

# The Disappearing Check

## How Much Longer Until the End?



### **It's time for an honest discussion about the future of the check in American payments.**

Right now, if you ask someone in banking or payments how much useful life the check has left, you'll invariably get one of two snappy soundbites for an answer: 'Checks are already dead!' or 'Checks will still be around for a long, long time.'

Which reply you get depends mostly on who you ask, and on what he or she stands to gain personally from checks' continued existence. Companies involved with checks keep on cheerleading them; payments-tech startups can't wait to dig them an early grave. What we're left with is a lot of hype, wishful thinking, and outright guessing.

We may be in the check business, but we know the future of the check is not going to be dictated by spin and PR. The following is intended as a realistic projection of the check's future, based on pure mathematics and objective analysis of recent trends. We hope you will find it a good starting point for a frank debate about the future.

# Executive Summary

Check usage in the United States has been on the decline for many years, but reliable predictions about the future of the check can be hard to come by. Exaggerations and generalities tend to creep into arguments both for and against their continued existence. Some predict that checks will disappear entirely within a few years; others expect them to continue more or less indefinitely. Who is right?

This paper is intended to provide some realistic projections about how long checks will continue to exist in the United States, and in what numbers. While these should be considered theories rather than scientific results, we have attempted to predict realistic scenarios in which check usage may either decline precipitously or stabilize at reduced levels from today's. The report is roughly organized into three sections:

## Common Myths About Check Usage

Clearing up a few widely held misconceptions about how check usage is measured, who is still using them the most, and which other payment methods are superseding them.

## Why Are Checks Declining, and What Is Replacing Them?

An examination of several disruptive technologies that have displaced more than half of check usage already; why some people keep writing checks despite the availability of other options; and the final obstacles in the way of converting the last several billion checks from paper to electronic payments. We also explore an alternate future in which cryptocurrencies such as Bitcoin experience runaway success and further impact the payments landscape.

## Conclusions and Projections

We summarize the major factors that will affect how rapidly, or slowly, check usage will continue to decrease, followed by three scenarios in which it declines from the current 18 billion to between 8 billion and 3 billion payments per year by the end of the next decade. Finally, we address the effect of the biggest demographic factor commonly associated with checks' continued use – the user's age – and why it may or may not be as big a contributing factor as you think.

We hope you will find reading this paper to be an experience as useful and thought-provoking as producing it was for us.

## Before We Start: Clearing Up a Few Important Myths

Make no mistake about it: Check usage in the United States is clearly declining, and doing so quickly. Denying that obvious fact is by no means the intention of this report.

However, before we embark on any serious attempt to understand the future of the check, it's necessary to address some common misconceptions about what's happening right now. Here are three widely cited facts that, without closer examination, could well lead us in the wrong direction.

### Myth #1: Check usage is declining at an accelerating rate.

**Reality: Checks are declining at a linear rate of approximately 2 billion per year, and that rate has remained steady for about a decade.**

The "accelerating decline" is often cited in order to underscore the rapid demise of paper payments. But referring to the decline as a percentage, rather than a simple number, paints a false picture. While it's true that the drop in check usage has more than doubled *in percentage terms* over the past decade, that's because the rate of decline has remained roughly the same, but our starting pool of checks is only half the size today that it was in 2004. This effect will further magnify any change in check volume the further ahead we look. Therefore, it is important to keep in mind the difference between percentages and simple volume as we make projections.

Where does this leave us? Even though the decrease has been linear, it still represents a staggering number: For every day that goes by, annual check volume decreases by over 5 million, and this has been going on for 4,700 consecutive days. Another important purpose this myth serves is to remind us just how big a billion is.

### Myth #2: Business-to-Business payments are the main reason why the paper check is still alive

**Reality: B2B is the second-biggest use for the check, but C2B payments are still the largest category by far, at almost double anything else.**

In the latest Federal Reserve Payments Study, 46% of all checks paid in the United States were consumer-to-business, or C2B; B2B made up 28%, and was actually declining slightly faster than C2B. In both cases, bill payment accounted for the vast majority of transactions.

Breaking the data down further shows us that the #1 reason for anyone to write a check today remains the mailed-in bill payment. In that category, consumer checks still outnumber those from businesses, although in the past several years, consumers have been abandoning it nearly twice as fast overall (a 31% decline in C2B since 2005, versus 16.6% for B2B). However, this is partly due to a temporary bump up in B2B checks in the 2009 report. More recently, the rate of decline in B2B has again surpassed C2B.

