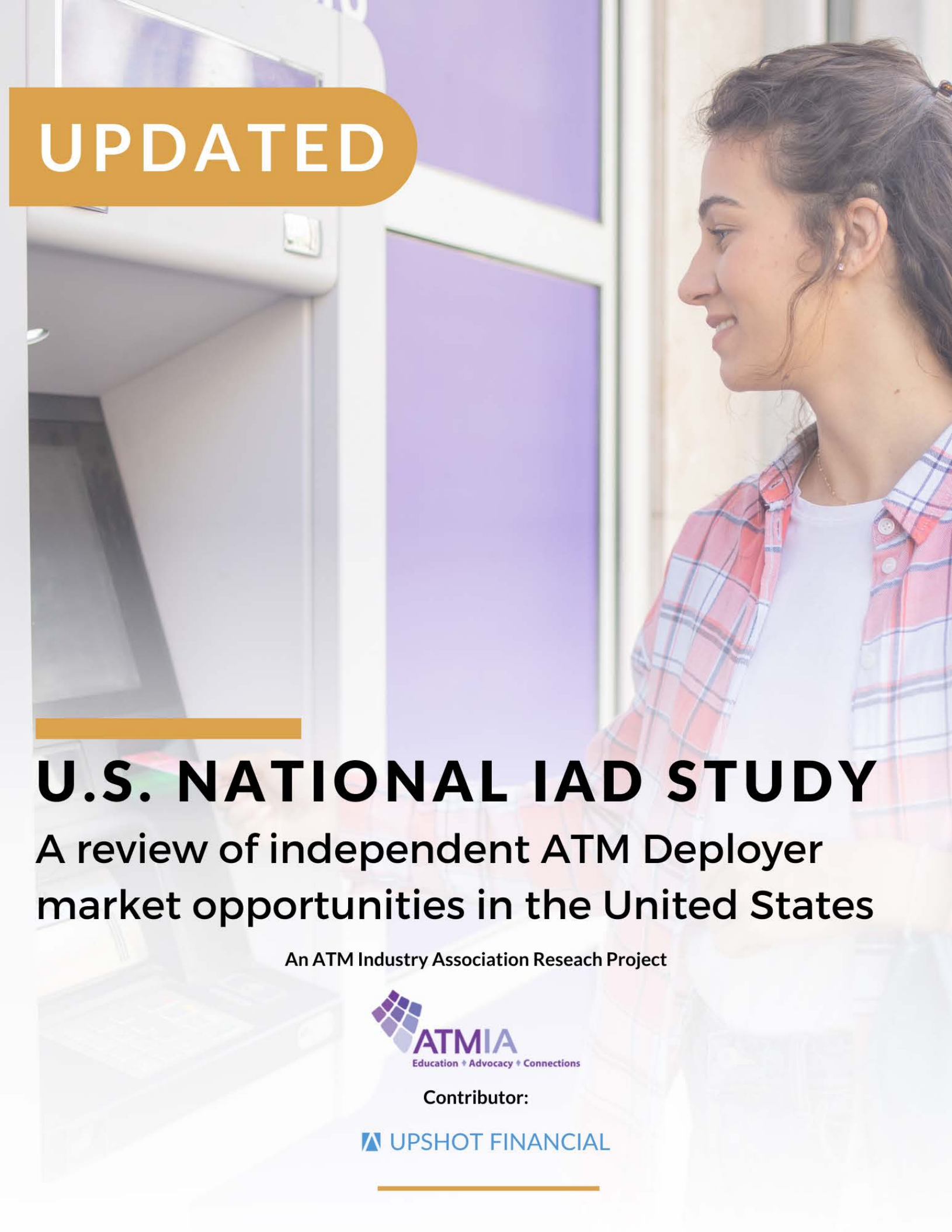


UPDATED

U.S. NATIONAL IAD STUDY

A review of independent ATM Deployer market opportunities in the United States

An ATM Industry Association Reseach Project

ATMIA
Education • Advocacy • Connections

Contributor:

UPSHOT FINANCIAL

National IAD Study 2024
The United States

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An ATM Industry Association Research Project

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Foreword

The United States has the world's largest and most successful IAD community. Appropriately, it is the first of ATMIA's national IAD studies to receive a post-pandemic update.

Industry expert Leland Englebardt, Practice Leader at Upshot Advisors and author of the original 2018 US IAD Study as well as ATMIA IAD studies of Africa, Australia, Canada, Germany, and the UK, has summarized the myriad changes in cash use and the ATM business that occurred during the 2020-2021 Covid-19 years and immediately afterward. The result is a fresh and compelling portrait of this lucrative and growing market.

The research shows that financial self-service in the United States continues to be a growing market, both from a consumer demand perspective and an ATM operator perspective. Emerging technology and financial product development provides our industry with exciting new opportunities as well as technical and commercial challenges.

Analysis of the most recent data shows that, despite various setbacks during the pandemic, the IAD ATM industry is rebounding strongly. There are solid grounds for optimism about the future growth of the North American IAD market.

Welcome to Release 2.0 of our US IAD study. Feedback is welcome at lonnie.talbert@atmia.com. Additional updates of other ATMIA IAD market studies, such as Canada and the UK, are anticipated during 2024.

ATMIA believes that this updated study will illuminate opportunities for profitable growth in the crucial independent sector of retail ATMs. In addition, we are hopeful that our updated IAD research will become an authoritative reference point for discussion of important U.S. market forces and developments, in the media and among ATMIA member organizations.

Lonnie Talbert, CEO, ATMIA

February 2024

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Introduction

In 2023, the American ATM industry stands at a strategic inflection point.

Its opportunities for expansion and growth have never been greater. The market for financial self-service is growing rapidly.[1] Consumer demand for new forms of financial and quasi-financial transactions has never been stronger. Community and regional banks seek to outsource their ATM estates to independent operators who possess the skills and experience to locate and manage terminals most effectively. FIs are also aggressively exploring digitization of teller services, both inside branch offices and elsewhere.

U.S. ATMs now dispense more than $10 trillion in cash annually.[2] Consumers continue to love the speed, simplicity, and anonymity of transacting in cash. The U.S. now has $1.6 trillion of cash in circulation and the Federal Reserve predicts it will continue to grow by 4% to 6% per year.

At the same time, the industry faces unprecedented challenges. The 2019-2021 Covid-19 pandemic was devastating for retail merchants, which are a prime channel for ATM deployment and cash use. The rapid rise of consumer prices during and after the pandemic, after years of persistently low inflation, has eroded the number of under-$25 transactions that historically are paid mostly with cash. Technical support for new forms of financial self-service is driving up the cost and complexity of operating ATMs. Ever-escalating bank disloyalty fees plus higher surcharge fees are, in some cases, causing consumers to think twice before using an out-of-network ATM.

How IADs face and respond to these opportunities and challenges will largely determine who wins and who loses in the next five to ten years. To paraphrase James Baldwin, not every challenge that is faced can be overcome, but no challenge can be overcome until it is faced.

This updated market analysis is intended to provide IADs with facts and perspectives that can help them clearly focus on the most significant opportunities and challenges and make informed decisions about what investments and strategic priorities will grow their businesses, serve their customers, and maximize their profits.

[1] For example, on 27 October 2023, ATM Marketplace reported "The self-service technology market will grow by $17.39 billion from 2022-2026 … ATMs will see particular growth during the forecasted period … 40% of all growth in the market will come from North America."

[2] Source: CUinsight.com, 18 September 2023

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Chapter 1. Overview

The U.S. has more independent ATM deployers (IADs) and independently-owned ATM terminals than any other national market in the world. With IADs ranging in size from ~100,000 terminals to just a few dozen, the U.S. market is diverse and highly competitive. Many of the larger U.S. IADs also offer support services to other IADs, such as terminal maintenance, cash replenishment, and administrative or technical support.

The largest U.S. banks[3] have invested heavily in highly visible ATM networks with enhanced functionality. Many smaller banks[4] are using branded off-premises ATMs to enlarge their perceived footprint and improve their return on expenses.

Consolidation among independent ATM operators has resulted in ~70% of all non-bank ATMs being owned and/or operated by two large nationwide IADs: Cardtronics (acquired in 2021 by NCR, one of the leading global ATM hardware providers) and Payment Alliance International (now a subsidiary of Brink's, the well-known logistics and cash management company). Hundreds of additional regional and local IADs, including independently owned affiliates of larger IADs, operate throughout the market.

Cash is still American consumers' favorite means of payment. In 2022, more U.S. consumers used cash than any other payment instrument: 83% used cash versus 69% using credit or charge cards, 67% using debit cards, 52% using bank online bill payment, and 46% using checks. Only 20% used a prepaid card.[5]

The general trend of U.S. ATM usage is toward less frequent cash disbursements and larger cash disbursement amounts per transaction. That pattern could change as banks continue to shift a broader range of consumer interactions from human tellers to self-service terminals.

Issuer disloyalty fees of $1.50 or more for out-of-network transactions are widespread in the U.S. Added to the ATM access fee, average total fees for an off-us cash disbursement are now almost $5.00. The rising consumer cost for an off-us ATM cash disbursement has fueled the growth of surcharge-free networks in the U.S. (see section 3.4.b).

[3] Such as JP Morgan Chase with ~16,000 ATMs and more than 4,700 branch offices, Wells Fargo with ~12,000 ATMs and more than 4,600 branches, and Bank of America with ~15,000 ATMs and more than 3,800 branches.

[4] As of December 2022, there were 4,001 community banks with 27,511 branches and 134 regional banks with 13,109 branches across the U.S.

[5] Source: *2022 Findings from the Diary of Consumer Payment Choice*, The Federal Reserve Bank of San Francisco. Percentages reflect use of each payment medium within a 30-day period.

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Barriers to entry are low for small IADs operating a local footprint of fewer than 100 ATMs.[6] But competition among IADs for the best ATM locations[7] is intense.

Estimates of the total number of ATMs in the United States in 2022-2023 range from ~451,500 to ~530,000.[8] The total U.S. ATM footprint is forecast to continuously increase between 2024 and 2028 by ~21,500 ATMs annually (+4.16%). At that growth rate, there will be somewhere between ~538,000 and ~650,000 U.S. ATMs in 2028.

The industry's growth brings with it various challenges for IADs trying to grow their scale, including but not limited to:

- US merchants of all sizes are sophisticated about negotiating ATM placement deals,
- Cash-in-transit (CIT) services are costly,
- Technical barriers to offer the diverse and dynamic selection of services that consumers want must be addressed,
- Vault cash supply from banks may be challenging to obtain,[9] and
- State-of-the-art security tools are becoming more necessary to fight rising criminal attacks.

