The Disappearing Check

Part 2: Assessing the Decline

It's time to continue an honest discussion about the future of the check in American payments.

Check use in the United States has been on the decline for years, as other more modern forms of payment – credit cards, debit cards, prepaid, and ACH – have taken off in popularity. If the current rate of decline keeps up, the number of checks written per year will drop to zero by 2021. Will it really happen?

In our previous white paper, *The Disappearing Check: How Long Until the End?*, we predicted that the decline would slow down, based on a number of factors that would make the last remaining checks harder to eliminate. But the last "official" check usage figures from the government are from 2012, and a lot has happened in the meantime.

In this paper, we examine recent and historical trends in payments to determine whether the decline of the check is indeed slowing, and if so, by how much.

In April, NACHA – The Electronic Payments Association® published its statistics on ACH payments for the year 2014, and it looks like the ACH business is booming. Nearly 23 billion transactions were processed via ACH last year, an increase of more than 1 billion from 2013. That sounds like bad news for checks, since – in many respects – an ACH transaction is a direct replacement for a paper check. Direct deposit, online bill pay, taxes, corporate reimbursements, Social Security payments – all of these things that were formerly the domain of checks are now often handled electronically with ACH transactions.

So, what, if anything, can these figures tell us about where check volume is headed? It's tempting to think that a billion more ACH transactions means that a billion paper checks went away, keeping the check right on course for an early grave.

But few trends are as simple as straight 1-to-1 relationship, and check vs. ACH is no exception. To find out what these extra billion ACH transactions *really* say about check use, we need to account for at least three related factors:

1. How many of these billion ACH transactions replaced check transactions, and how many were new transactions resulting from the growth in payments overall?

2. What effect are the three other major payment methods – credit, debit, and prepaid – having on checks, and can we project their current effect from the ACH numbers?

3. Are any recent events or new technologies exerting an outsize pressure on checks or on payments in general?

Natural Growth vs. Cannibalizing

To our first point, some of the rise in ACH payments undoubtedly came at the expanse of checks – but some ACH growth could also be expected to occur naturally, as the number of all transactions everywher also increased.

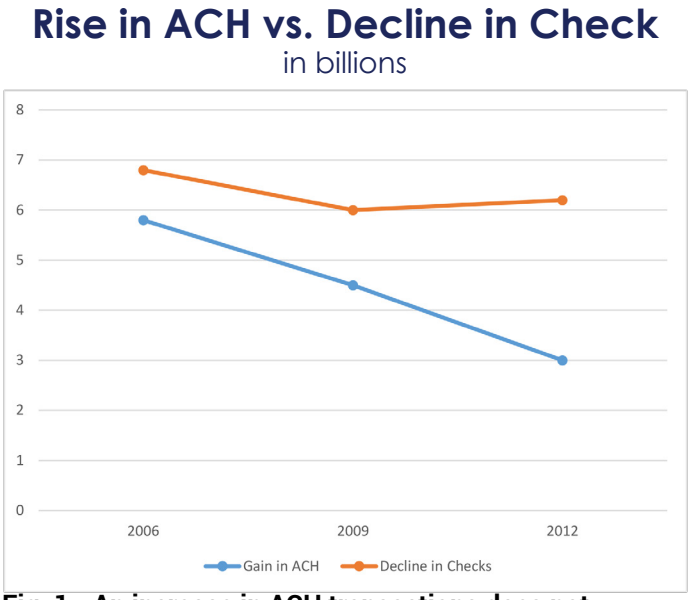


Fig. 1 - An increase in ACH transactions does not cannibalize check volume at a 1:1 ratio.

How much would natural growth account for? According to statistics from the Federal Reserve Bank, total transactions of all kinds in the United States have increased by 50.9 percent in the decade from 2003-12, from 81.4 billion to 122.8 billion. That rate of increase stayed relatively even for each three-year reporting period, varying between 13.5 percent and 17 percent – suggesting the current pace will not be vastly different.

