Mobile Payments; Costs of Losing Out

The term “mobile payments” encompasses the complex system of products, services, and infrastructure, involved in initiating, conducting, and settling monetary transactions between consumers, merchants, and financial intermediaries.

Banks, as owners of the financial relationships with consumers and merchants, play a central role in the retail payments system, earning fees from purchase transactions as well as earning interest income from the spread on credit card loans.

But changing customer expectations, new industry entrants, and rapidly evolving technological capabilities (specifically relating to growth in the use of mobile technology) are challenging existing business models and driving banks to re-evaluate their traditional payments strategies.

This report focuses on the participants and processes involved in everyday non-cash retail purchase transactions with a focus on credit cards. It discusses how banks benefit from their role in the payment system and how that role is being challenged by changes within the payments space. We also show some of the ways in which Canadian banks have adapted to these changes, in part to defend market share and in part to maintain the all-so critical primary customer relationships.

**SPEED READ**

- The domestic card businesses of the “Big 6” banks is on track for ~$3 billion in after-tax earnings or about 9% of the group’s overall profitability in 2015.
- We believe the Canadian non-cash payments market will be roughly $1 trillion by 2020, with the potential of upwards of 15% of these payments being mobile.
- Mobile payments are attracting new entrants to the payments eco-system, increasing pressure on banks to compete for both the customer and their piece of the financial pie.
- One of the ways some banks are responding is the introduction of mobile wallet applications. So far, adoption rates have been low in Canada.
- We do not expect the Canadian banks to cede ground in payments uncontested, given that they occupy the “high ground” currently.

This report was prepared by an analyst(s) employed by BMO Nesbitt Burns Inc., and who is (are) not registered as a research analyst(s) under FINRA rules. For disclosure statements, including the Analyst’s Certification, please refer to pages 24 to 26.
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Background

In Canada, non-cash transactions now account for roughly 60% of all transactions (up from roughly 45% six years ago), and credit cards account for about half of those transactions.

The credit card business is an important source of profitability for the Canadian banks. In the payments ecosystem, banks, as issuers of credit cards, traditionally have generated income from two sources:

1. Providing credit to consumers and generating net interest income less credit/fraud losses, and
2. Providing consumers access to the payment networks and generating interchange fees.

By our estimates the domestic credit card businesses of the “Big 6” banks are on track to generate close to $9 billion in revenue (or about 7% of total industry revenue), and account for roughly $3 billion in after-tax earnings (or about 9% of the group’s overall profitability) in 2015. We estimate that 40% of the card revenue is fee income (as opposed to spread income) mostly comprised of interchange fees.

Exhibit 1: “Big 6” Credit Card Earnings vs. Total Earnings

The domestic Credit Card business of the “Big 6” is on track for $3 billion in after-tax earnings or about 9% of the group’s overall profitability in 2015.

Banks have been effective in managing most aspects of the non-cash payment network, from issuing the card to the back-end support in the acquirer relationship offering merchant accounts and services.

Their positioning has allowed them to harvest fees, and strengthened their ability to cross-sell banking services generating spread income.

Cards are also leveraged by banks to enrich the customer relationships, deepen product penetration, boost brand awareness, and provide valuable opportunities for client insight.

In order to facilitate the sale of their product in a credit card transaction, merchants leverage the payments ecosystem at a cost equivalent to the merchant discount rate (Exhibit 2).
Exhibit 2: Paying With a Credit Card – Easy but Not Simple

One place where the banks are not exercising influence over the card network is the “rails” or the network for non-cash payments.

Interchange fees (i.e., the toll for using the rails) are set by the network operators, paid by merchants, and earned by the banks.

While the merchants would typically prefer to receive cash for the goods/services sold, for a variety of reasons not all consumers transact in cash.

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What happens when a customer uses a credit card to pay for a $100 purchase?

As shown below, the merchant, through the merchant discount rate (MDR), facilitates the credit card transaction. In a nutshell, the MDR is intended to compensate all parties involved in ensuring the successful completion of a non-cash sale. For example, in a $100 transaction where a customer pays for the goods using a credit card, the merchant would end up receiving $98. The $2 differential is the merchant discount rate (i.e., paid by the merchant) and is intended to fund:

1. A $1.70(1) payment to the issuing bank (this is the interchange fee), which is providing credit to the customer, taking risk of fraudulent transactions, and funding the loyalty rewards associated with the credit card;
2. A $0.10 payment to the card network operators - think of this as a toll paid for using the networks’ “rails” that connect the merchant and issuing bank; and
3. A $0.20 processing fee paid to the merchant acquirer, which is the gateway for the merchant to the card network.

Source: BMO Capital Markets

(1) After 2014 regulation $1.70 will now be ~$1.50 for traditional credit payments; for Interac Debit transactions, the rate is 0.6012¢ per transaction. For Interac Flash, there are additional interchange fees of 2.0-3.5¢ per transaction.

(2) Rewards to customer for the use of a specific issuer's card. The cost of rewards must be taken into account in order to calculate “net interchange.” The cost of rewards for the “Big Six” banks has been about ~1% of purchase volume, while interchange has been historically ~1.70%.

(3) Merchant acquirers (such as Moneris, Global Payments, TD Merchant Services, etc.) process credit or debit card payments on behalf of a merchant.
Interchange fees (which are a large portion of the merchant discount rate) represent the cost of using that payment network by the merchants, and vary by purchase volume, type of purchase, and level of rewards associated with the card used by the customer.

We estimate that the Canadian banks, on average, collect interchange fees of 1.5% (down from 1.7% following the recent change in interchange fees) on all purchase volume from credit cards issued by them. By our estimates so far, in 2015, total purchase volume on credit cards issued by the “Big 6” has been close to $300 billion, which suggests the group has collected interchange fees of nearly $5.0 billion (Exhibit 3).

The interchange fees are used by the issuing banks to fund a variety of items, some of which include:

1. Rewards programs for card holders – which we estimate run at 56-58% of interchange fee revenue;
2. Fraudulent charges (reported as part of credit losses) – which amounted to about 15 bps of total purchase volume for the industry in 2014 (i.e., about 11% of interchange fee revenue).
3. Marketing, administration and technology expenses.