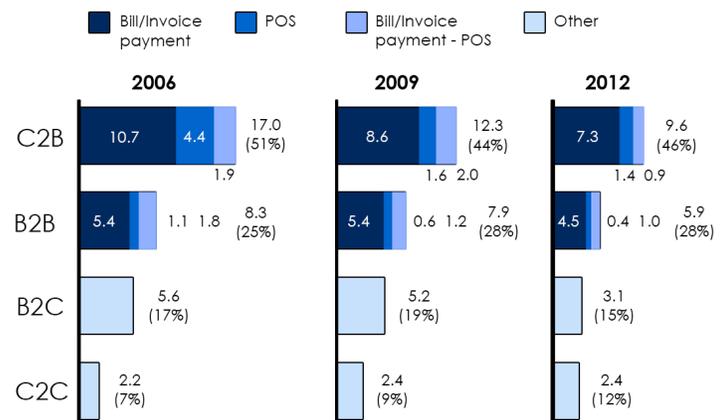
There may one day be some truth to this myth, if C2B experiences a dramatic drop. For now, though, C2B remains the lifeblood of both the check and of remote deposit capture.

## Check Volume, 2001-13 (billions)

Study Year	Checks	Decline	% Decline
2001	41.9	n/a	n/a
2004	36.7	5.2	12.4%
2007	30.6	6.1	16.6%
2010	24.5	6.1	19.9%
2013	18.3	6.2	25.3%

Source: Federal Reserve Payments Studies, 2001-13

## Checks written by counterparty



**Myth #3:**  
**Credit cards and mobile payments are what's "taking over" for the check**

**Reality: Checks have already all but disappeared from point-of-sale situations where cards are used. However, ACH payments and debit cards, not credit cards, have been the big winners overall.**

Over the past 10 years, what has basically happened is that most of the lost check transactions *by volume* have migrated to debit; most of the lost check transactions *by value* have migrated to ACH; and credit card transactions have simply grown moderately along with payments in general. This distinction is important, because debit and ACH are essentially just different methods of executing the same fundamental type of payment that a check does.

Despite the electronic payments boom, credit card payments actually represent a lower percentage of total transactions by number than they did in 2003 (21.3% vs. 22.6%). And even though debit card payments have tripled in number, all card transactions put together still represent only 5% of total value in the U.S. – a figure that has stayed flat for most of the past decade.

What appears to be happening is that debit cards have replaced personal checks for low-value point-of-sale transactions, while ACH continues to replace checks for high-value payments. *This means that, despite a shift in methods, there has been little fundamental change in what people buy or how they pay for it.* Of course, that begs the question of whether Silicon Valley has merely invented a thousand different ways of paying for the same thing – however, that lies beyond the scope of this report.

**So, Where are Checks Headed?**

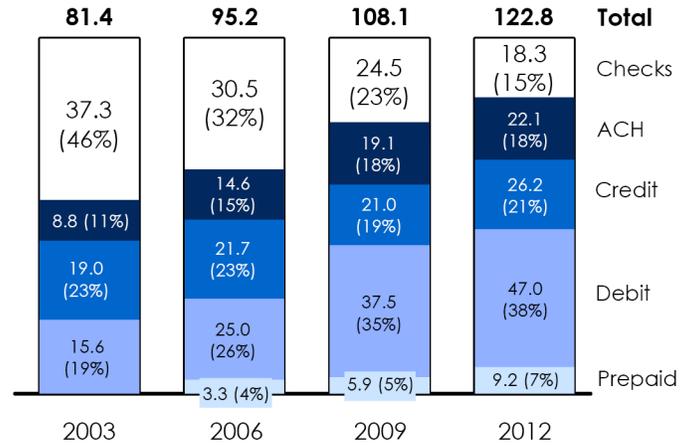
Now that we've cleared the way, let's turn to the real question that's the point of this report. **When will the check go away completely – or will check volume find a "floor" and stabilize at some new, lower level?**

Let's start with the trend we spotted in "Myth #1" – that checks are actually declining at a linear, not an accelerating, rate. Right now, there are 18.3 billion checks paid per year, and an average decline of 6.1 billion checks in each recent three-year FRB Payments Study period. In an incredible stroke of convenience, that rate takes us to zero right on the nose in three reporting cycles, which would be the 2022 report covering the year 2021.

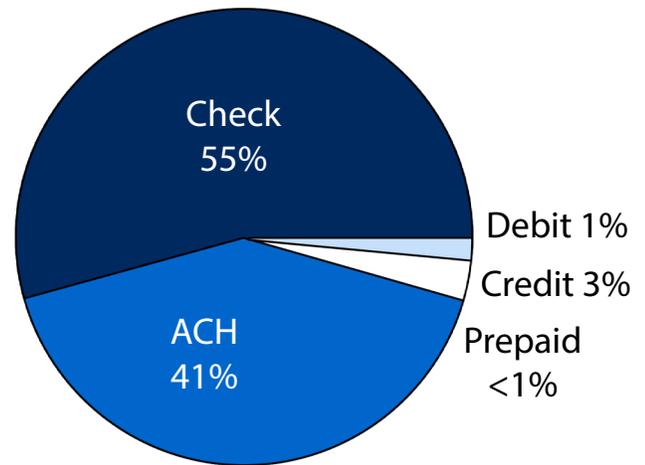
Is that how it's going to play out? On the one hand, it's what the numbers say. On the other, some part of you is wondering how likely it really is that *every single check* will disappear in just over six years. To answer that, let's simplify the problem into two very fundamental questions:

- 1) What motivation will businesses have for continuing to accept checks as payment?
- 2) Will their customers continue to have motivation for writing them?

