U.S. EMV Smart Card Migration: What Cards Do Merchants Hold in their Hand?

Moderator: Claudia Swendseid, Federal Reserve Bank of Minneapolis

Panelists: Rue Jenkins, Costco Wholesale Corporation
          Malcolm Nunes, The Home Depot
          Gavin Waugh, The Wendy’s Company

October 30, 2013
Agenda

• Introductions
• EMV Overview
• EMV Global Deployment & Impact on Fraud
• EMV Adoption in the U.S.
• Business Case for Merchants
• Issues Facing Merchants
Who We Are – Claudia Swendseid

• Senior Vice President of the Federal Reserve Bank of Minneapolis

• Serves on the Bank’s Management Committee & has responsibility for FedACH operations & application development, Information Technology, Customer Contact Center, & the Payments Information & Outreach Office

Federal Reserve System:

• Establishes & executes U.S. monetary policy

• Promotes a stable financial system

• Supervises & regulates financial institutions (FIs)

• Provides financial services to FIs & U.S. Government

Mission in payments – To foster integrity, efficiency, & accessibility of U.S. payment & settlement systems in support of financial stability & economic growth
Who We Are – Rue Jenkins

- Assistant Treasurer of Costco Wholesale Corporation
- Responsible for a wide range of Treasury & Cash Management activities including treasury mgmt. & investment/borrowing activities, bank relationships & foreign exchange activities
- Manages global credit facilities

About Costco:
- Costco Wholesale Corporation operates an international chain of membership warehouses that carry quality, brand name merchandise
- Over 600 warehouses worldwide
- $99.1 billion in revenue in 2012
- Employs over 107,000 people in the U.S.
Who We Are – Malcolm Nunes

• Senior Manager of the Financial Services Department, the group responsible for managing the cost of acceptance
• Current focus is on alternative & emerging payments

About Home Depot:
• World’s largest home improvement retailer
  — 2,200 locations in the US, Canada & Mexico
• Home Depot corporate has annual revenues of $70 billion
• Employs 325,000 people in the U.S.
• Home Depot U.S. processes 2 million card transactions per day; accepts Visa, MasterCard, AMEX & Discover credit cards plus signature & PIN debit
• First retailer to accept PayPal at the point of sale
Who We Are – Gavin Waugh

- **Vice President & Assistant Treasurer for The Wendy’s Company, operator & franchisor of the Wendy’s® restaurant brand**
- **Responsible for capital markets, Treasury operations, & tender type card programs**
- **Serves on several Treasury advisory committees including the AFP Treasury Advisory Group**

About Wendy’s:

- **World’s third-largest quick-service hamburger company**
  - 6,500 franchise & company restaurants in the U.S. & 26 countries worldwide
- **Wendy’s corporate has revenues of $2.5 billion & employs 40,000 people in the U.S.**
- **Wendy’s U.S. processes 300,000 card transactions a day & accepts Visa, MasterCard, AMEX & Discover credit cards & signature debit (but not PIN debit)**

“Upgrading the Wendy’s U.S. system to PIN pads inside our restaurants & at the drive-thru would cost more than 12 times the annual amount of post-liability shift fraud.”
EMV Overview

What Is EMV?

EMV Choices

Why EMV?
What Is EMV?

- EMV (Europay, MasterCard & Visa) is a set of global proprietary specifications for credit & debit payment cards, point-of-sale terminals & card transaction processing networks based on “smart chip” card technology.

- Chip cards contain embedded microprocessors that provide stronger security against counterfeit fraud in card-present transactions – i.e., card authentication.

EMV chip cards use an embedded microprocessor for payment transactions.
Why EMV & Why Now?

• Helps reduce counterfeit card fraud by using dynamic data to authenticate card rather than static data as with magnetic stripe card

• Doesn’t improve protection against lost & stolen & card-not-present fraud

• May facilitate interoperability with global card infrastructure as EMV is adopted worldwide

• May help prevent fraud shift from countries with EMV to U.S.

• May serve as security foundation for other types of payment applications such as near field communication (NFC)
Chip Choices

Card issuers must decide which EMV smart chip functions to implement

Card Interface
- Contact
- Contactless
- Dual interface

Card Authentication
- Online authentication
- Offline authentication

Cardholder Verification
- Online PIN
- Offline PIN
- Signature
- No CVM

Transaction Authorization
- Online authorization
- Offline authorization
EMV Global Deployment & Impact on Fraud
EMV Around the World

80 Countries Use EMV Payments

Europe zone 1:
84.4% of cards
94.4% of terminals

Europe zone 2:
14.5% of cards
68.1% of terminals

Africa & the Middle East:
20.6% of cards
75.9% of terminals

Asia Pacific:
28.2% of cards
51.4% of terminals

EMV Adoption Rates by Region*

*Figures reported as of Q4 2011 and represent the latest statistics from American Express, JCB, MasterCard, and Visa, as reported by their member financial institutions globally. Figures do not include data from the United States.

