

# THE RISE OF ELECTRONIC PAYMENTS

In this issue

## PRODUCT SPOTLIGHT

In this issue, we take a look at some of the ways that PNC is using mobile technology to provide more efficient commercial payments to our clients.

## INDUSTRY SPOTLIGHT

Explore the many benefits that electronic payments can provide to the healthcare sector.

## BY THE NUMBERS

Big changes are coming. Review key statistics related to the rollout of EMV® payments in the U.S.

## NATIONAL ECONOMIC UPDATE

### A NOTE FROM JEFF FELSER, SENIOR VICE PRESIDENT



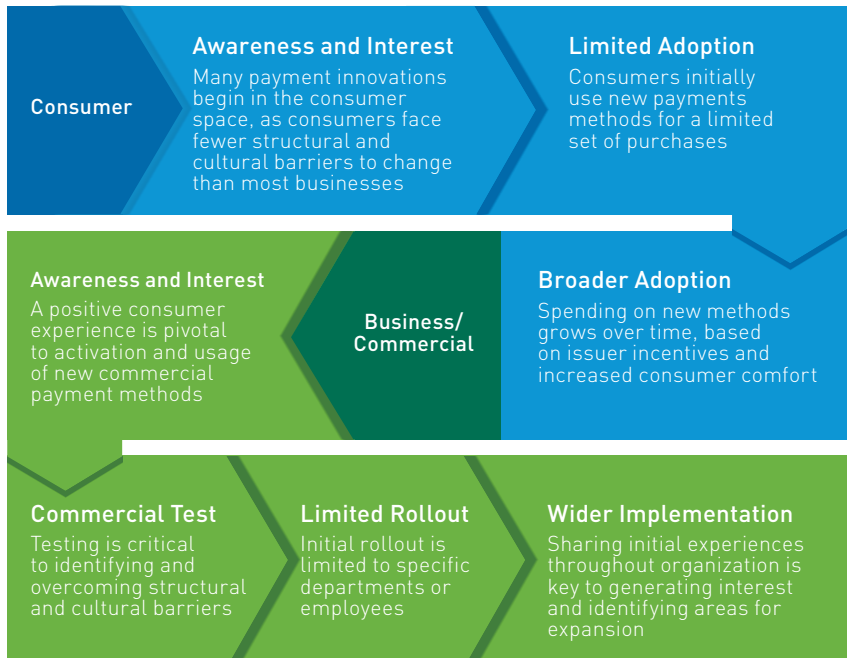
With the growing adoption of electronic payments and emergence of new payment methods, the payments landscape will continue in its evolution over the next few years.

New technologies will play an increasingly important role in the management of payments by consumers and businesses alike. Here at PNC, we are committed to early adoption of new technologies that help improve commercial payment processing efficiency and productivity for our clients.

In this issue, we'll take a look at some of the latest trends and where we expect payments to be headed over the next few years. These trends include the continued decline of paper-based payments, the emergence of new payment methods, and the growth of corporate financial management technology.

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

#### ADOPTION PATH FOR NEW PAYMENT METHODS

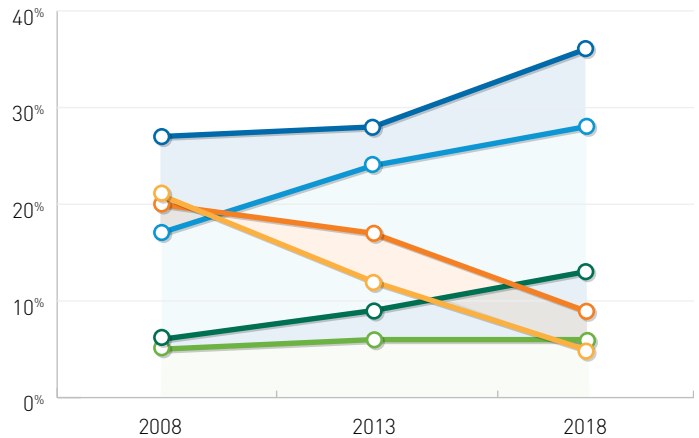


**ELECTRONIFICATION OF PAYMENTS**

Though paper-based transactions have long held a dominant share of consumer payments, it is eroding. The Nilson Report<sup>1</sup> projects that cash and checks' share of U.S. consumer payments volume will fall dramatically from 30% in 2013 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.

