

THE RISE OF ELECTRONIC PAYMENTS

With the growing adoption of electronic payments and emergence of new payment methods, the payments landscape will continue in its evolution over the next few years.

New technologies will play an increasingly important role in the management of payments.

Trends include the continued decline of paper-based payments, the emergence of new payment

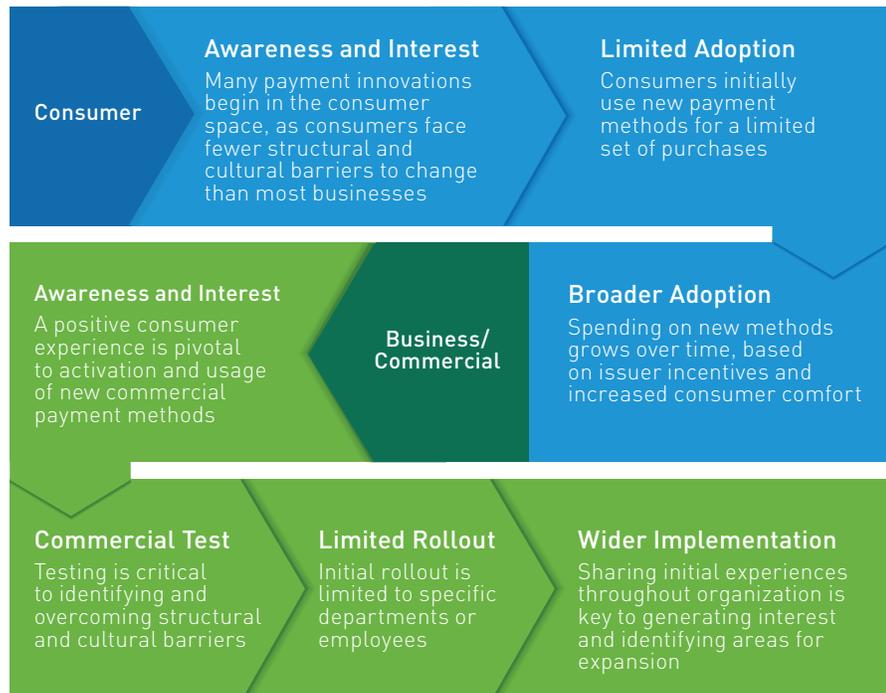
methods, and the growth of corporate financial management technology.

The chart below shows the typical adoption pattern for emerging payment methods and financial management technologies.

ELECTRONIFICATION OF PAYMENTS

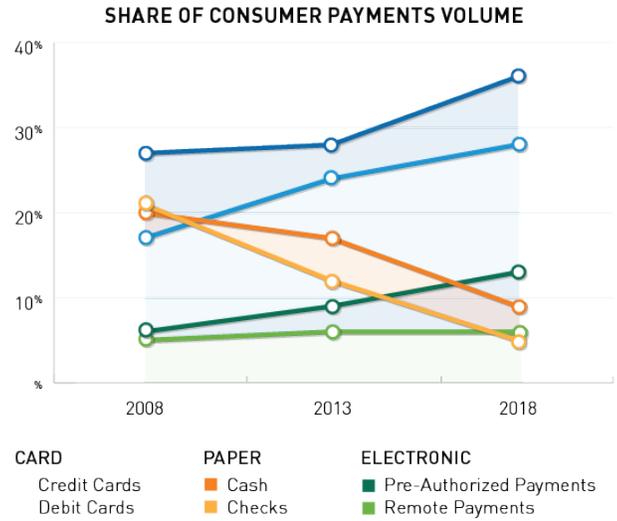
Though paper-based transactions have long held a dominant share of consumer payments, it is eroding. The Nilson Report¹ projects that cash and checks' share of U.S. consumer payments volume will fall dramatically from 30% in 2013

ADOPTION PATH FOR NEW PAYMENT METHODS

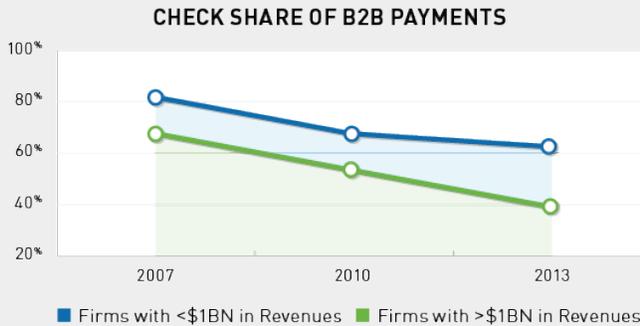


to 14% in 2018. Even with that decline, cash and check payments will still account for \$1.6 trillion in annual payments volume.