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Card-not-Present (CNP) Fraud after EMV

Cross-Border Fraud after EMV

Fraud Rates after EMV

Results vary by market

Sources: Financial Fraud Action UK, The Observatory for Payment Card Security, Interac, Australian Payments Clearing Association
Global Card Fraud Up 14.6% in 2012

- Acquirers, issuers & merchants lost $11.27 billion worldwide due to card fraud in 2012
  - Issuers averaged fraud losses of 6.13 cents per $100 spent
  - U.S. based counterfeiting crime accounted for over ¼ of global losses
  - U.S. led world in CNP fraud losses; as U.S. is largest e-commerce market

Distribution of Card Fraud Losses

US accounts for nearly half (47.3%) of world’s total card fraud losses, but only 23.5% of total card transactions

EMV Adoption in the U.S.
## U.S. Card EMV Smart Chip Migration Roadmap Key Dates

<table>
<thead>
<tr>
<th></th>
<th>October 2012</th>
<th>April 2013</th>
<th>October 2013</th>
<th>April 2015</th>
<th>October 2015</th>
<th>October 2016</th>
<th>October 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visa</td>
<td>PCI audit relief</td>
<td>Acquirers &amp; processors required to support merchant acceptance of EMV transactions</td>
<td>3rd party ATM acquirer processors &amp; sub-processors required to support EMV data</td>
<td>Card-present counterfeit liability takes effect excluding automated fuel dispensers (AFD)</td>
<td>ATM liability shift</td>
<td>Card-present counterfeit liability takes effect for automated fuel dispensers</td>
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<tr>
<td>MasterCard</td>
<td>Account Data Compromise (ADC) relief (50%)</td>
<td></td>
<td></td>
<td>ADC relief (95% - 100%)</td>
<td>ATM liability shift</td>
<td>Lost or stolen liability shift for AFD</td>
<td></td>
</tr>
<tr>
<td>Discover</td>
<td>PCI audit relief</td>
<td></td>
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<tr>
<td>American Express</td>
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</table>
EMV Migration Forum

- Consortium of stakeholders working together to facilitate the U.S. migration
  - Card brands, ATM networks, debit networks, issuers, merchants, acquirers, processors, equipment & card manufacturers, consultants, & others; about 220 in total
  - Members pay fees to Smart Card Alliance
  - Entire group meets about every 3 months
EMV Forum Working Committees

- Debit
- Testing & Certification
- ATM
- Card-Not-Present
- Communication & Education
- EMV Deployment Coordination
  - Orlando, FL chosen as test city
Issuers Slow to Issue EMV Debit Cards

When Do You Plan to Issue EMV Debit Cards?

- 2% Already have issued
- 8% Plan to issue in 2013
- 38% Plan to issue in 2014
- 50% Plan to issue in 2015
- 2% No plans

Reasons for Waiting

- Uncertainty about merchant acceptance & changes in liability shift dates
- Inadequate business case
- Unresolved issues related to compliance—e.g., how to migrate to EMV & meet Reg II merchant routing choice requirements

Source: 2013 Pulse Debit Issuer Study
Business Case for Merchants
Is There a Positive Cost/Benefit Proposition for EMV Acceptance by Merchants?

**Acceptance: Pros**

- Reduces counterfeit fraud in card-present transactions
- Avoids assuming liability shift
- Reduces PCI reporting cost
- May help protect against fraud loss shifts to U.S. from countries adopting EMV
- Supports more standard card payment methods across countries
- Ability to accept EMV cards from international travelers

**Acceptance: Cons**

- New investments in equipment, software, & infrastructure
- Protection still needed for card lost or stolen fraud & card-not-present fraud
- CNP fraud may increase due to shift from card present
- Check out may take longer; cards may be forgotten more often
- Complexity of supporting different card brand roadmaps
- May not integrate readily with mobile payment acceptance
Biz Case for Individual Merchants Depends on Fraud Liability Costs

• In October 2015, fraud liability for card-present disputed transactions will shift to the party that is not EMV-enabled

• The big question is: how much could fraud potentially cost merchants?
  – Merchants may find it challenging to quantify the impact of this liability
Are U.S. Card Fraud Losses Big Enough to Justify EMV?

