



Use of Financial Services by the Unbanked and Underbanked and the Potential for Mobile Financial Services Adoption

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Mobile phone use has become a standard aspect of daily life for many Americans in the last decade. The increased use of these devices coupled with the evolution of technologies that enable consumers to conduct financial transactions using their mobile phones has the potential to change how consumers manage their finances as new services and tools emerge. In addition, innovative financial service technologies may help foster financial access and inclusion in the mainstream financial system for underserved consumers—those who are unbanked or underbanked. For these reasons, the Federal Reserve Board has been monitoring trends and developments in mobile financial services such as mobile banking and payments. In late December 2011 and early January 2012, the Board's Division of Consumer and Community Affairs (DCCA) conducted a survey in order to better understand consumers' use of and opinions about mobile financial services.¹

Key Findings

Using data from the Board's Survey of Consumers and Mobile Financial Services (SCMFS), this article provides a description of unbanked and underbanked consumers, and examines their use of financial products and services (see [Appendix A: Survey Data Collection](#)). The article further explores how unbanked and underbanked consumers are making use of emerging mobile financial services technologies. The potential for mobile banking and mobile payments to expand access and inclusion to the mainstream financial system is also examined. Several key findings from the survey stand out:

- Approximately 11 percent of U.S. consumers are unbanked, and another 11 percent are underbanked.

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¹ See Matthew B. Gross, Jeanne M. Hogarth, and Maximilian D. Schmeiser (2012), "Consumers and Mobile Financial Services," report (Washington: Board of Governors of the Federal Reserve System, March), www.federalreserve.gov/econresdata/mobile-devices/files/mobile-device-report-201203.pdf.

- Unbanked and underbanked consumers are more likely than fully banked consumers to have lower incomes and be younger, minority, female, unmarried, unemployed, and unwilling to take financial risks.
- Unbanked and underbanked consumers are also more likely to use alternative financial service providers, such as check cashers; payday, title, and pawn lenders; or rent-to-own services.
- Sixty-three percent of unbanked consumers have a mobile phone, and 91 percent of underbanked consumers have a mobile phone.
- The most frequent mobile banking activity reported by respondents overall was checking account balances or recent transactions (90 percent), while the most frequent type of mobile payment activity was paying a bill online (47 percent).
- Underbanked consumers make comparatively heavy use of both mobile banking and mobile payments—28 percent have used mobile banking and 17 percent have used mobile payments in the past 12 months, compared with 21 and 12 percent, respectively, of fully banked consumers.

Why the Focus on Financially Underserved Groups?

Consumers' access to financial accounts and inclusion in the mainstream financial marketplace have long been on the minds of policymakers, who have explored ways to reduce barriers and increase access to mainstream financial services in order to encourage cost savings, public safety, disaster preparedness, and asset building for underserved groups.² For example, the EFT '99 initiative (developed to implement the Debt Collection Improvement Act of 1996) included a provision requiring selected federal payments to be made by direct deposit, spurring an interest in bringing unbanked households into the financial mainstream.³ And in December 2010, the Treasury Department's Financial Management Service published rules requiring recipients of federal nontax payments, including many unbanked benefit recipients, to receive payment by electronic funds transfer. Those without a bank account for direct deposit will be issued a prepaid debit card as part of the Go Direct program.⁴

Data from the Federal Reserve Board's 2010 Survey of Consumer Finances (SCF) show that 7.5 percent of households (about 8.8 million households) have no transaction accounts (that is, no checking, savings, money market deposit accounts, money market mutual funds,

² Signe-Mary McKernan and Michael Sherraden (2008), *Asset Building and Low-Income Families* (Washington: Urban Institute Press); and Michael Barr (2012), *No Slack: The Financial Lives of Low-Income Americans* (Washington: Brookings Institution). For example, the Department of the Treasury has an Office of Financial Education and Financial Access and the Federal Deposit Insurance Corporation has an Advisory Committee on Economic Inclusion.

³ For a description of the EFT '99 initiative, see Jeanne M. Hogarth and Kevin H. O'Donnell (1999), "Banking Relationships of Lower-Income Families and the Governmental Trend toward Electronic Payment," *Federal Reserve Bulletin*, vol. 87, pp. 459–73, www.federalreserve.gov/pubs/bulletin/1999/0799lead.pdf.

⁴ 31 CFR 208; see 73 *Fed. Reg.* 80315 (December 22, 2010), www.gpo.gov/fdsys/pkg/FR-2010-12-22/pdf/2010-32117.pdf. For information on Go Direct, see www.godirect.gov/gpw/index.gd. The rule requires anyone applying for benefits on or after May 2011 to receive all payments electronically via direct deposit to a deposit account at a depository institution or via a prepaid card. Treasury has contracted with a commercial bank to make Direct Express® Debit MasterCard® prepaid card accounts available to recipients who will not be receiving benefits via direct deposit; these cards can be used like other debit cards, and funds that recipients receive through the card are FDIC insured. There is no cost to sign up for the card and no monthly fee, although there are fees for some optional transactions (such as making more than one ATM withdrawal in a single month, receiving a paper statement and getting a replacement card). Recipients currently receiving benefits via checks will be required to switch to an electronic payment method by March 2013.

or call or cash accounts at brokerages).⁵ In comparison, the 2011 Federal Deposit Insurance Corporation (FDIC) National Survey of Unbanked and Underbanked Households found that 8.2 percent of U.S. households (approximately 10 million households) were unbanked.⁶ Thus, while the proportion of unbanked households may seem small, the absolute number of these households is quite large.

Being unbanked in today's financial marketplace can be problematic for consumers. Consumers who operate on a cash-only basis may face fees for cashing checks and for money orders needed to pay some bills. For example, the cost of using a check-cashing service can range from about 2 percent of the face value of the check when regulated by states to 4 or 5 percent when not.⁷ In addition, conducting transactions only in cash presents financial and personal risks, since there is no recourse when cash is lost or stolen. Further, consumers who prefer cash may not be building a financial identity through consumer and credit reporting agencies. Finally, many of the consumer protections available to fully banked consumers, such as FDIC insurance and protections provided to credit and debit card users under the Truth in Lending Act and the Electronic Fund Transfer Act, are not available to consumers who use alternative financial services. For these reasons, there may be some benefits for consumers to connect with mainstream banking and financial services.

In addition to unbanked consumers, there is a segment of consumers with bank accounts who also use alternative financial service providers, such as check cashers, money order providers, payday lenders, pawn shops, auto title lenders, or rent-to-own merchants. The FDIC survey report estimates that 20.1 percent of households are underbanked; that is, they use one or more of these alternative financial services. These service providers often charge higher implicit interest rates or fees than banks might charge and may lack some consumer protections. Again, there may be some benefit for consumers to conduct more transactions with mainstream financial services.⁸

Who Are the Unbanked and Underbanked?

In this article, we define an unbanked consumer as someone who does not have a checking, savings, or money market account; also, the consumer's spouse or partner does not have such an account. An underbanked consumer is someone who has a checking, savings, or money market account but who also has used at least one alternative financial service in the past 12 months, such as an auto title loan, payday loan, check-cashing service, or payroll card. By contrast, we refer to a consumer who has a bank account and does not use alternative financial services as "fully banked."