However, there is strong momentum in adopting more convenient electronic payment methods. With total consumer payments dollar volume projected to grow by 27% during this period, the decline in cash and check spending is being offset by increased card usage and adoption of other emerging methods, including preauthorized payments and online bill pay.



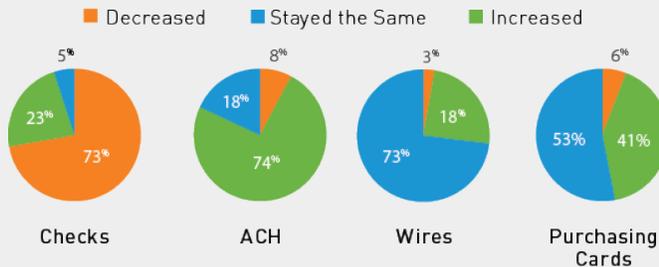
Source: The Nilson Report, issue 104, December 2014
Preauthorized payments are handled electronically through an automated clearing house
Remote payments are made using a telephone or computer



Source: 2013 AFP Electronic Payments Survey, Association for Financial Professionals

Mirroring consumer payments, checks' dominant share in commercial payments is also steadily declining. According to the Association for Financial Professionals, among large firms with more than \$1 billion in revenues, checks accounted for 40% of payments volume in 2013, down from 68% in 2007.

CHANGE IN USE OF COMMERCIAL PAYMENT METHODS



Source: Paystream's 2013 Electronic Supplier Payments research, reported in "Migrating from Paper to Electronic Payments," NAPCP TransAct! Newsletter, April 29, 2014

Decreased commercial check usage has led to increases in electronic payments, which include commercial cards, wires and ACH. According to a 2014 PayStream study, a significant percentage of businesses grew their usage of ACH and purchasing cards in 2013, with nearly three quarters of businesses of all sizes reporting much lower check usage.

THE LATEST PAYMENT TECHNOLOGIES

2015 looks to be a watershed year for new technology innovations, two of which — EMV® and mobile payments — have already garnered much attention and should see accelerated adoption this year. In addition, there is a range of emerging payments that are at an embryonic stage of development, but which could also find ready markets in the coming years. These include wearables, virtual currency, and peer-to-peer payments.

EMV CARDS

Europay, MasterCard® and Visa® (EMV) is a payments technology that augments magnetic stripes on cards with electronic chips. EMV cards are well established in Europe and Asia, where their introduction led to a decline in card fraud. EMV has been slower to take hold in the U.S. However, in October 2015, the liability for fraudulent credit card transactions will switch from issuers to merchants for any merchants that have not upgraded their terminals to accept EMV payments. In advance of this deadline, issuers are distributing new chip-enabled plastic; 575 million credit cards (71% of the total) are expected to be EMV-enabled by the end of the year.² Merchants are rapidly upgrading their terminals to accept chip transactions: 59% of terminals are expected to be ready to accept EMV transactions by the end of this year.³

Both issuers and merchants have started to engage with cardholders to educate them on switching from mag-stripe to chip-based payments. To ease consumer adoption, most issuers have embedded chip and signature functionality into their consumer credit cards, which involves less behavior change than asking consumers to switch to chip and PIN right away. However, in the commercial card space, many issuers — including PNC — also provide chip and PIN functionality, which provides an additional layer of security.

MOBILE PAYMENTS

U.S. mobile-based payments are projected to nearly triple, from \$50 billion in 2014 to \$142 billion in 2018.⁴

This anticipated increase is based on the strong growth in smartphone and tablet usage; according to eMarketer, more than a quarter of U.S. smartphone users will use mobile payments.⁵ We are seeing the emergence of a range of mobile wallets and mobile payment services to capture a share of this growing market. One such service is **Apple Pay™**, which was launched in September 2014.

In early November 2014, PNC rolled out Apple Pay to its consumer credit and debit cardholders. Only four months following its launch, this near-field communications (NFC)-based mobile payment service had alliances with 750 financial firms that account for 90% of U.S. consumer credit card volume.