[6] This does not mean that a successful small ATM business can be operated on a shoestring or part-time. Even small IADs compete with well-resourced large ones and must maintain high standards of liquidity, quality, and consistency.

[7] Such as bars, casual restaurants, and convenience stores.

[8] Estimates vary considerably because reliable ATM footprint numbers are notoriously hard to get. ATMIA estimates that there were 520,000 to 540,000 U.S. ATMs in 2023. In March 2023, the Wall Street Journal stated there were 451,500 U.S. ATMs at the end of 2022, citing Euromonitor International as its source. The WSJ/Euromonitor estimate has been republished by many others, including Forbes and PYMNT.com. Statista.com, a global data and business intelligence platform, estimated 511,650 U.S. ATMs in 2022.

[9] Starting in 2013, the IAD industry was swept up in a national program called Operation Choke Point, led by banking regulators and the U.S. Justice Department, targeting certain types of businesses thought to pose high risks of money laundering and other illegal activities. Though the program officially ended in August 2017, the unfounded discrimination, burdensome information requirements, and toxic climate it caused between banks and IADs have not yet fully dissipated.

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Chapter 2. U.S. Macro Market Factors

2.1. U.S. Gross Domestic Product (GDP)

The U.S. has the highest GDP of any nation, ~42% bigger than #2 China and larger than the GDPs of the next seven nations (Canada, France, Germany, India, Italy, Japan, and the U.K) put together (see Figure 1). GDP is a highly accurate indication of an economy's size.

GDP is composed of four components that are added together: federal, state and local government spending (with the exception of debt and transfer payments such as Social Security), consumer spending (household consumption), investment (such as businesses' purchases of machinery) and trade balance (the net value of exports less imports).

GDP growth rate is probably the single best indicator of economic growth. U.S. GDP growth has rebounded strongly from a 2020 pandemic-driven dip into negative territory, and some observers believe it is growing faster than is sustainable over the long run. The "hot" growth rate may suggest that the Federal Reserve will keep interest rates elevated for some time to come.

GDP per capita and U.S. consumer spending correlate closely with the trend in living standards over time (which relates to payment activity, including cash usage).

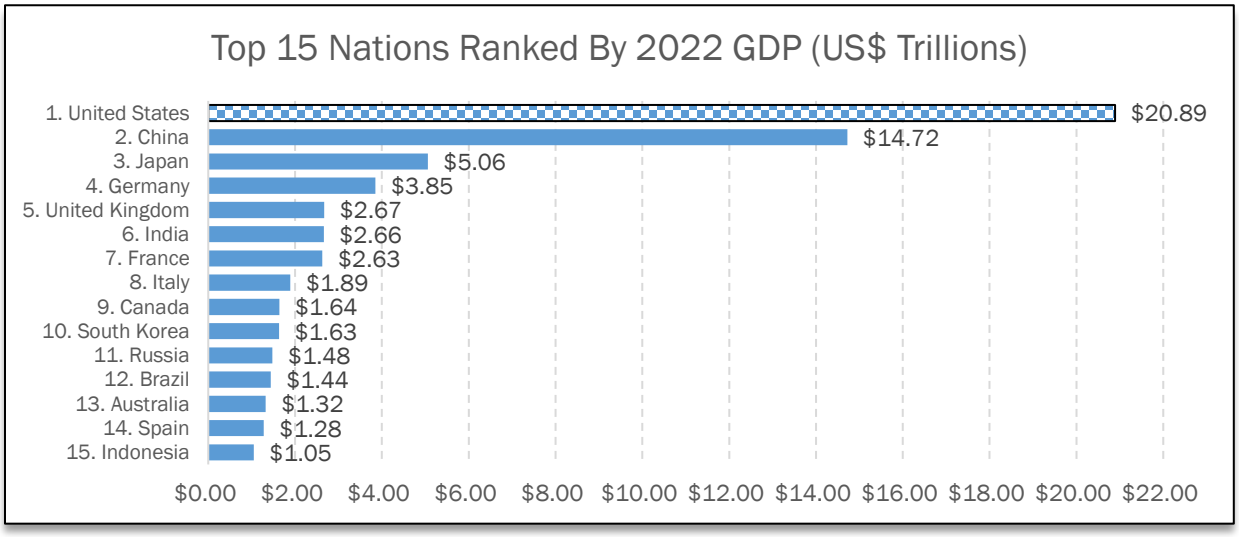
All three of these indicators suggest that the US economy is relatively robust, which augurs well for overall consumer transaction activity.

In the US, 2022 consumer spending was $17,333.81 trillion, about 83% of total GDP. Since 2018, consumer spending has grown faster than GDP, which is a healthy sign for consumer payments, including cash.

Since 2020, growth of the US economy has outpaced most other nations, driven in large part by robust consumer spending.

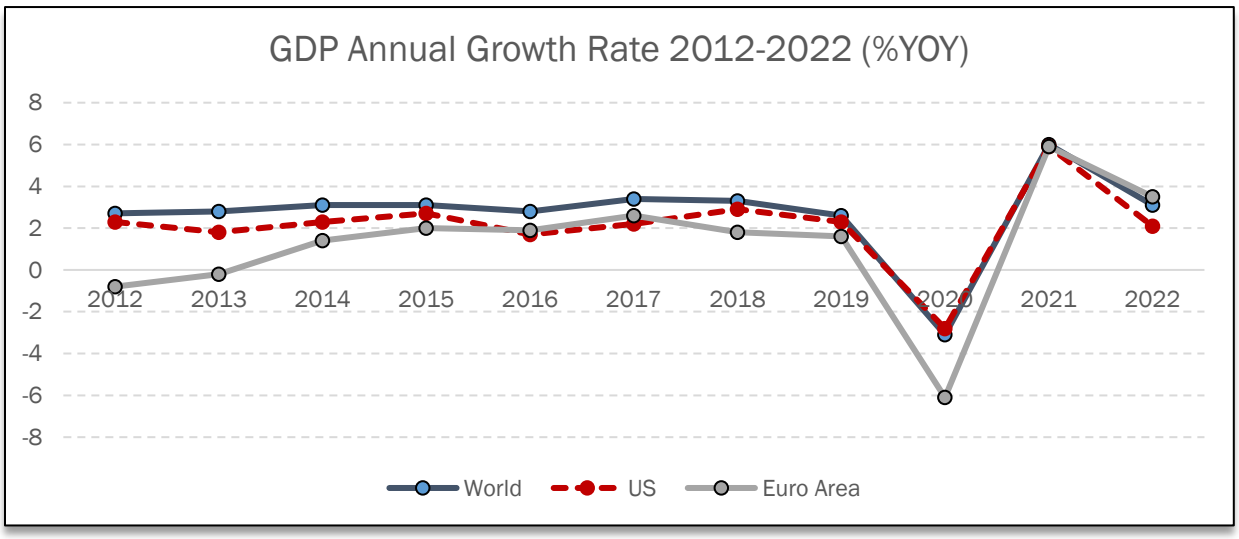
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Figure 1



Source: The World Bank

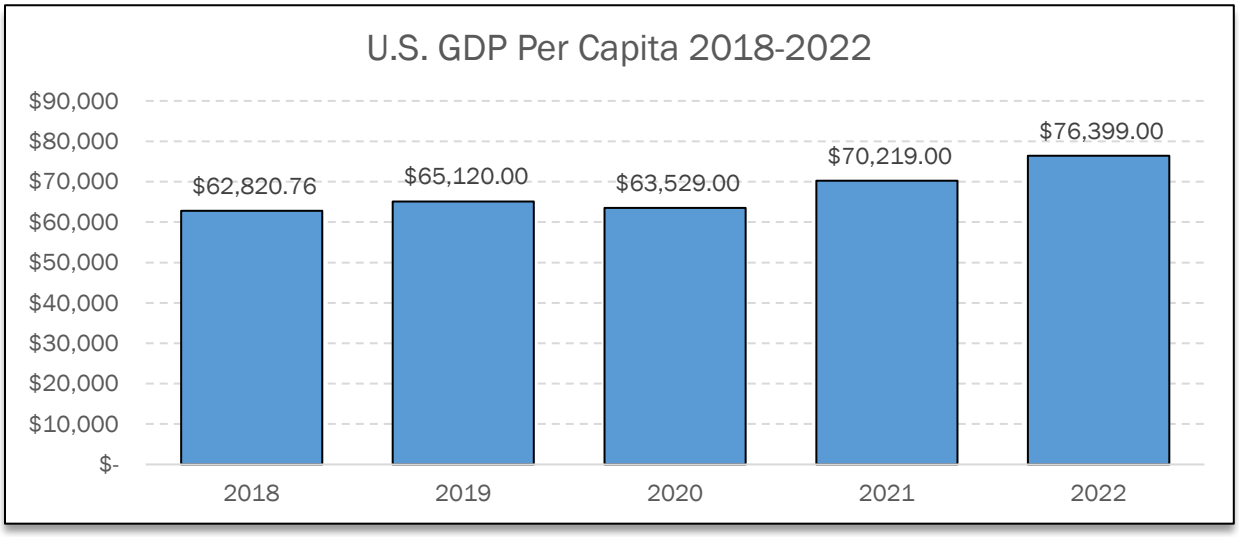
Figure 2



Source: The World Bank

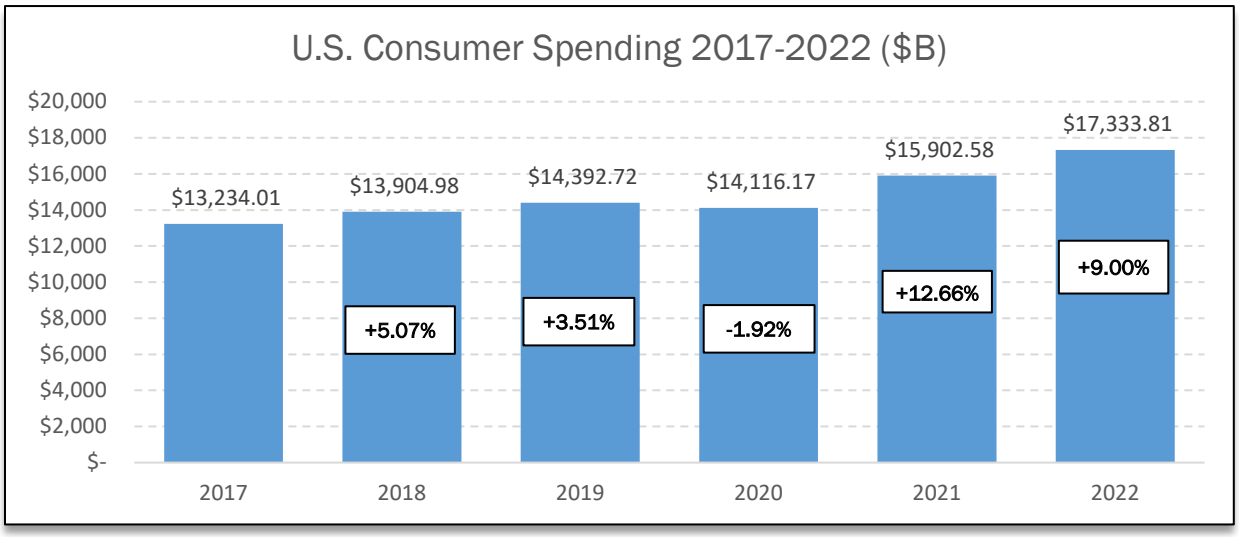
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Figure 3



