Credit Card Networks
Financial Services – Payment Services

Investment Thesis
We recommend an overweight position for the credit card networks industry. The industry is well positioned to benefit from the progressively cashless consumer and the technological advancements associated with this shift. Furthermore, the industry is highly concentrated, quite profitable, and enjoys ubiquitous brand equity. We believe the trends in technology and non-cash transactions, combined with the industry’s stable oligopolistic structure, will enable the credit card networks to capture a greater share of commercial spending. While broader economic headwinds, greater levels of disintermediation, and potentially disruptive technology could detract from industry growth, we consider it unlikely that such risks will materialize in the near future. Therefore, we believe the credit card networks industry represents an attractive investment.

Drivers of Thesis
- The credit card networks industry is a profitable oligopoly with extreme brand recognition and high barriers to entry.
- Innovation once thought to be disruptive is actually strengthening the economic moats surrounding this industry.
- The shift from cash to non-cash transactions is increasing, as cash is expected to drop from 33% to 14.5% of the value of US payments by 2018 and the number of cash retail transactions in Europe is expected to drop 11% by 2020.
- With only 9% of the $19T domestic commercial spending market penetrated, there remains plenty of growth opportunity for the networks.

Risks to Thesis
- A significant economic slowdown could cause consumer spending to decline to a point that the networks’ revenue is negatively impacted.
- PayPal increases transactions that do not involve a debit/credit card significantly beyond the current level of 50%.
- Drastic evolution in the payments medium, such as mainstream acceptance of Bitcoin, diverts consumers and businesses from card based transactions.

Market Cap (B)
- Visa (V) $170
- MasterCard (MA) $98
- American Express (AXP) $57
- Discover (DFS) $21

Key Statistics (avg.)
- Beta 0.92
- ROE 33.15%
- ROA 15.98%
- Operating Margin 54.42%
- P/E (ttm) 18.35
- P/E (forward) 15.38
- PEG Ratio (5 yr. exp.) 1.40
- Price/Sales (ttm) 6.65
- Price/Book (mrq) 6.62

12 Month Performance

Source: FactSet; “Credit Card Networks” is the total return (TR) of a hypothetical portfolio of the 4 networks, weighted relative to their proportions in the S&P 500 Index, rebalanced daily.

Industry Description
The credit card networks industry provides intermediary services that facilitate the authorization, clearing, settlement, and processing of electronic payments. Hence, credit card networks have established the nexus that enables consumers, businesses, and financial institutions to transfer electronic funds. Credit card networks collect a fee every time a transaction using one of their branded products, such as a credit or debit card, is executed.

Important disclosures appear on the last page of this report.
EXECUTIVE SUMMARY

The credit card networks industry is profitable, stable, and will continue to grow for the foreseeable future. Consumers are spending more money and are increasingly using cards, physically or electronically, to pay for such spending. Technological development, such as the digital wallet, is furthering industry growth. Also, despite the industry’s historical success, the commercial spending market is so large that it remains unsaturated. Accordingly, there remains significant growth opportunity for the networks. Ultimately, we expect the networks to leverage their unique position to take advantage of the favorable changes in consumer payment preferences and realize the growth potential that exists for their industry. Accordingly, we recommend an overweight position for this industry.

INDUSTRY DESCRIPTION

Credit card networks are part of the broader payments industry, which includes non-networks such as merchants, acquirers (also known as “merchant banks”), processors, gateways, and issuers. And in order to better understand the narrower networks industry, it is helpful to examine the broader payments ecosystem through the lens of a typical online credit card transaction:

1. After the order is placed on the merchant’s website, the transaction request is sent to the “Payment Gateway” (such as PayPal);
2. The gateway submits the request to the “Merchant Bank Account Provider/Processor” (such as FirstData);
3. The processor sends the transaction request to the “Credit Card Network” (such as Visa);
4. The network then sends the request to the “Customer’s Credit Card Issuing Bank” (this is the bank that issues the network branded credit card, such as US Bank);
5. The issuer accepts or refuses the request based on the customer’s available funds/credit;
6. The network forwards the issuer’s acceptance/refusal response to the processor;
7. The processor relays this to the gateway;
8. The gateway saves this acceptance/refusal and sends it to the merchant’s website, who ultimately delivers it to the customer, completing the approval process. This 8 step process typically takes less than 3 seconds;
9. Assuming the issuer has approved the transaction, it will send the customer’s funds to the network;
10. The network relays the funds to the “Merchant’s Bank” (also known as an “acquirer”). After 2-4 business days, the bank will deposit the funds in the merchant’s bank account - this last part is known as the settlement process.

