



## **ADB Working Paper Series**

### **MILLENNIAL MOBILE PAYMENT USERS: A LOOK INTO THEIR PERSONAL FINANCES AND FINANCIAL BEHAVIOR**

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No. 1074  
January 2020

**Asian Development Bank Institute**

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#### Suggested citation:

Scheresberg, C. B., A. Hasler, and A. Lusardi. 2020. Millennial Mobile Payment Users: A Look into Their Personal Finances and Financial Behavior. ADBI Working Paper 1074. Tokyo: Asian Development Bank Institute. Available: <https://www.adb.org/publications/millennial-mobile-payment-users-personal-finances-financial-behavior>

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**Abstract**

The financial technology (fintech) sector is revolutionizing traditional financial practices, yet little information exists on the users of these services. In this study, we examine untapped information from the 2015 National Financial Capability Study and the 2016 GFLEC Mobile Payment Survey to provide insights on the financial capability of American millennials who use mobile payments. Using data from both surveys, we find striking differences in financial capability between users and non-users. In particular, we reveal that users of mobile payments are more likely to overdraw their checking accounts, use credit cards expensively, borrow through alternative financial services, and withdraw from their retirement accounts. Even after controlling for socio-demographic factors, the results indicate that mobile payment users are more inclined to engage in behaviors that do not seem to follow good financial management practices.

**Keywords:** financial literacy, fintech, financial services, financial behavior, personal finance

**JEL Classification:** D14, G51, G53, G20, O16

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Technological innovation is fundamentally changing how people use financial products and make financial transactions. Thanks to innovations such as mobile applications, web applications, and cloud-based services, over the last decade there has been a rapid multiplication of tools that promise to provide easier, quicker, and cheaper access to financial services. This steady growth is attracting important capital investments. According to a study by KPMG and CB Insights (2017), the global fintech startup industry received \$25 billion in investments in 2016, a 30% increase from 2015. Over 70% of these investments were focused on innovation in the last mile of the customer experience (Citi 2016).

Payments and point-of-sale transactions are some of the areas where the fintech industry has concentrated to date. Mobile payments such as Google Wallet, Apple Pay, Samsung Pay, Android Pay, and Starbucks mobile are becoming increasingly popular. According to the Federal Reserve, 24% of smartphone users reported using mobile payments in 2015, a 100% increase from only four years earlier (Federal Reserve Board 2016). Mobile point-of-sale transactions accounted for nearly \$30 billion in 2016 and are forecast to grow to about \$200 billion in 2021 (eMarketer 2017). As these tools become more prevalent, it is increasingly important to understand what types of users they attract and whether technological innovation is changing users' financial behaviors.

In this study, we analyze data from the United States (US) using the 2015 National Financial Capability Study (NFCS) to investigate the demographics, financial behavior, and financial literacy of millennials (respondents aged 18–34) who use mobile payments. In addition, we examine data from the 2016 GFLEC Mobile Payment Survey (hereinafter “GFLEC survey”), which we designed and fielded in the US to collect additional information on mobile payment users. Through analyzing these two data sets, we find that millennials who use mobile payments are more likely to use financial products (for instance, they are more likely to have bank accounts, credit cards, and retirement accounts). However, they are also more inclined to engage in expensive financial behaviors compared to non-users. For example, millennial mobile payment users are much more likely to overdraw their checking accounts, pay fees on their credit cards, turn to alternative financial services, and withdraw from their retirement accounts than are millennial non-users. On top of this, mobile payment users demonstrate lower levels of financial literacy.

These insights offer early information on mobile payment users at a time when the mobile payment sector is growing rapidly, but little research exists. Due to the nature of the data, we cannot draw a causal link between mobile payment use and financial behavior—that is, we cannot say whether the financial behaviors that we report happen *because* people use mobile payments. However, we offer information that can aid entrepreneurs and innovators in developing products, and we identify directions for future research on fintech.

## 1. BACKGROUND

The term “m-payment” was coined to describe payments made by laptops, tablets, and mobile phones (Jacob 2007; Au and Kauffman 2008; Goode 2008). More recently, as mobile phones have emerged as the leading technology, m-payments or “mobile payments” have been defined as “a transfer of funds in return for a good or service where the mobile phone is involved in both the initiation and confirmation of the payment” (de Bel and Gâza 2011, p. 12). Money transfers occur through near-field communication (NFC) technology, barcode or quick response codes, or cloud. With mobile payments,

there has been a shift from consumers visiting banking websites on mobile browsers to consumers using mobile phones directly for payment, substituting for check, cash, and credit/debit card transactions (Contini et al. 2011).<sup>1</sup>

Mobile payments offer significant advantages to consumers: they tend to be convenient and flexible, and they are often quicker than traditional methods of payment. They also offer significant advantages to merchants in the form of lower costs, improved shopping experience, and access to customer data (Hayashi and Bradford 2014). Mobile payments are becoming increasingly available and adoption is growing rapidly. According to the Consumers and Mobile Financial Services Survey, 28% of respondents with a smartphone use mobile payments (Federal Reserve Board 2016).<sup>2</sup> Usage is disproportionately common among the young and among minorities. Interestingly, the Federal Reserve survey included additional questions for respondents who reported *not* using mobile payments. For most, the main reason for not using the technology is that they see little value in adopting it (76% report that it is easier to pay with cash or a credit/debit card), and second, respondents are concerned with security (42% feel that mobile payments are “somewhat unsafe” or “very unsafe”).