The proportions of respondents who report being unbanked or underbanked in this survey are similar to those found in previous national studies, and differences can be explained in part by variation in the definitions. As estimated from the data collected in this study, the

⁵ Jesse Bricker, Arthur B. Kennickell, Kevin B. Moore, and John Sablehaus (2012), "Changes in U.S. Family Finances from 2007 to 2010: Evidence from the Survey of Consumer Finances," *Federal Reserve Bulletin*, vol. 98 (2), pp. 1–80, www.federalreserve.gov/pubs/bulletin/2012/PDF/scf12.pdf.

⁶ Federal Deposit Insurance Corporation (2012), 2011 National Survey of Unbanked and Underbanked Households (Washington: FDIC, September), www.fdic.gov/householdsurvey.

⁷ Martha Perine Beard (2010), "Reaching the Unbanked and Underbanked," Federal Reserve Bank of St. Louis, *Central Banker*, vol. 20 (Winter), www.stlouisfed.org/publications/pub_assets/pdf/cb/2010/CB_winter_10.pdf.

⁸ Consumers may choose to use alternative financial services for a number of reasons (convenience, comfort, etc.); however, they pay a higher cost for these benefits. See William H. Greene, Sherrie L.W. Rhine, and Maude Toussaint-Comeau (2003), "The Importance of Check-Cashing Business to the Unbanked: Racial/Ethnic Differences," working paper (Chicago: Federal Reserve Bank of Chicago, August), www.chicagofed.org/digital_assets/publications/working_papers/2003/wp2003-10.pdf.

national proportion of unbanked consumers is about 11 percent of the U.S. adult population. This number compares with approximately 8 percent of households based on the 2011 FDIC National Survey of Unbanked and Underbanked Households and 7.5 percent of households based on the Federal Reserve Board's 2010 SCF. Moreover, the data for this study indicate that an additional 11 percent of the U.S. population is underbanked. This rate is well below the 20 percent underbanked rate found in the FDIC study; however, the definition of underbanked here is narrower than the FDIC's definition, as the latter includes consumers' use of services such as money orders when classifying an individual as underbanked.⁹

Respondents to the SCMFS report a variety of reasons for not having a bank account. Of the unbanked participants in the study, 24 percent say they do not like dealing with banks, and 24 percent indicate they do not write enough checks to make a bank account worthwhile. Another 13 percent say that the fees and service charges are too high, and 10 percent say that no bank will give them an account (see [box 1](#), "Why Are the Unbanked Unbanked?").

Household Characteristics of the Unbanked and Underbanked

In general, unbanked and underbanked households tend to have low-to-moderate incomes ([table 1](#)). Unbanked households are most likely to be low income: 61 percent report incomes of less than \$25,000. Underbanked households are more likely to have moderate incomes in the \$25,000 to \$39,999 range.¹⁰

Unbanked households are younger than others, with a median age of 39. More than one out of three (36 percent) are ages 18 to 29 while only 8 percent are over age 60. Nearly three-fourths of unbanked households (74 percent) report having a high school education or less, consistent with the lower income profile for this group. The unbanked are less likely to be homeowners, with only 42 percent owning their home, compared to 60 percent of the underbanked and 76 percent of the fully banked.

The survey question regarding banking status was worded as "Do you or does your spouse/partner currently have a checking, savings, or money market account?" Unbanked respondents are more likely to be unmarried, and in particular, they are more likely to have never married (consistent with being younger). Households with more people may mean there is greater opportunity for at least one person in the household to have an account.

Black respondents are more likely to report that their households are unbanked or underbanked, consistent with findings from other studies.¹¹ Respondents in the "other" race category and those reporting two or more races (but who are non-Hispanic), are more likely to be in unbanked households than non-Hispanic white respondents.

Individuals who are experiencing unemployment, but who are still in the labor force, are more likely to be unbanked. Nearly one out of three respondents who live in an unbanked household (32.5 percent) report that they are temporarily laid off or looking for work.

⁹ The FDIC defines the underbanked as those who have used nonbank money orders, nonbank check-cashing services, payday loans, rent-to-own agreements, pawn shops, refund-anticipation loans, or nonbank remittances within the last year. In defining unbanked, the FDIC and SCF surveys ask if anyone in the respondent's household has a bank account, whereas we only ask about the spouse/partner. Some of these differences may be due to the margins of error in the various surveys.

¹⁰ All the differences in characteristics by banking status discussed in this section are statistically significant at the 5 percent level when controlling for other characteristics in a regression analysis. These results are available from the authors upon request.

¹¹ Hogarth and O'Donnell, "Banking Relationships"; and FDIC, 2011 National Survey.

Box 1. Why Are the Unbanked Unbanked?

According to several studies, the most frequently reported reason for a family not having an account with a deposit-taking institution is that they have little to no month-to-month financial savings to deposit in an account.¹ Other studies cite negative past experiences, mistrust of banks, and the greater convenience found in alternative financial services as reasons why consumers choose to be unbanked.² Finally, some consumers may choose to abstain from traditional bank services for cultural or other reasons. For example, a qualitative study of the unbanked and underbanked populations in the 10th Federal Reserve District (Kansas City) found differences between Hispanic and non-Hispanic consumers in their view of how they managed financial resources and how that affected their desire to have a checking account.

In both the survey discussed here and the Board's 2010 Survey of Consumer Finances (SCF), the top three reasons consumers gave for not having a bank account or a checking account were consistent: consumers reported that they did not like dealing with banks, they didn't think they wrote enough checks to make it worthwhile, and they thought the fees and service charges were too high (see table A). Respondents in this survey also reported that they did not think any bank would give them an account, while respondents in the SCF reported that they thought they did not have enough money or that they did not need or want an account. Minimum balance requirements were cited by 7 percent of the SCF respondents, but by an insignificant number of this survey's respondents, as a reason for not having an account.

Table A. Most important reason for not having a bank account

Percent	Mobile Financial Services Survey ¹	2010 Survey of Consumer Finances ²
I don't like dealing with banks	24.2	27.8
I don't write enough checks to make it worthwhile	23.5	20.3
The fees and service charges are too high	13.3	10.6
No bank will give me an account	10.2	...
The minimum balance is too high	*	7.4
No bank has convenient hours or location	*	...
Do not have enough money	...	10.3
Do not need/want an account	...	7.3
Cannot manage or balance a checking account	...	4.7
Credit problems	...	4.2
Other	17.8	7.4

¹ See www.federalreserve.gov/econresdata/mobile-device-report-201203.pdf.

² See www.federalreserve.gov/pubs/bulletin/2012/PDF/scf12.pdf.

... Not applicable (response was not provided in the survey instrument).

* Ten or fewer observations.

