



# The Future of Cash

*Will digital payment systems replace paper currency?*

By [Hannah H. Kim](#)

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## Introduction

*While cash continues to circulate widely in the United States, many consumers, as well as many business experts, believe paper money will soon become antiquated. Advocates of a cashless society point to countries such as Sweden and to some Chinese cities where mobile payment applications are supplanting paper currency. In the United States, digital payment systems are helping to change consumer habits, and some businesses have stopped accepting cash. Advocates of a cashless society argue that credit and debit cards and digital payment methods are efficient and transparent and inhibit financial crimes. Because cash is anonymous and largely untraceable, it can facilitate illicit activities such as tax evasion and money laundering. Critics of the cashless trend raise concerns regarding privacy, security and equality. They argue that cash lacks the fees associated with cards or electronic money transfers and that cashless businesses discriminate against people who must, or choose to, rely on cash. In the face of this criticism, some businesses that went cashless are reversing course.*

Street musician Peter Buffery, with his custom guitar that allows him to accept cashless donations, performs in London's Soho Square. (Getty Images/PA Images/Lewis Whyld)



## Overview

Jamie Birdwell-Branson does not remember a time when she regularly used cash to buy things. “I’ve always just used my debit card,” says the 30-year-old freelance writer and editor who lives in Toledo, Ohio. “I’ve always thought it was more convenient because I have an actual record online of every single thing I’m purchasing.”

It doesn’t always work. On a holiday road trip last year, she and her husband stopped at a toll plaza outside Oklahoma City. Her husband, who was driving, handed his card to the man in the toll booth, who “just looked completely befuddled,” she says. “It was like he had never been confronted with this modern mystery of a debit card before.”

A customer makes a cashless purchase using a Square device in San Francisco. Square allows businesses to accept mobile payments without a traditional merchant bank account, which can carry substantial fees. In 2018, nearly one-third of American adults said they did not use cash during a typical week. (Getty Images/Bloomberg/David Paul Morris)



But such cash-only facilities may be a dying breed. In a typical week, Birdwell-Branson routinely uses her debit card to pay for almost every transaction, from her morning coffee to her gym membership to weekly grocery purchases. “I get really salty” about having to take out cash, she says. “I’m 99.99 percent cashless.”

The rise of digital payment systems and electronic banking has led to debates among economists, business experts and the public about the future of cash. Advocates of a cashless economy argue that the physical wallet and its contents will soon become historical artifacts. A cashless society, in which all financial transactions will be conducted through transfers of digital information, could be a more efficient, practical and traceable money system, they argue.

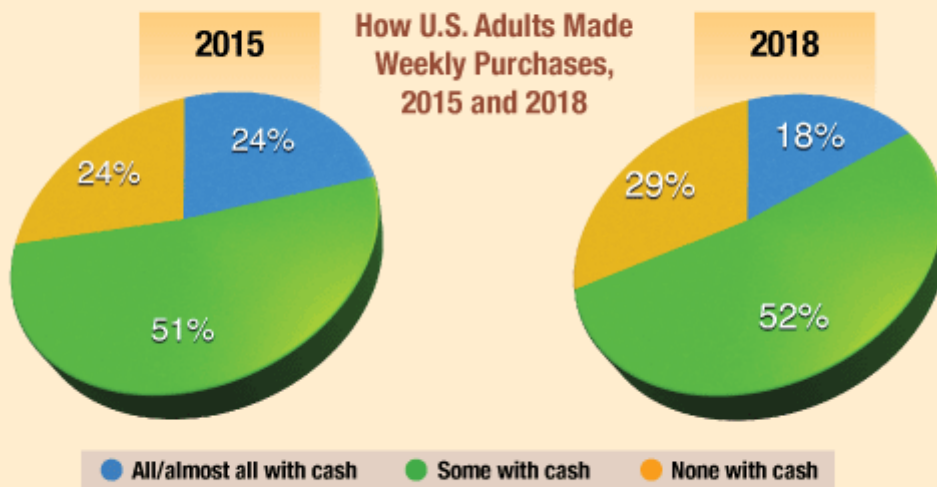
Critics of a cashless economy, however, say the nation is ill-equipped for such a transition. Barriers to banking and technology may deny portions of the population access to basic goods and services, they say. Some people will want to continue to use cash for a variety of reasons, such as for budgeting or privacy, the critics also point out. Others may not have the access, finances or skills to acquire formal banking services or a smartphone, or simply do not like banks.

“We have fierce individualism in this country, and cash is a part of that in many parts of the country,” says Sarah Jane Hughes, a professor of commercial law at Indiana University’s Maurer School of Law in Bloomington.

[Long Description](#)

## Fewer Americans Using Cash

The share of U.S. adults who say they do not use cash in their typical weekly transactions increased 5 percentage points from 2015 to 2018, while the proportion who made almost all purchases with cash fell 6 points.



Note: Nonresponses not shown. The margin of error is plus or minus 1.5 percentage points.

Source: Andrew Perrin, "More Americans are making no weekly purchases with cash," Pew Research Center, Dec. 12, 2018, <https://tinyurl.com/yyq9aw16>

Cash is still the most frequently used payment instrument in the United States, but mainly for transactions of less than \$10, according to a 2018 study by the Federal Reserve Bank of Boston. The study found that while debit cards, cash and credit cards were the most popular payment instruments, the adoption of mobile apps and online accounts for making payments was steadily increasing. About half of U.S. consumers used mobile or online methods in 2017.<sup>1</sup>

"It's inevitable that [payments] are going to become more digitized and that cash is going to eventually wither," says Michael Best, an assistant professor of economics at Columbia University. "It will end up being that cash gets used only for very small, or very illegal, transactions."

Cashless payments include a wide range of fund transfer methods: credit and debit cards, prepaid cards, bank account transfers, bank and traveler's checks, money orders, direct deduction from income and cryptocurrency such as bitcoin. They also include mobile apps linked to credit and debit cards, as well as transactions connected to a user's credit card or bank account that are made through online payment intermediaries such as PayPal and Venmo.<sup>2</sup>

The trend toward cashless payments may be accelerated by Facebook's announcement in June that it would create its own Libra cryptocurrency in partnership with digital and credit card companies.<sup>3</sup>

The dollar is the U.S. national currency. Its value is backed by collateral held by the Federal Reserve, the central bank of the United States, most of it in the form of government securities.<sup>4</sup>



each year, and the Treasury Department's Bureau of Engraving and Printing prints U.S. currency.<sup>5</sup> About \$1.70 trillion is in circulation, according to the Federal Reserve.<sup>6</sup>



The \$100 bill became the most widely circulated U.S. note in 2017. Many experts say the rising demand is tied to its utility for illicit activities. (Getty Images/Bloomberg/Paul Yeung)

The Treasury's U.S. Mint produces coinage. But due to the rising prices of metals, the cost of producing pennies and nickels has exceeded their worth since 2006, resulting in financial losses to the Mint, according to the U.S. Government Accountability Office.<sup>7</sup> In 2015, a penny cost about 1.7 cents to make, while a nickel cost 8 cents to produce.<sup>8</sup>

The Federal Reserve Bank of Chicago estimates that demand for U.S. currency will increase by at least 1.7 percent, and as much as 10.2 percent, by 2028. If the lower estimate proves correct, the main reason will be increased consumer adoption of new payment technologies, the bank said. If the higher projection is borne out, it will be because of increased foreign use of U.S. dollars.<sup>9</sup>

The dollar is also the global economy's reserve currency, the currency that other nations hold, in part to pay for purchases of oil and other commodities that are priced in dollars. As the world's most popular currency, the dollar is accepted for routine transactions in many countries, even North Korea.<sup>10</sup> U.S. dollars are seen as a secure form of currency in many other countries, especially those with unstable political or financial systems, according to a 2018 report by the Federal Reserve Bank of Chicago.<sup>11</sup> Some nations, such as Ecuador, have even adopted the dollar as their official currency.<sup>12</sup>

"There are places around the world that don't enjoy the sound banking systems that we have in the U.S., so they're more likely to use cash than to rely on deposit accounts to make payments," says William J. Luther, a director at the American Institute for Economic Research, a Massachusetts-based think tank.

According to research by Federal Reserve economist Ruth Judson, while overall demand for U.S. currency continues to grow, demand for smaller denominations, including the \$20 bill, has been slowing, which may be the first indication of a declining domestic need for cash.<sup>13</sup>

Cash serves another purpose: it is the medium of choice for illicit activities. This helps explain two seemingly contradictory trends: a steady increase in the demand for U.S. dollars, most notably the \$100 bill, even as the average value of consumer purchases made in cash declines. In 2017, the \$100 bill became the most widely circulated note in circulation, even exceeding the \$1 bill.<sup>14</sup>

“Eighty percent of the value of all U.S. cash in circulation is in \$100 bills,” says Campbell Harvey, a professor of finance at Duke University. “But most people don’t carry \$100s. They’re hard to use, because retailers don’t want to accept them because of counterfeit risk. Where are these \$100 bills?” Cash critics say the rising demand for \$100 bills is directly tied to paper currency’s utility for activities such as money laundering, tax evasion and purchases of illegal goods.

