RESEARCH REPORT

September 16, 2019

Visa vs. Mastercard vs. AMEX:
Payments Space Revisited

Visa Inc. was first pitched by the QUIC team in November of 2015 and has been one of FIG's top performers ever since. Now, nearly four years later, given the company's strong performance and high multiples, the team felt it was necessary to re-evaluate if Visa still has room to outperform.

Through this report, we have furthered our understanding of the payment processing space. Going forward, the FIG team continues to believe that Visa is the same high-quality business it once was, and we have more conviction in it than Mastercard and American Express.

This report will dive further into:

– The payments industry and key players within the space

– Revisiting the original Visa theses and an overview of Mastercard and American Express

– Comparing the three companies side by side and exploring which we like the most

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Industry Overview

Electronic Payments Overview

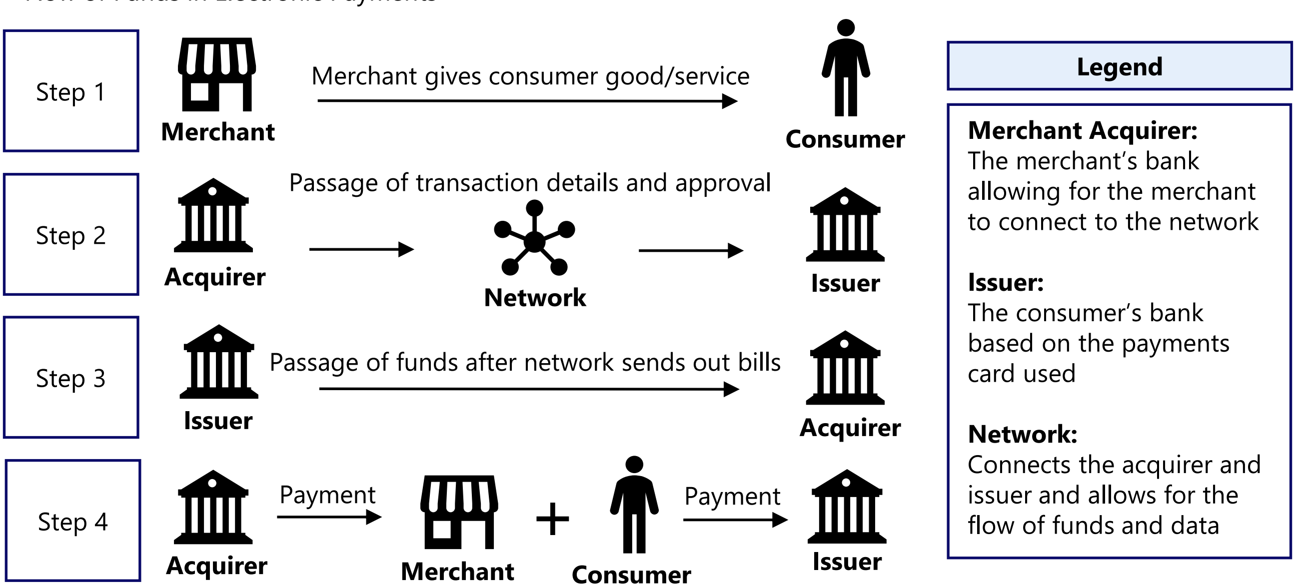
The electronic payments industry involves several players to connect the merchant and consumer. The first player is the merchant acquirer, who acts as the merchant's bank and connects it to the network — examples include Worldpay and Chase Merchant Services. The second player is the issuer, which is the consumer's bank for the credit or debit card — examples include TD and RBC. The last player is the network itself, which allows for the flow of information and funds between the acquirer and issuer — examples include Visa and Mastercard. The transaction process consists of authorization, clearing and settling.

When a consumer purchases goods or services from a merchant, the first step of authorization is initiated, which happens within seconds. A digital message containing the details of the transaction is sent to the acquirer, who then sends it to the network. The network will run it through fraud prevention tools then send the request to the issuer. The issuer will check the customer's account balance and possibly approve the transaction. If approved, the issuer places a hold on those funds and sends information back to the network, which sends an approval message to the acquirer, allowing the merchant to successfully sell the item to the customer. The second step is clearing — the acquirer will format the data and submit the transaction to the network. The network sorts all the transactions and transmits a consolidated file to each issuer, the issuer then debits the transaction amount.

The final step is settlement — the network sends net settlement statements to all acquirers and issuers. The issuer will pay the acquirer the transaction value, less an interchange fee of about 1.75%. The acquirer will have to pay the merchant, less a merchant discount of about 0.5% on the amount received. The account holder will also have to pay the issuing bank (Exhibit I). Interchange fees are collected by the issuer and merchant discount fees are collected by the acquirer. The electronic payments network charges a network fee of about 0.25%.

EXHIBIT I

Flow of Funds in Electronic Payments



Industry Overview

Competitive Landscape

The primary players controlling the digital payment networks include Visa, Mastercard and American Express (Exhibit II), with Visa controlling 53% of the market in 2018. In addition, market shares in the industry have stayed relatively consistent given the stability and strength in the businesses.

Digital Disruption and Industry Consolidation

Large payment network companies are extremely hard to disrupt. The U.S. recently introduced tap-to-pay machines and, soon after, Apple Pay and Google Pay were introduced, but both decided to partner with a network instead of competing with them since they are widely accepted and very reliable. Historically, every company has only controlled one aspect of the digital payments chain. However, cross consolidation is becoming more common. In 2019, FIS (issuer processor) acquired Worldpay (merchant acquirer) for $35B and Fiserv (issuer processor) acquired First Data (merchant acquirer) for $22B. There are several end-to-end players controlling everything from the merchant to the end consumer such as PayPal, Square, Chase and Alipay. End-to-end players would work similarly to current process, but since every step is controlled by the same company, it allows for more efficient interactions with merchants and consumers. End-to-end players can pursue unique strategies such as offering merchants fee discounts in exchange for the merchants giving better deals to the consumer.