¹ John Caskey (2005), "Reaching Out to the Unbanked," in M.W. Sherraden, ed., *Inclusion in the American Dream: Assets, Poverty, and Public Policy* (New York: Oxford University Press); Jeanne M. Hogarth, Christoslav E. Anguelov, and Jinkook Lee (2004), "Why Don't Households Have a Checking Account?" *Journal of Consumer Affairs*, vol. 38 (1), pp. 1–34; and Jeanne M. Hogarth, Christoslav E. Anguelov, and Jinkook Lee (2004), "Why Households Don't Have Checking Accounts," *Economic Development Quarterly*, vol. 17 (1), pp. 75–94.

² Federal Reserve Bank of Kansas City (2010), "Unbanked and Underbanked Consumers in the 10th Federal Reserve District," report (Kansas City, MO: Federal Reserve Bank of Kansas City, May), www.kansascityfed.org/publicat/research/community/Unbanked.Report.pdf.

Use of Alternative Financial Services

Previous studies have shown that the underbanked and unbanked are more likely to use alternative financial service providers, such as check cashers; payday, title, and pawn lenders; or rent-to-own services, even though alternative financial service providers are often in

Table 1. Sample characteristics

Percent, except where noted

	Full sample	Fully banked	Underbanked	Unbanked
Observations	100	78	11	11
Income				
Less than \$25,000	21.5	15.6	24.4	60.8
\$25,000–\$39,999	17.3	16.6	25.3	13.6
\$40,000–\$74,999	26.2	28.6	22.2	13.4
\$75,000–\$99,999	12.9	14.2	12.2	4.8
\$100,000 or more	22.0	24.9	15.8	7.4
Age				
Average age (in years)	46.6	47.9	44.8	39.2
Median age (in years)	47.0	48.0	43.0	39.0
Age categories				
18–29	21.4	19.8	19.0	36.0
30–44	26.0	24.6	33.1	27.3
45–60	27.6	27.2	28.2	29.1
Over 60	25.1	28.4	19.7	7.6
Education				
Less than high school	12.7	9.4	11.8	35.7
High school or GED	30.4	28.5	34.4	39.0
Some college	28.8	29.9	31.3	18.5
Bachelor's degree or higher	28.2	32.2	22.6	6.8
Gender				
Female	51.6	50.8	60.6	48.4
Male	48.4	49.2	39.4	51.6
Marital Status				
Married	52.8	57.2	48.4	25.7
Widowed	4.2	4.3	*	5.2
Divorced	10.5	9.6	16.4	10.4
Separated	1.7	1.1	*	5.2
Never married	21.0	18.1	19.4	42.8
Living with partner	9.9	9.6	11.1	10.8
Race/ethnicity				
White, non-Hispanic	67.9	74.0	57.0	37.2
Black, non-Hispanic	11.6	7.8	20.7	29.0
Other, non-Hispanic	5.6	5.4	5.0	8.6
Hispanic	13.7	11.9	16.1	22.9
2 or more races, non-Hispanic	1.2	1.0	*	*
Employment status				
Working as a paid employee	48.7	50.2	54.7	31.8
Self-employed	6.9	6.9	8.4	4.9
On temporary layoff from a job	1.2	0.9	0.7	4.2
Looking for work	8.5	5.9	6.0	28.3
Retired	17.3	20.3	10.3	*
Disabled	8.0	6.1	12.4	17.7
Other	9.3	9.7	7.4	9.3
Region				
Northeast	18.4	19.6	14.9	14.3
Midwest	21.7	21.6	25.1	19.9
South	36.6	35.1	42.9	40.6
West	23.2	23.8	17.1	25.2
Own home	70.2	75.8	60.0	41.5
House size				
Mean number of persons	2.8	2.7	3.0	3.0
Median number of persons	2	2	2	3
Proportion of households with child under 18	35.8	33.9	42.9	43.1

* Ten or fewer observations.

Table 2. Experience with alternative financial services				
Percent				
	Full sample	Fully banked	Underbanked	Unbanked
Credit				
Use payday loan ever	11.2	6.0	42.6	15.5
Used payday loan in last 12 months	29.9	*	64.2	16.3
Use auto title loan	3.6	*	29.5	*
Use layaway	3.8	*	28.8	5.4
Payments				
Use check casher	4.1	*	26.8	10.1
Prepaid cards				
Gift card	48.0	51.5	48.8	22.0
General-purpose card	14.5	13.2	17.9	20.6
Payroll card	1.7	*	8.4	6.6
Government card	4.8	3.2	6.0	14.8
None	45.4	45.0	40.2	54.6
Reloaded prepaid card in last 12 months	59.7	33.3	53.7	65.1
Most recent reload				
Past 7 days	21.2	24.2	*	*
Past 30 days	41.1	35.4	53.3	44.6
Past 90 days	20.0	18.3	28.8	*
Past 12 months	17.1	21.1	*	*
More than 12 months ago	*	*	*	*
* Ten or fewer observations.				

the same neighborhoods as financial institutions.¹² Responses to the SCMFS are consistent with these other studies. Two-fifths of underbanked households had used a payday loan; of these, two-thirds had used one within the past 12 months (table 2). In comparison, only about one out of six unbanked households had ever used a payday loan; this dropped to one in about twenty among fully banked households. Vehicle title loans and layaway were used less frequently; about three out of ten underbanked households report using these services.

The underbanked are also more likely than others to report using check cashers; about one out of four underbanked respondents report using this type of service. While it might seem surprising that the unbanked do not make more use of check cashers, there is some evidence that these households avoid check-cashing fees by cashing checks at grocery stores and some large retailers when making purchases.¹³

The use of prepaid cards has grown rapidly over the past several years.¹⁴ General-purpose reloadable prepaid cards usually carry one of the major payment-card network logos and can act as a substitute for a transaction account in that funds from wages, tax refunds, government benefits, and other sources can be loaded onto the cards, which then can be used for payments online or in stores. One out of seven respondents report using a general-purpose reloadable card, while substantially fewer report using an employer's payroll card or

¹² FDIC, 2011 National Survey; Timothy Bates and Constance R. Dunham (2003), "Introduction to Focus Issue: Use of Financial Services by Low-Income Households," *Economic Development Quarterly*, vol. 17 (2), pp. 3–7; and Matt Fellowes and Mia Mabanta (2008), "Banking on Wealth: America's New Retail Banking Infrastructure and Its Wealth-Building Potential," research brief (Washington: Brookings Institution, January), www.brookings.edu/~media/research/files/reports/2008/1/banking%20fellowes/01_banking_fellowes.pdf.

¹³ Michael S. Barr, Jane K. Dokko, and Benjamin J. Keys (2009), "And Banking for All?" Finance and Economics Discussion Series Working Paper No. 2009-34 (Washington: Board of Governors of the Federal Reserve System, August).

¹⁴ Javelin Strategy and Research (2012), "Prepaid Cards and Products in 2012: Enabling Financial Access for Underbanked and Gen Y Consumers," report (Pleasanton, CA: Javelin Strategy and Research).