With this study, we seek to build a more comprehensive profile of mobile payment users and to initiate greater dialog on how fintech is influencing users’ financial behaviors.

## 2. DATA

Data on mobile payment users were obtained from the 2015 National Financial Capability Study (NFCS) as well as from an independent survey that we fielded in 2016. The NFCS is a triennial survey that was first administered in 2009 with the aim of assessing and benchmarking financial capability among American adults. Using a large sample size (more than 25,000 observations), the NFCS examines key indicators of financial capability: how people manage their assets and resources, how they make financial decisions, their financial skill sets, and the knowledge that informs their choices (Financial Industry Regulatory Authority [FINRA] Investor Education Foundation 2016). We focused on millennials and restricted the sample to those aged 18–34.

To complement the analysis of the 2015 NFCS, in 2016 we fielded our GFLEC survey on Amazon’s Mechanical Turk platform, a popular online labor platform that facilitates access to a large and diverse population of workers at a relatively low cost.<sup>3</sup> We chose Mechanical Turk because workers on this platform are known to be young and technologically savvy, so we expected that they would be more likely to use mobile payments. The new survey included questions from the NFCS as well as additional questions to complement and enrich our analysis.

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<sup>1</sup> While mobile payments are a substitute for traditional methods of payment, they are usually funded through a bank account or a credit card or through a non-bank payment provider, such as the mobile carrier.

<sup>2</sup> The results found in the Federal Reserve study cannot be directly compared with the results in this paper due to question wording and variations in the definition of mobile payments.

<sup>3</sup> For research regarding the use of Amazon’s Mechanical Turk, see Mason and Suri (2012).

In order to have the same sample base in both data sets, we used the same question regarding mobile payments:

*How often do you use your mobile phone to pay for a product or service in person at a store, gas station, or restaurant (e.g., by waving/tapping your mobile phone over a sensor at checkout, scanning a barcode or QR code using your mobile phone, or using some other mobile app at checkout)?*

- Frequently;
- Sometimes;
- Never;
- Don't know;
- Prefer not to say.

We defined respondents as mobile payment “users” if they responded “frequently” or “sometimes” to the question, and “non-users” if they responded “never.” Individuals who indicated “don't know” or “prefer not to say” were removed from the sample and excluded from the analysis. After exclusions, we were left with a sample of nearly 8,000 millennials from the NFCS, of whom 39% reported using mobile payments, and a sample of over 2,000 millennials from our 2016 GFLEC survey, of whom 49% reported using mobile payments.<sup>4</sup> In the following section, we compare users and non-users from both samples, analyzing how they differ in terms of demographics, assets, liabilities, and financial management practices.

### 3. DEMOGRAPHICS

We begin by examining the main demographic characteristics of mobile payment users among the samples of millennials from the NFCS and the GFLEC survey. First, we outline which demographic groups use mobile payments most often, and second, we identify how mobile payment users compare to non-users in terms of socio-demographic characteristics. The findings from this section provide invaluable insights into fintech's millennial customer base.

#### 3.1 Rate of Mobile Payment Usage

Table 1 reports the rate of mobile payment usage among demographic groups.<sup>5</sup> According to the data from the NFCS and the GFLEC survey, the usage rate is highest among males, respondents who work full-time, and minorities. Specifically, usage of mobile payments is at least 9 percentage points higher for each minority group than for Caucasians.<sup>6</sup> Both data sets show that mobile payment usage is high among those with a college degree or higher education. This is particularly true in the GFLEC survey, where 44% of those with a high school diploma or less use mobile payments, compared to 51% of those with at least a bachelor's degree (37% vs. 42% in the NFCS). We also find that mobile payment usage is greater among those with a high income. In the NFCS, about

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<sup>4</sup> Apps are the most common mobile payment method. They allow users to pay through their phone and charge the amount directly to a pre-selected credit or debit card. Other common methods include prepaid cards, e-gift cards, and PayPal (data from the GFLEC survey).

<sup>5</sup> Statistics in this table should be read as “\_\_% of males use mobile payments.”

<sup>6</sup> “Caucasians” refers to respondents who identified themselves as Caucasian (white non-Hispanic), while “minorities” refers to Blacks, Asians, and Hispanics. This study was conducted in the US.

a third of those in the lowest income group use mobile payments compared to over half of those in the highest income category. Usage is also considerable among those who work full-time. Substantial usage among these groups might be expected, as individuals with higher income and higher education are typically more financially active, which means that they may have more incentives to use this method of payment (FDIC 2009).

**Table 1: Rate of Usage of Mobile Payments by Demographics Groups among 18-to-34-year-olds**

	% Use of POS Mobile Payment	
	<i>NFCS Survey</i>	<i>GFLEC Survey</i>
<b>Gender</b>		
Male	45	50
Female	35	49
<b>Ethnicity</b>		
White	35	46
Black	49	63
Asian	51	59
Hispanic	44	59
<b>Marital Status</b>		
Married	41	52
Single	38	48
Separated/Divorced/Widowed	52	52
<b>Income</b>		
Income <\$25k	31	39
Income \$25k–\$35k	38	52
Income \$35k–\$50k	34	50
Income \$50k–\$75k	43	58
Income >\$75k	51	63
<b>Educational Attainment</b>		
High school diploma or less	37	44
Some college	37	49
Bachelor's or more	42	51
<b>Work Status</b>		
Self-employed	39	36
Work part-time	39	41
Work full-time	45	56
Homemaker	29	47
Full-time student	36	53
<b>N</b>	7,894	2,007

Note: Statistics read as "45% of males use mobile payments in the NFCS."