By our estimates, net interchange revenue (i.e., net of cost of rewards) have amounted to about a $2 billion revenue pool for the “Big 6,” and have accounted for about a quarter of total credit card revenue of the banks in recent years (Exhibit 3).

### Exhibit 3: “Big 6” Domestic Credit Card Business (C$MM)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card Balances ($B)</td>
<td>50.7</td>
<td>56.9</td>
<td>58.2</td>
<td>59.2</td>
<td>60.8</td>
</tr>
<tr>
<td>Charge Volume ($B)</td>
<td>241</td>
<td>261</td>
<td>273</td>
<td>296</td>
<td>319</td>
</tr>
<tr>
<td>Interchange Fees</td>
<td>4,015</td>
<td>4,349</td>
<td>4,560</td>
<td>5,079</td>
<td>5,393</td>
</tr>
<tr>
<td>Cost of Rewards</td>
<td>2,368</td>
<td>2,436</td>
<td>2,550</td>
<td>3,051</td>
<td>3,346</td>
</tr>
<tr>
<td>Net Interchange Revenue</td>
<td>1,647</td>
<td>1,913</td>
<td>2,010</td>
<td>2,028</td>
<td>2,047</td>
</tr>
<tr>
<td>Other fees(1)</td>
<td>916</td>
<td>937</td>
<td>1,022</td>
<td>1,283</td>
<td>1,487</td>
</tr>
<tr>
<td>Net Card Fees (2)</td>
<td>2,562</td>
<td>2,850</td>
<td>3,032</td>
<td>3,311</td>
<td>3,535</td>
</tr>
<tr>
<td>Card FX Fee</td>
<td>134</td>
<td>124</td>
<td>141</td>
<td>155</td>
<td>156</td>
</tr>
<tr>
<td>Total Fee Revenue</td>
<td>2,696</td>
<td>2,974</td>
<td>3,173</td>
<td>3,466</td>
<td>3,691</td>
</tr>
<tr>
<td>Net Interest Income(3)</td>
<td>4,532</td>
<td>5,062</td>
<td>5,198</td>
<td>5,187</td>
<td>5,364</td>
</tr>
<tr>
<td>Total Card Revenue</td>
<td>7,094</td>
<td>7,912</td>
<td>8,230</td>
<td>8,498</td>
<td>8,898</td>
</tr>
<tr>
<td>Expenses</td>
<td>2,483</td>
<td>2,769</td>
<td>2,880</td>
<td>2,974</td>
<td>3,114</td>
</tr>
<tr>
<td>Credit Losses</td>
<td>2,176</td>
<td>1,976</td>
<td>1,876</td>
<td>1,732</td>
<td>1,762</td>
</tr>
<tr>
<td>Pre-tax Earnings</td>
<td>2,435</td>
<td>3,167</td>
<td>3,473</td>
<td>3,792</td>
<td>4,022</td>
</tr>
<tr>
<td>Taxes</td>
<td>633</td>
<td>823</td>
<td>903</td>
<td>986</td>
<td>1,046</td>
</tr>
<tr>
<td>After-tax Earnings</td>
<td>1,802</td>
<td>2,343</td>
<td>2,570</td>
<td>2,806</td>
<td>2,976</td>
</tr>
</tbody>
</table>

| Net Interchange Revenue % Total Card Revenue | 23% | 24% | 24% | 24% | 23% |

Source: CBA, Interac, BMO CM estimates
Notes: 2015 is LTM July 31st, 2015
(1) Includes annual dues as well as fees from purchase volumes as well as card FX-related fees.
(2) Excludes estimates for U.S. debit operations at BMO, International cards at Scotia, and U.S. debit and merchant services operations at TD.
(3) Based on credit card portfolio yield at TD and BMO; assume funded by 90-day BAs.
(4) Assumed the same card mix and consumer spending habits across all banks, regardless whether they are primarily a Visa or MasterCard issuer.
The Shift Away From Cash

Total gross payment value (GPV) in Canada through debit and credit is close to $600 billion, of which about 70% is conducted on credit (Exhibit 4). Since 2010, GPV in Canada has increased at a compounded annual growth rate of 6%; credit GPV CAGR has been 7.2%, outpacing debit GPV CAGR of 4.6%. We estimate the Canadian banks have 75-80% of total GPV in Canada, which amounts to a volume of roughly $450 billion.

Exhibit 4: Credit vs. Debit Card GPV ($B) at the “Big 6”

In Canada, credit card payment value has grown to 64% of all non-cash payments, up from 61% in 2010.

We believe banks prefer the use of credit over debit card due to better interchange economics, and the potential for net income pickup from customers carrying balances.

Growth in credit cards is an area of focus for all the banks. TD, for example, is targeting $500 million in incremental annual revenue from its Canadian cards business by 2018.

BNS has highlighted credit cards as a key pillar of its payment strategy and a primary driver of its targeted earnings growth for its Canadian Banking segment; it expects incremental annual earnings of $80 million from cards in the next three to five years.

CM and BMO (the latter of which is the #1 MasterCard issuer in Canada) have highlighted the role of payments as key to superior engagement in growth, although neither has provided explicit financial targets.

For RY, the focus is also going beyond just new credit card customer acquisitions and balance growth because it believes the value proposition to the client matters. This bank is zeroing in on the “critical” variables it believes will bring the “in-app experience to the physical world” for its customers, which include:

- Ease of use;
- Security;
- Mobile device, mobile network acceptance;
- Cost;
- Merchant acceptance;
- Payment instrument (debit/credit).

See also Appendix A for key takeaways from the BMO Think Series on digital payments.
Sizing the Prize

In Canada, branch foot traffic, ABM transaction, and telephone banking transaction trends are all on the decline, while mobile is the fastest growing line of communication for the banks with their clients. Digital trends are changing the way customers interact with their banks. In Canada, the number of wireless subscribers now essentially equals the bankable population, suggesting near 100% penetration of mobile devices.