To clarify, the above transaction is a malleable example. In other words, there are transactions where no gateway is involved (i.e., a consumer uses the card option instead of the PayPal option), or instead of hiring a 3rd party processor the acquirer and/or issuer performs the processing in-house, etc. However, for general descriptive purposes, the above example paints a sufficient picture.

Open Loop and Closed Loop Networks

There are four major credit card networks: Visa, MasterCard, American Express, and Discover. There are two other international players: JCB (Japan) and Union Pay (China). Union Pay is the sole network in China and dominates that market domestically. And while Chinese regulators have announced plans to potentially allow the four US networks to operate in China, it is unlikely they will compete directly with Union Pay any time soon. Similarly, JCB, as a network, is concentrated in Japan. Additionally, both Union Pay and JCB operate on Discover’s network for US based transactions. It’s also worth noting that Canada has a nonprofit network for debit cards, Interac. As a nonprofit, solely Canadian, debit card network, Interac is not in the same league as the four major networks.

In short, there are six comprehensive networks in the entire world, and a seventh that is a nonprofit debit card network. Consequently, outside of China, Japan, and...
Canada’s debit card system, the global payment rails revolve around Visa, MasterCard, American Express, and Discover.

Among the four major networks, there is a substantive distinction worth noting. Visa and MasterCard operate an “open loop” network that includes customers, gateways, processors, merchants, acquirers, and issuers.\textsuperscript{v} Whereas American Express and Discover administer a “closed loop” network, that can exclude issuers and/or acquirers, because American Express and Discover can extend credit and/or issue their payment products directly.\textsuperscript{vi}

In other words, closed loop networks often act as the issuer and/or acquirer, in addition to their network functions. Thus, American Express and Discover, generate revenues via credit extension and card issuance – which also subjects them to credit risk and regulations that come with being a financial institution. Contrastingly, open loop networks almost singularly generate revenues via transaction volume.

The primary driver of network related revenue is payments volume. This is fairly intuitive: the more payments transacted, the more transaction fees a network generates. However, the open loop networks chase volume more aggressively, while American Express, with far fewer merchants, focuses on charging merchants a higher amount and targeting higher spending consumers.\textsuperscript{viii} This is demonstrated by the much higher average spending amount per purchase for American Express members, relative to the open loop network card holders.

A secondary driver of network related revenue is the exchange of information. In other words, when the network is involved in the routing of transaction information, it will charge a processing fee. However, if the acquirer’s processor and the issuer’s processor exclude the network from this aspect, the network will lose out on exchange process (“processing fees”), and every time a card is used where the merchant and issuer are in different countries (“cross-border fees”). Collectively these three sources of income can be thought of as “network related revenue.”
the processing fee. Since closed loop networks also act as issuer and/or acquirer, it is less likely (if not impossible), for them to be excluded from the flow of information. Therefore, this is more of a potential problem for open loop networks.\textsuperscript{10}

**MARKETS AND COMPETITION**

On the most basic level, cash and check are the traditional foe of the networks. However, cash/check are becoming more obsolete in today’s technology driven economy. In fact, according to 2014 Federal Reserve study, cash/check only made up 33% of the value of payments transacted in the US.\textsuperscript{11}

![Shares of transactions by payment instrument](image)

Source: The Financial Brand; Federal Reserve

Similarly, cash payments in the retail realm are steadily declining in Europe.

![Share of cash payments in total retail transactions in Europe from 2005 to 2020](image)

Source: Statista, AT Kearney

Additionally, credit cards are now the most preferred payment method, globally, for online transactions.

![Preferred payment methods of online shoppers worldwide as of 4th quarter 2015](image)

Source: Statista

These trends are consistent with projections for consumer payment choices over the next two years. In fact, by 2018, cash/check is expected to drop to approximately to 14.5% of the value of payments made in the US.

![Consumer Payment Systems in the U.S. 2013 vs. 2018](image)

Source: Nilson Report
Hence, it is plainly clear that the viability of cash/check as a debit/credit card alternative is meager and declining.

On a more nuanced level, the digital payments space appears to operate more as a complement to the networks, rather than a disruptor. In fact, many digital wallets and/or apps actually need to access to the card networks in order to transfer funds properly. For example, several digital platforms, such as Apple Pay, Android Pay, Samsung Pay, and Stripe have recently partnered with Visa, in order to maximize the benefits of Visa’s network. The other three networks have similar deals with Apple Pay, Android Pay, and Samsung Pay as well. Such partnerships fortify the networks’ position in the payments ecosystem because non-physical use of their branded products, whether through a digital wallet or phone app, still contributes to transaction volume.