We find that usage is higher among those who use financial services. In particular, mobile payment usage is much greater among respondents who have a checking or savings account and those who have a credit card. These findings contrast with the notion that mobile payments are a substitute for those who do not have access to traditional financial products, something that is true in developing countries.



### 3.2 Comparing Users and Non-Users

We now turn to the analysis of how users differ from non-users. This information can be especially helpful for fintech developers who want to identify untapped needs or to better customize their services. Table 2 shows that users are more likely to be male and of a minority ethnicity compared to non-users, especially in the NFCS. We also find that while many mobile payment users have low incomes, they tend to have higher household incomes than non-users. Moreover, users tend to be better educated. In the NFCS, 38% of users have a bachelor's degree compared to 33% of non-users (in the GFLEC survey the figures are 52% and 48%, respectively). Furthermore, mobile payment users are more likely to be employed on a full- or part-time basis compared to non-users.

**Table 2: Breakdown of Users and Non-Users**

	Demographics of 18-to-34-year-olds (NFCS Survey)			Demographics of 18-to-34-year-olds (GFLEC Survey)		
	<i>Total Sample</i>	<i>Non- Users</i>	<i>Users</i>	<i>Total Sample</i>	<i>Non- Users</i>	<i>Users</i>
<b>Gender</b>						
Male	41%	37%	48%	52%	51%	52%
Female	59%	63%	52 %	48%	49%	47%
<b>Ethnicity</b>						
White	59%	64%	53%	74%	79%	70%
Asian	7%	6%	9%	8%	6%	10%
Black	12%	10%	15%	7%	6%	9%
Hispanic	17%	15%	19%	8%	6%	9%
<b>Marital Status</b>						
Married	38%	37%	40%	34%	32%	36%
Single	59%	60%	57%	62%	64%	61%
Separated/Widowed/Divorced	3%	3%	3%	4%	3%	3%
<b>Income</b>						
Income <\$25k	31%	35%	24%	32%	39%	25%
Income \$25k–\$35k	13%	14%	13%	17%	16%	18%
Income \$35k–\$50k	16%	17%	14%	19%	18%	19%
Income \$50k–\$75k	20%	18%	22%	18%	15%	21%
Income >\$75k	20%	16%	26%	12%	9%	16%
<b>Education Attainment</b>						
High school diploma or less	26%	27%	24%	11%	12%	9%
Some college	29%	30%	27%	27%	29%	25%
Associate's degree	10%	10%	11%	12%	10%	13%
Bachelor's degree	35%	33%	38%	41%	39%	42%
Postgraduate	11%	9%	13%	10%	9%	10%
<b>Work Status</b>						
Self-employed	6%	6%	6%	14%	18%	10%
Work full-time	44%	40%	51%	57%	50%	65%
Work part-time	14%	14%	14%	10%	12%	9%
Homemaker	11%	13%	8%	6%	7%	6%
Full-time student	15%	16%	14%	7%	6%	7%
<b>N</b>	7,894	4,823	3,071	2,006	1,011	995

Note: Statistics read as “37% of non-users in the NFCS are male.” Statistics may not sum to 100% due to rounding.

In order to look deeper into these findings, we report the results from a multivariate analysis that demonstrate which demographic characteristics are more likely to be associated with mobile payment usage. We ran ordinary least squares (OLS) regressions using mobile payment usage as a dummy response variable equal to 1 if respondents “sometimes” or “frequently” use mobile payments and 0 if they “never” use mobile payments. Those who indicated “don’t know” or “prefer not to say” were excluded from the sample.

Table 3 presents the findings. Looking first at the regressions for the NFCS sample, we find that minorities are more likely to utilize mobile payments. Respondents with the highest education (bachelor’s or postgraduate degree) and household incomes are much more likely to utilize mobile payments. Interestingly, having a basic level of financial literacy is *negatively* associated with using mobile payments.<sup>7</sup> Specifically, respondents with a basic level of financial literacy are over 15 percentage points less likely to use mobile payments than those without a basic level of financial knowledge. The results are similar for the GFLEC survey. In other words, those who use mobile payments are much less likely to be financially knowledgeable.

**Table 3: Regressions on Mobile Payment Usage**

	NFCS Survey	GFLEC Survey
	Uses Mobile Payments	Uses Mobile Payments
Age 25–29	–0.0504*** (0.0141)	–0.0653** (0.0313)
Age 30–34	–0.0910*** (0.0147)	–0.122*** (0.0321)
Female	–0.113*** (0.0110)	–0.0410* (0.0232)
Black non-Hispanic	0.158*** (0.0173)	0.124*** (0.0405)
Hispanic (any race)	0.0922*** (0.0147)	0.106** (0.0419)
Asian non-Hispanic	0.140*** (0.0210)	0.108*** (0.0416)
Single	–0.0283** (0.0127)	–0.0123 (0.0266)
Separated	0.0482 (0.0654)	–0.00351 (0.136)
Divorced	0.0386 (0.0402)	0.0782 (0.0741)
\$25,000–35,000	0.0821*** (0.0175)	0.151*** (0.0327)
\$35,000–50,000	0.0577*** (0.0171)	0.126*** (0.0325)
\$50,000–75,000	0.150*** (0.0167)	0.212*** (0.0344)
\$75,000–100,000	0.201*** (0.0207)	0.296*** (0.0462)

*continued on next page*

<sup>7</sup> We defined a respondent as “financially literate” if he or she responded correctly to three basic financial literacy questions (also known as the Big Three), measuring knowledge of the workings of interest rates, inflation, and risk diversification.