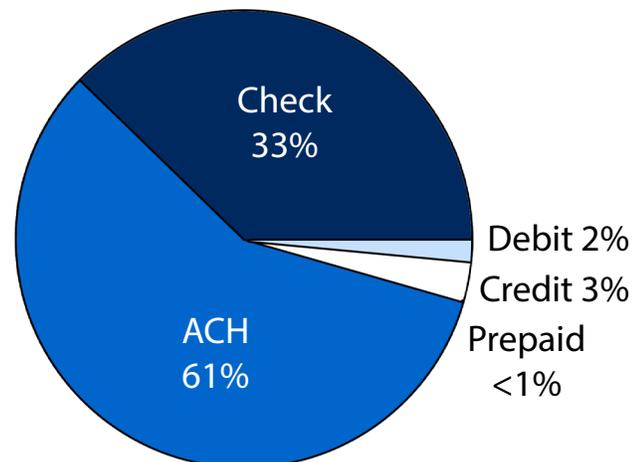
**Payment Types by Volume**  
 2003-12, in billions



**Payment Types by Value**  
 2006



**Payment Types by Value**  
 2012



## Most Businesses That Currently Accept Checks Will Continue to Do So

As noted earlier, checks have virtually disappeared from the point of sale; their main use in C2B and B2B is for bill payment. Ignoring customer motivation for the moment, we believe that most businesses will continue to accept checks for bill payment, for a combination of reasons that we call the “utility problem.”

What we mean by that is that utility companies – along with similar companies like ISPs, mobile phone carriers and insurance companies – do business with literally the entire public, and therefore need payment methods that 100% of the public can use. Credit cards are one option, but not everyone has a credit card. Debit and ACH transactions are the most convenient for the business, but not everyone has a bank account. The only two payment methods that truly everyone has access to are money orders and cash.

Therefore, it is almost certain that businesses in this category will continue to accept money orders, and if you accept money orders, it makes no sense not to accept checks as well. So it seems that customers will at least have the option to pay with checks for the foreseeable future.

A secondary factor is the cost of accepting various payment methods. Consider a typical \$100 monthly mobile phone bill, and the fees associated with the most common billpay methods:

Method	Cost Structure	Cost
ACH	flat rate	\$0.50
Check	employee time	\$1.25
Visa/MC	3% fee	\$3.00
AMEX/Discover	up to 6% fee	\$6.00

While paper check processing is a notoriously clumsy manual process, making it more expensive than ACH, the percentage fee for credit cards makes them the least cost-effective method of all.

Naturally, the preference of most corporations is to get as many customers as possible paying via ACH, and to discourage cards except as a method of last resort (some companies, particularly public utilities, have stopped accepting credit cards entirely).

The check, being inferior to ACH in most respects, is not promoted; however, it is preferable to credit, so it is still tolerated.

## What this means for the outlook of C2B checks

**Essentially, what we have just proven is that the decline of the C2B check – the biggest piece of remaining check volume – mostly depends on how fast consumers decide to move away from checks voluntarily.**

There is no doubt that this is happening. The question is whether the trend is going to speed up, remain steady, or tail off and stabilize. As it turns out, the rate of decline among C2B checks is actually slowing – 21% in the most recent reporting period, compared with almost 28% in the previous cycle (the decline in absolute numbers also slowed, from 4.7 billion to 2.7 billion). This is partly because of the end of checks at the point of sale: Almost all of them have been removed already, so they can no longer contribute much to the overall decline.

For the category that really matters, C2B billpay checks, the rate of decline is also slowing slightly, at 17.8% this period against 19.6% the one before (we will discuss why, and what this means, in a moment). If the tailing-off were to continue at the same rate, the future would look like this:

Year	Billpay Checks	% Decline
2015	6.13 bn	16%
2018	5.26 bn	14.2%
2021	4.61 bn	12.4%
2024	4.12 bn	10.6%
2027	3.76 bn	9.8%
2030	3.46 bn	8.0%

**Under these circumstances, we would see the number of C2B checks stabilize at approximately 3 billion per year in the long term, and total checks at perhaps 6-7 billion.**

## Why would the decline slow? The battle between disruptive technology and marginal difficulty

Right now, Americans write only about a third as many checks as they did 20 years ago, when check usage hit its all-time volume record – an estimated 49.5 billion in 1995. Do we know why? Well, it didn’t just happen for no reason, or because everyone suddenly decided checks were “old.” Checks were replaced, use case by use case, as something cheaper, faster, or easier came along.

