The Future of Commerce
New Horizons for Payments and Remittance

2016 New York Cash Exchange

Steven Bernstein, J.P. Morgan
Frank D’Amadeo, Consolidated Edison
Same Day ACH—Getting ready for 23 September

Our active participation on the NACHA Board of Directors, The Rules and Operating Committee and The Clearing House Payments Association, allowed J.P. Morgan to play an integral part in the formation of the new NACHA Same Day ACH Rule changes on behalf of our clients. J.P. Morgan is committed to driving the Payments Industry forward with new and innovative functionality and products which will provide our clients with the most flexible payment processing options available.

NACHA Same-Day ACH Rule Summary

- All receiving financial institutions are mandated to receive Same-Day ACH transactions. Same Day ACH is optional for originators. J.P. Morgan is committed to providing Same Day ACH Origination options to our clients, resulting in certainty that credits you originate will be received and posted to the receiver on the Same Day.
- Originating Financial Institutions will be able to submit Same-Day ACH transactions in two new processing windows.
- Participating banks will be assessed a 5.2 cent Network transaction fee for Same-Day ACH items. As a premium offering, Same-Day ACH transactions will carry a higher price.
- Transactions above $25,000 and IAT transactions are not eligible.

What it Means for J.P. Morgan Clients

- As a leader in the ACH Industry, J.P. Morgan will support Same Day ACH Origination for all of our clients by the Same Day ACH Receipt mandated deadline.
- Existing ACH originators will automatically be enabled to initiate Same Day ACH transactions by using the Effective Entry Date within the batch header record. An opt-out process will be available for clients who do not want the Same Day ACH option.
- New client-focused file deadlines for origination of Same Day ACH will be established and communicated once finalized.
- J.P. Morgan will provide robust reporting of Same Day ACH transaction information through a variety of reporting channels.
- ACH Same-day initiation will be available within all payment channels:
  - J.P. Morgan ACCESS
  - PaySource
  - Direct Send
  - Chase.com

Greater Payment Flexibility

With 70 different Consumer and Business options, Same Day ACH will greatly enhance payment processing options for our clients.

NACHA Implementation Timeline

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACH Credits</strong></td>
<td><strong>ACH Credits and Debits</strong></td>
<td><strong>ACH Credits and Debits</strong></td>
</tr>
<tr>
<td>Morning and Afternoon Processing Windows</td>
<td>Morning and Afternoon Processing Windows</td>
<td>Morning and Afternoon Processing Windows</td>
</tr>
<tr>
<td>End of Day Receiver Funds Availability</td>
<td>End of Day Receiver Funds Availability</td>
<td>5:00 p.m. Receiver Funds Availability</td>
</tr>
</tbody>
</table>

September 2016 | September 2017 | March 2018 |

• Bill Pay
• eCommerce
• POS check conversion
• Merchant debit
• Collections

• Person to Person
• Account to Account

• Trading partner payments
• Due-date and invoice payments

• Payroll
• Insurance
• Refunds
Federal Reserve Faster Payment Initiative-2017

In 2013, the Fed released a Public Consultation Paper discussing its initial thoughts around improvements to the payment system, which envisioned a new, Faster Payments capability. This was followed up by the January 2015 release of its final paper solidifying its commitment to ubiquitous, safe, and a secure Faster Payments system.

J.P. Morgan is supportive of this effort as we believe real time payments can meet client needs around a number of key use cases:

- Emergency payroll
- Just-in-time vendor/supplier payments
- Corporate to consumer disbursements
- P2P payments
- Bill Payment

We are working closely with The Clearing House, a bank consortium, which has agreed to develop a new Faster Payments infrastructure. The goal of this effort is to enable all US chartered financial institutions to allow their customers to send payments in a real time basis in a safe and secure way, and to build a new payment system that will stand the test of time. We are targeting the system design around a few key characteristics to do this:

- Credit push only
- Irrevocable
- Dollar limits which start relatively low, and expand as the industry gets more comfortable with risk
- Robust messaging standards that meet international norms and allow for future innovation