**SHARE OF CONSUMER PAYMENTS VOLUME**

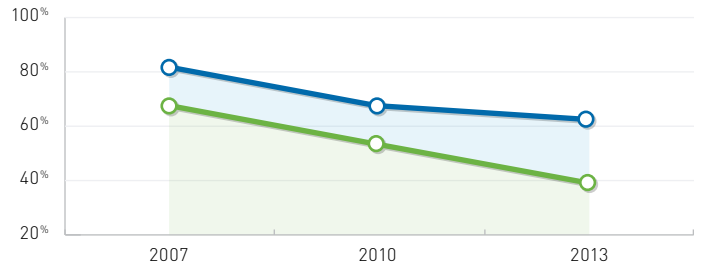


- CARD**
  - Credit Cards
  - Debit Cards
- PAPER**
  - Cash
  - Checks
- ELECTRONIC**
  - Pre-Authorized Payments
  - Remote Payments

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

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.

**CHECK SHARE OF B2B PAYMENTS**

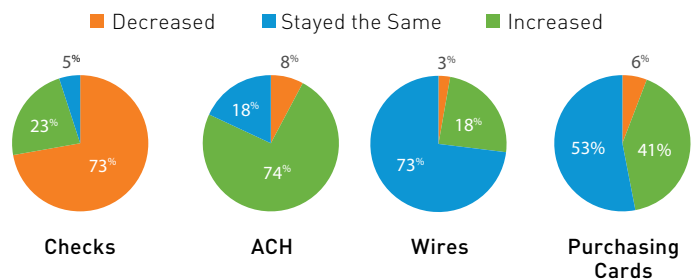


- Firms with <\$1B in Revenues
- Firms with >\$1B in Revenues

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

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.

**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

## 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 are 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.<sup>2</sup> 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.<sup>3</sup>

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.<sup>4</sup>

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.<sup>5</sup> 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.<sup>6</sup>

A recent survey found that security concerns constituted the main barrier to using Apple Pay or other mobile payment services.<sup>7</sup> To address consumer concerns regarding mobile payments security, 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.<sup>8</sup> In addition, they launched Android Pay, a platform that enables developers to incorporate payments into their apps.<sup>9</sup>
- **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.

### FOCUSING ON EMERGING COMMERCIAL PAYMENTS TECHNOLOGIES

At PNC, we are continually looking to introduce new payment methods and management tools that enhance and improve productivity for our commercial clients' payment processes.

In previous issues of *Payment Solutions News*, we discussed our introduction of e-invoicing as well as enhancements to our corporate card suite, including the incorporation of chip-and-PIN functionality.





In the [Product Spotlight](#) section of this issue, we showcase some of our most recent commercial mobile applications, including ActivePay® Mobile Receipt Capture and Visa IntelliLink® Receipt Imaging, which address clients' needs for simplification in T&E and purchasing card receipt aggregation and accounting.

### IN THIS ISSUE

- Take a look at some of the ways that PNC is using mobile technology in the [Product Spotlight](#).
- We focus on how the Healthcare sector can benefit from electronic payments in the [Industry Spotlight](#).
- In [By the Numbers](#), we present some key statistics related to the adoption of EMV payment technology in the United States.

**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.

	<p><b>Wearables</b></p>	<p><b>Make payments via an electronic device worn on your body</b></p> <ul style="list-style-type: none"> <li>▪ Apple announced plans to launch Apple Watch in April 2015, with prices to start at \$349<sup>10</sup></li> <li>▪ Issuers like Discover<sup>®11</sup> and Barclaycard<sup>12</sup> are creating wearable payment apps</li> <li>▪ A recent survey found that 67% of smartphone users would prefer to use a wearable device vs. a mobile phone to make in-store payments<sup>13</sup></li> </ul>
	<p><b>Peer-to-Peer Payments (P2P)</b></p>	<p><b>Pay people directly via electronic channels, including social media</b></p> <ul style="list-style-type: none"> <li>▪ P2P payments are projected to rise from \$5 billion in 2015 to \$17 billion in 2019<sup>14</sup></li> <li>▪ In March 2015, Facebook announced the launch of a peer-to-peer money transfer service<sup>15</sup></li> <li>▪ Barclays (UK) updates its PingIt mobile payments app to enable fund transfers via Twitter handles<sup>16</sup></li> <li>▪ PNC is developing a B2C electronic payment solution that will email or text a link to a secure website where the consumer can select their preferred payment method and direct the funds to their bank account.</li> </ul>
	<p><b>Virtual Currencies</b></p>	<p><b>Transact with currency based on computer algorithms</b></p> <ul style="list-style-type: none"> <li>▪ Generating awareness and interest and some big-name merchants (Overstock<sup>™</sup>, Expedia<sup>®</sup>, Microsoft<sup>®</sup>)</li> <li>▪ Lingering concerns, including volatility</li> <li>▪ Bitcoin leading the charge, with strong transaction growth (but declining value)<sup>17</sup></li> </ul>
	<p><b>Cloud-Based Mobile Payments</b></p>	<p><b>Develop mobile payment systems using a cloud based architecture</b></p> <ul style="list-style-type: none"> <li>▪ Leveraging growing ubiquity of cloud-based solutions and as counterpoint to NFC-based mobile payments</li> <li>▪ Google is testing “Plaso,” an Android-based mobile payments service<sup>18</sup></li> </ul>

