results imply that promoting financial literacy may result in less cash usage at points of sale accompanied by the currency in circulation growth, due to the overwhelming effect of increased non-transactional demand following a positive change in financial literacy level.

**Keywords:** Financial Literacy, Money Demand, Cash Demand

**JEL:** C50, E41, G53

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## **Non-Technical Summary**

In this paper we examine the effect of financial literacy level, one of the less-studied drivers of cash demand, on cash holdings in Turkey. Our study is entirely based on the Methods of Payment Survey (MPS), which contains data for payment behavior of Turkish households, as well as their financial literacy level.

MPS adopts the “Big Three” approach to measure financial literacy. This method measures the basic knowledge of interest rate, inflation and risk diversification with one question for each concept. The respondents who answers all three questions correctly are classified as financially literate. According to the MPS results, only 7 percent of Turkish households are financially literate.

Our results show that the respondents with high financial literacy hold less cash on hand, reflecting a lower transactional demand. On the other hand, they store more cash elsewhere, reflecting a higher non-transactional cash demand. On average, the financially literate respondents have more total cash holdings due to the overwhelming effect of additional non-transactional demand.

Moreover, we document that credit/debit card ownership, as a proxy of readiness to pay cashless, is higher among the financially literate respondents and the proportion of the respondents who increased contactless payments and avoided handling cash during pandemic is higher among financially literate ones.

Our regression analyses empirically show that financial literacy decreases the transactional cash demand and increases the non-transactional cash demand. However, we find that the effect of financial literacy on the non-transactional demand is higher. Moreover, demographic and socioeconomic factors are found to be significant determinants of cash holdings.

Our findings reveal that the total cash holdings of the financially literate respondents are higher than the other groups which indicates that the decrease in cash on hand is overwhelmed by the increase in cash stored elsewhere. This implies that promoting financial literacy may be useful only if policy makers' aim is to reduce cash usage at points of sale, not the overall cash demand.

# 1. Introduction

Payment ecosystem has been rapidly evolving in recent years. As payment innovations offered by private sector get more attention day by day, central banks have been conducting researches on new digital payment methods (Boar and Wehrli, 2021). However, ambiguity surrounding the future of cash, in the form of banknotes and coins, has yet to disappear. Up to now, no government or central bank has publicized a tendency to phase out cash by force while it is still being demanded by households. Even Sweden, which plans to be the first cashless economy by 2023, is taking actions against the exclusion of cash-dependent social groups by ensuring the accessibility of cash (Sveriges Riksbank, 2020a). This hints that the future of cash will most likely depend on household demand. Whether new payment technologies will cause the elimination of cash by affecting the demand side is still uncertain. Due to its unique attributes, cash retains its power among the payment methods. Payment innovations, developed so far, singularly could not succeed in embodying all features of cash (Orcutt, 2020). Moreover, Ashworth and Goodhart (2020a) clearly demonstrate that the demand for cash has been increasing in developed economies in the last 20 years. This increase has accelerated upon the 2008 Global Financial Crisis, and the spike in demand for cash during recent Covid-19 pandemic proves that the precautionary demand for cash is still strong (Ashworth and Goodhart, 2020b). High cash demand in Covid-19 pandemic is more significant considering most of the in-person payments, where cash is mostly used, cannot be made due to social lockdowns and some households are deceived by the fake news<sup>3</sup> that claim that handling cash contains high risk for virus contamination.

Although the precautionary demand for cash is still strong, recent surveys from developed economies expose that the demand for cash as a medium of exchange continues to decline (Caddy *et al.*, 2020; Deutsche Bundesbank, 2018; Henry *et al.*, 2018; Sveriges Riksbank, 2020b; Kim *et al.*, 2020; European Central Bank, 2020). Furthermore, Covid-19-special studies suggest that pandemic may permanently change the payment habits of some people in favor of cashless payment methods (VISA, 2020; Wisniewski *et al.*, 2021). Especially social lockdowns and distancing measures have accelerated the speed of adoption of alternative payment methods. The survey of VISA (2020) states that a vast majority of the respondents used a new shopping or payment method for the first time following Covid-19 outbreak. Some of these first-time users are expected to continue to use these payment methods even after the pandemic is no longer a factor.

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<sup>3</sup> At the beginning of Covid-19 pandemic, some news contained baseless claims falsely attributed to World Health Organization (Gardner, 2020). Subsequently, these were proved to be wrong by several studies (Caswell *et al.*, 2020; Panetta, 2020; Tamele *et al.*, 2021)

Most of the central banks adopt neutral approach to the methods of payment in order to avoid the exclusion of any group of society. However, they may develop tools and implement certain policies to have a better control over the payment ecosystem. In this respect, many central banks conduct surveys to have a broad perspective on the demand of cash as a medium of exchange or a store of value. The Central Bank of the Republic of Turkey carried out “Methods of Payment Survey (MPS)” in 2020 to obtain a thorough comprehension of the patterns and determinants of the usage of payment instruments. The results of this survey expose strong preference of cash as a payment method by Turkish households<sup>4</sup> (Çevik and Altunel, 2021). In this respect, a complete understanding of the determinants of cash demand is important for policy makers in order to formulate policies regarding cash management.