Payment cards represent a disproportionate amount of fraud

![Pie chart showing $ Volume by Non-Cash Payment Type - 2010]

![Pie chart showing FI's Fraud Losses by Payment Type - 2010]

PIN Debit Fraud is 8X Lower than Signature in U.S.

Issuers net fraud loss rates fell by about 30% for both signature & PIN debit in 2012

Basis points shown in white: e.g., in 2012, average fraud loss rate was 5.4 bps, or 5.4 cents per $100 of card spend on signature debit transactions

Net fraud loss rates -- $ per transaction

<table>
<thead>
<tr>
<th>Year</th>
<th>Signature Debit</th>
<th>PIN Debit</th>
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</thead>
<tbody>
<tr>
<td>2006</td>
<td>4.7</td>
<td>0.6</td>
</tr>
<tr>
<td>2007</td>
<td>5.4</td>
<td>1.1</td>
</tr>
<tr>
<td>2008</td>
<td>5.2</td>
<td>0.8</td>
</tr>
<tr>
<td>2009</td>
<td>7.5</td>
<td>1.0</td>
</tr>
<tr>
<td>2010</td>
<td>7.5</td>
<td>1.3</td>
</tr>
<tr>
<td>2011</td>
<td>5.4</td>
<td>1.0</td>
</tr>
<tr>
<td>2012</td>
<td>8.1</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Source: Pulse Debit Issuer Studies
Issues Facing Merchants
### Debit Interchange Rules Struck Down

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>July 31</strong></td>
<td>District court struck down Reg II</td>
</tr>
<tr>
<td><strong>August 21</strong></td>
<td>Federal Reserve filed an appeal</td>
</tr>
<tr>
<td><strong>September 19</strong></td>
<td>Appeals court approved request for expedited action on appeal</td>
</tr>
<tr>
<td></td>
<td>— Briefings to appeals court due by end of 2013</td>
</tr>
<tr>
<td><strong>September 20</strong></td>
<td>District court stayed decision to allow existing rules to remain in place during appeal</td>
</tr>
</tbody>
</table>
Debit Routing Issues

• Reg II requires that debit cards offer merchants a choice of at least two unaffiliated networks on which to route transactions

• Merchants want continued ability to route all transactions at a switch level for maximum reliability & negotiation flexibility; merchants do not want to support multiple applications on a debit card

• Even when Reg II issues resolved, industry needs time to agree on routing technology
What about the Dynamic Mobile Payments Environment?

- Mobile QR Code Payments
- Mobile NFC Payments
- Mobile Card Reader
- Mobile Wallets
- P2P Payments
Integration with Mobile Payments

• Near Field Communication (NFC) technology can support payments (mobile, contactless cards) by enabling data exchange between devices in close proximity, e.g., mobile phone & POS terminal/reader
  — EMV can facilitate NFC-based mobile payments by offering a network to accept & process chip transactions, but:
    1. Will NFC be the primary mobile payment enabling technology?
    2. Does EMV technology offer the best security foundation to protect against fraud?
Authentication & Verification

- Merchants want issuers to allow both online & offline authentication: offline is especially needed for small-value, repetitive transactions (e.g., transit)
- Merchants want issuers to opt for chip cards that use PIN verification, not signature
  - PIN debit fraud rates are 8X lower than signature debit
Customer Service at the Point of Sale

- Merchants want minimal changes & processing requirements at terminal level, with same or better transaction speed & reliability/uptime as magnetic stripe cards
- Speed of checkout: don’t create delays at the POS by requiring customers to make additional decisions
- Concerns about customers learning to use chip cards: e.g., use of PIN on both credit & debit transactions, cards left behind in terminal, etc.
  - Will need to train staff & customers
Card-Not-Present Fraud Mitigation

- Online fraud cost merchants $3.5B in 2012
- Merchants &/or issuers can take steps to authenticate & validate online transactions
  - Collect all card account information including card verification number
  - Use address verification service
  - Use one-time password
  - Enroll in payer authentication services, e.g. 3D Secure®
  - Enable consumers to authenticate online transactions with a bank-issued PIN, e.g. Acculynk’s PaySecure®
  - Use IP geolocation technology to verify customer’s location with account billing or shipping address
  - Use anomaly detection software to flag suspect transactions