Growth in Digital Payments

In 1990, only 15% of all transactions were credit or debit while in 2017, 72% of all transactions were credit or debit. By 2022, it is expected this number will rise to 82%. In addition, between 1990 to 2017, cash has hovered around the 20% mark of all transactions, since debit and credit cards have primarily replaced the large market share that checks held. Cash has stayed flat, as it represents transactions where merchants can't afford a point-of-sale terminal. In response, Square released a revolutionary point-of-sale reader that transforms a cellphone into a payment gateway — this was replicated by PayPal, Clover and Shopify.

There is significantly more room for growth in emerging economies, as much of the population still relies on cash. Emerging Asia's non-cash transactions rose 34% annually between 2012 to 2016 (Exhibit III). During that same time period, North America's non-cash transactions only rose 5.9% annually.

EXHIBIT II

2018 Market Share Breakdown

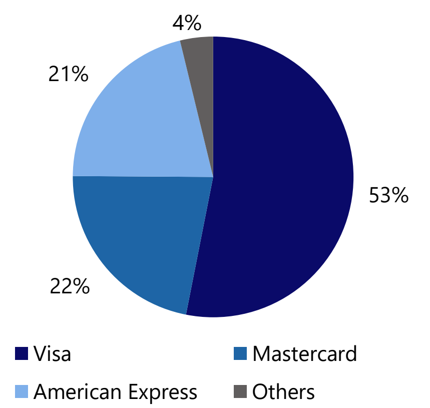
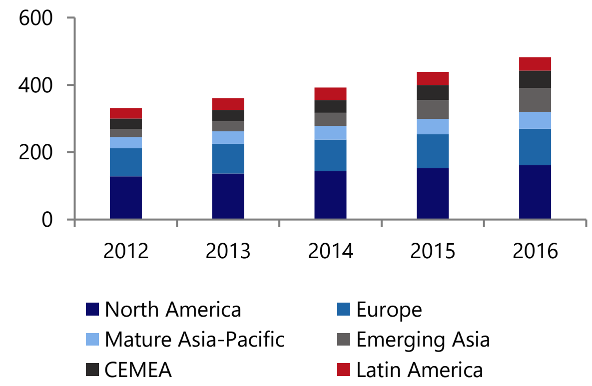


EXHIBIT III

Number of Worldwide Non-Cash Transactions



Revisiting the Visa Theses

Visa was first pitched by QUIC in 2015 in order to gain some exposure to companies in the FIG sector that are less interest rate sensitive. In short, Visa operates a network that allows for almost instantaneous transaction processing between customers, businesses and their respective banks. Visa is a network as opposed to a traditional financial institution. It does not offer credit or earn revenue from interest. Visa earns money by charging network fees to the card issuer and the merchant processor.

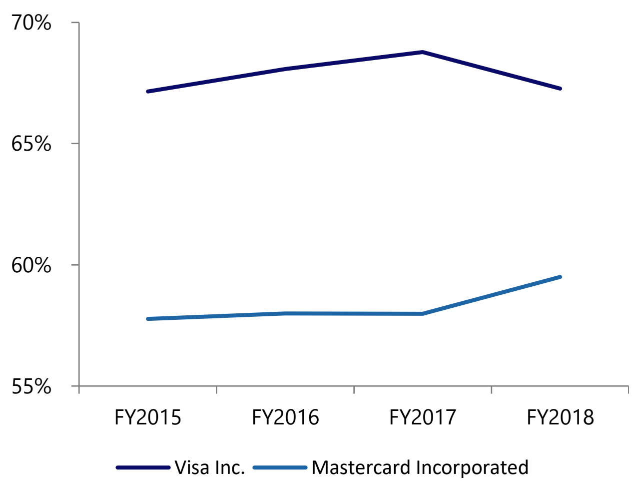
The main investment theses for Visa was their dominant market position and strong underlying growth drivers. Going deeper into their dominant market position, the argument was that Visa cards accounted for over 60% of all payment cards in 2013, additionally Visa cards accounted for almost 60% of worldwide electronic transactions. As a result of Visa's market leading scale at the time it was first pitched, it has been able to leverage economies of scale in order to expand their margins to be significantly larger than competitors.

In terms of the strong underlying growth drivers, it was more of a call on changing payment industry dynamics rather than Visa's unique growth prospects. The change in the payment industry has certainly been beneficial for Visa. The initial scale advantage relative to competitors has allowed Visa to expand its network faster than competitors.

Recently, Visa has made a series of acquisitions to make their network simpler and more secure for their users. The largest acquisition Visa has made since the first pitch was in November 2015, when Visa acquired Visa Europe. The strategy behind the deal was to create an integrated global leader in the payment industry and to capitalize on low card penetration rates in Europe. Additionally, on September 12, 2019, Visa completed the acquisition of Verifi which is a technology company that reduces the occurrences of chargebacks. Verifi works with all parties of the payment industry to develop a more secure network throughout the whole process.

EXHIBIT IV

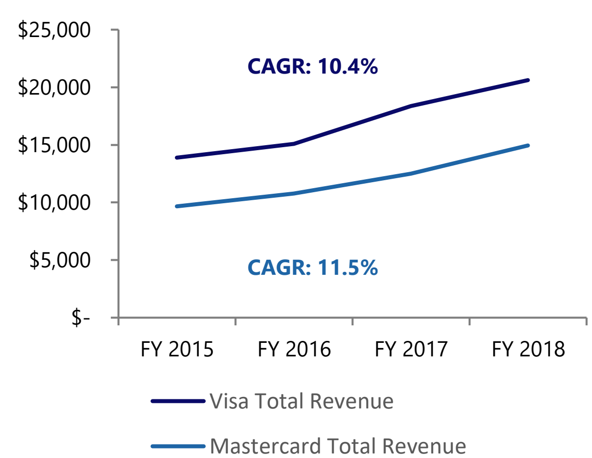
Visa and Mastercard EBITDA Margin (%)



Source(s): S&P Capital IQ

EXHIBIT V

Visa and Mastercard Revenue Growth (USD Millions)



