Overview: Payments Industry

Some Discussion on:

Visa Inc., MasterCard, and American Express

Twitter: Value Seeker @Find_Me_Value

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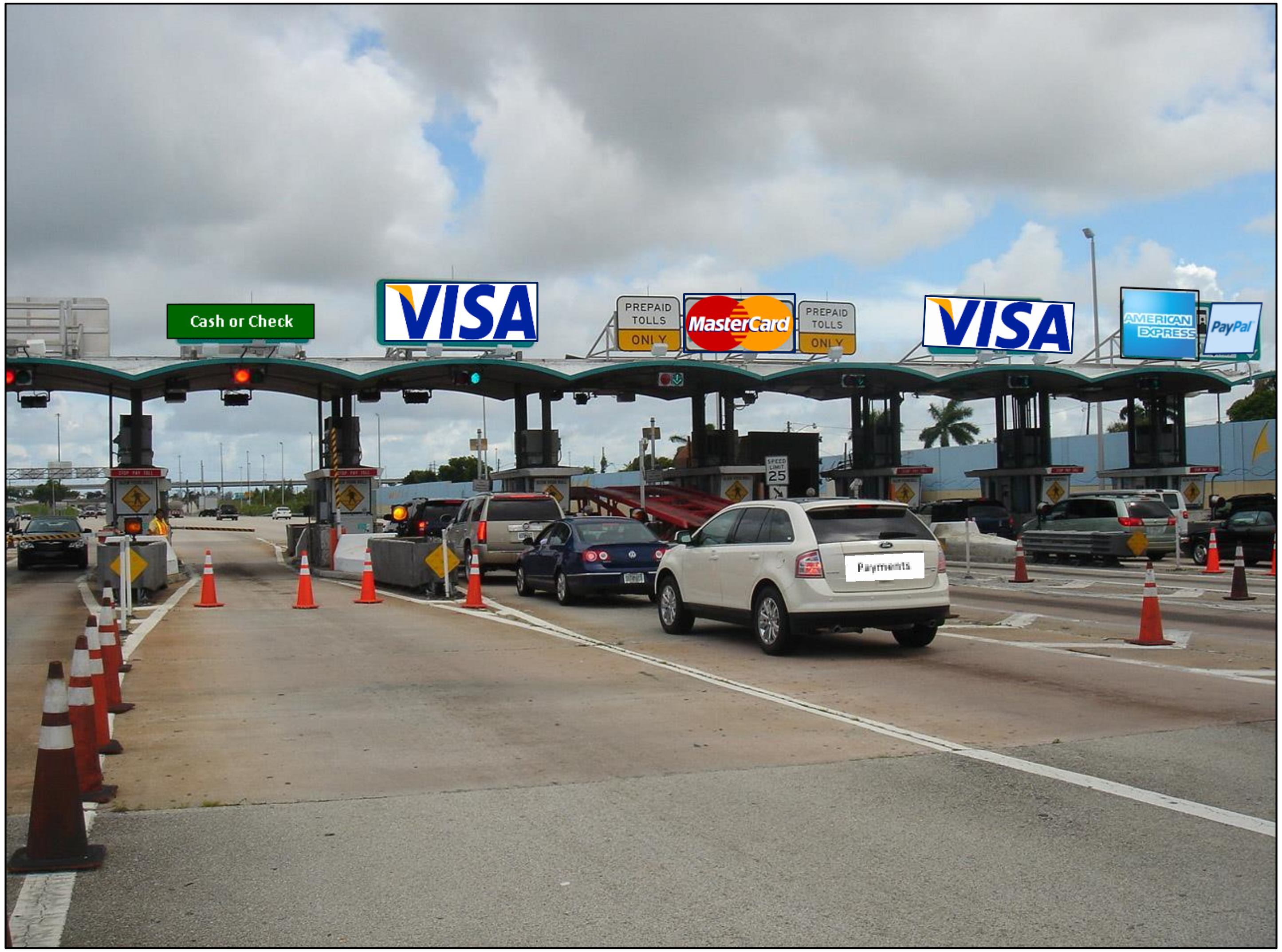
The Purpose of This Slide Deck

- To hopefully help others learn more about the payments industry
- To create dialogue as to some of the content in this slide deck, hopefully in a way that is beneficial to all and helps others understand these businesses even more
- As a reference for myself to review periodically
- To bring more awareness as to the ins-and-outs of these businesses, as it seems some investors do not understand some of the reasons they own some of the card networks, or some of the risks
- To create awareness on some of the risks, and hopefully others, who may be more educated on these risks, can share opinion as to the impact on the industry

The Payments Industry

Charlie Munger's quote is from the 2017 DJCO annual meeting. Buffett's quote is fiction, except Berkshire does own the stocks mentioned in the dollar amounts mentioned.

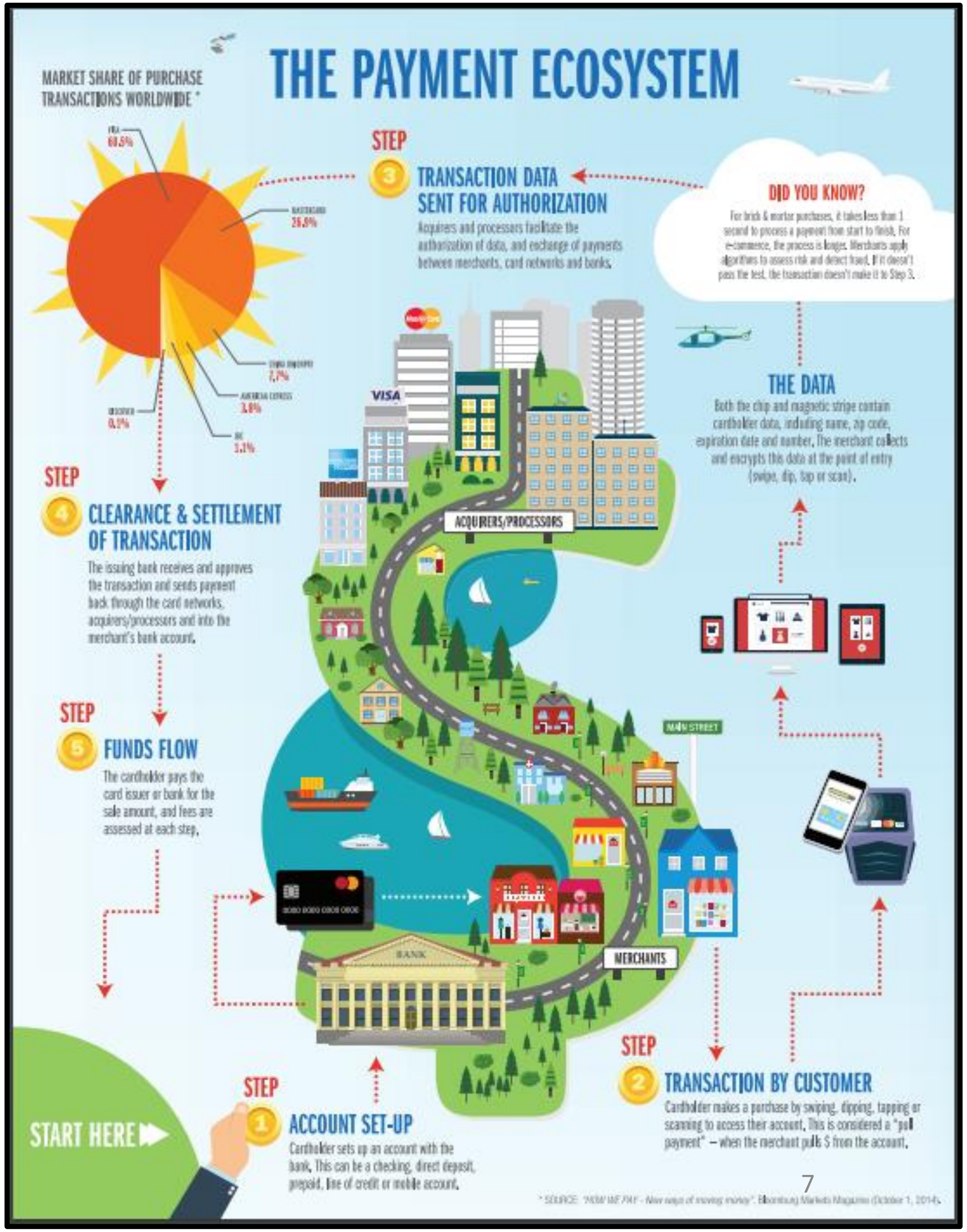
Payments Industry



Overview of the Payment Ecosystem

- Encompasses all payments made globally
- By consumers and businesses
- Payment forms include cash, check, credit card, debit cards, prepaid, ACH, and other methods
- The C2B (Customer-Business), which will be focused on in this slide deck, is large at about $36 - $40 trillion in payments volume globally, generating about $300 - $400 billion in payments fees
- Current payment volume in the C2B is about $13 trillion +
- Penetration of “electronification” of payments is about 37% / 63% penetration of cash/ check/ transfer

Plenty of remaining opportunity to displace cash and check, both in terms of payment transactions *and* payment volumes



The Payment Industry

- Benefits the local and global economy –
- Benefits all parties involved –
- Large and *still* growing –
- High returns on invested capital –
- Secular tailwinds *still* intact –

Why is the Industry **Attractive**

- Strong secular growth that is less macro-based, more specific to industry
- Continued shift from cash to digital
- Scale based business
- Network effects
- Products are integral part of US economy, and largely global economy as well, though to varying degrees based on region
- Capital light business models
- Many confuse the technology and new FinTech entrants as possibility of business model disruption, but ignore the businesses are more protected based on brand, reputation for security, ease of use, ubiquity
- Old business models are not standing-still
    - Partnering with ApplePay, Samsung Pay, PayPal
    - Continuing to open new innovation centers
    - Acquiring stakes in bitcoin companies
    - Visa with ChaseNet, ChasePay
- Proven examples of difficulty
    - FirstData attempt in early 2000s
    - MCx
    - New technology companies are using legacy company technology (V/ MA)

Why is the Industry **Un**-attractive

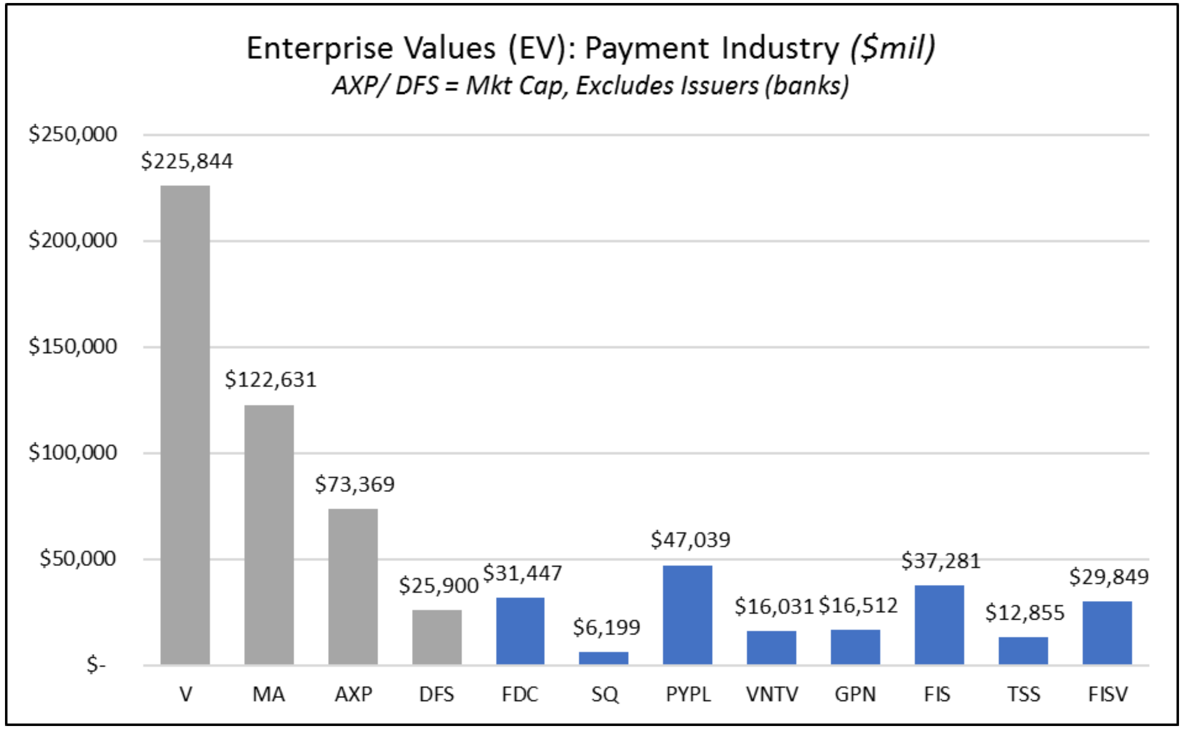
- High regulatory focus globally given necessity of the products
- On-going legal issues
- Some countries have their own debit payment scheme
- Technology could change
- Possible brand deterioration through rise of digital wallets
- Uncertainty on some players as to their intentions (JP Morgan Chase: ChaseNet)
- Uncertainty regarding some lawsuits with some of the networks
- Blockchain potential – threat to network economics/ competitive advantage?
- What if other countries take way similar to Europe with both debit and credit interchange regulation, whereas most regulation is purely on debit interchange?
- Large merchants demanding more leverage

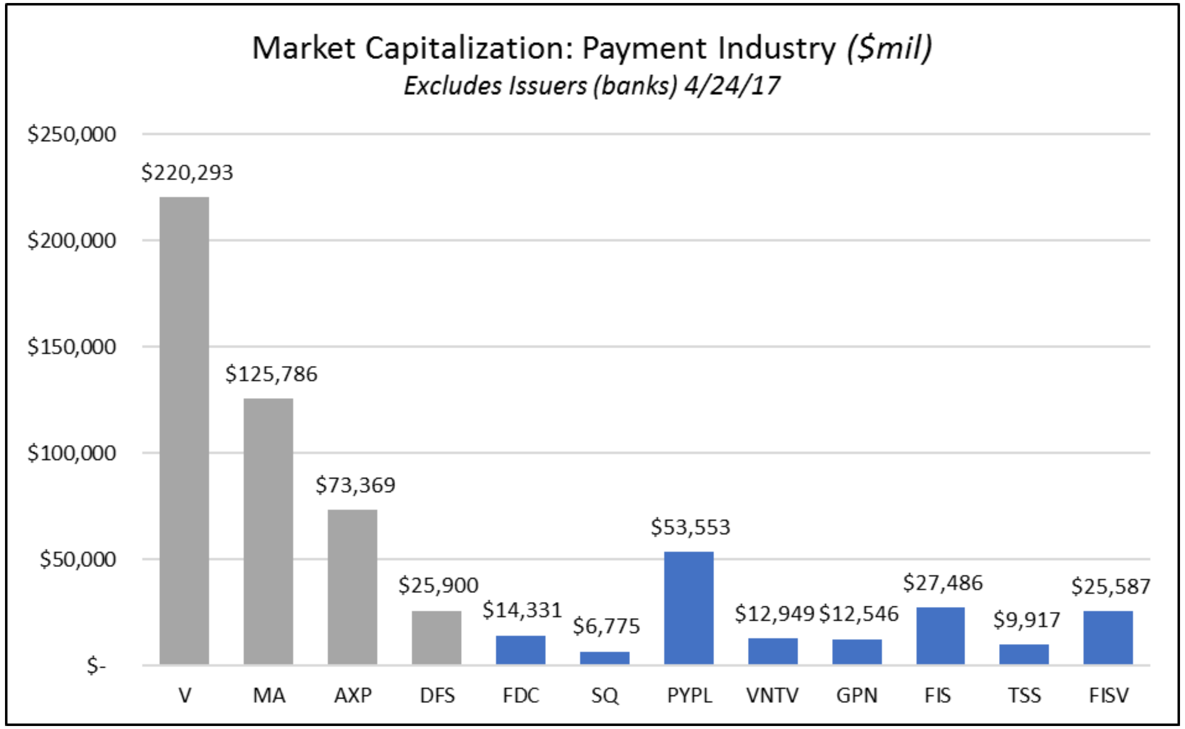
What Investors *Should* Know

- The global addressable market for card payment volume
- The underlying economics of each transaction
- How the economics are split per transaction
- The underlying drivers of future payment volume and transaction growth
- How much of the future volume drivers is secular vs. macro
- Where the growth will come from geographically
- What companies benefit the most from these trends and economics

Overview of the Payments Industry

Valuation of Payments Companies





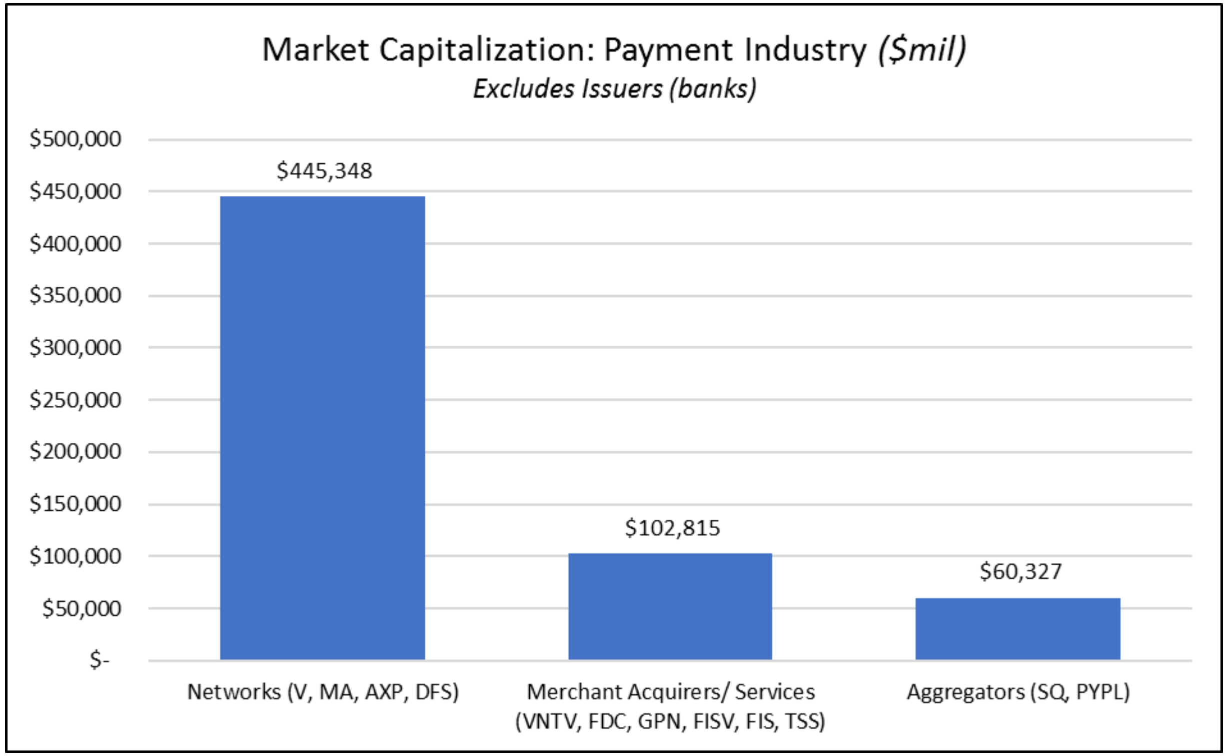
Payments Industry: 4/24/2017

Company	Ticker	Type	S/O (diluted)	Share Price	Market Cap	Net Debt	EV
Visa Inc	V	Network	2,406.00	$ 91.56	$ 220,293	$ 5,551	$ 225,844
MasterCard	MA	Network	1,090.00	$ 115.40	$ 125,786	$ (3,155)	$ 122,631
American Express	AXP	Network (Closed)	913.00	$ 80.36	$ 73,369	[redacted]	$ 73,369
Discover Financial	DFS	Network (Closed)	385.53	$ 67.18	$ 25,900	[redacted]	$ 25,900
First Data	FDC	Merchant Acquirer	921.00	$ 15.56	$ 14,331	$ 17,116	$ 31,447
Square Inc	SQ	Aggregator/ Acquirer	382.53	$ 17.71	$ 6,775	$ (576)	$ 6,199
PayPal	PYPL	Aggregator/ Acquirer	1,216.00	$ 44.04	$ 53,553	$ (6,514)	$ 47,039
Vantiv	VNTV	Merchant Acquirer	197.24	$ 65.65	$ 12,949	$ 3,082	$ 16,031
Heartland/ Global Payments	GPN	Merchant Acquirer	153.99	$ 81.47	$ 12,546	$ 3,966	$ 16,512
Fidelity National Information	FIS	Merchant Acquirer	330.00	$ 83.29	$ 27,486	$ 9,795	$ 37,281
Total System Services	TSS	Merchant Acquirer	184.53	$ 53.74	$ 9,917	$ 2,939	$ 12,855
Fiserv Inc	FISV	Merchant Acquirer	214.56	$ 119.25	$ 25,587	$ 4,262	$ 29,849
Total					$ 608,490	$ 36,466	$ 644,956