**Table 3** *continued*

	NFCS Survey	GFLEC Survey
	Uses Mobile Payments	Uses Mobile Payments
High school diploma	0.0448 (0.0346)	−0.0402 (0.0387)
Some college, no degree	0.0385 (0.0344)	0.0663* (0.0385)
Associate's degree	0.0682* (0.0371)	0.0228 (0.0285)
Bachelor's degree	0.0682* (0.0353)	0.0331 (0.0433)
Postgraduate degree	0.125*** (0.0380)	−0.660 (0.498)
Basic financial literacy	−0.155*** (0.0138)	−0.149*** (0.0235)
Constant	0.350*** (0.0365)	0.501*** (0.0440)
N	7,894	2,006
R-squared	0.073	0.077

The dependent variable is for mobile payment usage based on the question “How often do you use your mobile device to pay in store or in person?” Responses were coded 1 if respondents answered “yes” and 0 if they indicated “no”; respondents who indicated “don’t know” or “prefer not to say” were excluded. The sample is restricted to those who have a checking account. Baseline categories: age 18–24, male, white, married, income <\$25,000, less than a high school diploma. OLS regressions were used. Controls for income \$100k–150k, income \$150k+, “other” ethnicity, and widow/widowed were included but not reported for brevity. Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

In summary, the data from both surveys show that mobile payment users are more often male, of a minority ethnicity, employed either full- or part-time, have higher education, and have higher household incomes than non-users. Given these data, one might expect that mobile payment users are more financially secure and have better financial management practices, as factors such as being employed and having higher incomes and education are usually linked to better financial outcomes. However, as demonstrated in the following sections, this is not what we find, as evidenced by the financial literacy levels of users.

## 4. FINANCIAL PROFILE

While our data sets cannot be used to say whether usage of mobile payment technology *causes* specific financial behavior, we can use them to understand the extent to which the personal finances and financial behaviors of users differ from non-users. T-tests were used to test the statistical difference between the two groups and, unless otherwise noted, all differences discussed in the following sections are statistically significant at a 10% level or lower.

### 4.1 Assets and Liabilities

Before we analyze whether a difference in financial management exists between mobile payment users and non-users, we first consider the financial products these millennials own. In particular, we look at a snapshot of their balance sheet of assets and liabilities (Table 4).

**Table 4: Assets and Liabilities**

	NFCS Survey		GFLEC Survey	
	Non-Users (18–34)	MP Users (18–34)	Non-Users (18–34)	MP Users (18–34)
<b>Assets</b>				
Has a checking or savings account	91%	94%	95%	96%
Has a credit card	66%	82%	76%	88%
Has a retirement account	44%	55%	N/A	N/A
Owns a home	33%	48%	29%	35%
<b>Liabilities</b>				
Has credit card debt*	47%	47%	55%	51%
Has an auto loan	29%	34%	27%	30%
Has a student loan	45%	53%	44%	46%
Has a home mortgage*	70%	63%	73%	72%
Has a home equity loan*	6%	30%	5%	15%
<b>N</b>	4,823	3,071	1,011	995

Note: \* Indicates statistics are conditional on having the related asset.

In terms of assets, the data reveal important differences between users and non-users. Table 4 indicates that in both samples, mobile payment users are more likely to have a checking or savings account. Users are also more likely to have at least one credit card, with 82% owning at least one, compared to 66% of non-users in the NFCS (88% vs. 76% in the GFLEC survey). Finally, users are 11 percentage points more likely to have a retirement account than are non-users in the NFCS.

Turning to liabilities, we find that millennial mobile payment users are more likely to hold nearly every form of debt included in the surveys. For example, the data show that in both surveys, mobile payment users are much more likely to have auto loans, student loans, and home equity loans. The largest contrast between users and non-users can be seen when looking at home equity loans. Similar differences were found in the GFLEC survey.

All of these findings combined indicate that mobile payment users are much more likely to use financial instruments and to carry several forms of debt. They demonstrate that there is an opportunity for fintech to expand in areas beyond payments.

## 4.2 Management of Personal Finances

As discussed earlier, one might expect that mobile payment users are more financially secure and have better financial management practices because they have more assets, higher incomes, and higher levels of education. However, our findings do not point in this direction. This can be seen by looking, for example, at the management of checking accounts. As reported previously, millennial mobile payment users are more likely to have a bank account. However, they are also much more likely to report that they occasionally overdraw their checking account, an action that often incurs steep penalty fees (Consumer Financial Protection Bureau 2016; The Pew Charitable Trusts 2016). In the NFCS, 33% of millennial mobile payment users reported occasionally overdrawing their checking account, compared to 19% of non-users (Table 5).<sup>8</sup>

<sup>8</sup> The difference is smaller in the GFLEC survey, but still significant.