### Same-day ACH

**September 2016**

- ACH Credits
- A.M. & P.M. Transmissions
- 5 P.M. ET Settlement
- Transactions under $25K

**September 2017**

- ACH Credits and Debits
- A.M. & P.M. Transmissions
- 5 P.M. ET Settlement

**March 2018**

- ACH Credits and Debits
- A.M. & P.M. Transmissions
- Faster Funds Availability

Current or blank effective date = Same Day processing

Returns received after midnight will be provided in next day’s returns file
As corporate revenue grows, treasuries seek more centralized solutions to gain efficiency benefits.

Globally-distributed corporate clients are looking to gain even more efficiencies out of their bank account structure whilst establishing tighter controls around their transactional flows, and in response are setting up Payment Factories, which may leverage ‘payment’ and / or ‘receive on-behalf-of’ models, often referred to as POBO and ROBO.

- **In-House Bank**
  - Centralized cash concentration and investment
  - Improved control & timeliness of cash flows
  - Improved risk mitigation

- **Regional Treasury Center**
  - Regional liquidity solution
  - Minimize limitations of in-country regulations
  - Improved Risk Mitigation

- **Shared Service Center**
  - Aggregation of operations into one entity
  - Reduction in operations costs
  - Leverage centers of expertise

- **Local Entity/Subsidiary**
  - Operates for self
  - Perspective of single legal entity
  - Single geography
  - Single funds pattern

- **Payments Factory (OBO)**
  - Centralized operation at either regional, global, or country-level
  - Reduce bank transactions
  - Reduce number of accounts
Pay-On-Behalf-Of (POBO) and Receive-On-Behalf-Of (ROBO) models are often leveraged in Payment Factories

**Pay-On-Behalf-Of (POBO):**

- Each of the participating legal entities are liable to their suppliers for payables in lieu of the goods purchased.
- The payment factory pays the supplier on behalf of the local entity.
- The payment factory becomes a creditor while the subsidiary legal entity becomes the debtor.
- Intercompany loan is booked to reflect the Pay-On-Behalf-Of transaction.

**Receive / Collect-On-Behalf-Of (ROBO / COBO):**

- Each of the participating legal entities is a creditor to their clients for goods sold.
- The collection factory collects the receivable on behalf of the local entity.
- The local entity becomes the creditor of the collection factory for the receipts collect on their behalf.
- Intercompany loan is booked to reflect the above transaction.

Note: J.P. Morgan recommends you engage internal / external tax and legal advisors for each jurisdictions to review the implications of the suggested structure.
Vision of sub-accounting - application examples, including OBO

**Reconciliation & entitlements**

- Segregation of account activity by operational area

  ![Diagram showing segregation of account activity by operational area]

  **Allows:**
  - Fewer accounts
  - Self-service set-up and entitlements by operational area
  - Customized fraud/limits by pay/receive type

**Corporate structure - aligned reporting**

- Slice and dice reporting, independent of legal entity

  ![Diagram showing corporate structure and aligned reporting]

  **Allows:**
  - Hierarchy build and graphical depiction
  - Custom ERP-aligned business unit identifiers
  - Multi-channel information delivery

**Multicurrency virtual accounts**

- Foreign currency receipt without automatic conversion

  ![Diagram showing multicurrency virtual accounts]

  **Allows:**
  - Single routable account regardless of currency
  - Accept foreign currency without conversion
  - Option to hold, convert or redirect foreign currencies

**On-Behalf-Of execution & activity**

- Pay/collect multi-entity subsidiaries with tracked intercompany positions

  ![Diagram showing on-behalf-of execution & activity]

  **Allows:**
  - Intercompany loan tracking & reconciliation
  - Internal interest, FX rate & fee-based service allocation
  - Fully documented AML-compliant structures
### J.P. Morgan’s Receivables Reference Number (RRN) solution