Below, we see the actual growth in ACH transactions compared with the growth that would be expected to occur naturally:

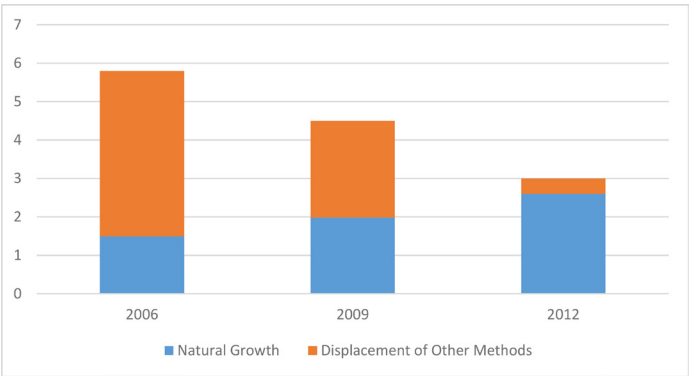


Fig. 2 - As ACH's rapid growth rate starts to flatten out, a bigger share of that growth can be attributed to the rising number of payments in general, while less comes at the expense of other payment methods.

The blue bar in the chart on the previous page represents what we would call "natural" growth – the rise in ACH volume that could be expected if all payments methods retained identical market share. The orange is what ACH gains at the expense of other transaction types, primarily checks.

As the chart tells us, growth in ACH transactions rapidly outpaced overall payments growth in the mid-2000s, but recently has slowed to be more in line with the growth rate of transactions in general.

Has ACH Taken A Break from Being a 'Disruptive' Technology?

The numbers make it obvious that ACH is no longer in the midst of the meteoric rise it experienced in the early 2000s. That's partly because such a pace was mathematically impossible to sustain: At 2003-06 growth rates, ACH payments would today account for $87.6 trillion worth of transactions – that's 111 percent of the actual $79 trillion reported across *ALL* payment types.

But the slowdown also happened in part because ACH is a maturing technology. In the 2000s, direct payroll deposit reached essentially full participation among those equipped for it; ecommerce sites became widespread; and any company with a compelling reason to accept ACH for online billpay became able to do so relatively easily. In other words, the "land rush" days are over, and while ACH still continues to displace some number of paper checks, it is now doing so use case by use case.

So, let's figure out exactly how closely ACH's growth rate compares to the natural baseline increase we'd expect in payments overall.

In the last two reporting cycles, growth in payments overall has remained remarkably steady, at 13.55% and 13.60%, respectively. At that rate, ACH transactions should have risen naturally by 3.0056 billion from 2012-2015. Or, in other words, by 1.0019 billion each year. That's almost an exact match with the 1 billion increase that was reported by NACHA in its 2014 data.

ACH's Growth Slowed Down, But There's Still More to the Story

Wait – did we just prove that ACH transactions are no longer eating into check volume at all? Well, not necessarily. All we've shown is that ACH growth has slowed down to roughly the same as the expected growth rate of payments in general. But that leaves us with multiple possiblities:

1. ACH is no longer displacing check transactions.

2. ACH is still displacing check transactions, but this effect has been masked by payments in general growing more slowly than expected.

3. ACH is still displacing check transactions, but other payment types are also displacing ACH.

4. ACH is not displacing check transactions, but other payment methods are replacing checks.

First, let's try to address the key question in #2 – is a billion really the right number that we should've expected ACH to grow by?