**Table 5: Management of Personal Finances**

	NFCS Survey		GFLEC Survey	
	Non-Users (18–34)	MP Users (18–34)	Non-Users (18–34)	MP Users (18–34)
<b>Checking Account Management (in the Past Year)</b>				
Occasionally overdraws their account*	19%	33%	18%	21%
<b>Credit Card Management (in the Past Year)</b>				
Has made only the minimum payment*	40%	45%	49%	50%
Charged a fee for a late payment*	16%	26%	21%	25%
Charged an over-the-limit fee*	6%	21%	8%	17%
Charged a fee for a cash advance*	7%	25%	9%	19%
<i>Demonstrated at least one expensive behavior*</i>	45%	58%	52%	61%
<b>Retirement Account Management (in the Past Year)</b>				
Took a loan from their account*	7%	31%	N/A	N/A
Made a hardship withdrawal from their account*	4%	29%	N/A	N/A
<i>Made some form of withdrawal*</i>	9%	37%	N/A	N/A
<b>Use of Alternative Financial Services (in the Past Five Years)</b>				
Took out an auto title loan	7%	28%	5%	16%
Took out a payday loan	8%	31%	9%	22%
Used a pawn shop	18%	38%	17%	27%
Used a rent-to-own store	7%	28%	5%	19%
<i>Used at least one of these four forms</i>	27%	50%	23%	40%
<b>N</b>	4,823	3,071	1,011	995

Note: \*Indicates statistics are conditional on having the related asset or liabilities.

Credit cards are another potential source of fee payment. As noted above, in both surveys mobile payment users more often own at least one credit card, yet the data show that they are much more likely to rack up fees from these cards. Respondents in both surveys were asked whether in the past 12 months they had paid the minimum payment only, were charged a fee for a late payment, were charged a fee for exceeding their credit limit, or used their credit card for a cash advance, all actions that can yield high fees and even lead to financial distress. Among credit card owners, those who utilize mobile payments are much more likely to report each of these behaviors than those who do not use mobile payments. Moreover, the percentage of users who pay these fees is quite high. For example, 25% of users reported being charged fees for making cash advances from their credit card, compared to only 7% of non-users. Twenty-one percent were charged an over-the-limit fee, compared to 6% of non-users. Twenty-six percent were charged a fee for a late payment, compared to 16% of non-users. Overall, 58% of users were charged one or more of these fees compared to 45% of non-users, a 13-percentage point difference. The findings are similar in the GFLEC survey. Considering that credit cards are the most prevalent source of funding for mobile payments—with over three quarters of users in the GFLEC survey reporting that their mobile payments are funded through their credit card—these statistics are troubling.

We find other similar statistics when looking at the management of retirement accounts. Among those who have such accounts, mobile payment users are 28 percentage points more likely to withdraw money from such accounts than non-users. Specifically, 37% of millennial mobile payment users reported having made some form of withdrawal from their retirement account within the past year, compared to only 9% of non-users.<sup>9</sup> This is concerning because these young people are raiding their

<sup>9</sup> Information on withdrawals from retirement accounts was not collected in the GFLEC survey.

retirement accounts early in the life cycle, paying steep penalties and potentially jeopardizing their long-term financial security.

The use of so-called alternative financial services (AFS) such as auto title loans, payday loans, pawnshops and rent-to-own stores is also of concern. As we documented in a previous paper, AFS have become common in the US, especially among millennials (Lusardi and de Bassa Scheresberg 2013). AFS are very expensive forms of short-term borrowing that can charge annual percentage rates (APRs) in the order of 400% or higher. In this study, we confirm that usage is widespread among millennials, but we also find that mobile payment users are much more likely to use AFS than those who do not use mobile payments. In the NFCS survey, 50% of mobile payment users reported having used at least one form of AFS in the five years prior to the survey, compared to 27% of non-users. The difference remains large when we focus on the GFLEC survey (40% and 23%, respectively).

These findings further confirm that many mobile payment users routinely resort to very expensive short-term borrowing behaviors. Moreover, while these findings cannot establish a causal link between use of mobile payments and financial management practices, they do portray a complex and worrying picture of the financial savvy of millennials, a topic to be investigated in greater detail in future research.

### 4.3 Multivariate Analysis

To look deeper into the link between financial outcomes and mobile payment use, we conducted a set of multivariate OLS regressions focusing on three key financial capability indicators:

- Spending vs. saving;
- Checking account management;
- Use of alternative financial services.

The indicator for spending versus saving was based on the question “*In a typical month, do you spend on average more than, about equal to, or less than your income?*” Responses were coded as 1 if respondents answered “more than” income, and zero otherwise. The second indicator was based on the question “*Do you occasionally overdraw your checking account?*” The indicator was equal to 1 if the respondent answered “yes,” and zero if they answered “no.” The third indicator reported whether the respondent used AFS (auto title loans, payday loans, pawnshops, or rent-to-own stores) in the five years prior to the survey. The indicator was equal to 1 if they had, and zero otherwise.

These three indicators were chosen because the questions from which they were constructed were asked of all or nearly all respondents, with the exception of the indicator for checking account management, which was available only to respondents with a checking account. However, over 90% of users and non-users in both the NFCS and the GFLEC surveys have a checking account. Therefore, the findings from these three indicators can be generalized to the whole sample.

Tables 6, 7, and 8 report the regression estimates for the three sets of regressions. The results show that mobile payment usage is positively associated with each of the three behavioral indicator variables. Even after accounting for numerous socio-demographic characteristics, mobile payment usage continues to be positively associated with poor financial management practices. In particular, those who use mobile payments are nearly 16 percentage points more likely to overdraw their checking account and 23 percentage points more likely to turn to AFS.