The proliferation of cashless payment methods, as well as payment service providers (PSPs) such as PayPal that facilitate online money transfers, has given consumers and business owners more ways to conduct cashless transactions than in the past. The global payments market grew 11 percent in 2017, topping \$1.9 trillion, according to the consulting firm McKinsey, which identified the Asia-Pacific region as dominating the revenue pool. The report predicted increased growth in the payments market as more emerging economies continue to invest in electronic money systems.<sup>15</sup>

Cashless payment methods are not as widely used in the United States as in some other parts of the world, where both cards and mobile wallets are so popular that cash use is declining rapidly. Sweden is the world’s most cashless society; most payments are made with debit cards or a mobile payment app called Swish — which allow the user to make a purchase by withdrawing an amount directly from a checking account.<sup>16</sup> The country could become completely cashless by 2023, according to researchers at the Copenhagen School of Economics.<sup>17</sup> ([See Short Feature.](#))

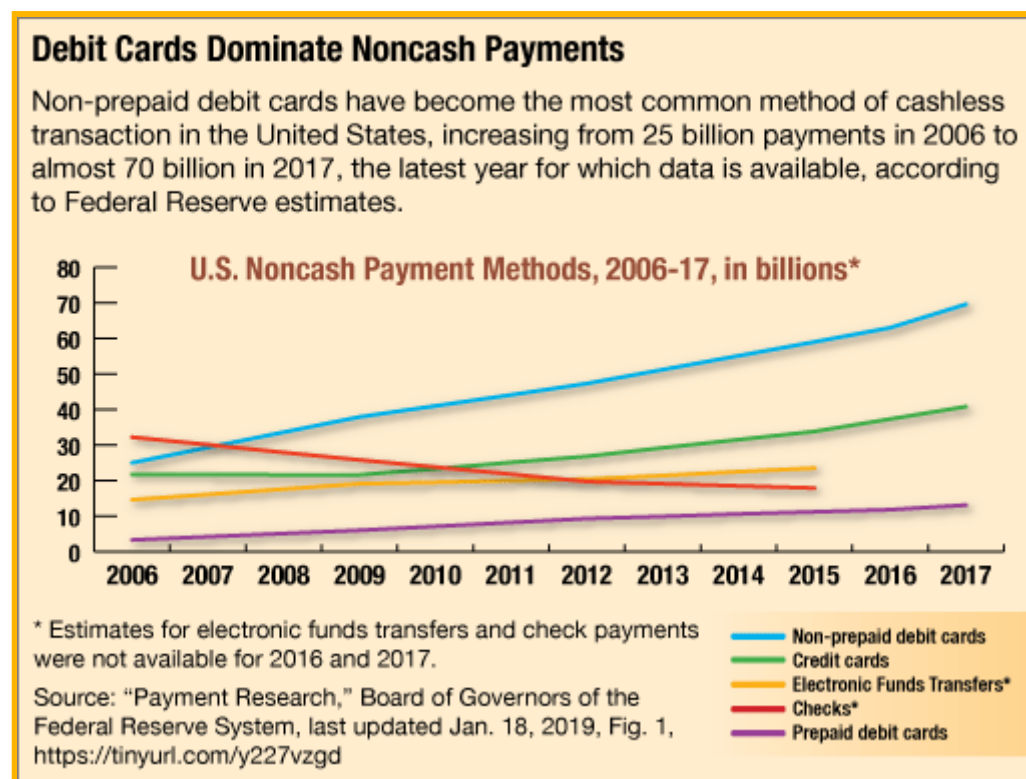
In China, mobile payment apps have drastically changed day-to-day transactions in cities over the last five years. Some stores, markets and food stalls in urban centers no longer accept paper currency.<sup>18</sup> More than three-fourths of Chinese smartphone users made a mobile purchase in 2017, according to the market research firm eMarketer. Earlier this year, China’s central bank and other regulatory bodies released a joint report announcing an initiative to make mobile payments accessible in rural areas by the end of 2020.<sup>19</sup>

“There are societies much more cashless than the U.S. We’re behind,” says Daniel Levine, the director of the Avant-Guide Institute, a business consultancy on trends influencing the global marketplace. “We have technological challenges and societal challenges.”

Nevertheless, payment card transactions have grown rapidly in the United States since 2000,

payments are also increasing faster than in-person payments, which suggests a changing pattern in how U.S. consumers buy and spend.<sup>20</sup>

The payment habits of younger U.S. consumers are leading the cashless trend. A 2018 study by the Pew Research Center, a Washington-based research organization, found that more than one-third of adults under age 50 made no cash purchases during an average week.<sup>21</sup> A survey by the credit card and banking company Capital One found that Millennials, defined as those born between 1981 and 1996, were the demographic most likely to report that they “rarely or never” carried cash and that paying with cash was “inconvenient.”<sup>22</sup>



[Long Description](#)

Polls that have attempted to measure public perception regarding the outlook of cash show conflicting results. A 2016 Gallup poll found that 62 percent of respondents expected the United States to become a cashless society within their lifetime.<sup>23</sup> But a 2018 study by YouGov, an international public opinion and market research firm, found that only one in five U.S. adults believed that their payments will become completely cashless within their lifetime. Among those who expressed that belief, almost half said the United States would transform into a cashless society within five years.<sup>24</sup>

“It really doesn’t make any sense that in the future we’re going to be using paper,” says Harvey, the Duke professor. “Physical cash will be a legacy.”

Stella Adams, the CEO of S J Adams Consulting, a fair housing and lending consulting firm in Durham, N.C., disagrees. “We need cash,” she says. “Cash is protected by the Federal Reserve. It



As economists, businesses, payments specialists and the public debate the future of cash, these are some of the questions they are asking:

### Are cashless payment policies discriminatory?

In recent years, some brick-and-mortar businesses have experimented with becoming cash free. In 2017, clothing shops Everlane and Bonobos, the hair salon Drybar and fast-casual restaurants Sweetgreen, Dos Toros and Shake Shack stopped accepting cash, according to a report by the market research company eMarketer. Many of these businesses were in metropolitan areas where digital-only branding appealed to younger consumers. However, public criticism that cashless businesses are discriminatory and a legislative backlash have halted the trend.<sup>25</sup>



A Sweetgreen restaurant in Washington, D.C., gets ready for business. The fast-casual chain stopped accepting cash in late 2016 but reversed course in April amid criticism that the move discriminated against customers who lack access to digital payment methods or simply prefer cash. (Getty Images/The Washington Post/Jahi Chikwendiu)

The growing acceptance of online and mobile banking, as well as e-commerce businesses such as Amazon, have normalized the idea of conducting financial transactions digitally. Within the last two decades, a number of payment service providers have emerged to allow more businesses to accept cashless transactions. Notable PSPs include PayPal, which facilitates worldwide money transfers, and Square, which offers point-of-sale and mobile payment services.

Before PSPs, businesses that accepted credit or debit cards and other electronic funds had to open a traditional merchant account with a bank. This required processing service fees, equipment, software and security features that were prohibitively expensive for many small businesses.<sup>26</sup> The advent of PayPal, Square and other payment service technologies made it more convenient and affordable for a variety of businesses to accept card and electronic transactions, and even allowed solo service providers, such as street musicians, to accept cashless payments.



“Cash transactions are becoming less and less popular every day, and businesses who refuse to adapt are doomed to fail,” says Nate Masterson, CEO of the e-commerce business Maple Holistics, which sells hair care products.

But in some instances there has been a backlash against brick-and-mortar businesses that do not accept cash. Critics assert that cashless payment policies exclude people who rely on paper currency and who may not have bank accounts. In the face of this reaction, many no-cash pioneers, such as Apple, the brick-and-mortar convenience store chain Amazon Go and the salad chain Sweetgreen, have reversed their policies.

Many of the first cashless brick-and-mortar businesses were urban fast-casual restaurants. Sweetgreen announced its decision to go cashless in late 2016 with a blog post titled, “Welcome to the Future — It’s Cashless.”<sup>27</sup> Sweetgreen said it was going the no-cash route because the level of cash transactions at its restaurants was declining anyway and that eliminating cash handling could discourage theft and improve employee efficiency.