The answer: Probably not. To see why, we need to look at data for a completely different transaction type:

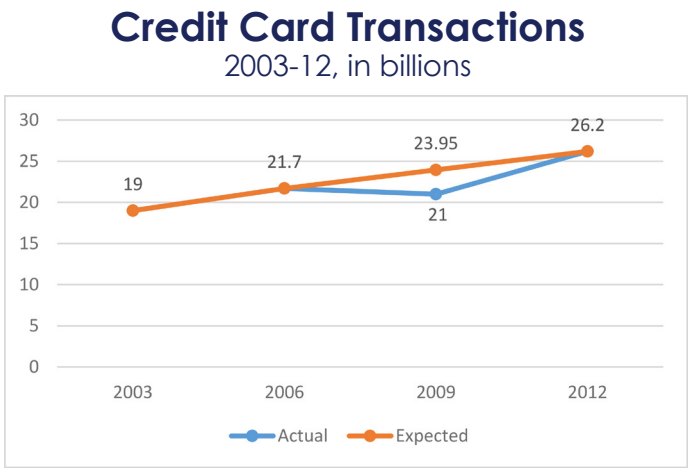


Fig. 3 - Due to the economic downturn of 2007-08, credit card use suffered a temporary depression during one reporting cycle, then rebounded the next.

So, what exactly are we looking at with that credit card data? Well, over a full decade, credit card payments are the only transaction method that neither gained nor lost a significant amount of market share. From 2003-12, they increased at a remarkably steady rate of about 0.8 billion annually. However, the economic downturn of 2007-08 had a severe negative impact on credit cards in particular, which actually *lost* both market share and absolute volume in the 2009 reporting cycle.

In the long term, that didn't matter: Once the economy returned to normal, credit cards made up the difference quickly, and were right back where we expected them. But in the short term, the beating that credit cards took was enough to throw off the growth rate of payments overall by about 3 percent. Let's look at what happens if we flatten out that up-and-down swing by averaging it across the period:

Total U.S. Transactions
in billions, with/without recession

	2003	2006	2009	2012
Actual	81.4	95.2	108.1	122.8
% Gain	n/a	16.95%	**13.55%**	**13.6%**
Adjusted	81.4	95.2	111.1	122.8
% Gain	24.5	16.95%	**16.7%**	**10.53%**

Fig. 4 - About 3 billion "missing" credit card transactions in 2009 distorted payments growth figures overall for the subsequent two cycles.

Here's the important part: Adjusting for the credit card swing, payments as a whole were actually growing *MUCH* faster in 2009 than they were recently. Once that's accounted for, we should have expected ACH to gain 775 million transactions in 2014, not 1.056 billion.

That means that, out of the billion new ACH transactions reported by NACHA last year, about 225 million would have come at the expense of other methods – most likely the paper check.

Is there a way to verify this? Well, according to NACHA's figures, the number of ARC transactions – which are essentially paper checks received for bill payments, then converted to ACH transactions – fell by 180 million. Meanwhile, PPD Debit transactions – the type used by consumers for online bill pay – rose by 190 million. CCD Debits, the business-to-business equivalent of PPD Debits, added about another 75 million.

That gives us a slightly imbalanced ratio of 265 million new ACH transactions for online billpay, compared with 180 million fewer for paper billpay. Neither of these offers explicit confirmation of our projected 225 million checks displaced.

But consider that about 10% of the new ACH transactions were due to payments growth in general, and we arrive at 238.5 million; furthermore, not every check that was displaced was necessarily an ARC item before. So we have at least circumstantial evidence that ACH is indeed replacing around 225 million paper checks per year.

Other Payment Methods Are Now Replacing More Checks than ACH Is

When the next Federal Reserve report comes out in 2016, ACH transactions should effect a reduction of about 675 million checks over the three-year reporting period. But, since checks have been declining by more like 6 billion every three years, that leaves 90% of the usual decrease unaccounted for. The rest will have to come from other forms of payment, namely credit, debit, and prepaid cards.

How much of an impact has ACH had on check volume compared to these other forms of payment? To answer that, let's examine how those payment methods have done compared to each other. In other words, we take the level of Check, ACH, Credit, and Debit/Prepaid transactions in 2003, project where we would expect them to wind up in 2012 if they had grown by the same amount (50.9%) as payments overall did, and use the difference to figure out which have done well and which have done poorly.