At the same time, Apple Pay entered into partnerships with leading card networks like Visa, MasterCard and American Express®. And Apple® reported in March 2015 that 700,000 U.S. locations could now accept Apple Pay for mobile payment.⁶

A recent survey found that security concerns constituted the main barrier to using Apple Pay or other mobile payment services.⁷ To address consumer concerns regarding the security of mobile payments, Apple Pay incorporates tokenization, a process of replacing a sensitive data element (such as an account number) with a non-sensitive element (called a token) in a transaction. Currently, Apple Pay is mainly available to participating issuers' consumer credit and debit cardholders. A few issuers have extended Apple Pay to their small business credit cardholders. While no issuer has as yet made Apple Pay available on their corporate cards, it is anticipated that Apple Pay will be extended to corporate and commercial cardholders in 2016.

Other companies looking to develop leadership positions in mobile payments include:

- **Google:** Launched the NFC-based Google Wallet in 2011, and recently entered into an agreement with AT&T, Verizon and T-Mobile — the three carriers who created Softcard — to preinstall Google Wallet on new Android phones sold by these carriers later this year. Google also acquired technology and intellectual property

from Softcard.⁸ In addition, they launched Android Pay, a platform that enables developers to incorporate payments into their apps.⁹

- **Samsung:** In March 2015, Samsung launched two new smartphones (Galaxy S6 and S6 Edge), which will be available in the U.S. in the summer of 2015. Both new phones will have Samsung Pay pre-installed. The phones can be used with both magnetic card-reading technology (following Samsung’s acquisition of LoopPay) and NFC.
- **PayPal™:** In March 2015, PayPal announced the acquisition of Paydiant, a payments firm

that powers payment apps for large companies, including MCX, an alliance of large merchants (including Walmart, Target and CVS) that is developing a payment app called CurrentC to compete directly with Apple Pay and other NFC-based payment options. In addition, PayPal announced that its Here point-of-sale reader would enable merchants to accept NFC payments.

In addition, there are a large number of mobile payment startups vying for position as this market starts to gain critical mass.

PAYMENTS TECHNOLOGY SNAPSHOT

In addition to EMV and mobile payments, which already have strong awareness and are expected to move towards critical mass in the next few years, there are a number of other payment technologies on the horizon.

[Icon/Image]	Wearables	<p>Make payments via an electronic device worn on your body</p> <ul style="list-style-type: none"> ▪ Apple announced plans to launch Apple Watch in April 2015, with prices to start at \$349¹⁰ ▪ Issuers like Discover¹¹ and Barclaycard¹² are creating wearable payment apps ▪ A recent survey found that 67% of smartphone users would prefer to use a wearable device vs. a mobile phone to make in-store payments¹³
[Icon/Image]	Peer-to-Peer Payments (P2P)	<p>Pay people directly via electronic channels, including social media</p> <ul style="list-style-type: none"> ▪ P2P payments are projected to rise from \$5 billion in 2015 to \$17 billion in 2019¹⁴ ▪ In March 2015, Facebook announced the launch of a peer-to-peer money transfer service¹⁵ ▪ Barclays (UK) updates its PingIt mobile payments app to enable fund transfers via Twitter handles¹⁶
[Icon/Image]	Virtual Currencies	<p>Transact with currency based on computer algorithms</p> <ul style="list-style-type: none"> ▪ Generating awareness and interest and some big-name merchants (Overstock, Expedia, Microsoft) ▪ Lingering concerns, including volatility ▪ Bitcoin leading the charge, with strong transaction growth (but declining value)¹⁷
[Icon/Image]	Cloud-Based Mobile Payments	<p>Develop mobile payment systems using a cloud-based architecture</p> <ul style="list-style-type: none"> ▪ Leveraging growing ubiquity of cloud-based solutions and as counterpoint to NFC-based mobile payments ▪ Google is testing “Plaso,” an Android-based mobile payments service¹⁸

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- 4 Forrester, reported in "U.S. Mobile Payments Market to Boom by 2019, Research Firm Says," *New York Times*, November 17, 2014.
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- 7 Walker Sands Communications research, reported in "Are Security Concerns Holding Back Mobile Payments?," *eMarketer Daily*, March 10, 2015.
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- 15 "Facebook Launches Peer-To-Peer Payments," *Social Media and Marketing Daily*, March 18, 2015.
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- 18 "Google is testing 'Plaso' mobile payment service to challenge Apple Pay," *The Paypers*, February 12, 2015.

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