Source: The World Bank

Figure 4



Source: Bureau of Labor Statistics

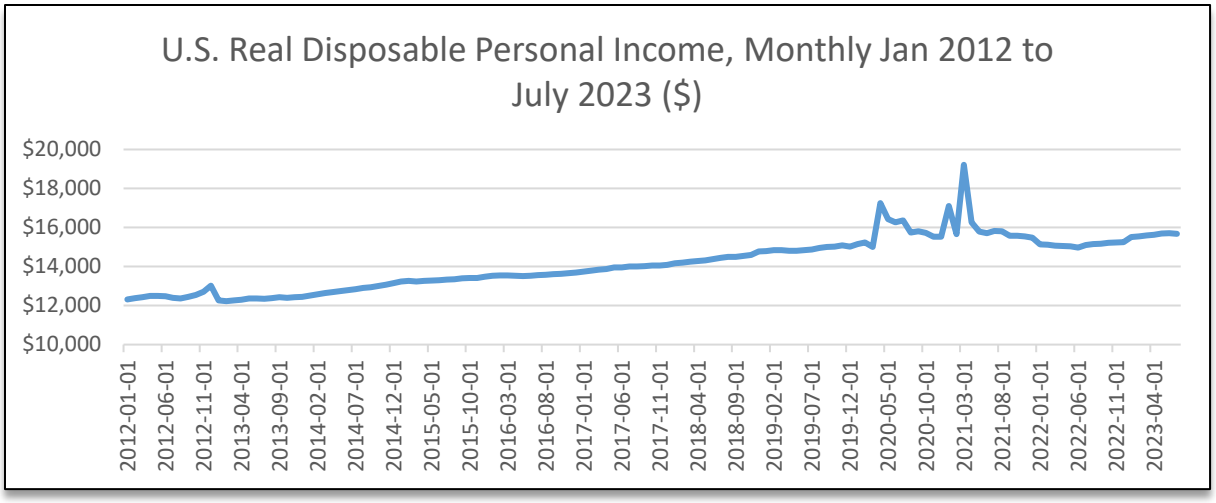
The most recent government figures available when this Study was written reflect continued robust consumer spending. In September 2023, U.S. personal income increased $77.8 billion (0.3% at a monthly rate), according to estimates by the Bureau of Economic Analysis. Disposable personal income increased $56.1 billion (0.3%). Personal consumption expenditures increased $138.7 billion (0.7%), more than double the growth rate of personal income.[10]

[10] Source: *US Consumer Spending Exits Third Quarter on Strong Note*, Reuters, 27 October 2023

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2.2. Disposable Income Growth in the U.S.

Figure 5



Source: Federal Reserve Bank of St. Louis

Disposable income is the amount of money that individuals have available for spending and saving after income taxes. Growth in disposable income boosts consumer buying power and increases the probability of consumer spending on leisure activities and discretionary retail purchases, both of which help drive retail transactions (and implicitly cash and ATM usage). Reduction of disposable income has the opposite effect.

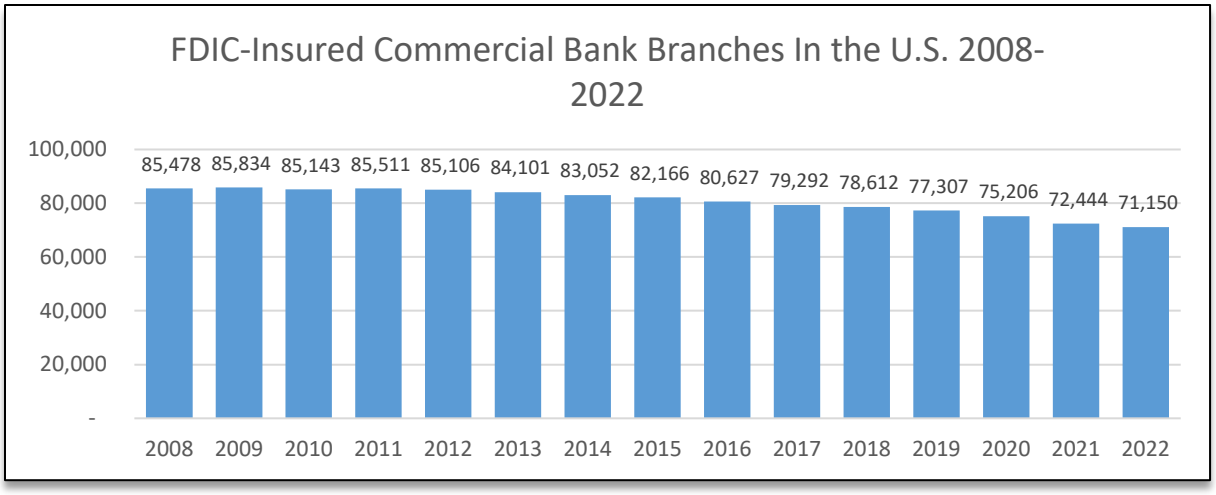
Abrupt fluctuations in U.S. disposable income occurred during the 2020-2021 Covid-19 pandemic and a slow decline followed from mid-2021 to mid-2022 (see Figure 5). That pattern helps us understand why in 2023 many U.S. consumers expressed economic anxiety and perceived the state of the national economy negatively, although slow-but-steady disposable income growth resumed in mid-2022.[11] In general, this anxiety tends to support continued demand for cash as a store of value but may also affect retail spending.

[11] *Expectations Index Declined for the Second Straight Month, Sinking Back Below Recession Threshold*, The Conference Board, 26 September 2023

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2.3. Bank Density in the U.S.

Figure 6



Source: Statista

In the first quarter of 2023 there were 4,672 FDIC-insured commercial banks and savings institutions in the U.S. Those banks collectively maintained about 71,000 branch offices – approximately one bank branch for every 3,666 adults in the country.

Since 2009, U.S. banks have been closing branch offices at the rate of about 1,000 per year (see figure 6). That trend creates opportunities for independent ATM operators to help banks maintain brand visibility and customer access to services, while controlling their customer service costs. Terminal access fees and issuers' foreign fees on off-us ATM cash withdrawals incent consumers to seek out their own bank's ATMs for cash disbursements. Many IADs in the US are pursuing growth via ATM outsourcing relationships with banks.

Replacement of bank branches with self-service terminals is an opportunity for IADs to apply their expert terminal management and placement skills to strike revenue-driving deals with banks. The increasing use of so-called "Interactive Teller Machines" or ITMs, which provide real-time audio and sometimes video links to bank personnel, to replace full-service branch offices adds a further technological dimension to the services IADs can provide. (See section 3.4.d.)

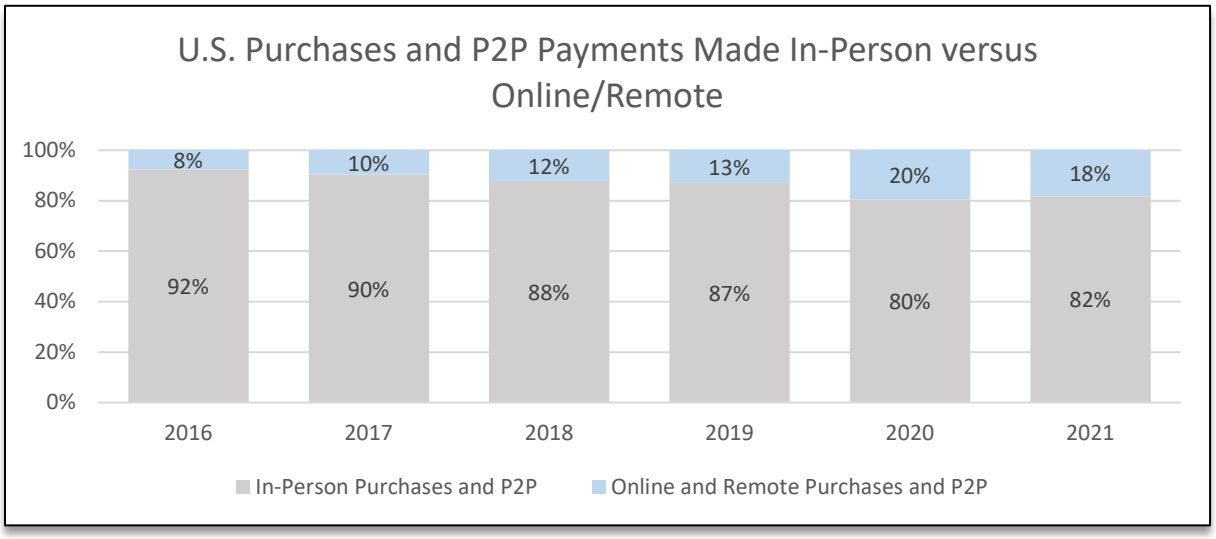
In the U.S., independently owned ATMs play an important role in delivering financial services to underbanked populations in neighborhoods where banks have closed their branch offices. In many cases, those demographic groups rely on cash for a high share of their payments, because their household income is lower and payment instruments like credit and ACH are relatively less accessible.

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2.4. Cash Use in the U.S.