Payment Growth

compared with payments in general, billions

	2003	2012 expected	2012 actual	Diff.
ACH	8.8	13.3	22.1	**+8.8**
Credit	19.0	28.7	26.2	**-2.5**
Debit/PPD	15.6	23.5	56.2	**+32.7**
Check	37.3	56.3	18.3	**-38.0**

Fig. 5 - ACH and debit/prepaid growth outpaced that of payments overall, while credit lagged slightly and checks shrank.

This exercise is a zero-sum game: If a particular payment method grew faster than the average for all payments, it is assumed that it did so by encroaching on the market shart of another type. If a method grew more slowly, it is assumed that it gave up market share to another method that was outcompeting it.

So compared to payments overall, ACH grew much faster than expected, and credit cards actually gave up a small bit of market share. But the runaway winners – at least in terms of transaction volume – were debit and prepaid cards, which grew more than five times faster than payments in general.

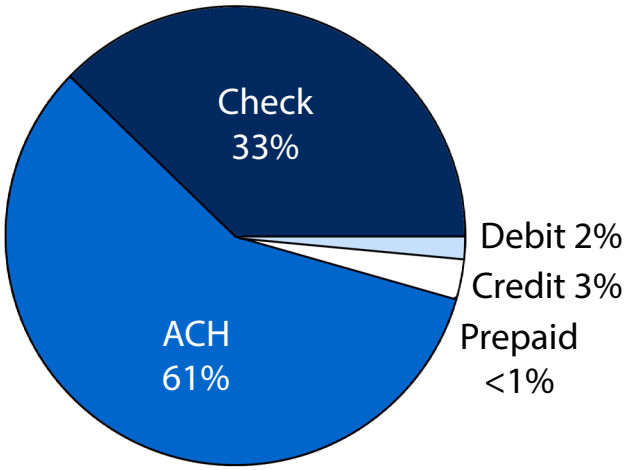
Setting aside for a moment the relatively small shrinkage in credit cards, what we are essentially looking at is a breakdown of which payment methods are cannibalizing check volume. By this measure, debit and prepaid cards had an effect about 3.7 times greater than ACH over the past decade.

This is to be expected, because ACH has tended to replace higher-value payments, while the debit-card explosion has occurred mainly in small purchases, of which there are more. In fact, despite making up two-thirds of transactions, all cards still account for just 5% of net dollars spent.

Coming back to our original question: How much effect will this have on check volume when the Fed releases its next set of figures? We hypothesized earlier that ACH growth is currently displacing about 225 million checks per year. With an effect roughly 3.7 times greater, we could expect debit and prepaid to displace another 833 million. Between all payment methods, then, that would be 1.06 billion per year, or 3.18 billion over the three-year period.

Payment Types by Value

2012



Debit and Prepaid will Likely Get an Even Bigger Share This Time Around

Even a decline of 3.18 billion checks per three-year period would represent a significant, almost improbable slowdown compared to the 6-billion rate that has held up for most of the past decade. Surely there's more to it?

There is. As we mentioned, the growth of ACH payments was much stronger at the start of the past decade than at the end. In fact, the difference was so pronounced that applying the 3.7 multiplier for the overall decade is probably misleading. Debit and prepaid also started running into a bit of a wall over the past few years, but the effect was much less drastic there than with ACH.

Measured in percentage terms, ACH started out growing at a 66 percent clip in 2003-06, followed by

31 percent in 2006-09, and 16 percent in the period ending 2012. The same numbers for debit were 60 percent, 50 percent and 25 percent; for prepaid, a near-infinite percentage gain in 2003-06, followed by 79 percent and 56 percent. Some of this is to be expected – as we mentioned earlier, you can't keep growing at the same *percentage* rate for long before you create a mathematical absurdity – but the point is that debit and prepaid are at least once cycle closer to their respective peaks than ACH is.

How can we translate this effect into a rational prediction about check volume? A closer look at debit and prepaid together reveals their strongest showing was in the period from 2006-09, when they grew by 14.6 billion. More recently, they grew by 12.8 billion – a slowdown *in both percentage and absolute terms.* Debit cards taken separately grew by 9.5 billion in this period, compared with 12.5 billion the period before.