There are various determinants of cash demand and financial literacy is suspected to be one of them<sup>5</sup>. Fujiki (2020) deduces that the promotion of financial literacy and cashless payments may reduce the relatively small amount of cash demand for day-to-day transactions, while would not necessarily reduce the cash hoarding behavior of households in Japan. In the study based on Polish household payment behavior survey, Swiecka (2018) finds that people who prefer cashless payments have higher level of education and a higher material status. Additionally, Swiecka *et al.* (2021) conclude that households that have higher level of financial knowledge are more likely to use cashless payments. Moreover, Henry *et al.* (2018) show that Canadians’ cash on hand is negatively correlated with their financial literacy level. In a recent study, Trütsch and Marcotty-Dehm (2021) find that financial literacy does not affect individual payment behavior. On the other hand, they use a novel payment-related literacy index and conclude payment-literate individuals are more likely to adopt cashless payment methods.

Using the results of the MPS survey, the objective of this paper is to demonstrate to what extent financial literacy affects cash holdings in Turkey, thereby to show whether financial literacy can be a useful tool to manipulate the cash holdings of households in a constructive way. In this respect, firstly we investigate the fundamentals of financial literacy in Turkey in several dimensions. Subsequently, we analyze the relation between financial literacy and cash holdings. Moreover, by using regression models we test the effect of financial literacy on both transactional and non-

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<sup>4</sup> According to the payment diaries in Turkey, cash was used in 89% and 75% of all shopping transactions in terms of volume and value, respectively.

<sup>5</sup> As a different aspect of financial literacy and cash relation, cashless economy discussions raise concerns regarding financial education of children. Banknotes and coins enable children to settle basic transactions at a very young age. Since physical representations are considered to be important for pedagogical purposes, children are expected to struggle to comprehend the money phenomenon in a cashless environment. However, this paper will solely focus on the effect of financial literacy on holding cash, not vice versa.

transactional cash demand. As we discuss in detail in the following sections, financial literacy impacts the financial behavior of households and cash usage is affected by several macroeconomic and demographic variables. However, to the best of our knowledge, the direct effect of financial literacy on cash usage in Turkey is not covered in the literature. In that sense, our work contributes to the literature by being the first study that investigates the effect of financial literacy on cash usage in Turkey. Our findings suggest that Turkish households have room for financial literacy improvement. Moreover, we empirically find that financially literate households tend to hold less cash for daily transactional purposes and more cash as a reserve in places such as home and safe. The average change in absolute amounts are higher in cash stored as a reserve which implies, all else equal, a currency in circulation growth following an enhancement in financial literacy level. Therefore, our results suggest that, depending on the policy makers' objectives, financial literacy may be a useful tool, since it provides an alternative way to constructively manipulate the households' cash holding behavior.

This paper is organized as follows. The next section presents a brief description and the descriptive statistics of the MPS. Section 3 provides detailed evidence regarding financial literacy in Turkey. Section 4 shows the relationship between financial literacy and cash holdings. Section 5 provides the results of the regressions and finally, section 6 concludes.

## 2. Methods of Payment Survey

The Methods of Payment Survey (MPS) was conducted in 2020 to study the households' payment habits and perceptions toward different payment instruments. The sample consists of 2400 individuals, aged 16 years and older in the selected provinces in 26 sub-regions of Turkey. The survey is structured in two parts: a questionnaire and a payment diary. The questionnaire was conducted as face-to-face interviews on 2400 individuals. The questionnaire covers questions about individuals' socioeconomic and demographic characteristics, whether they are familiar with all payment methods, how often and how they access cash, cash holding habits, payment habits, their perceptions and attitudes toward different payment attributes, and the effects of Covid-19 pandemic on their cash payment habits. Besides, 1537 individuals out of 2400 questionnaire participants completed the payment diaries. The payment diaries cover a four-day period starting on Friday and ending on Monday, in which individuals record all details of their daily transactions including the amount of the transaction, the type of establishment in which the transaction took place (in 18 categories), and the type of payment instrument used (cash, debit card, credit card, etc.) with several questions about their cash on hand.

In this study, we focus on cash holdings of individuals. MPS consists the following two questions regarding the cash holdings:

1. How much cash do you carry in your wallet or on your person?
2. How much cash do you hold as a reserve for unseen expenses or targeted saving in places such as home and safe?

From this part of the study, we will refer to the cash holdings that are carried for daily transactions and cash stored in places such as home and safe as "cash on hand" and "cash stored elsewhere"<sup>6</sup>, respectively.

Table 1 reports the average amount of cash on hand and cash stored elsewhere based on their demographic characteristics. As can be seen from this table, the average cash on hand and cash stored elsewhere is 209 TL and 1329 TL, respectively. Table 1 also indicates that men tend to hold more cash and those who are married have higher cash holdings. Besides, those in the youngest age group and age 65 and above hold less cash than others. As the income level increases, cash holdings increase. Further, cash holdings are highest in the employers and in the Mediterranean region.