Just over two years later, Sweetgreen reversed its payments policy in response to growing criticism. In a statement, the company said its cashless policy “had the unintended consequence of excluding those who prefer to pay or can only pay with cash.”<sup>28</sup>

Federal law is silent on the question of whether businesses must accept cash.<sup>29</sup> But in May 2019, lawmakers introduced two pieces of legislation in Congress to stop businesses from going cashless. Rep. David Cicilline, D-R.I., introduced the Cash Always Should Be Honored (Cash) Act, which would authorize the Federal Trade Commission to enforce a ban on cashless establishments. The bill has attracted nine co-sponsors, all Democrats. Rep. Donald Payne, D-N.J., introduced a similar bill called the Payment Choice Act that would allow consumers to sue stores for not accepting cash.<sup>30</sup>

The bills follow recent action by some state and municipal governments to stop businesses from going cashless. In March, New Jersey became the second state to ban cashless stores (Massachusetts was the first), and in the same month Philadelphia became the first major U.S. city to do so.<sup>31</sup> Other cities, including New York, Chicago, San Francisco and Washington, are considering similar measures.<sup>32</sup>

New Jersey Assemblyman Paul Moriarty, who supported his state's law, said he did so because “a ban on cash is discriminatory. It marginalizes the poor, marginalizes young people who haven't established credit yet. People prefer to pay in cash, and people ... don't want every aspect of life noted by a credit card company, right down to a stick of gum.”<sup>33</sup>

Supporters of cash payments argue that card and digital payment systems have adoption barriers that may exclude some people. For example, they say, those under the age of 18 may be forced to

The so-called unbanked — adults who do not have a bank or credit union account — also rely on cash. About 5 percent of adults in the United States are unbanked, according to a 2018 Federal Reserve report. And about 18 percent of those who do participate in traditional banking services are considered underbanked, which the Fed defined as having used an alternative financial service, such as a check-cashing service.<sup>35</sup>

Advocates of policies to promote greater economic equality argue that many bank accounts have maintenance and overdraft fees that are prohibitive for people of modest means.<sup>36</sup> “We are not prepared,” says Adams, the fair lending consultant. “We currently do not have the financial infrastructure in place that has addressed the needs of low- or moderate-income communities and workers as it relates to movement into a cashless society.”

A 2018 Pew study found a sharp divide along income lines regarding the use of cash. Those with a yearly household income of at least \$75,000 were more than twice as likely to say they made no purchases with cash during a typical week than those making less than \$30,000 annually, Pew found.<sup>37</sup>

Some owners of cashless establishments argue that their policies are not discriminatory. “We are inclusive of all because anyone can go get a prepaid card and load cash on it and then eat with us, if they want,” said Jeremiah Dupin, who runs a restaurant in Kansas City, Mo., that specializes in poke, a Hawaiian raw-fish salad.<sup>38</sup>

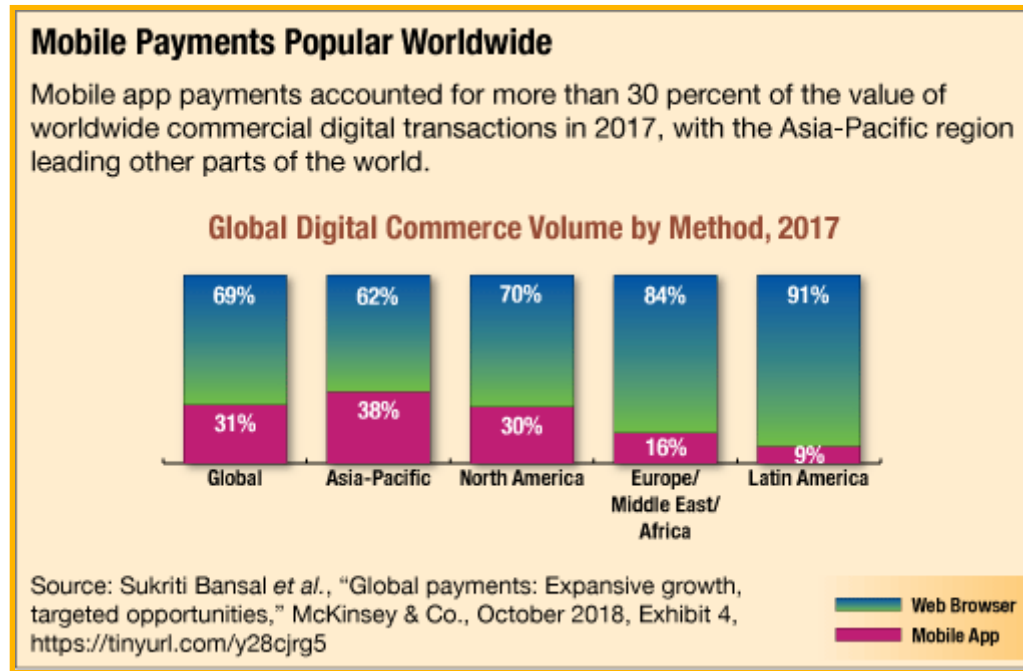
### Can cashless transactions be private and secure?

While digital payment methods create transaction records for each user, cash can be anonymous, providing a measure of privacy to the purchaser. Internal Revenue Service (IRS) rules require a cash transaction to be reported only when it exceeds \$10,000.<sup>39</sup> Cash is also essentially untraceable.

In addition, noncash transactions and the systems that process them are vulnerable to cyberattacks. Such attacks on financial service firms are more frequent than in other industries, and increased by more than 70 percent worldwide in 2017 over the previous year, according to a report by HTF Market Intelligence, a consulting firm based in India.<sup>40</sup> A 2018 survey by the International Monetary Fund found that businesses ranked cyber risks as the greatest threat to the broader economy, outranking geopolitical threats or the impact of new regulations.<sup>41</sup>

Many of the biggest cyberattacks on record have targeted databases that store sensitive personal and financial information. When stolen, such information can be used for identity theft and fraud. One of the largest data breaches was the 2017 hack involving Equifax, the consumer reporting agency, in which more than 150 million customer records were stolen, including Social Security numbers, birthdates and credit card data.<sup>42</sup>

Cybersecurity consultant Tom Arnold says it is difficult to measure how well databases that store personal information are protected. “Sadly, there are so many of them,” says Arnold, who is co-founder of Payment Software Co., a California-based security firm. “Whether it's a government database, or a bank's database, or an individual company that has a database — are they tested? Have they really been examined? And what's coming in the future that might cause them a problem is hard to tell. Consumers still have to be vigilant.”



[Long Description](#)

Government regulations in the United States protect consumers against being held responsible for the losses due to credit card fraud and theft, according to the Federal Deposit Insurance Corporation, the government agency that insures bank deposits.<sup>43</sup> “If consumers weren't indemnified, and were actually carrying the brunt of the loss, they wouldn't use [payment cards] because it would be too dangerous,” Arnold says. As a result, he says, credit card issuers and other payment companies support such regulations, “and that's frankly why they charge fees. They're trying to cover that loss that the industry is carrying as a burden.” (Credit card companies charge some cardholders annual service fees and charge businesses per-transaction fees.)

Those fees also give banks and credit card companies a strong financial interest in promoting the idea of a cashless future, critics of the cashless trend argue. Brett Scott, author of *The Heretic's Guide to Global Finance: Hacking the Future of Money*, wrote that financial institutions are trying to steer consumers toward digital banking.

“Payments companies such as Visa and Mastercard want to increase the volume of digital payments services they sell, while banks want to cut costs,” wrote Scott. “Branches require staff. Replacing them with standardized self-service apps allows the senior managers of financial institutions to directly control and monitor interactions with customers.”<sup>44</sup>

Some payment processors, such as Visa and Mastercard, as well as intermediaries such as PayPal, offer user protections.<sup>45</sup> The payment processors' contract usually requires the issuing bank to absorb the cost of a fraudulent transaction, according to NerdWallet, a personal finance website directed toward Millennials. The bank could shift the burden of reimbursement to the business that allowed the fraudulent transactions to take place. While a large bank or business may be able to cover serious fraud reimbursement costs, the liabilities could jeopardize the solvency of smaller regional banks as well as smaller businesses.<sup>46</sup>

Other critics say a society that relies too heavily on cashless payments creates privacy concerns. While federal financial privacy laws limit the amount of personal and payment information a financial institution can share with unaffiliated third parties, banks that issue credit or debit cards monitor consumer spending for fraud detection, risk management and marketing. Privacy advocates have raised concerns about how financial institutions could excessively monitor this data. For example, credit card issuers have used detailed credit card information — such as the types of stores where consumers have shopped — to determine how much customers can borrow and at what interest rates.<sup>47</sup>



Supporters of Venezuelan presidential candidate Henri Falcón hold replica \$100 bills at a rally in Caracas in 2018. Falcón, who lost the election, called for swapping Venezuela's devalued currency for the U.S. dollar. American banknotes are favored during times of political upheaval as a way to safeguard assets. (Getty

Images/Bloomberg/Wil Riera)

“Cash is the ultimate privacy protector,” says Paul Stephens, a director of policy and advocacy for the Privacy Rights Clearinghouse, a San Diego-based consumer advocacy group. “Once you start bringing in other forms of payment, there are opportunities for you to be tracked, both by the company that you are paying and by the issuer of the credit card or debit card. And then when you bring a digital payment into the picture, you're adding yet another entity.”