Table 3. Financial capability measures				
Percent responding correctly				
	Full sample	Fully banked	Underbanked	Unbanked
Financial literacy questions¹				
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?	70.4	74.8	65.5	44.7
Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return?	55.8	60.9	46.4	29.9
If an investor who only owns two stocks right now decides to instead spread their money among many different assets (i.e., more stocks, add bonds, add real estate), their risk of losing money on their entire portfolio will:	52.4	55.9	46.6	34.2
If you were to invest \$1,000 in a stock mutual fund for a year, it would be possible to have less than \$1,000 when you withdraw your money.	76.0	80.8	67.7	50.5
Suppose you owe \$1,000 on a loan and the interest rate you are charged is 10% per year compounded annually. If you didn't make any payments on this loan, at this interest rate, how many years would it take for the amount you owe to double?	34.2	37.7	28.7	14.1
Financial risk questions²				
Are you willing to take:				
Substantial risk for substantial gain	3.4	3.4	*	*
Above-average risk for above-average gain	15.0	16.3	14.8	6.3
Average risk for average gain	37.9	42.4	30.9	13.4
No risk	43.6	37.9	51.1	76.4
¹ The exact wording of the financial literacy questions and their possible responses is provided in appendix B. Correct answers are bolded.				
² For financial risk questions, percent of affirmative responses.				
* Ten or fewer observations.				

some type of government benefits card. Underbanked and unbanked respondents are more likely to report using these reloadable cards than fully banked respondents.

Among those who used reloadable cards, half the underbanked and two-thirds of the unbanked report reloading funds onto their cards. The highest proportion report doing this within the past 30 days, consistent with government benefits payments and some employer pay cycles.

Measures of Financial Capability

The survey also tested the financial knowledge of respondents with a commonly used set of questions pertaining to interest rates, inflation, return on assets, portfolio diversity, mutual funds, and repayment methods (table 3; see appendix B for full text of financial literacy questions).¹⁵ Unbanked households were less likely to give correct answers than underbanked or fully banked households.

Fewer than half of the unbanked respondents correctly answered a question about inflation, compared with two-thirds of the underbanked respondents and three-fourths of the fully banked respondents. About three out of ten unbanked households correctly answered

¹⁵ Annamaria Lusardi and Peter Tufano (2009), "Debt Literacy, Financial Experiences, and Overindebtedness," NBER Working Paper No. 14808 (Cambridge, MA: National Bureau of Economic Research, March); and Annamaria Lusardi, Olivia S. Mitchell, and Vilsa Curto (2010), "Financial Literacy among the Young," *Journal of Consumer Affairs*, vol. 44 (2), pp. 358–80.

a question about relative rates of return on savings accounts, government bonds, and stocks, compared with about half of the underbanked and three-fifths of the fully banked. Finally, about half of the unbanked households correctly answered a question about the risks associated with investing in stock mutual funds (that is, one could lose some of the principle). In comparison, two-thirds of the underbanked households and four-fifths of the fully banked households correctly answered this question.

Unbanked respondents were the most risk-averse among the three groups; three-fourths of them were unwilling to take any financial risk, compared with half of the underbanked respondents and just over one-third of the fully banked respondents. This risk aversion may be related to lack of experience with a range of financial products and services, and lack of experience may explain, in part, why the unbanked scored low relative to other respondents on the financial capability questions. The greater risk aversion among the unbanked may also reflect the fact that low-income individuals have little, if any, margin for error or loss in their finances.

Mobile Phone Ownership and Use

The survey examined respondents' ownership and use of mobile phones as well. Overall, 87 percent of respondents to the SCMFS said they had a mobile phone (table 4). The unbanked are less likely to have a mobile phone than their underbanked or fully banked counterparts. Among the unbanked, 63 percent have a mobile phone compared with 91 percent of the underbanked and 90 percent of the fully banked.

Among mobile phone owners, more than two-fifths have smartphones.¹⁶ Underbanked households are more likely than their unbanked and fully banked counterparts to have smartphones. Among underbanked households with mobile phones, 57 percent have smartphones compared with 26 percent of unbanked and 44 percent of fully banked households (see box 2, "Smartphone Adoption").

Potential for Mobile Financial Services to Reach Underserved Consumers

Although consumers in the United States have been slow to adopt mobile financial services, the experiences of some developing countries offer a glimpse of the potential benefits that using mobile phones to conduct transactions and access services can bring to underserved populations as well as to the financial system.¹⁷

Globally, Kenya is a leader in mobile payments implementation and adoption. Kenya has received substantial international attention for the extent to which the M-PESA service has promoted financial inclusion through mobile banking and payments. World Bank Findex Data reveals that 60 percent of Kenyan adults over the age of 15 use mobile payments to send money, and 66 percent use mobile payments to receive money. Among the 144 countries surveyed, the use of mobile financial services in Kenya was 20 percentage points higher than in any other country.¹⁸ A recent study of Kenya reveals that in 2011, nearly

¹⁶ This article uses *smartphone* to refer to mobile phones that can access the web, send e-mails, and interact with computers and *feature phone* to refer to more traditional mobile phones that lack such capabilities.

¹⁷ Catherine J. Bell, Jeanne M. Hogarth, and Eric Robbins (2009), "U.S. Households Access to and Use of Electronic Banking, 1989–2007," *Federal Reserve Bulletin*, vol. 97, pp. A99–A121, www.federalreserve.gov/pubs/bulletin/2009/pdf/OnlineBanking09.pdf.

¹⁸ Asli Demirguc-Kunt and Leora Klapper (2012), "Measuring Financial Inclusion: The Global Findex Database," World Bank Policy Research Working Paper 6025 (Washington: World Bank).

Table 4. Mobile phone ownership and mobile banking				
Percent				
	Full sample	Fully banked	Underbanked	Unbanked
Have mobile phone	87.1	89.7	91.4	63.4
Smartphone	43.9	43.9	56.9	26.3
Feature phone	55.9	55.9	43.1	73.3
Use mobile banking—all mobile phone users				
Now	20.9	20.8	28.4	9.7
In next 12 months	11.3	9.0	22.4	18.7
Ever	17.0	16.6	25.5	11.3
Use mobile banking—smartphone owners				
Now	42.0	42.7	44.3	*
In next 12 months	22.9	20.1	35.3	*
Ever	27.3	25.4	39.2	*
Use mobile banking—feature phone owners				
Now	4.3	3.9	*	*
In next 12 months	5.9	3.9	12.4	15.8
Ever	13.2	13.5	17.4	*
Used mobile banking for				
Check balance in account	90.1	90.6	88.6	91.3
Download bank app	48.1	49.8	43.1	*
Transfer money between accounts	41.7	38.9	54.9	*
Set up text message alert	33.4	35.7	30.0	*
Low-balance alert	66.4	65.3	71.5	*
Payment due alert	31.7	32.1	*	*
Savings reminder	*	*	*	*
Fraud alert	30.3	30.9	*	*
Action after receiving alert				
Transferred money into account	57.6	58.7	*	*
Deposited money into account	16.3	*	*	*
Reduced spending	41.2	45.4	*	*
Payment alerts improved paying on time				
Yes, by a lot	37.3	30.6	*	*
Yes, by a little	40.5	43.7	*	*
No	*	*	*	*
Satisfaction with mobile banking				
Very satisfied	63.7	62.7	60.8	97.4
Somewhat satisfied	33.0	33.5	37.8	*
Somewhat dissatisfied	*	*	*	*
Very dissatisfied	*	*	*	*

* Ten or fewer observations.