**Table 1. Average Cash on Hand and Cash Stored Elsewhere by Demographic Characteristics (TL)**

	<b>Cash on Hand</b>	<b>Cash Stored Elsewhere</b>
<b>Total</b>	209	1329
<b><u>Gender</u></b>		
Female	185	926
Male	234	1941
<b><u>Marital Status</u></b>		
Single	178	1212
Married	236	1369
<b><u>Age</u></b>		
16-24	127	745
25-39	227	1060
40-54	238	1625
55-64	224	1091
65+	217	1839
<b><u>Household Income Quartile</u></b>		
1 <sup>st</sup>	129	569
2 <sup>nd</sup>	188	640
3 <sup>rd</sup>	198	1543
4 <sup>th</sup>	247	1711
<b><u>Occupation</u></b>		
Unemployed	147	834
Regular Employee	215	977
Employer/Own account worker	369	3276
Retired	216	1579
<b><u>Region</u></b>		
Mediterranean	249	3579
Eastern Anatolia	248	615
Aegean	172	130
Southeastern Anatolia	234	1504
Black Sea	224	440
Marmara	219	1639
Central Anatolia	159	492

<sup>6</sup> Cash stored elsewhere consists of all the cash holdings other than cash on hand.

### 3. Financial Literacy in Turkey

Organisation for Economic Co-operation and Development defines financial literacy as follows: “A combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial wellbeing” (Atkinson and Messy, 2012, p. 14). Therefore, financial literacy is considered to play a significant role on personal finance decisions such as consumption, investment and saving (van Rooij *et al.*, 2007; Lusardi, 2008). Additionally, Béres and Huzdik (2012) state that the financial literacy of individuals impacts macroeconomic processes both directly and indirectly, thereby also affecting monetary and fiscal policy as well as the functioning of financial markets.

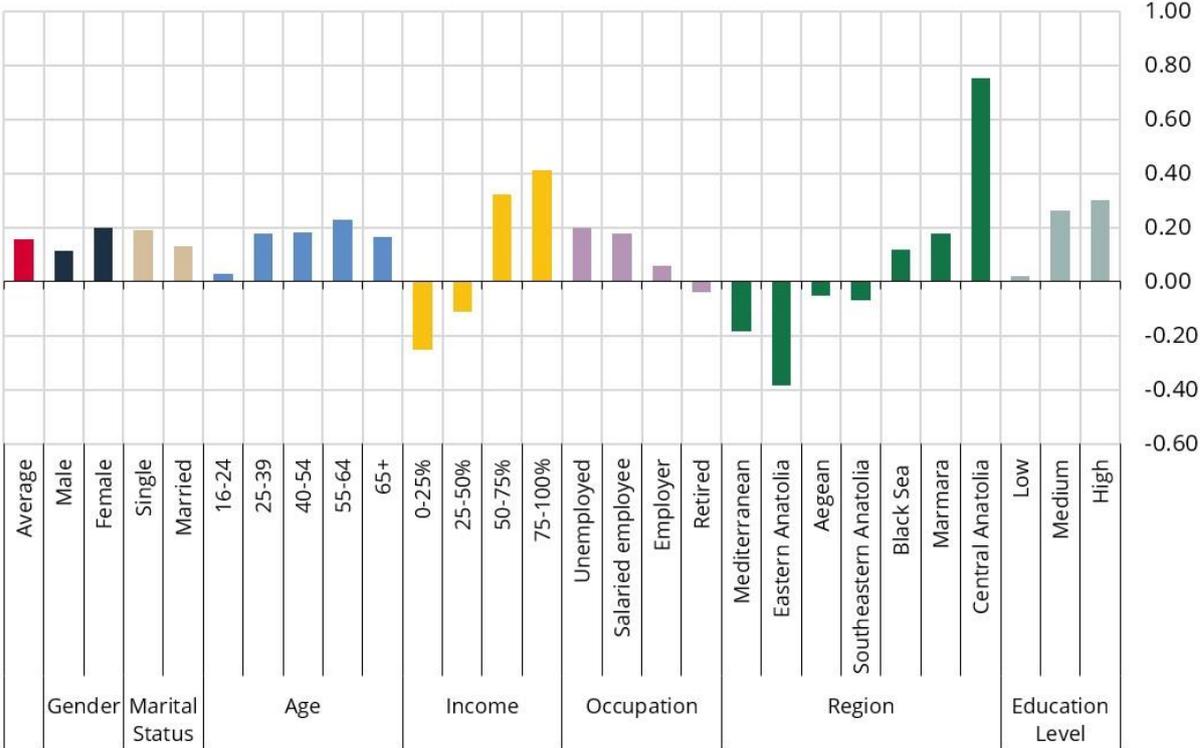
To date, there is no conceptual consensus on measuring financial literacy. This causes various measurement approaches to be adopted (Huston, 2010; Ouachani, 2021; Rieger, 2020). MPS adopts “Big Three” approach to measure financial literacy developed by Lusardi and Mitchell (2011) which has been used in more than 20 countries to measure financial literacy. This method measures the basic knowledge of interest rate, inflation and risk diversification with one question for each concept. The questions are given in Table I in the Appendix. The respondents are asked to answer these three questions with the option of “Do not know (DNK)” answer. Thus, a financial literacy score (FLS) can be calculated to measure overall performance on three concepts. The respondents are given 1/-1 point for each correct/incorrect answer, where DNK answers are given 0 point. FLS is simply acquired by adding up all points obtained from three questions, with minus three being the lowest and plus three being the highest score. Then, the respondents are grouped into three financial literacy level. First group contains the financially illiterate respondents whose FLSs are zero or lower, where second group which represents the medium level of financial literacy includes the respondents who has two correct answers or one correct answer with no incorrect answer. And third group consists of financially literate people who answered all three questions correctly.