** Depository institution, excludes debt, short-term borrowing, etc.

Market Capitalization

- The payments networks have the largest market valuations in the industry…and its not even close.
- Visa / MasterCard = ~ $350 billion combined in market capitalization
- Visa / MasterCard are > 50% of the valuation of the 11 companies (excluding issuers/ Chinese companies) that are large payments players

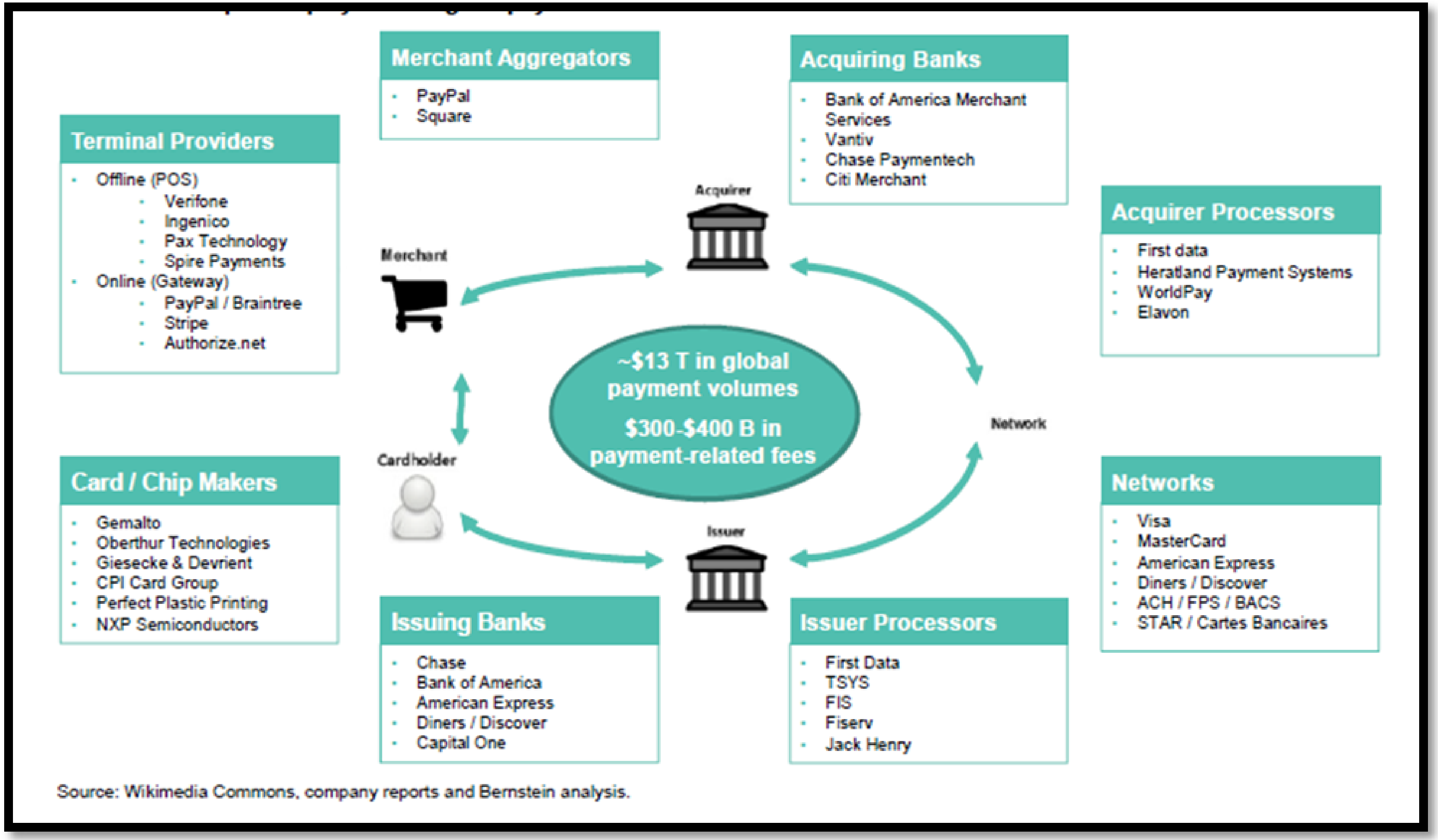


Networks (V, MA, AXP, DFS)	$	445,348	73.2%
Merchant Acquirers/ Services (VNTV, FDC, GPN, FISV, FIS, TSS)	$	102,815	16.9%
Aggregators (SQ, PYPL)	$	60,327	9.9%
Market Capitlization (4/24/2017)	$	608,490	

Payments Industry Players

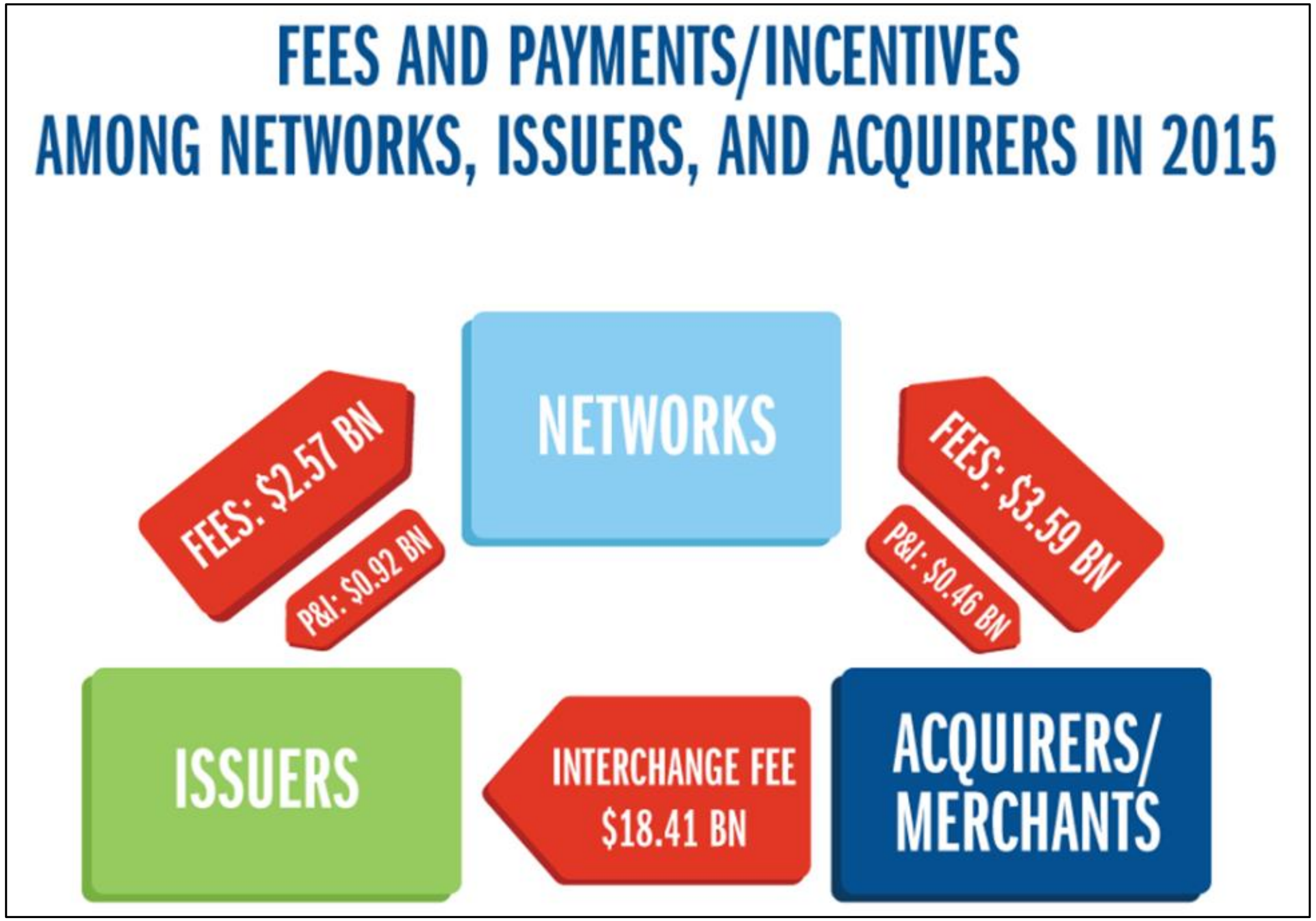
~ 73% of the industry valuation goes to these 4 players (excluding issuers)

Payments Industry Players



Payments Industry:

- ***Networks***: get paid from issuers and merchant acquirers, but not directly from the interchange fee
- ***Merchant Acquirers***: get paid in the form of the "merchant discount rate", which is the largest fee in the ecosystem
- ***Issuers***: get paid mostly from the interchange fee, which is set by the card networks, but also from other fees
- ***Merchants:*** charged the merchant discount rate as a fee from a typical transaction. The sale price minus the MDR is what gets deposited in their bank account.



Industry Size: *Cards in Circulation*

- Based on Nilson Reports, expectation of card growth will be slower from 2015 to 2020, versus the period of 2010 to 2015
- Excluding domestic scheme cards, here are expecting growth rates from 2015 – 2020 in cards:
    - Visa + 3.5%
    - MasterCard +6.5%
- This has not been adjusted post-Visa Europe, as currently Visa has 3.144 billion cards as of 12/31/16
- These numbers appear reasonable based on V/ MA reports
- *Will provide more granularity on “cards in circulation” late in this slide deck*

Based on Nilson Report "Market Share in 2015" cards in circulation

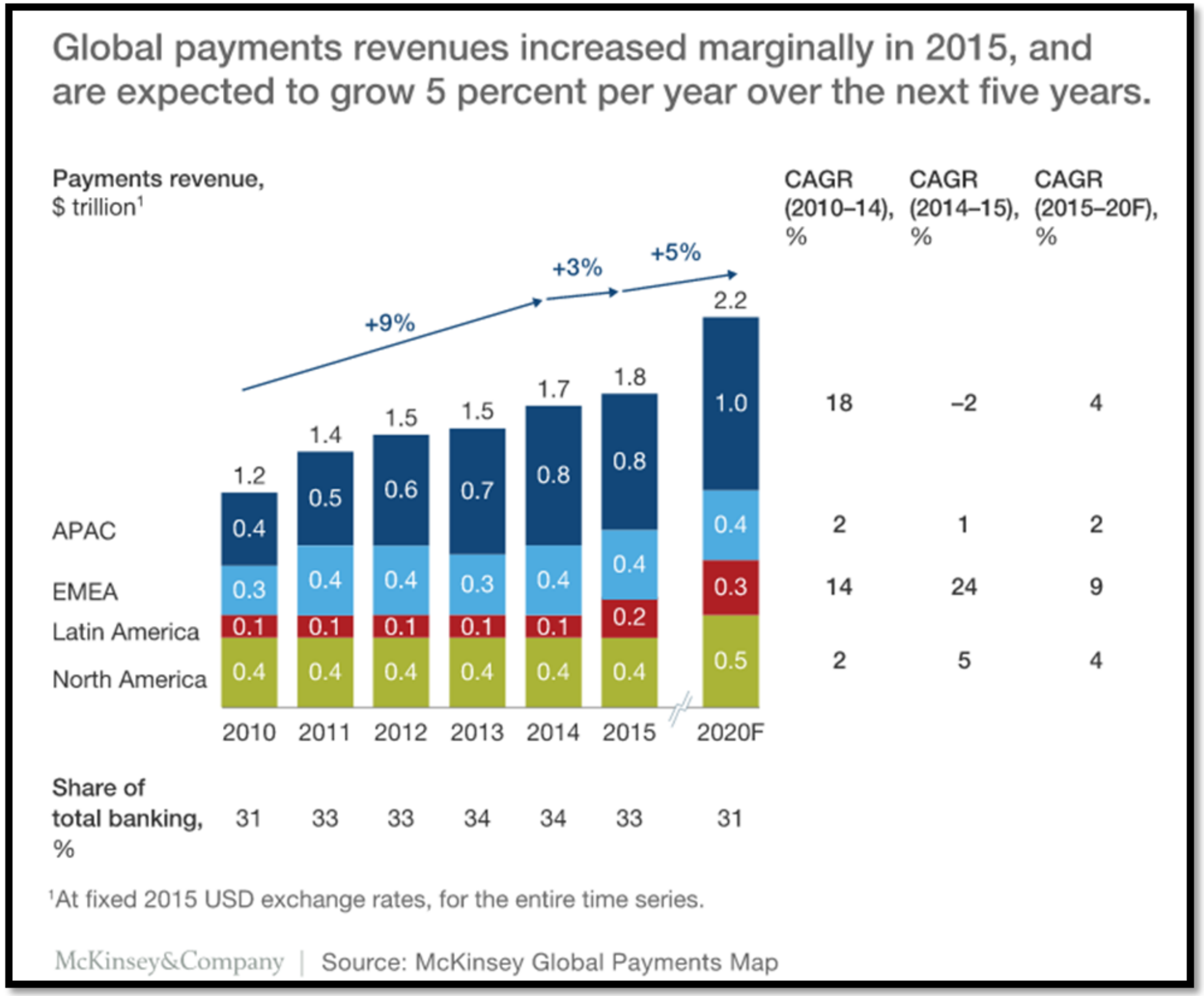
(billions)	2010	2015	Est. 2020	**10 - '15**	**15 - '20**	**10 Yr**
Private Label	5.14	6.09	7.13	*3.5%*	*3.2%*	*3.3%*
Union Pay	2.42	5.44	7.46	*17.6%*	*6.5%*	*11.9%*
Visa	2.26	2.97	3.53	*5.6%*	*3.5%*	*4.6%*
MasterCard	0.97	1.57	2.15	*10.1%*	*6.5%*	*8.3%*
Domestic Scheme	0.64	1.00	1.65	*9.3%*	*10.5%*	*9.9%*
Maestro	0.66	0.74	0.68	*2.3%*	*-1.7%*	*0.3%*
Other	0.23	0.27	0.31	*3.3%*	*2.8%*	*3.0%*
	12.32	18.08	22.91	*8.0%*	*4.8%*	*6.4%*

Market Shares of Cards in Circulation

Private Label	*42%*	*34%*	*31%*
Union Pay	*20%*	*30%*	*33%*
Visa	*18%*	*16%*	*15%*
MasterCard	*8%*	*9%*	*9%*
Domestic Scheme	*5%*	*6%*	*7%*
Maestro	*5%*	*4%*	*3%*
Other	*2%*	*1%*	*1%*

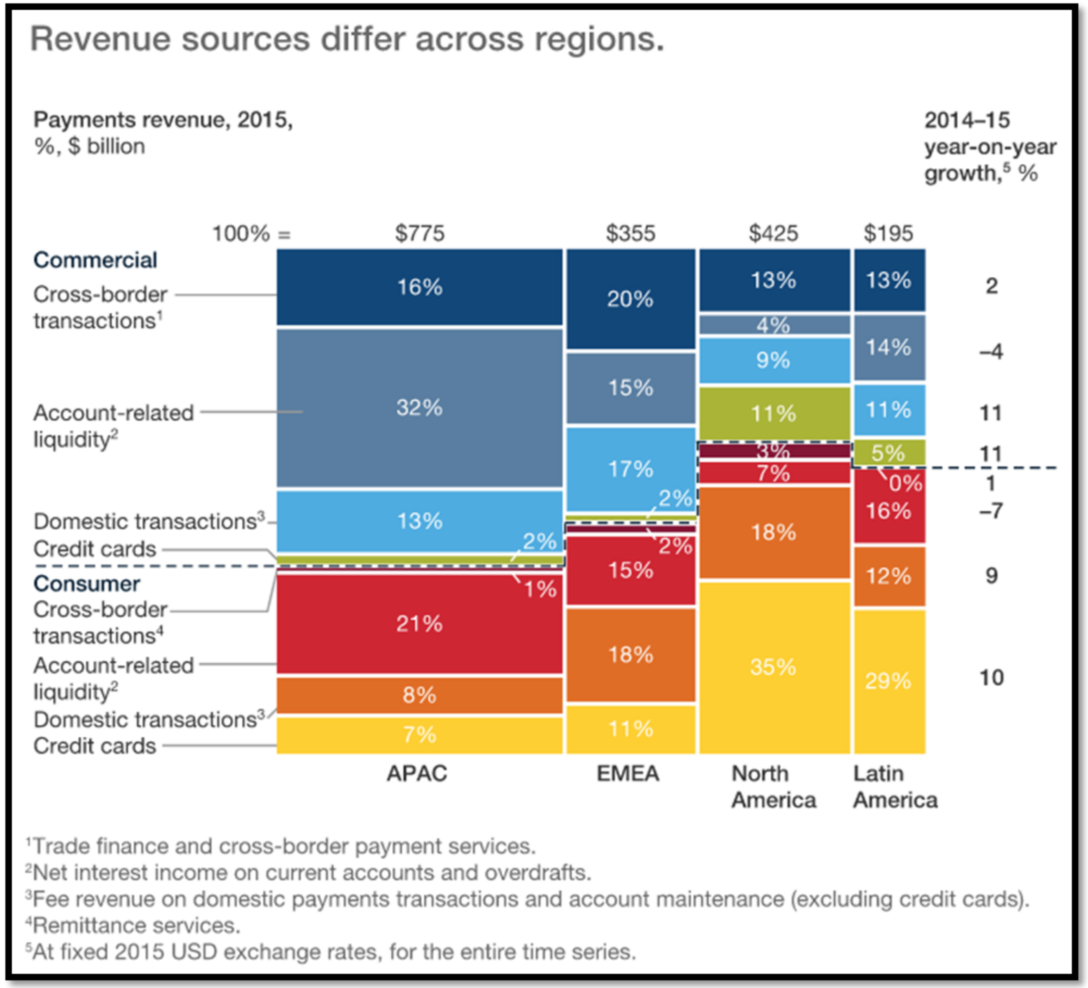
Industry Size: *Payments Revenue Globally*

- By geography (versus company-specific), McKinsey believes payment volumes will grow ~ 5% from 2015 to 2020
- This number (5%) is similar to the expectation from Nilson on card growth globally (4.8%)
- One of these will prove to be <u>incorrect</u>
  - If Nilson is correct, then McKinsey essentially assumes minimal growth in GDP/ PCE per card, which is highly unlikely
  - If McKinsey is correct, then it is possible the card growth will be near zero based on historical demand drivers if payment volume were to grow at 5% CAGR from 2015 – 2020
  - Payment revenues could imply negative pricing, which has not been the case despite regulation on debit interchange
  - Or, McKinsey implies much lower net interest income from credit cards



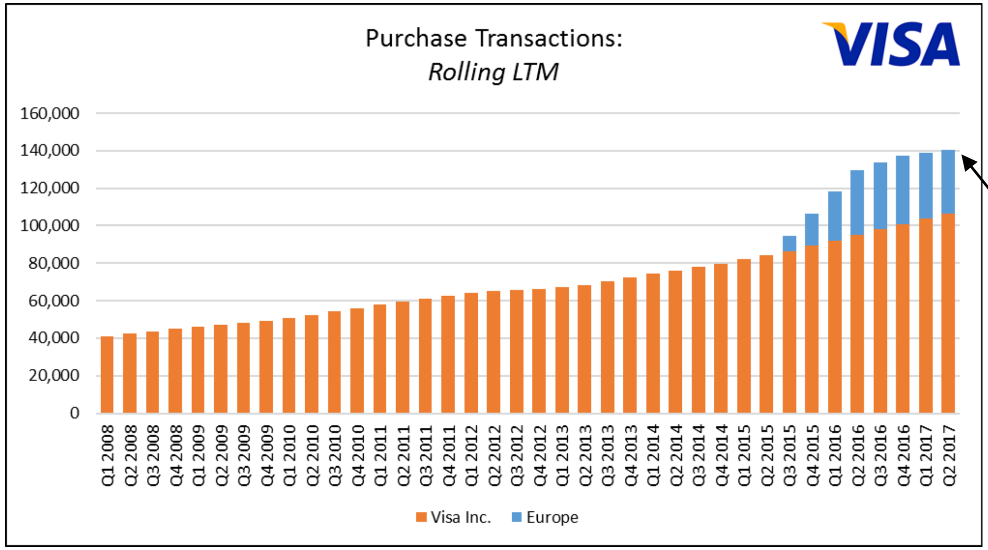
Industry Size: *Payments Revenue Globally*