However, it should be noted that certain digital platforms, such as the gateway PayPal, do bypass the networks for certain transactions. The consumer has the choice, when using PayPal, to transfer the funds via credit/debit card or bank account. Therefore, if the consumer has PayPal transfer the funds directly from the consumer’s bank account, a card network is not present in the transaction. The ability for such network-less transfer techniques is known as disintermediation. Nevertheless, this does not appear to pose a serious threat to the card networks as approximately 50% of PayPal’s payments still involve a debit or credit card.

The brand recognition and high concentration of the card networks have also helped them leverage technological innovation into an asset, and not a liability. This stems, at least in part, from the fact that there are only four truly global networks that have entrenched themselves in mainstream commerce over the past 60+ years. Moreover, while having only four players signals a high level of concentration, the industry is actually even further concentrated within the four player spectrum. Per our “network related revenue” measure estimated above, Discover is not in the same league as the other three; lagging behind third place MasterCard by about $10 billion. Per another metric, Visa and MasterCard made up 84% of the card based transactions in 2014.

American Express likely ranks low in this metric since it intentionally sacrifices number of transactions for higher fees and larger purchase amounts per transaction. Regardless, through the lenses of both revenue and volume, the card networks industry is extremely concentrated, with three dominant players (at most).

Such high concentration indicates that the networks are less likely to intensely compete against each other. Furthermore, card networks enter into contracts with third-party issuers that tend to range from 10-20 years – making it very costly for issuers to switch networks.

While the networks compete with each other for such contracts, there is a lack of fierce price competition because none of the networks wants to risk reducing their healthy profit margins. In other words, trying to alter the stable, and profitable, equilibrium would likely cause more harm than good for the network making such an attempt.

Additionally, a potential new network would have extremely high entry costs. Some examples: creating the network infrastructure, convincing other issuers to break long-term contracts with the current networks, advertising persuasive enough to get consumers to switch from the only networks they’ve ever known, etc.
Quite simply, the credit card networks industry is a profitable oligopoly. The unique nature of the network payment rails, lack of alternatives to cards (physical or digital), brand recognition, and long-term relationships with issuers make it extremely expensive and time consuming for an outsider to replicate and/or disrupt the networks industry. Similarly, the high concentration and comfortable profitability, make it unattractive to intensify price competition within the networks industry.

**Profitability Metrics**

<table>
<thead>
<tr>
<th></th>
<th>Visa</th>
<th>MC</th>
<th>AmEx</th>
<th>Discover</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA (5 yr. avg.)</td>
<td>12%</td>
<td>23.05%</td>
<td>3.27%</td>
<td>3.05%</td>
</tr>
<tr>
<td>ROE (5 yr. avg.)</td>
<td>16.50%</td>
<td>46.19%</td>
<td>26.54%</td>
<td>24.19%</td>
</tr>
<tr>
<td>OM (5 yr. avg.)</td>
<td>62.08%</td>
<td>53.62%</td>
<td>21.96%</td>
<td>40.25%</td>
</tr>
</tbody>
</table>

*Source: FactSet*

Note the differences in ROA between the open loop networks and the closed loop networks. The reason for such a wide-gap is fairly straightforward: recall that the closed loop networks also operate as financial institutions; consequently, they are for more levered than the open loop networks. Thus, leverage drives the closed loops ROE, but when that heavy dose of debt is adjusted for in ROA, they appear significantly less profitable.

### TRENDS AND DEVELOPMENTS

#### Fraud Prevention

As long as there have been card payments, there has been a risk of fraud. However, two recent technological advancements aim to reduce this risk: EMV and tokenization.

EMV, which stands for Europay, MasterCard and Visa, is a global standard that adds an element to networks’ branded physical cards. More specifically, EMV equipped cards have a computer chip that acts as an alternative to the traditional magnetic stripe. Accordingly, EMV cards are either read or inserted, or “dipped”, into a terminal slot instead of swiped. The biggest benefit of this new technology is that the card chip, unlike the magnetic-stripe, creates a one-time transaction code that cannot be used again, eliminating the risk of duplication – a common form of hacking.

Tokenization occurs when standard card details are swapped for a substitute number – the “token.” While EMV is a physical card development, tokenization aims to deter fraud in the increasing digital payments space. There is issuer tokenization and acquirer tokenization. Issuer tokenization involves the card networks’ tokenizing the consumer’s card information used in a digital wallet, such as Apple Pay. Acquirer tokenization is handled between acquirers and merchants, and involves tokenizing the data that merchants keep from various transactions.