Source(s): S&P Capital IQ

Company Overview: Mastercard

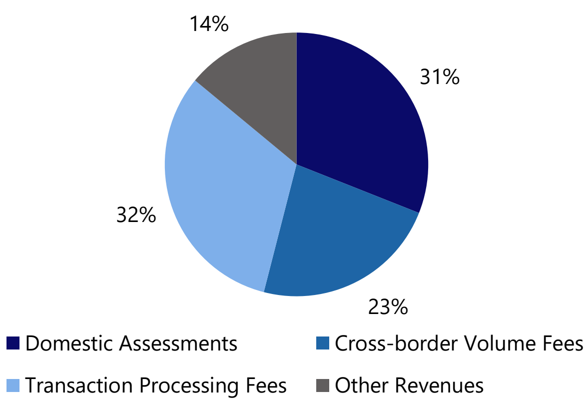
Overview

Mastercard Incorporated (NYSE: MA) is a global payment processor that connects consumers, financial institutions, merchants, governments and other organizations, to use electronic forms of payments as opposed to cash or check. The company also provides many value-added offerings such as safety and security products, information and analytics services, consulting, and loyalty and reward programs. The company grows its business through a combination of organic growth, led by changes in consumer spending, and strategic investments.

Mastercard's unique global payments network allows them to authorize, clear and settle transactions for acquirers and issuers in more than 150 currencies and 210 countries and territories. The company employs about 14,800 people, with 903 million credit cards in circulation worldwide and approximately 47 million individual merchants accepting Mastercard as payment. Mastercard's network has tremendous value, given the scale they have achieved. This allows them to create superior returns — Mastercard has achieved an annual return on invested capital above 35% for the past ten years.

EXHIBIT VI

Mastercard's Revenue Breakdown by Segment



Mastercard's revenue can be segmented into four categories (Exhibit VI). Transaction processing fees are based on the number of transactions, regardless of the dollar values. Domestic assessments and cross-border volume fees are both based on the dollar volume of activity. Other revenues consist of value-added service offerings for acquirers and issuers.

Mastercard owns three major trademarks that are essential to its business including Mastercard, Maestro and Cirrus. The company has made 6 acquisitions in 2019 to date, as it aims to become tech-enabled (Exhibit VII). In addition, management pursues acquisitions to control more of the industry's value chain, which would allow for highly integrated transactions and faster processing speeds. Controlling more of the value chain also allows for a less costly and better experience for merchants and consumers.

EXHIBIT VII

Mastercard's Strategic Acquisitions

April 16, 2019	Vyse is a technology platform that connects merchants with lenders, enabling them to offer customers diversified credit options
March 12, 2019	Ethoca is a global provider of technology solutions that connects merchants and card issuers in real-time to resolve fraud related issues
July 9, 2019	Transfast is a payments company with significant cross-border network reach, as Transfast reaches 90% of the world population
August 6, 2019	The payments platform owned by Nets was acquired for $3.19B, it includes an electronic billing platform with instant-payment services.

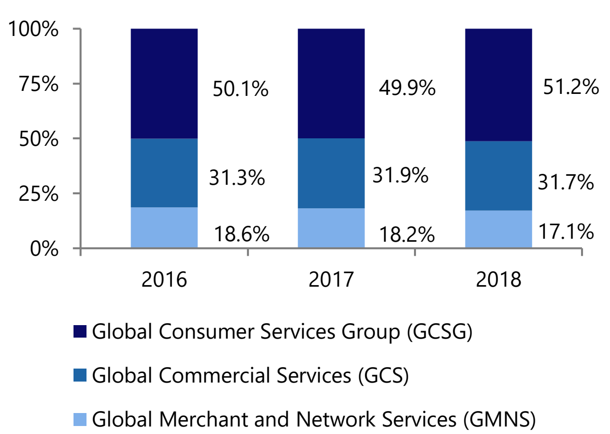
Company Overview: American Express

American Express (AMEX) was founded in 1850 and it offers credit card payment as well as travel and concierge services to its customers. AMEX has typically been a very premium credit card brand, offering credit cards positioned for wealthy individuals who could take advantage of their premium services such as airport lounges and the American Express concierge. AMEX operates in three segments: Global Consumer Services Group (GCSG), Global Commercial Services (GCS) and Global Merchant and Network Services (GMNS).

In the GCSG segment, American Express offers credit cards coupled with cash back and travel rewards to its customers in order to attract and retain high spending and credit worthy individuals. Compared to their competitors, AMEX cardholders typically have larger transaction values. The main difference between American Express, and its competitors is the way in which the company generates revenue. American Express generates revenue on annual cardholder fees, interest on outstanding balances and has the largest merchant fees in the industry. However, these revenue streams do not come without their own risks, since American Express has seen provisions for credit losses grow almost 70% from 2016. AMEX cards are very expensive to own, with some cards costing hundreds of dollars in annual fees. The reason why the American Express business model works is that although merchants do not like paying the higher fees when a customer uses an American Express card, these cardholders are often wealthier and it is likely that they will spend more per transaction than other customers. In the GCSG segment. American Express also offers credit and other business services to companies of all sizes, worldwide. The network services revenue stream is lower compared to other credit card companies due to the fact that their business model focuses on growing extremely profitable relationships from fewer individuals in a concentrated area. However, management outlined growing their network as something that they would like to improve along with expanding its leadership in the premium card space and growing commercial payments and digital offerings.