**Discover how PNC can deliver ideas, insights and solutions to help you achieve your objectives. Contact your Treasury Management Officer or Account Manager, or visit [pnc.com/treasury](http://pnc.com/treasury).**

## COMMERCIAL PAYMENT TOOLS AND MOBILE TECHNOLOGY

In support of clients looking to optimize their payment processes, PNC continues to be an innovator in the commercial payments space.

PNC pioneered the use of credit cards for A/P payments and, more recently, we collaborated with Tungsten™ Network to introduce an electronic invoicing solution. In 2014, we launched enhanced versions of our PNC Executive Card and Corporate Card, both of which now feature chip-and-PIN functionality, providing an additional layer of security as well as functionality. As each of these examples demonstrates, we are continuing to leverage emerging payment technologies that can offer measurable benefits to our clients.

Like many other banks, PNC has seen strong growth in mobile banking usage by our consumer clients. In the fourth quarter of 2014, 49% of our consumer clients used non-branch channels for a majority of their banking transactions. We expect growth in mobile payments to continue and, in anticipation of increased commercial demand for mobile payment tools, PNC has been developing new mobile payment management applications.

Smartphones and tablets are now becoming important financial management tools for businesses of all sizes. According to the 2013 Association for Financial Professionals Electronic Payments Survey, only 11% of organizations used mobile devices to initiate payments, but 32% planned to do so over the next three years. The survey also highlighted a number of areas in which organizations were evaluating increased usage of mobile tools in the coming years, including reviewing payments sent or received (cited by 37% of survey respondents), reviewing balance or other payment information (37%) and approving payments (36%).

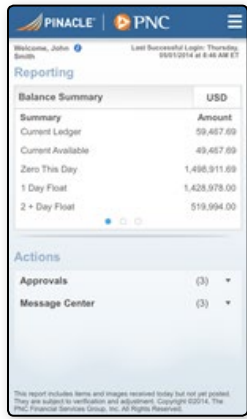
A 2014 survey by Frost & Sullivan found that 71% of organizations issued company-owned smartphones and 47% issued company-owned tablets to their employees.<sup>19</sup> In anticipation of this broad adoption of commercial mobile payment technologies, PNC has introduced a number of commercial mobile solutions.

### PINACLE® MOBILE

PINACLE is PNC's corporate online and mobile banking portal providing commercial clients with the ability to initiate account transfers and ACH transactions or wires, manage their receivables and disbursements and gain insight into their daily cash position through robust information reporting tools.

In 2010, PNC became one of the first banks to offer mobile banking to commercial clients with the launch of our mobile browser version of PINACLE. In 2014, we released dedicated mobile apps for the iPad®, iPhone® and Android Phone. The apps provide customers with a suite of functionality tailored to mobile decision-makers: Information Reporting and Transaction Search, Event Notification, ACH Positive Pay and Positive Pay Approvals and Decisions, Operator and Wire approvals and key Administration functionality such as password resets and enabling/disabling users.

Soon, we will be adding payment initiation functions to the mobile app, along with enhanced user-authentication capabilities.