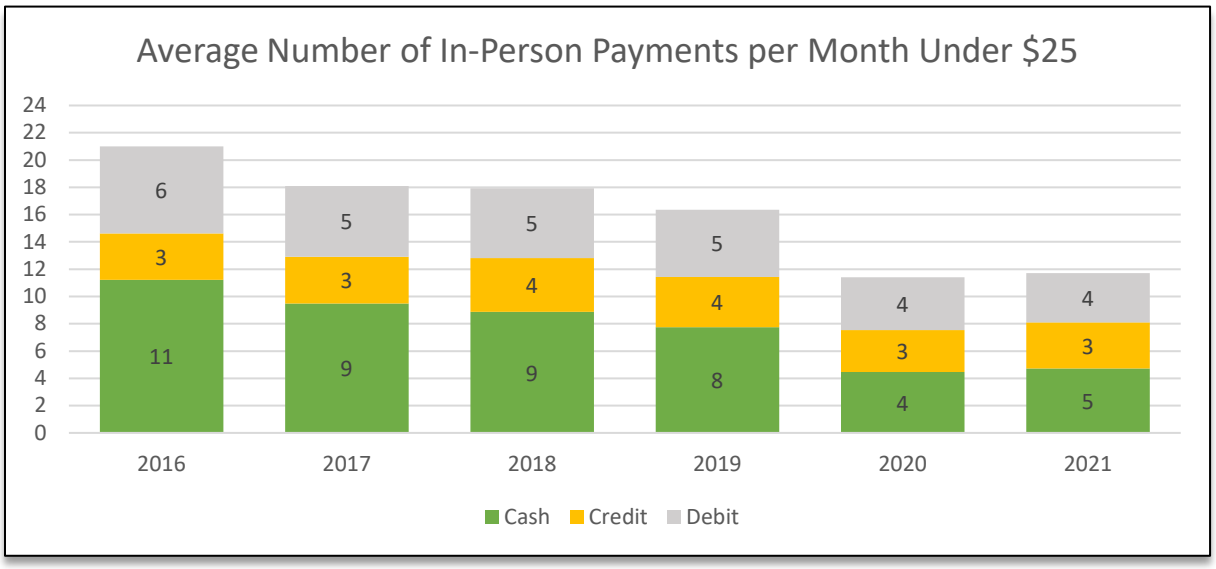
Viewed together, Figures 7-9 below speak to the recent evolution of in-person payments in the U.S. and the strength and resilience of cash as a payment medium.

Figure 7



Source: Federal Reserve Bank of San Francisco

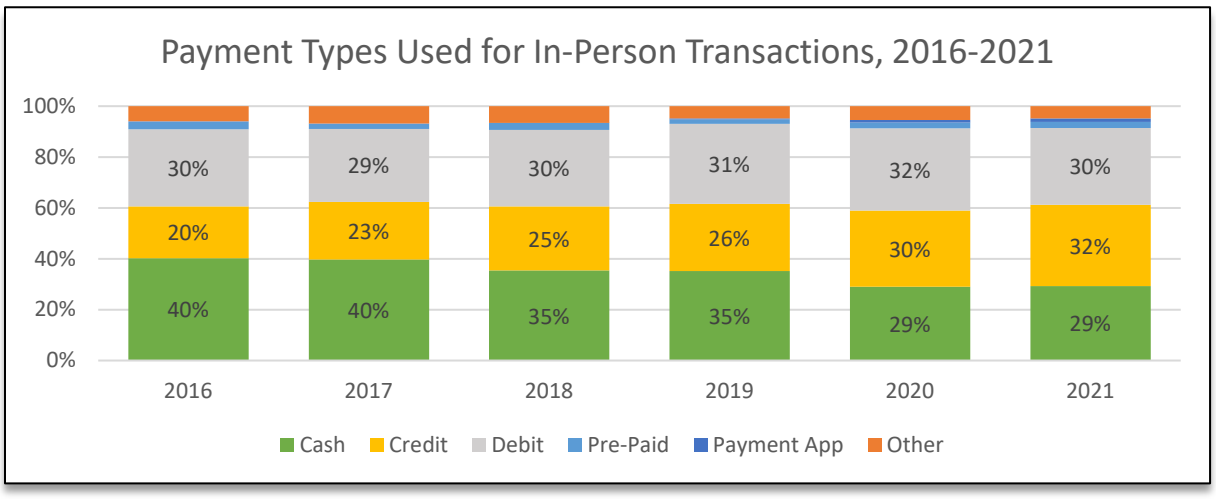
Figure 8



Source: Federal Reserve Bank of San Francisco

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Figure 9



Source: Federal Reserve Bank of San Francisco

From 2016 to 2020, Americans conducted a growing share of their transactions remotely, where payment in cash is not usually an option. In 2021 that trend reversed, with remote purchases retreating to 18% market share from 20% in 2020 (the height of the Covid pandemic).

During 2016-2021, low-value (under $25) in-person transaction volumes (the "sweet spot" for cash use) declined precipitously as consumer price increases chipped away at the dollar's value.

Despite these headwinds, use of cash for in-person low-value transactions declined less than the overall number of such payments (-45% versus -60%) and in 2021, as the country began to emerge from the pandemic, cash use started to increase while debit and credit card payments were static. In every year from 2016 to 2021, cash was the most often-used means of payment for transactions under $25.

In addition, the overall change in payment types used for all in-person transactions from 2016 to 2021 shows sustained growth only for credit cards. That trend may reverse as short-term pandemic-related government benefits taper off and credit card interest rates continue to rise. Debit's share of use for in-person transactions barely budged between 2016 and 2021.

Add the facts that U.S. consumers' on-person cash holdings (in a pocket, purse, or wallet) increased ~12% from 2019 to 2021[12] and cash use by U.S. consumers as a store of value (e.g., kept in the home) doubled during the period, from an average of $173 in 2016 to $347 in 2021. In 2022, 79% of U.S. consumers held on-person cash at least once a day.[13]

[12] see section 2.10

[13] Source: *2022 Findings from the Diary of Consumer Payment Choice*, The Federal Reserve Bank of San Francisco

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Contrary to many reports that young people use mobile apps instead of cash, the 2022 Diary of Consumer Payment Choice[14] found that people aged 18 to 24 used cash for a larger share of their payments than people aged 25 to 44. The Diary also found that use of cash for payments grew from 2021 to 2022 among consumers in several age groups: those aged 25 to 34, those aged 45 to 54, and those aged 55 to 64.

Although use of electronic payments has grown over the long term and grew even faster during 2020-2021 as the Covid-19 pandemic depressed opportunities for face-to-face retail transactions, cash remains a major portion of the payments ecosystem in the United States. It is clear that cash continues to play a central role in American households. Cash becomes even more vital in times of turbulence and uncertainty – terms that accurately characterize the present and the recent past.

At least one 2023 study has concluded that cash use is increasing among young U.S. consumers: "According to a study conducted by The Harris Poll among 2,118 U.S. adults ages 18+, 69% of Gen Z (born 1997-2012) report using cash more now compared to 12 months ago – more so than Gen X (47%, born between 1965 and 1980) and Boomers (37%, born between 1946 and 1964) – and they're using it for a large portion of their purchases.

Nearly a quarter of Gen Z (23%) say they use cash for the majority of their purchases. Groceries (50%), clothing (46%), nonessentials, like coffee and other one-off purchases (40%) and takeout (40%) are the top categories in which Gen Z use cash as payment. Of Gen Z who use cash to pay for purchases, 59% say they do so as a way to budget their money, and 64% say they spend less money when they pay with cash."[15]

When the Federal Reserve asked U.S. consumers in 2022 whether they anticipate going cashless in the future, 93% responded that they have no plans to stop using cash. Only 3% said they plan to stop using cash within 2-5 years and it is unlikely that they all will follow through on those plans. Cash is still the dominant means of making person-to-person (P2P) payments – in 2021, cash beat mobile apps in P2P payments by twenty percentage points.[16]

The Fed report also noted that "the average number of cash back and ATM withdrawals increased from 1.1 withdrawals in 2020 to 1.5 in 2021 … The average value of ATM withdrawals increased by $12 …"[17]

[14] The Federal Reserve Bank of San Francisco, 2022

[15] Cash is King for Gen Z as Cash Stuffing Trend Catches On, creditkarma.com, 1 May 2023

[16] Source: *2022 Findings from the Diary of Consumer Payment Choice*, The Federal Reserve Bank of San Francisco. Cash access and cash preservation are among the goals of the Federal Reserve's Special Committee on Payments Inclusion.

[17] Source: 2022 Findings from the Diary of Consumer Payment Choice, The Federal Reserve Bank of San Francisco

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The Fed report concluded, "Overall, results showed that a substantial portion of the population continued to use cash to make everyday purchases and to hold cash as a store of value."[18]

Separately, a 2020 Deutsche Bank analysis of cash use in six major markets concluded that "cash will be part of the economy for decades to come." The analysis found that 37% of U.S. consumers aged 18-34 call cash their favorite form of payment.

The most popular reasons given by U.S. consumers for preferring cash include (i) transactions in cash are faster (selected by 41%), (ii) cash is most convenient (37%), (iii) cash is accepted almost everywhere (33%), (iv) cash is a secure way to pay (31%), and (v) cash makes it easier to monitor spending (28%).

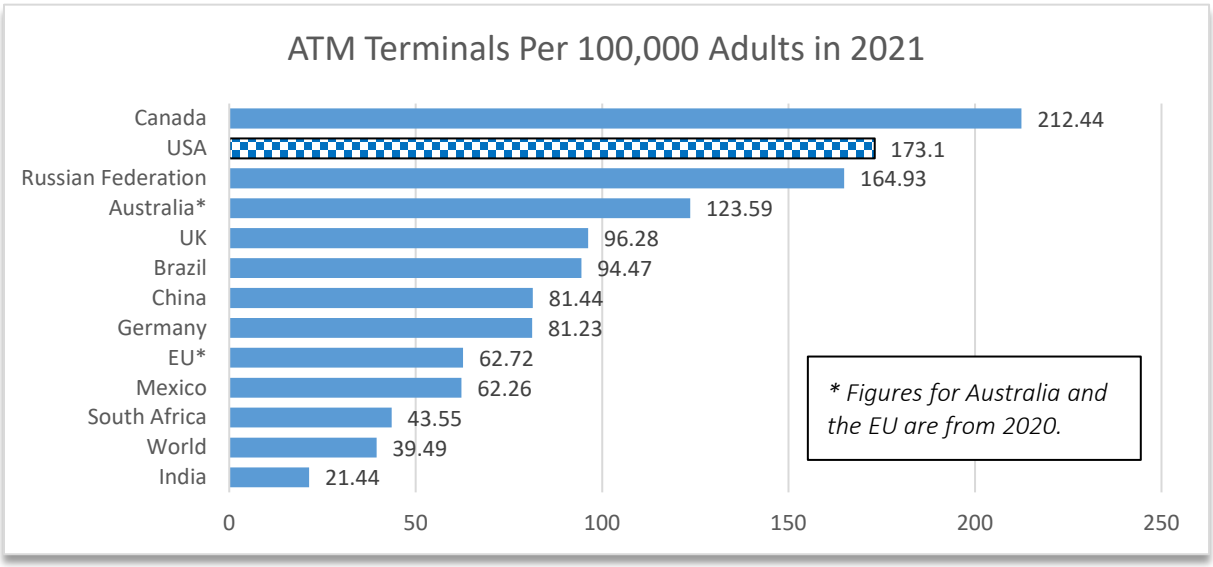
[18] Source: 2022 Findings from the Diary of Consumer Payment Choice, The Federal Reserve Bank of San Francisco

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Chapter 3. The U.S. ATM Market

3.1. ATM Density in the US

Figure 10



Source: The World Bank

ATMs are nearly ubiquitous throughout the United States. U.S. ATM density relative to population is high compared to all other major markets except Canada. The high density is sustained by several mega-trends, including, but not limited to:

- The ongoing wide use of cash for relatively small consumer retail purchases at places such as coffee shops, bars, casual restaurants, and convenience stores;
- Investments by U.S. banks in enhanced self-service capabilities and their use of ATMs to enhance their visibility and perceived footprint; and
- Continued consumer willingness to pay ATM access fees in return for convenient access to cash (though the addition and steady rise of issuer off-us fees by almost all major U.S. banks has made surcharge-free networks a common feature at U.S. ATMs; see section 3.4.b.).