<table>
<thead>
<tr>
<th>Incoming Credits</th>
<th>Collection Point</th>
<th>Receivables Management</th>
<th>Information Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Payments from customers</strong></td>
<td><strong>Electronic Payments</strong></td>
<td><strong>Automated Routing to Client DDA</strong></td>
<td><strong>Data Transmission</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Receivables Reference Number Solution routing engine</strong></td>
<td><strong>Automated posting to designated DDA</strong></td>
<td><strong>Reports show reference number for easier reconciliation of funds</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Receivables Reference Number is associated with the corresponding DDA</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Wires**
- **Local ACH**

**J.P. Morgan ACCESS®**
- Host-to-Host
- Receivables Edge
- ERP
GPS overview

Strategic Global Payments Infrastructure

**Open Roads**
Configurable open interface; any payment type/format/channel

**Virtual References**
Corporate structure reporting and entitlements; multicurrency virtual accounts; on-behalf-of (OBO) reconciliation

**Payment Tracking**
E2E transparency for originator and beneficiary

**Inventory Manager**
Single query-able global repository and views; format advisory capabilities

**Optimizer**
Aggregate, net, offset flows; intelligent router/GPS route; just-in-time funding; cheapest, fastest, shortest

**Core Cash Management Account**
Network payments; capture and award more business

*Note: While the scope and timing of the planned roll-out of Global Payments Strategy products are based on currently available information, they are subject to applicable laws and regulations (including any regulatory approval and/or notification requirement that applies to new products) and prevailing market practice.*
Going forward: Advancing to Receive-On-Behalf-Of (ROBO)

- Consolidate CCY payments processing activities to exploit scale benefits
- Set-up CCY Payment Factories to consolidate CCY payables to suppliers globally
- Potentially more complex but possible to centralize CCY collections into one single entity

Key challenges of Centralized Receivables

- Ensure the highest rate of automatic reconciliation against the Accounts Receivables. Receiving funds on behalf of can create significant reconciliation challenges for the ROBO Payment Factory
- ROBO Payment Factory, acting On Behalf Of the Legal entities, aims at
  - Reducing DSO
  - Reducing manual reconciliation effort

Technical solutions aimed at addressing these challenges exist, and can be leveraged to help automating the reconciliation process, both for the Client and its Counterparts
Receivables Reference Number banking solution is critical for Payment Factories implementing a “receive-on-behalf-of” (ROBO) solution.

The Receivables Reference Number used by the Ordering Party as the account number of the Beneficiary Party is automatically captured in the reporting sent to Client under the “Your Ref” field, considerably easing reconciliation.
Alias-based and card-based payment networks are critical enablers of these global commerce trends.

**Benefits: Broad Acceptance and Penetration Across the Globe**

Local digital payment networks are solving interoperability challenges in various geographies.

The growth of these digital payment networks has brought millions into the formal economy:

- PayPal users have doubled from 84.1MM in Q1 2010 to **169MM** in Q2 2015\(^1\)
- More users of Alipay (**800MM**) than internet users (629MM) in China in 2013\(^2\)
- Used by ~40% of Kenya’s adult population and processes more transactions than Western Union globally\(^3\)
- ~3.9 Billion Visa and MasterCard branded cards globally\(^4\)


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Disruptors and crypto-processing is solving interoperability & data challenges across geographies

**Benefits: Secure, Inexpensive, Fast Transfers in Any Currency**

**What it is:**
- Utilizes a cloud-based ledger interconnecting the world’s disparate financial systems
- Enables international movement of funds while riding the rails of existing infrastructure

Ripple – One Example of Blockchain processing:

**Sender** provides payment details and a sending FI connects to Ripple to get and accept the FX rate

The **receiving FI** gets payment notification and processes payment

A **market maker** holds the both the sender and receiver’s currencies and facilitates the transaction

Source: Ripple.com
Blockchain – a simple definition

A blockchain is a cryptographic, or encoded, ledger comprising a digital log of transactions shared across a public or private network.*

What does the blockchain actually do?