EXHIBIT VIII

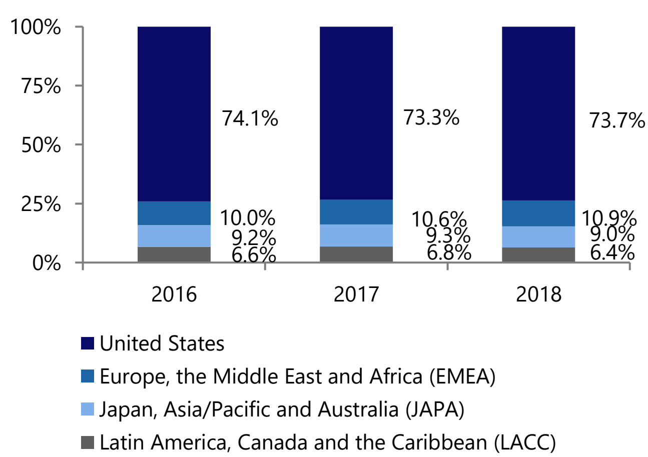
American Express Revenue by Segment



Source(s): S&P Capital IQ

EXHIBIT IX

American Express Revenue by Geography



Source(s): S&P Capital IQ

Explaining Differences in Valuation

Mastercard has always traded at relatively higher valuations than Visa and American Express. Looking at Exhibit XI, it is quite rare for Mastercard to have worse performance than either American Express or Visa. This is due to the market pricing in growth of Mastercard in emerging markets as well as their strategic acquisitions in the space. Visa has recently pursued active M&A in order to develop new technologies to improve the payment process. AMEX typically trades at a lower premium compared to Mastercard and Visa due to the fact that their network is not as large and their business model is slightly riskier. However, AMEX has since added 1 million merchants in the US in 2018.

EXHIBIT X

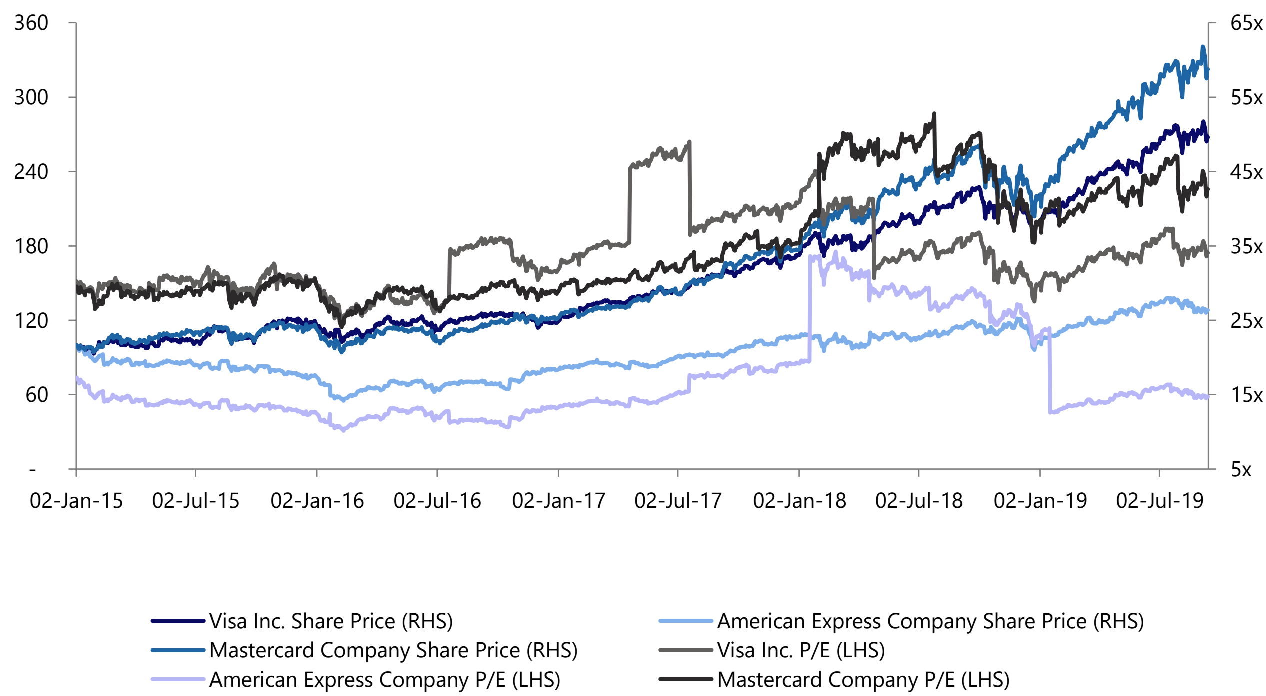
Comparable Company Valuations

	Market	P / B		P / E		ROE	
Company Name	Cap ($MM)	Current	5-yr	2018	2019E	2017	2018
V	$386,720	13.1x	13.7x	37.3x	31.7x	20.4%	30.9%
MA	$280,424	56.1x	53.5x	42.8x	36.3x	69.6%	106.0%
AXP	$98,748	4.3x	4.6x	16.1x	14.7x	14.2%	34.1%

Source(s): S&P Capital IQ

EXHIBIT XI

Relative Performance of Visa Inc., American Express Company and Mastercard Incorporated



Source(s): S&P Capital IQ

Comparing Visa, Mastercard, and American Express

EXHIBIT XII

Comparing Strategic Qualities of Visa, Mastercard, and American Express

	Visa	Mastercard	American Express
How is Revenue Earned?	1) Card issuer fees 2) Merchant fees	1) Card issuer fees 2) Merchant fees	1) Annual cardholder fees 2) Interest on outstanding balances 3) Merchant fees
Primary Users of Products/Services	1) Merchants: fraud protection, customer loyalty 2) Cardholders: through banks and financial institutions	1) Merchants: security services, customer loyalty 2) Cardholders: through banks and financial institutions	1) Cardholders: premium brands/experiences 2) Merchants: e-commerce companies, premium retailers and brands
Average Transaction Value (2016)	US$80	US$80	US$141
Revenue by Geography (2018)	US: 45% International: 55%	North America: 36% International: 64%	US: 74% International: 26%
Growth Strategy per Management (FY 2018)	1) Investment in Europe 2) Investment in tech 3) Expanding into B2B	1) Investment in Europe 2) Investment in tech 3) Growing into B2B	1) Expanding in premium consumer space 2) Strengthening network and position in commercial payments