**Table 6: Regressions: Factors Correlated with Spending More than Income**

	NFCS Survey (1)	NFCS Survey (2)	GFLEC Survey (1)	GFLEC Survey (2)
	Spends more than Income	Spends more than Income	Spends more than Income	Spends more than Income
Uses m-payments		0.0660*** (0.0106)		0.0314 (0.0200)
Age 25–29	0.0418*** (0.0136)	0.0453*** (0.0135)	–0.0371 (0.0283)	–0.0349 (0.0283)
Age 30–34	0.0410*** (0.0142)	0.0485*** (0.0142)	–0.0264 (0.0288)	–0.0219 (0.0289)
Female	0.0193* (0.0105)	0.0262** (0.0105)	0.0962*** (0.0204)	0.0967*** (0.0204)
Black non-Hispanic	0.0605*** (0.0168)	0.0473*** (0.0169)	0.0727** (0.0360)	0.0676* (0.0361)
Hispanic (any race)	0.0171 (0.0141)	0.00993 (0.0141)	0.0353 (0.0378)	0.0316 (0.0378)
Asian non-Hispanic	0.0150 (0.0198)	0.00453 (0.0198)	–0.0384 (0.0374)	–0.0421 (0.0375)
Single	–9.62e-05 (0.0120)	0.00143 (0.0119)	0.0130 (0.0240)	0.0137 (0.0240)
Separated	0.0683 (0.0721)	0.0613 (0.0719)	0.141 (0.121)	0.140 (0.121)
Divorced	0.161*** (0.0389)	0.156*** (0.0388)	–0.0782 (0.0659)	–0.0798 (0.0659)
\$25,000–35,000	0.00830 (0.0171)	0.00252 (0.0171)	–0.00294 (0.0294)	–0.00762 (0.0295)
\$35,000–50,000	–0.0319* (0.0165)	–0.0353** (0.0164)	–0.0990*** (0.0292)	–0.103*** (0.0293)
\$50,000–75,000	–0.0513*** (0.0160)	–0.0616*** (0.0160)	–0.0419 (0.0309)	–0.0481 (0.0312)
\$75,000–100,000	–0.0981*** (0.0196)	–0.111*** (0.0196)	–0.123*** (0.0413)	–0.132*** (0.0417)
High school diploma	0.0333 (0.0411)	0.0347 (0.0410)	0.149 (0.147)	0.151 (0.147)
Some college, no degree	0.0556 (0.0407)	0.0593 (0.0406)	0.207 (0.145)	0.208 (0.145)
Associate's degree	0.0106 (0.0426)	0.0122 (0.0425)	0.197 (0.147)	0.196 (0.147)
Bachelor's degree	0.0309 (0.0412)	0.0339 (0.0410)	0.193 (0.145)	0.194 (0.145)
Postgraduate degree	0.0330 (0.0431)	0.0330 (0.0429)	0.241 (0.148)	0.242 (0.148)
Constant	0.174*** (0.0423)	0.148*** (0.0425)	0.0623 (0.147)	0.0472 (0.148)
Observations	6,785	6,785	1,965	1,965
R-squared	0.016	0.022	0.038	0.039

Note: OLS regressions were used. The dependent variable is an indicator for saving vs. spending behavior based on the question “In the past year, would you say your spending was less than, more than, or about equal to your income?” Responses were coded 1 if respondents answered “more than income” and 0 if they indicated that they spend “less than” or “about equal to” their income; respondents who indicated “don’t know” or “prefer not to say” were excluded. Baseline categories: age 18–24, male, white, married, income <\$25,000, less than a high school diploma. Controls for income \$100k–150k, income \$150k+, “other” ethnicity, and widow/widowed were included but not reported for brevity. Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 7: Regressions: Factors Correlated with Overdrawing Checking Account**

	NFCS Survey (1)	NFCS Survey (2)	GFLEC Survey (1)	GFLEC Survey (2)
	Overdraws Checking Account	Overdraws Checking Account	Overdraws Checking Account	Overdraws Checking Account
Uses m-payments		0.158*** (0.0108)		0.0509*** (0.0190)
Age 25–29	0.0243* (0.0138)	0.0322** (0.0136)	0.0339 (0.0272)	0.0377 (0.0272)
Age 30–34	–0.00242 (0.0145)	0.0150 (0.0143)	0.0230 (0.0276)	0.0300 (0.0276)
Female	0.00752 (0.0107)	0.0242** (0.0106)	0.0701*** (0.0195)	0.0701*** (0.0195)
Black non-Hispanic	0.100*** (0.0172)	0.0687*** (0.0171)	0.131*** (0.0356)	0.123*** (0.0357)
Hispanic (any race)	0.0186 (0.0144)	0.00212 (0.0142)	–0.0127 (0.0359)	–0.0200 (0.0360)
Asian non-Hispanic	0.0192 (0.0202)	–0.00628 (0.0200)	–0.0675* (0.0360)	–0.0727** (0.0360)
Single	–0.0783*** (0.0122)	–0.0746*** (0.0121)	–0.0602*** (0.0227)	–0.0594*** (0.0227)
Separated	–0.0217 (0.0731)	–0.0372 (0.0720)	–0.0779 (0.117)	–0.0784 (0.117)
Divorced	0.0512 (0.0393)	0.0398 (0.0387)	0.0752 (0.0635)	0.0714 (0.0634)
\$25,000–35,000	–0.00626 (0.0174)	–0.0202 (0.0172)	0.0245 (0.0283)	0.0173 (0.0284)
\$35,000–50,000	0.0113 (0.0168)	0.00352 (0.0166)	–0.0585** (0.0280)	–0.0647** (0.0280)
\$50,000–75,000	0.00349 (0.0163)	–0.0201 (0.0161)	–0.0302 (0.0294)	–0.0408 (0.0296)
\$75,000–100,000	–0.000366 (0.0200)	–0.0312 (0.0198)	–0.0851** (0.0396)	–0.0988** (0.0398)
High school diploma	–0.0420 (0.0413)	–0.0379 (0.0406)	–0.187 (0.131)	–0.187 (0.130)
Some college, no degree	–0.0574 (0.0408)	–0.0487 (0.0402)	–0.164 (0.129)	–0.164 (0.128)
Associate's degree	–0.0817* (0.0429)	–0.0777* (0.0422)	–0.189 (0.130)	–0.193 (0.130)
Bachelor's degree	–0.116*** (0.0413)	–0.108*** (0.0407)	–0.198 (0.128)	–0.199 (0.128)
Postgraduate degree	–0.0994** (0.0433)	–0.0987** (0.0427)	–0.238* (0.131)	–0.240* (0.131)
Constant	0.340*** (0.0425)	0.276*** (0.0421)	0.396*** (0.131)	0.375*** (0.131)
Observations	6,888	6,888	1,864	1,864
R-squared	0.018	0.048	0.042	0.045