Figure 1 presents average FLSs with respect to demographic and socioeconomic characteristics. As can be seen from this figure, FLS does not differ much across gender and marital status. With regards to age, all age groups perform similarly, except for the ages between 16 and 24. Young respondents negatively diverge from the other age groups. As expected, higher income can be attributed to the higher financial literacy. Surprisingly, the unemployed respondents have a higher financial literacy on average compared to the employed respondents. This may stem from the scope of unemployment in Turkey. In MPS, the unemployed group consists of all the respondents who are not employed or retired, unlike the formal unemployment scope which excludes students and people who does not seek for a job. With regards to regions, Central Anatolia has the highest

average FLS. Results also show that the residents of five most populated cities of Turkey perform far greater on financial literacy questions. And finally, higher financial literacy can be attributed to the higher education level in Turkey.

According to the MPS results, only 7 percent of Turkish households answered all three questions correctly. This proportion of the respondents can be defined as “financially literate”. Financially literate people can be used as a financial literacy indicator of a country. Lusardi (2019) compares the share of financially literate people in 15 countries that used the “Big Three” method to measure financial literacy<sup>7</sup>. According to the percentage of financially literate people, Turkey is better than only 2 countries which are: Romania and Russia.

**Figure 1: Average Financial Literacy Score**



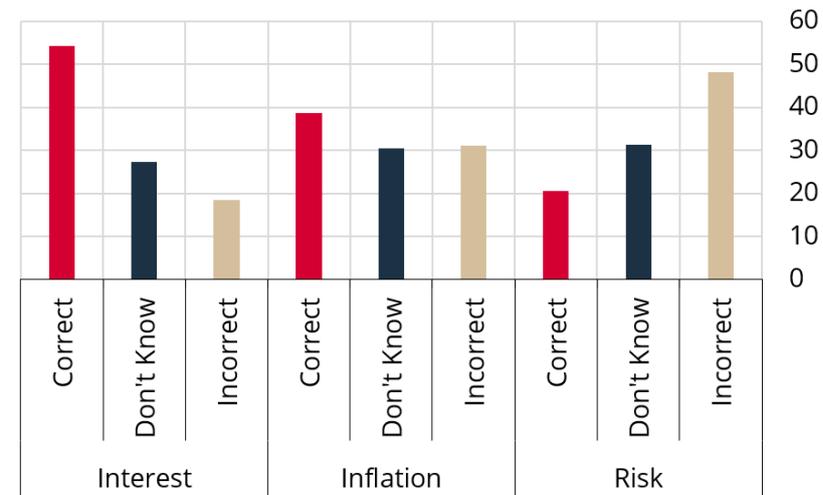
Source: MPS

Figure 2 discloses that the MPS respondents perform relatively better on the interest rate question with slightly more than half of them answering it correctly. On the other hand, 39 percent of the respondents answer the inflation question correctly and only one-fifth of the respondents answer the risk question correctly. Lusardi (2019) also presents question specific results of fifteen countries.

<sup>7</sup> The field work of these studies are conducted between the years of 2007 and 2014. Moreover, considering the field work of MPS is conducted in 2020, this non-negligible time range requires a cautious interpretation of the results.

Turkey's performance on interest rate question is relatively better with it being ninth best among sixteen countries. However, Turkey is better than only two countries in inflation and risk questions. Turkish households' performance on inflation question is surprising in the sense that Turkey consistently experiencing inflation levels that are above 10% in the recent years do not result in higher relative knowledge regarding inflation, in contrast to the study of Lusardi and Mitchell (2011) in which they find that the households from countries with experience of relatively high inflation in recent past are more knowledgeable on inflation.

**Figure 2: Turkish Households' Performance on Big Three Questions (%)**



Source: MPS

Question specific results with respect to demographic characteristics are presented in Table II in the Appendix. Despite having less correct answers in all of the three questions, women have higher average FLS than men. This result stems from women's behavior to opt for DNK answer at a higher rate than men. Observing the similar behavior among the Dutch respondents, Bucher-Koenen *et al.* (2021) state that it is unclear whether women lack knowledge or confidence. They estimate that one-third of the financial literacy gender gap could be attributed to the women's lack of confidence. MPS also discloses that elderly people marked DNK at a higher rate than the young people. The MPS respondents who belong to highest income group are the ones who opted for DNK at the lowest rate in all three questions. With regards to regions, the respondents reside in Central Anatolia region perform overwhelmingly better on interest rate and inflation questions. Finally, the respondents with higher level of education are observed to diverge from other groups in tendency to mark the DNK answer, especially in the risk question.

Performance on preceding questions appear to have played a role on respondent behavior when filling the questionnaire. When conducting the questionnaire, the respondents are asked interest

rate, inflation and risk questions, respectively. Despite their lack of knowledge, the respondents who answered interest rate and inflation questions correctly opted to mark the DNK answer in the risk question at a very low rate. Among this proportion of the respondents, only %6 of them mark the DNK, while 74% of them mark the incorrect answer. On the other hand, 58% of the respondents who fail to mark the correct answers in the first two questions mark the DNK in the last question. Moreover, 86% of the respondents who mark the DNK in both of the first two questions mark the same option in the last question. Interestingly, the respondents who have the highest proportion of correct answers in the risk question are the ones who mark the incorrect answers in interest rate and inflation questions.

