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Payment Systems Evolution: How Does Money Move from a Buyer to Seller?

Mike Kaiman, Senior Economic Education Specialist

READING GUIDE

"Americans rely on the payment system all day every day to make purchases, pay bills, and get paid—without ever needing to consider the complex infrastructure that is operating under the hood."[1]
—Lael Brainard, Former Vice Chair, Board of Governors of the Federal Reserve System

Introduction

For many people, purchasing goods and services with cash is as outdated as downloading MP3 music files and talking on a landline telephone. The options available for consumers and businesses to pay for items has spread out of the wallet and into the smartphone with cashless transactions. Debit cards, cash transfer apps, and virtual wallets have all displaced currency in the past decade.

While most people think of **money** as widely accepted, the payment systems most Americans use without hesitation comprise a vast network—one that took decades to build and is still evolving thanks to new developments in technology. It's an **infrastructure** that applies to financial tools needed in an economy. In this article, we dive headfirst into the "financial plumbing system" of the United States to see what it takes to maintain such a vast structure in an age of rapid technological change, and what central banks are doing to monitor and regulate the systems.

Background Knowledge

In the space below, describe the different ways you pay for goods and services. What is the appeal of using money to buy things?

1970s consumer credit card, courtesy of Mike Kaiman.

What Kind of Payment Systems Exist in the US?

The movement to cashless payment systems in the US has been a successful one built by private companies and financial services firms. In 1950, the Diners Club card became the first modern-day credit card. In 1973, American Express adopted the magnetic strip that allows for cashless transactions. By the end of the 1970s, **debit** cards began to emerge as an alternative to writing checks or carrying cash.

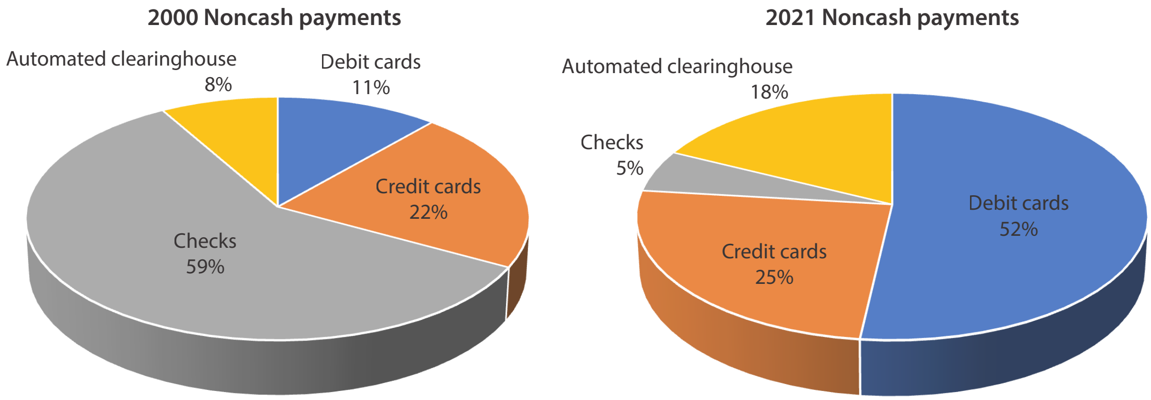
Since their introduction, debit cards have used the same payment verification system as credit cards, which is why they also carry the credit card logo (e.g., Visa or MasterCard). Because of the costs to build, maintain, and expand this payment system, companies such as Visa and MasterCard charge a transaction fee on all credit and debit card purchases. These services have been regulated by the Federal Reserve System, which oversees US banks. Today, the average fee charged for using a debit card from a large bank is approximately $0.23 per transaction.[2]

The development of the debit and credit card system has remained successful during the expansion of cashless payment options throughout the past two decades: The time it took to settle payments decreased rapidly with the widespread adoption of the internet in the early 1990s; prior to this time, payments had to be conducted over telephone lines or managed with a physical paper trail. Payment terminals at store checkouts and electronic servers sped up the process, but each infrastructure development came at a cost to the private companies that own and operate the systems. Those costs, which consumers don't generally see, impact the individual or business receiving the transaction because of each transaction or "swipe" fee. Unlike large retailers that can absorb these fees as part of the cost of doing business, many small firms find the fees cut into their revenues; or, they pass the costs directly on to the consumer.