Comparing Key Financial Metrics of Visa, Mastercard, and American Express

	Visa	Mastercard	American Express
ROA	**2016:** 12% **2017:** 12% **2018:** 12%	**2016:** 21% **2017:** 21% **2018:** 23%	**2016:** 3% **2017:** 2% **2018:** 4%
Net Income Margin	**2016:** 40% **2017:** 37% **2018:** 50%	**2016:** 38% **2017:** 31% **2018:** 39%	**2016:** 16% **2017:** 8% **2018:** 19%
U.S. Market Share (Network Purchase Volume)	**2016:** 51% **2017:** 53% **2018:** 53%	**2016:** 23% **2017:** 22% **2018:** 22%	**2016:** 23% **2017:** 21% **2018:** 21%
5-Year Beta	0.98	1.07	1.06

Source(s): Company Filings, Nilson Report, Capital IQ

Comparing Visa, Mastercard, and American Express (Cont'd)

Strengths and Weaknesses

1) Market Share and Growth Opportunities

Visa and Mastercard both have very similar growth strategies with a focus on Europe and B2B customers. In contrast, American Express is focused on expanding the premium services and benefits it can offer to both its cardholders as well as its merchant partners.

When evaluating these two strategies, it is important to consider each company's resiliency through business cycles and the risk each company is taking on through its growth strategy. For example, while American Express is known as a premium credit card brand and derives significant value from its relatively high average transaction value per card, it is also exposed to the credit risk of its customers. This gives American Express high interest rate exposure compared to the other companies. Because Visa and Mastercard are not exposed to the same type of credit risk that American Express is, we believe that these two companies have more resilient strategies.

Furthermore, unlike other financial institutions where expansion in Asia is a crucial determinant of future growth, these network companies face significant risk and competition in the region due to existing competitors, the nature of mobile payments, and the presence of significant end-to-end providers. This makes the Europe strategy that much more important to the continued market share growth of Visa and Mastercard. Even though Mastercard has historically grown faster in Europe than its competitors, we believe that there is no meaningful difference between Visa and Mastercard's European strategy due to Visa's recent reacquisition of its European business.

2) Efficiency

Visa has the highest net income margin among the three companies, while Mastercard has the highest ROA. Furthermore, Visa's net income margin has improved in recent years, more so than Mastercard, representing the result of the company's measures to invest in improvements to its transaction processes to reduce costs.

ROA, compared to net income margin, looks at the balance sheet impacts of the company's acquisitions, relative to its earnings. Visa's lower ROA is due to it's higher intangible assets from it's reacquired Europe business (~US$16Bn). With this consideration in mind, Visa's integration of its Europe business with its technological advantages gives the company a significant runway for growth. Ultimately, we believe that Visa has not realized the full value of it European business yet.

3) Value of Offering

While American Express has a significantly different offering compared to Mastercard and Visa, most notably its role in the system as a card issuer as well as a network, we do not feel comfortable with the associated risk of American Express' business. Visa and Mastercard have very similar offerings and the most important points of differentiation is how these two companies will build their network through offering services to merchants. We believe that Visa's focus on improving its transaction process will have direct benefits on its relationships and its financial performance.

Do We Still Have Conviction in the Payments Space?

Do We Still Have Conviction in Visa?

Based on our research, we see little risk for immediate disruption for payment networks in North America and Europe. Visa, Mastercard, and American Express have developed fast, reliable networks, with high merchant acceptance over the past few decades. In addition, the networks take a relatively small portion of each transaction fee such that the incentive to replace them is lower compared to merchant acquirers and issuers. Most likely, the team sees tech companies leveraging existing networks and putting their consumer-facing software on top of it (i.e. Apply Pay).

Asia, Latin America, and the Middle East are where determining the outlook is less clear-cut. Many countries are in the process of developing networks to be less reliant on U.S. companies. For example, players like Alipay and UnionPay benefit from regulatory advantages in China.

Which Company Has the Better Strategy?

To determine which company has the best strategy, we must first establish which markets we believe to be most attractive. As previously mentioned, the European segment, as well as the growing B2B segment, present the best opportunities for payment networks going forward.

Based on our basic market sizing, we see that there is a large immediate opportunity in Europe and Japan. To size this opportunity, we ranked the world's 20 largest economies based on GDP and highlighted those with more than $30K GDP per capita. Finally, we listed countries with an electronic payment penetration below 20% of GDP. Based on this, we see that there is an immediate $4.81B USD opportunity within the European and Japanese market (see exhibit XIV).

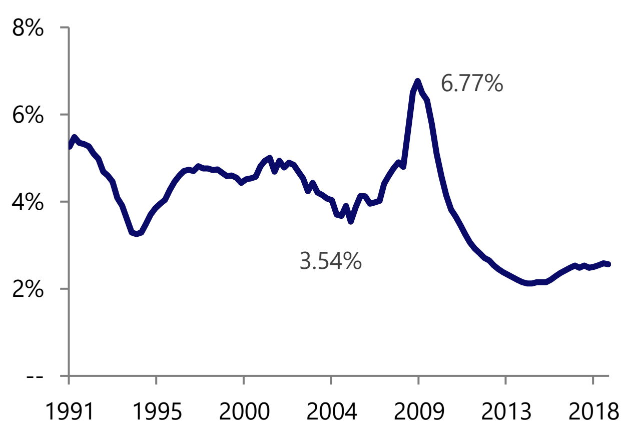
The B2B market is another highly attractive opportunity that we see given its purchase volume of $20T that is only ~10% penetrated by card. The space is currently dominated by cash, automated clearing house (ACH) and cheque. This penetration rate is considered quite low compared to the 40/50% penetration of the retail POS market. Assuming a 40% penetration rate on that $20T and 20bps earned per transaction, this represents another $16B revenue opportunity. While many roadblocks are currently preventing the B2B market from seeing the same penetration as the retail market (i.e. legacy ERP systems, disparate accounting systems), we see players who can offer a streamlined B2B solution as long-term winners in this space.

Now that we have established which markets we are most bullish on, we must determine which of the 3 company's has the strategy that is best suited.