#### **4. Financial Literacy and Cash Holdings**

In this section, we investigate the relationship between financial literacy and cash holdings. Households demand cash with two main motives: Transactional and non-transactional. The transactional demand roughly equals to the amount that households carry on their person to settle day-to-day transactions. The non-transactional demand, on the other hand, reflects the households' cash demand as a store of value, be it precautionary demand or hoarding. Cash demand is found to be determined by number of variables such as gross domestic product, deposit interest rates, demographics, financial inclusion, the size of shadow economy and overseas demand (Finlay *et al.*, 2020; Judson, 2017; Reimers *et al.*, 2021; Shirai and Sugandi, 2019). Moreover, cash demand is highly responsive to any type of crisis (Rösl and Seitz, 2021). During crises, households' cash demand is affected through two different channels. First, growing uncertainty leads households to store more cash. Second, implementing expansionary monetary policies to stimulate the economy result in lower nominal interest rate, hence less opportunity cost of holding cash leads households to store more cash. Response to nominal interest rate changes is expected to be more significant among financially literate people.

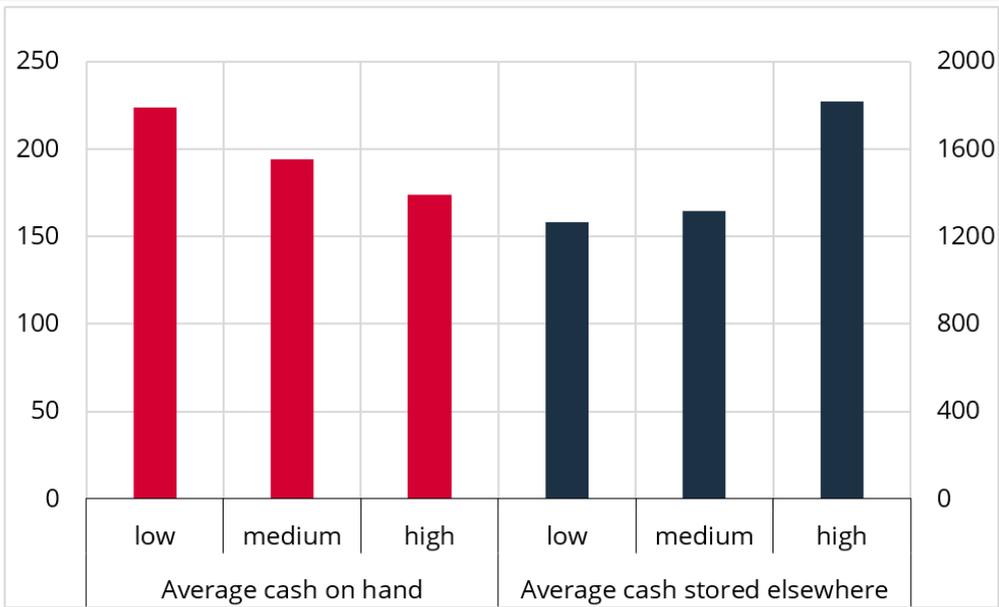
MPS measures the transactional cash demand with the respondents' "cash on hand" on a typical day, while the non-transactional demand is represented by the amount of "cash stored elsewhere". Results reveal that the respondents with high financial literacy hold less cash on hand on average, as shown in Figure 3. Their cash stored elsewhere on average, on the other hand, is higher than lower financial literacy groups. On average, the financially literate respondents have more total cash holdings due to the overwhelming effect of additional non-transactional demand.<sup>8</sup> Using Japanese

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<sup>8</sup> The Analysis of Variance (ANOVA) is used to determine if there are any differences in cash holdings (cash on hand and cash stored elsewhere) between financial literacy groups (low, medium and high). The results of this analysis indicate that there is

household surveys, Fujiki (2020) also state that households with higher financial literacy tend to have a higher amount of cash holdings. However, he concludes that cash demand for day-to-day transactions do not differ much across financial literacy groups.

**Figure 3: Average Cash on Hand (left axis) and Average Cash Stored Elsewhere (right axis) with Respect to Financial Literacy (TL)**