Check Your Understanding

How did private companies build the current payment infrastructure?

Figure 1
Noncash Payment Types in the US, 2000 and 2021



SOURCE: Board of Governors of the Federal Reserve System, Federal Reserve Payments Study.

Consider the two pie charts in Figure 1: According to the Board of Governors of the Federal Reserve System in its triennial data release,[3] in 2000, written checks made up 59% of all noncash transactions in the US, while debit cards made up only 11%. Twenty years later those numbers have shifted dramatically. Now, debit cards make up 52% of all noncash transactions, while written checks make up only 5%. Credit cards and automated clearinghouse (ACH) transactions (payroll direct deposits and some online bill payments) have remained relatively consistent.

How Has Technology Enhanced the System?

Most individuals today know that smartphones brought a major paradigm shift in how payment systems function. With each technological innovation, delays in funds passing from buyer to seller decrease, bureaucratic regulations decrease, and the system becomes more efficient. For example:

- Entrepreneurs built new products to capitalize on accelerating internet speeds and the widespread use of portable electronic devices.
- Tech companies such as PayPal, which launched in 1998 and acquired Venmo in 2013, helped popularize digital payment transfers.
- Large financial corporations, such as Bank of America and JPMorganChase, have also released their own peer-to-peer (P2P) payment apps that use ACH to settle payments.
- Apple and Google Pay, which are in many cases connected to a customer's debit card, have also added to the increase of debit card transactions.

Regardless of the payment system, in the US these transfer apps rely on the same infrastructure and the companies that operate them. These are known as "closed loop" systems, meaning that to send funds with a particular service, the receiver must also have an account—and agree to the fee structure and terms of the managing company.

Check Your Understanding

How did the use of debit cards change between 2000 and 2021?

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Vocabulary Application

In your own words, describe how apps like PayPal, Venmo, and Apple Pay are "closed loop" systems.

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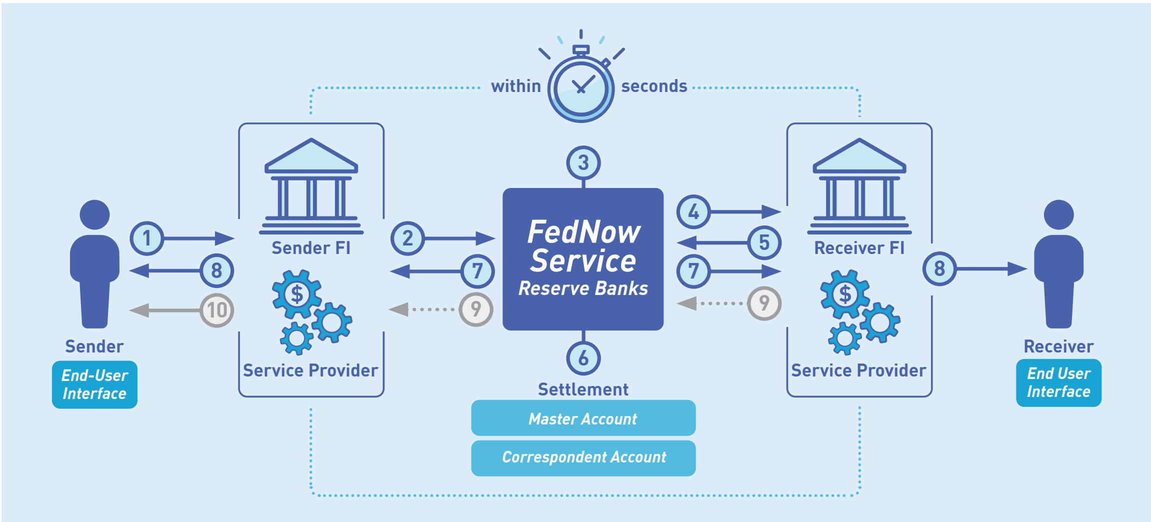
Figure 2
FedNow Structure Infographic



NOTE: FI, financial institution.