One place where mobile devices are having an impact on customer behaviours is in the way we pay. Mobile payments currently only account for about 1% of total non-cash payments, but are attracting new entrants to the payments eco-system and are witnessing an acceleration in innovation.

Based on our estimates of current credit, debit, and prepaid card spend, we believe the Canadian non-cash payments market will be close to a trillion dollars by 2020, with the potential of upwards of 15% of these payments being mobile payments (Exhibit 5).

<table>
<thead>
<tr>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Household Final Consumption Expenditure</td>
<td>$1,073</td>
<td>$1,126</td>
<td>$1,183</td>
<td>$1,242</td>
<td>$1,304</td>
<td>$1,369</td>
<td>$1,438</td>
</tr>
<tr>
<td>Total Credit Payments</td>
<td>$394</td>
<td>$426</td>
<td>$460</td>
<td>$496</td>
<td>$534</td>
<td>$575</td>
<td>$619</td>
</tr>
<tr>
<td>of which are Mobile</td>
<td>$3</td>
<td>$6</td>
<td>$15</td>
<td>$29</td>
<td>$48</td>
<td>$72</td>
<td>$102</td>
</tr>
<tr>
<td>% of Total Credit Payments</td>
<td>1%</td>
<td>1%</td>
<td>3%</td>
<td>6%</td>
<td>9%</td>
<td>12%</td>
<td>16%</td>
</tr>
<tr>
<td>Total Debit Payments</td>
<td>$211</td>
<td>$225</td>
<td>$237</td>
<td>$248</td>
<td>$261</td>
<td>$274</td>
<td>$288</td>
</tr>
<tr>
<td>of which are Mobile</td>
<td>$1</td>
<td>$2</td>
<td>$5</td>
<td>$8</td>
<td>$12</td>
<td>$18</td>
<td>$24</td>
</tr>
<tr>
<td>% of Total Debit Payments</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
<td>5%</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>Prepaid/Stored-Value Payments</td>
<td>$27</td>
<td>$28</td>
<td>$30</td>
<td>$31</td>
<td>$33</td>
<td>$34</td>
<td>$36</td>
</tr>
<tr>
<td>of which are Mobile</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$2</td>
</tr>
<tr>
<td>% of Prepaid/Stored-Value Payments</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Total Non-Cash Payments</td>
<td>$632</td>
<td>$679</td>
<td>$726</td>
<td>$775</td>
<td>$827</td>
<td>$883</td>
<td>$942</td>
</tr>
<tr>
<td>% of Total Non-Cash Payments</td>
<td>1%</td>
<td>1%</td>
<td>3%</td>
<td>5%</td>
<td>7%</td>
<td>10%</td>
<td>14%</td>
</tr>
</tbody>
</table>

We estimate that the Canadian non-cash payments volume can grow to $1 trillion by 2020, with the potential of upwards of 15% of these payments being mobile.

The insertion of the mobile device in everyday life has the potential of altering the bank-client relationship (Exhibit 6). Each new entrant is a potential competitor to the banks and a potential intruder on their existing client relationships. Some of the main issues/threats in having the smartphone in-between the bank and the banks’ customers are:

1. **Loss of Interchange:** Apple, through Apple Pay, is inserting itself in the payments eco-system and taking a portion (15 basis points) of the interchange fees otherwise earned by the banks. See Appendix B for a brief history of Apple Pay, for example.

2. **Lower Consumer Awareness:** Cards have typically served an important branding role for the banks. The banks are at risk of losing this branding point in a mobile world.

3. **Payments as a gateway to basic banking:** A prepaid account such as those offered by PayPal, Google, and Walmart can act as an alternative to a traditional checking account.

4. **Data:** Companies such as PayPal and Square are able to establish themselves as the merchant of record for transactions processed through their platform.

5. **Security:** By surrendering control of aspects of the payments process, banks open themselves up to security threats.
Control of the customer relationship is paramount for the banks.

Non-bank payment providers are getting increasingly good at inserting themselves between banks and their customers, capturing existing profit streams as well as opening up new revenue opportunities. In the coming years, banks will have to leverage their installed advantages to enhance the customer value proposition, and ensure they mutually benefit from changes being brought on by mobile payments.

The typical credit card payment process in Canada involves a chip-enabled card, as depicted in Exhibit 7. We also provide four additional cases studies of how the payments eco-system is being impacted by the mobile disruption. In addition, Appendix C provides a glossary of payment terminology.

### Exhibit 6: From the Issuers’ Perspective the Smartphone Is a Potential Point of Disruption

*Source: BMO Capital Markets*

### Exhibit 7: Traditional Point-of-Sale Purchase

*Source: BMO Capital Markets*
Payment Method Case Studies

Case Study #1:
Apple Pay – Point-of-Sale Purchase

![Diagram](Image)

Source: BMO Capital Markets

How does this case change the banks’ relationships within the payment ecosystem?

Apple Pay\(^1\) pushes the banks through the corridors of the Apple experience. While customer interactions with Apple are generally defined as exceptional, the experience will not be defined by the banks.

Clarifying some of the noise:

1. **How does Samsung Pay compare to Apple Pay?** There are two main differences between Apple Pay and Samsung Pay. Apple Pay only works at POS terminals that have “tap-to-pay” technology (RFID/NFC; 40% of terminals in Canada accept contactless payments and tend to control 60-70% of the purchase volume), whereas Samsung Pay will work utilizing a unique technology that allows communication with swipe-only POS terminals. While we cannot be sure of any specifics from country to country, Samsung has stated that it will not charge issuers; Apple Pay is charging 15 bps in the U.S.

2. **How does Apple Pay compare to Android Pay?** Android pay essentially will use the same model as Apple Pay with NFC technology, tokenization, and fingerprint authentication. Android Pay will use HCE to store payment information, whereas Apple Pay uses a secure element. Based on our understanding, Google has not yet confirmed whether or not it will receive any portion of interchange for payments using their platform.