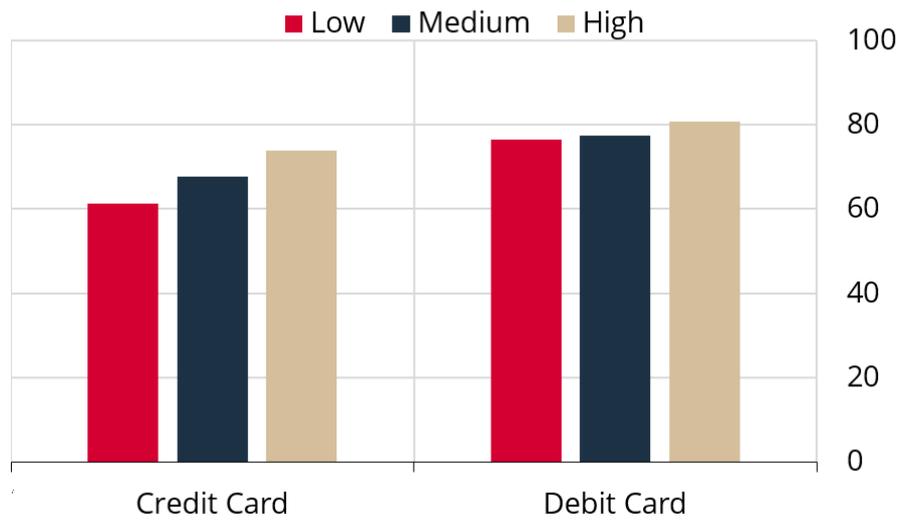
Source: MPS

Cash on hand may be affected by supply-side limitations as well. It is a known fact that cash is accepted almost everywhere, yet cashless payments are denied at some points of sale in Turkey. Therefore, readiness to pay cashless may give an idea about possible direction of cash on hand changes, if there were no supply-side limitations. Figure 4 shows that credit/debit card ownership, as a proxy of readiness to pay cashless, is higher among the financially literate MPS respondents. This hints that, together with inclusive point-of-sale terminal network, financial literacy may reduce average cash on hand. Moreover, Akin *et al.* (2012) found that financial literacy is a determinant of satisfaction, when using a credit card. This implies that promoting financial literacy may provide both quantitative and qualitative enhancement regarding credit card usage.

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significant evidence that the means of the cash on hand (F=2.99, p-value 0.06) and cash stored elsewhere (F=3.03, p-value 0,06) significantly vary with respect to financial literacy groups.

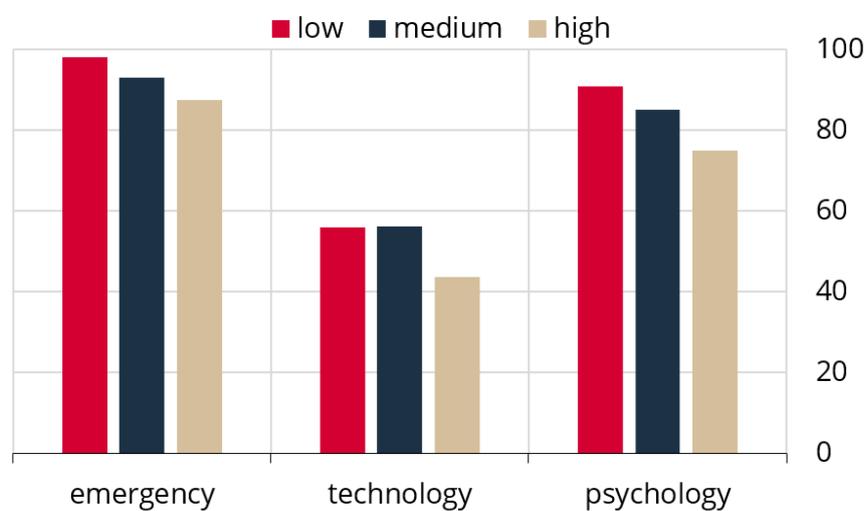
**Figure 4: Card Ownership with Respect to Financial Literacy (%)**



Source: MPS

Cash is the most liquid asset which makes it utilizable as a payment instrument at any physical transaction point at any time. This attribute of cash induces people to store cash with number of motives. Figure 5 shows that, when asked about their motives for storing cash, most of the MPS respondents state the emergency situation as one of their main motives. However, the financially literate respondents are witnessed to store cash, as a precaution for emergency situation, at a lower level. Moreover, financially literate people are less worried about potential technological outages. Besides, less proportion of the financially literate respondents appear to store cash to feel psychologically better.

**Figure 5: Motives for Storing Cash Among Financial Literacy Groups (%)**

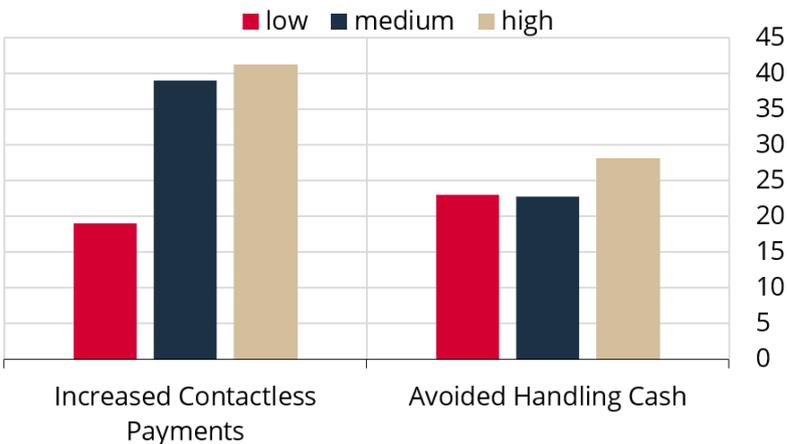


Source: MPS

An important aspect to note regarding MPS is that its field work is completed in the October of 2020 which is within the Covid-19 pandemic period. Pandemic-special surveys from Canada, United Kingdom and USA expose that the respondents changed their cash holdings significantly in a very short time (Caswell *et al.*, 2020; Chen *et al.*, 2021; Coyle *et al.*, 2021). Two motives, transactional and non-transactional, for demanding cash are expected to have opposite movements during Covid-19 pandemic, which makes it hard to clearly observe the total effect of pandemic on cash holdings. Although households from different countries have different characteristics with regards to all sorts of financial behavior, based on the results of Canadian and USA surveys, MPS results may also suffer from the pandemic bias. When asked about their cash usage during the pandemic, only 23% of the Turkish respondents state that they avoided using cash. This hints that the pandemic effect on Turkish households' cash holding behavior is rather limited. Moreover, considering roughly 50% increase in the currency in circulation in Turkey during the first six months of Covid-19, pre-pandemic cash holdings of households would most likely be lower than the pandemic cash holdings in total.