SOURCE: Board of Governors of the Federal Reserve System, FedNow Resources.

A New System

In July 2023, the Federal Reserve Board of Governors launched a new real-time payment service called FedNow, which combines the speed and efficiencies of the private, closed-loop fee-based model with wider accessibility. As part of its financial services mission, the Federal Reserve acts as a **clearinghouse** for check processing between banks. With the decline of check writing and the proliferation of electronic payments, FedNow acts as an alternative for any financial institution, regardless of size, to create an open-source system that transmits funds within seconds. While individual consumers and businesses cannot set up an account with FedNow, any financial services firm, from banks to credit unions, may subscribe and offer it to their customers.

Figure 2 illustrates how the FedNow system works.[4] Say you forgot to pay your car insurance bill and the night it's due you realize that if it's not paid by midnight, your coverage is dropped. If you and your insurance carrier bank with institutions using the FedNow system, you would initiate a request to send funds from your bank account to the insurance firm's account. Your bank (shown in the figure as "Sender FI") would make sure you have enough funds available and pass along the request to FedNow, which would in turn contact the insurance company's financial institution. Once that bank (shown in the figure as "Receiver FI") accepts the request, FedNow transfers the money, which is deposited and recorded in the auto insurance company's account in a matter of seconds, allowing you to keep your insurance coverage. While there won't be a FedNow app on your phone to send and receive money, the bank or financial institution you use may build and

Check Your Understanding

In your own words, what does "clearinghouse" mean? How is the FedNow system different from other instant payment systems?

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Benefits for financial institutions	Benefits for businesses	Benefits for individuals
Create new products that customers want Remain relevant in a changing payment system environment	Access customer funds quicker for better cash flow management	Instantly send (or receive) money with a lower transaction fee Reduce the risk of overdraft or late fees

promote this payment system into their consumer products for individual customers as an added feature.

Not only is the speed, reliability, and security of the transfer appealing, but the scale of the central bank is so large that the fees to operate this infrastructure are lower: The sender of a funds transaction on FedNow would pay $0.045, approximately a quarter of the fees charged using the existing system. And as this system grows, all parties involved would benefit.

It is important to note that FedNow is not a digital currency, but a payment system no different from the types consumers have used worldwide for decades. And the Federal Reserve makes clear this system is intended not to eliminate cash from the economy, but to offer one more option to transact funds.

Conclusion

FedNow supporters anticipate that the new payment system offered by the Federal Reserve will complement, not replace, the existing infrastructure many Americans are accustomed to. In terms of spending habits, many consumers trust the current system and enjoy the convenience and familiarity it brings. No matter which payment system consumers use, whether it's a private closed-loop system or a national open-source system, the "plumbing" that keeps payments freely flowing throughout the economy is an often-overlooked but essential part of the financial system. ■

Check Your Understanding

What is the benefit of FedNow as an additional payment option for your bank?

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ANSWER KEY

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Background Knowledge

In the space below, describe the different ways you pay for goods and services. What is the appeal of using money to buy things?

* *Answers will vary.*
* *Money is universally accepted and transportable, which makes it an appealing option for purchasing goods and services.*

1970s consumer credit card, courtesy of Mike Kaiman.

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Check Your Understanding

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* *Credit cards were introduced in 1950.*
* *Bank debit cards were introduced in the 1970s.*
* *Visa and Mastercard charge fees to offset the cost of maintaining their system.*