3. **Why does Apple Pay charge the issuer versus other parties in the payments network?** There are many theories surrounding this question, but in its simplest form the interchange component of the MDR is the only place where you could realistically take 15 bps. Apple wouldn’t be able to take 15 bps from the network (assessment fees only 10 bps) or from the acquirer (processing fees only 20 bps). This economic model is the least disruptive to the payments network, and arguably maintains the delicate balance of the payments ecosystem.

\(^{1}\) For a brief history of Apple Pay please see Appendix B
Case Study #2:
RBC Mobile Wallet – Point-of-Sale Purchase Using an Android

How does this case change the banks’ relationships within the payment ecosystem? In this case RBC is able to maintain all of the existing relationships as in a traditional payment. Importantly, physical cards have been used in the past as a point of branding that is less relevant in a mobile world. RBC’s Mobile Wallet attempts to capture as many “brand points” as possible throughout a mobile transaction; however, unless they were to become smartphone manufacturers, they will be unable to completely control/brand a mobile payment.

Clarifying some of the noise:

1. **What is the difference between HCE (Host-Card Emulation) and a secure element payment storage?** HCE storage uses cloud infrastructure, whereas a secure element is physically on the smartphone. Payment applications in Canada are reliant on the telecommunications carriers, who store credit card data in a secure element on the carriers’ SIM card (i.e., Suretap and CIBC).

2. **Is a connection (data plan or wireless) required for a mobile payment?** Apple Pay does not require a data plan or a wireless connection to make contactless POS payments; however, in-app payments will require an internet connection. Apple Pay, therefore, can be used at brick and mortar retailers who are out of the customer’s service area. The recently announced Android Pay will be able to handle a limited amount of transactions while in a “dead zone,” and we expect RBC’s Mobile Wallet will be able to do the same.

3. **How will the RBC Mobile Wallet work within the Apple versus Android ecosystems?** The Apple model is not economically “issuer friendly” versus alternative payment apps. Apple forces banks to run their payments applications through Apple Pay in order for Apple to control some portion of the payment process (Apple requires any third-party wallet application such as RBC Mobile Wallet to run through Apple’s secure element). At this point, under the Android umbrella payments made with the RBC Mobile Wallet would not lose any share of interchange, as RBC securely stores card information in its “secure cloud.”

See also Appendix A.
Case Study #3:
Starbucks App – Point-of-Sale Coffee Purchase

Replaces physical card

| Android or iPhone: Acts as conduit | Starbucks Mobile Wallet: Acts as payment method and storage | Transmission Mechanism: QR Code, replaces NFC or chip and pin | Acquirer: Verifies with the payment network that the customer is ‘money good’ | Card Network: Verifies with the issuer the customer is ‘money good’ | Issuing Bank: Verifies customer is ‘money good’ and releases funds | Merchant: Receives ‘approval,’ customer funds are on their way |

How does this case change the banks’ relationships within the payment ecosystem? A merchant specific mobile wallet such as Starbucks limits the banks’ ability to influence the customers’ buying decisions. The rewards that Starbucks offers within its mobile app push customers towards purchasing Starbucks coffee over alternatives such as Tim Hortons; this is no different than the use of a Starbucks rewards card. The main consideration for banks with respect to a proprietary retail app comes from the network effect they might have with other retailers. CurrentC is a mobile payments application that operates in a similar fashion to a Starbucks mobile payment. However, it has a group of retailers from 7-Eleven to Walmart. They all plan to accept payments for the current mobile application, which is funded through ACH payment, a direct link to your checking account; this effectively bypasses the interchange paid to card issuers.

Clarifying some of the noise:

What is the main difference between NFC and QR Codes?

1. First, NFC payments (used by Apple and RBC Mobile Wallet) require storage of credit card data in a secure location. In the case of Apple Pay, this is in a secure element on the phone, while for the RBC Mobile Wallet it is in the cloud using HCE technology. Second, NFC payments also have an additional process called tokenization which effectively gives only the network (Visa/MasterCard) access to sensitive personal and credit card information. The acquirers and merchants only now see a “token.”

2. Similar in concept to standard barcodes, QR codes are scannable images that store data about a product, person, or application (item identification, tracking numbers, price, bank or credit card account information, URL).

Key Point: If a retailer such as Starbucks is able to control the payment method it may be able to nudge customers towards the use of debit, decreasing the interchange earned by banks.
Case Study #4:  
In-App Uber Payment

How does this case change the banks’ relationships within the payment ecosystem? If we view Uber as a payment company, then we can see the 20% cut it takes from the taxi driver as effectively increasing the MDR to ~20% from ~2% (MDR = Interchange + Assessment Fees + Processing Fees + Uber’s Cut). In this sense it seems to be a natural fit that Uber partnered with American Express, which traditionally has a higher MDR, ~1-2% higher than Visa/MasterCard. This is a direct hit to the banks, top and bottom line, as American Express is the issuer as well as the network.

The mobile commerce (mCommerce) payment space may have a variety of different economics models that have yet to unfold; Uber is simply one of the most unique and successful. The traditional four-party system of the issuer, network, acquirer and merchant is changing and banks will have to adapt rapidly to new POS models as well as mCommerce models, specifically the in-app payment experience.

Clarifying some of the noise:

1. Why has Uber been the subject to so many case studies related to payments? Uber has done extremely well creating a “frictionless” payment experience. After the customer completes their initial sign-up, which includes entering their payment information, the client never has to go through the physical process of paying. The client simply exits the taxi and is emailed a receipt with the details of their trip.

2. Is this 20% charge reasonable? While we cannot opine on the reasonableness of this charge, we point people to the fact that Apple takes 30% of all in-app purchases of digital goods (i.e., non-physical goods or services). For instance, if you develop a game for iOS and you sell additional levels or downloadable content for $10, Apple takes $3.

**Key Point:** The Uber App with an AMEX reward partnership is an interesting model that demonstrates a scenario where Canadian banks have little involvement in a payment.
Mobile Disruption

The actual act of payments is not what’s defining the customer experience. If it were that simple, BMO’s PayPass solution would have been a very efficient solution to the puzzle: stick a NFC-enabled card behind your mobile phone, tap with your phone, and you are done. After all, upwards of 40% of point-of-sale terminals in Canada accept contactless payments (and these terminals tend to control 60-70% of the purchase volume).