Consider direct deposit, one of the earliest disruptive technologies to replace checks on a mass scale. It solved a tremendous problem – printing, distributing and cashing payroll checks – for both employers and consumers, and at a fraction of the cost of the previous process. Literally billions of checks per year were eliminated as it became the standard.

## THE DISAPPEARING CHECK: HOW MUCH LONGER UNTIL THE END?

But how much downward pressure is direct deposit exerting on the check today? The answer is not much. Having essentially reached full participation – nearly everyone with the option to use direct deposit already does so – it has achieved close to its maximum possible effect on check volume, and further disruption will have to come from something else.

Still, there remains another untapped market in payroll checks – it will just be much harder to reach. An estimated 1 in 9 Americans don't have bank accounts, and as of 2011 nearly half of small businesses were not set up for direct deposit on the owner's end. So hundreds of millions, if not billions, of paper payroll checks are still issued every year. Could all of those checks conceivably be electronified under the right circumstances? By all means. Will it be as easy as converting the first billion? Almost certainly not.

This is the same issue that ACH billpay will face – not yet, but eventually. Right now, most customers of large companies like utilities have the option to pay with ACH instead of a check – but for whatever reason, some percentage of them don't, by choice. Those will be the easy conversions. Another subset of the customer base forgoes ACH because it doesn't have reliable Internet access, or distrusts electronic payments. On the supply side of the equation, many small businesses aren't set up to accept ACH payments and don't look to have much interest in doing so. Those will be the difficult conversions.

All of this tells us that, *barring the introduction of a further disruption*, the fact that C2B ACH and debit payments are widely available will not take billpay checks all the way down to zero by itself. This is the scenario laid out in the projections on the previous page: Slightly more than half of existing check volume is eroded before marginal difficulty takes over and flattens out the decline. The rest will have to come from something else.

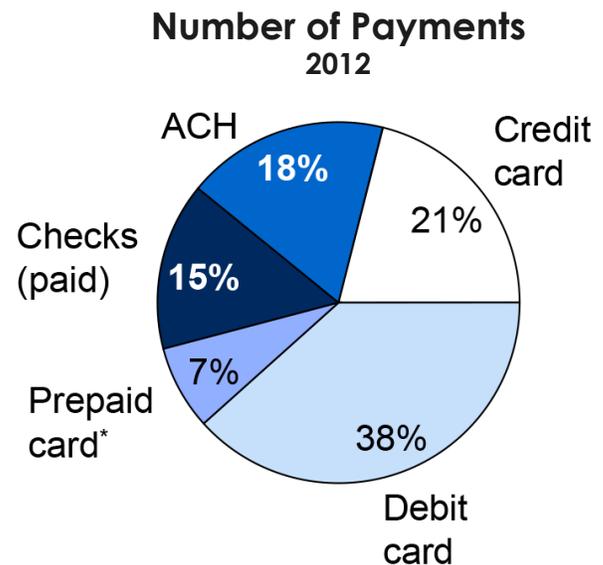
And eventually, another disruption *will* arrive; this could come in the form of a new technology, a government regulation, or a concerted industry effort. It's impossible, however, to say when the disruption will come or how effective it will be, only that the further into the future we go with our projections, the more likely one becomes. This is one reason why we've limited our projections to the year 2030.

### A Disruptive Technology in Motion: Prepaid Cards Eviscerate the B2C Check

So far, we've seen direct deposit as an example of a (very effective) disruptive technology that's mostly run its course, and ACH billpay as another that's on a slow burn toward completion. What does it look like when one is in full swing? For that, the prepaid card is an excellent example of a disruptive technology that's in action right now.

In the reverse of the "utility problem" – businesses needing to accept payments from customers who don't have credit cards or bank accounts – every business also needs ways to disburse funds to individuals. This may be for payroll, rebates, services, simple refunds, or any number of purposes, but the common theme is that some percentage of these individuals will also be unbanked.

For decades, the check was the one universal way that a business could issue a payment to anyone in the public – banked or unbanked – and be certain that it would be accepted. For that reason, they were neck-and-neck with B2B checks for second place on the usage list for years. However, the prepaid card has displaced a huge number of low-value B2C checks. The decline in B2C check usage sped up from 7% in the 2006-09 period to an abrupt 40% in 2009-12. Meanwhile, use of prepaid cards increased from virtually zero a decade ago to 7% of all transactions today. The increase of 3.1 billion prepaid transactions annually over the 2009 report closely mirrors the decrease of 2.5 billion B2C checks per year in that same period.