- Allows for digitization of assets
- Enables bilateral transactions between network participants
- Distributes validation of transactions among multiple network participants
- Leverages cryptographic techniques in managing assets and ownership on the ledger

What problems could it solve?

- Reduce the need for a trusted 3rd party
- Eliminate centralized systemic risk
- Prevent fraudulent activity
- Improve inconsistent data quality & governance
## Disruptors

### Bitcoin Blockchain versus Private Blockchains

<table>
<thead>
<tr>
<th></th>
<th><strong>Bitcoin Blockchain</strong></th>
<th><strong>Private / Permissioned Blockchain</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example</strong></td>
<td><img src="bitcoin-logo.png" alt="Bitcoin Logo" /></td>
<td><img src="private-blockchain-logos.png" alt="Private Blockchain Logos" /></td>
</tr>
<tr>
<td><strong>Immutable Record</strong></td>
<td>Immutable transaction database shared by all nodes participating within a network</td>
<td></td>
</tr>
<tr>
<td><strong>Synchronized Data</strong></td>
<td>All systems hold a local copy of the entire ledger and the network ensures that they are all in sync</td>
<td></td>
</tr>
<tr>
<td><strong>Participants / Nodes on Protocol</strong></td>
<td>Anyone</td>
<td>Permissioned / Known</td>
</tr>
<tr>
<td><strong>Consensus Method</strong></td>
<td>No Trust in System&lt;br&gt;Proof of Work + Mining</td>
<td>Proof of Stake / Proof of Consensus&lt;br&gt;No Mining</td>
</tr>
<tr>
<td><strong>Scale</strong></td>
<td>7 transactions / second</td>
<td>10,000+ transactions / second</td>
</tr>
<tr>
<td><strong>Assets</strong></td>
<td>- Bitcoin as token and native asset&lt;br&gt;- Colored coin experiments</td>
<td>- Potentially any asset&lt;br&gt;- Fiat Currencies&lt;br&gt;- LCs&lt;br&gt;- Securities&lt;br&gt;- Titles</td>
</tr>
</tbody>
</table>
Disruptors

Customized payment networks will start to emerge to address specific payment needs

Emerging customizable cloud-based global payment networks

Innovation = Compliant Solutions that Leverage Today’s Technology

Local Alias-based payment networks that have solved geographic interoperability challenges
Disruptors

Payment Systems of Today: Apple Pay, Bitcoin, Venmo

**Apple Pay**

A wireless system that lets owners of iPhone 6 or 6 Plus pay for goods at retailers with payment terminals.

- **2,500** Financial institutions now support Apple Pay as well as some **700,000** retail locations.
- In January 2015, Apple Pay accounted for **TWO OUT OF THREE** dollars spent via contactless payments.
- **MILLENNIALS** are the most likely to use a smartphone to make a mobile payment.

This year, **COCA-COLA PLANS TO DEPLOY UP TO 100,000 VENDING MACHINES** that will accept Apple Pay.

Source: New Jersey Institute of Technology
Disruptors

Payment Systems of Today: Apple Pay, Bitcoin, Venmo

Bitcoin
A digital cryptocurrency that is simultaneously a cryptographic protocol and a virtual currency which gives consumers a way to exchange money for free or a nominal fee.

In 2014, the price of Bitcoin OPENED THE YEAR AT $770

![Bitcoin price drop](image)

This represents a DROP OF MORE THAN 50% from the start of the year.

By mid-December, it was trading in the MID-$300 RANGE.

The number of Bitcoin ATMs as of March 3, 2015

- **The United States**: 111
- **Canada**: 61
- **Australia**: 20
- **The United Kingdom**: 20
- **Finland**: 13

About 93% of the cryptocurrency’s users are MALE.

A study found that most Bitcoin users were grouped in the states of California, Utah, Oregon, Washington, Nevada, New Hampshire and Vermont.

**Millennials are more likely** than any other age demographic to use digital currencies now and in the future – 13% use them today and 26 project using them by 2020.