The FIG team is least bullish on American Express due to its primarily U.S. exposure. Over 70% of its revenues in 2018 came from within the U.S. In addition, we have less conviction in the credit card lending business due to historical credit card delinquency rates. The QUIC team wants to pursue a more resilient strategy in the event of a downturn (see exhibit XIII).

EXHIBIT XIII

Historical U.S. Credit Card Delinquency Rates



Source(s): FRED Economic Data

Do We Still Have Conviction in the Payments Space? (Cont'd)

EXHIBIT XIV

Sizing the Immediate Opportunity for Visa and Mastercard

Rank	Country	2017 GDP (B USD)	Population (millions)	GDP Per Capita	V/MA Volume (B)	Cards per Capita	Payment Penetration (GDP)
1.	United States	$19,485	326	$59,771	$4,717	4	24%
2.	China	$12,062	1,386	$8,703	$946	0.2	8%
3.	Japan	$4,860	127	$38,267	$382	1.2	8%
4.	Germany	$3,701	83	$44,586	$44	0.1	1%
5.	India	$2,652	1,339	$1,981	$87	2.4	3%
6.	United Kingdom	$2,640	66	$40,000	$858	0.3	33%
7.	France	$2,588	67	$38,622	$510	1	20%
8.	Brazil	$2,053	209	$9,824	$311	1.4	15%
9.	Italy	$1,947	61	$31,916	$175	1.2	9%
10.	Canada	$1,650	37	$44,600	$394	3	24%
11.	Russia	$1,578	144	$10,961	$159	0.9	10%
12.	South Korea	$1,531	51	$30,015	$298	1.6	19%
13.	Australia	$1,386	25	$55,454	$282	1.5	20%
14.	Spain	$1,317	47	$28,020	$135	1.1	10%
15.	Mexico	$1,158	129	$8,979	$81	0.7	7%
16.	Indonesia	$1,015	264	$3,846	$3	0	0%
17.	Turkey	$852	81	$10,513	$129	0.9	15%
18.	Netherlands	$832	17	$48,955	$10	0.5	1%
19.	Saudi Arabia	$689	33	$20,866	$40	0.5	6%
20.	Switzerland	$679	8	$84,876	$20	0.4	3%

Rank	Country	2017 GDP (B USD)	Population (millions)	GDP Per Capita	V/MA Volume (B)	Cards per Capita	Payment Penetration
1.	Japan	$4,860	127	$38,267	$382	1.2	8%
2.	Germany	$3,701	83	$44,586	$44	0.1	1%
3.	Italy	$1,947	61	$31,916	$175	1.2	9%
4.	Netherlands	$832	17	$48,955	$10	0.5	1%
5.	Switzerland	$679	8	$84,876	$20	0.4	3%

Total Volume at Current Penetration	$631
Total Volume Assuming 20% Penetration	$2,404
Immediate Revenue Opportunity for V/MA (Assuming 20bps Per Transaction)	$4.81

Source(s): World Bank, JPMorgan

Do We Still Have Conviction in the Payments Space? (Cont'd)

Between Visa and Mastercard, both companies have strategies that we are in favor of. The two companies are investing heavily into the European space as well as the B2B space. In 2018, Visa completed its integration of Visa Europe into its global VisaNet system. Meanwhile Mastercard has been able to secure a partnership with Nordic financial institutions to help bring real-time payments to the Nordic markets. Both companies have been investing heavily in instant payment services so that workers can receive funds the day of – an increasingly important feature for ride hailing drivers and others in the gig economy.

Which Company is Better Value?

As both Visa and Mastercard are high quality companies with strategies that we like, deciding on one will come down to which valuation we are most comfortable with. Mastercard has historically traded at a slight premium due to its higher growth profile. In our DCF, despite the Visa model assuming less growth and a lower exit multiple, returns are still higher. Therefore, our conclusion is that we continue to have the most conviction in the Visa name.

EXHIBIT XV

Visa DCF Assumptions & Output		
Implied UFCF CAGR in Projection Period		9.1%
Terminal Multiple		18.0x
Terminal Year EBITDA		$35,490
Discount Rate		5.57%
Terminal Value:		$638,824
PV of Terminal Value:		$371,474
Sum of PV of Cash Flows:		$87,485
Enterprise Value:		**$458,959**
Less Net Debt:		($8,782)
Less Preferred Equity		($5,462)
Equity Value		$444,715
Shares Outstanding		2,172.8
Implied Price Per Share:	**$**	**204.67**

Target Return	
Current Share Price	$177.27
Target Share Price	$204.67
Dividend Yield	0.56%
Return	*13.95%*

EXHIBIT XVI

Mastercard DCF Assumptions & Output		
Implied UFCF CAGR in Projection Period		14.8%
Terminal Multiple		22.0x
Terminal Year EBITDA		$35,346
Discount Rate		5.56%
Terminal Value:		$777,601
PV of Terminal Value:		$452,639
Sum of PV of Cash Flows:		$109,418
Enterprise Value:		**$562,057**
Less Net Debt:		($2,533)
Less Preferred Equity		$0
Equity Value		$559,524
Shares Outstanding		1,801.4
Implied Price Per Share:	**$**	**310.61**

Target Return	
Current Share Price	$276.32
Target Share Price	$310.61
Dividend Yield	0.48%
Return	*11.52%*