Over time, we can expect the prepaid debit card to displace the majority of B2C checks for values between approximately \$10-\$100 (at higher amounts, the check is a more "official" type of payment; at very low amounts, the cost of the card itself becomes counterproductive).

But we're not done yet: So far, we've mainly been talking about non-reloadable debit cards used for low-value rebates and refunds. More recently, reloadable prepaid cards have also gained acceptance as a legitimate mode of high-value payments, even on the level of payroll and monthly living expenses. Tellingly, the federal government opted in 2010 to phase out paper checks for Social Security payments, which have since been migrated to ACH or prepaid cards, as have many states' welfare and unemployment benefits.

The number of payroll checks written, therefore, now depends not on the number of small businesses without access to direct deposit, but on the number of small businesses without access to direct deposit OR reloadable debit cards. While we expect these will be roughly the same businesses, the more choices are added, the more likely one of them is to displace some check volume. What we appear to be waiting for here is the introduction of a solution that is both easy and cost-free for the business, as well as universally accessible to the public, banked or unbanked.

Given the rapid rate of adoption for competing technology, B2C checks have declined much more sharply than checks in general, at 40% in the past three years after previously being one of the most stable categories in the mix. However, while the prepaid card is not completely finished making inroads, it would be mathematically very difficult for it to repeat its most recent performance. Merely maintaining the same pace would drop total B2C checks to a flat 1 billion by in 2015 (likely including a lot of difficult marginal cases like payroll checks and low-tech small businesses). Accelerating the decline at the same pace as in the last reporting period would drop the number of B2C checks below zero. Seeing just where the number of B2C checks ends up in 2015 will provide a key benchmark as to how many "marginal" or difficult checks exist in that group.

### Does B2C foreshadow "Doomsday" for checks?

B2C checks provide an excellent cautionary example of the precipitous decline in check volume that can come about when a truly effective disruptor is introduced. While prepaid cards affected only one segment of the check ecosystem, a similar disruption in other segments, and especially C2B, could decimate any one category within a matter of a few years. In such a scenario, total check volume in the U.S. could drop as low as 2-3 billion by the early 2020s before shrinking to the point of irrelevance. (We'll get to exactly how in a moment.)

However, the extreme situation mentioned above – the "Doomsday" scenario for checks, if you will – would require multiple compelling technologies to come to market almost immediately, and with very fast adoption. Therefore, even if a complete decline were to happen, it is still likely to take place over the course of a decade or more.

As for B2C checks themselves, while further erosion is likely, it can be expected that their rate of decline will slow in the next FRB Payments Study – it almost must slow, in fact. What will be left of B2C checks are most likely three main subcategories: Payroll checks for the unbanked, or from businesses without direct deposit; very low-value rebates and rewards; and miscellaneous payments such as refunds that are not part of an organized program, and other one-time payouts. These, of course, are the "marginal" payments that are hardest to uproot. We expect that about 1.5 billion B2C checks, +/- 0.1 billion, will still be around at the start of the next decade.

### What B2B checks say about the human element

From a purely financial standpoint, there is no reason why most B2B payments should not be conducted by ACH. Virtually all businesses have bank accounts, and are therefore capable of sending and receiving such payments; the speed and cost are also better than with checks. The likely main reasons why businesses do not pay via ACH are: 1) Their current back-office procedures use checks, and they do not want to go through the trouble of changing; 2) Smaller businesses lack the knowledge to set up ACH; or 3) Companies are unwilling to give out their bank account information, for reasons of security or company policy.

In B2B, as with C2B billpay and B2C payroll, ACH is the name of the game, and the main thing holding it back is a lack of access, or in some cases willingness. We can therefore expect this situation to play out along similar lines, with check volume steadily declining until we reach the tipping point of marginal difficulty – in this case, mostly checks that are entrenched in the small business world.

For these reasons, we do believe that the check still holds some long-term value in the business world – though, as with the other categories, at a reduced level from today. While we can expect the decline in B2B checks to continue, the above factors will likely mean that it begins to tail off in 1-2 reporting cycles, flattening out in perhaps the 2-3 billion range next decade.

### So, what's the next great disruptor?

Change happens fast in the payments industry, and right now, nothing is hotter than mobile wallets and smart-chip (EMV) credit and debit cards. But these technologies – and others like them – will probably have minimal impact on check usage, because they focus on the point of sale, where checks have already disappeared.

In order to exert further downward pressure on check volume, a future disruptive technology will most likely have to affect one of the use cases that has proven resistant thus far:

- ♦ **Payroll and other B2C payments where the business lacks ACH or prepaid card access**
- ♦ **C2B payments where the business currently does not accept online payments**
- ♦ **C2B payments where the consumer lacks a credit card or bank account**
- ♦ **C2C payments of all kinds**

The first three cases are underscored by a common trait: Lack of access to a suitable electronic replacement for a check. The fourth, C2C payments, appears to be a standardization and adoption issue. In all four cases, a new disruptive technology will be going after the "difficult" portion of remaining check volume.