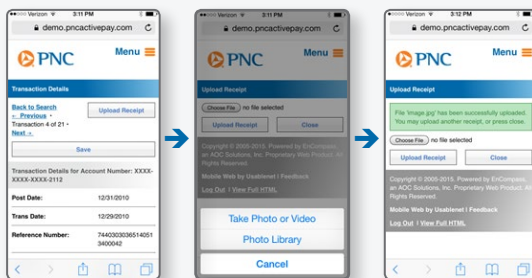
- 2010 PINACLE Mobile
- ↓
- April 2014 PINACLE Mobile app for iPad
- ↓
- June 2014 PINACLE Mobile app for iPhone
- ↓
- Sept 2014 PINACLE Mobile app for Android
- ↓
- Feb 2015 Incorporated Positive Pay and ACH Positive Pay into PINACLE Mobile

**ACTIVEPAY MOBILE RECEIPT CAPTURE**

Similarly, PNC has introduced a mobile version of ActivePay, our web-based card management system, and continues to incorporate additional functionality to meet clients' needs to be able to perform more commercial payment management activities on their mobile devices. Most recently, PNC launched Mobile Receipt Capture, which enables users to upload receipt images into ActivePay via their mobile devices. This builds on an already impressive array of mobile functions for cardholders, managers and administrators that can be performed in ActivePay, including:

- Approving and activating card accounts
- Viewing and managing card accounts
- Viewing, creating and approving workflow items
- Viewing and approving transactions
- Viewing statements
- Making payments via Pay Online
- Allocating charge codes to transactions

**UPLOAD RECEIPTS WITH ACTIVEPAY'S MOBILE RECEIPT CAPTURE**



**INTELLILINK RECEIPT IMAGING**

Visa IntelliLink Spend Management is an information and expense management tool available to our Purchasing, Corporate, Commercial and Commercial Express Card clients. Visa IntelliLink's expense management capabilities can be customized to individual company needs.

For example, Receipt Imaging enables Visa IntelliLink users to manage receipts electronically. Receipts can be emailed from any mobile device with email and camera capabilities directly into the IntelliLink Image Library. This is accomplished by sending the receipt image to the email address which acts as the user ID in IntelliLink. Receipt Imaging can be used by employees to upload receipts (with the ability to email multiple images at once), by managers to view receipt images and by administrators to extract images and generate reports. Planned enhancements to Visa IntelliLink Spend Management's mobile user interface in 2015 include the addition of approver and cardholder functionality.



PNC is committed to the mobile channel and enabling our clients to manage their finances from anywhere, on virtually any device. We will continue to invest in mobile technology and, as always, endeavor to provide the best possible mobile experience for our clients.

**Meet with your Treasury Management Officer or Account Manager to learn more about new payment technologies at PNC.**



## DRIVING EFFICIENCY IN HEALTHCARE PAYMENTS

Like many other sectors, the healthcare industry is continuously looking for ways to improve efficiency and productivity. Electronic payments can support these goals by reducing costs, improving payments accuracy (resulting in fewer disputes) and optimizing working capital.

According to a recent survey of healthcare firms, the top three factors driving adoption of electronic payments by healthcare firms are reduced overall payment costs (60%), better cash management (60%) and removing some of the paperwork from the A/P department (45%).<sup>20</sup>

However, the healthcare industry is seen as laggard in electronic payment adoption. This is due to several factors:

- **Complexity of the healthcare payments environment.** The number of stakeholders (hospitals, individual practitioners, health insurance firms, government agencies, patients) means that payment cycles tend to be much longer than in other industries.
- **Continued reliance on paper-based systems** for healthcare administration in general, and healthcare payments in particular. According to the 2014 CAQH<sup>®</sup> Index, about half of claim payments and remittance advice transactions remain manual. The CAQH Index also found that the average cost to healthcare providers of a manual transaction is more than \$5, compared to \$1.60 for an electronic transaction.<sup>21</sup>
- **Growing administrative burden from new regulations.** According to a 2014 study, administrative costs account for 25% of U.S. hospital spending, more than twice as much as Canadian hospitals.<sup>22</sup>

### ELECTRONIC PAYMENT PROCESSING INCREASES EFFICIENCY IN PROVIDER-PAYER TRANSACTIONS

Many providers (hospitals, medical practices) continue to receive their healthcare claim payments and Explanation of Benefits (EOB) on paper. For a given payment, the paper check comes attached to the EOB in a packet in the mail. The provider must deposit the check in the bank and manually update their Practice Management/Accounts Receivable System (PMS) with the details from the EOB to update patient accounts. Check payments do not require any type of EDI enrollment with the payer and do not require any additional technology to receive or process. Reconciliation of receivables to bank deposits is also easier because paper EOBs and checks are received together, whereas Electronic Remittance Advices (ERAs) are sent in different files and at different times than the Electronic Funds Transfers (EFTs). Many providers use lockbox services for check processing and key entering of EOB data. A lockbox service can help to simplify the handling of incoming payments for providers, but it is not without its disadvantages. Mailing checks and manually processing them takes time. Manual entry can have a high incidence of errors (and disputes). Also, using a lockbox service to process incoming payments can be costly when compared to electronic processing. However, providers may not have the option to receive ERAs/EFTs from certain types of payers, such as Workers' Compensation, Auto, or Property and Casualty.