Most peer-to-peer payment services — digital services that allow payments to be sent directly from one user to another, such as Venmo, Zelle and Facebook Payments — reserve broad rights to sell users' data to third parties for purposes that include targeted advertising.<sup>48</sup>

“You need to look at what is being done with your personal information by that new entity,” Stephens says. “Are they just acting as an intermediary and passing the information through without utilizing it in any manner, or are they monetizing that data?” Stephens says that many privacy policy statements sent to consumers are written in highly legalistic language and often do not help inform consumers on how their information is being used.

### Will cash become obsolete?

Demand for cash increases during periods of economic and political uncertainty. During the 1990s and early 2000s, greater demand for U.S. currency coincided with political and economic upheaval in Germany, the former Soviet Union and several Latin American countries as well as in the aftermath of the Sept. 11 terrorist attacks in the United States, according to research by Federal Reserve economist Judson.<sup>49</sup>

She noted that demand for dollars declined around 2002, coinciding with the introduction of the European Union's euro and the stabilization of economies in countries around the eurozone and the former Soviet Union. Then, as the global financial crisis struck in 2008, demand for U.S. dollars increased once again, both internationally and domestically.

Demand for cash continues to grow today.<sup>50</sup> Luther of the American Institute for Economic Research says foreigners may use U.S. dollars in their home countries for both day-to-day transactions and to safeguard their money. “If you're in a kleptocracy and you hold your wealth in a bank account, that's pretty easy to confiscate,” he says. “If you're holding your wealth in the denominated assets of the domestic currency, and that currency experiences really high inflation rates unexpectedly, then you see your wealth eroded.”

For some economists, such as Kenneth Rogoff of Harvard University, the anonymity that cash affords is why it is used for illegal economic activity. “The biggest use of cash — really, by far — in the world is in large-scale real estate transactions, where people are trying to launder money,” he said.<sup>51</sup>

In his 2016 book *The Curse of Cash: How Large-Denomination Bills Aid Crime and Tax Evasion and Constrain Monetary Policy*, Rogoff argued for a society that relies less on cash, although not one that is completely cashless. Phasing out large-denomination bills, such as the \$100 bill, will help to crack down on the underground economy, he said in an interview with *Quartz* last year.

“If someone wants to buy something for a couple thousand dollars and not have anyone know about it, that's one thing. If they want to buy a \$40 million apartment in Trump Tower or pay off a

Columbia University's Best says there is an international dimension to cash real estate purchases. High-wealth U.S. citizens who may try to hide some of their earnings from the IRS “don't have big piles of cash sitting around to buy real estate with,” Best says. “On the other hand, if you think about oligarchs from countries with a weaker rule of law who might actually have large piles of cash and want to park it in real estate in Manhattan, those transactions are likely to be taken first in cash.”

Best thinks transitioning to a cashless economy in order to reduce tax evasion would mainly affect small-business owners and self-employed individuals. “It's important to note that tax evasion by very, very high-wealth individuals or very large corporations has nothing to do with the ability to use cash,” Best says.



Activists in Mumbai, India, protest on the second anniversary of the removal of 500- and 1,000-rupee notes from circulation. Prime Minister Narendra Modi invalidated the notes to crack down on tax evasion and financial crimes, but critics say the move was poorly planned. (Getty Images/Hindustan Times/Bhushan Koyande)

In an effort to crack down on tax evasion and other financial crimes, Indian Prime Minister Narendra Modi in 2016 removed his country's two highest-value notes from circulation. The 500 and 1,000 rupee notes (worth about \$7 and \$14 respectively), which made up about 85 percent of India's currency in circulation, were “demonetized,” or invalidated by the government. The move led to street protests, long lines at banks and ATM machines and cash shortages.<sup>53</sup>

Critics of India's demonetization efforts argue that the move failed to expose unreported wealth. While cashless payments and direct tax collection did increase in the year following demonetization, some analysts said cash use in India has not decreased, and that there had been increases in direct tax collection in the past.<sup>54</sup> “In large part it didn't go well because it wasn't very well planned,” Best says. “There's a very large informal economy in India that operates on cash,

The eurozone's 19 member countries stopped issuing the 500 euro note (worth about \$570) this year. The decision to stop printing the note was made by the European Central Bank (ECB) in 2016, due to the denomination's use in illegal activities. However, in Germany and Austria, the least cashless countries in Europe, the ECB's move was controversial, and both nations delayed the phaseout of the note by three months.<sup>55</sup>

Some critics of going cashless argue that an electronic money system can give too much power to the state, citing past examples when U.S. government agencies used electronic payment systems to police activities. In 2010, the government pressured Visa, Mastercard, PayPal and other financial enterprises to stop processing donations to the whistleblower site WikiLeaks after the organization released thousands of State Department cables.<sup>56</sup>

“How much do you trust government and corporate authorities to run a public banking system in a liberal and open manner, and to not use that power to punish either political ideologies or social behaviors they don't like?” wrote Jeff Spross, a business and economics journalist.<sup>57</sup>

Public distrust of corporate banks also remains a long-standing issue. Even nearly a decade after the 2008 financial crisis, Millennials continued to feel skeptical of big banks and credit issuers, according to a 2017 survey conducted by the World Economic Forum, the international economic think tank. Less than a third of the 30,000-plus respondents said they agreed with the statement that banks are fair and honest.<sup>58</sup>

For many people, the financial crisis demonstrated “that banks can't be trusted, and your money is only as safe as the government allows you to believe,” said Tom Lee, co-founder and managing partner of Fundstrat, a New York-based market research firm. “That's why Millennials today have so little trust in banks, because of what their parents went through.”

Analysts say that enduring distrust in banks is partly why new payment technologies have flourished among younger consumers.<sup>59</sup>

## Background

### Establishing the Dollar

In the country's early history, money took many forms of chaotic value. In colonial America, there was no standard unit of currency. And because the colonists had an unfavorable balance of trade with the mother country, Great Britain, most British money circulating in the colonies was quickly returned to England to pay for imports.

For everyday purchases, colonists used the Spanish dollar, which circulated throughout the New World, especially from trade in the West Indies and Mexico.<sup>60</sup> They also used commodities — such as tobacco leaves, beaver skins, sugar, rice and shells — as money. However, these items'

In the 18th century, local colonial governments issued two types of paper currency: commodity-backed money and fiat money. Commodity-backed money included paper notes issued by land offices, which allowed colonists to use their land as collateral for debts and to pay interest in gold and silver coins.<sup>62</sup> Colonial governments also issued fiat money, or money without intrinsic value but with value established by users' faith in the issuing party.

One example of fiat money was the Continental, currency issued by the Continental Congress in 1775 to help finance the Revolutionary War and backed by anticipated tax revenues.<sup>63</sup> Continentals quickly lost their value, however, because the Continental Congress did not properly manage the amount in circulation and the British mounted a massive counterfeiting effort.<sup>64</sup> By 1781, Continentals had become worthless and ceased to circulate.<sup>65</sup>

After the federal government was established in 1789, Treasury Secretary Alexander Hamilton helped create a modern financial system for the new country and defined the U.S. dollar as backed by reserves of gold and silver. Hamilton also founded a national bank, the Bank of the United States, prompting state legislatures to charter more local banks. By the mid-1790s, a banking system had taken root in the United States that facilitated the growth of the national economy.<sup>66</sup>

However, the Bank of the United States was politically controversial. State governments reaped revenue from local banks through chartering fees, taxes and dividends earned from investments in the banks. Some state bankers resented how a national bank could compete directly with local banks.<sup>67</sup>

Congress rejected renewal of the national bank's charter in 1811. The Second Bank of the United States was established five years later, but President Andrew Jackson vetoed its rechartering in 1832, and the United States ceased to have a central bank until passage of the Federal Reserve Act of 1913.<sup>68</sup>

Throughout the first half of the 19th century, the country also lacked uniformity in banknotes. The national government provided currency only in coins, while individual banks issued several denominations of their own paper money. By 1860, there were several thousand different banknotes circulating in the country, each printed with the name of an individual bank and its promise to redeem the note in coins. The value of these banknotes fell the further they traveled from the issuing bank, and counterfeit currency thrived.<sup>69</sup>

In 1861 and 1862, Abraham Lincoln's Union government issued the country's first general circulation of paper money, called demand notes, as a way to pay for the costs incurred during the Civil War. The demand notes were printed with green ink, leading to the name "greenbacks." In 1862 they were replaced by United States notes, also known as legal tender notes.<sup>70</sup> The Confederacy issued its own currency.



different currencies were still in circulation in the Union states alone. But with the creation of a new banking system, chartered by the federal government rather than by individual states, a common national currency could be issued and accepted across state lines. Banknotes became a liability of the federal government, rather than that of state-backed banks.<sup>71</sup> However, the country still lacked a central bank to oversee monetary policy, which contributed to a series of financial panics following the Civil War.<sup>72</sup>

The Federal Reserve Act of 1913 established the Federal Reserve system, a central bank with 12 regional banks to oversee monetary policy — management of the nation's money supply and interest rates — and promote economic stability.<sup>73</sup> The Fed, as it came to be known, operated a national check-clearing system and introduced Federal Reserve notes denominated in U.S. dollars, the type of banknote still used today.<sup>74</sup> The Fed was authorized to print new currency, set interest rates and buy and sell U.S. Treasury debt.<sup>75</sup>