Appendix

Visa Inc. Discounted Cash Flow

	Historical	Projected										
($ in Millions Except Per Share Data)	**FY2018**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**2029E**
Service Revenues	$8,918	$9,810	$10,791	$11,870	$13,057	$14,232	$15,513	$16,909	$18,262	$19,723	$21,300	$23,004
Year over Year Growth %	*11.8%*	*10.0%*	*10.0%*	*10.0%*	*10.0%*	*9.0%*	*9.0%*	*9.0%*	*8.0%*	*8.0%*	*8.0%*	*8.0%*
Data Processing Revenues	$9,027	$10,110	$11,323	$12,569	$13,952	$15,347	$16,728	$18,234	$19,692	$21,268	$22,969	$24,807
Year over Year Growth %	*15.9%*	*12.0%*	*12.0%*	*11.0%*	*11.0%*	*10.0%*	*9.0%*	*9.0%*	*8.0%*	*8.0%*	*8.0%*	*8.0%*
International Transaction Revenues	$7,211	$8,076	$8,884	$9,772	$10,554	$11,398	$12,310	$13,295	$14,359	$15,507	$16,593	$17,755
Year over Year Growth %	*14.1%*	*12.0%*	*10.0%*	*10.0%*	*8.0%*	*8.0%*	*8.0%*	*8.0%*	*8.0%*	*8.0%*	*7.0%*	*7.0%*
Other Revenue	$944	$1,010	$1,071	$1,135	$1,192	$1,251	$1,314	$1,380	$1,448	$1,521	$1,597	$1,677
Year over Year Growth %	*12.2%*	*7.0%*	*6.0%*	*6.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Client Incentives	($5,491)	($5,801)	($6,414)	($7,069)	($7,751)	($8,446)	($9,173)	($9,963)	($10,752)	($11,604)	($12,492)	($13,448)
% of Gross Revenue	*21.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*
Total Operating Revenue	$20,609	$23,205	$25,655	$28,277	$31,003	$33,783	$36,692	$39,854	$43,009	$46,415	$49,968	$53,794
Year over Year Growth %	*12.3%*	*12.6%*	*10.6%*	*10.2%*	*9.6%*	*9.0%*	*8.6%*	*8.6%*	*7.9%*	*7.9%*	*7.7%*	*7.7%*
Total Operating Expenses	($7,655)	($8,818)	($9,749)	($10,745)	($11,781)	($12,500)	($13,576)	($14,746)	($15,913)	($17,174)	($18,488)	($19,904)
% of Revenue	37.1%	38.0%	38.0%	38.0%	38.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%
EBITDA	$13,567	$15,077	$16,669	$18,373	$20,144	$22,288	$24,207	$26,293	$28,375	$30,622	$32,966	$35,490
% of Revenue	65.8%	65.0%	65.0%	65.0%	65.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%
Year over Year Growth %	*6.8%*	*11.1%*	*10.6%*	*10.2%*	*9.6%*	*10.6%*	*8.6%*	*8.6%*	*7.9%*	*7.9%*	*7.7%*	*7.7%*
Less: Depreciation and Amortization	($613)	($690)	($763)	($841)	($922)	($1,005)	($1,091)	($1,185)	($1,279)	($1,381)	($1,486)	($1,600)
% of Revenue	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
EBIT	$12,954	$14,387	$15,906	$17,532	$19,222	$21,283	$23,116	$25,108	$27,096	$29,241	$31,480	$33,890
% of Revenue	*62.9%*	*62.0%*	*62.0%*	*62.0%*	*62.0%*	*63.0%*	*63.0%*	*63.0%*	*63.0%*	*63.0%*	*63.0%*	*63.0%*
Year over Year Growth %	*6.7%*	*11.1%*	*10.6%*	*10.2%*	*9.6%*	*10.7%*	*8.6%*	*8.6%*	*7.9%*	*7.9%*	*7.7%*	*7.7%*
Less: Income Taxes	($2,591)	($2,877)	($3,181)	($3,506)	($3,844)	($4,257)	($4,623)	($5,022)	($5,419)	($5,848)	($6,296)	($6,778)
Net Operating Profit After Taxes	$10,363	$11,510	$12,725	$14,025	$15,378	$17,027	$18,493	$20,086	$21,677	$23,393	$25,184	$27,112
Year over Year Growth %	*6.7%*	*11.1%*	*10.6%*	*10.2%*	*9.6%*	*10.7%*	*8.6%*	*8.6%*	*7.9%*	*7.9%*	*7.7%*	*7.7%*
Plus: Depreciation and Amortization	$613	$690	$763	$841	$922	$1,005	$1,091	$1,185	$1,279	$1,381	$1,486	$1,600
Plus: Amortization of client incentives	$5,491	$5,801	$6,414	$7,069	$7,751	$8,446	$9,173	$9,963	$10,752	$11,604	$12,492	$13,448
Less: Capital Expenditures	($718)	($928)	($1,026)	($1,131)	($1,240)	($1,351)	($1,468)	($1,594)	($1,720)	($1,857)	($1,999)	($2,152)
% of Revenue	*3.5%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*
Less: Change in Working Capital*	($2,657)	($4,733)	($5,233)	($5,768)	($6,324)	($6,891)	($7,484)	($8,129)	($8,773)	($9,468)	($10,192)	($10,973)
% of Revenue	*12.9%*	*20.4%*	*20.4%*	*20.4%*	*20.4%*	*20.4%*	*20.4%*	*20.4%*	*20.4%*	*20.4%*	*20.4%*	*20.4%*
Unlevered Free Cash Flow	$7,601	$6,538	$7,229	$7,968	$8,736	$9,789	$10,632	$11,548	$12,463	$13,450	$14,479	$15,588
Free Cash Flow Growth Rate			*11%*	*10%*	*10%*	*12%*	*9%*	*9%*	*8%*	*8%*	*8%*	*8%*
Discount Period		0	1	2	3	4	5	6	7	8	9	10
Present Value of Unlevered Cash Flows		**$6,538**	**$6,847**	**$7,149**	**$7,424**	**$7,881**	**$8,108**	**$8,342**	**$8,527**	**$8,717**	**$8,889**	**$9,064**