Most sources agree that after decades of almost uninterrupted growth, the total number of ATMs in the U.S. declined between 2019 and the end of 2022 (see section 3.6, The Impact of Covid-19 on Cash and ATMs). However, market forecasts suggest that the U.S. ATM footprint will resume growing at 4%-6% per year for at least the rest of this decade.

Within the U.S., total ATM density has declined slightly. The small overall net decline may be attributable to the following factors, among others:

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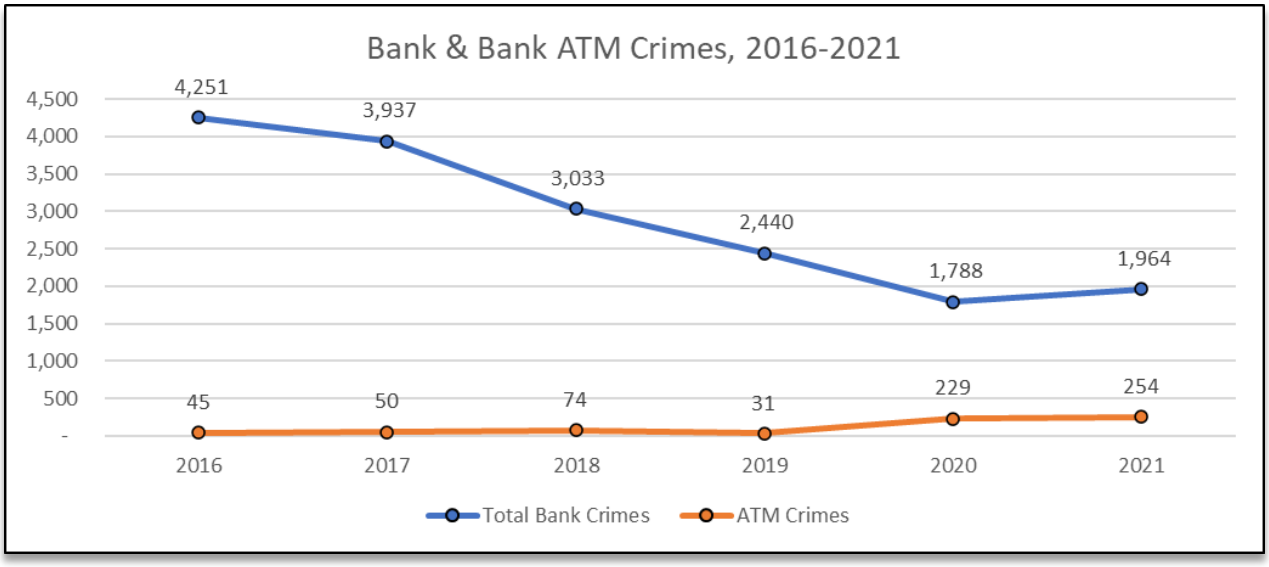
- Industry consolidation that rationalizes unprofitable ATM locations;
- Bank branch closures that include removal of drive-through, lobby, and through-the-wall ATMs; and
- Accelerated retirement of older machines that cannot be upgraded to comply with current PCI or EMV requirements.

Notwithstanding these moderate headwinds, IAD ATM deployment is increasing, especially in retail locations. The nation's continuously high ATM density reflects a large market for bank self-service terminals and IADs, but also suggests that securing prime, profitable ATM locations requires a strong value proposition, knowledge of customer needs, and skillful negotiation.

There is some evidence that consumers who use retail ATMs spend more money in the store; for example, at least one study claims that in convenience stores ATM users spend 20-25% more.[19]

3.2. ATM Crime in the U.S.

Figure 11



Source: The Federal Bureau of Investigation

Attacks on ATMs and ATM service personnel in the U.S. are on the rise and have become more violent. According to the F.B.I., the total annual number of bank ATM crimes rose 454% from 2016 to 2021. As a share of all crimes targeting banks, ATM crime rose from less than 1% in 2016 to 13% in 2021.[20]

[19] Source: National Cash Systems

[20] F.B.I. Bank Crime Statistics Annual Reports

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The F.B.I. reports on financial institutions, so its data understates the true number of attacks on all U.S. ATMs. But even if the absolute numbers are off, the trend they identify is probably a reasonable proxy for the rate of change in all ATM crime incidents.

The rising incidence of ATM attacks may be the #1 current threat to the U.S. ATM industry. About 80% of all ATM attacks are physical – such as attempts to destroy the machine to extract cash on the spot or to rip the ATM from its mountings and transport it elsewhere – and the remainder are logical (for example, skimming, jackpotting, and remote takeovers).

In 2023, a proposal was introduced in Congress to make robbery from IAD ATMs a federal crime, as bank robbery already is.[21] ATMs located in convenience stores and non-banking establishments frequently are not now subject to federal law enforcement. The bill is designed to close that loophole. The bill is co-sponsored by Rep. John Rose, R-Tennessee, and Rep. Glen Ivey, D-Maryland – a rare incidence of bipartisan support in the current political climate, which improves the chances of its passage.

Decisions taken by ATM operators can also help combat crime or at least minimize liability for losses. For example, when an ATM is modified to accept contactless NFC transactions, it may use magnetic stripe data or EMV data. Experts recommend that ATM operators always choose contactless EMV data, to prevent magnetic stripe fallback transaction authorizations.[22]

An anti-crime checklist for IADs should include at least the following five considerations.

- Periodic security audits or assessments, measuring progress against a security roadmap.
- Physical security elements, such as barriers and surrounds that deter attempts to remove the ATM, banknote neutralization via indelible security ink or a bonding agent, burglar alarms, and upgraded surveillance cameras.
- Data security elements, for example ensuring that software and security patches are up to date, dynamic (not static) safe access codes, and tracking who has access to the ATM.
- Cyber security.
- Security monitoring, especially making such information available to the operator in near-real time.

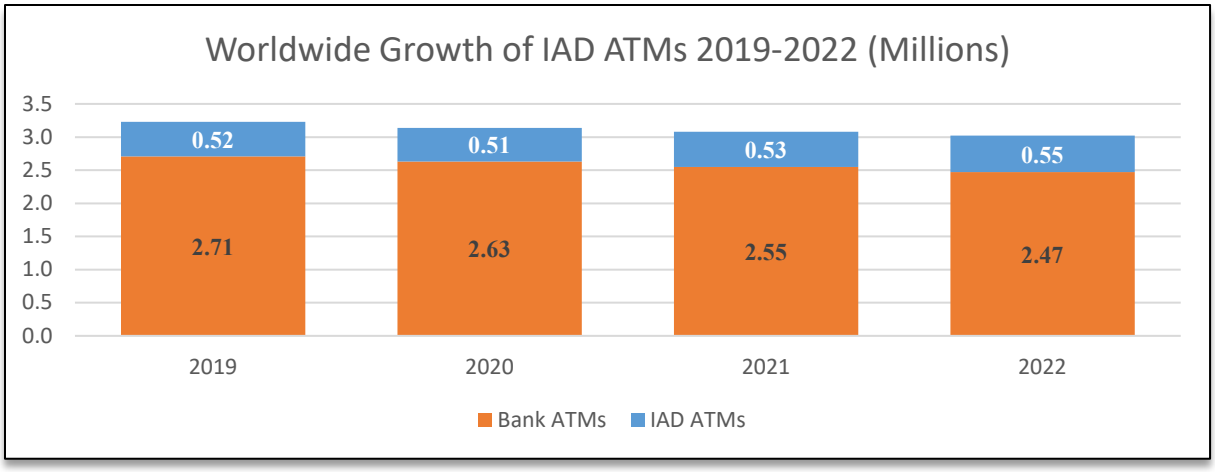
[21] The Safe Access to Cash Act of 2023, H.R. 3398, would add robbery and theft from independently-owned or operated ATMs, as well as from persons loading and servicing such ATMs, to the Bank Robbery Act.

[22] Source: *How to Fight Back Against ATM Fraud*, Kiosk Marketplace, 3 October 2023

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3.3. IAD Market Share Versus Bank ATMs

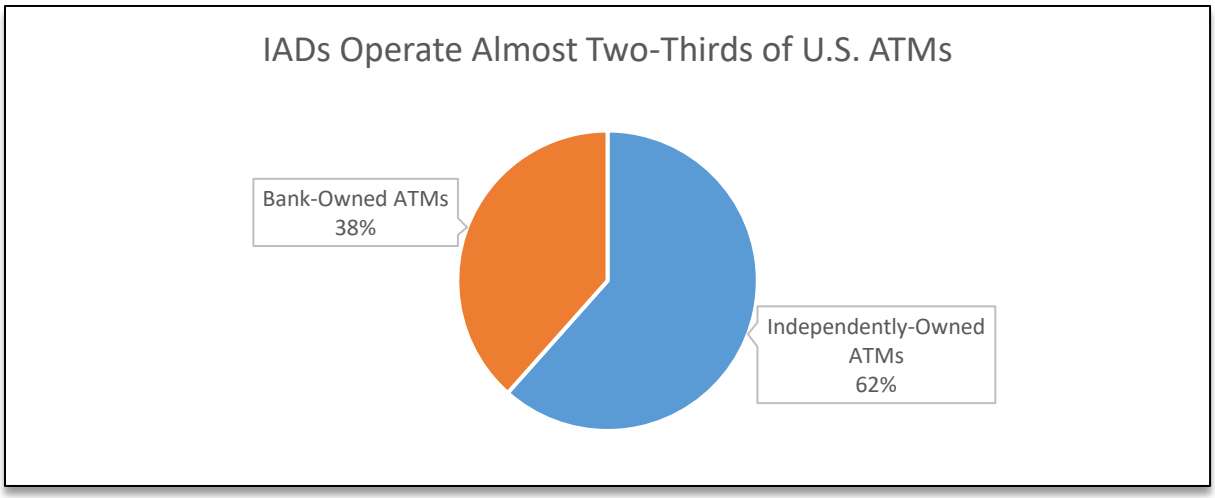
Figure 12



Source: Kiosk Marketplace & Vending Times, 8 August 2023

Worldwide, the total number and market share of IAD-owned ATMs is growing (from 0.52 million or 21.1% in 2019 to 0.55 million or 22% in 2022), while the number of bank ATMs is shrinking (from 2.71 million in 2019 to 2.47 million in 2022).