\$10 billion—about 30 percent of Kenya’s GDP—was transferred through mobile payments.¹⁹ More than 20 other countries report having a strategy for mobile banking and payments as part of the innovations in their payment systems.²⁰

The international success of the microfinance industry in developing nations has demonstrated that with appropriate products and services, even those individuals in extreme poverty can be bankable.²¹ In India, mobile financial services are viewed as a means of extending financial access to the roughly 43 percent of the population who are unbanked, with

¹⁹ Anjana Ravi and Eric Tyler (2012), “Savings for the Poor in Kenya,” report by the Savings for the Poor Innovation and Knowledge Network (Washington: New American Foundation, May).

²⁰ Bank for International Settlements (2012) “Innovations in Retail Payments,” Committee on Payment and Settlement Systems, www.bis.org/publ/cpss102.pdf.

²¹ Janine Firpo (2005), “Banking the Unbanked: Technology’s Role in Delivering Accessible Financial Services to the Poor,” SEMBA Consulting, www.sevaksolutions.org/docs/Banking%20the%20Unbanked.pdf.

Box 2. Smartphone Adoption

In the Survey of Consumers and Mobile Financial Services (SCMFS), a smartphone is defined as “a mobile phone with features that may enable it to access the web, send e-mails, and interact with computers. Smartphones include the iPhone, BlackBerrys, as well as Android and Windows Mobile powered devices.” Data from the survey are compared with results from relevant reports by the Pew Research Center and Javelin Strategy and Research.¹

Approximately 87 percent of respondents to the SCMFS have mobile phones, compared with 83 percent in the Pew survey and 85 percent in the Javelin survey. Of respondents who have mobile phones, approximately 44 percent have smartphones, compared with 42 percent in the Pew study and 45 percent in the Javelin study.

Among smartphone owners, 51 percent are women. Smartphone owners tend to be younger than the overall population: 32 percent of smartphone owners are between ages 18 and 29, 35 percent are between ages 30 and 44, 22 percent are between ages 45 and 59, and 11 percent are age 60 and over.

The racial composition of smartphone owners reflects that of the overall population except that Hispanics are slightly more likely to own smartphones. Among smartphone owners, 65 percent are white, 12 percent are black, 16 percent are Hispanic, and 6 percent are classified as other.

Smartphone owners seem to have higher educational attainment than the overall population: 28 percent have a high school degree or less, while 33 percent have completed some college and 39 percent have a bachelor’s degree or higher.

Smartphone owners also have higher incomes. Among smartphone owners, 12 percent earn less than \$25,000 a year; 14 percent earn between \$25,000 and \$39,999; 26 percent earn between \$40,000 and \$74,999; 14 percent earn between \$75,000 and \$99,999; and 33 percent earn \$100,000 or more a year.

¹ Aaron Smith (2011), “Smartphone Adoption and Usage,” report (Washington: Pew Research Center, July), http://pewinternet.org/~media/Files/Reports/2011/PIP_Smartphones.pdf; and Javelin Strategy and Research (2011), “Mobile Banking, Smartphone and Tablet Forecast 2011–2016: Mobile Banking Moves Mainstream to Mid-Sized, Community Banks, and Credit Unions,” report (Pleasanton, CA: Javelin Strategy and Research).

telecom companies and banks working together to offer new services, such as mobile savings accounts or remittance payments.²²

However, the challenges of many developing countries have been unique in that, in many cases, no physical banking or payments infrastructure existed in the first place, making banking in remote areas more difficult. In these countries, mobile financial services are filling a void. For the United States, the presence of a longstanding banking and payments infrastructure may mean different challenges in the diffusion of mobile financial services.²³ Ninety-two percent of the top 25 financial institutions by deposits already offer mobile banking services, while 17 percent of credit unions and 15 percent of community banks offer mobile banking, although the prevalence varies with the size of the institution.²⁴ As the comfort level with mobile financial services among the unbanked and underbanked

²² “Airtel, Axis Bank Join Hands for Mobile Banking,” (2012) *Times of India*, May 16, www.timesofindia.indiatimes.com/business/india-business/Airtel-Axis-Bank-join-hands-for-mobile-banking/particleshow/13174195.cms?prtpage=1.

²³ Darin Contini, Marianne Crowe, Cynthia Merritt, Richard Oliver, and Steve Mott (2011), “Mobile Payments in the United States: Mapping Out the Road Ahead,” report (Atlanta: Federal Reserve Bank of Atlanta), www.frbatlanta.org/documents/rprf/rprf_pubs/110325_wp.pdf.

²⁴ Javelin Strategy and Research (2011), “2011 Mobile Banking Financial Institution Scorecard: Money Begins to Move on Mobile,” report (Pleasanton, CA: Javelin Strategy and Research); and Independent Community

increases, the use of new and innovative ways to reach these marginalized populations creates opportunities for new relationships with financial institutions.

Use of Mobile Banking and Payments

Although a “digital divide” in computer Internet access still exists across the socioeconomic spectrum in the United States, this divide is significantly narrower for mobile phone access.²⁵ As noted earlier, a high proportion of unbanked and underbanked respondents to the SCMFSS report having mobile phones (63 percent and 91 percent, respectively). The underbanked, in particular, already make substantial use of services such as mobile banking and mobile payments.

Mobile Banking

In the survey, mobile banking was defined as using “a mobile phone to access your bank account, credit card account, or other financial account. This can be done either by accessing your bank’s web page through the web browser on your mobile phone, via text messaging, or by using an application downloaded to your mobile phone.” Nearly 21 percent of the mobile phone owners say they have used some form of mobile banking in the past 12 months, and another 11 percent expect to use mobile banking in the next 12 months. Mobile banking is highly correlated with having a smartphone—42 percent of smartphone owners report using mobile banking compared with 4 percent of feature phone owners. Underbanked households are more likely than others to have used mobile banking (28 percent, compared with 10 percent and 21 percent for unbanked and fully banked respondents, respectively). Also, a higher proportion of underbanked respondents expects to use mobile banking in the next 12 months—22 percent, versus 9 percent of fully banked and 19 percent of unbanked. In comparison, more than two-thirds of fully banked and underbanked respondents report using online banking with a personal computer (see [box 3](#), “Internet Access and Online Banking”).

While it may seem counterintuitive for unbanked households to use their phones for banking, these respondents may have had a bank account within the past 12 months. They may be also referring to using their phones with another financial account, such as a prepaid or payroll card.

Across all levels of banking, nine out of ten mobile banking respondents use their phones to check balances and recent transactions in their accounts, the most-frequently reported mobile banking task. The next most-frequent use, reported by fewer than half the respondents, is to download a bank “app” to their phones. About half of fully banked respondents report downloading an app, compared with about two-fifths of underbanked respondents. More than half of the underbanked respondents report using mobile banking to transfer funds between accounts compared with nearly two-fifths of fully banked respondents.