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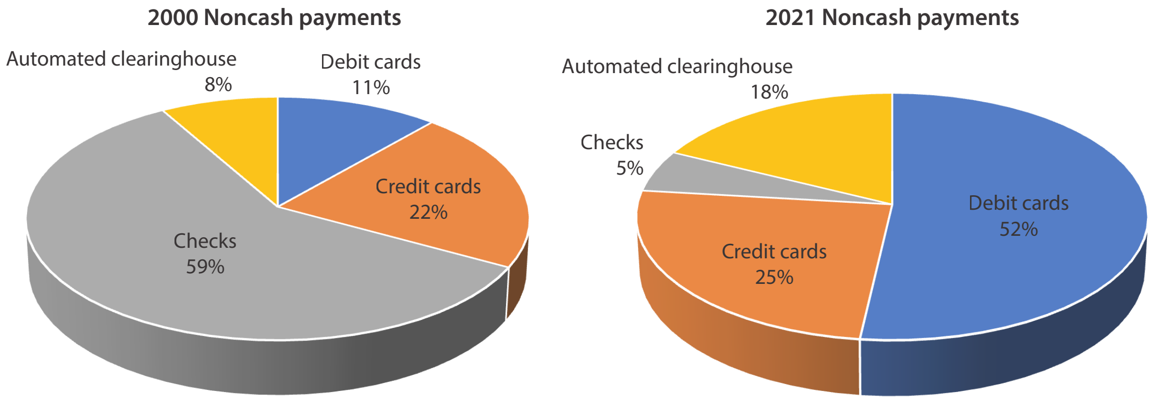

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Check Your Understanding

How did the use of debit cards change between 2000 and 2021?

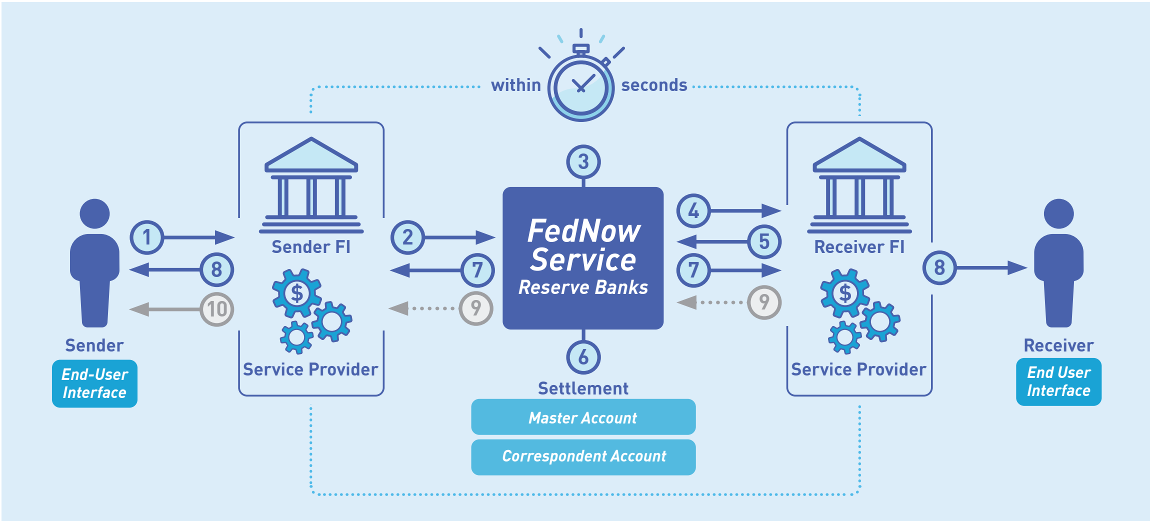
The use of debit cards has increased significantly.

Vocabulary Application

In your own words, describe how apps like PayPal, Venmo, and Apple Pay are "closed loop" systems.

Each app requires both the buyer and the seller to use the system AND pay fees to send and receive money.

Figure 2
FedNow Structure Infographic



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Check Your Understanding

In your own words, what does "clearinghouse" mean? How is the FedNow system different from other instant payment systems?

* *A clearinghouse acts as a middleman, serving two separate groups (in this case, banks moving money from one checking account to another).*
* *It is an open-loop system.*
* *Any financial institution can subscribe to the service, allowing customers to send or receive money.*

Benefits for financial institutions	Benefits for businesses	Benefits for individuals
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Check Your Understanding

What is the benefit of FedNow as an additional payment option for your bank?

* *FedNow complements the existing infrastructure by offering faster, safer, and more reliable transactions at a lower cost.*
* *FedNow helps the economy to move smoothly.*