Figure 13



Source: Upshot Advisors Estimate, 2023

U.S. IADs have a much larger market share than the global average, reflecting the market's scale and the widespread acceptance of ATM access fees. Banks are rationalizing their ATM estates as part of overall cost-cutting efforts, and IADs that are more agile and flexible than banks are benefiting from bank outsourcing deals.

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The largest non-bank ATM provider in the U.S. is Cardtronics, operating more than 100,000 ATMs. Payment Alliance International (PAI) is the second-largest U.S. IAD, with over 70,000 ATMs in service.

Cardtronics and PAI together constitute about 61% of the ~278,000 non-bank-owned ATMs in the US. The three largest US retail banks measured by ATM footprint are Chase with ~16,000 ATMs, Bank of America with ~15,000 ATMs, and Wells Fargo with ~12,000 ATMs.

The number of non-bank-owned ATMs skyrocketed after 1996, when Visa and Mastercard changed the rules that previously prohibited ATM access fees. US IADs typically derive the largest part of their revenue per cash disbursement from access fees, and that revenue structure tends to support extensive ATM distribution by IADs.[23]

It used to be generally true that bank ATMs were bank-branded and independent ATMs were unbranded. No longer. While unbranded IAD ATMs are still common, many independent ATM operators have business arrangements with banks to brand, support, or fully operate bank-branded ATMs in retail locations.

ATM outsourcing to IADs can reduce a bank's self-service capital requirements and create a better consumer experience, for example by locating bank-branded terminals in retail locations frequented by the bank's customers. This trend is consistent with academic theory that argues IAD activity is good for bank profits in an environment where consumers are directly charged for off-us cash disbursements.[24]

US IAD ATMs perform a valuable role in financial inclusion. When compared to bank-owned ATMs, independent ATMs tend to be in areas with less population, lower population density, lower median and average income (household and disposable), lower labor force participation rate, less college-educated population, higher unemployment rate and lower home values.[25] Lower-income households (those earning less than $50,000) use cash as their primary method of payment, and independent ATM owners are giving these households access to financial services that would otherwise be limited.[26]

[23] Tobias Wenzel, Independent Service Operators in ATM Markets, Düsseldorf Institute for Competition Economics (DICE), 2013

[24] Tobias Wenzel, Independent Service Operators in ATM Markets, Düsseldorf Institute for Competition Economics (DICE), 2013

[25] Locational Study of ATMs in the US by Ownership, Coggin College of Business, University of North Florida, 2018

[26] David Lott, Take On Payments, Who Owns Your ATM? Federal Reserve Bank of Atlanta, http://takeonpayments.frbatlanta.org

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3.4. Growth of ATM Functions Beyond the Core

IADs are increasingly augmenting their core cash disbursement and balance inquiry functions with additional services that generate revenue, draw more consumers to the terminal, and counter the legacy perception of ATMs as single-purpose devices.

(a) **Government Benefits Delivery.** IAD ATMs play an important role providing public access to government benefit programs delivered by state and federal agencies through electronic benefit transfer (EBT) cards. Though direct charges to cardholders are generally prohibited for such transactions, the ATM operator receives materially higher interchange compensation for supporting government benefits than for a private consumer cash disbursement.

(b) **Surcharge-free ATM Networks (SFAs)** are another material business segment for U.S. IADs. Allpoint, owned by NCR, and Moneypass, owned by Fiserv, are the largest SFAs in the U.S. Allpoint claims more than 37,500 ATMs nationwide (Allpoint also has ATMs in Australia, Canada, Mexico, and the U.K.) and Moneypass claims approximately 40,000 ATMs in the U.S.

The Allpoint brand appears at some IAD ATMs, and MoneyPass is accepted at some bank and IAD ATMs. SFAs play an important role supporting government benefit programs and payroll card programs.

SFAs typically pay the ATM operator a much higher rate of interchange than other networks, though on a per-transaction basis the incremental interchange doesn't fully compensate for the inability to charge an access fee. ATM operators bank on the volume uplift from SFA acceptance to outweigh the sacrifice of access fees.

(c) **Cryptocurrency Trading.** The United States has the most Bitcoin ATMs (BTMs) of any nation. At the beginning of 2023 there were about 33,769 dedicated BTMs in the USA.[27] A Bitcoin ATM allows users to buy cryptocurrency by directly depositing cash into the terminal. Some newer Bitcoin ATMs also dispense cash and allow consumers to exchange Bitcoin for fiat currency.

Only 14 years have passed since Bitcoin, the first cryptocurrency, was launched in 2009 with a value of less than a penny. During that relatively short time, Bitcoin hit a historical high value of more than $68,000. Its value has since fallen by more than half. More than 21,000 different cryptocurrencies have been created since 2009, and about 14% of U.S. adults now own some form of cryptocurrency.[28]

[27] Source: CNBC, 30 January 2023. However, other sources claim significantly different BTM totals: the website "How Many Bitcoin ATMs" reported 67,962 U.S. BTMs as of January 2023 and Coin ATM Radar reported 30,712 U.S. BTMs in operation in July 2023.

[28] According to a July 2023 survey by Morning Consult. In August 2023, the Federal Reserve estimated that between 10%-25% of U.S. adults own cryptocurrency.

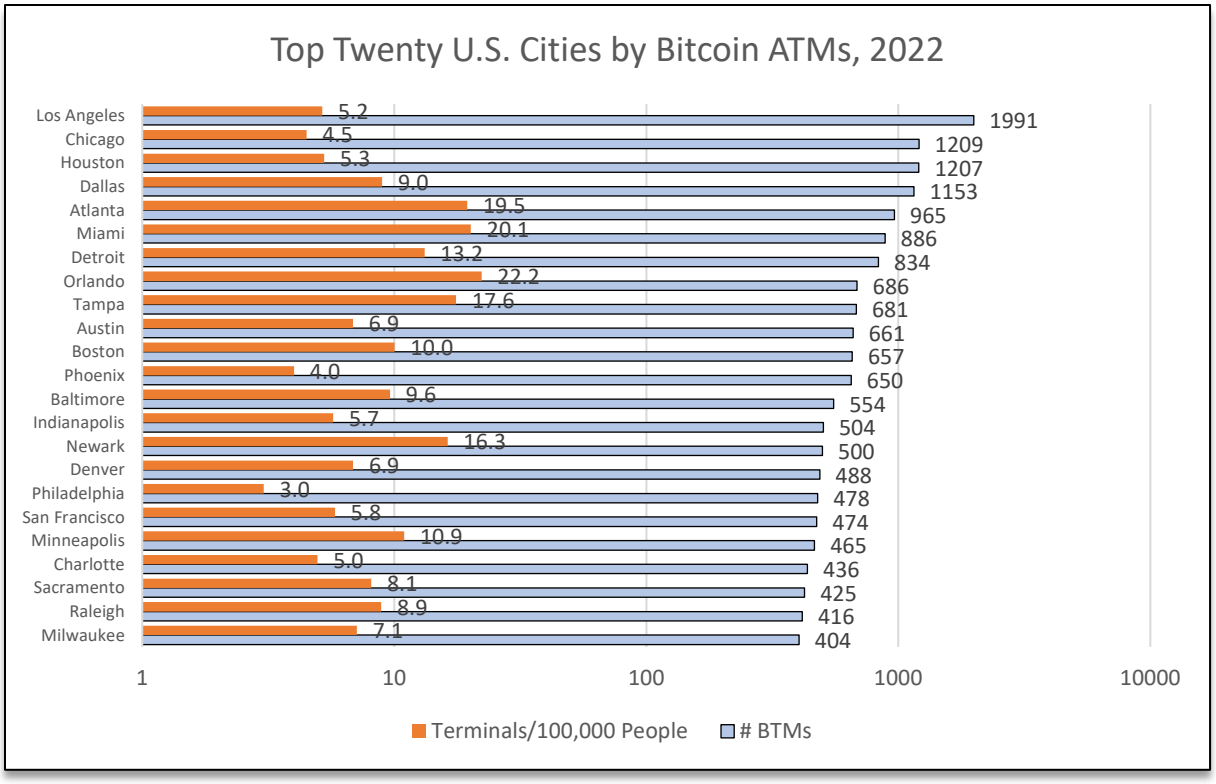
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Cryptocurrency remains almost entirely a speculative investment and not a retail transaction medium. Some retailers who began to accept Bitcoin for payment during its heyday have backed away from it, largely due to volatile changes in its value. For example, Tesla suspended its acceptance of Bitcoin in 2021, fashion retailer Pacsun has de-emphasized crypto as a payment method, and electronics retailer Gamestop ended support for its crypto wallet in August 2023.[29]

In 2022-2023, cryptocurrency trading volumes suffered from a series of blows. Sharply higher interest rates diverted some investors to less volatile products; bankruptcies, collapses, and criminal investigations of some major industry players such as FTX, Celsius Network, Jesse Powell (founder of the crypto exchange Kraken), Binance, and Silvergate Bank dampened investors' enthusiasm; and the exits of some large market makers lessened liquidity.

Still, many consumers continue to trade actively and view crypto as an important part of their personal investment portfolios. U.S. crypto trading volume in September 2023 totaled $1.4 trillion.[30] While that was less than half of the monthly trading value a year earlier, it was still sufficient to keep many BTMs very profitable.

Figure 14



Source: Statista and Upshot Advisors estimates

[29] Source: PaymentsDive.com, 10 October 2023.

[30] Source: Reuters, 3 October 2023.

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A 2023 study by the Federal Reserve Bank of Kansas City reached several conclusions about BTM users: "Demographically, most BTM users are male and almost evenly distributed across age groups, with a slight majority age 30 to 44 … the vast majority of BTM users earn less than $80,000 per year … low- and middle-income consumers are over-represented among BTM users … a significant proportion of BTM users belong to minority groups … with Asian users slightly outpacing Black and Hispanic users."