Consumers who use mobile banking generally are satisfied with their mobile banking experience. The unbanked are the most satisfied with their mobile banking experience: close to 100 percent report being very satisfied. The underbanked and fully banked have similar satisfaction levels with their mobile banking experience: about three-fifths report being very

Bankers of America (2010), 2010 ICBA Community Bank Technology Survey, (Washington: ICBA), www.icba.org/files/ICBASites/PDFs/2010TechnologySurveyResults.pdf.

²⁵ Aaron Smith (2011), “Smartphone Adoption and Usage,” report (Washington: Pew Research Center, July), http://pewinternet.org/~media/Files/Reports/2011/PIP_Smartphones.pdf.

Box 3. Internet Access and Online Banking

Ninety-six percent of respondents to the Survey of Consumers and Mobile Financial Services report regular access to the Internet, and four out of five report accessing the Internet at home (see table A).¹ Those with bank accounts were also asked if they used online banking with a desktop, laptop, or tablet computer in the past 12 months; two-thirds of the fully banked and underbanked report using online banking.

Results from previous phone-based surveys show a smaller percentage of respondents with regular Internet access, generally ranging between 71 and 78 percent of the population.² Despite the widespread adoption of computers, tablets, and smartphones, a significant portion of consumers do not have access to the convenience of online banking due to the lack of regular Internet access. Moreover, the vulnerable groups that could potentially benefit from readier access to financial institutions through the Internet are those with low rates of Internet access.³

Table A. Internet access and online banking

Percent	Full sample	Fully banked	Underbanked	Unbanked
Have regular access to the Internet at home or elsewhere	96.2	96.5	99.8	86.6
Place where consumer uses the Internet most often				
Home	81.4	80.6	80.4	85.8
Work	14.5	16.1	15.0	4.6
School	1.0	*	*	*
Library	1.4	*	*	*
Someone else's home	0.9	*	*	*
Use online banking with desktop, laptop, or tablet computer in past 12 months	67.8	67.9	68.7	*

Note: Accessing the Internet at school, libraries, or someone else's home were mentioned by fewer than 10 respondents in each category; access at Internet cafés was mentioned by fewer than 10 respondents.

* Ten or fewer observations.

¹ See appendix A for a detailed discussion of the survey methodology and the representativeness of the sample.

² M. Rebecca Blank and E. Lawrence Strickling (2011), "Exploring the Digital Nation," report (Washington: Department of Commerce), www.esa.doc.gov/sites/default/files/reports/documents/exploringthedigitalnation-computerandinternetuseathome.pdf; and Kathryn Zickuhr and Aaron Smith (2012), "Digital Differences," report (Washington: Pew Research Center, April), <http://pewinternet.org/Reports/2012/Digital-differences/Overview.aspx>.

³ Zickuhr and Smith, "Digital Differences."

satisfied, while about one-third report being somewhat satisfied with their experience. These high levels of satisfaction are somewhat as expected, given that consumers are choosing to use mobile banking as a complement to other access channels (see box 4, "Why Aren't Consumers Using Mobile Banking and Payments?").

Text Messages

About one-third of all respondents who use mobile banking also use text message alerts. Text messages have the potential to help consumers manage their accounts by alerting them when balances are running low or when bill payments are due and to remind people of savings goals.²⁶ Furthermore, text messages work equally well with feature phones as with smartphones. The most common text message alert that respondents had set up was a low-balance alert—about two-thirds of all respondents who use text messaging had set up this type of alert. About one-third had also set up reminders for when bill payments were due, and nearly one-third report setting up fraud alerts.

²⁶ Dean Karlan and Jacob Appel (2011), *More Than Good Intentions* (New York: Penguin Books).

Box 4. Why Aren't Consumers Using Mobile Banking and Payments?

Among those individuals in our survey who do not use mobile banking, but do have a mobile phone, the primary reasons they gave for not using mobile banking were that their banking needs were already being met with existing services or that they have concerns about the security (see table A). Reasons for not adopting mobile banking are similar between the fully banked and underbanked. Not surprisingly, the reasons why the unbanked have not adopted mobile banking are significantly different from these other two groups. The most common reason for not adopting mobile banking, listed by 50 percent of the unbanked, was simply that they don't have a bank account. This reason was followed by security concerns and lack of trust in the technology (25 percent and 21 percent, respectively).

Among those respondents who do not use mobile payments, the most commonly cited reasons were concerns about security (42 percent), not seeing any benefits to using mobile payments (37 percent), and that it was easier to pay with another method such as cash or credit cards (36 percent). The primary reasons for not using mobile payments varied with banking status. While security was consistently the number one concern, the unbanked indicated significant lack of trust in the technology (31 percent) relative to the underbanked (16 percent) and the fully banked (19 percent). The unbanked also cited lacking the necessary feature on the phone as a major impediment to adoption (29 percent), as did the fully banked (32 percent). The underbanked were least likely to indicate that their phones lacked the necessary feature to perform mobile payments, with only 21 percent citing this reason. This is consistent with the underbanked having the highest rate of smartphone ownership among the three groups. Lastly, the unbanked were the least likely to indicate that they did not see any benefit from using mobile payments, with 15 percent citing this as a reason they do not use mobile payments, relative to 30 percent of the unbanked and 40 percent of the fully banked. This may indicate that the unbanked are open to using mobile technology as a means of performing financial transactions, provided their concerns about the security of the technology are addressed.

Table A. Reasons for not using mobile banking and mobile payments

Percent	Full sample	Fully banked	Underbanked	Unbanked
Mobile banking				
Banking needs already met	57.5	63.0	57.5	10.2
Security concerns	48.0	50.3	51.6	25.2
I don't trust the technology	21.8	21.5	25.5	20.7
Data costs too high	18.3	20.0	16.8	*
Too difficult to see my phone's screen	16.6	16.5	21.9	12.0
Difficult/time consuming to set up	9.5	8.8	13.2	12.3
I don't have a bank account	8.8	5.0	*	50.4
Not offered by my bank/credit union	2.7	3.0	*	*
My bank charges a fee for mobile banking	2.2	1.9	*	*
Mobile payments				
Security concerns	41.5	42.7	38.1	36.2
I don't see any benefit	36.7	39.9	30.2	14.8
Easier to pay another way (for example, cash or credit card)	36.0	37.0	36.3	25.2
I don't have the necessary feature on my phone	30.8	32.4	20.9	29.4
I don't trust the technology	19.8	19.3	15.5	30.6
Data costs too high	15.3	16.0	15.4	8.5
Difficult/time consuming to set up	9.1	7.4	18.3	11.5
I don't know any stores that allow mobile payments	9.0	9.5	8.6	*
Not offered by my bank/credit union	4.3	4.2	*	*
My bank charges a fee for mobile payments	1.9	2.0	*	*

* Ten or fewer observations.

Respondents who use low-balance alerts were asked what actions they took as a result of receiving an alert. Responses varied by level of connection to the banking system. Fully banked respondents report that they transferred money into their accounts or they reduced spending. Underbanked respondents say they transferred money into the accounts or deposited money into the accounts. Unbanked respondents report that they reduced spending in response to these low-balance alerts.