What might such a technology look like? In July 2014, the Federal Reserve Bank announced that it was discontinuing research on Electronically Created Items (ECIs), citing declining check usage and changes in the payments landscape. In theory, an electronic check that worked exactly like a paper check could be a 1:1 replacement for many of the use cases that call for paper checks today. In the case of small business payroll, for example, the process would work the same as issuing a paper paycheck, only without the paper.

At present, such technology probably is, as the Fed noted, superfluous in light of other forces that are making greater inroads into check usage. But in several years, when check volume begins to flatten out because mostly "difficult" items remain, ideas like ECIs may get a second look.

## THE DISAPPEARING CHECK: HOW MUCH LONGER UNTIL THE END?

The case of C2C (or P2P) payments is a curious one, as not only does the technology to replace paper checks exist – much of it is already in widespread use. New money transfer apps and services are popping up constantly in the P2P space. Yet the number of paper checks written in this category not only remained steady but *grew* during the past six-year period. Why would this be happening?

Early on, the issue was standardization, as banks, mobile phone providers, and standalone private companies all got to various stages of P2P services, few of which were compatible with one another. Other services have since cut across banking boundaries: Square Cash, PopMoney, ClearXchange, and Google Wallet, to name a few; as yet, none have reached the “critical mass” of participation to emerge as a clear standard. Some face the additional challenge of convincing customers to pay a transaction fee – an uphill battle in a time when consumers expect mobile services to be instant and free.

Then there's PayPal, which has existed as a household name for over a decade, and boasts the closest thing to full participation in the P2P realm. Transfers between individuals are simple and free, it is multi-platform and bank-independent, and adoption is high across all age groups. If anything could be expected to displace checks in the C2C space, PayPal is it.

Yet, for some reason, it hasn't. What's more, there is no logical or financial reason why it would not be used in place of a check (or cash). It is very nearly the ideal weapon against C2C paper payments. So we are left with the theory that, for some reason, there is simply something about the “personal” nature of C2C transactions that makes a physical payment preferable.

This is a rather thin defense for checks and cash, but the trend has somehow held up for years. It's clear that the same attachment to checks and cash does not exist in C2B payments – and certainly not in B2C or B2B – so its effect is limited to this specific segment. The logical approach, as far as check volume is concerned, is to treat C2C payments as a special case.

While we're on the subject of special cases, we feel there is one more that needs to be addressed ...



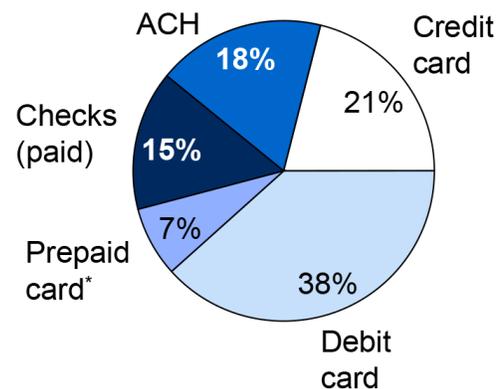
## Could Bitcoin Be the Next Check Killer?

Bitcoin is worth discussing due to its unique status as a payment method that is seemingly all of the other major payment methods and none of them at the same time. However, any time an article or study mentions Bitcoin, it risks turning into a referendum on cryptocurrency's eventual success or failure, and that is not our intention here.

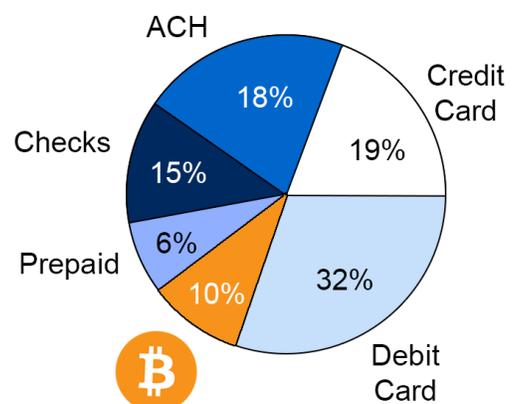
In any event, the only case worth exploring further is an eventual Bitcoin success; otherwise, there is nothing to talk about. *Therefore, the following projections are based on cryptocurrency increasing from less than 1% of payments volume to a respectable 10%, or roughly the same as what prepaid managed to achieve over the past six years.*

Compare the following two charts – the one at top shows the 2013 statistics for payments by volume from the Federal Reserve. The chart at bottom is a theoretical representation of what might happen if successful cryptocurrencies were included in the mix. Note that these figures should be considered “near-future” projections based on today's statistics, and do not account for future trends like continuing decline in check volume.