It is more than that; it is about the dramatic change around how commerce is occurring and will continue to occur. Data goes hand in hand with mobile payments. Customer data is what all innovative payment models are targeting. Data helps merchants know who shops in their stores and who does not. Client data is what banks have been leveraging to come up with targeted offers; and more data, processed quicker, and analyzed for greater relevance to the client is what the competitors, new and old, are in pursuit of in digital payments.

For banks, the risk of new entrants is not solely about losing interchange revenue. True, by inserting itself in the payments flow, Apple, for example, will be taking a portion of the interchange fees otherwise earned by the banks. The bigger issue for the banks, in our view, is the risk of being further removed from their customers as non-traditional competitors (such as Apple) enter the payments ecosystem. The challenge for the banks will be to deliver what their customers expect better than the alternative, and we believe customers expect the ability to pay securely on their phone (Apple or Android) with an intuitive and frictionless experience.

One of the ways banks have experimented with mobile technology has been with the introduction of mobile wallet applications – downloadable apps that allow users to pay for purchases using their mobile device.

**Exhibit 8: Global Relative Interest in “mobile payment” and “mobile wallet” Keywords Search**

Source: Google Trends (www.google.com/trends)

(1) An upward (downward) trending line means that a search term’s popularity is increasing (decreasing). It does not mean that the absolute, or total, number of searches for that term is increasing (decreasing).
Canadian Bank Mobile Wallets

Mobile wallets can take two forms: open or proprietary. Open mobile wallets, in theory, allow customers to pay by any method (credit or debit), with any card, using any mobile device, over any mobile network. The advantages of potentially higher consumer adoption rates are countered by the disadvantages to banks of disintermediation (management of operations, security, and client relationships).

Proprietary mobile wallets, however, are mobile applications created and managed by a specific card issuer. Typical proprietary mobile wallets allow customers to use only the issuer’s proprietary cards. They also often restrict the device and the mobile network that the wallet can be used on. While banks retain control of the payment process, they do so at the expense of lower adoption rates.

Regardless of whether a mobile wallet is open or proprietary, given the complexity of establishing extensive contracts between the many different participants, issuers have been slow to promote their products, and consumer adoption rates have remained low.

In Exhibit 9 we show a brief description of the mobile wallet initiatives made by the “Big 6” Canadian banks to date both in Canada and the U.S. We note that Royal and TD have so far been the “first movers” in this space, while BMO and National look to have been the least active.
### Exhibit 9: Mobile Wallets Scorecard

<table>
<thead>
<tr>
<th>Application:</th>
<th>Proprietary WALLETS</th>
<th>OPEN WALLETS</th>
<th>OTHER WALLETS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMO Paypass Tag</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scotiabank Mobile Wallet</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CIBC Mobile Payment App</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RBC Wallet</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TD Mobile Payment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suretap Ugo Wallet</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Apple Pay (6)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Android Pay</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Application:**
- BMO Paypass Tag
- Scotiabank Mobile Wallet
- CIBC Mobile Payment App
- RBC Wallet
- TD Mobile Payment
- Suretap Ugo Wallet
- Apple Pay (6)
- Android Pay

**Launched:**
- September 2011
- July 2014
- November 2012
- December 2013
- May 2014
- November 2014
- April 2014
- September 2014
- May 2015

**Description (3):**
- Payment sticker for any mobile device
- Proprietary mobile wallet
- Proprietary mobile wallet
- Proprietary mobile wallet
- Open mobile wallet
- Open mobile wallet
- Open mobile wallet
- Open mobile wallet

**Transmission:**
- NFC
- Proprietary mobile wallet
- NFC
- NFC
- Secure Element
- Secure Element
- Secure Element
- Secure Element

**Security (4):**
- Equivalent to chip and PIN card
- Proprietary mobile wallet
- NFC
- NFC
- Secure Element
- Secure Element
- Secure Element
- Host Card Emulation

**Ease of Use:**
- Telcos: All
- Credit Card: BMO
- Cost: No fee
- Acceptance: NFC enabled retailers (1)
- Telcos: All
- Credit Card: All
- Cost: No fee
- Acceptance: NFC enabled retailers (1)
- Telcos: All
- Credit Card: RBC
- Cost: No fee
- Acceptance: NFC enabled retailers (1)
- Telcos: Bell, Rogers, TELUS
- Credit Card: Proprietary to issuer (5)
- Cost: Monthly fee + loading fee
- Acceptance: NFC enabled retailers (1)
- Telcos: All (U.S.)
- Credit Card: In partnership with U.S banks
- Cost: No Fee
- Acceptance: ~70 U.S. retailers

**Application:**
- Apple Pay (6)
- Android Pay

**Launched:**
- September 2014
- May 2015

**Description (3):**
- Open mobile wallet
- Open mobile wallet

**Device:**
- iPhone
- Android

**Transmission:**
- NFC
- NFC

**Security (4):**
- Secure Element
- Host Card Emulation

**Ease of Use:**
- Telcos: All (U.S.)
- Credit Card: All (U.S.)
- Cost: No Fee
- Acceptance: ~70 U.S. retailers

**Source:** Company websites, BMO CM

Note: All mobile payments are limited to a maximum of $100 at point of sale

1. Approximately 30 percent of all POS devices in Canada are enabled to support NFC payments and 70% of “targeted categories” (pharmacy, grocery etc.) (Source: CBA Payments Security White Paper, July 2015)
2. UGO wallet also available for iPhone but for loyalty cards only (not payment)
3. Proprietary wallets allow issuer more control over user experience and security. Open wallets require the outsourcing of these processes. In both cases, issuers bear the liability for fraud
4. On a relative scale, secure element (SE) is the highest level of security. Host Card Emulation (HCE) can be as secure as SE but is contingent on security applications. Chip and PIN card security is lower security
5. CIBC customers can use CIBC enabled cards, TD customers can use TD enabled cards etc.
6. Apple Pay is also available in the U.K. (accepted at ~30 retailers), and is expected to launch in Canada and Australia partnered with American Express.
Recent Developments:

Chase introduced its new proprietary mobile wallet called “Chase Pay,” a wallet that will work on both Apple and Android software and uses QR code technology.