The results of the MPS show that financially literate people are more adaptive to swiftly changing circumstances. Figure 6 discloses that the proportion of the respondents who increased contactless payments and avoided handling cash during pandemic is higher among financially literate ones.

**Figure 6: Covid-19 Behavior with Respect to Financial Literacy (%)**



Source: MPS

## 5. Methodology and Estimation Results

In this section, we carry out OLS regression analyses to examine the association between the financial literacy of the respondents and their cash holdings. The models are specified as follows.

$$Y = \beta'X + \varepsilon$$

where  $Y$  is the participants' cash on hand of in the first model, whereas cash stored elsewhere in the second model. Cash on hand and cash stored elsewhere are average amounts of cash holdings (in terms of TL) that are carried for daily transactions and cash stored in places such as home and safe, respectively.  $\beta$  is the vector of the coefficients; and  $X$  is the vector of explanatory variables, which includes the financial literacy and socio-demographic controls comprising of gender, marital status, age, income level, employment status and region of residence. Table 2 gives detailed information about the explanatory variables used in the models.

**Table 2. Definition of Explanatory Variables**

Financial Literacy	3 dummy variables; 1 if the respondent is in high, medium or low financial literacy group; 0 else.
Gender	Dummy variable that equals 1 if gender is female; 0 else.
Marital status	Dummy variable that equals 1 if the respondent is married; 0 else.
Age	5 dummy variables; 1 if the respondent's age is between 16-24, 25-39, 40-54, 55-64, or above 65; 0 else.
Job status	4 dummy variables; 1 if the respondent is currently retired, unemployed, regular employee or employer/own account worker; 0 else.
Household income	Continuous variable indicating the reported income of a respondent (in terms of TL).
Region	7 dummy variables; 1 if the respondent is residing in that region; 0 else.

The regression results are presented in Table 2. Overall model fits are tested using F-test and results ( $p$ -value < 0.01) conclude that the explanatory variables play a significant role in predicting cash holdings. Financial literacy has significant effects in both regressions. The coefficients on financial literacy are found to be significantly negative in the cash on hand model at the 1% level, thereby suggesting that those respondents with higher levels of financial literacy have lower cash on hand. On the other hand, the coefficients on financial literacy are found to be significantly positive in the cash stored elsewhere model at least at the 5% level, which implies those respondents equipped with higher levels of financial literacy have higher cash stored elsewhere. Regarding demographic characteristics, the estimation results show that cash on hand and cash stored elsewhere increases

with the age level (except age 65 and over) and income level. Results also reveal that, marital status and gender do not influence the cash stored elsewhere, but being married increases the cash on hand whereas being a female decreases it. Being unemployed and regular employee decreases cash stored elsewhere; whereas being employer/own account worker increases cash on hand. Besides, the region of residence is also found to be significant on cash holdings.

Overall, the results suggest that financial literacy plays an important role in cash demand. A person with higher financial literacy tends to have a large amount of cash stored elsewhere, maybe for the sake of hoarding; however, that person tends to have a lower cash demand for daily transactions. One possible story behind this could be that person with higher financial literacy may have more knowledge about payment methods and he is more likely to reduce the use of cash by using cashless payment methods.

**Table 3. Estimation Results**

	<b>Cash on Hand</b>	<b>Cash Stored Elsewhere</b>
Financial Literacy (Low Financial Literacy Comparison Group)		
Medium Financial Literacy	-0.214***	0.352**
High Financial Literacy	-0.309***	0.667***
Female	-0.104***	-0.124
Married	0.261***	-0.200
Age (age between 16-24 comparison group)		
Age between 25-39	0.386***	0.490*
Age between 40-54	0.388***	0.736***
Age between 55-64	0.440***	0.944***
Age 65 and over	0.300***	0.821**
Income (per month)	0.325***	0.743***
Occupation (Retired Comparison Group)		
Unemployed	-0.295***	-0.859***
Regular employee	-0.023	-0.820***
Employer/Own account worker	0.383***	-0.131
Region (Central Anatolia Comparison Group)		
Mediterranean	0.473***	2.385***
Marmara	0.381***	1.351***
Aegean	0.180***	0.833
Eastern Anatolia	0.635***	1.140***
Southeastern Anatolia	0.545***	0.995***
Black Sea	0.336***	0.700***
<b>F-value</b>	<b>35.08</b>	<b>14.01</b>
<b>R-square</b>	<b>0.25</b>	<b>0.50</b>

Notes: \*\*\*, \*\* and \* indicate significance at the 1, 5 and 10 per cent level, respectively.