International recognition of the U.S. dollar as the world's reserve currency emerged at the end of World War II. In 1944, delegates from the Allied nations gathered in Bretton Woods, N.H., to establish an international monetary system and stabilize exchange rates.<sup>76</sup> At the time, the United States controlled two-thirds of the world's gold, which gave U.S. negotiators leverage to successfully argue that the Bretton Woods system should rest on both gold and the U.S. dollar. An international payments system was developed in which all other currencies were defined by their relationship to the dollar, which was convertible to gold.<sup>77</sup> This forced other countries to keep sufficient reserves of U.S. dollars, as well as other securities, to maintain fixed exchange rates.<sup>78</sup>

In the early 1970s, when some countries and currency traders increasingly began demanding gold for the dollars they held, the United States did not have enough gold to cover the global volume of dollars at the set price of \$35 per ounce. In 1971, President Richard M. Nixon severed the link between the dollar and gold. This ended the Bretton Woods system and transitioned the U.S. dollar from a representative currency — money that could be exchanged for items of value such as precious metals — to a fiat currency, or money with a value based upon the perceived stability of the government issuing it.<sup>79</sup>

## Payment Technologies Evolve

With the circulation of money came the problem of how to use it to efficiently transact business. In the late 18th century, banknotes with face values of \$500 or higher were used in the United States primarily for interbank transfers and real estate purchases.<sup>80</sup> In 1780, North Carolina issued the first \$500 note; in 1781, Virginia printed \$2,000 notes.<sup>81</sup> With the absence of federal paper money, the U.S. government issued high-denomination Treasury notes to fund short-term national debts in periods of financial stress, such as the War of 1812 and the Mexican War of 1846-48.<sup>82</sup>

In 1865, the government printed the first gold certificates, a form of U.S. paper currency backed by

\$5,000 and \$10,000 were printed in 1945 but discontinued in 1969 due to lack of use.<sup>85</sup> While the main purpose of these bills was for bank transfer payments, the Federal Reserve banks in 1918 had begun using an electronic funds transfer network using a Morse code system, which later evolved into the Federal Reserve Wire Network.<sup>86</sup>

The post-World War II economic and population boom increased consumer demand for products, as well as the volume of bank checks that had to be processed.<sup>87</sup> The number of checking accounts opened by American consumers roughly doubled between 1939 and 1952.<sup>88</sup>

In 1950, check clearing — the process in which funds move from a repository account to a recipient account — was so slow and labor intensive that it threatened to overwhelm banks' operational capacities. By 1955, the Stanford Research Institute, a scientific research organization, developed an automated check bookkeeping and proofing system, which laid the groundwork for future payment systems.<sup>89</sup>

The credit card was another major development in payment technologies. The first credit cards originated in 1928 as metal cards issued by individual stores to select customers, who paid the full balance each month.<sup>90</sup> In the 1940s, department stores introduced credit cards with revolving credit, which allowed cardholders more time to pay balances while continuing to charge new purchases to their accounts.<sup>91</sup>

In 1950, Diners Club introduced the first universal credit card, which could be used at a variety of establishments. American Express, the financial services company, launched a paper credit card in 1958.<sup>92</sup> Banks began issuing credit cards in the late 1950s. Bank of America issued the BankAmericard in California in 1958, which evolved into a national plan in 1966 and was renamed Visa in 1976.<sup>93</sup> Also in 1966, a group of California banks launched the credit card company Mastercard.<sup>94</sup>

The automated teller machine (ATM), first introduced by Barclays Bank in London in 1967, allowed consumers more convenient ways to access their bank accounts without a bank teller's assistance. Two years later, Chemical Bank installed an ATM in Long Island, N.Y.<sup>95</sup>

The world's first ATM, unveiled at a Barclays Bank just north of London on June 27, 1967, quickly drew a crowd. (Getty Images/Mirrorpix/Tom King)



The debit card was first issued in 1978 by the First National Bank of Seattle. Credit card use paved the way for debit card adoption, and in 1984 Landmark Bank created a nationwide ATM and debit card system.<sup>96</sup>

In the 1990s, as computer use increased and more Americans gained access to the internet, the first online banking and shopping platforms emerged. In 1994, Stanford Federal Credit Union began offering customers online banking.<sup>97</sup> That same year, the Internet Shopping Network and NetMarket made the first retail transactions over the internet, requiring customers to download software to securely transmit their credit card information online.<sup>98</sup> In 1995, the e-commerce websites Amazon and eBay opened and gradually normalized the practice of paying for things online.<sup>99</sup> PayPal was launched as part of a Palo Alto, Calif., company called Confinity in 1999 to support worldwide money transfers.<sup>100</sup>

Throughout the 2000s, online banking and shopping grew rapidly, and consumer habits shifted toward making more financial transactions over the internet.<sup>101</sup> The number of U.S. consumers who bought or researched a product online roughly doubled between 2000 and 2007, according to a Pew report. And the share of Americans who used online banking grew from 9 percent to 39 percent over the same period, the report said.<sup>102</sup>

Also in 2008, an unidentified person, or group of people, released a white paper titled “Bitcoin: A Peer to Peer Electronic Cash System” under the pseudonym Satoshi Nakamoto. Bitcoin, the first cryptocurrency, utilized a digital ledger called blockchain to record and protect the security of



In 2010, financial service providers, such as the mobile payment company Square Inc. and the online payments processing company Stripe, emerged to allow online and brick-and-mortar businesses more ways to process card and digital payment transactions.<sup>104</sup> In 2011, the debut of the Google wallet allowed consumers to pay for goods with their mobile device rather than a physical card.<sup>105</sup>

In 2013, Apple introduced a biometric security feature in the form of a fingerprint scan to unlock its iPhone 5S. Soon after, Apple's iPhone payment service, Apple Pay, used a fingerprint scan to authenticate transactions.<sup>106</sup> The mass adoption of mobile devices has played a key role in the wide acceptance of biometric security features in mobile devices and digital financial services.<sup>107</sup>

## Current Situation

### Banking Barriers

In April, an Amazon executive announced to employees that Amazon Go will begin accepting cash.<sup>108</sup> The first Amazon Go store had opened in 2016 on the e-commerce giant's campus in Seattle with no cashiers or checkout lines. The stores automatically detected products removed from the shelves, and customers were charged via a mobile app upon exiting.

Amazon Go's reversal of its no-cash policy came as a growing number of cities and states banned most cashless retail stores and restaurants.<sup>109</sup>



Amazon Go employee Mari Avellaneda stocks shelves using a mobile device at a Seattle location. Amazon Go stores began accepting cash in April after being cash free since 2016. (Getty Images/Stephen Brashear)



Some retail business owners assert that the process of cash handling and reconciliation has become more difficult because banks themselves are moving away from cash. “The number one obstacle we’re seeing right now in the industry is that banks have been resistant to handling customers’ cash,” said Dean Fox, a director of finance at Paradigm Investment, which owns the chain restaurants Hardee’s and Jersey Mike’s.

Fox said many banks have stopped counting cash at the time of deposit, postponing the tallying until later. This causes delays for retail businesses in verifying the amount of cash they have at the close of business, he said. <sup>110</sup>

Owners of cashless businesses have argued that eliminating cash improves workers’ safety and operational efficiency. Going cashless also frees up workers’ time to serve customers rather than having to make change, go on bank runs or manage accounting books. Eliminating cash also reduces losses from robberies or employees’ difficulties in counting change, they said.

At a New York City Council hearing in February, industry representatives from three cashless businesses spoke against a ban on cashless establishments. “By not keeping any cash in our stores our employees feel safer, especially in our preopening and closing hours when our stores are relatively empty,” said Annamária Ferencz, a regional director for ByChloe, a vegan restaurant chain.

In response, council member Ritchie Torres said: “Some of these businesses have endured for more than 100 years, accept cash and are able to operate smoothly and efficiently and safely in the Bronx, which is probably much tougher than some of the neighborhoods in which you operate.” Council members have not yet scheduled a vote on the cashless ban. <sup>111</sup>

Despite the backlash against cashless establishments, some experts argue that laws banning cashless brick-and-mortar businesses are not long-term solutions. <sup>112</sup> They point to underlying issues regarding financial inclusion for people without bank accounts or credit cards, such as the accessibility and affordability of banking services. “The future does not lie in” banning cashless businesses, Rogoff, the Harvard professor, said. “The future lies in giving people free debit cards and financial inclusion.” <sup>113</sup>

Adams, the fair lending consultant, points to barriers that inhibit financial inclusion, such as lack of access to bank branches and digital services. “Many of the unbanked and underbanked live in banking deserts, so they don’t have ready access to banking services,” Adams says. “A lot of the unbanked are also in digital deserts, and so access to some of the alternatives is also very difficult for them.”