- **Notes:**
  - North America derives nearly half of total payments revenues from credit cards – more than any other region
  - North America has significantly lower reliance on earning revenues from account related liquidity – Net Interest Margin on credit cards, versus other regions
  - Expectation of North America transaction growth to outpace any potential interchange pressure
  - Asia-Pacific is largest region for revenues, larger than EMEA/ North America combined
  - APAC revenues largely driven by net interest income on the consumer side, with 57% of consumer payments revenues from NIM and overdraft fees
  - Meanwhile, North America derives only 11% of consumer payments revenue from NII/ Overdraft

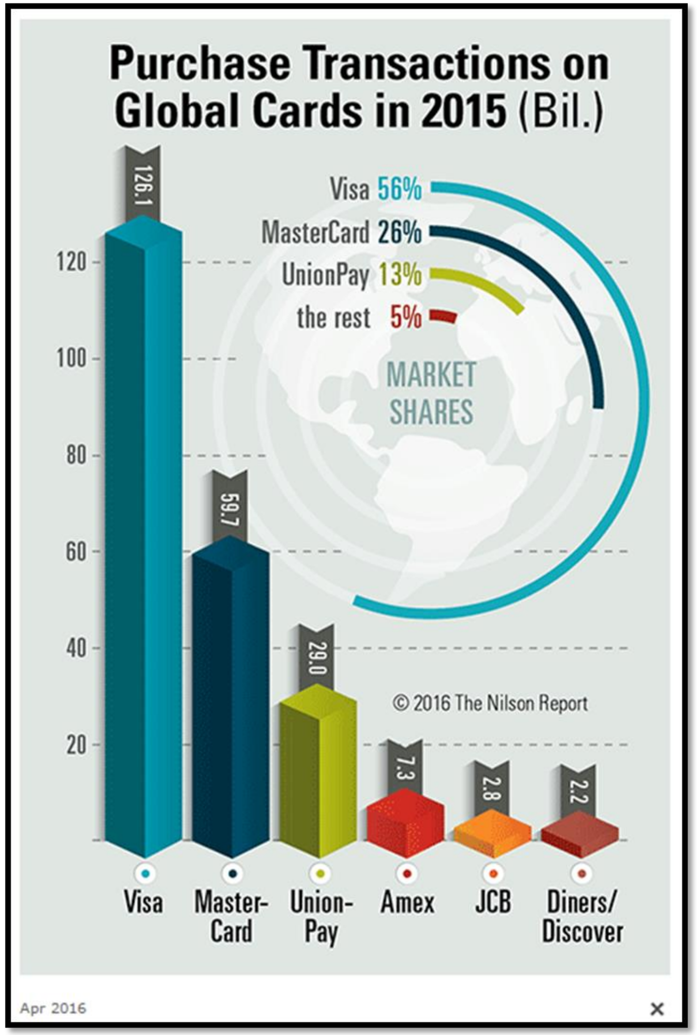


Industry Size: *Purchase Transactions*

- Despite UnionPay (China) having almost *double* the cards in circulation at the end of 2015 (5.44b) versus Visa, Visa has about *4x* the number of purchase transactions
- As of 2015, Visa / MasterCard had a 82% global market share on purchase transactions
- As of the end of March 2017, Visa has 140.24 billion purchase transactions globally, inclusive of Visa Europe

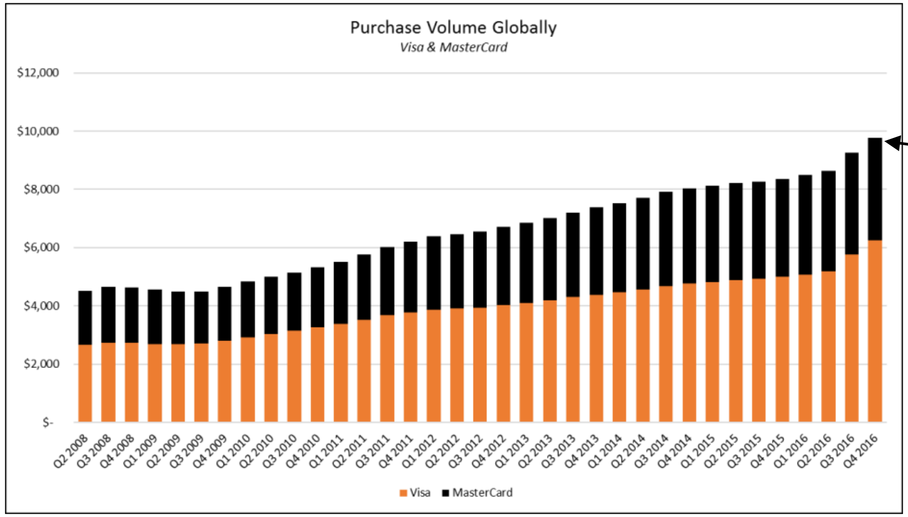


140.244 billion purchase transactions LTM for Visa Inc….. or….4,447 purchase transactions per *second*.

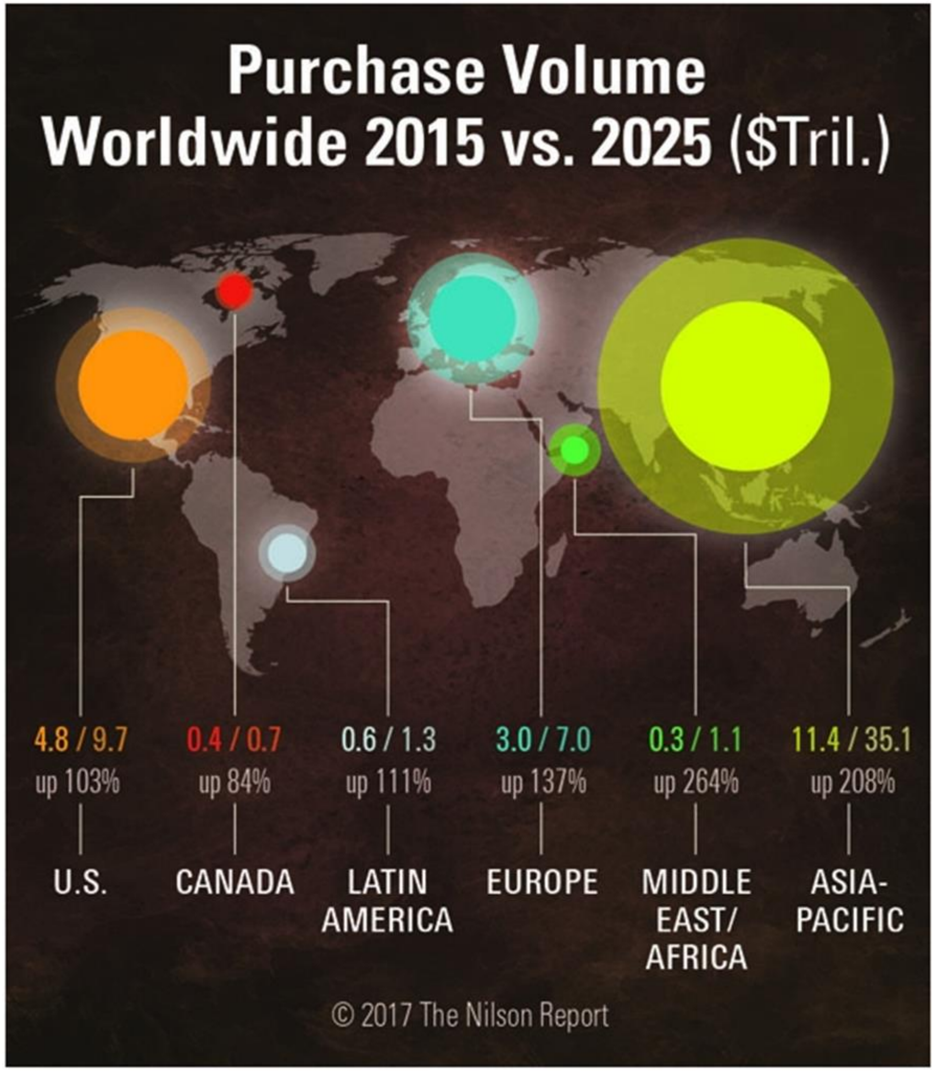


Industry Size: *Purchase Volume*

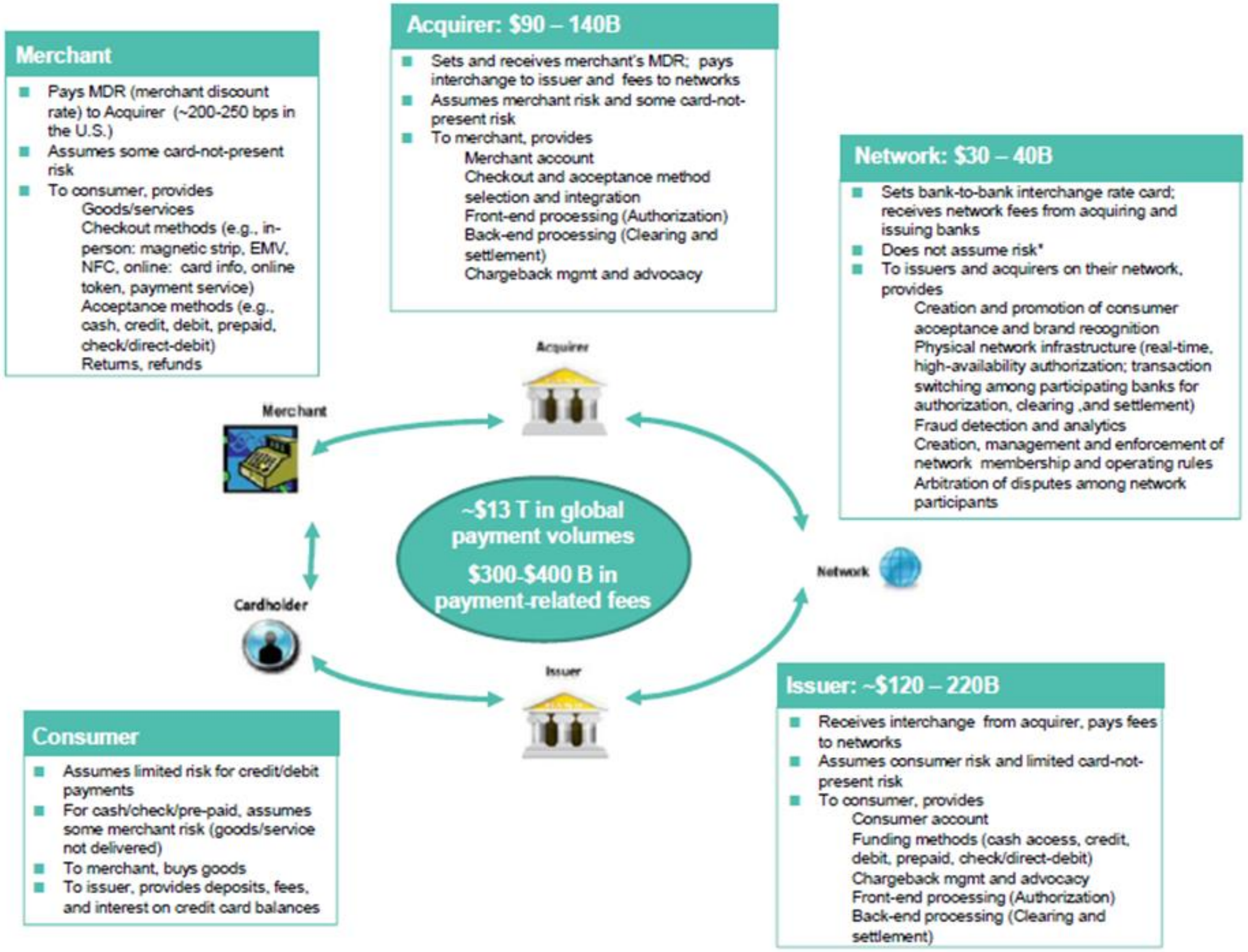
- Based on Nilson Report, 2015 had $20.4 trillion of purchase volume in 2015, with the U.S. and Asia-Pacific making up ~80% of this globally
- The largest regions in 2025 are estimated to be:
  - Asia Pacific at $35.1 trillion
  - United States at $9.7 trillion
  - Europe at $7.0 trillion
  - All other regions at $3.1 trillion



Visa and MasterCard have a combined ***$9.8 trillion*** in purchase volume over the last 12 months.



Industry Size: Consumer-to-Business Market



Source: Wikimedia Commons and Bernstein analysis

Industry Growth

- Personal consumption (PCE)
  - Real disposable income
  - Real interest rates
  - Card penetration
- Nominal GDP (Real + Inflation)
- Penetration of cash and check
- Mix – credit card usage vs. debit card
- The basic metrics in the payments industry are the volume of the transaction (payment size) and the number of transactions done with a certain payment method

Why The Industry Exists

Why The Industry Exists

Why the industry exists?

- Instead of paying with cash or check, early credit cards meant to be an alternative
- Early credit cards were charge cards, which had to be paid in full at the end of the billing period
- Credit cards exist as a means to pay for something
- Credit cards are more convenient, safe, don't have to worry about cash, if a credit card is stolen you are protected, and consumers can earn rewards for usage
- Issuers want to push credit and debit cards as a means to keep a customer within the bank system
- Also, credit cards are very lucrative for banks: annual fees, interest expense is high on outstanding debt, late payments, also earn fees (incentives) from card networks in exchange for volume
- Provide consumers convenience and secure access to funds
- Reduces cash and check handling for merchants
- Expands the pool of customers guaranteed to pay
- Provides governments greater ability to collect tax revenue by reducing unreported transactions in gray economy
- All these things reduce friction and leads to increased spending on goods and services, which leads to a virtuous economic cycle

Industry Impact and Role on Economies

- As more cards are issued and more merchants accept cards, transaction volumes *increase*
- Then, consumers feel more comfortable using the card, as it is more convenient and secure
- Creates a virtuous cycle
- Electronic payments added $296 billion in real US to GDP in 70 countries studied, between 2011-2015
- That equals 2.6 million jobs on average per year, or 0.4% of total employment in the 70 countries
- Average of 0.18% increase in consumption per year
- 0.1% increase in GDP per year between 2011-2015
- From 2015 Moody's study, using years 2011-2015 (see tables on the right)

Summary Table: Average Increase in GDP from Increased Card Usage, %

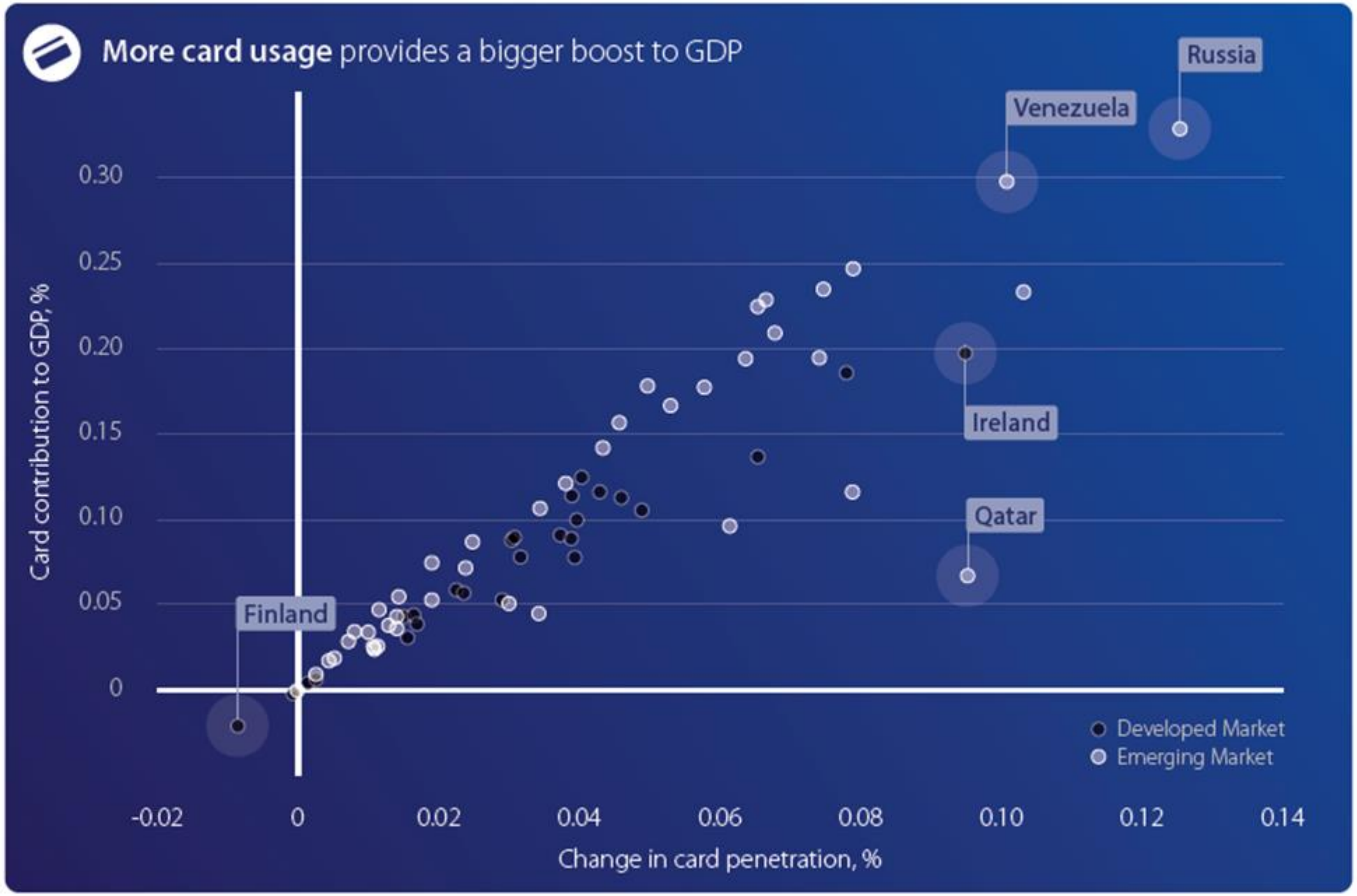
Region	Average Weighted by GDP	Average Weighted by Consumption
South America	0.20	0.33
Oceania	0.12	0.22
North America	0.12	0.18
Europe	0.10	0.18
Middle East	0.09	0.23
Asia	0.06	0.12
Africa	0.05	0.08

Table 1B: Card Usage's Contribution to GDP

% average between 2011-2015 weighted by GDP

Argentina	0.23	Greece	-0.00	Netherlands	0.08	South Korea	0.04
Australia	0.19	Hong Kong	0.09	New Zealand	0.06	Spain	0.01
Austria	0.09	Hungary	0.25	Nigeria	0.03	Sri Lanka	0.04
Azerbaijan	0.03	India	0.07	Norway	0.05	Sweden	0.03
Belgium	0.04	Indonesia	0.05	Oman	0.10	Switzerland	0.06
Brazil	0.17	Ireland	0.20	Peru	0.21	Taiwan	0.09
Cambodia	0.05	Israel	0.00	Philippines	0.01	Thailand	0.19
Canada	0.10	Italy	0.12	Poland	0.19	Tunisia	-0.00
Chile	0.23	Japan	0.04	Portugal	0.09	Turkey	0.22
China	0.05	Jordan	0.03	Puerto Rico	0.09	UAE	0.23
Colombia	0.11	Kazakhstan	0.02	Qatar	0.07	UK	0.11
Czech Republic	0.11	Kenya	0.03	Russia	0.33	Ukraine	0.07
Denmark	0.14	Kuwait	0.04	Rwanda	0.02	Uruguay	0.18
Egypt	0.01	Lebanon	0.05	Saudi Arabia	0.12	USA	0.12
Finland	-0.02	Malaysia	0.04	Serbia	0.12	Venezuela	0.30
France	0.03	Mexico	0.16	Singapore	0.10	Vietnam	0.14
Germany	0.08	Morocco	0.04	Slovakia	0.11	Emerging Markets	0.11
Ghana	0.03	Myanmar	0.02	South Africa	0.18	Developed Countries	0.08