Typically, a BTM charges a fee to buy Bitcoin. The fee ranges widely from a low of about 4% to as high as 20%. BTM operators, crypto exchanges, and networks are all compensated by dividing the fee. Because the total cost of operating a BTM is estimated at only 3 to 6 percent of revenue, Bitcoin ATMs are a high-margin business for operators.[31] Though industry data is sparse and unreliable, monthly income from a typical BTM in the United States has been reported to range between $5,000 and $7,250.[32]

All Bitcoin ATM operators in the U.S. must register with the Financial Crimes Enforcement Network (FinCEN) and comply with the anti-money laundering provisions of the Bank Secrecy Act. Those regulators impose various restrictions, including the amount of cash consumers can deposit and the number of transactions they can make.

BTMs are not without risk. The 2023 Federal Reserve report cautioned, "The BTM industry has been charged repeatedly with predatory and illicit behavior, gaining a reputation that may eventually affect consumer use as well as future regulation. BTM operators have already formed the Cryptocurrency Compliance Cooperative to get ahead of potential conflicts with regulators and law enforcement."

Overall, the cash-to-crypto BTM industry in the U.S. continues to benefit from robust consumer demand, despite (or perhaps partly because of) the volatility of the cryptocurrency market and some controversy over potentially predatory or illicit uses. The continued swift growth of BTM deployment reflects that demand and continues to be a boon to IADs.

(d) **Interactive Teller Machines (ITMs)** are ATMs with enhanced capabilities that enable them to simulate a full-service bank teller experience using audio and video links plus other ancillary capabilities. ITMs have been around for more than a decade and have benefitted from recent technological advances. Banks, especially those that are rationalizing their branch footprints, are generally enthusiastic about the concept from a service efficiency perspective, but many balk at the high cost and technical complexity of ITM machines.

[31] https://ir.bitcoindepot.com/sec-filings/all-sec-filings/content/0001193125-22-296689/d428991dex991.htm, *Crypto's Brutal Slump Has Finally Caught Up With Bitcoin ATMs*, Carly Wanna, Anna Irrera, and Rachel Butt, 26 November 2022

[32] Source: *The Controversial Business of Cash-to-Crypto Bitcoin ATMs*, the Federal Reserve Bank of Kansas City, 30 August 2023

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ITMs are promoted as a way for banks to create an "omnichannel" banking experience by combining advanced self-service terminals with assisted and remote banking options.

IADs are cautiously entering the ITM space as part of bank outsourcing agreements. Operating an ITM introduces fresh operational challenges, such as authenticating IDs and other documents. For IADs, the initial capital investment requirements (the price of a new ITM can be 5-10 times what a basic retail ATM costs) can be offset by longer contractual commitments from bank partners, more favorable termination terms, and higher operating fees to the IAD.

(e) **Cash recycling**, where cash deposited into the ATM is later used for withdrawals, is receiving more attention as a way to manage the cost of cash replenishment (CIT). An old ATM terminal can be upgraded to a cash recycling ATM if it has the functionality to dispense and deposit cash from the same cassette. Adjustments to the mechanism and the software of the ATM are likely to be necessary.

Cash recycling ATMs must address the challenge of handling unfit bills deposited into the terminal (currency that is in too poor condition to be recycled as part of a cash withdrawal). Cash recycling can deliver the maximum economic benefit only when the terminal has an optimal balance between deposits and withdrawals. Either too little in deposits or too much will not support the goal of reducing the operator's CIT costs. Determining whether cash recycling will materially help operator economics requires thorough analysis of the terminal's current and potential patterns of usage.

Cash recycling is one of the ATM industry's most talked-about functional enhancements in the market today. Worldwide, the number of cash recycling ATMs is predicted to rise by more than 25% before the end of the decade.[33]

A decision to upgrade an ATM to recycle cash (or to buy a new terminal designed for cash recycling) should be based on a thorough analysis of the transaction patterns and cash demand of the location. Different monitoring and optimization approaches should also be assessed.

(f) **Contactless ATMs** do not require physical insertion of a payment card to initiate a transaction. Instead, they can authenticate the account via tapping a contactless card or a mobile phone payment application on a Near Field Card (NFC) reader. More than one-third of the ATMs in the world now support contactless and that share continues to increase, particularly since physical transactions became a source of concern during the Covid pandemic.[34] Contactless transactions help speed the transaction process and can therefore reduce queues at busy terminals, improving customer satisfaction.

[33] Source: NCR

[34] As noted elsewhere in this Study, the Covid health risks associated with use of physical currency were vastly exaggerated by some media outlets and public health officials.

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(g) **ATM-as-a-Service (ATMaaS)**. In its most comprehensive form, ATMaaS encompasses everything required to run the ATM channel, delivered by a partner for a monthly fee, with contracted business outcomes that generally target measures of efficiency, cost of ownership, and operating consistency. ATMaaS can include 24x7 software management (including updates), hardware maintenance and servicing, monitoring and security services, cash management, check image processing, ATM driving, and perhaps transaction processing.

ATMaaS is now being promoted by larger IADs and some ATM manufacturers. ATM manufacturer NCR Corp. specifically referenced ATMaaS in August 2023 when announcing that it will split the company into two newly-named units: "[the new name] speaks to NCR's drive to scale ATM as a Service, interactive tellers, and future innovations."

(h) **Cannabis Payments.** Many U.S. states have legalized recreational or medical cannabis use, but at the federal level it remains illegal.[35] That means cannabis merchants are not supposed to accept electronic payments, which travel on interstate networks (though some retailers have tried to skirt the prohibition). This muddled state of affairs has made cash the preferred (or only) legal means of payment for most cannabis transactions and has caused many cannabis retailers to install ATMs in or near their shops.

In July 2023, Mastercard instructed its bank customers to stop authorizing purchases of cannabis on its debit cards. This action, which may be emulated by Visa, will reinforce cash as the dominant payment method for the retail marijuana industry, at least in the near term.

3.5. Current ATM Business Challenges

In 2023, ATM operators in the U.S. face several challenges. Some are well-known and continual market factors and others are emerging for the first time.

(a) **PCI Mandates.** The requirements imposed on ATM operators by the Payment Card Industry Data Security Standards (PCI-DSS) regime, originated and maintained by the major payments networks, are updated regularly to address new and emerging security threats. These changes often require costly upgrades of terminal software and hardware, and sometimes make obsolete older terminals that cannot be upgraded.

[35] Congress has repeatedly considered but not enacted proposals to enable banks to support electronic payments for cannabis. Most recently, The SAFE Banking Act of 2023 aims to create protections for financial institutions that provide services to state-sanctioned marijuana businesses and service providers for such businesses. The bill does not legalize marijuana at the federal level, it merely addresses payment for marijuana purchases from state-sanctioned dispensaries. In mid-2023 the SAFE Banking Act was stalled in the Senate Committee on Banking, Housing, and Urban Affairs and there is no schedule for whether or when the bill will be reported to the full Senate for consideration.

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In early 2023, The PCI Security Standards Council released new mandates for ATM PIN pads and data encryption standards, known as TR31 Phase 3 key blocks. ATM terminals must be upgraded to comply by the end of 2024 or must be replaced with a compliant terminal. The upgraded hardware and software will require at least one site visit to the ATM, perhaps two or more visits.

An upgrade of this sort is a double-edged sword for IADs. It will require work, cost, and inconvenience, but at the same time it may prompt more banks and credit unions to reach out to IADs and ATM service providers to support their ATM estate rather than adding it to their already long list of compliance tasks.

(b) **The Windows Upgrade Cycle.** Most ATMs run the Microsoft Windows operating system. In 2020, Microsoft announced that it would cease supporting Windows 7 (i.e., no more security updates or patches). ATM operators still using Windows 7 can either continue to do so and risk being more vulnerable to cyber-attacks, or pay for Windows 7 extended support, or upgrade to Windows 10 (which Microsoft will support until 2026), or switch to a different operating system, like Linux.

None of these alternatives is easy, risk-free, or inexpensive. Just as Windows XP was replaced by Windows 7, so Windows 7 will be replaced by Windows 10 in a few years, and then other upgrade cycles will follow that one. The seemingly endless cycle of Windows OS upgrades drives significant operating costs.

Some ATM operators have switched from Windows to Linux or Unix-based operating systems. Unix is proprietary, while Linux is open-source and free. Linux and Unix have a strong reputation for security, perhaps because they are customizable and, being less common than Windows, present hackers with a smaller, less lucrative target. Unix and Linux are known to be reliable and stable systems that rarely experience outages.

The principal drawback of these alternative operating systems is also one of their core strengths: they are flexible and can be tailored to each user's needs. That requires skill and effort. Though both have active communities that provide updates, security patches, and support, neither is as "turnkey" as Windows. Significant scale is required to make the switch away from Windows pay off for an ATM operator.

(c) **Higher costs for cash.** The cost of cash is estimated to make up around 30%-40% of total ATM operating costs. Rising interest rates on borrowed cash to fill ATMs and higher cash logistics fees from CIT service providers[36] are further inflating an already major ATM cost category for IADs.

One way to moderate the impact of these trends is by using ATM monitoring systems that enable operators to make their replenishment schedule as efficient as possible.

[36] In August 2023, Brink's announced "Record Second Quarter Revenue and Operating Profit," which it attributed in part to "strong pricing discipline."

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3.6. The Impact of Covid-19 on Cash and ATMs

The global Covid-19 pandemic, which peaked from 2020 to late 2021, caused severe negative impacts on the U.S. ATM industry. Most of the effects were short-term but a few may persist for years to come.

Covid caused widespread closure of retail stores, especially small businesses and social gathering places like coffee shops, bars, and restaurants. Those that remained open experienced major declines in their volume of business and many of their customers shifted away from in-person transactions toward remote ordering and delivery.

These patterns diminished the accessibility of many retail ATMs and curtailed many opportunities to pay in cash. Adding insult to injury, some public health authorities tried to frighten people away from cash by publishing well-intentioned but inaccurate warnings that hand-to-hand exchanges of currency might help spread the virus.

Consequently, the share of all U.S. payments made with cash and the share of in-person payments made with cash both dropped sharply from 2019 to 2020.[37] However, as the pandemic receded in 2021, cash transactions and the volume of ATM usage began to rebound.