	CAGR 2003-12	CAGR 2009-12
ACH	10.9%	5.1%
Credit	3.7%	7.6%
Debit	13.0%	7.7%
Prepaid	30.7%	15.8%

Since payments as a whole, adjusted for the 2008 economic slowdown, grew almost 40 percent more slowly now versus in 2009 (10.5% vs. 16.7%), that means debit and prepaid are actually still doing better than average.

Taking all of these additional modifiers into account together adds another 750 million to the expected downward pressure on checks, putting us at a roughly 3.8 billion decrease over the three-year period.

That still leaves us well short of the usual 6 billion decline in check volume, so we're left looking at the final two elements of our original theory: Whether credit cards are further cutting into check volume, or whether cards are undermining ACH volume, and thereby masking the full effect that AHC has on the paper check.

Getting Into the Gray Areas

Predicting how other factors figure into the cushion between those 3.8 billion checks that are accounted for and the 6 billion historical rate is tricky. For example, it's tempting to look at the recent spike in credit card transactions and think they'll play a bigger role going forward, making up some of that gap. But if our previous assumptions are correct, the spike is simply a one-time correction for an anomalous event, and in the future, credit cards will continue to grow at about the same rate as always, which is to say, in lockstep with payments as a whole.

As we just mentioned, controlling for the credit card spike, payments' growth as a whole slowed signficantly from 2009-12. The converse of this is that, despite slower growth among other payment methods, checks declined by the same 6 billion in 2009-12 as they did in previous cycles. That would, by necessity, indicate that at least some of that check volume was swallowed up by credit cards (or, that debit and prepaid ate proportionally more check volume, and in turn, credit cards ate some debit and ACH volume on the back end).

The further downward pressure on checks from this is anybody's best guess. A simple way would be to say it could be anywhere between zero and 58% – that's the uptick we'd see in payments growth rate if they rose from their current "credit-controlled" rate of 10.53% back to the previous 16.7%. That yields an admittedly wide range of 3.8 billion to 6.1 billion fewer checks in the 2013-15 reporting period.

It's probably safe to rule out the extreme low end, as economic data do indicate a steady recovery from 2013-15. So, call it 4.8 billion to 6.1 billion; the middle of that range would be 5-5.5 billion. That would leave us with between 13.6 billion and

14.1 billion paper checks written per year by the end of 2015, slightly above the 12.5 billion that the linear trend of the past decade would predict.

So the decline in check writing isn't slowing by half, but if these figures bear out, the flattening out from 6 billion would still be noticeable.

Are We Hitting the 'Marginal Wall?'

Beyond raw numbers, it's worth exploring a question at the root of the decline in check use – one that we addressed in our related white paper, *"The Disappearing Check: How Much Longer Until the End?"* Put simply: Why would the advance on checks by electronic payments be slowing? After all, the check isn't getting any more convenient or technologically advanced. The answer is that a lot of the "low-hanging fruit" is gone, and the marginal difficulty of replacing the remaining checks becomes higher.

To further elaborate: Technologies like direct deposit or online bill pay haven't become any less useful, but when they reach near-full participation, there is simply not as much left for them to accomplish, and their growth inevitably slows. And the closer we get to zero paper checks, the more of them are entrenched in difficult-to-replace specialty situations – people without Internet access, small businesses not set up for direct deposit, high-value payments where merchants dislike paying a percentage fee for card transactions, and so on.

In a similar vein, much of the very recent activity in payments hasn't had much effect on check volume. Since checks have already disappeared from the retail point of sale and been replaced by various cards, major new technologies like Apple Pay and EMV haven't had any further impact. There's simply nothing left for the new technologies to "disrupt" there, except each other. The next "great disruptor" could always be just around the corner, but arguably none have arrived for checks since the rise of the prepaid card in the mid-2000s.

The paper check is not about to stop its decline and start growing again. But it does appear that this may be the first sign that the decline is slowing. So where are we headed next?