More Card Usage = Increase in GDP



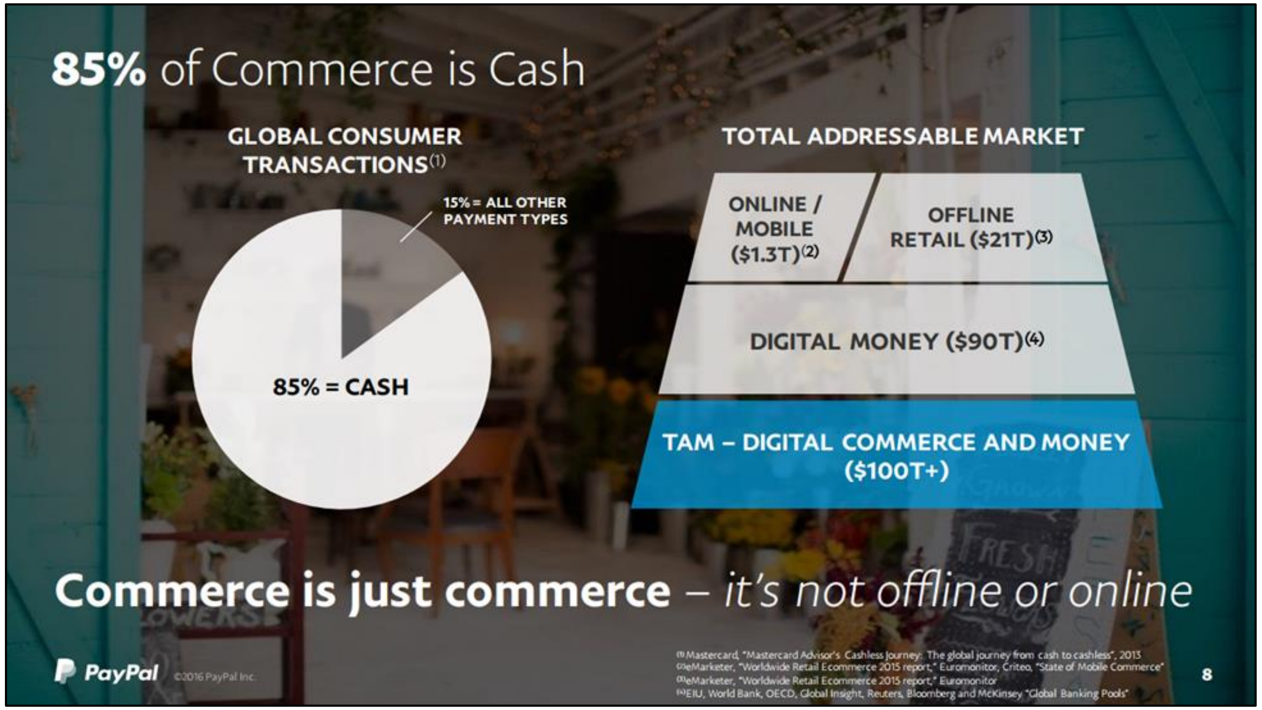
What is the Total Addressable Market?

What is the Total Addressable Market?

- Have seen multiple different numbers as to the estimate
- However, the point is: the total addressable market is large, there is still ample opportunity for the card networks, and the runway for increases in purchase volume and transaction volume is still in-tact
- “*Do you need to know how much a man weighs to know if he is fat or not?”*…as for the payment industry, the opportunity is still large enough, despite the differences in estimates as to the total addressable market.

What is the Total Addressable Market?

- Bernstein estimates that the total addressable market is about $30 trillion, excluding China, as it is a closed market
  - Bernstein believes the $30 trillion estimate is conservative
  - Based on purchase PCE, hand adjusted by region to exclude certain components where there is no purchase transaction
  - Around 80% of global PCE is the "addressable market" for potential purchase volume
  - This equates to around 48% of global GDP
- PayPal believes the addressable markets are
  - $1.3 trillion for online/ mCommerce
  - $21 trillion for physical retail



What Supports this “*Estimate*” of “*Large Opportunity*” ?

- Card penetration of purchases is still “low” and is growing quickly
- Card penetration in some countries is still ~nascent
- Around 80% of all payment *transactions* (not to be confused with payment volume) is still done in “cash”
- MasterCard has said the payment *volume* still done in cash/check is 42% on a consumer basis
- Continuation of growth in e-commerce sales, which are 3-4x the growth of the physical retail sales in US, and yet still only a fraction of total retail sales volume
- Online market share of card payments is >85% versus offline is ~37%
- Government intervention and desires (see: India/ Modi) will help increase electronification of payments and improve the under-banked person penetration
- Still a larger portion of world is under-banked, and card accounts directly tied to bank accounts in most cases
- Mobile-POS should further increase card penetration
- Square/ PayPal, others, are helping lower cost of physical infrastructure for merchants to accept payments, which could encourage merchants that predominantly transacted in cash due to cost barriers, to adopt card payments

Estimates of Total Addressable Market

- United States = **$8.9 trillion Volume / 58 billion transactions still cash/check (2015)**
  - 68% of US Personal Consumption Expenditures
  - March 2017 Annual Rate is $13.1 trillion
  - Visa has $3.1 trillion in payment volume (LTM) or 34.8% market share of total addressable market in the U.S.
  - MasterCard has $1.3 trillion in payment volume (LTM) or 14.6% market share of total addressable market in the US
  - Combined: V/MA have ~ 50% market share of the total addressable market in the US. This is not based on total volume but rather payment volume, V/MA have higher share including cash volume. AXP, DFS, Prepaid, EFT have the remaining non-cash market share.
  - Remaining market share: cash/check at ~25-30% of payment volume
- Europe = **$10 - $12 trillion**
  - 80% of Household Consumption Expenditure
  - Visa has $1.63 trillion in payment volume (LTM) in Europe, or ~15% market share of the total addressable market
  - MasterCard has ~$900 billion of payment volume (LTM) in Europe, or less than 10% of the total addressable market in Europe
- Bernstein estimates that around **$30 trillion** is actually addressable for the card networks globally (ex-China)
  - Visa has $8.85 trillion in total volume, $6.27 trillion in payment volume (LTM)
  - MasterCard has $4.9 trillion in total volume, $3.5 trillion in payment volume (LTM)

Estimates of Total Addressable Market

- Based on household spending data from OECD, excluding China and Russia, household spending in 2015 was $43.7 trillion
- Hard to pin down exactly the exact addressable market size, but could be helpful to have a range
  - 60% of PCE = $26.22 trillion addressable market
  - 80% of PCE = $34.96 trillion
- Better to think that the opportunity is still substantial on a "payment volume" basis (versus the common statement of "85% of the worlds transactions are done in cash. This is misleading as the card networks earn about 35-40% of revenue based on the payment volume, where as the transaction volume is the basis for the processing fee)
- **Range of $26 trillion - $35 trillion opportunity for addressable card payments (excludes 20-40% of payments that cannot be done in card, yet)**
- Given that Visa and MasterCard have payment volume of ~$10 trillion, and the industry outside of China operates as a duopoly (Discover, AXP have smaller share), there is **still** tremendous opportunity for Visa and MasterCard

Global Purchase Volume Drivers & Forecasting

Why is ‘Payment Volume’ Important?

- Payment Volume is an important metric as a majority of the industry revenues are a derivative of payment volume
  - Interchange fees
  - Merchant discount rates
  - Card networks assessment fees / processing fees
  - Payment volume also closely relates to purchase transactions
- Purchase transactions are another metric that supports industry fees
  - Fixed fee per transaction
  - Domestic assessment fees
- Although its difficult to be precise, it is still futile to estimate payment volume as this represents the opportunity for the global players (Visa, MasterCard, American Express, Discover….) as well as providing potential comfort in the runway for growth (a part of the “margin of safety” if ample opportunity vs. limited)

Payment Volume

Growth in: Payment Volume

Macro

Growth in: Personal Consumption Expenditure that *could* be paid with cards

Secular

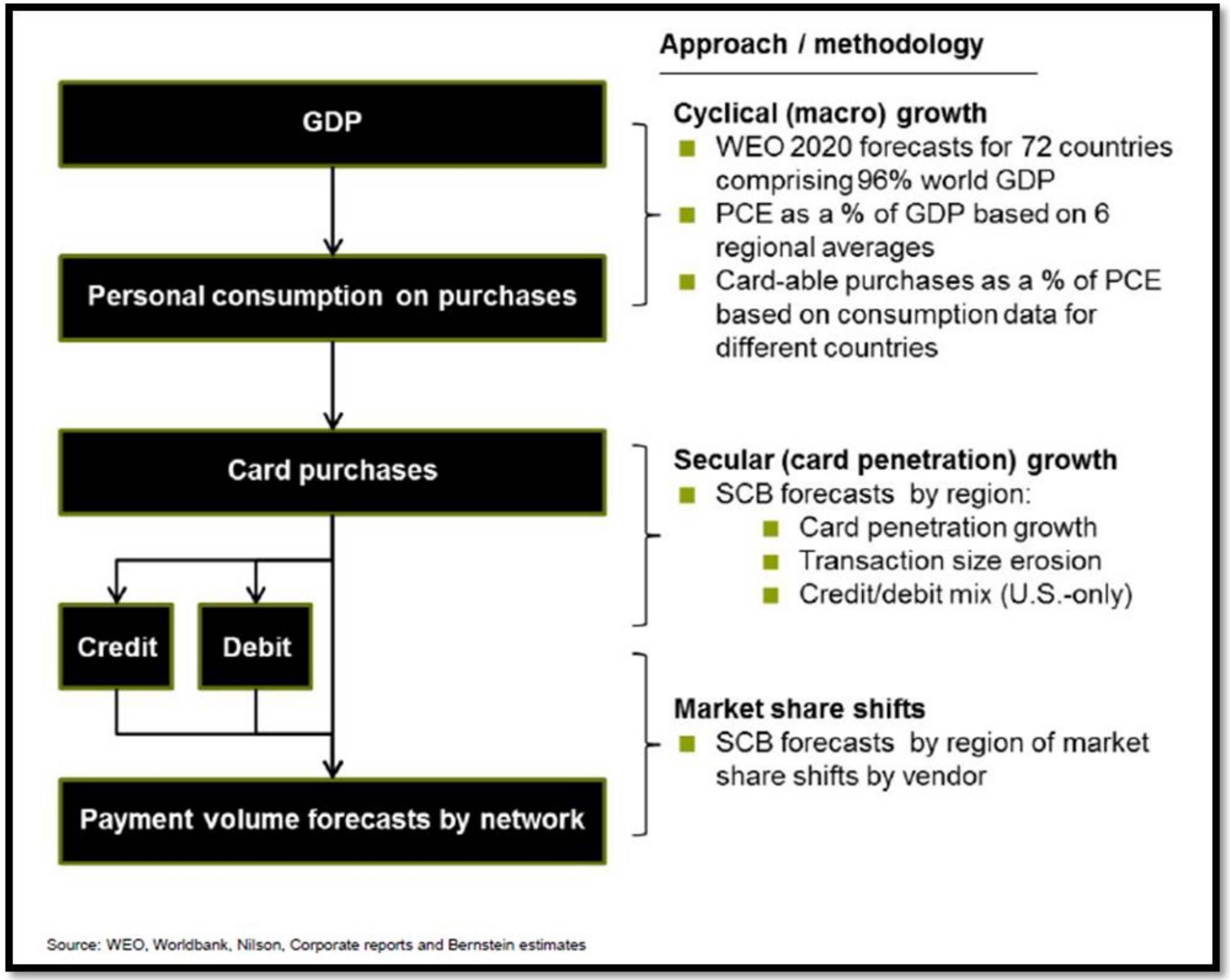
Growth in: Card payments as method of payment vs. cash / check

Specific to Company

Growth in: Market share gains of gaining merchant/issuer business

Forecasting Payment Volume

- Bernstein has a simpler method to forecasting payment volumes
- The foundation of payment volume started with overall economic spending globally (or per region)
- As there are some figures inside GDP that are not directly addressable for card payments, the additional layer for estimating is looking at "Personal Consumption on Purchases" (**PCE**)
- My discussion with the card networks is consistent with this methodology, which is using PCE as the "foundation" for estimating market share and potential opportunity



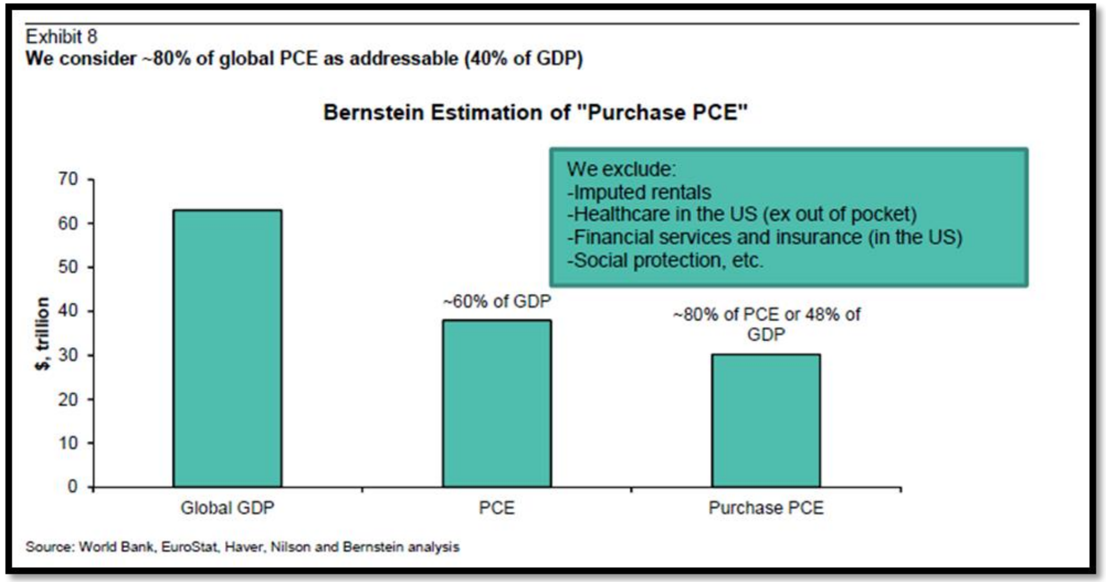
Forecasting Payment Volume

- If the cards in circulation stayed the same, all things being equal, the growth in purchase volume should be roughly in line with the growth in PCE
- How can growth be faster than PCE?
  - Market share gains of cards vs. alternative methods of payments (cash, check, ACH)
  - Market share of the card networks over each other
  - Mix of payment type (credit vs. debit, for example) and the associated pricing
- The growth of electronification of payments (i.e. increased usage of cards as a payment method vs. cash/check) lifts the tide for all boats (secular growth opportunity)
- Market share gains of MasterCard vs. Visa, for example, is based on the competitiveness of those businesses (competitive forces/ company-specific)

Foundation of Payments Addressable Market: PCE

- Personal Consumption Expenditures is about 60% of global GDP
- However, not all of PCE is an opportunity for card payments
- Therefore, only about 48% of GDP/ **80% of global PCE is the opportunity**
- Excluded from PCE:
  - Imputed rentals
  - Some healthcare
  - Insurances
  - Social protection, etc.

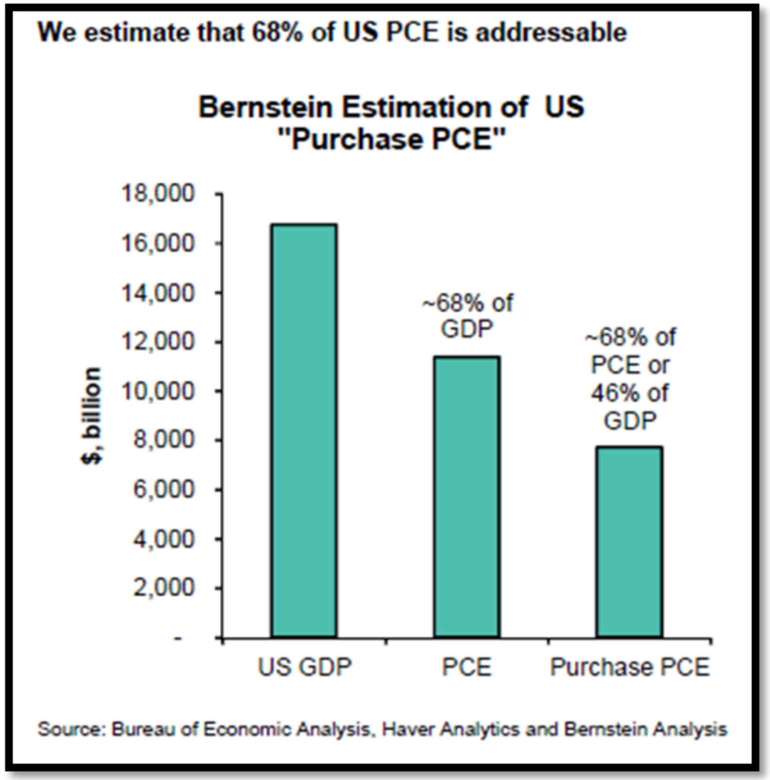
Global Estimate of Purchase PCE
(i.e. the "opportunity")

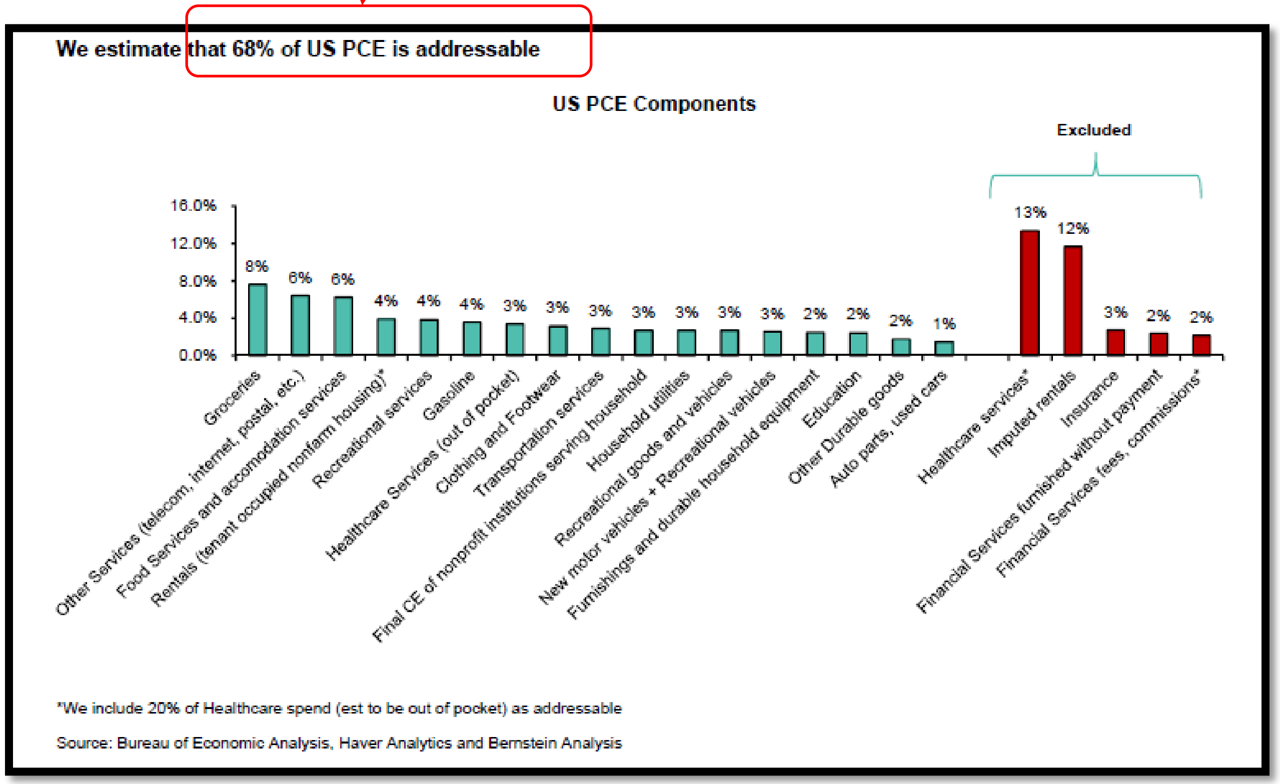


PCE Estimates: *United States*

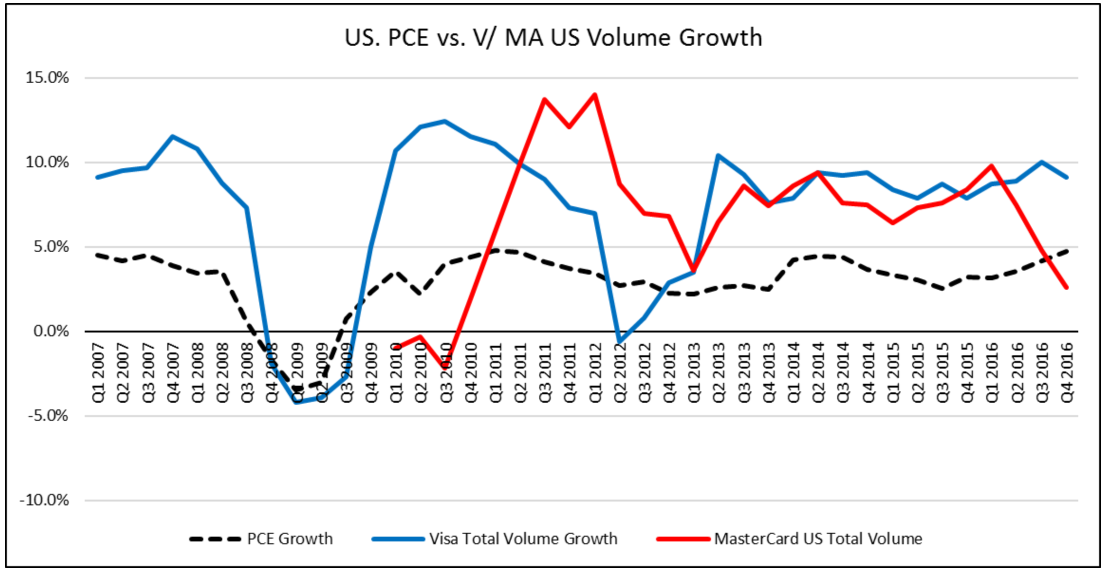
Current opportunity = **$8.9 trillion** of total addressable market in the United States