Note: OLS regressions were used. The dependent variable is an indicator for checking account management based on the question “Do you [or your spouse] occasionally overdraw your checking account?” Responses were coded 1 if respondents answered “yes” and 0 if they indicated “no”; respondents who indicated “don’t know” or “prefer not to say”



were excluded. The sample is restricted to those who have a checking account. Baseline categories: age 18–24, male, white, married, income < \$25,000, less than a high school diploma. Controls for income \$100k–\$150k, income \$150k+, “other” ethnicity, and widow/widowed were included but not reported for brevity. Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 8: Regressions: Factors Correlated with Using Alternative Financial Services (AFS)**

	NFCS Survey (1)	NFCS Survey (2)	GFLEC Survey (1)	GFLEC Survey (2)
	Used at least One Form of AFS	Used at least One Form of AFS	Used at least One Form of AFS	Used at least One Form of AFS
Uses m-payments		0.233*** (0.0109)		0.173*** (0.0204)
Age 25–29	0.0326** (0.0140)	0.0437*** (0.0136)	0.0450 (0.0292)	0.0567** (0.0287)
Age 30–34	–0.00885 (0.0147)	0.0138 (0.0143)	0.0220 (0.0297)	0.0463 (0.0294)
Female	–0.0849*** (0.0109)	–0.0617*** (0.0107)	0.0154 (0.0211)	0.0168 (0.0207)
Black non-Hispanic	0.145*** (0.0172)	0.104*** (0.0168)	0.248*** (0.0374)	0.221*** (0.0369)
Hispanic (any race)	0.0783*** (0.0147)	0.0544*** (0.0143)	0.166*** (0.0388)	0.143*** (0.0382)
Asian non-Hispanic	0.0210 (0.0210)	–0.0147 (0.0205)	–0.0403 (0.0387)	–0.0603 (0.0381)
Single	–0.0890*** (0.0127)	–0.0820*** (0.0123)	–0.0504** (0.0248)	–0.0479** (0.0244)
Separated	0.180*** (0.0662)	0.166** (0.0644)	0.132 (0.127)	0.126 (0.124)
Divorced	0.170*** (0.0402)	0.162*** (0.0390)	0.116* (0.0690)	0.106 (0.0678)
\$25,000–35,000	0.0787*** (0.0175)	0.0583*** (0.0170)	0.0156 (0.0305)	–0.0108 (0.0302)
\$35,000–50,000	0.0309* (0.0170)	0.0179 (0.0165)	–0.0267 (0.0302)	–0.0500* (0.0298)
\$50,000–75,000	0.0383** (0.0166)	0.00396 (0.0162)	–0.00720 (0.0320)	–0.0434 (0.0317)
\$75,000–100,000	0.0506** (0.0207)	0.00623 (0.0202)	–0.0578 (0.0429)	–0.107** (0.0426)
High school diploma	–0.0642* (0.0347)	–0.0749** (0.0338)	–0.171 (0.140)	–0.161 (0.137)
Some college, no degree	–0.129*** (0.0345)	–0.135*** (0.0335)	–0.187 (0.138)	–0.180 (0.135)
Associate’s degree	–0.142*** (0.0372)	–0.156*** (0.0362)	–0.183 (0.140)	–0.189 (0.137)
Bachelor’s degree	–0.264*** (0.0353)	–0.273*** (0.0343)	–0.289** (0.138)	–0.283** (0.135)
Postgraduate degree	–0.256*** (0.0379)	–0.277*** (0.0369)	–0.436*** (0.141)	–0.430*** (0.138)
Constant	0.546*** (0.0366)	0.470*** (0.0358)	0.542*** (0.141)	0.461*** (0.139)
Observations	7,826	7,826	2,002	2,002
R-squared	0.058	0.110	0.075	0.107

Note: OLS regressions were used. The dependent variable is an indicator for using alternative financial services. Responses were coded as 1 if respondents had taken out an auto title loan, taken out a payday loan, used a pawnshop,

or used a rent-to-own store at least once within the past five years based on the question and if they had not used any of these products. Those who indicated “don’t know” or “prefer not to say” for all forms of AFS were excluded. The sample is restricted to those who have a checking account. Baseline categories: age 18–24, male, white, married, income <\$25,000, less than a high school diploma. Controls for income \$100k–150k, income \$150k+, “other” ethnicity, and widow/widowed are included but not reported for brevity. Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## 4.4 The Role of Financial Literacy