A literal projection of payments trends in late 2013 would take check usage straight to zero by 2021. Let's look at what happens with a 5 billion decline per 3 years instead of 6 billion. (Or, a decline of 1.66 billion per year compared with 2.1 billion.)

	Current Rate 2.1B/year	New Rate 1.66B/year
2012	18.6 B	18.6 B
2013	16.5 B	16.94 B
2014	14.4 B	15.28 B
2015	12.3 B	13.62 B
2016	10.2 B	11.96 B
2017	8.1 B	10.3 B
2018	6.0 B	8.64 B
2019	3.9 B	6.98 B
2020	1.8 B	5.32 B
2021	0	3.66 B
2022		2.0 B
2023		0.34 B
2024		0

All we've really done in this case is add three years of low-level existence to the check's future. However, if this is the beginning of a trend where marginal difficulty starts to kick in, it could be a different story. Here's what happens when the rate at which checks are displaced starts to drop off by 0.33 billion per year, or 1 billion per three-year period:

	Flat Rate 2.1B/year	Diminishing Rate
2012	18.6 B	18.6 B
2015	12.3 B	13.6 B
2018	6.0 B	9.6 B
2021	0	6.6 B
2024		4.6 B
2027		3.6 B
2030		3.1 B

Those of you who read our earlier paper may have noticed that the projections on the preceding page are somewhat different from our previous ones, in which we predicted that the decline in check usage would gradually soften until their numbers more or less stabilize in the 8-10 billion range during the 2020s. We still believe those projections to be accurate; the figures in this report are modeled solely on current data with constant rates of change, and there is less accounting for the difficulty of replacing the "holdout" checks in specific situations.

In reality, checks will likely continue along roughly the predicted path until they reach about half their current number, and then the next big drop will come when the next "great disruptor" arrives. That disruptor will probably be a new technology that does one of two things:

1. Allows small businesses to accept ACH without setting up an online payments service (or without having a website at all), and with no percentage fee;

2. Allows businesses to initiate payments to any business or individual, regardless of whether that entity has a bank account, and for that new technology to be cheaper, more secure, and more reliably trackable than prepaid cards.

It is not difficult to imagine some combination of email-address or phone-number based payments, blockchain technology, and P2P payment services filling these gaps – indeed, the foundation for much of this technology already exists today. But only when it is accessible with no more than a momentary setup, and with a cost structure other than the percentage fee, will it become the next great disruptor.

Depending on how far you take our speculation about marginal difficulty, you could project checks surviving in some numbers for another 30, 50, even 100 years. But no matter how you work the statistics, one thing is a near-certainty: Beyond about the mid-2020s, the next big disruptive technology probably puts check volume at a third of what it is today, give or take a billion or two. And at that point, we are basically just arguing over how long it will take for the smoldering embers to burn out.

So perhaps just as important a question as "How long will the check last?" is: "In what numbers do checks need to exist in order to remain relevant to the payments system?" That's what we'll examine in the second part of this report.

The Disappearing Check

Part 3: Predicting the Endgame

In the first half of this paper, we investigated NACHA's data on ACH transactions, and compared it with recent and historical trends among other payment types, to see if we could figure out whether the decline of checks was slowing at all. The answer was yes, that there was likely a small (but significant) deceleration.

But what does it all mean? Have we gotten any closer to knowing when, or how, checks will cease to function as an effective payment method?

In the conclusion to our series of reports on the future of the check, we take a look at American habits and worldwide trends in an attempt to predict the ultimate fate of checks in the 2030s and beyond.

Checks Won't Go Out with a Whimper

The end of a major payment method is not something that most of us have experienced before, so let's begin with the most basic question of all: How is this going to work?

It's easy to imagine a future in which check use gradually dwindles until everyone just loses interest in them. You've hardly used them for years, then one day you have your watershed moment: Some computer is out of order or your card is declined, so you try to pay with a check – and the cashier gives you a funny look and says, "What's that?", then goes to get the manager. Checks have simply become irrelevant.