Estimate of ~ 68% of US PCE is the market opportunity for card payments



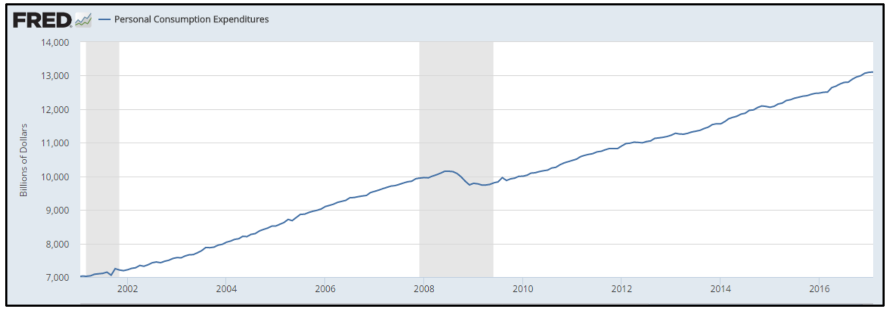


PCE Numbers: *United States*



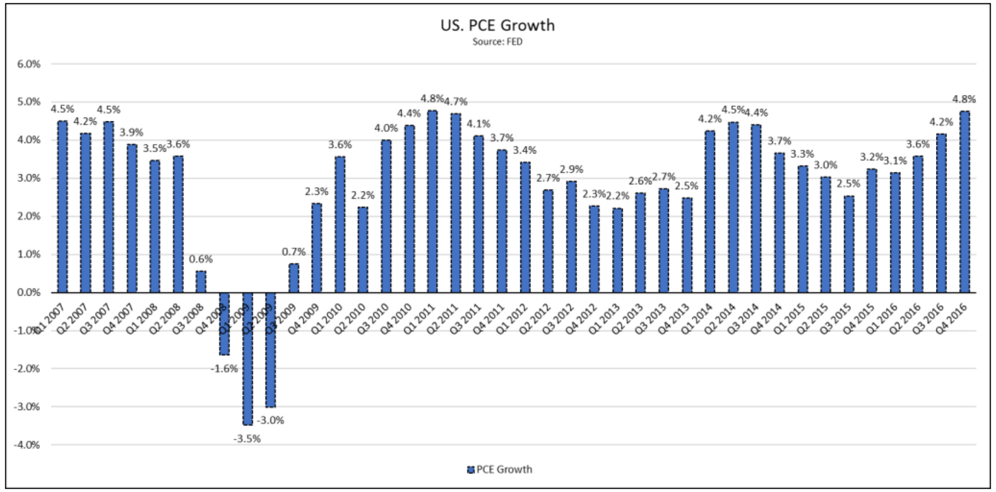
Comparing US. PCE vs. Visa and MasterCard Total Volume Growth

- V/MA constantly ~2x the growth rate of the US PCE
- V/MA growing faster than PCE due to market share gains vs. competitors and increased market share gains of card payments vs. alternative payment methods
- Some volume growth differences based on company-specific new contracts



Fed estimates an annual rate for US PCE of **$13.1 trillion**
At ~ 70% as the addressable market opportunity **= $9.2 trillion payments opportunity**

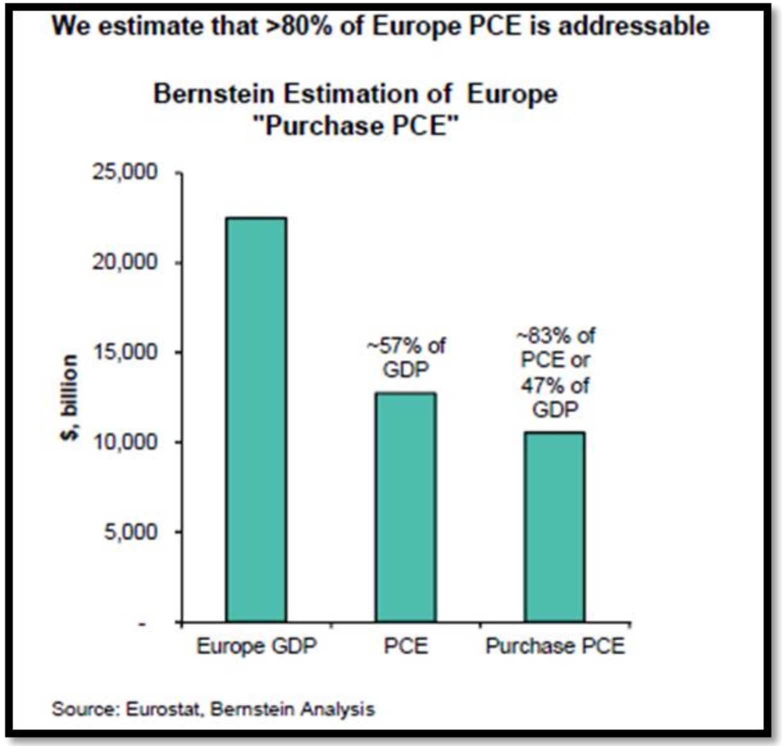
US PCE constantly growing at ~2x the US nominal GDP number

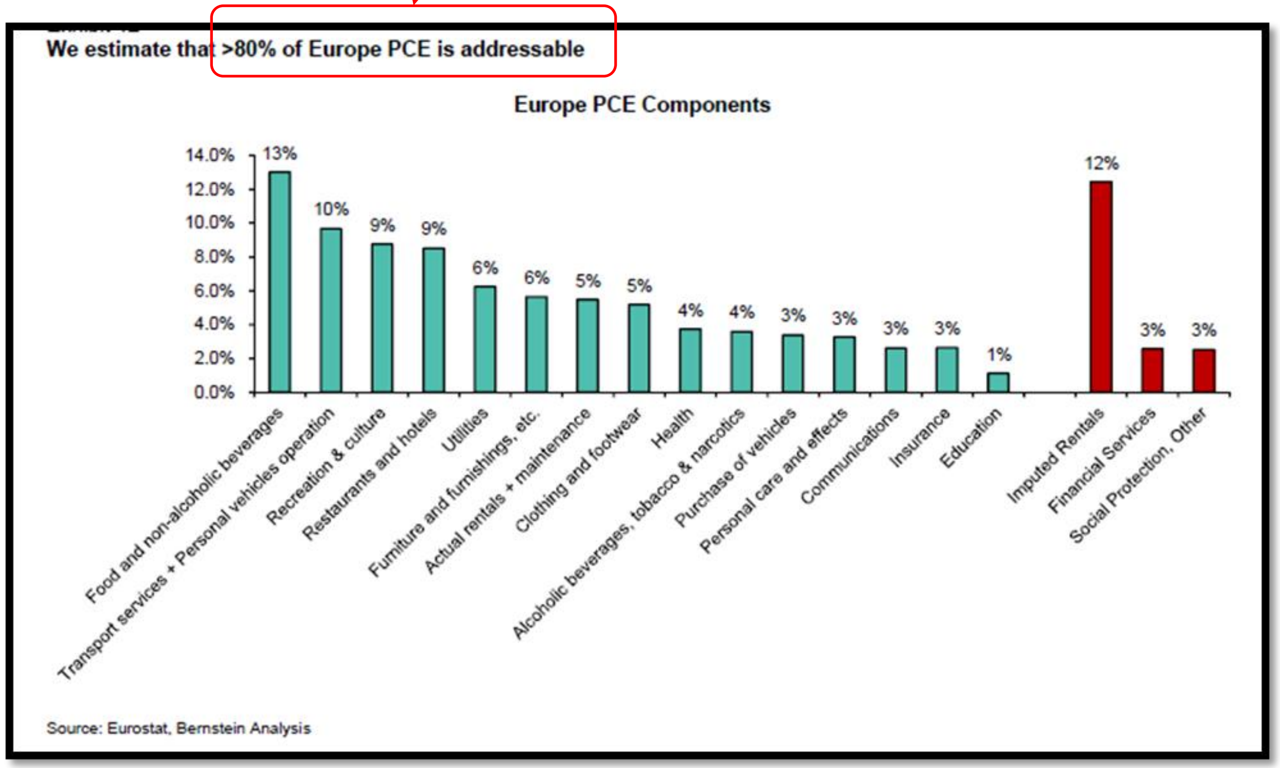


PCE Estimates: *Europe*

Current opportunity = **$10-12 trillion** of total addressable market in Europe

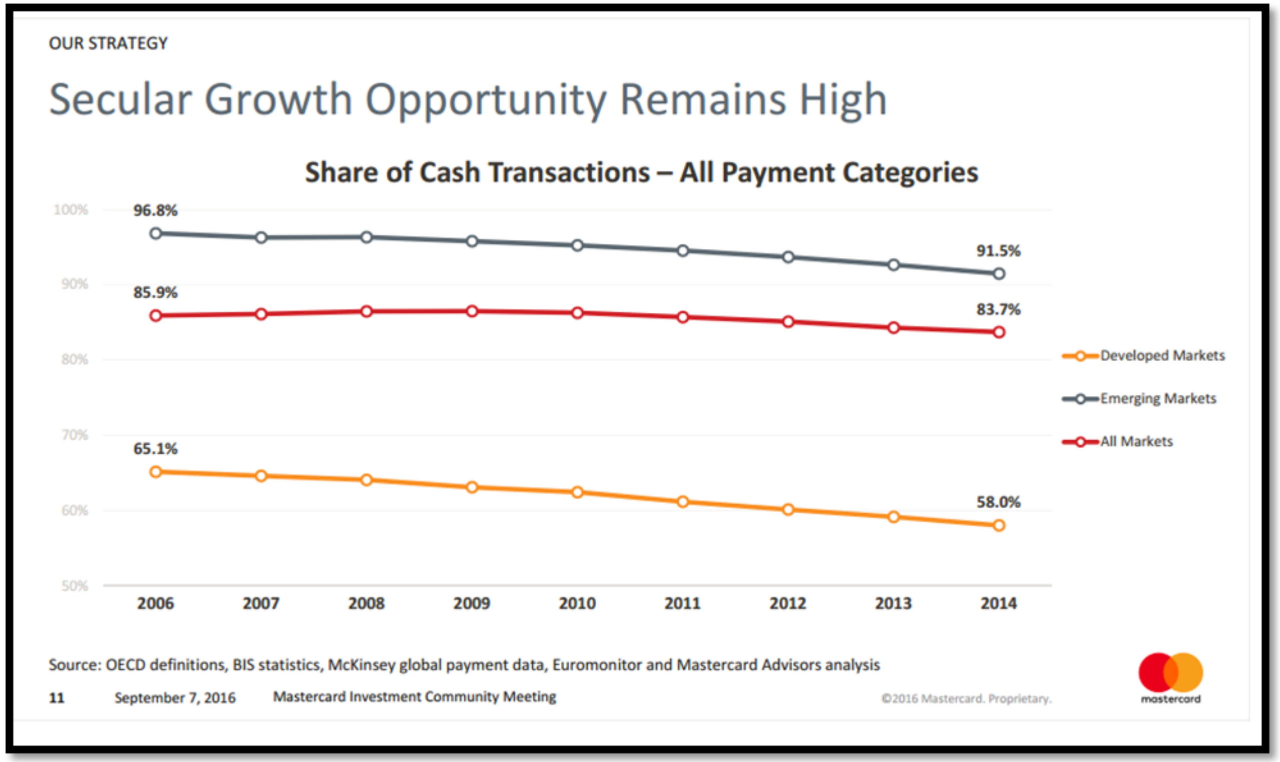
Estimate of ~ 80% of Europe PCE is the market opportunity for card payments





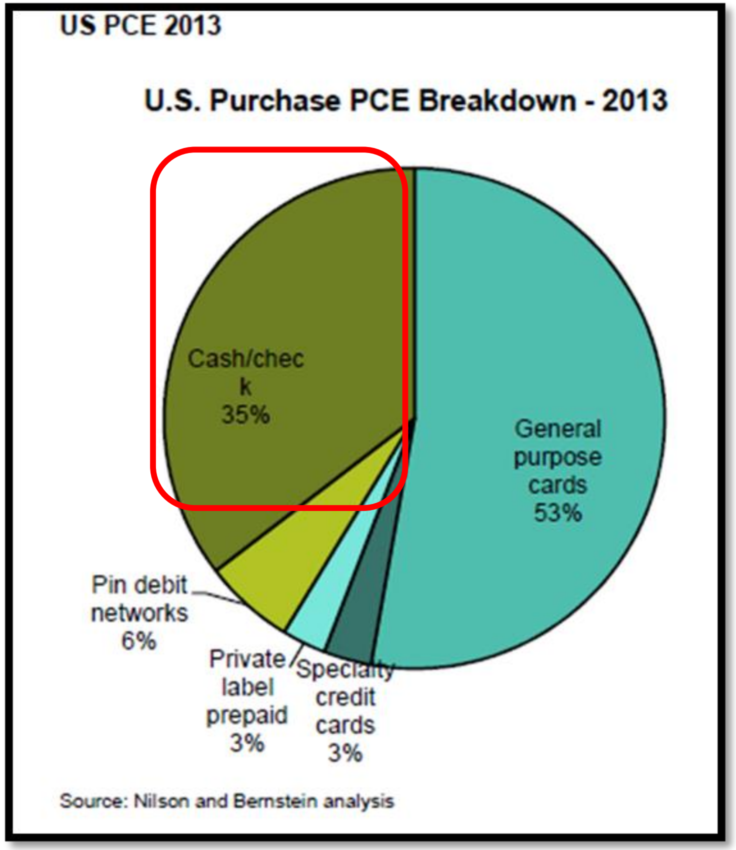
Secular: Cash Transactions Remain High

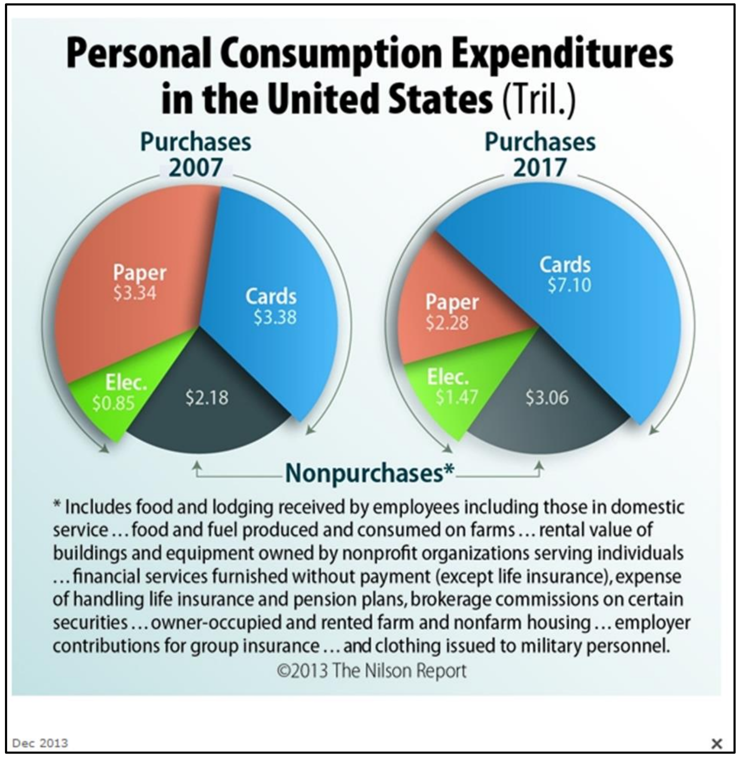
- Globally, ~80% of payment transactions are done in cash
- Emerging market opportunity to convert transaction to card is far higher than in developed markets
- ~90% of emerging market transactions in cash
- >50% of developed market transactions still done in cash
- Some industry fees are based on transaction count vs. transaction volume
- However, majority of fees come from the volume, not the transaction, thus important to know the volume of payments still done in cash/check and not just the transaction amount
- This statistic *("85% of transactions globally are done in cash*") is overused and misleading, in my opinion, for this reason.