Overall, financial literacy is significantly lower among mobile payment users compared to non-users in both samples (Table 9). In order to gain more insights into the factors that might explain such differences in financial management, we re-ran these regressions including a financial literacy dummy variable and an interaction term between mobile payment use and financial literacy. The results of these additional regressions can be found in Table 10, where we report only the coefficients of interest. The results presented in this table show that financial literacy is negatively associated with each of the three financial behaviors, suggesting that financially literate respondents are less likely to engage in these behaviors, which is consistent with research that indicates that financial literacy is correlated with better management practices. Moreover, the interaction term is negative for all regressions and statistically significant in both surveys.<sup>10</sup> In other words, respondents who use mobile payments and who are financially literate are much less likely to engage in each of these behaviors. The magnitude is also large, as “financially literate users” are over 16 percentage points less likely to use AFS and 13 percentage points less likely to overdraw their checking account.

**Table 9: Financial Literacy Levels**

	NFCS Survey		GFLEC Survey	
	Non-Users (18–34)	MP Users (18–34)	Non-Users (18–34)	MP Users (18–34)
<b>Big three</b> financial literacy questions correct	21%	14%	53%	40%
<b>Five out of six</b> financial literacy questions correct	6%	5%	19%	16%
<b>N</b>	4,823	3,071	1,011	995

**Table 10: Regressions with Financial Literacy Interactions**

	NFCS Survey			GFLEC Survey		
	Spends More than They Save	Occasionally Overdraws Checking Account	Used at Least One Form of AFS	Spends More than They Save	Occasionally Overdraws Checking Account	Used at Least One Form of AFS
Uses m-payments	0.0747*** (0.0119)	0.173*** (0.0120)	0.251*** (0.0119)	0.0545** (0.0272)	0.0638** (0.0262)	0.220*** (0.0274)
Basic financial literacy	–0.0260* (0.0155)	–0.0658*** (0.0156)	–0.0751*** (0.0160)	–0.0672** (0.0283)	–0.0600** (0.0269)	–0.0800*** (0.0286)
Mobile payment*Basic financial literacy (Interaction)	–0.0685*** (0.0259)	–0.130*** (0.0261)	–0.166*** (0.0272)	–0.0786** (0.0393)	–0.0475 (0.0376)	–0.143*** (0.0398)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.148*** (0.0425)	0.279*** (0.0419)	0.476*** (0.0356)	0.0709 (0.147)	0.390*** (0.131)	0.475*** (0.137)
Observations	6,785	6,888	7,826	1,965	1,864	2,002
R-squared	0.025	0.061	0.125	0.053	0.055	0.134

<sup>10</sup> An exception is the checking account management regression for the GFLEC survey sample, where the interaction term is not significant.

Note: OLS regressions were used. See Notes for Tables 6–9 for descriptions of dependent variables. Controls used were the demographic characteristics used in the regressions from Tables 6–9. Basic financial literacy is a dummy variable equal to 1 if respondents answered three questions correctly regarding interest, inflation, and risk diversification, and zero otherwise. Standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

These findings and those from the univariate analysis signal a stark contrast in behavior between users and non-users. Despite having higher incomes and better education, the data show that mobile payment users are at much greater risk of financial distress and financial mismanagement than are non-users. This is particularly true for financially illiterate users. However, given that in this study we cannot say whether mobile payment use causes specific financial behavior, further research is needed to understand why millennial mobile payment users exhibit less savvy financial behavior than non-users.

## 5. CONCLUSION

The fintech industry is revolutionizing our concept of financial transactions. Today, we can access a variety of financial products and make payments with the click of a button. Rapid innovation is also spreading from payments to other areas of consumer finance. However, despite the rapid growth of the industry and the impact that these technologies are having on the way we spend and make financial decisions, little research exists on these new technologies. Our unique insights serve as an in-depth analysis of the financial behaviors of mobile payment users. Combining data from the 2015 NFCS and our own independent survey (GFLEC Mobile Payment Survey), we have found that millennial mobile payment users are more diverse, more educated, and have higher incomes than their non-user counterparts. They are also more likely to own a bank account (i.e., savings and/or checking account) and use financial products (i.e., credit cards, retirement accounts, student loans, auto loans, and home mortgages). However, millennial mobile payment users demonstrate several risk factors connected with their financial management. For example, they are much more likely than non-users to overdraw their checking accounts, use credit cards expensively, use high-cost borrowing methods, and withdraw from their retirement accounts. Many of these users also display very low levels of financial literacy.

These findings suggest that mobile payment services are attracting segments of customers who have a much broader range of needs than simple monetary transactions. These needs—for example, help in dealing with short-term debt or minimizing fees—are clear opportunities for innovation that can be targeted by fintech developers. However, this study also raises an important question: Does mobile financial technology increase the risk of financial mismanagement? Our data indicate that mobile payment users are at a much higher risk of financial mismanagement compared to non-users, even after we control for a broad range of users' socio-demographic factors. However, our data cannot be used to establish any causal link between use of mobile payments and financial outcomes, and they only cover one sector of the fintech industry. More research is required to understand how fintech is changing our financial behaviors.

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