Mehrsa Baradaran, a law professor at the University of Georgia who specializes in banking law, argues in her book *How the Other Half Banks: Exclusion, Exploitation and the Threat to*

U.S. Postal Service Inspector General's Office that post offices could serve as a public banking option, especially in low-income communities underserved by commercial banks.

"There have never been barriers to entry at post offices, and their services have been available to all, regardless of income," Baradaran wrote. "And so, it is not unreasonable to suggest that as America's oldest instrument of democracy in action, the post office can once again level the playing field."<sup>114</sup>

Some political analysts have suggested that postal banking will become a part of the economic agenda for the Democratic Party in the 2020 presidential campaign.<sup>115</sup> In April 2018, Sen. Kirsten Gillibrand, D-N.Y., announced legislation to create a postal bank.<sup>116</sup> In May, Sen. Bernie Sanders, I-Vt., and Rep. Alexandria Ocasio-Cortez, D-N.Y., outlined a plan to create postal banking services as part of the Loan Shark Prevention Act, which aims to combat predatory lending.<sup>117</sup> Gillibrand and Sanders are presidential candidates.

Adams says she thinks the United States will become a cashless society at some point in the future, but that fundamental changes must first be made regarding the accessibility of banking and credit.

"Moving to a cashless society also means that we have to move to a different model in terms of fees and services on using apps or debit cards," she says. "You want to make sure that when we go to a cashless society, that we're not cheating workers out of their fair wage by using fees to access the money [they] earn."

Financial education experts argue that cashless transactions can make people, including children and young adults, less aware of the value of money, hindering their ability to make sound financial decisions. "The fact that we don't see cash, that we don't even feel the payment, makes [us] less focused on it," says Annamaria Lusardi, the academic director of the Global Financial Literacy Excellence Center at George Washington University.

Studies have shown that shoppers spend more and make poorer buying decisions when making noncash payments. Consumers are willing to pay up to double for an item when using a credit card, a 2000 study by the Massachusetts Institute of Technology's Sloan School of Management found.<sup>118</sup> A 2010 study by Cornell University's Johnson Graduate School of Management found that consumers felt parting with physical currency was more "painful" than paying for items with a credit or debit card, where payment could be delayed. The study also found that credit card payments weakened impulse control and resulted in shoppers buying more unhealthy foods than when they paid in cash.<sup>119</sup>

## Blockchain Investigations

Some cashless advocates believe cryptocurrencies such as bitcoin can serve as a cash alternative

Chainalysis, a blockchain analyst company, however, reported that most cryptocurrency was held as an investment rather than as a medium for exchange.<sup>120</sup>

Blockchain technology, the ledger in which cryptocurrency transactions are recorded, may provide the future infrastructure for central banks and other financial institutions to address issues regarding privacy, security and cyber resilience. Blockchain is a type of distributed ledger technology (DLT), a system in which transactions are recorded via multiple computers rather than in a centralized database.<sup>121</sup>

Ashley Lannquist, the project lead of blockchain and DLT at the World Economic Forum, says consumers are deterred from using cryptocurrency in everyday transactions because of logistical difficulties and low merchant acceptance, as well as the hope that cryptocurrency value may increase over time. “I think many countries like the U.S. will see greater use of mobile phone apps and cashless transactions, mostly from non-DLT-based services,” Lannquist says. “We’ll also likely see an increase in DLT-based payments, but I think adoption will remain challenged.”

Dozens of central banks currently are researching blockchain and other types of DLT to investigate long-standing interests, including retail central bank digital currency — a form of state-backed electronic currency — and to improve payments system efficiency and security, according to a 2019 white paper published by the World Economic Forum.<sup>122</sup>

The Bank of France has already successfully deployed a DLT-based application to automate and digitize a system for smart contracts, according to the white paper.<sup>123</sup> (A smart contract is a self-executing agreement in which the terms are written into computer code and automatically take effect when the conditions are fulfilled.)<sup>124</sup> Some central banks, such as South Korea’s, are conducting blockchain research with peer institutions in an effort to transition into a “coin-free society,” reported TokenPost, a South Korean news site.<sup>125</sup>

Lannquist says central bank researchers are still investigating whether DLT could help lower — or increase — risks of cyberattacks. However, the case for DLT improving operational resilience is the clearest, she says. “Because data and transactions are stored and operate in a decentralized manner across several ‘nodes’ or computers, the system has greater data redundancy and robustness against hardware faults in one or two servers,” Lannquist says.

Duke’s Harvey says blockchain is facilitating the issuance of new currencies that can compete with the state-issued money system. “Traditionally, the idea was to collateralize [currency] with gold, silver, public stocks, land,” Harvey says. While the U.S. dollar is a fiat currency, blockchain-based cryptocurrencies can be collateralized by a variety of assets.

JPMorgan Chase, the largest bank in the United States, announced in February a successful pilot of its own digital coin, called JPM Coin, based on blockchain technology. While each JPM Coin is

currency,” Harvey says. “Now, we’re going back to that system, where every bank will have their own currency.”

In June, Facebook announced it would develop a cryptocurrency called Libra with the goal of making it a stable global currency. Scheduled to launch in early 2020, Libra will be backed by a reserve of real assets, such as gold, and the interest on the assets will ensure low fees for users, Facebook said. Libra will be governed by an association that includes founding members that invested at least \$10 million each into the project, among them Visa, Uber, eBay and PayPal.<sup>127</sup>

## Outlook

### More Ways to Pay

While cash use will vary throughout the world in the coming decades, many experts think the future of consumer payments in the United States will include a greater variety of digital payment systems and currencies.

“We’re obviously headed in a direction where there is going to be more digital payments,” says Stephens of the Privacy Rights Clearinghouse. “It sets up a number of challenges for both legislators and regulators to come up with a framework that can protect consumers who are going to be using digital payments.”

Hughes, the Indiana University law professor, thinks the future of payments in the United States may not be in cash, cards or even with mobile devices. “The idea that the phone is going to be the principal repository of potential tools for payment purposes may be shortsighted,” she says.

Levine, the global trends consultant, foresees a future in which “we won’t have cards. It’ll be biometric,” such as Apple’s fingerprint scan. “It’s starting now. There are biometric payments already. One thing in the forefront is that the culture has to get used to it to accept it.”

Arnold, the cybersecurity expert, says a variety of institutions, including financial services, airport security and border protection, are increasingly using biometric authentication. He cited the Face ID security feature debuted by Apple’s iPhone X in 2017 that uses facial recognition to unlock the device, which then authorizes payments in the mobile wallet Apple Pay.

“It’s always been a very interesting marketplace to watch and to track when you see relatively new behaviors,” Arnold says. “It’s a long time to evolve a payment system.”

Payment analysts say U.S. consumers have been more reluctant to adopt mobile payments than those in other countries.<sup>128</sup> “We still have so many people who like the payment services that they have,” says Hughes. “Unlike some parts of the world, we have so many choices that it keeps us from being ready adopters of new options. In a sense, even cards are legacy systems.”



Some banking experts think the U.S. electronic payments system is fragmented and inefficient compared to other advanced economies, and that cash will remain more popular in the United States for longer than elsewhere. The global ubiquity of the U.S. paper dollar also places the United States in a unique position, experts say.

Researchers say governments that oversee large cash-based informal economies will likely become more interested in transitioning to electronic money systems. “The sheer scope of the problem is there is so much tax evasion in countries with big informal sectors,” says Best, the Columbia economist. “The fact that more and more transactions are electronic does seem extremely promising to crack down on tax evasion.”

Globally, the future role of cash will evolve as competition from cashless payments continues to increase. “As superior transaction technologies come along, the use of cash is declining,” Rogoff said. “And I think we’ll reach a tipping point where, regardless, central banks are going to find themselves having to buy back a lot of the cash supply. But that could take three or four decades. I would just say, we’re doing a lot of damage [by transitioning to cashless payments] now.” <sup>129</sup>

## Pro/Con

Will paper currency become obsolete in the United States?

### Pro



**Nash Foster**

CEO and co-founder, Pyrofex Corp.. Written for *CQ Researcher*, July 2019

Civilizations have used metal coinage for more than 5,000 years and paper money for nearly 1,500 years, but the explosive growth in mobile technology and the internet promises to make these ancient methods of payment obsolete within just a few years.

Money has always been used to conduct transactions, but both savings and debt also have social meaning, affecting social rank and people's perceptions. Moreover, while Americans are accustomed to doing business with global corporations, transactions still occur often between friends and acquaintances and are a natural part of our everyday social network.

No wonder, then, that the inherently social nature of internet communications affects how we think about and use money. Some applications are explicitly social, such as Venmo's default public wallet that lets friends see how one is spending money. Other applications, such as WePay, simply leverage the existing social network technologies to facilitate easier and faster payments. And the coming cryptocurrency revolution will allow people to interact with self-executing smart contracts that use the internet's social features for everything from small-scale

social function more thoroughly and flexibly than ever before. In some deep sense, this makes digital money “more real” than physical currency could ever be.