#### Blockchain

Blockchain is a technology that underlies Bitcoin, an alternative form of digital payment. Blockchain creates a network for Bitcoin based transfers and keeps a ledger of all the transactions that occur on the network. Consequently, and quite relevantly for card networks, Blockchain has the potential to create a new set of payment rails that completely exclude the card networks. Despite this potential, Blockchain has not had a material impact on the card network system, however its capabilities are certainly something that should be kept in mind.

Perhaps most fascinating, from a card network perspective, is the networks’ ability or inclination to respond to Blockchain if it becomes more mainstream. On the one hand, networks may attempt or develop the capacity to incorporate Blockchain into their existing rails, as they did with digital wallets. On the other, Blockchain may be so distinct that it presents the most formidable foe to the network in decades.

#### Costco

Last February, American Express and Costco announced that they would end their 15-year relationship in March 2016. This will likely cost American Express $80-90 billion in revenue. Although, given American Express’ dual role as issuer and network, it’s unclear how much of that loss will be in the form of network related revenues. Additionally, American Express stands to lose about 10% of its cards in circulation.

Subsequently, Costco announced it had entered into agreements with Citi, as the issuer, and Visa, as the network, to replace American Express. Assuming a decent amount of that $80-90 billion American Express lost was network related revenue, and thus directly transfers to Visa, this switch by Costco is a fairly significant development in the networks industry.
China

In 2015, Chinese authorities, for the first time, announced plans to potentially license foreign networks for domestic operation. Currently, Union Pay dominates the Chinese networks and foreign networks are only able to make money via co-branded cards making purchases outside of China. However, if these plans go through, US networks could potentially operate payment rails in China and compete directly with Union Pay for a share of the $6 trillion in Chinese purchase volume.

Unfortunately, details surrounding the licensing requirements and economics of the domestic card market have been sparse, reducing the likelihood that Chinese expansion, and the associated financial implications, occur in the near future. Nonetheless, this announcement was still a key development of the past year and could pave the way for significant opportunities for the card networks down the road.

Recent earnings

American Express’s most recent quarterly earnings (Q4 2015) of $1.23 per share gave mixed results. On the one hand, American Express beat estimates by 11 cents. On the other hand, this represented about a 12% drop YOY from $1.39 to $1.23. Accordingly, there is some concern about American Express’ ability to bounce back from the Costco loss mentioned above, and its overall trajectory going forward.

Discover’s most recent quarterly earnings (Q4 2015) were also a mixed bag. Discover missed estimates by 16 cents ($1.14 to $1.30), but its EPS was up 31% YOY from $0.87 to $1.14. This indicates that Discover is growing, but not at the rate the market expects. As Discover is a financial institution, its future hinges more on credit and rate dynamics, than it does payments volume. In other words, closed loop networks, are more sensitive to broader economic variables and lending trends, than open loops, and the muddled earnings results of Discover and American Express illustrate this.

MasterCard’s most recent quarterly earnings (Q4 2015) were quite positive. MasterCard beat estimates by 13 cents ($0.82 to $0.69), and its EPS was up almost 19% YOY from $0.69 to $0.82. This suggests that MasterCard is outgrowing market expectations.

Visa’s most recent quarterly earnings (Q1 2016) were fairly positive. Visa beat estimates by 1 cent ($0.69 to $0.68), and its EPS was up nearly 10% YOY from $0.63 to $0.69. Thus, similar to MasterCard, Visa is surpassing market expectations, albeit at a slightly lower rate.

Based on the most recent earnings and YOY growth of the card networks, it would seem that Visa and MasterCard are in better shape than American Express and Discover. Hence, the simplified business model of the open loops appears to contribute to better growth trajectory relative to the more bank-like model of the closed loops.

ECONOMIC OUTLOOK

A major economic driver of transaction volume, and in turn card network profitability, is consumer spending. On the one hand, annual US consumer spending has grown at a CAGR of approx. 2.5% over the last 3 years, reaching an all-time high in Q4 2015.