Appendix

Mastercard Inc. Discounted Cash Flow

	Historical					Projected						
($ in Millions Except Per Share Data)	**FY2018**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**2029E**
Domestic assessments	$6,138	$7,243	$8,402	$9,578	$10,919	$12,338	$13,942	$15,615	$17,333	$19,066	$20,973	$23,070
Year over Year Growth %	*19.6%*	*18.0%*	*16.0%*	*14.0%*	*14.0%*	*13.0%*	*13.0%*	*12.0%*	*11.0%*	*10.0%*	*10.0%*	*10.0%*
Cross-border volume fees	$4,954	$5,846	$6,781	$7,798	$8,968	$10,223	$11,552	$12,939	$14,362	$15,798	$17,378	$19,116
Year over Year Growth %	*18.7%*	*18.0%*	*16.0%*	*15.0%*	*15.0%*	*14.0%*	*13.0%*	*12.0%*	*11.0%*	*10.0%*	*10.0%*	*10.0%*
Transaction processing	$7,391	$8,721	$10,291	$11,835	$13,492	$15,246	$17,228	$19,295	$21,417	$23,559	$25,915	$28,507
Year over Year Growth %	*19.4%*	*18.0%*	*18.0%*	*15.0%*	*14.0%*	*13.0%*	*13.0%*	*12.0%*	*11.0%*	*10.0%*	*10.0%*	*10.0%*
Other Revenue	$3,348	$3,850	$4,428	$5,048	$5,754	$6,502	$7,283	$8,084	$8,892	$9,781	$10,759	$11,835
Year over Year Growth %	*17.4%*	*15.0%*	*15.0%*	*14.0%*	*14.0%*	*13.0%*	*12.0%*	*11.0%*	*10.0%*	*10.0%*	*10.0%*	*10.0%*
Client Incentives	($6,881)	($7,955)	($9,270)	($10,620)	($12,131)	($13,736)	($15,502)	($17,339)	($19,221)	($21,144)	($23,258)	($25,584)
% of Gross Revenue	*31.5%*	*31.0%*	*31.0%*	*31.0%*	*31.0%*	*31.0%*	*31.0%*	*31.0%*	*31.0%*	*31.0%*	*31.0%*	*31.0%*
Total Operating Revenue	$14,950	$17,705	$20,632	$23,638	$27,002	$30,574	$34,503	$38,594	$42,783	$47,061	$51,768	$56,944
Year over Year Growth %	*19.6%*	*18.4%*	*16.5%*	*14.6%*	*14.2%*	*13.2%*	*12.9%*	*11.9%*	*10.9%*	*10.0%*	*10.0%*	*10.0%*
Total Operating Expenses	($7,668)	($9,030)	($10,316)	($11,583)	($12,691)	($14,370)	($15,872)	($17,753)	($19,252)	($20,707)	($21,742)	($23,347)
% of Revenue	51.3%	51.0%	50.0%	49.0%	47.0%	47.0%	46.0%	46.0%	45.0%	44.0%	42.0%	41.0%
EBITDA	$7,741	$9,219	$10,950	$12,781	$15,140	$17,143	$19,691	$22,025	$24,844	$27,799	$31,615	$35,346
% of Revenue	51.8%	52.1%	53.1%	54.1%	56.1%	56.1%	57.1%	57.1%	58.1%	59.1%	61.1%	62.1%
Year over Year Growth %	*9.7%*	*19.1%*	*18.8%*	*16.7%*	*18.5%*	*13.2%*	*14.9%*	*11.9%*	*12.8%*	*11.9%*	*13.7%*	*11.8%*
Less: Depreciation and Amortization	($459)	($544)	($633)	($726)	($829)	($939)	($1,059)	($1,185)	($1,314)	($1,445)	($1,589)	($1,748)
% of Revenue	*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*
EBIT	$7,282	$8,676	$10,316	$12,056	$14,311	$16,204	$18,632	$20,841	$23,531	$26,354	$30,025	$33,597
% of Revenue	*48.7%*	*49.0%*	*50.0%*	*51.0%*	*53.0%*	*53.0%*	*54.0%*	*54.0%*	*55.0%*	*56.0%*	*58.0%*	*59.0%*
Year over Year Growth %	*10.0%*	*19.1%*	*18.9%*	*16.9%*	*18.7%*	*13.2%*	*15.0%*	*11.9%*	*12.9%*	*12.0%*	*13.9%*	*11.9%*
Less: Income Taxes	($1,311)	($1,562)	($1,857)	($2,170)	($2,576)	($2,917)	($3,354)	($3,751)	($4,236)	($4,744)	($5,405)	($6,047)
Net Operating Profit After Taxes	$5,971	$7,114	$8,459	$9,886	$11,735	$13,287	$15,278	$17,089	$19,295	$21,611	$24,621	$27,550
Year over Year Growth %	*10.0%*	*19.1%*	*18.9%*	*16.9%*	*18.7%*	*13.2%*	*15.0%*	*11.9%*	*12.9%*	*12.0%*	*13.9%*	*11.9%*
Plus: Depreciation and Amortization	$459	$544	$633	$726	$829	$939	$1,059	$1,185	$1,314	$1,445	$1,589	$1,748
Plus: Amortization of client incentives	$6,881	$7,955	$9,270	$10,620	$12,131	$13,736	$15,502	$17,339	$19,221	$21,144	$23,258	$25,584
Less: Capital Expenditures	($504)	($620)	($722)	($827)	($945)	($1,070)	($1,208)	($1,351)	($1,497)	($1,647)	($1,812)	($1,993)
% of Revenue	*3.4%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*
Less: Change in Working Capital*	($1,313)	($1,021)	($1,190)	($1,363)	($1,557)	($1,763)	($1,989)	($2,225)	($2,467)	($2,714)	($2,985)	($3,283)
% of Revenue	*8.8%*	*5.8%*	*5.8%*	*5.8%*	*5.8%*	*5.8%*	*5.8%*	*5.8%*	*5.8%*	*5.8%*	*5.8%*	*5.8%*
Unlevered Free Cash Flow	$4,613	$6,017	$7,181	$8,421	$10,062	$11,393	$13,140	$14,698	$16,644	$18,695	$21,413	$24,022
Free Cash Flow Growth Rate		*30%*	*19%*	*17%*	*19%*	*13%*	*15%*	*12%*	*13%*	*12%*	*15%*	*12%*
Discount Period		0	1	2	3	4	5	6	7	8	9	10
Present Value of Unlevered Cash Flows		**$6,017**	**$6,803**	**$7,557**	**$8,554**	**$9,176**	**$10,025**	**$10,623**	**$11,396**	**$12,126**	**$13,158**	**$13,983**

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