Confronting the challenges of low consumer adoption rates from a different angle, Chase’s wallet strategy is to target the merchant to incentivize customers to pay with the Chase app. Chase is partnering with a consortium of retailers called MCX (which includes Walmart, Target, and Best Buy) and will not only allow the integration of consortium merchant loyalty cards into its wallet, but will also offer lower transaction fees to the consortium retailers for Chase Pay transactions.

This announcement highlights some of the competitive advantages traditional banks – particularly ones with large customer bases and deep relationships with merchants – can use in the battle to preserve the client relationship under threat of disruption. Enabling the use of bank and merchant products on a single platform offers the consumer simplicity and convenience, while at the same time offering banks and merchants the capacity for data-enabled cross-sell.

One question this announcement raises relates to the interdependence of partnerships that is becoming more and more widespread as new technologies and platforms are introduced. As large banks launch proprietary mobile wallets while at the same time offering compatibility with open wallets, it remains to be seen how the complicated relationships among banks, technology companies, merchants, and consumers evolve.

Conclusion

In the past five or so years, we have seen some dramatic changes around how commerce is going to occur. Despite popular belief, we do not expect disruptors arriving in the Canadian payments space to derail the Canadian banks, nor do we expect the banks to take lightly the threat posed by these new entrants.

New entrants to the payments space have the potential to get between the banks and their customers, and this cannot be ignored by the banks, in our view.

We believe in some cases the new entrants can be partners to the banks, in terms of helping create digital/mobile solutions, and in any event are a “necessary evil” for the banks because their clients will want it (e.g., Apple Pay).

Ultimately, all of the banks want to stay atop their clients’ mobile wallets and not only maintain their piece of the financial pie, but also find ways to deliver a value proposition to their customers beyond just the simple processing of their transactions.

The question remains whether all the banks can remain in the payments business longer term or whether there will be a survival of the fittest. For the time being, the Canadian banks occupy the “high ground” and we do not expect them to cede “grounds” in payments uncontested.
Appendix A: BMO Think Series on Digital Payments

In April 2015, we hosted a very well-attended BMO Think Series lunch with Linda Mantia, the head of Digital, Payments and Cards for RY. Payments is an area of interest across a number of sectors beyond banks, and this was reflected in the clients attending.

Linda emphasized that “winning” in payments will come down to shaping the client experience and enhancing the value proposition for the customer, not mastering the method of payment. For banks, the key focus is to retain the primary point of interaction with their customers.

We walked away from this session with some insights:

• Consumers have demonstrated a desire to have Apple Pay as an option. Even if it comes with a cost to the issuer, banks will offer it to their customers; few other brands wield similar recognition with customers.

• Leveraging data for advertising will be an important profit pool - the key will be to balance the trade-off between being helpful and invasive from the end-user perspective.

• Payments nirvana is an in-app experience in the physical world - security is critical, but other important principles of success will include ease of use and versatility across all payment instruments and mobile devices.

Below are also select excerpts from Linda’s discussion:

• “With digital disruption, we’re all trying to figure out what are suitable competitive advantages that we should double-down on.”

• “Whoever has the best value proposition to offer their clients, in a secure way, will win.”

• “Apple, an amazing partner for all of the banks, in terms of helping create digital solutions, now has launched Apple Pay and if you read what’s in the U.S., they’ve taken 15 bps which about equals what the industry gave up in the recent change in interchange fees.”

• “If you look at the old world of physical coupons, they haven’t really figured out their digital life; so I would define the profit pools much more material than what you described because of the reinvention of the end-to-end shopping process.”

• “If you just look at the other industries and what’s happened on their quest to drive the slickest, quickest client experience at the lowest possible cost, there will be disruption and to succeed incumbents may very well have to evolve or risk getting marginalized.”
Appendix B: A Brief History of Apple Pay

Apple Pay was first announced in the U.S. in September 2014 and officially launched in October. While mobile payments had been an area of growing interest in the U.S. for several years, prior wallets such as Google Wallet had floundered. Only Starbucks was successful in building an in-store mobile payments application, but it was limited only to Starbucks locations. The launch of Apple Pay, which would tap the existing iTunes customer base of accounts on file, reenergized the mobile wallet space in the U.S., and was seen as the catalyst that would finally push mobile payments into the mainstream.

Light on Features, Heavy on Privacy and Security

Until this point, the thinking had been that a mobile wallet would need to offer consumers additional incentive features beyond just payment capability if it was to gain traction. Otherwise, why would a consumer take the time to set it up when a card swipe was just as fast and always reliable? Apple took a different approach, focusing instead on security and privacy features, and keeping the consumer experience as clean and simple as possible.

Apple Pay’s main features included

1) NFC technology
2) Tokenization of payment card data
3) Thumbprint authorization
4) Using iTunes cards on file rather than having to load new cards
5) Apple’s vow not to collect any consumer transaction data

Apple Pay was shocking in its simplicity. Not only was it NFC-based, which had come to be viewed as a failed technology given the inability of Google and other NFC-based wallets to gain traction, but it also had no unique consumer features. It simply stored payment cards and could be used at NFC-accepting POS terminals. Still, despite the low penetration of NFC-enabled terminals (estimated to be available at only a couple hundred thousand merchants at that time) and the fact it was only available on the iPhone 6, Apple Pay was hailed as the best wallet on the market and the only one with a real chance of broad adoption.

However, the decision to go with NFC is generally viewed as a savvy move, given it coincides with the conversion to the EMV standard: an event that is forcing merchants to upgrade to EMV terminals that likely also have NFC capabilities built in (for example, all of VeriFone’s EMV terminals are NFC ready).