**Payments by Volume (2012)**



**Payments by Volume with 10% Cryptocurrency (hypothetical)**



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So, why would the totals break down that way, and why would Bitcoin “steal” more transaction volume from some payment methods – particularly card transactions – than others? To answer that, let’s look at the main things helping and hindering cryptocurrency adoption now.

**Bitcoin’s main hurdle today is that relatively few Americans understand it, or are set up to use it.** This will change over time; however, expect most Bitcoin adopters in the near future to be of the tech-savvy and electronically enabled kind; in other words, the type of people likely to already be using electronic payments instead of checks and cash. On the other hand, many check transactions – and especially the difficult “marginal” transactions discussed in this paper – can be attributed to a lack of access to electronic payments, or to a lack of willingness to use them.

In the long term, cryptocurrency may wind up improving ease of access to electronic payments, given time for the technological barriers to come down. But in the near future, we expect that the people using checks due to access or technological issues will continue with business as usual, with Bitcoin mainly displacing other existing forms of electronic payments.

**Until cryptocurrencies’ volatility goes away, carrying a balance of them will remain an unattractive option for everyday consumers, as well as for businesses, leading to built-in transaction costs.** That’s not to say that everyday consumers won’t use Bitcoins at all until then. But when they do, we can expect the majority of payments to be spot transactions, where dollars are converted into Bitcoins for immediate use by the consumer, then quickly converted back into dollars by the merchant.

It is growing easier and easier to do this, and the process itself should not be a limiting factor for long. However, for purposes such as C2B billpay, particularly where automatic monthly payments from an account are set up, carrying a balance of Bitcoins may be unappealing. This, as you may recall, currently represents the single largest use of paper checks today. It will likely prove possible to use spot-pay conversion services for this purpose as well, but another issue will also make that unappealing unless resolved:

**Conversion fees will remain a problem for C2B payments, and for merchants accepting high-value payments.** Every time Bitcoins are converted into dollars and vice versa, it’s like a mini-foreign exchange transaction, and a third party takes a fee, typically up to 1% of the total. After all, the hundreds of new Bitcoin startups aren’t in it to lose money, so many of them have pinned their hopes on the notion that consumers or businesses will be willing to forgive a small exchange fee in order to use the technology.

But, consumers today have the expectation of executing payments for free, whether by cash, check or card – and even of receiving a percentage back from rewards programs. Therefore, when faced with paying a percentage for each transaction, consumers will abandon cryptocurrency in favor of methods that are free.

This can easily be fixed by passing the entire transaction fee on to the merchant while charging zero fees to the

consumer. But now the transaction starts to look awfully familiar: With no charge to the consumer and a fee of around 2% to the merchant, we are essentially describing the cost structure of a credit card payment.

Therefore, we would expect merchants to express mostly the same preferences as today: For high-value payments, ACH, cash and checks exclusively; for POS transactions, cash, then Bitcoin or cards; and for routine online bill payments, ACH first, check second, Bitcoin and card payments last.

So in this scenario, the cryptocurrency battle becomes a tug-of-war between Bitcoin and cards, with transaction fees the deciding factor. If the Bitcoin crowd can keep their costs below those of cards, they have a chance of moving up on merchants’ preference lists, ahead of credit and debit, but still behind flat-fee and fee-free payment types.

In summary, assuming it is possible for Bitcoin and other cryptocurrencies to overcome the technical and adoption challenges in front of them, other factors indicate they will be most likely to replace card transactions.

While the future still shows that check volume will continue to migrate to ACH and cards – and now possibly Bitcoin – we expect that cryptocurrency will be more a subset of the card element than a driving force behind migration overall.

## Conclusions

1. By 2020, the likelihood is that checks will still be around in significant numbers, with about **10-11 billion** being the most likely number and the worst case being **8 billion**.
2. A small number of “marginal” checks exists in each category that will be extremely difficult to remove. **Percentage fees and lack-of-access issues are the two major obstacles** preventing newer forms of payment from displacing the check in most of these cases.
3. Despite the focus on checks in the business world, **the personal check – and particularly the C2B check – is the underpinning of the check ecosystem** and the RDC ecosystem.
4. New technology is the main “wild card” for the health of checks overall, and for the sustainability of RDC. **If a disruptive new form of payment hits C2B and is successful, check volume could drop much more quickly than anticipated.**
5. The middle of the next decade is where checks’ probability of survival diverges depending on what new technology arrives. **Best case, they will stabilize for the long term at around 7-8 billion. Worst case, check volume will be down to 3 billion or less by 2030 and trail off to zero** over the next decade or two after that. As time goes on, the probability of a major disruptive event increases, and the Doomsday scenario becomes more likely.
6. Bitcoin has the potential to be a disruptive technology in payments – however, it appears that **cryptocurrencies will mostly compete with credit and debit cards.**
7. **C2C checks seem to be an anomaly**, resisting change despite the availability of alternatives. P2P payments could displace many of these checks at any time. This would not have much effect on the viability of desktop RDC, however.