In 2023, a U.S. personal finance company studied the increasing post-pandemic use of cash and concluded, "Consumers emerged from the depths of the pandemic into a period of sustained inflation, rising interest rates and market volatility, likely making it more difficult for many Americans to make ends meet … Perhaps as a result, many consumers adopted new habits to better manage their money including using cash instead of credit and testing out new online personal finance trends, like cash stuffing, which includes setting aside physical cash for different spending categories at the beginning of each month."[38]

Cash continues to be a frequently-used form of consumer payment in the US. The 2021 Federal Reserve Diary of Consumer Payment Choice found that consumers used cash in 20% of all transactions. For daily spending, the Fed wrote, "consumers paid mostly with cash (30.3 percent of payments)" and "cash is the most popular payment instrument by number for purchases." The survey also found that the average value of a consumer cash payment was $23.40 and that among consumers who reported having some stored cash at home (almost 22% of the sample), the average value of that cash was $738.[39]

[37] *2022 Diary of Consumer Payment Choice*, Federal Reserve Bank of San Francisco, 5 May 2022

[38] *Cash is King for Gen Z as Cash Stuffing Trend Catches On*, creditkarma.com, 1 May 2023

[39] 2017 Diary of Consumer Payment Choice, Federal Reserve Bank of Atlanta, 17 Sept 2018

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Despite the spread of electronic cash apps, contactless payments, and e-wallets, U.S. consumers' on-person cash holdings increased from ~$60 in 2019 to ~$67 in 2021. Among more affluent consumers (with annual incomes of $100,000 or more), on-person cash averaged more than $80.[40]

3.7. Opportunities on the Horizon

(a) **Central Bank Digital Currency.** The U.S. is progressing slowly toward creation of a Central Bank Digital Currency, an electronic form of the country's fiat currency, issued by the central bank, that comes with the same government guarantees as physical currency and is interchangeable with paper money. About 90% of central banks worldwide are actively exploring creation of a CBDC and several (including China) have already launched pilot programs. In the U.S., however, investigation of CBDC is mired in political debate.

The Board of Governors of the Federal Reserve has issued two discussion papers on CBDC: *Discussion of the Pros and Cons of a CBDC* in January 2022 and *Retail CBDC and Monetary Policy* in April 2022. Also in 2022, the Federal Reserve Bank of Boston (in partnership with the MIT Digital Currency Initiative) successfully completed testing of a core CBDC transaction processing platform that achieved throughput of 1.7 million transactions per second, using software released under open-source licensing at no cost. The Federal Reserve has not yet made any decision on issuing a U.S. CBDC.

As of September 2023, CBDC was the subject of multiple dueling legislative proposals in Congress. Broadly, CBDC development is opposed by Republicans and supported by Democrats, though the Biden administration has not proposed a CBDC of any kind. Congressman Alex Mooney (R-WV) has introduced a Digital Dollar Pilot Prevention Act, seeking to ban government testing of a CBDC before it begins. Rep. Tom Emmer (R-MN) has introduced a bill with 50 cosponsors to prevent creation of a retail CBDC. On 20 September 2023, Rep. Emmer's bill, called the "CBDC Anti-Surveillance State Act," was passed out of the House Financial Services Committee and favorably reported to the House floor for a vote. Across the aisle, Rep. Stephen Lynch (D-MA) is sponsoring a bill calling for the Treasury Department to create a U.S. CBDC pilot program.

Some Congressional supporters of private cryptocurrency oppose a CBDC ostensibly because of privacy concerns but more likely because CBDC could compete with (or seek to replace) privately-issued digital coins. In July 2023 Cointelegraph, a digital media publication focusing on blockchain technology and crypto assets, stated that "Republicans … have emerged as the industry's most important allies."

[40] *2022 Findings from the Diary of Consumer Payment Choice*, the Federal Reserve Bank of San Francisco, 5 May 2022

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Rep. Emmer has stated, "If not designed to be open, permissionless, and private – emulating cash – a government-issued CBDC is nothing more than a Chinese Communist Party-style surveillance tool that that can be weaponized to oppress the American way of life."

In mid-2023 about 120 countries, representing more than 95% of the world's GDP, were already researching or developing some form of CBDC. Eleven countries have already launched a CBDC and it is forecast that 20 more will pilot a digital currency within two years. In addition to use for retail transactions, some advocate digital fiat currencies on the grounds they will foster financial inclusion and bolster use of their money as a global reserve currency.

The Federal Reserve, which likely would play a central role if a U.S. CBDC is introduced, is taking a cautious approach. In a speech delivered on 8 September 2023, Michael Barr, the Fed's vice chair for supervision, stated "We continue to speak to a broad range of stakeholders and conduct basic research in emerging technologies that might support a CBDC payments backbone …" but emphasized that "investigation and research are very different from decision making about next steps in terms of payments system development, and we are a long way from that. The Federal Reserve has made no decision on issuing a CBDC and would only proceed with the issuance of a CBDC with clear support from the executive branch and authorizing legislation from Congress."

There are alternate ways to interpret the current situation. The emergence of a partisan political debate about CBDC may, paradoxically, validate its inevitability. However, the Fed's progress toward launching a U.S. CBDC, already slow, may become more bogged down by political attempts to influence design of the system and the rules that support it.

Only two aspects of CBDC seem clear at this time: within a few years it will become an integral part of the financial system in some other major countries and regions (such as the EU), and thus global payments systems will have to support it.

It appears unlikely that CBDC will soon become part of the U.S. domestic payments system. But it is not too early for ATM owners and operators, and their third-party service providers, to begin following the issue and contemplating the implications of a U.S. CBDC when it comes along.

The ATM industry is planning its future with CBDCs in mind. In August 2023, when NCR Corp. announced that it would split into two businesses, one to focus on ATMs ("NCR Atelos") and another to address retail, hospitality and digital banking ("NCR Voyix"), NCR's executive director of corporate communications, Scott Sykes, stated that a principal goal for NCR Atelos is "leveraging new ATM transaction types, including digital currency solutions, to drive market growth."

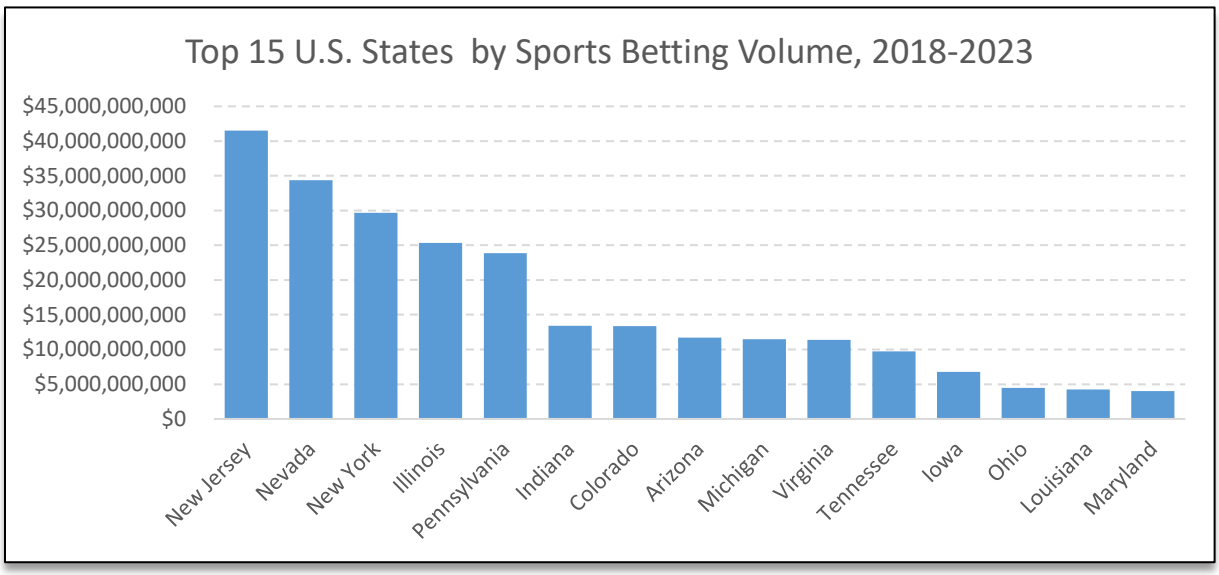
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(b) **Sports Betting.** Following a 2018 Supreme Court decision that broadened the ability of states to regulate sports betting, there has been an upsurge of interest in gaming/entertainment/sports wagering kiosks located outside of casinos. In the five years since the Court's decision, Americans have spent $220 billion on legal sports betting.

Sports betting continues to grow rapidly, both inside casinos and in other retail locations. In 2022, legal sportsbooks in the U.S. handled $93.2 billion in bets, a 63% increase over the prior year. Providers' revenue from that volume was $7.5 billion, 75% more than the prior year's total of $4.29 billion.[41]

As of 2022, legal commercial gaming was offered in 34 states and the District of Columbia, compared to 33 states in 2021.

Figure 15



Source: LegalSportsReport.com, 26 October 2023

(c) **Terminal Re-Engineering.** Efforts are underway to reduce the burdens of software storage and information processing at the terminal level. Doing so would materially lessen the technical support required of ATM operators and could foster a much more nimble and varied selection of services offered by ATMs.

The two principal vectors for accomplishing this are app-based infrastructure (exemplified by the Next Gen Architecture developed by ATMIA) and cloud-based remote hosting.[42] At least one major retail ATM manufacturer (Genmega) is collaborating with a cloud-based remote hosting platform to optimize their terminals for that approach.

[41] Source: Sports Pro Media, 17 February 2023

[42] The two approaches are not incompatible and could be combined.

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(d) **POS Discounts and Surcharges.** The long-running conflict about "swipe fees" between retailers and payment card companies is driving more frequent discounts when consumers pay in cash. Since 2016, the share of U.S. retail cash transactions with discounts has nearly doubled, from about 1.6% to almost 3% in 2022. At the same time, some retailers are imposing surcharges for paying with a credit card. Cash users are the beneficiaries of this battle.

Cash discounts are now being offered for high-value essential payments like rent and utilities, as well as smaller transaction types more typically associated with cash, like gas stations, parking lots, and dry cleaners.

Cash discount rates reportedly range from about 3% up to as much as 15%.[43] POS software providers offer apps that make it easy for merchants to seamlessly incorporate cash discounts and card surcharges into their pricing in ways that comply with network rules.

One New York consumer quoted by The Wall Street Journal remarked that to get the 15% cash discount offered by his local sushi restaurant, "I will absolutely go to the ATM every time just for that discount."[44]

[43] Source: "*Want A Discount? Pay In Cash.*", The Wall Street Journal, 14 October 2023

[44] Source: "*Want A Discount? Pay In Cash.*", The Wall Street Journal, 14 October 2023

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