**RECEIVING PAYMENTS ELECTRONICALLY**

The most common form of electronic payment to providers is **EFT**. New healthcare regulations mean that EFT payments sent via the ACH network are now considered a HIPAA transaction and health plans are now required to provide EFT payments if requested by a provider. Since the EFT Standards Final Rule became effective in 2014, EFT payments have increased more than 150%.<sup>23</sup>

Receiving claim payments and remittance advice information electronically can help increase the speed of payments by eliminating time in the mail as well as significantly reducing the need for manual handling of payments upon receipt. Funds can be directly deposited into the provider's bank account as soon as the next day\* after being released by the payer, and remittance advice information can be uploaded directly into the PMS if the provider receives a corresponding ERA. Some providers also opt to take advantage of services such as PNC's Reassociation service, where PNC warehouses ERAs until the matching payments are received and then transmits fully funded ERA files to them. The result is that credits can be posted to patient accounts more accurately and faster, especially with Reassociation, because the provider does not need to validate that the payments were received.

Another growing electronic payment type in healthcare is the **Virtual Card**. With this method, payments for healthcare claims are made to providers via single-use Virtual Cards. Information

about card payments are delivered to providers via online display, fax, email or mail, and providers key the card information into their merchant services systems (equipment, software or web site used to process patient card payments) to process payments. Payments can then be deposited into providers' bank accounts in as soon as 1-5 business days.\*

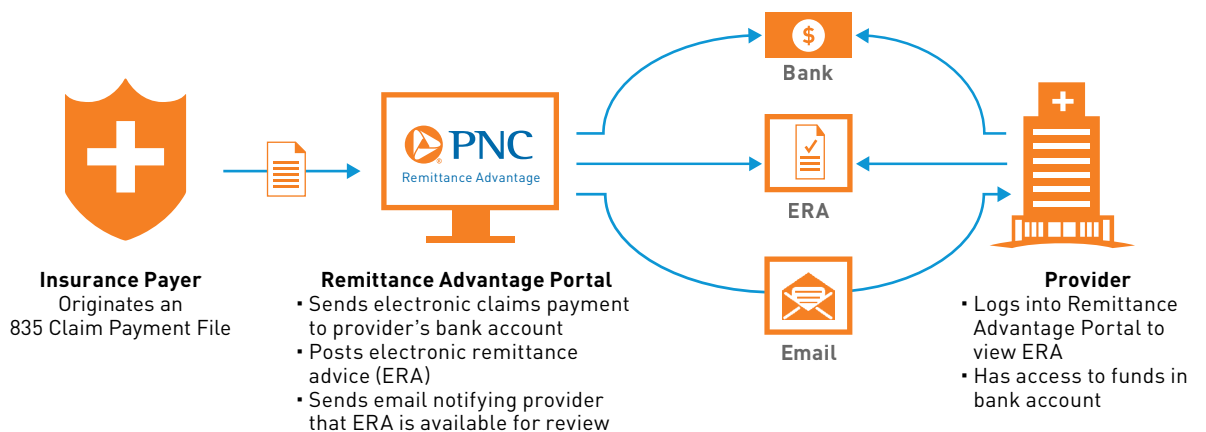
Since they are a form of electronic payment, Virtual Cards provide many of the same benefits as an EFT payment. Moreover, because Virtual Cards may not require payer enrollment, providers may prefer to receive them for payments from health plans that are not frequently used. Payers enjoy the benefits of providing electronic payments, along with a rebate that often occurs when issuing card payments.

In summary, whether using EFT or Virtual Cards, electronic payments can get funds to providers quicker, at a lower cost and with less risk than paper checks.