## 6. Conclusion

Literature shows that cash demand has number of determinants. Although not being supported by a broad literature, financial literacy is shown to be one of the determinants of the cash demand. Motivated by this, we investigate the relationship between financial literacy and cash holdings in Turkey utilizing the results of the MPS survey which includes questions about both financial literacy and cash holdings.

Measured with “Big Three” questions, the average financial literacy level among the MPS respondents is found to be quite low in both relative and absolute terms. The share of financially literate respondents in Turkey is one of the lowest among sixteen countries that used “Big Three” questions to measure financial literacy. On the other hand, Turkish households are observed to be relatively more knowledgeable on interest rate, with their performance being the ninth best among sixteen countries.

The results of this study show that the financially literate respondents tend to hold less cash on hand and store more cash elsewhere. Besides, credit card ownership increases through financial literacy. As to motives for storing cash, relatively less proportion of financially literate respondents indicates that they store cash for emergency situations, potential technological outages and to feel psychologically better. Moreover, the financially literate respondents are found to be more responsive to the changing conditions, as they further increased contactless payments and avoided handling cash during Covid-19 pandemic. Besides, the results of the regression models also show that people with higher financial literacy level tend to hold less cash on hand and store more cash elsewhere on average. Furthermore, demographic and socioeconomic factors are found to be other determinants of cash holdings in Turkey.

In conclusion, we demonstrate that Turkey has a considerable room for financial literacy improvement. Our findings suggest that financial literacy programs may serve well to reduce cash usage at points of sale in Turkey. However, financially literate respondents’ tendency to store more cash needs to be taken into consideration while promoting financial literacy. The results show that total cash holdings of the financially literate respondents are higher than the other groups which indicates that the decrease in cash on hand is overwhelmed by the increase in cash stored elsewhere. Therefore, our findings suggest that enhancement in financial literacy level, all else equal, may result in currency in circulation growth in Turkey. This implies that promoting financial literacy may be useful only if policy makers’ aim is to reduce cash usage at points of sale, not the overall cash demand.

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## Appendix

### Table I: Big Three Financial Literacy Questions

#### Q1- Interest Rate

Suppose you had 100 TL in a savings account and the interest rate was 10% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

- a. More than 110 TL
- b. Exactly 110 TL
- c. Less than 110 TL
- d. Do not know

#### Q2- Inflation

Imagine that the interest rate on your savings account was 15% per year and inflation was 10% per year. After 1 year, how much would you be able to buy with the money in this account?

- a. More than today
- b. Exactly the same
- c. Less than today
- d. Do not know

#### Q3- Risk diversification

Please tell me whether this statement is true or false. "Buying a single company's stock usually provides a safer return than a stock mutual fund."

- a. True
- b. False
- c. Do not know

**Table II: Performance on Big Three Questions (%)**

	Interest		Inflation		Risk		Average FLS
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	
<b>Gender</b>							
Male	55.1	20.6	38.6	33.6	22.0	50.2	0.1
Female	53.2	16.4	38.5	28.4	19.1	46.1	0.2
<b>Marital Status</b>							
Single	55	17.5	34.4	31.3	19.4	49.2	0.2
Married	53.4	19.4	37.5	33	21.5	47.3	0.1
<b>Age</b>							
16-24	50.9	23.9	36.2	30.3	18.0	47.9	0.0
25-39	57.9	17.3	38.6	34.1	21.7	49.0	0.2
40-54	55.3	17.5	41.0	32.7	21.3	49.2	0.2
55-64	51.2	14.7	37.9	23.9	19.8	47.4	0.2
65+	43.1	19.7	35.0	21.9	20.4	40.2	0.2
<b>Income (per month)</b>							
2034 TL or less	38.2	25.0	17.1	35.5	15.8	35.5	-0.3
2035 TL-3215 TL	46.4	21.7	29.4	36.5	18.4	47.3	-0.1
3216 TL-5034 TL	56.3	9.5	40.7	24.6	16.9	47.3	0.3
5035 TL or more	68.8	21.8	58.6	28.0	25.9	62.1	0.4
<b>Occupation</b>							
Unemployed	52.5	16.6	36.1	29.3	21	43.9	0.2
Regular employee	56.7	20.6	43.0	30.9	20.6	50.8	0.2
Employer/Own account worker	55.6	13.8	33.8	35.6	18.7	52.9	0.1
Retired	41.3	16.4	22.9	32.3	20.4	39.3	0
<b>Region</b>							
Mediterranean	55.9	15.5	22.3	43.0	15.9	53.6	-0.2
Eastern Anatolia	34.4	32.8	35.9	28.1	3.1	50.8	-0.4
Aegean	33.6	6.1	13.9	33.6	15.6	55.9	-0.1
Southeastern Anatolia	50.8	31.9	46.5	32.4	12.4	35.1	-0.1
Black Sea	39.9	15.0	30.1	25.6	21.1	40.6	0.1
Marmara	57.1	25.0	41.4	34.6	27.4	24.2	0.2
Central Anatolia	73.2	4.2	60.1	14.5	19.5	58.6	0.8
<b>Education Level</b>							
Low	47.3	21.3	34.5	31.4	18.8	45.9	0.0
Medium	60.8	16.1	41.2	32.2	22.6	50.0	0.3
High	56.7	16.0	45.0	25.5	20.2	20.2	0.3

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