On the other hand, average daily US consumer spending dropped to its lowest level in a year in January.
It would seem that the decline in oil would spur an increase in spending but it appears that the extra income from lower gas prices is being saved instead.\textsuperscript{xxxix}

Additionally, stock markets have gotten off to a turbulent start in 2016, dampening expectations for economic growth this year.\textsuperscript{xli} Accordingly, the Index of Consumer Sentiment was at 92 in January 2016, down 6.2% year-over-year.

\begin{figure}[h!]
\centering
\includegraphics[width=\textwidth]{consumer_sentiment.png}
\caption{Index of Consumer Sentiment}
\end{figure}

Source: University of Michigan Surveys of Consumers

Indeed, the direction of economic growth and consumer spending for 2016 is foggy. More than likely, whether the economy grows or contracts, such movement will be slight. Therefore, assuming growth and spending stay close to flat, relative to 2015, it is unlikely that card transaction volume will be significantly impacted, one way or the other, in 2016. In other words, slight growth or slight contraction, would have only slight impact on networks’ volume growth. And given that we expect GDP to plug along at 2.27%, the networks’ performance in 2016 will likely be independent of broader macro-economic variables

While consumer spending may not trigger a big increase (or decrease) in card transactions, the secular nature of the shift from cash to plastic and digital payments will likely boost transaction volume. In other words, since consumers’ choice of payment method is independent of macroeconomic variables the preference for non-cash purchases will likely generate revenue growth for the card networks. Also, despite the headwinds facing global markets, it is plausible that international economic conditions and consumer spending improve relative to the US.\textsuperscript{xlii} For example, since MasterCard and Visa have significant non-US transaction volumes, 63% and 52% of network related revenues respectively, such a scenario would increase transaction fees as well as cross-border fees.\textsuperscript{xlii}

Moreover, underpenetrated markets where the local merchants differ from the traveler’s card issuer represent a source of great potential for cross-border fee growth in the near term.\textsuperscript{xliii} For instance, increasing tourism to India, which has grown at a 5.85% CAGR the past 5 years, should contribute to networks’ cross-border fees for the foreseeable future.

\begin{figure}[h!]
\centering
\includegraphics[width=\textwidth]{tourism_india.png}
\caption{Number of foreign tourist arrivals in India from 2000 to 2014 (in millions)}
\end{figure}

Source: Statista; India Ministry of Tourism

In sum, while the US economy is unlikely to directly impact transaction volume, payment preference trends and potential for more international activity should help the networks achieve revenue growth in 2016.

\section*{CATALYSTS FOR GROWTH}

Given the sources of network related revenue, the catalysts for industry growth are pretty straight forward:

\begin{itemize}
  \item Higher consumer spending
  \item Continued shift from cash to card based transactions
  \item Increased tourist spending abroad
  \item Economic growth in foreign economies
  \item Continued leverage of existing and new digital platforms
\end{itemize}
VALUATION

We believe that the credit card networks industry is a stable and profitable oligopoly with strong economic moats surrounding its payment rails. The unique nature of the networks’ capabilities and role in the non-cash transaction process, unparalleled brand recognition, long-term contracts with issuers, and growing consumer preference for non-cash payment methods thicken these moats. Moreover, it appears that technological innovation will act complementary to the networks, further fueling the transaction volume that drives industry growth. In the near-term, there is still untapped potential domestically, as networks have only penetrated 9% of the $19 trillion in annual US commercial spending, and internationally as growth rates outside the US are expected to improve. In the medium to long-term, possible access to the Chinese market and how the networks respond to Blockchain are big-picture items to keep in mind.

The open loop networks, with their simpler business model and higher profitability, are better positioned than the closed loop networks to capture the expected growth outlined above. Visa in particular, as the largest and most profitable network in the world, is especially appealing.

INVESTMENT POSITIVES

- The industry maintains its profitable and oligopolistic structure without engaging in destructive price competition.
- The volume of non-cash transactions surges beyond current projections.
- Networks continue to leverage new payments technology in their favor.
- Disintermediation threats from PayPal are mitigated effectively.
- Macroeconomic growth, domestically and internationally, far exceeds expectations and, in turn, triggers massive levels of consumer and tourist spending ultimately causing a windfall in transaction fees for the networks.
- Access to China crystallizes from a possibility to a reality.

INVESTMENT NEGATIVES

- The oligopoly de-stabilizes and profitability declines as a result.
- Cash remains prevalent in consumers’ purchase habits.
- PayPal begins to syphon more payments from card-linked transfers to pure bank account ones, lessening the networks’ presence in the payments ecosystem.
- The global business cycle slides into severe recession, tightening consumer spending and leisure travel.

KEYS TO MONITOR

- Whether disintermediation, such as PayPal transfers directly from a bank account instead of a linked card, rises to a material level.
- Accessibility to China and the creation of payment rails therein.
- How Blockchain evolves and the level of mainstream consciousness it achieves.
- Consumer spending, here and abroad.
- Consumer payment preference trends, here and abroad.
- Economic growth rates, here and abroad.

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