To observe the obsolescence of physical cash, we need only look at existing statistics. Across a variety of retail environments — from department and discount stores to gas stations and restaurants — debit and credit cards already have begun to dwarf the use of cash. According to data from payment processor TYTS, there are no retail environments remaining that use cash for most transactions. Optimistic predictions about how quickly Americans would move to a cashless society notwithstanding, the use of cash continues to plummet precipitously. The Federal Reserve reported that between 2011 and 2016, the share of Americans using cash for all transactions dropped from 19 percent to 10 percent.

It is hard to imagine a world where paper money and coinage ceased to exist. Technologies as venerable as these rarely die completely. But they are often relegated to performing extremely limited functions that exploit their few advantages over improved technologies. In an increasingly social world, where payments are increasingly integrated into our mobile-first, internet-driven lives, it seems inevitable that cash will become obsolete, and statistics suggest this future is already closer than many think.

## Con



**Brett Scott**

Journalist and author of *The Heretic's Guide to Global Finance: Hacking the Future of Money*. Written for *CQ Researcher*, July 2019

There are no citizens campaigning for the end of cash, but there are large companies doing so. For decades, banks and payments companies such as Visa have waged a “war on cash” for commercial reasons. Recently, for example, Amazon lobbied against legislation in Philadelphia requiring businesses to accept cash. Critics of the city's policy say it damages “innovation.” What they really mean is that it hampers *automation* — cash doesn't play well with Amazon's desire for fully automated systems.

The digital payments industry tries to present cash as the horse-drawn carriage of payment methods, but for many people, cash is more like a bicycle: They may not use it for every transaction, but they enjoy keeping it as an option. In advance of hurricane landfalls, demand for cash spikes by up to 500 percent because people don't want their money trapped in cyberspace when the electricity goes down. As the saying goes, cash doesn't crash.

“Going cashless” actually refers to the process of becoming more dependent on the banking system. Digital payment firms like the term “cashless society” precisely because it is so misleading — like referring to whisky as beer-less alcohol. We should instead call it the *bankful* society, since cashless payments is just a convoluted way of saying bank transfers.

In many countries, though, the payments industry helps determine how the issue is framed. Every time the media interviews me on the dangers of the bankful society, the interviewer inevitably says, “but surely we all just want convenience,” as if the only thing people value is laziness. This channels the biased terms of debate established by the industry and ignores the deep politics of being dependent on banks' digital money.

It is actually not obvious that digital payment is much more convenient than cash, especially when the electricity goes out. Regardless, it's the wrong focus. Maintaining good body posture and eating healthily also appear “inconvenient” in the short term. Likewise, maintaining the resilience, privacy and openness of our payments system can superficially appear inconvenient. But if convenience means becoming dependent on financial institutions that have repeatedly proven they do not have our best interests at heart, it is not something to strive for.

The people least concerned about having banks insert themselves into every transaction (enabling fine-grained financial surveillance) are high-status urban professionals who consider it obvious that everyone should desire institutionally mediated, frictionless commerce — and that the spread of digital payments is thus a *gentrification* process. If you don't believe me, just look at which shops lead the anti-cash charge.

## Chronology

### 1600s–1860s

U.S. experiments with early forms of banking and currency.

#### 1600s

American colonists use the Spanish dollar coin, commodity money (such as animal pelts or other objects of widely accepted value) and paper money issued by colonial governments as mediums of exchange.

#### 1775

Continental Congress issues Continental currency to help finance the American Revolution, but it quickly depreciates and is worthless by 1781.

#### 1791

Treasury Secretary Alexander Hamilton founds the First Bank of the United States, partly to create a common currency.

#### 1811

Congress narrowly rejects renewal of the First Bank of the United States' charter, partly because state banks fear competition from a national bank.

#### 1816

Second Bank of the United States is established. President Andrew Jackson vetoes its recharter in 1832 and redistributes its money among various state banks in 1836, ending the bank's operations.

#### 1861

President Abraham Lincoln's government issues demand notes, a type of paper money, to finance Union participation in the Civil War. The Confederacy, initially formed by seven states that seceded from the United States, issues its own paper currency, the Confederate States dollar.

1862

United States notes, also known as legal tender notes, replace demand notes as paper currency.

1863

The National Banking Act of 1863 establishes a national banking system and currency, and an 1865 revision levies a tax that effectively abolishes state-backed currencies.

### 1900s–1960s

The credit card industry take shape.

1913

The Federal Reserve Act establishes the Federal Reserve system, which introduces Federal Reserve notes, the paper currency now used throughout the United States.

1928

First credit cards, made of metal and called Charga-Plates, are issued by certain stores to select customers.

1944

Bretton Woods Conference, organized by Allied nations to create an international monetary policy after World War II, establishes the U.S. dollar as the global reserve currency and ties the dollar's value to U.S. gold reserves.

1950

Diners Club introduces the first credit card that can be used at a wide variety of establishments.

1955

Stanford Research Institute develops an automated bookkeeping system to speed up check processing.

1958

Bank of America issues its first BankAmericard credit cards in Fresno, Calif., an effort that goes national in 1966 and is renamed Visa in 1976.

1966

A group of California banks launch Mastercard.

1969

Chemical Bank installs the nation's first ATM on Long Island, N.Y.... Advances in electronic banking technology make Federal Reserve notes of \$500 and above obsolete.



## Banking and credit card payments move online.

1971

President Richard Nixon severs the link between the U.S. dollar and gold, ending the Bretton Woods system.

1978

First National Bank of Seattle issues nation's first debit card, which functions like a check.

1984

Landmark Banking Corp. establishes a nationwide ATM and debit card system.

1994

Stanford Federal Credit Union in California becomes the first financial institution to offer online banking.... In the first e-commerce sales transaction, a Philadelphia resident uses a credit card to buy a CD through a New Hampshire website called NetMarket.

1995

E-commerce websites Amazon and eBay launch.

1999

PayPal is established as part of a Palo Alto, Calif., company called Confinity to facilitate worldwide money transfers.

2000s–

Present

Mobile payment apps debut.

2008

Blockchain is introduced as the digital ledger for bitcoin cryptocurrency.

2010

Online payments processing company Square launches in San Francisco, expanding the number of brick-and-mortar stores and independent businesses that accept credit card and electronic payments.... Technology company Stripe launches in San Francisco to allow people and companies to make and receive credit card payments over the internet.

2011

Google Wallet (now known as Google Pay) debuts, allowing customers to make purchases using a mobile device.

2013

The iPhone 5S offers a fingerprint scanner that Apple later adapts to authenticate Apple Pay online purchases.

2017

The \$100 bill becomes most popular U.S. currency in circulation around the world.

2019

States and cities increasingly enact laws requiring most brick-and-mortar businesses to

## Short Features

### Sweden Moves Toward National E-Currency

E-krona may be offered to public for everyday use.

Sweden is well on its way to becoming the world's first cashless society.

Use of cash continues to decline in the country of 10 million. Only 13 percent of Swedes paid for their most recent purchase in cash, according to a 2018 survey by the Riksbank, the country's central bank.<sup>1</sup> Researchers at the Copenhagen School of Economics have predicted that cash could be obsolete in Sweden by 2023.<sup>2</sup>

To prepare for that possibility, the Riksbank will operate a pilot project from 2019 to 2021 to test the need for a state-backed electronic currency called “e-krona” — named after the country's basic monetary unit — that would be offered to households and companies as a complement to cash.<sup>3</sup>



A shopper uses a Swedish 50 kronor note at a grocery store in Stockholm. Cash may be obsolete in Sweden by 2023, one study has predicted. The government is researching ways to prepare for a cashless society. (Getty Images/Bloomberg/Mikael Sjoberg)

Sweden's move away from cash is rooted in the country's culture of trusting institutions and new technologies, said Claire Ingram Bogusz, a researcher at the Stockholm School of Economics. “The convenience of having your bank account, your money at your fingertips and increasingly on your smart watch vastly outweighs any concerns that [Swedes] have about security or about being tracked,” Bogusz said.<sup>4</sup>

The e-krona project aims to address concerns that the Riksbank has linked to the rapid decline in use of cash. An electronic currency could, for example, provide a parallel system to help the country weather severe economic downturns, some experts say.<sup>5</sup> Swedish officials “want to

financial crises, or even in the case of a war,” says Konstantinos Georgantas, a researcher at the Warwick Business School in the United Kingdom who has studied Sweden's e-krona initiative.

In 2018, Swedish financial authorities asked banks to continue offering cash to citizens, as government officials figure out ways to deal with the potential consequences of a cashless society.<sup>6</sup> A cashless money system can marginalize groups of people who rely on paper currency, such as the elderly, people with disabilities and those without bank accounts. It could also be vulnerable to cyberattacks or power outages, critics of the cashless trend say.<sup>7</sup> The e-krona would reduce this vulnerability by creating an independent, alternative payment system, Riksbank Governor Stefan Ingves said last year.