Source: CyberSource Online Fraud Report, 2013
Other Concerns of Merchants

• Card brands must address unique needs of specific industry segments, e.g., quick service restaurants & fuel
• Want simplified certification process which reduces redundancy in testing
  – Facing resource constraints when testing point of sale equipment: expect testing queue bottlenecks due to volume of activity to meet roadmap deadlines
  – Want ability to remotely inject future updates for software
Summary

To decide on the right strategy & timeframe, merchants should:

1. Assess relevant benefits & costs to decide whether to accept EMV cards & when
2. Determine impact on business operations & customer service
3. Monitor status of open issues
   —Debit routing costs & options
   —Interrelationship with mobile payments
   —Fed’s appeal of July 31 ruling
Q & A Session

U.S. EMV Smart Card Migration: What Cards Do Merchants Hold in their Hand?
Resources

- EMV in the U.S.: Putting it into Perspective for Merchants and Financial Institutions, by FirstData

- EMV for U.S. Acquirers: Seven Guiding Principles of EMV Readiness, by MasterCard Advisors
  [www.mastercardadvisors.com/_assets/pdf/emv_us_aquirers.pdf](http://www.mastercardadvisors.com/_assets/pdf/emv_us_aquirers.pdf)

- Post Durbin & Pre-EMV: Payment Acceptance Trends Evolving for Retailers, by Association for Financial Professionals
  [http://www.afponline.org/pub/pdf/Retail_PostDurbinandPre-EMV.pdf](http://www.afponline.org/pub/pdf/Retail_PostDurbinandPre-EMV.pdf)

- The Efficiency & Integrity of Payment Card Systems, FRB Philadelphia Discussion Paper,
  [http://www.philadelphiaced.org](http://www.philadelphiaced.org)

- U.S. EMV Roadmap Announcements
  - MasterCard [http://www.mastercard.us/mchip-emv.html](http://www.mastercard.us/mchip-emv.html)


- Contactless Mobile Payment, by EMVCo  [http://www.emvco.com](http://www.emvco.com)

- Managing the Migration to EMV & NFC Payment Technology, by Frost & Sullivan
  [http://www.frost.com](http://www.frost.com)


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Interest in Open, Consensus Integrated Chip Standards

- EMVco’s proprietary standards are privately developed & controlled by a limited number of participants with vested interest in outcomes
- In contrast, open, consensus standards are developed in a public forum by interested parties working with standards development organizations certified by a quasi-government body; adoption of such standards is voluntary
  - e.g., X9, X12, & ISO 20022 develop open, consensus standards
- On December 9 & 10, 2013, an integrated chip standards industry meeting will be held in Philadelphia
  - Sponsored by X9 & the Federal Reserve Bank of Minneapolis
  - Invitation-only event for diverse stakeholders who will explore need for open, consensus standards for smart chip payments in U.S.
EMV Primer: Terminology

• Cardholder verification methods (CVM) exist to answer the question “Is this card in the right hands?”
  – The object is to protect against lost & stolen card fraud
• Card authentication answers the question, “Is the card genuine?”
  – The object is to prevent losses from counterfeit fraud
• Online verification & authentication methods are performed by the issuer or issuer processor
  – In the online PIN verification process, the POS terminal electronically communicates with the issuer & verifies that the PIN is correct, thus authenticating the cardholder
• Offline methods are performed by the card & terminal; they don’t require a connection to the issuer or issuer processor
  – In the offline PIN verification process, the PIN is validated by comparing the given PIN to the PIN that is stored securely on the card
• A risk management aspect of EMV implementation that merchants have to address is to decide whether to authorize the transaction offline or send an online authorization request to the issuer
Credit card-present fraud losses from counterfeit & lost or stolen declined 41% between 2008 & 2012, but losses from card-not-present fraud more than doubled over the same period. In aggregate, credit card fraud increased by $39.9M CAD.
Conversion to EMV chip cards was mainly complete by year-end 2012.

With EMV chip/PIN processing, Canada’s Interac debit card system cut card-present fraud losses by 73% between 2009 & 2012 — to a record low.

Source: Interac
UK Counterfeit Fraud after EMV

Fraud data includes debit & credit cards; EMV chip migration was nearly complete by year-end 2006

Source: Financial Fraud Action UK
France Domestic Card Present Fraud after EMV

Fraud data includes debit & credit cards; EMV chip migration was nearly complete by year-end 2006

Source: The Observatory for Payment Card Security. 2012 France data is not available yet.
Australia Domestic Card Present Fraud after EMV

Fraud data includes debit & credit cards; EMV chip migration began in 2008

Source: Australian Payments Clearing Association