Emerging Risk Forum
"Cash, Check, or Cell Phone?"
Protecting Consumers in a Mobile Finance World

The Mobile Payments Landscape

Marianne Crowe
Federal Reserve Bank of Boston

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Agenda

• International Mobile Payment Landscape
• U.S. Mobile Payment Landscape
• Business & Regulatory Framework
• Role of Central Bank in Mobile Payments
International Mobile Payment Applications in Developing Countries

- *Developing* countries are using mobile text messaging/SMS for remittances & money transfers between people
  - Remittances are a huge market in countries with high unbanked populations & high mobile phone penetration
    - e.g. Philippines, India, Kenya
  - Market for remittances totaled $433 billion in 2008 (World Bank)

- Countries lack banking infrastructure to reach people located remotely

- Mobile Network Operators (MNOs) usually take lead role with extensive networks of local agents, outstripping presence of local banks

- Mobile payments can replace ‘risky’ cash since not many payment alternatives exist
Mobile Money P2P Application in Kenya

- Kenya has a limited banking/branch network
- 50% of Kenyan population has mobile phones
- Safaricom (MNO) & Vodafone started M-Pesa Kenya in 2007
  - 8.3 million registered customers
    - About 21% of the entire population or 40% of adults
    - Early adopters were young male urban migrants who sent money home to families in country
  - Safaricom customers can send money to any mobile phone user, including non-Safaricom customers.
  - Use has expanded to school fees, cab fare, other basic money transfers

**Diagram:**
- Agent
- Customer #1
- M-Pesa
- Customer #2
- Customer #1 gives agent cash to load onto phone
- Agent loads e-money onto customer #1’s phone
- Customer #1 sends e-money to customer #2 using recipient’s phone #
- Confirmation text messages sent to both parties to confirm transaction
Regulatory Oversight for Mobile Payments in Developing Countries

- India - illegal to receive remittances from mobile phone
- Egypt - security requirements mandate more non-SMS authentication
- Nigeria
  - “Lead” in mobile payments model must ensure solutions/services meet Central Bank regulatory requirements
  - Forbids MNOs to allow use of prepaid airtime value for payments or to transfer monetary value
- Kenya
  - Authorities concerned with M-Pesa lack of bank status
  - Ordered audit over possible pyramid scheme
  - New bill regulates M-Pesa outside banking regulation under money transfer & payment systems

Above examples highlight need for banks to work with MNOs in developing countries to add their financial services skills, experience & risk/compliance expertise
International Mobile Payment Applications in Developed Countries

• *Developed* countries use mobile phones with NFC (near field communication) chips to pay for transit and/or retail purchases

• Most successful are technologically advanced with highly concentrated banking markets and/or leadership of MNO to partner with banks, government, transit authorities
  – Japan, Singapore, Korea

• Debit card is not major payment method; mobile payments typically replace cash

• Governments are more willing to intervene to ensure success of mobile payments
Mobile NFC Retail Payments in Japan

• JR East, major commuter RR, first implemented Sony’s NFC technology, FeliCa, in a re-loadable prepaid card
  – Merchants near train stations installed readers to expand use of NFC cards to purchases

• NTT DoCoMo is a major mobile carrier with 50% of the market in Japan
  – 2004
    • DoCoMo launched FeliCa on mobile phones with an e-wallet application
  – 2005
    • DoCoMo allowed consumers to use credit cards for mobile payments
    • Other major mobile carriers implemented FeliCa for mobile payments
  – 2006
    • DoCoMo entered consumer credit business

• October 2009
  – 60 million FeliCa handsets in circulation
  – On average, 30% of consumers with mobile FeliCa handsets use them regularly

Source: various studies, according to Innovasia Research, December 2009
### U.S. Mobile Payment Landscape

**Consumer demand for mobile payments is low**

|                                | 2009    | 2008    |
|                                |         |         |
| Bank account adopters          | 93.0%   | 93.8%   |
| Mobile banking adopters        | 10.2%   | 8.2%    |
| Used mobile banking last 12 months | 8.9% | n.a.    |
| Cell phone adopters            | 89.5%*  | n.a.    |
| Mobile payment adopters        | 3.0%    | n.a.    |
| Paid using SMS/Text**          | 2.0%    |         |
| Paid via contactless mobile    | 1.1%    |         |

*Consistent with industry estimates of mobile phone subscribers by household

**Before Haiti earthquake**

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FRBB SCPC Survey of Consumer Payment Choice
Preliminary and unofficial statistics, subject to revision
U.S. Mobile Payment Landscape

Why U.S. may ‘lag behind’ with NFC mobile payment adoption

• U.S. has a well-established & widely adopted electronic payment system
• Many payment options exist to meet most consumer needs
  – Most consumers carry and use credit and debit cards
  – Although this may not address the unbanked in the U.S.
• Growth of debit card in U.S. in recent years made payments for small value purchases quicker & more convenient
  – Debit card regulation eliminated need for merchant to return receipt for POS purchases under $15 & some electronic (vending) purchases
• Cash is used much less in U.S. than in countries where retail mobile payments most successful
  – And cash users have easy access to cash at banks & over 400,000 ATMs across the U.S.
U.S. Mobile Payment Landscape