Secular: Cash Transactions Remain High

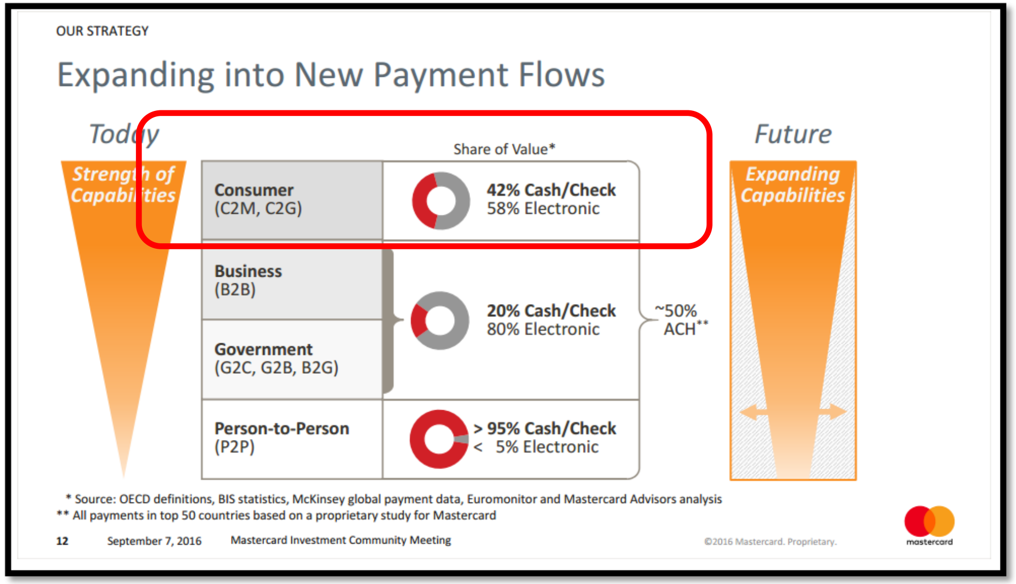
- In the United States, cards are gaining market share, but the volume in cash still represents a large opportunity
- Nilson (2013) found that 35% of purchase PCE (the opportunity) was still done in cash/ check
- Card payment varies based on:
  - Transaction size
  - Item of purchase (high card purchase penetration for food, drinks, travel, clothing, etc.)
  - Low penetration for cards for utilities, telecom, insurance

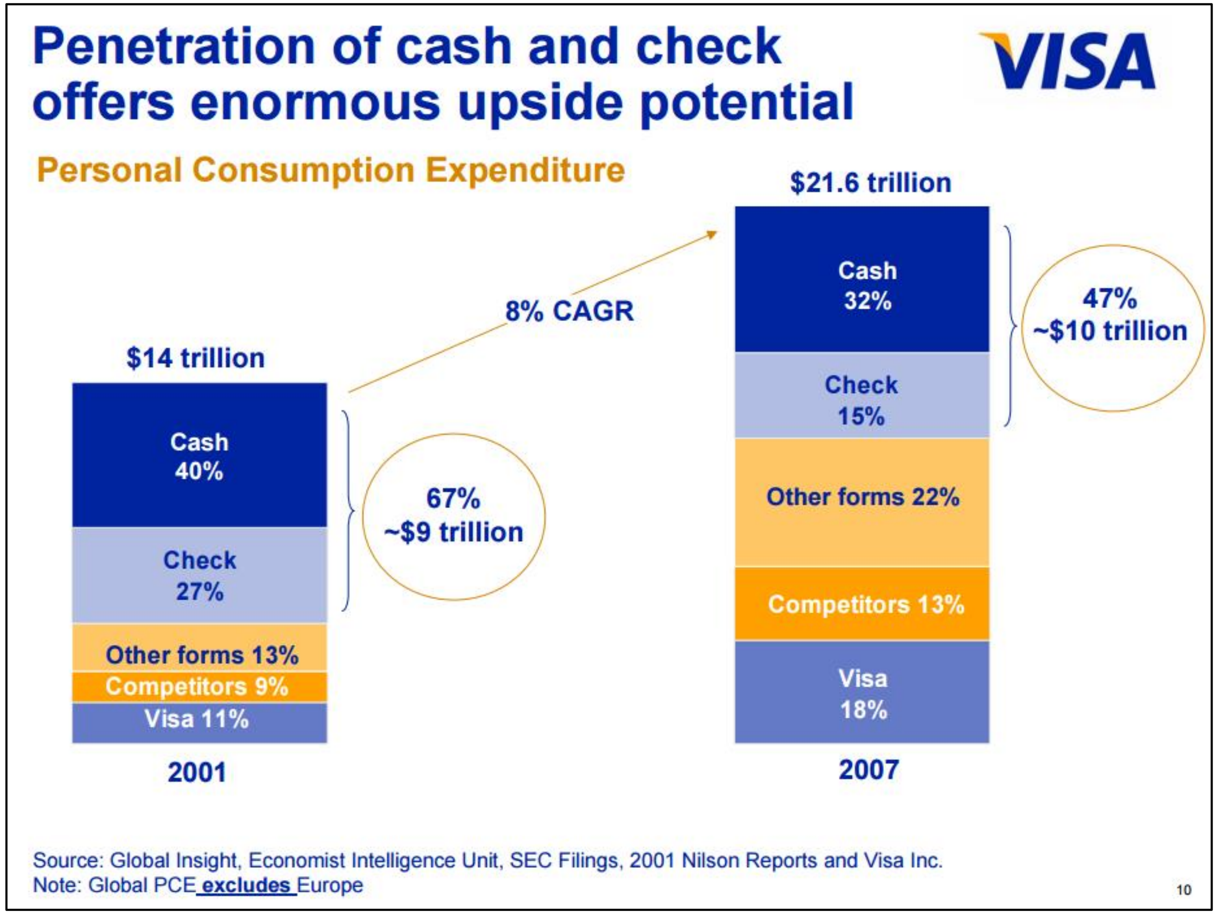




Secular: Cash Transactions Remain High

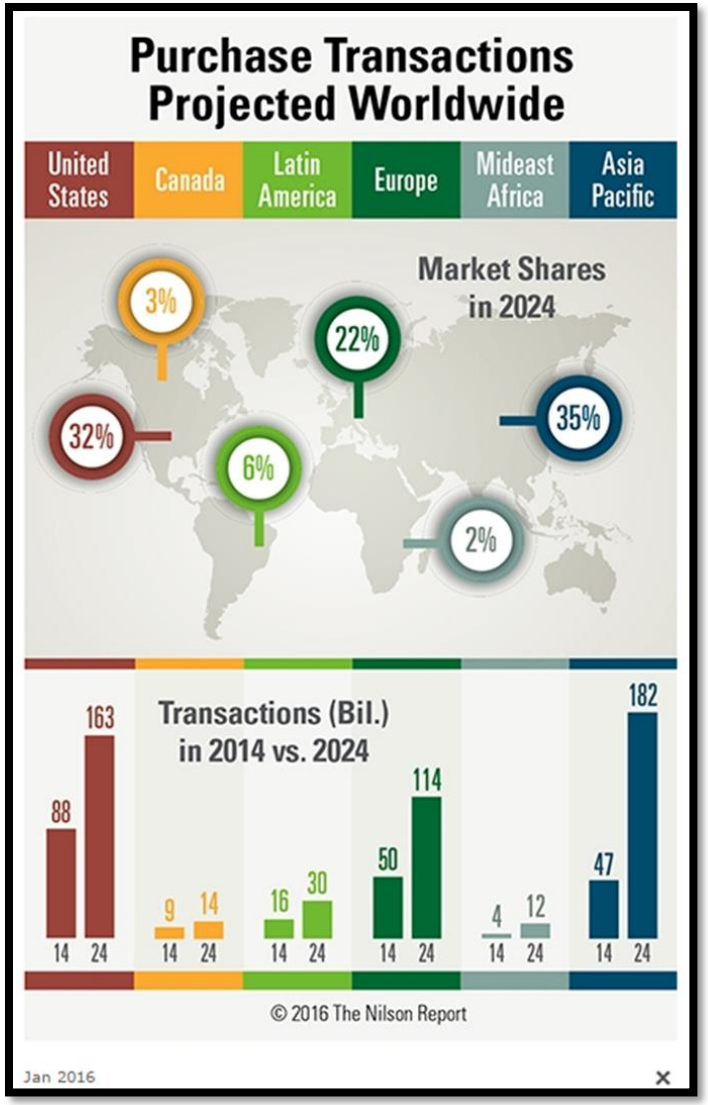
- MasterCard provided additional information as to the volume share of cash/check versus electronic
- This also helps show potential in other categories besides C2B, which is where Visa and MasterCard (and other players) are heavily focused on
- Visa (from 2010) provides a cleaner example of how to understand the drivers of potential opportunity
    - PCE Growth
    - Card Penetration vs. Cash/Check
    - Visa takes market share



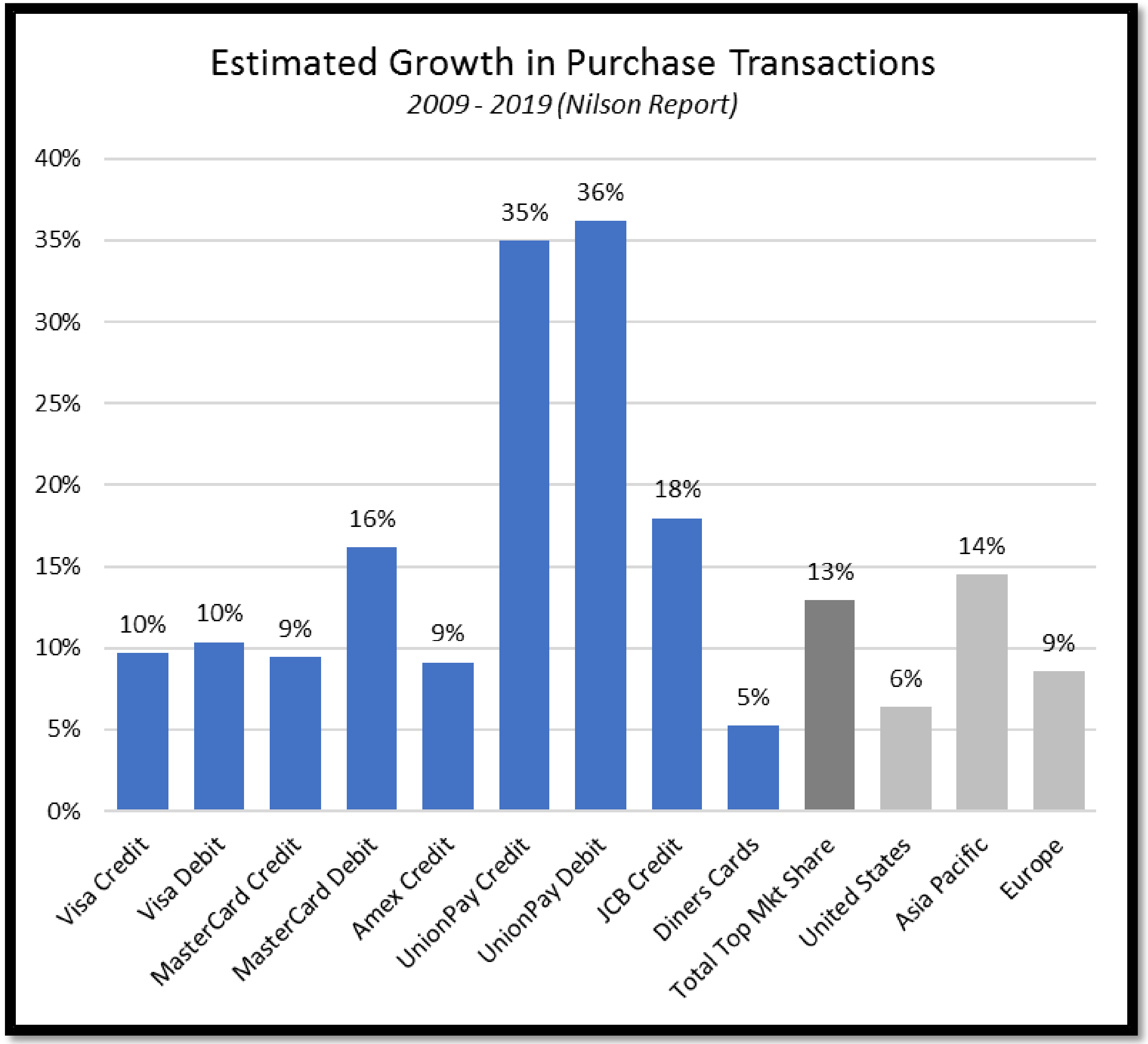


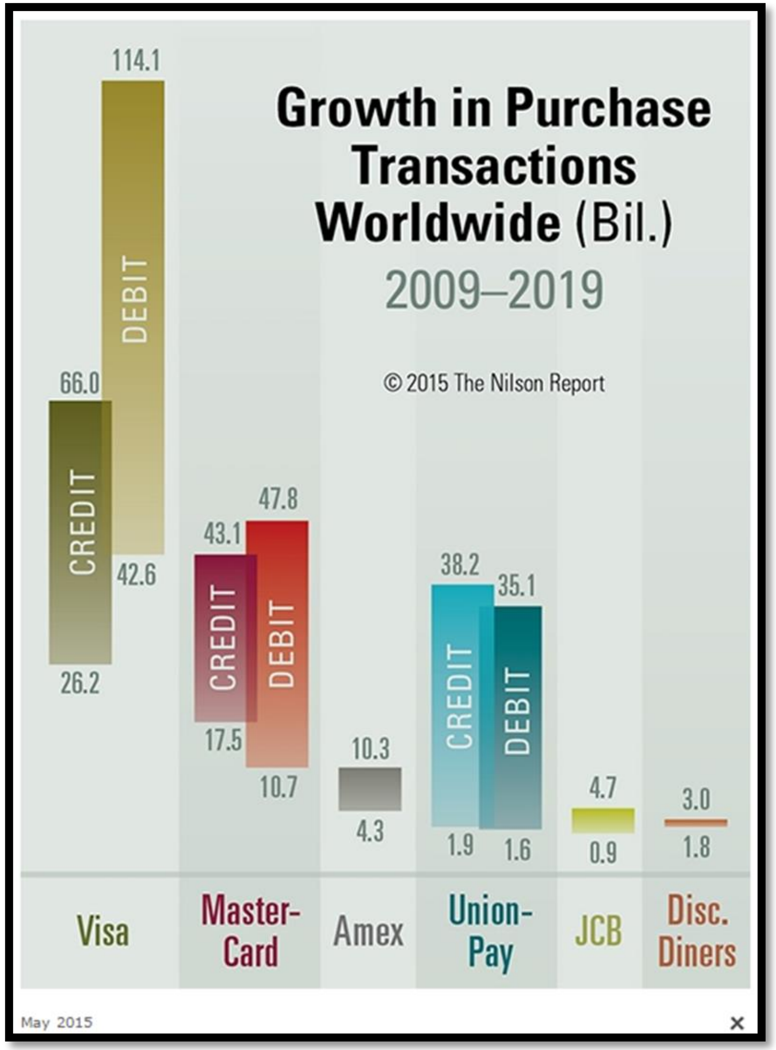
Secular: Cash Transactions Remain High

- The secular shift of cash/check → card is one of the largest driving forces as to why the card networks are expected to grow transaction volume above GDP and PCE
- From Nilson Report:
  - Global transactions in Asia Pacific will surpass the United States in 2024
  - US + Europe + Asia Pacific will account for 89% of global transactions
  - Despite the growth opportunities in other regions – Latin America, Africa – those top 3 regions are where investors should focus on in terms of growth drivers for the card networks
  - Given Visa and MasterCard's strong global presence, they will be a participant in the global growth story versus just relying heavily on the US market
- Expected growth in transactions from 2014 - 2024
  - United States + 85%, a 6.3% CAGR
  - Asia Pacific + 287%, a 14.8% CAGR
  - Europe +128%, a 8.6% CAGR



Electronification: Growth in Purchase Transactions by Card Network





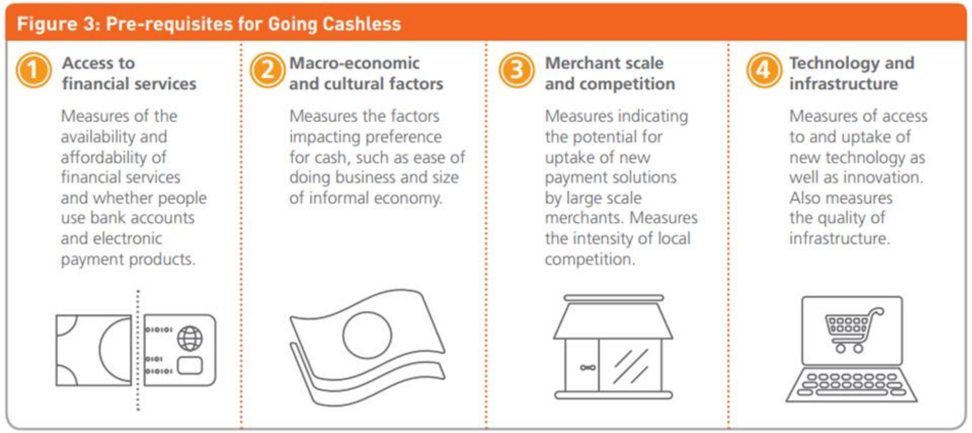
Secular: Going From Cash to Non-Cash

- MasterCard states there are four categories in the evolvement of a country going from using cash as a predominant payment method to non-cash payments

  1. Inception
     - Typically developing countries where cash accounts for > 90% of all transactions
     - Likely due to low financial inclusion rates, absence cashless infrastructure
     - In some countries, like Italy and Greece, preference for cash is driven by cultural reasons
  2. Transitioning
     - Mix of developing and developed, where cash is 80% - 90% of transactions
     - Japan: use of cash seems to be cultural, helped by saturated ATM network
     - Brazil and China have grown out of inception phase thanks to growing middle class stimulating new banking/ financial services
     - Spain: high cash due to sluggish economy
  3. Tipping Point
     - 29% - 45% cash usage, factors appear to be in place to move from cash to non-cash
  4. Advanced
     - Nearly everyone has debit card and merchant acceptance is ubiquitous
     - Benefits of paying cashless is well understood

Secular: Going From Cash to Non-Cash

- MasterCard states the readiness for going cashless depends on:
  - Infrastructure
  - Financial inclusion
  - Merchant scale and competition
  - Macro and cultural factors
- Chart (*right*) is of estimated percentage of payment transaction done using non-cash methods

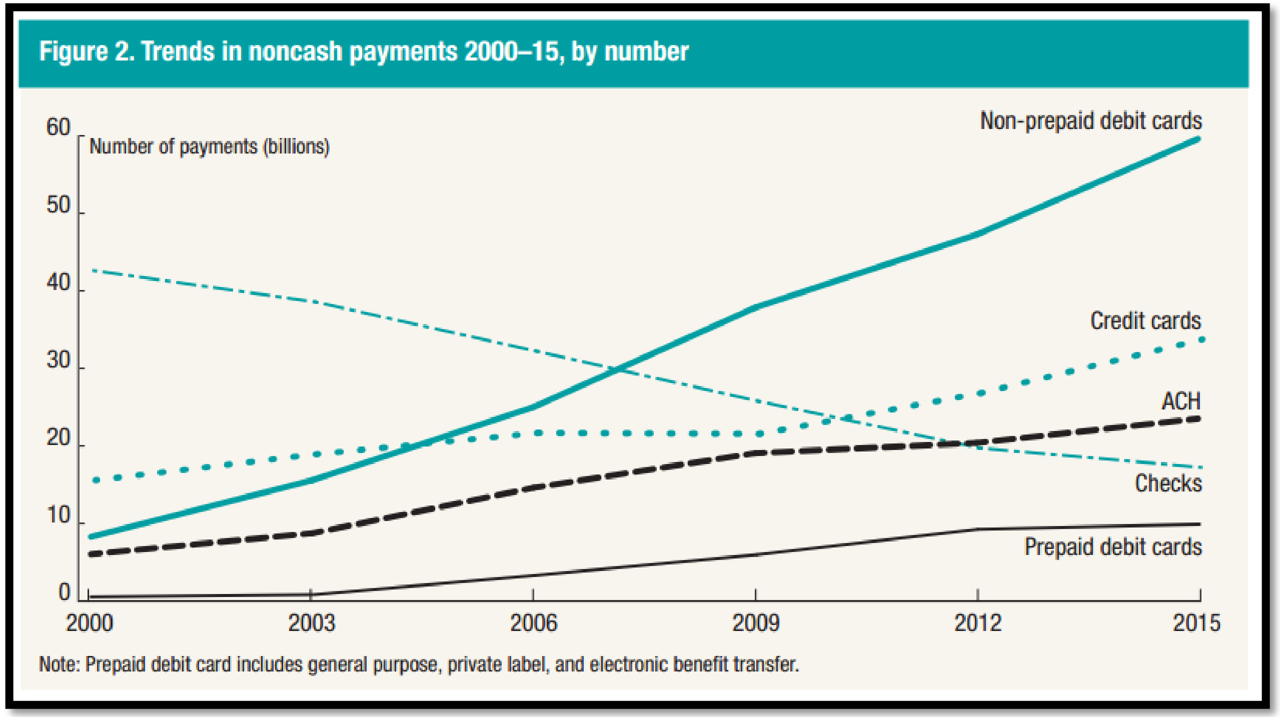


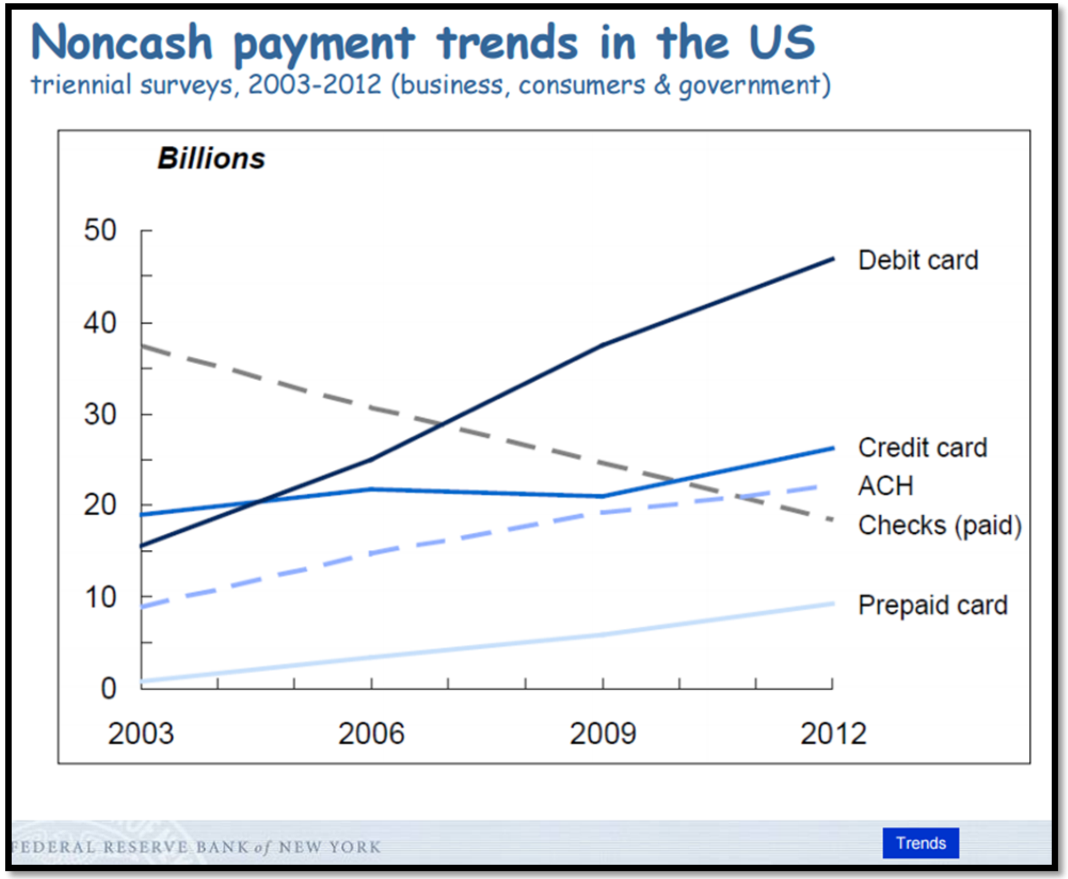
Secular: Going From Cash to Non-Cash

- MasterCard shares what they believe is the "readiness" by country to go from cash to non-cash, based on the pre-requisites they believe allow for the transition