**PNC HEALTHCARE AND REMITTANCE ADVANTAGE**

Over 25 years ago, PNC launched PNC Healthcare to serve the unique needs of our healthcare clients. Today, we work with more than 1,600 healthcare organizations across the country, including payers, providers, pharmacies, Medicare fiscal intermediaries and government agencies. PNC Healthcare has been at the forefront of innovation in the healthcare payments space, providing industry-leading products and services.

**HOW A TYPICAL PNC REMITTANCE ADVANTAGE PAYMENT WORKS**



\* Funds may not be available for immediate withdrawal. Please see the applicable funds availability policy for your account to determine when your funds may be made available

One of our most popular products in the healthcare space is **Remittance Advantage**, an online network of payers and providers for enrollment and delivery of electronic claim payments and remittances. Remittance Advantage—the only bank-sponsored solution that has earned CAQH CORE® Phase III certification—provides multiple payment and remittance options, with PNC able to create the most appropriate payment and remittance format for each provider while meeting the federal government mandates for 835 file formats and content.

There is no cost for providers to enroll in Remittance Advantage, which has led to broad adoption within the industry—a significant benefit for payers. The Remittance Advantage web portal provides a wide range of support, including online enrollment, delivery of EOBs in both human-readable and Electronic Data Interchange (EDI) formats, enhanced search tools, online bank account management, self-administration tools and payment reporting.

In addition to providing innovative products, PNC Healthcare provides comprehensive support to our healthcare clients. This support includes implementation specialists, who offer onboarding support to help your organization achieve a successful implementation and adoption of new products and programs.

Following implementation, we provide account, technology, product and innovation staff dedicated to supporting the needs of healthcare clients. Our commitment to the healthcare sector is also seen in our participation in industry events and leadership of many industry committees, as well as development of a range of thought leadership assets for our clients.

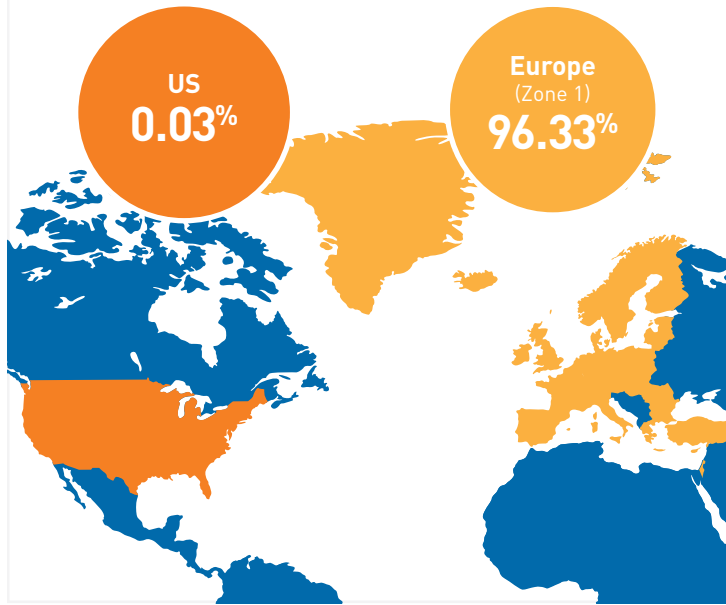
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**To learn more about PNC Healthcare, contact your Treasury Management Officer.**

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# EMV MIGRATION IN THE UNITED STATES