Supply-side issues also create barriers to NFC Mobile Payments

- U.S. banks have very low market concentration compared to other countries
- U.S. MNOs are more concentrated but extremely competitive
  - Top 4 have 90% of market
- Low merchant interest due to real/perceived costs of implementation
- Technological inconsistencies
  - 1500 handsets, over 450 configurations, screen sizes, different operating systems and functionalities
  - Span of handset age and capabilities
- Security concerns & emerging risks
  - Authentication and fraud, especially cross-channel
  - Lost/stolen phones, dropped calls
  - Secure access via wireless network
U.S. Mobile Payment Landscape involves many stakeholders

- Financial Institutions
- Customers and merchants
- Debit/Credit Card Networks
- Clearing/settlement organizations
- Software solution providers
- Third party payment processors
- MNO/wireless carriers
- Handset/chip manufacturers

- Each party views its responsibilities & liabilities differently

- Roadmap is needed to sort out the infrastructure & functionality surrounding the transaction

- Success requires collaboration between industries that have never worked together before with a shared infrastructure
What needs to be done to develop Mobile Payments in the U.S.?

• Bring stakeholders together in a neutral environment to discuss and resolve issues
  – Agree on business model for revenue-sharing & customer ownership
  – Develop customer value proposition & education
  – Address merchant cost issues
  – Address security concerns & emerging risks
  – Address technology inconsistencies
  – Develop standards to address interoperability among payment systems and networks, and a common security model
  – Address regulatory uncertainty
What needs to be done to develop Mobile Payments in the U.S.?

- Consider a collaboration model & Trusted Service Manager (TSM) infrastructure
  - TSM would be a neutral intermediary to oversee business & operational requirements for mass deployment of mobile payments
  - TSM functions could include:
    - Management of business rules, authentication
    - Connect MNOs and service providers
    - Guarantee end-to-end security; manage secure element key
    - Application life cycle management for MNO, hand-set & customers
    - End-to-end customer support
  - TSM does not participate in actual NFC contactless transaction process
    - Transactions process over existing payment rails (credit/debit card networks, ACH)
    - TSM would facilitate secure authentication to the edge of the network, prior to transmission over existing rails
TSM role in Mobile Payments

**TSM Benefits**
- Avoid Balkanization of market
- Reduce redundancy in build-out costs
- Consistent message to encourage adoption
- Clear direction for merchants
- Distinguish between core & shared services
Many regulatory agencies touch payments and/or wireless transactions:
- Financial Institutions: Federal Reserve, NACHA, FDIC, OTC, OCC, NCUA, SEC, FTC
- Mobile carriers: FCC

Underlying payment methods are covered by existing bank regulations & rules for credit, debit & prepaid cards, ACH transactions.

Financial service and MNO regulations differ significantly:
- Carriers are unfamiliar with payments/banking requirements:
  - e.g., KYC, BSA/AML, money transmitting, compliance & consumer protection

Mobile channel may create gaps where coverage and liability unclear:
- What regulations are impacted?

Clear guidance is needed on where current regulations cover mobile payments & where they do not.
Where is oversight needed?

- Ubiquitous mobile financial services
  - Fair access for all consumer segments
- Consumer Protection & Customer data privacy
- Interoperability among networks and handsets
- Security Controls & Risk Management
  - Authentication
  - Protect against unauthorized transfer of funds anywhere in process
  - Protect against unsolicited text messages, malware, and spyware on mobile devices
- Customer Notification & Recourse
  - Provide adequate and timely disclosure of risks, responsibilities and liabilities of mobile transactions to customers
  - Identify recourse for technical failures
  - Establish grievance procedures
Why the Fed cares about Mobile Payments

- Fed has history of involvement in payments as regulator and operator
  - Evolution of check imaging has its roots with Fed
- Mobile payments enter the payment system through a new channel
- Fed must ensure mobile payments meet requirements of other payments
  - Don’t add risk to payment system
  - Comply with consumer fraud protection requirements
  - Ensure customer data privacy
- May require Bank exam procedures to be updated as well
- Fed’s neutrality can facilitate discussion between banks and non-banks
  - Determine how roles get apportioned related to customer, data, money, liability & risk
  - Help ensure new non-bank players entering ecosystem - MNOs and others such as Google, Apple, PayPal - are prepared to handle the ‘banking’ aspects.
Current Fed activities related to Mobile Payments

- Industry mobile workgroups
  - FSTC
  - NACHA
  - ISO/X9 Standards
- Dialogue with key stakeholders in mobile ecosystem
- Primary and secondary research & data collection
  - 2008 Mobile Banking & Payments Survey of New England Bankers
  - Survey of Consumer Payment Choice
  - Consumer mobile payments pilot