Modi's (India) attempt to push electronification of payments in India has a long runway, as a vast majority of transactions are still in cash

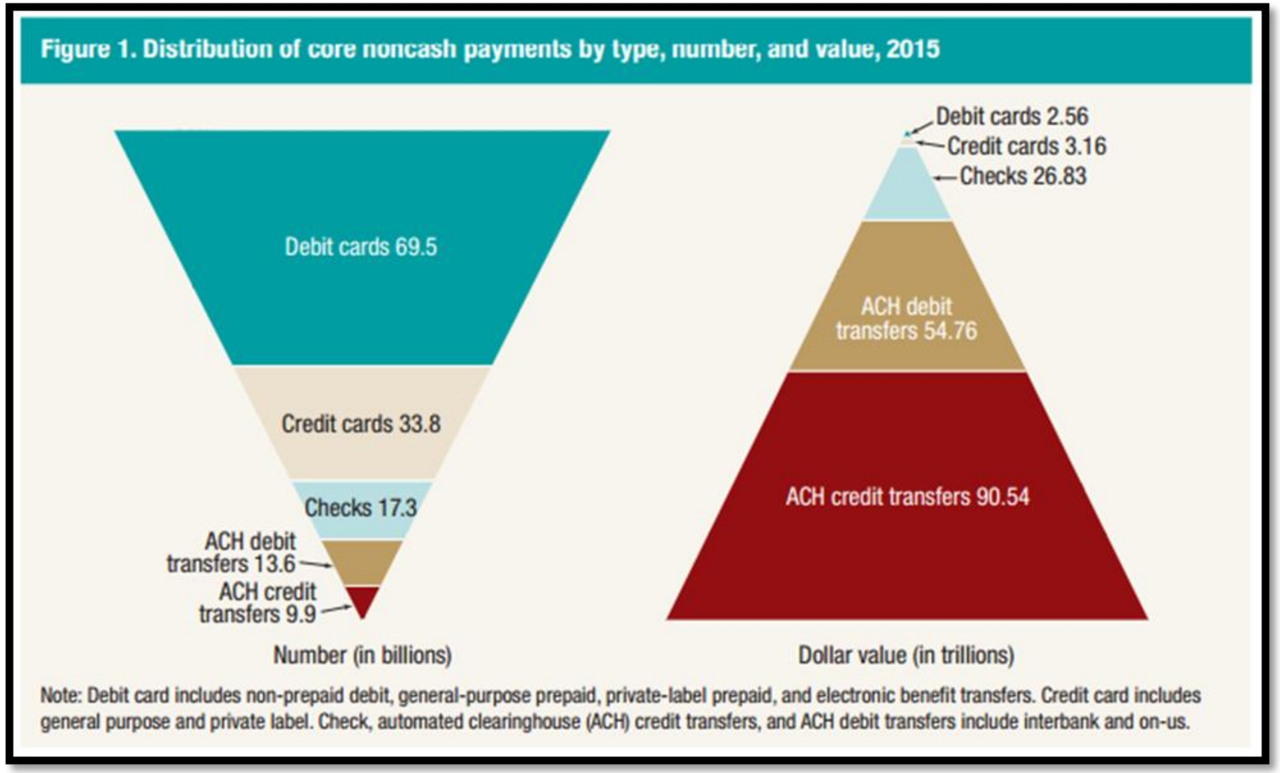
Secular: Payment Trends: **U.S.**





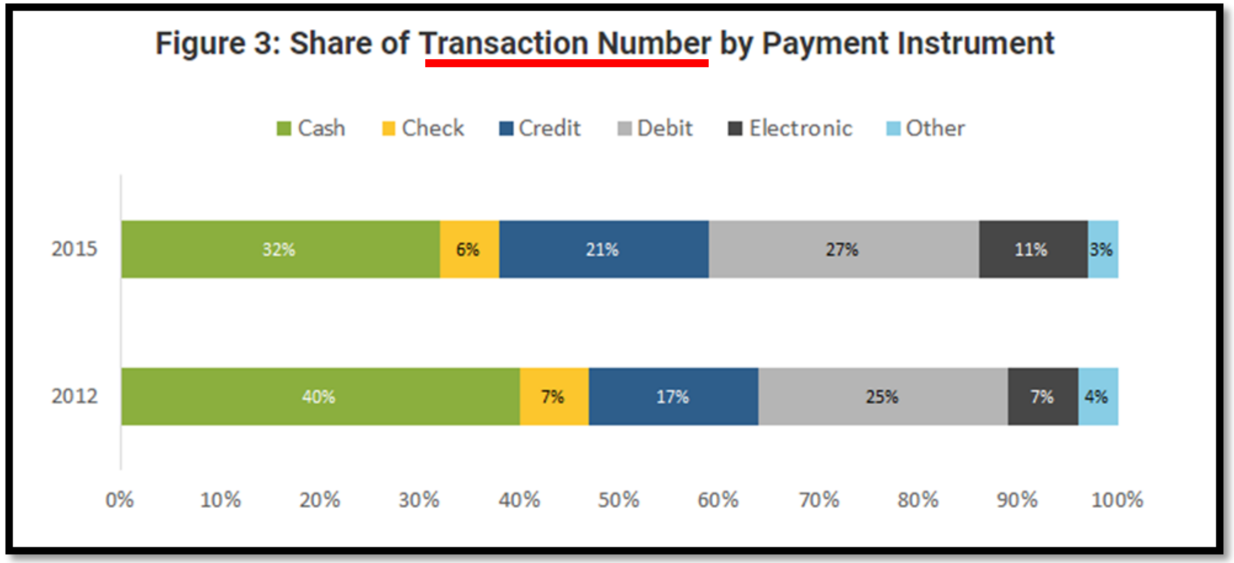
Secular: Cash Transactions Remain High: **U.S.**

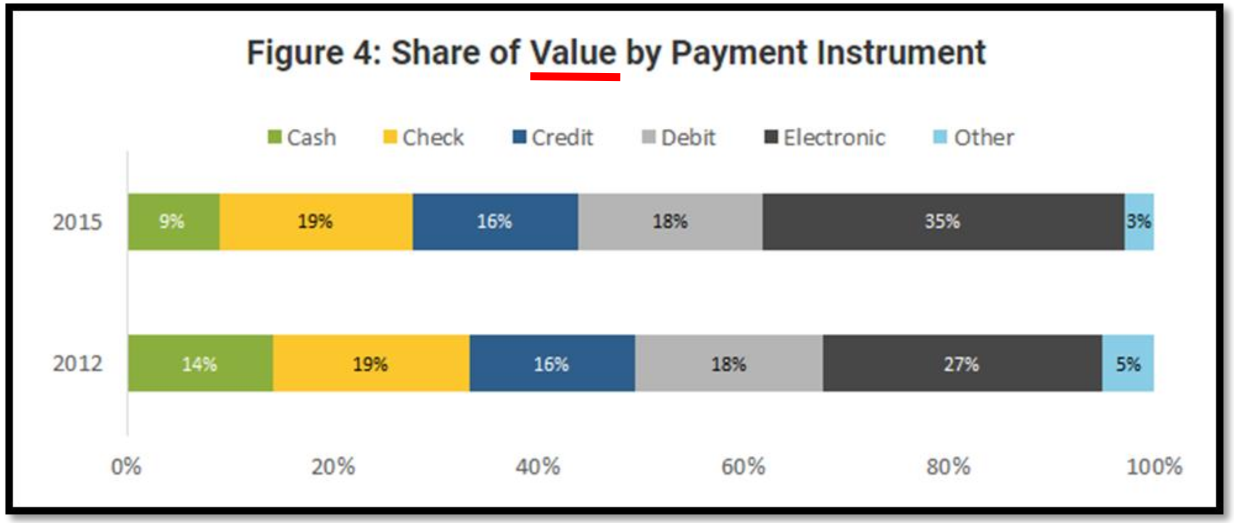
- Chart on right
  - Distribution chart on left side is base on the number of payment transactions
  - Distribution chart on right side is based on the dollar value of those transactions
- In terms of transactions, debit and credit cards dominate, with debit ~2x credit
- In terms of dollar value, ACH credit dominated heavily
- Debit has the largest share of transactions but the smallest share of payment volume
- Debit = large number of smaller purchases



Secular: Cash Transactions Remain High: **U.S.**

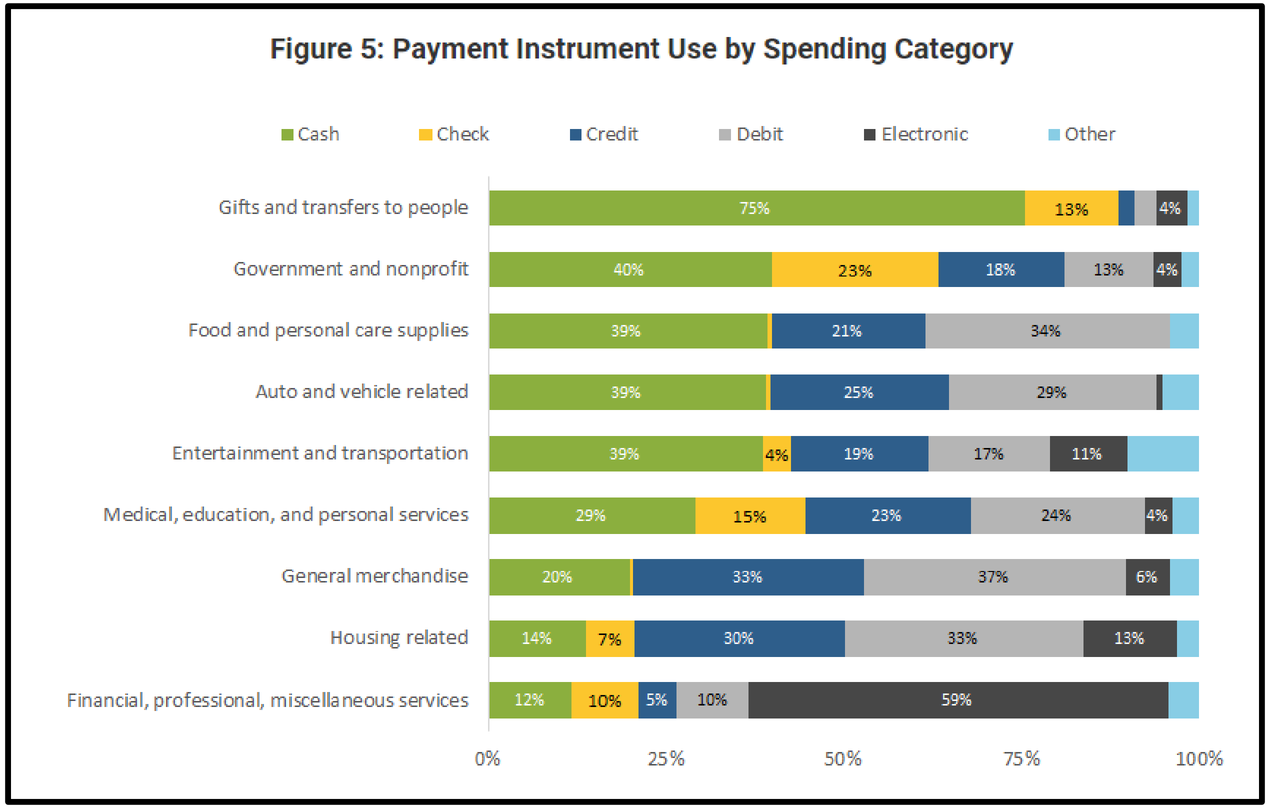
- ***What is the opportunity in the U.S.?***
  - Cash continues to be the most frequently used consumer payment instrument
  - Cash is widely used in a variety of circumstances
  - Cash dominates small-value transactions
  - The average value of cash holdings has grown
- 2015 = 32% of consumer transactions were made with cash
- 2012 = 40% of transactions were made with cash
- Debit + Credit = 48% of transactions, up from 42% in 2012
- Cash/check represents about 38% of payment transactions but only 28% of payment volume
- "Growing consumer comfort with payment cards and the growth of online commerce, among other factors, contribute to this trend. Nonetheless, a broad range of results suggests that cash remains resilient and continues to play a key and unique role for consumers."
- Source: 2015 Diary of Consumer Payment Choice, by Federal Reserve of San Francisco http://www.frbsf.org/cash/publications/fed-notes/2016/november/state-of-cash-2015-diary-consumer-payment-choice





Secular: Cash Transactions Remain High: **U.S.**

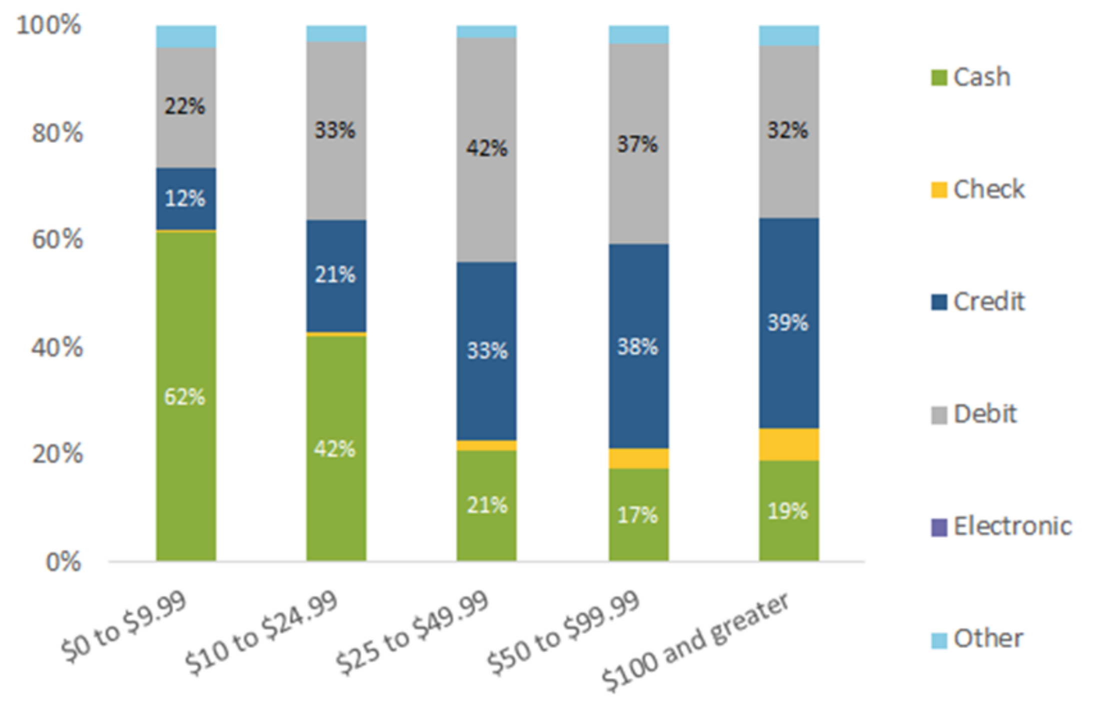
- ***What is the opportunity in the U.S.?***
  - Some of the categories that has cash and check as the most used payment type are attempted to be disrupted
  - Government payments being pushed with prepaid
  - Gifts and Transfers = PYPL/V partnership where you can transfer money with Visa debit card
  - Lower cost POS infrastructure helping more mom-and-pop food and personal care/ auto shops accept electronic payments



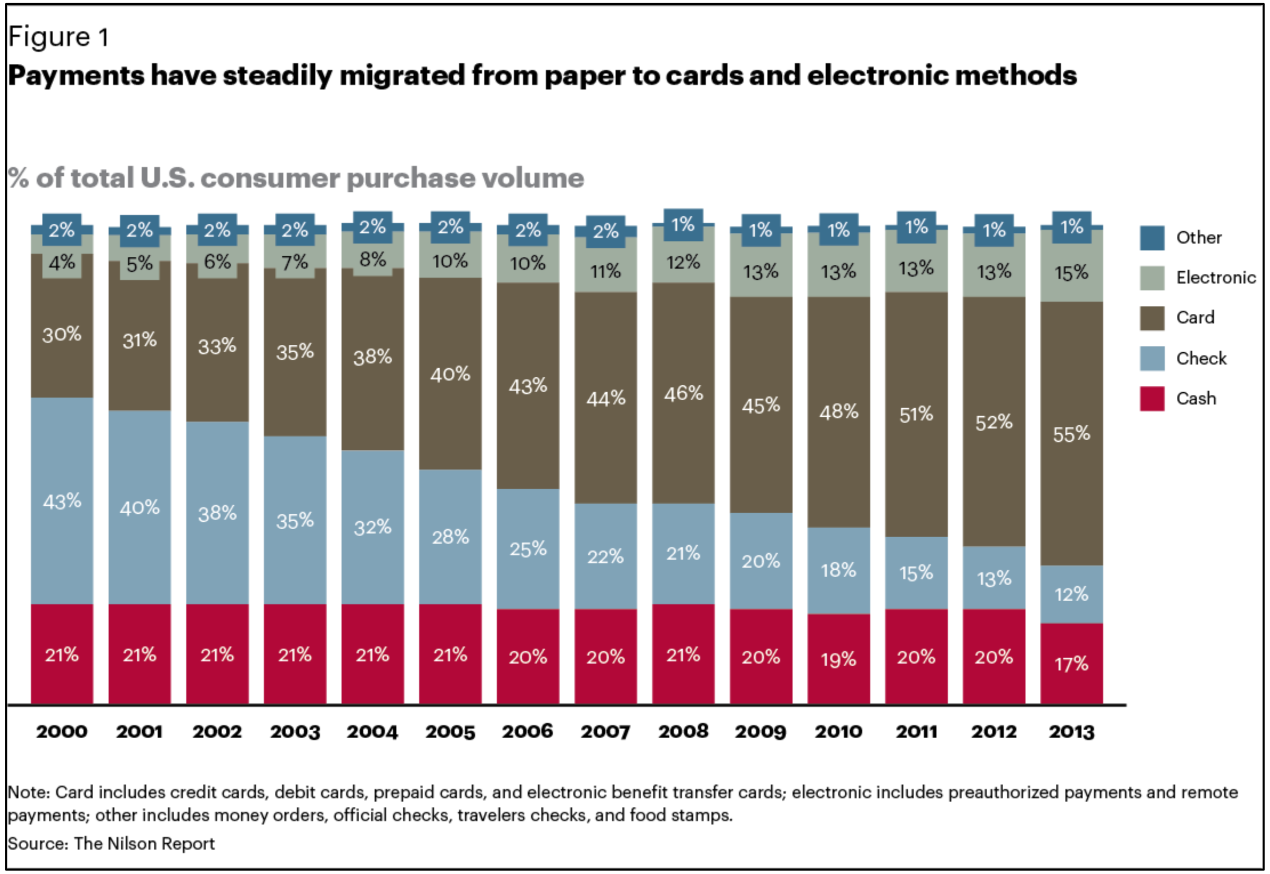
Secular: Cash Transactions Remain High: **U.S.**