Joining, Rather Than Disrupting, the Eco-system

Another key differentiator of Apple Pay was that it did not seek to disintermediate the legacy payment system intermediaries the way other mobile payment wallets before it had (i.e., Google Wallet, Starbucks, PayPal, and Softcard). Rather, Apple Pay sought to partner with banks and networks to build a platform that did not disrupt the current system. The only catch was that banks would have to pay Apple a fee (which is estimated to be 15 bps per transaction).
This fee structure was very surprising, as many could not understand why banks would be willing to share interchange revenue with Apple Pay. There are many theories to explain this, usually consisting of some combination of the following:

1) Banks see the fee as worth the outsourced fraud risk from Apple Pay’s tokenized format.
2) Banks fear missing out on what could be a widely used payment format.
3) Banks get a branding opportunity to market Apple Pay to customers.
4) Banks may have opportunities to advertise or offer other features to consumers through Apple Pay.
5) Once one bank agreed to pay, they all had to.

Across the main players in payments, Apple Pay’s impact can be summarized as follows:

- Payment Networks: Apple Pay is largely viewed as a net positive for the networks (MasterCard and Visa), as it keeps payments on the network and introduces the potential to monetize payment tokenization.

- Merchants: Apple Pay did not change economics for merchants, which still pay the same merchant discount fee. However, as Apple Pay now receives a fee on the transaction, there is a view that merchants are unhappy about effectively paying a major retail competitor a portion of the merchant discount.

Apple Pay also provides merchants with a more secure transaction method, as tokenization prevents payment card data from entering the merchant technology environment. While this is an added security measure, there is some debate whether this impacts a merchant’s ability to use customer purchase data for internal customer management purposes (loyalty, advertising, analytics).

- Bank Issuers. Apple Pay reduces interchange economics, but also reduces merchant fraud risk through tokenization. Apple Pay potentially favours those banks able to establish “top of wallet” position. There are potentially lingering issues with regard to whether Apple Pay is compliant with Durbin payment routing restrictions.

- Processor and Acquirers. The impact of Apple Pay is viewed as relatively neutral, as they generate the same fees for processing payments at the POS.

- POS providers. Terminal providers are viewed as beneficiaries of Apple Pay to the extent merchants decide to upgrade to NFC-capable devices.

Controversy

Apply Pay has not been without its share of controversy. Days after it was launched, several large national merchants which are part of the Merchant Customer Exchange (MCX) announced they would be disabling the NFC functionality at their stores (this included CVS and Rite Aid pharmacies). More recently Apple Pay has come under scrutiny for increased fraud. This has stemmed not from the transaction itself, but from claims that stolen cards are able to be loaded into Apple Pay relatively easily, as some banks do not enforce strict verification procedures.
Other complaints against Apple Pay include lack of acceptance locations, failure to work, too time consuming.

**Use**

There is not a lot of good data on use out there. The Federal Reserve released a survey in March 2015 that contained data on mobile payments use. Of mobile phone users, 13% said they had used their phone to pay for a product in a store in 2014. Of those who have made mobile payments, 11% said they had used Starbucks, 9% Google Wallet, and 5% Apple Pay.

In its introductory year, the adoption of Apple Pay has been somewhat lackluster. Between March and June 2015, according to a survey by Payments.com, growth in eligible customers who had tried the service had declined to 13% from 15% and committed users were down to 33% from 48%. Negative trends were also seen in customer attitudes towards the general functioning and security of the service.

Despite these trends, Apple is continuing to expand its services and signing deals with new partners, including Starbucks in October 2015.

**Other Markets**

An international roll-out is ongoing. Support for U.K.-issued payment cards is already in place. Apple is expected to expand to Canada later this year and is already in negotiations with local banks. Apple is reported to be in talks with Alibaba to bring its mobile payments system to China.
Appendix C: Glossary

Transmission Mechanisms:

**NFC (Near field communication)/RFID (Radio-frequency identification)** – Allows for payment information to be passed from a smartphone to a POS terminal, with a card this process uses RFID. NFC is technically a subset of RFID technology.

**Chip & PIN** – The typical payment routine in Canada whereby the customer inserts their credit card into the POS terminal and types a pin. NFC, QR Codes, or contactless card payments replace this process.

**NFC Enabled POS** – A POS terminal which has been upgraded to accept NFC payments from an NFC enabled device (I.E. NFC enabled smartphones or contactless physical credit cards)

**QR (Quick Response) Code** – An alternative method to NFC for payment information to be passed from a smartphone to a POS terminal.

**Swipe Payment** – A slightly dated payment routine in Canada (still widely used in the U.S.) whereby the customer swipes their credit card through the POS terminal, chip & PIN, NFC payments or QR Code payments replace this process.

Secure Storage

**SIM Card** – A SIM card is used by a telecommunications company to give a customer access to their networks. The SIM card is inserted into the side of a phone.

**Secure Element** – For the purposes of this research we can understand the secure element as a virtual lockbox for credit card information. NFC payments require a “secure” storage area. The secure element can either be on the physical phone (Samsung Pay and Apple Pay), in the cloud (HCE), or on a carrier specific SIM card.

**SIM Card with a secure element** – A SIM card which securely stores credit card data in a secure element. MNOs have tried to store credit card data in the secure element on their SIM card in order to charge issuers a “rental” fee.

**HCE (Host-Card Emulation)** – For the purposes of this research we can understand HCE as the process of “putting a secure element into the cloud,” or more simply, storing credit card information in the cloud. HCE is RBC’s solution to securely storing credit card information without having to “rent” space on the phone from Apple or on the SIM card from telecommunications companies.
Payment Solutions

**Acquirers**: Acquirers offer merchant accounts and other merchant services in addition to payment processing.

**Third Party Processors**: An additional party which conducts the payment processing rather than the acquirers themselves.

**Merchant Services**: Includes a wide range of services including merchant accounts, payment processing, payment gateways, POS terminals, etc.

**Merchant Account**: The account where funds are deposited from a customer’s card purchase before being transferred to the businesses bank account.

**Payment Gateway**: Essentially an online POS terminal

**Braintree** – A payment gateway recently acquired by PayPal which stores credit card data and processes credit card payments for apps such as Uber.