In reality, the death of paper checks won't be a gradual fade to black. We won't see their numbers decline to 50 million one year, then 25 million the next, then drop to zero naturally when the last person decides to stop using them. Much more likely, check use will diminish to a certain point where the banking industry and/or the government agrees that it is no longer worth the expense of dealing with them, and a formal deadline will be set for a phaseout. In any discussion about the check's future, identifying *that* key trigger point is just as important as projecting raw usage numbers.

A World Full of Examples

Canada is not what we would call a particularly check-happy (or cheque-happy) nation: In 2012, Canadians wrote 881 million checks, compared to 18.6 billion for Americans. Of course, the population of the United States is more than 9 times greater than that of Canada, at 318.9 million vs. 35.1 million. If Canada contained the same number of people as the United States – an upsetting scenario for many Canadians, we assume – then they would have written just barely more than 8 billion checks that year.

Why is this significant? Because in 2012, Canada was beginning to move to an electronic check-clearing process similar to the one in the U.S. – in fact, the Canadian system became fully operational in 2014. So in effect, we've shown that even at half the present level in the U.S., checks remain relevant enough that the financial industry, and the government, still finds it beneficial to engage in modernization projects, rather than a simple winding-down process.

Check Use by Country

	Population (M)	Checks/ year (M)	Checks/ person
USA	318.9	18,600	58.3
Canada	35.1	881	25.1
Brazil	200.4	1,800	9.0
UK	64.1	718	11.2

If the "floor of relevance" for the U.S. isn't 8 billion, where does it lie? Next on our list is Brazil, whose 200.4 million people write nearly 2 billion checks per year. Adjusting for the population difference, that equates to 3.2 billion checks in the U.S. Yet Brazil also recently introduced image-based check clearing between banks, and is in the process of rolling out remote deposit capture. So even at one-sixth their present use rate in the U.S., checks must still at least be accounted for, and developing an image-based infrastructure remains worthwhile.

But could Canada and Brazil be anomalies, perhaps due to their vast geographical size, which makes the physical exchange of paper documents as or more difficult than in the United States? Well, certainly one reason why we started with those two is because – like the U.S. – they're continental countries with fairly large populations and well-developed banking systems. And in both cases, at least part of the original clearing process involved expensive air transportation, with settlement requiring multiple days.

What if we shrink both the number of checks per person and the physical distance we're dealing with? The United Kingdom, with an area about half that of California, contains 64.1 million people, and processed 718 million business and personal checks in 2013. That projects into 3.6 billion checks at a U.S.-equivalent population, about a fifth as many per person and not too different from Brazilian levels. With a geographical size one-fortieth that of the U.S., British banks transported paper checks by rail, part of a clearing process that took up to six days. (In fact, the delay, rather than the expense, was often cited by British banks and consumers alike as their chief complaint about using checks.)

Here's where it gets interesting: In 2009, the Payments Council – one of Britain's major banking industry associations – announced that it would close the country's central check-clearing system by 2018. However, after two years of public and political debate, the organization reversed course and decided that the clearing system should be modernized and check usage continued indefinitely.

Is 3 Billion Checks Our 'Floor?'

The United Kingdom appears to provide an excellent example of the threshold at which checks, in a developed country with a modern banking system, had faded to near the "floor of relevance." If it's strictly a matter of check writing per capita, that would put the floor in the U.S. somewhere around 3 billion – any lower, and banks or the government might find it easier to do away with them.

Brazilians, you may have noticed, write even fewer checks per capita than Britons. But we suspect that geography may have played a role in tipping the balance back in favor of modernizing, rather than abolishing, the paper check. Consider, then, the check usage table at the bottom of this page, with two new columns added.

As a crude estimate of geography's effect, we've divided, rather than multiplied, each country's per-capita check writing propensity by its population density. The idea is that, prior to image-based clearing, a dispersed population makes each paper check more difficult (and expensive) to deal with on average, while a concentrated population makes the task easier. The resulting coefficient, in the right-hand column, represents the expected gain from modernizing the check-clearing system versus simply scrapping it altogether.