Source: New Jersey Institute of Technology
Future Forms of Payment

**BIOMETRICS**

Payment methods that rely on a palm’s unique vein pattern for authentication

**VOICE RECOGNITION & FINGER VEIN**

Barclays is introducing voice recognition for users of its telephone banking service as well as finger vein biometric scanners

**APPLE WATCH**

Available starting April 2015

The user **DOUBLE TAPS** the side button on the Apple Watch and holds it near an NFC to pay

**SOCIAL MEDIA**

There is an idea to enable consumers to acquire products or discounts with social media actions **IN LIEU OF CASH**

Instagram users with at least **500 FOLLOWERS** are eligible to pay at participating businesses by posting photos of the purchase

The number of products available for this type of exchange increases in proportion with the number of followers

Source: New Jersey Institute of Technology
Disruptors

Cyber Security Threat to Current and Future Payment Systems

<table>
<thead>
<tr>
<th>Percentage of American who are very concerned about potential fraud with each of the following forms of payment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VIRTUAL CURRENCY</strong></td>
</tr>
<tr>
<td>48%</td>
</tr>
</tbody>
</table>

It is possible to trace Bitcoin transactions although it may be **DIFFICULT TO ASSOCIATE A TRANSACTION WITH A PARTICULAR INDIVIDUAL**.

**THE CRYPTOGRAPHY** used in Bitcoin is military grade and the blockchain **IS BELIEVED TO BE SECURE**.

Apple Pay Transactions are secured by means of:

- Storing users credit card information directly on their iPhones **IN A SPECIALLY DESIGNED CHIP AND THEN GENERATING PROXY ACCOUNT** numbers that it provides to retailers
- **A uniquely generated code**
- Fingerprint authentication

In Venmo, **ALL DATA IS SENT OVER A 256-BIT ENCRYPTED CONNECTION** – the same encryption method used to protect classified government information – and transactions are protected by the Federal Deposit Insurance Corporation.

Source: New Jersey Institute of Technology
In February 2014, Mt. Gox, a major exchange that once handled over 70% of Bitcoin transactions, announced its LOSS OF 850,000 Bitcoins, valued at over $500 MILLION.

In early 2014, hackers discovered that DATA FROM STARBUCKS’ IOS USERS WAS NOT ENCRYPTED FOR SECURITY. The company didn’t report any data stolen.
Disruptors

Mobile adoption

Half of the world’s population now has a mobile subscription. With an additional billion by 2020, taking the global penetration rate to 60%.  

- Now 50.3% of ecommerce website traffic comes through a mobile device
- In 2013, 95 million U.S. adults used mobile banking—27 million more than 2012
- By 2018, 63% of the mobile consumer population is forecasted to be using mobile banking

Mobile mindset

Nearly half (44%) of Americans say they couldn’t make it a day without their mobile device. Older millennials (ages 25-34) and Gen X (ages 35-49) are even more dependent on their smartphones.

How long could you last without your smartphone?

<table>
<thead>
<tr>
<th></th>
<th>Less than one hour</th>
<th>24 hours</th>
<th>About a week</th>
<th>Indefinitely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total respondents</td>
<td>11%</td>
<td>33%</td>
<td>24%</td>
<td>21%</td>
</tr>
<tr>
<td>Older millennials</td>
<td>11%</td>
<td>41%</td>
<td>22%</td>
<td>14%</td>
</tr>
<tr>
<td>Gen X</td>
<td>15%</td>
<td>37%</td>
<td>21%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Adoption of mobile money transfers

In the US, the number of mobile P2P users is expected to grow from 69 million adults in 2015 to 126 million (57% of all mobile device owners) by 2020.