Among respondents who receive payment-due alerts, three-fourths report that these alerts helped them pay their bills on time. Paying bills on time has the double benefit of maintaining or improving consumers' credit records and saving on late-payment fees. Virtually all of the underbanked who use payment-due alerts report improvements in paying on time.

Mobile Payments

In the survey, mobile payments were defined as “purchases, bill payments, charitable donations, payments to another person, or any other payments made using a mobile phone. You can do this either by accessing a web page through the web browser on your mobile device, by sending a text message (SMS), or by using a downloadable application on your mobile device. The amount of the payment may be applied to your phone bill (for example, Red Cross text message donation), charged to your credit card, or withdrawn directly from your bank account.” Twelve percent of respondents use their mobile phones to make some type of payment; a higher proportion, 17 percent, of underbanked households report using mobile payments (table 5).

Among those who use mobile payments, the most common uses are paying a bill online (47 percent), making an online purchase (36 percent), and transferring money (21 percent). Person-to-person transfers are used by only a small proportion of respondents (8 percent of those who used mobile payments). Higher proportions of underbanked households report using mobile payments services.

Percent	Full sample	Fully banked	Underbanked	Unbanked
Use mobile payments	12.3	11.6	17.4	12.2
Paid bill online with mobile	47.1	44.9	61.7	*
Made online purchase	36.0	37.3	32.3	*
Transferred money	20.5	19.7	*	*
Received money from someone else	7.9	7.4	*	*
Made charitable donation by texting	5.1	*	*	*
Sent remittance to family in another country	*	*	*	*
Payment channel for mobile payments				
Billed to credit card, debited from prepaid card	66.4	60.4	81.4	93.8
Debited from bank account	45.4	46.7	53.4	*
PayPal, Google Wallet, iTunes, etc.	21.9	20.2	*	*
Charged to phone bill	8.4	9.5	*	*
Other	*	*	*	*
Satisfaction with mobile payments				
Very satisfied	59.4	63.6	45.5	*
Somewhat satisfied	35.4	32.5	45.2	*
Somewhat dissatisfied	*	*	*	*
Very dissatisfied	*	*	*	*

* Ten or fewer observations.

The majority of mobile payment users—60 percent of the fully banked, 81 percent of the underbanked, and 94 percent of the unbanked—report that the payment was charged to a credit card or a prepaid card. About half of the fully banked and underbanked also use mobile payments via a debit to a bank account. Approximately one out of five of all consumers make mobile payments through a third-party provider, such as PayPal, Google Wallet, or iTunes.

Consumers' satisfaction with their mobile payment experiences is more variable than their satisfaction with mobile banking. More than half of all respondents report that they are very satisfied with their experiences, and an additional third report that they are satisfied with their experience. However, satisfaction varies across the groups, with the fully banked having the highest proportions of very or somewhat satisfied respondents (see box 4).

Mobile Phones and Personal Financial Management

Mobile phones can provide consumers with just-in-time information on account balances and credit limits, which in turn can aid in consumer financial management and decision-making. Armed with this information, consumers can avoid overdrawing their accounts or going over their credit limits, both of which may trigger fees. Smartphones in particular can also be used to shop for products and services, enabling consumers to save money by finding lower prices or products that fit better with their needs.

About half the survey respondents report that they are responsible for “all or most” of their household’s decisionmaking when it comes to budget management, paying bills, shopping, and saving and investing. Slightly higher proportions of underbanked respondents claim this level of responsibility, compared with substantially lower proportions of unbanked households (table 6).

Those who said they used mobile banking were asked if they used their mobile phones to check account balances or available credit before making a purchase. Two-thirds of these

Table 6. Mobile phones, shopping, and financial decisionmaking

Percent

	Full sample	Fully banked	Underbanked	Unbanked
All or most of the responsibility for the household's				
Budget management	49.3	50.8	58.3	39.9
Bill paying	52.9	54.8	60.4	31.9
Shopping	48.1	49.3	55.2	33.2
Saving and investing	41.7	42.1	49.2	32.3
Use mobile to check account balance or available credit before purchase	67.2	64.6	76.9	66.9
Decided not to buy something	59.2	58.3	58.3	*
Compare prices online before going to stores	58.4	62.2	59.0	28.9
Look at product reviews online before going to stores	57.6	62.0	57.2	24.7
Use mobile to comparison shop while at retail store	19.4	19.4	23.7	12.9
Use mobile for online shopping	16.4	16.2	22.3	9.4
Use mobile to read product reviews while at retail store	16.0	15.5	24.7	8.8
Changed which item you purchased	76.9	75.6	86.2	*
Use barcode scanning to shop for prices	12.3	11.7	20.2	*
Changed where you purchased	65.6	65.7	71.2	*

* Ten or fewer observations.

respondents report using their mobile phones to obtain this type of information. As a result of learning about their balances, three out of five respondents say they decided not to go ahead with a purchase.

All respondents in the survey were asked if they compared prices and looked at product reviews online before making a major purchase. Nearly three-fifths of the respondents indicate they do this type of online review and comparison; these activities are more prevalent among the fully banked and underbanked than among the unbanked.

Much lower proportions—generally between one out of eight and one out of five—have used their mobile phones to shop either online or in a retail store, with higher proportions of underbanked respondents reporting these activities. Among all respondents, one out of six report reading product reviews in the store; of those, a substantial proportion (about three-fourths) say they have changed their minds about the product they were purchasing as a result of reading a review. A smaller proportion, one in eight, report using barcode scanning applications on their mobile phones to shop for prices; among those, three-fourths changed where they purchased the item. Again, underbanked respondents are more likely to use these shopping activities and more likely to report that the information available through their mobile phones changed what they purchased or where they purchased it.

Mobile Phones as a Channel for Financial Inclusion

The widespread ownership of mobile phones by underbanked and unbanked consumers suggests that providing a full suite of mobile financial services (for deposits, payments, and personal financial management tools) may be a means to facilitate their access to, and inclusion in, the mainstream financial system. The data indicate that the unbanked and underbanked can be characterized as having lower levels of education and income; being younger, minority, female, not married, and unemployed; and not being willing to take risks.²⁷ The unbanked are less likely to have a mobile phone than their underbanked and fully banked counterparts, and they are also less likely than the underbanked to have a smartphone.

However, it is also the case that consumers with characteristics that typify the unbanked and underbanked—lower income, younger, minority, female, not married, and unemployed—are highly likely to have mobile phones and may be open to using this channel for financial services (table 7). For example, three-fifths of unbanked respondents with incomes less than \$25,000 report that they have a mobile phone, and two-thirds of unbanked respondents between ages 18 and 29 report having a mobile phone. Half of unbanked Hispanic respondents and two-thirds of unbanked African American respondents have mobile phones, and 72 percent of unbanked females have a mobile phone. Three-fifths of unmarried unbanked respondents and three-fourths of unbanked unemployed respondents have mobile phones. Thus, access to the technology does not seem to be a barrier.