Viewed in this light, the UK would appear to be the extreme outlier among the group, and its incentive to modernize checks much lower. The same principle would apply to much of Europe, where many countries have indeed begun phasing out the check already. For the United States to match the UK's density-benefit number, its volume of checks written annually would need to be about half a billion – or just under two checks per person.

Clearly, this is not an entirely apples-to-apples comparison. Canada, for example, has a financial industry dominated by five megabanks, compared to thousands of all sizes in the U.S., so infrastructure

Check Use by Country, Adjusted for Geography

	Population (M)	Checks/ year (M)	Checks/ person	Population density	Checks/ density
USA	318.9	18,600	58.3	84/mi	0.69
Canada	35.1	881	25.1	8.8/mi	2.85
Brazil	200.4	1,800	9.0	62/mi	0.145
UK	64.1	718	11.2	660/mi	0.017

projects will take on a much different look. Brazil has a well-run banking system that, in many aspects, rivals or even surpasses those of other Western countries – but until fairly recently, few Brazilians had credit cards and the majority lacked Internet access. The point is that each country's individual circumstances will have a lot to do with the staying power of the check, and on the cost/benefit analysis of keeping them.

Reaching the Final Minimum

From this exercise, we feel safe saying that we can draw the following conclusions:

1. There is no "magic number" at which the check becomes irrelevant across all countries. If there were, the experiences of Canada and Britain would at least show that number to be well under a billion in absolute terms; in per-capita terms, Brazil would show it to be less than 9 checks per person annually.

2. Based on per-capita usage alone, we would expect the point of irrelevance in the U.S. to lie somewhere around 3 billion.

3. Based on per-capita usage adjusted for geography and other considerations, the point of irrelevance could be as low as 500 million.

Therefore, the point of irrelevance in the U.S. ought to be somewhere between 500 million and 3 billion checks per year. That's not an exact number, but it's far better than "I don't know."

There is reason to believe that the floor will be closer to 1 or 2 billion than to 500 million, though. For one, the American banking system is the biggest in the world, so the overall fixed infrastructure for clearing checks – even electronically – is by necessity going to be larger and more expensive than in other countries. When this fixed expense grows too large in comparison with the number of checks to be cleared, we can expect pressure from the industry to cut costs or eliminate the process entirely.

So, where does a 2 billion floor leave us? If the current rate of decline were to continue, it would mean the end of the check moves up a year, from 2021 to 2020. Accounting for our earlier calculations about NACHA's recent ACH data, it would be between 2021 and 2025. If our assumptions about the difficulty of replacing the last checks are true, it takes us well into the 2030s.

However, since a move to eliminate checks altogether would require a few years' advance warning from regulators, we would expect 2025, five years after our earliest possible drop-deadline, to be the soonest realistic timeframe. Assuming a more typical pace, 2025 would bring the announcement of a phaseout, with 2030 the eventual target.

If our further assumptions about the increasing difficulty of eradicating the last few checks is also borne out, the window would more likely extend another decade or more. Therefore, we conclude:

1. The end of the check in the United States will probably not happen when their number drops to zero naturally. It will likely be a joint decision of the banking industry and regulators to "pull the plug" on a certain date.

2. We expect serious consideration of this idea to start when there are around 3 billion checks per year in the U.S., and adopted when they are at the 1-2 billion level, with a phaseout no sooner than 2 years from that date, but possibly as many as 10 years.

3. Therefore, 2021 would be the absolute earliest possible, and 2025 the earliest reasonable, hard deadline for the end of checks. In the event of a more natural tailing-off in check volume, the end would more likely arrive in the early to mid-2030s.

In an extreme case, where the last bit of check volume remains exceptionally difficult to replace, the check would survive the 2030s in the 3-4 billion range, and last into the 2040s with marginal use.