## Projections

The following represent approximate projections for check usage in the United States under three different scenarios: 1) Current trends in check usage continue almost exactly as now; 2) Current trends continue, but C2C checks experience a disruption instead of remaining flat; and 3) A disruptive technology hits C2B, the largest segment of the check ecosystem ("Doomsday" scenario).

### Scenario 1: Present path; C2C remains flat

(in billions; "Total" includes checks converted to ACH)

Year	C2B	B2B	B2C	C2C	Total	Paper
2013	9.6	5.9	3.1	2.4	21.0	18.6
2020	6.05	2.75	1.5	2.4	12.7	11.3
2025	5.0	1.9	1.2	2.4	10.5	9.3
2030	4.2	1.4	1.0	2.4	9.0	8.0

### Scenario 2: Present path; C2C gradual decline

(in billions; "Total" includes checks converted to ACH)

Year	C2B	B2B	B2C	C2C	Total	Paper
2013	9.6	5.9	3.1	2.4	21	18.6
2020	6.05	2.75	1.5	2.0	12.3	10.9
2025	5.0	1.9	1.2	1.5	9.6	8.6
2030	4.2	1.4	1.0	1.0	7.6	6.6

### Scenario 3: Disruptive C2B technology arrives ("Doomsday scenario")

(in billions; "Total" includes checks converted to ACH)

Year	C2B	B2B	B2C	C2C	Total	Paper
2013	9.6	5.9	3.1	2.4	21	18.6
2020	4.0	2.75	0.5	2.0	9.25	8.2
2025	1.5	1.9	0.4	1.5	5.3	4.7
2030	0.7	1.4	0.3	1.0	3.4	3.0

### Addendum: A Word About Check Writing and Demographics

"Wait a minute," some readers are almost certainly thinking, "You've gotten through an entire paper about the decline of paper checks, and you haven't once mentioned age?" It is a popular opinion that the remaining lifespan of the check is directly tied to the remaining lifespan of Americans middle-aged and older, and one that is repeated in banking circles and barroom conversations alike.

We considered addressing this theory in the "Myths" section at the start of this paper, but decided against it because the same level of hard statistical data is not available to prove or disprove it. However, we can say with total certainty that it is not the *only* cause for declining paper check volume, and with a good degree of certainty that its influence is akin to that of a modifier applied to the decline in checks that would happen anyway due to technological disruption.

Let's start by revisiting a key statistic from "Myth #1: Check usage is declining at an accelerating rate." In that segment, we discovered that checks are in fact declining at a linear rate, and that if the same pace continues, the number of checks written will drop to zero in 2021 – nine years after the date of the most recent Federal Reserve Payments Study. Well, according to the CDC, the annual U.S. death rate in the 65+ age group is 4.4%, so in any nine-year period, we could expect that group to decrease by 39.6%, and the remaining 60.4% to carry on living. So using the old-age explanation alone leaves about two-thirds of the projected decline in check volume unaccounted for; in the decade past, death rates also trail the decline in check usage considerably. Clearly, there are additional factors at work, and there are plenty of likely candidates to choose from.

#### Cause, or Effect?

One undeniable fact is that older Americans write more checks than young ones. In 2009, the Federal Reserve Bank of Boston commissioned a research paper titled *Why Are (Some) Consumers (Finally) Writing Fewer Checks: The Role of Payment Characteristics*, which attempted to explain consumers' payment preferences using mathematical models. That study showed that Americans in the 65+ age group who wrote checks did so much more often than those in the 25-34 category, using them for twice as many of their overall transactions (49 percent vs. 24 percent).

However, the main correlation discovered in the report was not of age but of availability: Regardless of age, the likelihood of using a check had a strong inverse relationship with the number of other payment methods held by the consumer that could serve as a check alternative. Moreover, the authors estimated that, with other forms of payment reaching the market, the relative cost of checks rose 30 percent while convenience decreased by the same amount. Put together, cost, convenience and

availability were gauged to account for 70 percent of the decline in check writing in the early part of the decade.

It's another way of stating a point we touched on earlier: People don't write checks just because they're old. Nor does anyone say, "I'm going to avoid checks because I'm young." It's the availability of something perceived as better that brings about change.

Adoption of check alternatives has partly played out along age-group lines – but it is also possible to draw connections by income level, education, and even race. These demographic tendencies have the look of symptoms – the end product of innovation – while the new technology itself remains the driving factor.

That is not to ignore age entirely. Out of the four traits mentioned above, age happens to be the only one where everyone will change groups in a predictable way over time. However, while generational tendencies may be one manifestation of the wave of new payment options, they should not be confused with the main story.