The Swedish government has warned citizens that giving up on cash completely may not be wise, and it distributed leaflets advising households to set aside some cash in case of a national crisis.<sup>8</sup>

For daily transactions, however, the Riksbank project proposes letting Swedes access e-krona that is stored on a card or a mobile app or held in an account at the Riksbank. Both options will be supported by an electronic platform that will contain an underlying central register for recording transactions. The register will make e-krona transactions traceable, the bank's second report on the e-krona project said.<sup>9</sup>

The Riksbank has said that e-krona will differ from bitcoin and other cryptocurrencies because, while cryptocurrencies have no official issuer, e-krona would be issued by the central bank and have the same value as banknotes and coins.<sup>10</sup>

The bank is considering a variety of technical systems to support e-krona, with particular emphasis on security and reliability, the second project report on e-krona said.<sup>11</sup>

The Riksbank will also explore changes to banking laws that would allow the bank to issue e-krona to the public. While the central bank currently offers money in the form of electronic transfers to commercial banks, “we're not supposed to offer accounts to citizens, so Parliament will need to make a decision on whether to allow this,” said Monika Johansson, a lawyer and adviser at the Riksbank's payments department.<sup>12</sup>

The Swedish Parliament would also have to act to include e-krona in the country's definition of legal tender, according to Trijo, a Swedish cryptocurrency news site.<sup>13</sup> If e-krona becomes legal tender, the Riksbank would become a source of competition with private banks and payment service providers, experts say. “The Riksbank now is basically the bank of banks,” Georgantas says. “Its customers are the banks themselves. But [Riksbank] would open up to the public and let people move their money into the central bank. The pushback from the commercial banks is expected to be strong.”

A majority of Swedes were skeptical of the e-krona initiative, a 2018 survey conducted by the

respondents said they wanted paper currency around as a payment option, the survey found.<sup>14</sup>

Bogusz, the Stockholm School of Economics researcher, said digital security and surveillance issues have created some skepticism about a completely cashless society. “There is a very, very large number of people who ... don't think that the state should be trusted as blindly as many do,” she said.<sup>15</sup>

While Sweden is a forerunner in cashless commerce, some 40 other countries are also experimenting with or planning to research state-issued electronic currencies, according to the World Economic Forum.<sup>16</sup>

— **Hannah H. Kim**

[1] “The Riksbank's e-krona project, Report 2,” Sveriges Riksbank, October 2018, <https://tinyurl.com/y6ldc36s>.

[2] Kyree Leary and Chelsea Gohd, “Sweden could stop using cash by 2023,” World Economic Forum, Oct. 11, 2017, <https://tinyurl.com/yxfeurt6>.

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## Mobile Payment Systems Attract Younger Consumers

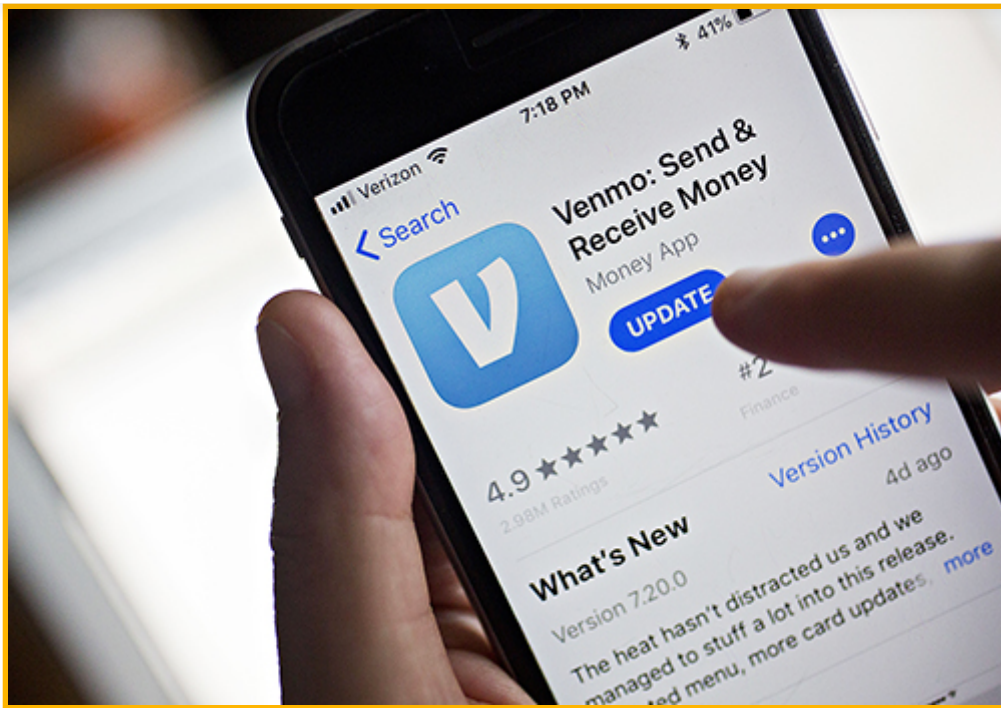
“GenZers want their mobile wallets to think for them.”

Younger Americans have embraced the digital wallet — but they want more than just convenience from it, experts in payment trends say.

Millennials (defined as those born between 1981 and 1996) and Generation Z consumers (born after 1996) make up more than 70 percent of U.S. mobile payment users, a survey by the Pew Research Center, a Washington research organization, found.<sup>17</sup> About a third of Millennials believed the future will be cashless, according to a 2015 survey by LinkedIn, the online social network, and Ipsos, a global market research firm.<sup>18</sup>

Experts say that the high adoption rates of payment service technologies among younger consumers will continue to reshape the finance industry. A cashless society is “a matter of time,” although it will not arrive immediately, said Michael Vaughan, the chief operating officer at payment service provider Venmo. “It's going to take our lifetime and our kids' lifetime before you start to see this work itself out.”<sup>19</sup>

Venmo, a peer-to-peer payment app, allows users to transfer money directly. Younger consumers favor such payment methods, as more than 70 percent of mobile app users are Millennials or Gen Zers, according to the Pew Research Center. (Getty Images/Bloomberg/Andrew Harrer)



Millennial and Gen Z consumers have payment preferences that contrast sharply with those of their parents' and grandparents' generations, according to a 2017 study by the global consulting firm Accenture. Younger adults and teenagers grew up in the digital age and are the leading adopters of new payment technologies, the study found.<sup>20</sup>

Gen Z is “likely to be the first generation to forgo the leather wallet for the digital wallet,” the Accenture report said. “GenZers want their mobile wallets to think for them. One example would be a wallet that automatically chooses the card that offers the best reward or savings.”<sup>21</sup>

But some researchers warn that mobile payments may encourage risky attitudes regarding spending and debt. Millennials who use mobile payment apps were more likely to be poor money managers than those who do not use such apps, according to a 2017 study by researchers at the George Washington University School of Business. App users, for example, were more likely to overdraw their checking accounts and accrue fees on their credit cards, the study found.<sup>22</sup>

The George Washington study does not argue that there was a causal relationship between using mobile payments and increased spending or debt, says Annamaria Lusardi, the lead researcher on the study and academic director of the university's Global Financial Literacy Excellence Center. But consumers using cashless payment systems may be less aware of the consequences of spending than those who use cash, she says. “What could happen is that people who are prone to using mobile payments are also those who pay less attention to their finances,” Lusardi says.

While Millennials are the first cohort to widely embrace digital payments, they are less inclined to use credit cards and are actually more debt-averse than older generations, experts say.<sup>23</sup> Analysts attribute the aversion to credit cards largely to the 2007-09 financial crisis and to the cost of paying

Members of Gen Z, the oldest of whom were children during the crisis, also have developed a more conservative approach to finances and debt, researchers say. More than 75 percent of them, including teenagers, are working, and more than 30 percent have their own a bank account, according to a study by Raddon Research, an Illinois-based research firm.<sup>[25]</sup>

Even as the economy has stabilized in recent years, Lusardi says that there continues to be consequences from the high amount of debt that adults carry. “It’s a constraint on people and what they can do,” Lusardi says. “Young people start their economic life in debt, [which can result in] loss of opportunities, whether that’s being an entrepreneur or undertaking some careers.”

In the first quarter of 2019, U.S. consumer debt rose for the 19th consecutive quarter to reach \$13.67 trillion, according to the Federal Reserve Bank of New York. However, average credit card balances fell by 2.5 percent.<sup>[26]</sup>

The younger generations’ attitudes toward payment technologies and debt may indicate that there is a demand for services in budgeting, savings and planning that financial technologies and financial literacy programs can address. “It is obvious that we are moving toward an economy where information and knowledge is truly essential,” Lusardi says. “Technology gives us a lot more opportunities, and we need to be able to use these opportunities well.”

— **Hannah H. Kim**

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U.S. central bank that sets monetary policy and determines the amount of new currency produced each year.

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Sweden's central bank, which is researching the development of an electronic currency to largely replace cash.

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Treasury Department agency that produces U.S. coinage.

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[www.moneyfactory.gov](http://www.moneyfactory.gov)

Treasury Department agency that produces U.S. paper currency.

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