- With mobile P2P you don't need the correct change, a paper check, or a nearby ATM
- Transactions are also fast compared to the time it often takes to wait for a check or bank transfer to clear
- Mobile P2P payments remove some of the stigma of asking for money—users can request money remotely

Source: Javelin, Mobile P2P Payments in 2015: The Growth and Adoption of Mobile Money Transfers, 9/15
Regional Updates and Trends

Companies from Six Different Industries are Influencing the Mobile Payments Conversation

**Financial Institutions**
- Bank of Beijing (China)
- Royal Bank of Canada (Canada)
- BMO (Canada)
- HSBC (UK)
- Central Bank of Nigeria (Nigeria)
- Barclays (UK)
- ICICI Bank (India)
- Reserve Bank of Zimbabwe (Zimbabwe)
- Standard Bank (Kenya)

**Retailers and Services**
- OpenTable
- Starbucks
- Amazon
- eBay
- Chipotle
- Whole Foods

**Wireless (Network Providers)**
- Verizon
- Vodafone (India)
- Rogers (Canada)
- Teius (Canada)
- China Mobile (China)
- Deutsche Telekom (Germany)

**Payment Services (Mobile)**
- PayPal
- LevelUp
- Braintree
- Venmo
- Square
- Clinkle
- UniteU Technologies
- Seamless Payments AB (Sweden)
- Kopo Kopo (Kenya, Rwanda, Tanzania)

**Payment Services (Traditional)**
- MasterCard
- SinglePoint
- VeriFone

**Payment Services (Traditional)**
- Apple
- Google
- Microsoft
- Samsung
- Xiaomi (China)
- Motorola
- Broadcom

Source: Appionions 2014
Regional Updates and Trends

Mobile Payment Users from 2009 to 2016 by Region

Source: PaymentEye
Regional Updates and Trends

Mobile Phone Owners Who Use Their Devices For Payments In Emerging Markets

(Do you regularly use your mobile phone to make or receive payments?)

Percentage Who Answered "Yes"

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tunisia</td>
<td>3%</td>
</tr>
<tr>
<td>Bolivia</td>
<td>3%</td>
</tr>
<tr>
<td>Turkey</td>
<td>4%</td>
</tr>
<tr>
<td>Lebanon</td>
<td>4%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>4%</td>
</tr>
<tr>
<td>Jordan</td>
<td>5%</td>
</tr>
<tr>
<td>Brazil</td>
<td>5%</td>
</tr>
<tr>
<td>El Salvador</td>
<td>5%</td>
</tr>
<tr>
<td>Egypt</td>
<td>6%</td>
</tr>
<tr>
<td>Pakistan</td>
<td>9%</td>
</tr>
<tr>
<td>Argentina</td>
<td>10%</td>
</tr>
<tr>
<td>China</td>
<td>11%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>11%</td>
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<tr>
<td>Philippines</td>
<td>11%</td>
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<tr>
<td>Chile</td>
<td>11%</td>
</tr>
<tr>
<td>Mexico</td>
<td>11%</td>
</tr>
<tr>
<td>Ghana</td>
<td>18%</td>
</tr>
<tr>
<td>Nigeria</td>
<td>24%</td>
</tr>
<tr>
<td>Venezuela</td>
<td>24%</td>
</tr>
<tr>
<td>Russia</td>
<td>29%</td>
</tr>
<tr>
<td>Senegal</td>
<td>50%</td>
</tr>
<tr>
<td>S. Africa</td>
<td>68%</td>
</tr>
<tr>
<td>Uganda</td>
<td>50%</td>
</tr>
<tr>
<td>Kenya</td>
<td>11%</td>
</tr>
</tbody>
</table>

Median: 11%

Source: Pew Global 2013
EMV

EMV Merchant Adoption

1. Of card-accepting merchants are EMV-ready
   37% (Prior TSG survey estimated over 40% would be EMV-ready at this point)

2. Expected EMV Readiness
   - Sept. '15 Est.: 75%
   - Mar. '15 Est.: 72%
   - Jun. '16: 50%
   - Dec. '16: 72%
   - 2017: 90+

3. Top EMV Hurdles
   - Processor Readiness: 57%
   - Gateway Readiness: 54%
   - Technical Staff Resource Availability: 53%

Source: www.thestrawgroup.com