## EMV ADOPTION FOR CARD-PRESENT TRANSACTIONS (2013-2014)<sup>24</sup>

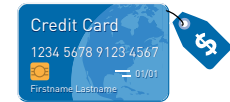


## THE COST OF EMV CONVERSION<sup>27</sup>

Total Price Tag  
**\$8.65B**



Terminal Upgrades **\$6.75B**



Cards **\$1.4B**



ATM Upgrades **\$0.5B**

**575 Million Chip Cards** Expected to be Issued by US Card Issuers in 2015<sup>28</sup>

## EMV EFFECT ON CARD FRAUD<sup>25</sup>



**UK**  
Implements EMV In 2004.  
Card fraud falls

**-33%**



**France**  
Implements EMV in 2005.  
Card fraud falls

**-91%**

**\$3B** The approximate annual cost of card fraud to **US banks**<sup>26</sup>

## EMV AWARENESS

Merchants **66%**<sup>29</sup> Consumers **49%**<sup>30</sup>

- <sup>1</sup> The Nilson Report, issue 1054, December 2014
- <sup>2</sup> ["Payment Trends for 2015 Revealed at Payments Summit,"](#) Hospitality Technology, February 10, 2015.
- <sup>3</sup> Aite Group, reported in ["U.S. EMV's 59 Percent POS Milestone,"](#) PYMNTS, February 16, 2015.
- <sup>4</sup> Forrester, reported in ["U.S. Mobile Payments Market to Boom by 2019, Research Firm Says,"](#) New York Times, November 17, 2014.
- <sup>5</sup> ["Will SBOs Invest In Mobile Payments?,"](#) eMarketer Daily, February 12, 2015.
- <sup>6</sup> ["Apple Pay Now Accepted in 700,000 Locations Because Apple's Timing Was Impeccable,"](#) re/code, March 9, 2015.
- <sup>7</sup> Walker Sands Communications research, reported in ["Are Security Concerns Holding Back Mobile Payments?,"](#) eMarketer Daily, March 10, 2015.
- <sup>8</sup> ["Google Strikes Deal With Carriers for Payments,"](#) Wall Street Journal, February 23, 2015.
- <sup>9</sup> ["Google's new mobile payment platform is called Android Pay,"](#) Engadget, March 2, 2015.
- <sup>10</sup> ["Challenge for Apple Watch: Style but No 'Killer App',"](#) Wall Street Journal, March 9, 2015.
- <sup>11</sup> ["Discover Tests Wearable Apps for Google Glass and Watches,"](#) eMarketer Daily, October 17, 2014.
- <sup>12</sup> ["Barclaycard's Hot Ideas for Wearables Are a Chilly Forecast for Biometrics,"](#) Payments Source, December 17, 2014.
- <sup>13</sup> ["Wearables: The Next Mobile Payment Device?,"](#) eMarketer Daily, March 3, 2015.
- <sup>14</sup> ["Facebook Launches Peer-To-Peer Payments,"](#) Social Media and Marketing Daily, March 18, 2015.
- <sup>15</sup> ["Facebook Launches Peer-To-Peer Payments,"](#) Social Media and Marketing Daily, March 18, 2015.
- <sup>16</sup> ["Barclays launches Twitter payments via PingIt mobile app,"](#) The Paypers, February 26, 2015.
- <sup>17</sup> ["Bitcoin transactions to double by 2017,"](#) The Paypers, February 12, 2015.
- <sup>18</sup> ["Google is testing 'Plaso' mobile payment service to challenge Apple Pay,"](#) The Paypers, February 12, 2015.
- <sup>19</sup> Frost & Sullivan research, reported in "Nearly half of corporates hand out tablets to employees," The Online Reporter, July 11, 2014.
- <sup>20</sup> "Healthcare ePayables: Curing Inefficiencies in the Healthcare Payment Market", PayStream Advisors report, reported in "Accounts Payable Automation Is Curing Inefficiencies in Healthcare Payments," Marketwire, July 25, 2013.
- <sup>21</sup> ["\\$8 Billion Annual Savings Opportunity for U.S. Healthcare With Adoption of Electronic Business Transactions,"](#) PR Newswire, March 17, 2015.
- <sup>22</sup> ["A Comparison of Hospital Administrative Costs in Eight Nations: U.S. Costs Exceed All Others by Far,"](#) by D.U. Himmelstein, M. Jun, R. Busse et al., Health Affairs, 33(9):1586-94, September 2014.
- <sup>23</sup> ["NACHA Announces Healthcare EFT via ACH Volume Exceeds 149 Million Transactions in 2014,"](#) PRWeb Newswire, February 12, 2015.
- <sup>24</sup> ["Percentage of card present transactions that are EMV, 7/13-6/14,"](#) EMVCo Newsletter, December 2014.
- <sup>25</sup> Gemalto, <http://www.gemalto.com/emv/fraud>.
- <sup>26</sup> Aite Group, reported in ["Bank EMV Upgrades Pit Cost Control Against Risk Control,"](#) American Banker, February 19, 2015.
- <sup>27</sup> [Reuters](#), 3/3/2015.
- <sup>28</sup> [Press Release](#), MasterCard, 8/13/2014.
- <sup>29</sup> ["More Than Half of U.S. POS Terminals to Be EMV Chip-Enabled by Year-End 2015,"](#) BusinessWire, February 12, 2015.
- <sup>30</sup> ["Chip Cards Are Coming, But Most Consumers Are Unaware,"](#) Wall Street Journal, February 17, 2015.

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