Smartphone Operating System

**Android** – Google’s operating system, available on the majority of the world’s smartphones excluding Apple’s iPhone.

**iOS** – Apple’s smartphone operating system.

Payment/Transfer Methods

**ACH**: ACH payments/transfers are directly debited from the customer’s account and do not require the card networks such as Visa, MasterCard, or Interac. Examples of typical ACH transfers include direct payroll deposits, direct debit payments to for telecommunications bills, rent, utilities, etc.

**P2P Payments**: Peer-to-peer payments, payments between two individuals, not consumer-to-business or business-to-business.

**EMV (Europay, MasterCard, Visa) Compliance**: A compliance standard for credit cards which use chip and pin technology; implies a higher level of security than traditional swipe credit cards.
### Appendix D: Comparable Statistics

#### S&P/TSX Bank Index

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Price</th>
<th>Change</th>
<th>Cash Operating EPS</th>
<th>P/E Cash Earnings</th>
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<td>$83.00</td>
<td>-6%</td>
<td>11.3x</td>
<td>$4.80</td>
</tr>
<tr>
<td>CM</td>
<td>$100.00</td>
<td>9%</td>
<td>11.5x</td>
<td>$4.80</td>
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<td>$4.80</td>
</tr>
<tr>
<td>TD</td>
<td>$57.00</td>
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<td>10.1x</td>
<td>$4.80</td>
</tr>
<tr>
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<td>11.2x</td>
<td>$4.80</td>
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<td></td>
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<td>$850.00</td>
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<tr>
<td></td>
<td>$16.3x</td>
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<td>$7,816.7</td>
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<td></td>
<td>$11,900.7</td>
<td>3.1%</td>
<td>$11,820.7</td>
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</tr>
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</table>

**Dividend yield:**
- **RY:** 4.15% or 138% of the long bond rate target
- **CM:** 1.7x or 128% of the long bond rate target
- **BNS:** 1.4x or 108% of the long bond rate target
- **TD:** 1.2x or 98% of the long bond rate target
- **NA:** 1.2x or 98% of the long bond rate target
- **LB:** 1.0x or 88% of the long bond rate target
- **CWB:** 0.9x or 80% of the long bond rate target

#### One-Year Price Targets Assume:

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<tr>
<th>1YR Dividend</th>
<th>1YR Price Target</th>
<th>Price Change</th>
<th>Earnings</th>
<th>Price/Nonacc.</th>
<th>Market Cap</th>
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<td>CWB</td>
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<td>18%</td>
<td>11.1x</td>
<td>$4.80</td>
<td>$1,213.2</td>
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#### COMPARATIVE VALUATION

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<td>9.5x</td>
<td>12.3x</td>
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<td>12.5x</td>
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<tr>
<td>10.2x</td>
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<td>12.0x</td>
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#### CAPITAL ADJUSTED 2016E FORWARD PIE

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<tr>
<th>Current</th>
<th>Relative to min</th>
<th>Operating EPS</th>
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<td>RY</td>
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<tr>
<td>CM</td>
<td>10.8%</td>
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</tr>
<tr>
<td>BNS</td>
<td>10.4%</td>
<td>9.0x</td>
</tr>
<tr>
<td>TD</td>
<td>10.1%</td>
<td>11.3x</td>
</tr>
<tr>
<td>NA</td>
<td>9.5%</td>
<td>9.2x</td>
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</tbody>
</table>

**Note:** U.S., U.K. and Australian banks are Bloomberg consensus estimates.

Source: Company Reports, Bloomberg, Fame, BMO CM estimates

**BMO Nesbitt Burns Inc. and BMO Nesbitt Burns Ltee are subsidiaries of BMO Nesbitt Burns Corporation Limited. Bank of Montreal, through a subsidiary, owns all of the voting and participating securities of BMO Nesbitt Burns Corporation Limited. Accordingly, Bank of Montreal is a related and connected issuer of BMO Nesbitt Burns Inc. and BMO Nesbitt Burns Ltee.**

---

**Relative to min CET1:**
- **RY:** 10.1%
- **CM:** 10.8%
- **BNS:** 10.4%
- **TD:** 10.1%
- **NA:** 9.5%

**Capital Adjusted 2016E Forward Pie:**
- **RY:** 10.1% (10.7x)
- **CM:** 10.8% (10.3x)
- **BNS:** 10.4% (9.0x)
- **TD:** 10.1% (11.3x)
- **NA:** 9.5% (9.2x)

**Price/Nonacc. Estimations:**
- **RY:** 10.7x
- **CM:** 10.3x
- **BNS:** 10.0x
- **TD:** 9.8x
- **NA:** 9.5x

---

**Note:** Includes 2 largest investment banks and excludes processing banks.
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Distribution of Ratings (September 30, 2015)

<table>
<thead>
<tr>
<th>Rating Category</th>
<th>BMO Rating</th>
<th>BMOCM US Universe*</th>
<th>BMOCM US IB Clients**</th>
<th>BMOCM US IB Clients***</th>
<th>BMOCM Universe****</th>
<th>BMOCM IB Clients*****</th>
<th>Starmine Universe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy</td>
<td>Outperform</td>
<td>42.2%</td>
<td>18.6%</td>
<td>54.7%</td>
<td>44.3%</td>
<td>56.9%</td>
<td>56.3%</td>
</tr>
<tr>
<td>Hold</td>
<td>Market Perform</td>
<td>54.3%</td>
<td>11.3%</td>
<td>42.7%</td>
<td>51.8%</td>
<td>40.9%</td>
<td>38.7%</td>
</tr>
<tr>
<td>Sell</td>
<td>Underperform</td>
<td>3.5%</td>
<td>11.1%</td>
<td>2.7%</td>
<td>3.9%</td>
<td>2.2%</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

* Reflects rating distribution of all companies covered by BMO Capital Markets Corp. equity research analysts.
** Reflects rating distribution of all companies from which BMO Capital Markets Corp. has received compensation for Investment Banking services as percentage within ratings category.
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(S) = Speculative investment;
NR = No rating at this time; and
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