One of the most commonly cited reasons that consumers give for not having a bank account is that they “don’t like dealing with banks.” Mobile banking may provide sufficient separation from “dealing with banks” that consumers could feel comfortable using a bank

²⁷ Willingness to take risks is measured using the financial risk-aversion question from the Survey of Consumer Finances. The question asks “Which of the following statements comes closest to describing the amount of financial risk that you are willing to take when you save or make investments?” The four possible responses are (1) “Take substantial financial risks expecting to earn substantial returns”; (2) “Take above average financial risks expecting to earn above average returns”; (3) “Take average financial risks expecting to earn average returns”; and (4) “Not willing to take any financial risks.”

Table 7. Select consumer groups and their access to mobile phones				
Percent				
	Full sample	Fully banked	Underbanked	Unbanked
Income less than \$25,000	74.6	81.0	76.2	62.2
Age 18–29	91.2	96.1	98.7	67.7
Hispanic	81.3	88.8	87.8	49.3
Black, non-Hispanic	85.1	92.4	89.5	67.1
Female	89.2	91.0	92.4	71.8
Not married	83.5	87.8	87.4	62.7
Unemployed	86.0	92.5	81.0	76.7

account (see box 1). Another common reason for not having an account is that consumers “don’t write enough checks to make it worthwhile”; mobile banking and mobile payments allow for transferring funds or paying bills without writing checks.

The third most-cited reason for not having an account is that “fees and service charges are too high.” Some financial institutions, however, are examining whether emerging technologies such as mobile banking have the potential to reduce costs. And, the financial interaction that mobile banking would provide may be particularly beneficial to budget-conscious consumers. For example, the use of text alerts has the potential to help consumers manage their finances with reminders about when bills are due or warnings about low balances that may trigger an overdraft. Since many unbanked consumers also make use of general-purpose reloadable cards (see table 2), using a mobile device to track balances on these cards—perhaps in conjunction with text alerts—could prove useful to these consumers.

Other concerns that unbanked consumers raised with the use of mobile banking and mobile payments were issues surrounding security and trust in the technology. Such issues need to be addressed if unbanked and underbanked consumers are to adopt mobile banking and payments. Financial service providers may want to consider developing a simple customer security toolkit showing consumers how to protect their mobile devices and payments data by creating passwords for login and access; using antivirus software to ensure the applications downloaded are safe from viruses and malware; loading software that enables the phone to be remotely wiped, locked, or deactivated if lost or stolen; and encouraging more consumers to set up fraud alerts.

Conclusion

The analysis of the Federal Reserve Board’s SCMFS presented here suggests that mobile technologies offer the potential to better integrate the unbanked and underbanked into the mainstream financial system. Substantial majorities of both the unbanked and underbanked have mobile phones, and significant shares have smartphones. Thus, even if consumers aren’t located near a bank or credit union branch, mobile banking technology could allow these consumers to perform many financial transactions through their phones. Moreover, with the emergence of these technologies, some financial institutions are exploring whether they can realize sufficient cost savings and better meet the needs of the unbanked. Because the technology and business models are so new and still evolving, it is unclear to what extent mobile services may ultimately complement, augment, or supplant more traditional means of delivering financial services to consumers, including consumers without banking relationships and those who are banked but also use alternative financial services.

Appendix A: Survey Data Collection

In consultation with a mobile financial services advisory group composed of key Federal Reserve System staff, the Consumer Research Section in the Federal Reserve Board's Division of Consumer and Community Affairs designed a survey instrument to examine consumers' usage of and attitudes towards mobile phones and mobile financial services.

The survey was administered by GfK Knowledge Networks, an online consumer research company, on behalf of the Board. The survey was conducted using a sample of adults ages 18 and over from KnowledgePanel®, a proprietary, probability-based web panel of more than 50,000 individuals. The KnowledgePanel is designed to be statistically representative of the entire U.S. population. Until 2009, the panel was selected using list-assisted random digit dialing methods. However, as more U.S. households became mobile-only households, Knowledge Networks switched to address-based sampling (ABS). ABS uses the U.S. Postal Service Delivery Sequence File to randomly recruit participants to the panel. If a randomly sampled household does not have a computer and/or Internet access, but is willing to participate in the panel, Knowledge Networks provides the household with a computer and Internet at no cost.

Knowledge Networks has conducted research to demonstrate the representativeness of its sample vis a vis U.S. Census Bureau benchmarks.²⁸ Other researchers have shown samples drawn from the Knowledge Networks panel yield similar estimates to those obtained from a larger random digit dialing survey.²⁹ As with any survey method, the possibility of bias exists. For example, given that this is an online survey about use of mobile phone technology, one could conceive of respondents predisposed to technology adoption having greater representation in our sample. However, the comparability of our estimates to those obtained in other surveys suggests that our sample displays little effects of bias.

The survey instrument was pre-tested on a sample of 50 respondents, and the full data collection effort for the survey began on December 22, 2011, and concluded on January 9, 2012. A total of 3,382 e-mail solicitations to participate in the survey were sent out to the KnowledgePanel, and the survey was kept open until 2,290 individuals had completed the survey, for a survey completion rate of 67.7 percent. Knowledge Networks sent e-mail reminders to non-responders on days three and six of the field period to prompt participation. The survey took a median time of 15 minutes to complete.

²⁸ J. Michael Dennis (2010), "KnowledgePanel: Processes and Procedures Contributing to Sample Representativeness and Tests for Self-Selection Bias," research note (Menlo Park, CA: Knowledge Networks, Inc.), <http://knowledgegenetworks.com/ganp/docs/KnowledgePanelR-Statistical-Methods-Note.pdf>. See also Don A. Dillman, Ulf-Dietrich Reips, and Uwe Matzat (2010) "Advice in Surveying the General Public Over the Internet," *International Journal of Internet Science*, vol. 5 (1), pp. 1–4.

²⁹ A list of research into the representativeness of the KnowledgePanel is available at <http://knowledgegenetworks.com/ganp/reviewer-info.html>.

Appendix B: Financial Literacy Questions

The Board included in its survey several questions pertaining to interest rates, inflation, return on assets, portfolio diversity, mutual funds, and repayment periods to gauge the financial literacy of respondents. Correct answers are in bold.

1. Imagine that the interest rate on your savings account was 1 percent per year and inflation was 2 percent 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**
2. Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return?
 - a. Savings accounts
 - b. U.S. Government bonds
 - c. **Stocks**
3. If an investor who only owns two stocks right now decides to instead spread their money among many different assets (i.e., more stocks, add bonds, add real estate), their risk of losing money on their entire portfolio will:
 - a. Increase
 - b. **Decrease**
 - c. Stay the same
4. If you were to invest \$1,000 in a stock mutual fund for a year, it would be possible to have less than \$1,000 when you withdraw your money.
 - a. **True**
 - b. False
5. Suppose you owe \$1,000 on a loan and the interest rate you are charged is 10 percent per year compounded annually. If you didn't make any payments on this loan, at this interest rate, how many years would it take for the amount you owe to double?
 - a. Less than 2 years
 - b. Between 2 and 5 years
 - c. **5 to 9 years**
 - d. 10 years or more