- ***Some trends in US payments, by category:***
  - Cash's share for gifts and transfers increased 8% points
  - Cash share of Houston related increased6% points
  - Cash share of auto and vehicle related increased 5% points
  - Food and personal care saw cash decline from 51% to 39%
  - General merchandise from 29% to 20%
  - Cash being used for more than 50% of transactions under $25
  - Cash was used for more than 60% of purchases under $10
  - Lower income individuals had much higher propensity to pay with cash
- Why does cash dominate smaller dollar transactions?
  - Maybe merchant doesn't accept credit or debit
  - Maybe there are minimums required to use cards
  - Consumers are holding more cash, using it less frequently, as cash is becoming the backup payment option

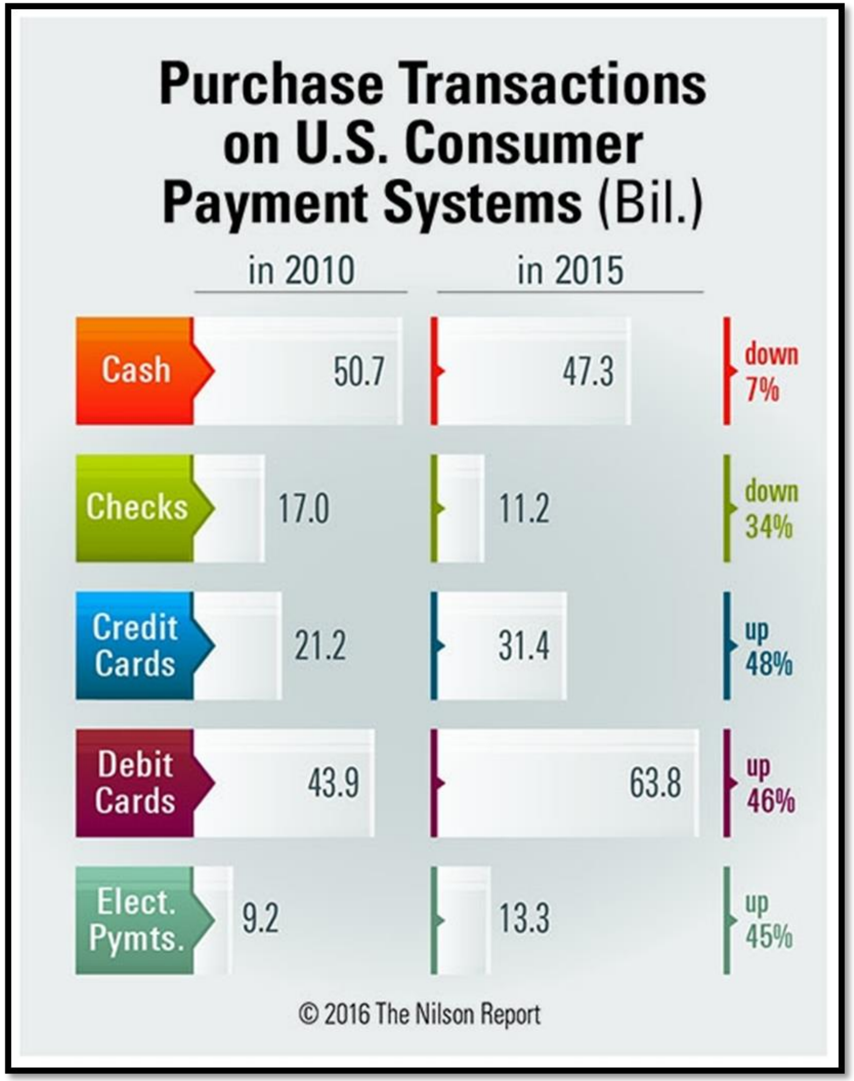
Figure 7: Payment Instrument by Amount, In-Store 2015



Secular: Cash Transactions Remain High: **U.S.**



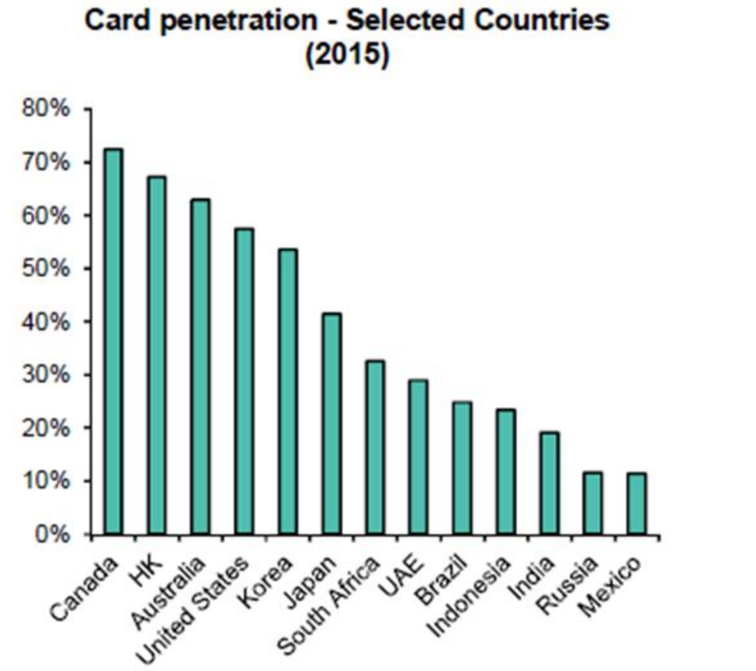
From 2000 – 2013, card payments have increased from 30% to 55% of US consumer purchase volume. Interestingly, check has been the primary market share detractor, with cash remaining fairly steady (likely smaller purchases)



Card Penetration

- Many countries still have a long runway for card penetration growth
- With the exception of Canada (> 70%), even the mature developed countries like the US (~50-55%) and Japan (~45%) have ample upside
- MasterCard stated that ~50% of all payments in the top 50 countries by volume are ACH
- In the US, ACH represented $145 trillion of the $178 trillion in non-cash payments in 2015
- ACH is another opportunity for card, as it is heavily prevalent in B2B

EXHIBIT 2: **Penetration levels of at least ~70% are attainable, as some countries are there already (e.g., Canada at 72%), while many lag far behind (e.g., Mexico ~11%), implying runway remains beyond 2020**

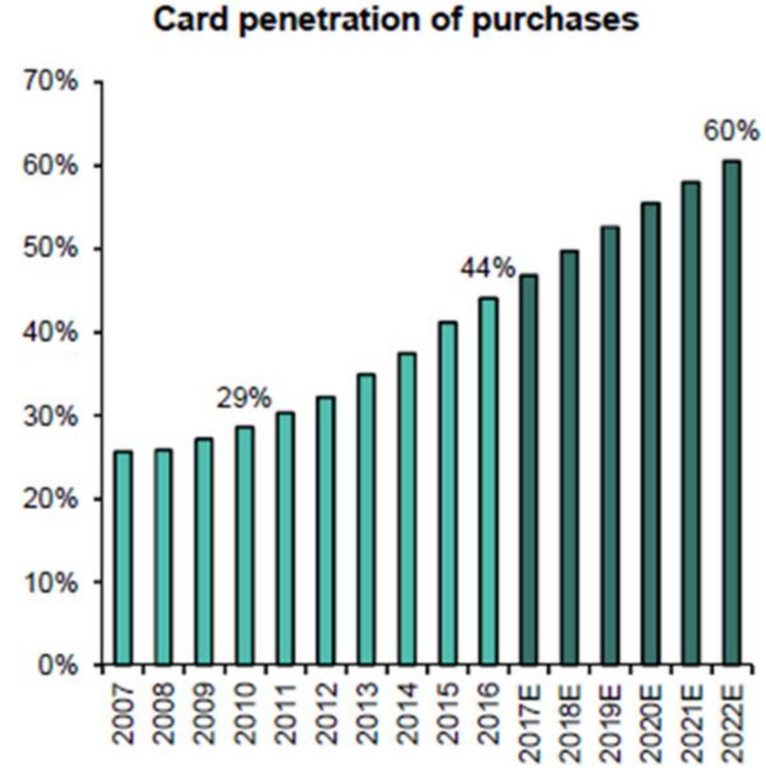


Source: IMF, World Bank, Nilson, Corporate reports and Bernstein analysis

Card Penetration: *Growth*

- Currently, 44% globally is penetrated by card in terms of global payments, is expected to reach 60% by 2022
- This would result in payments growth of 11% CAGR, according to Bernstein
- One of the **largest** drivers of the bull thesis for the card networks is the underlying secular underpinnings of the strength and growth rates of cash/check payments to card payments
- Since 2008, volume growth has been heavily aided by the secular trend of card penetration
- Furthermore, this card penetration growth has been accelerating due to a virtuous cycle of acceptance and trust among all parties involved

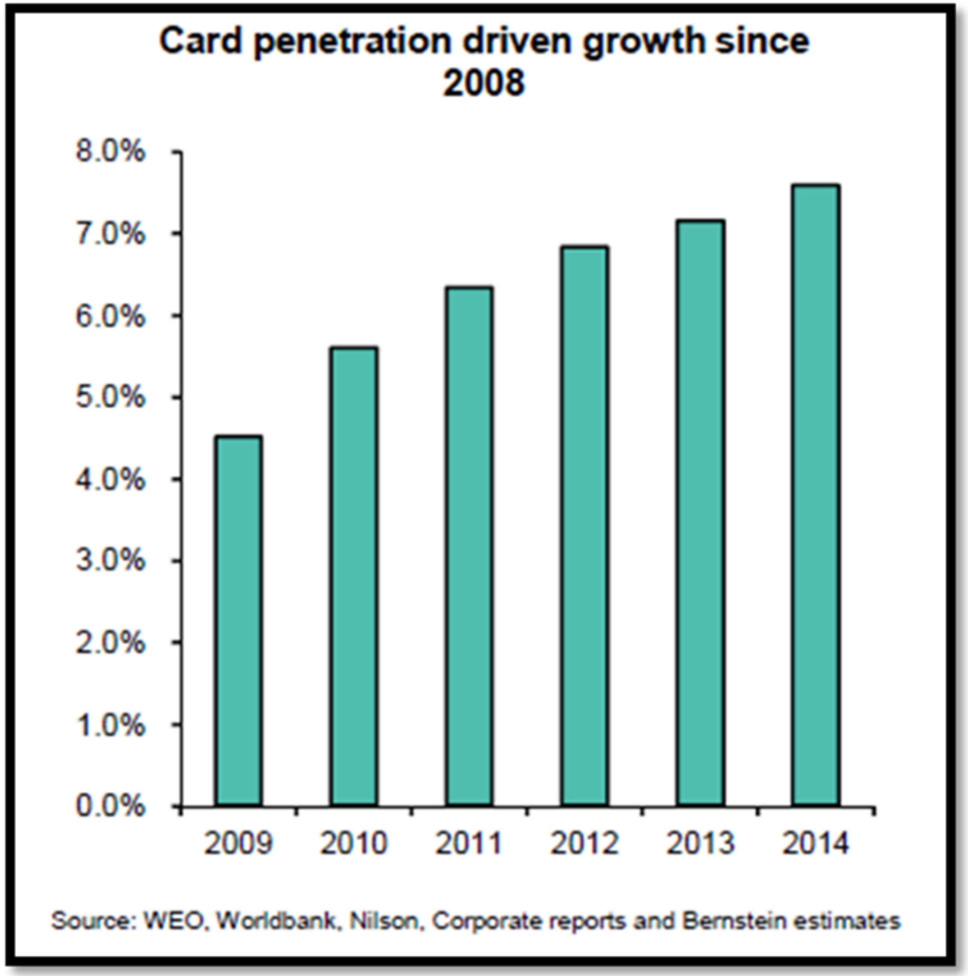
EXHIBIT 1: **Card payment penetration (with a conservatively defined denominator) is 44% today, up from 29% in 2010, and going to 60% by 2022**



Source: Nilson, World Bank, IMF and Bernstein analysis

Card Penetration Statistics

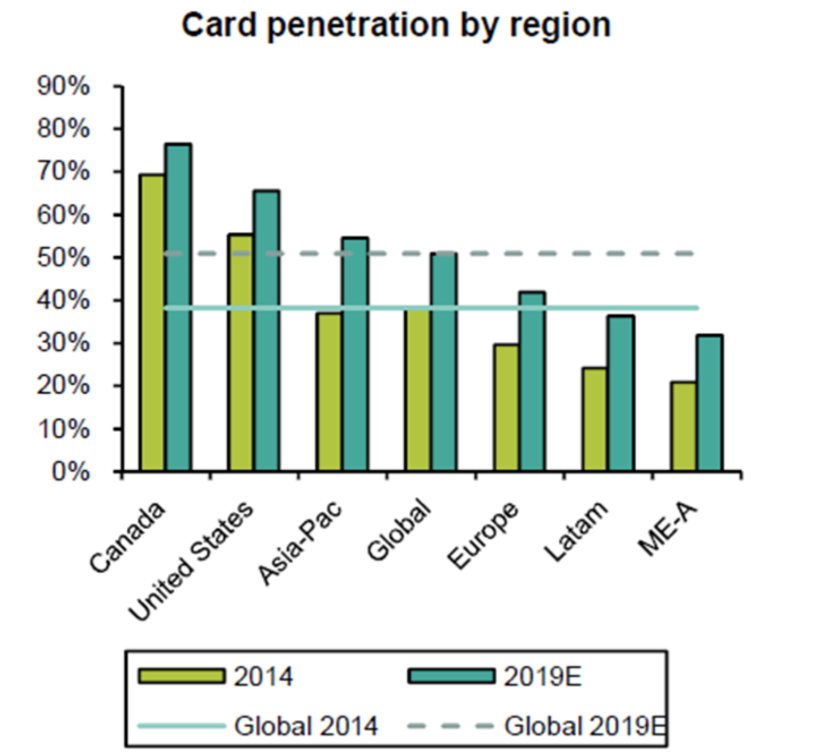
- Card penetration is expected to add at least 6%+ to underlying payment volume growth, which is slightly less than recent trends but reflects some conservatism / law of large numbers, etc.
- Payment volume expectations (Bernstein)
  - US = 9.0%
  - Europe = 12.6%
  - Asia (ex-China) = 13.3%
- Expectation of 60% penetrated in 5 years globally
  - 2010 was 28.5% penetrated
  - 2016 44%
- Country level card penetration statistics
  - Canada 74%
  - US ~57% (have seen range of 53% - 57% based on different analysis/ sources)
  - Brazil 25%
  - Mexico and India at 10%



Card Penetration Statistics

- Card penetration expectations, by region
- Globally, card penetration is estimated to go from high-30% in 2014 to low-50% in 2019
- As transaction volume will increase, the additional secular tailwind of card penetration will further encourage strong payment volume growth

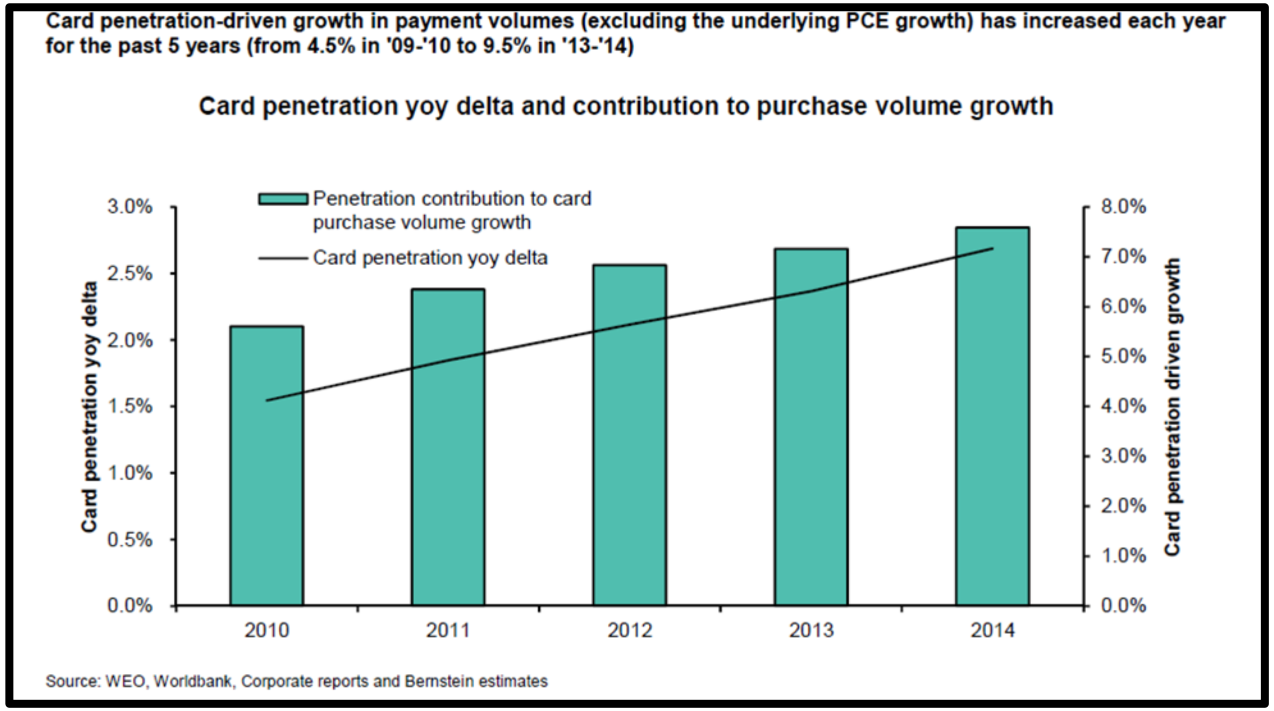
At least 5 years of additional runway to increase card penetration will remain beyond 2019 as 2/3rd of global PCE will still have <65% penetration in 2019



Source: WEO, Worldbank, Nilson, Corporate reports and Bernstein estimates

Card Penetration Statistics

- Card penetration contribution is a large component of the bull thesis for the card networks (Visa/ MasterCard)
- The penetration of cards in terms of payment volume has been increasing each year, likely due to network effects, acceptance, and trust
- 2016: 44% penetration of card in payment volume globally
- 2022E: 60% penetration of card
- Combining increased penetration of card as a form of payment and growth in volume due to economic growth = appealing tailwind for card networks



What Will Drive Increased Card Penetration?

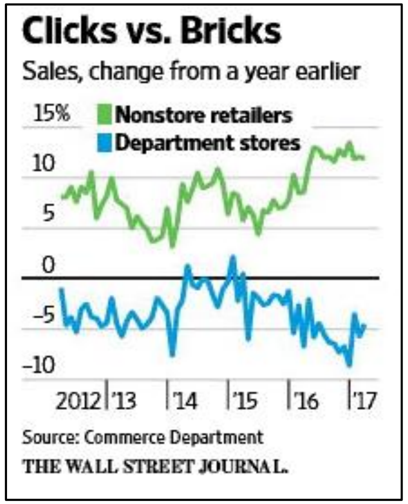
- E-Commerce is growing at 3-4x more than physical
- E-commerce is still in double digit growth
- Mobile payments, usage will continue this trend, or accelerate it
- Card payments online are > 85% of payment method versus offline, so the more purchasing the moves to mobile / internet/ electronic, the more card wins market share vs. cash/check
- Many things that could have been paid for with cash, now heavily card-payment focused:
  - Taxi → Uber, Lyft, other
  - Books, House Supplies from brick-mortar → eBay, Amazon
  - Groceries next?

What Will Drive Increased Card Penetration?

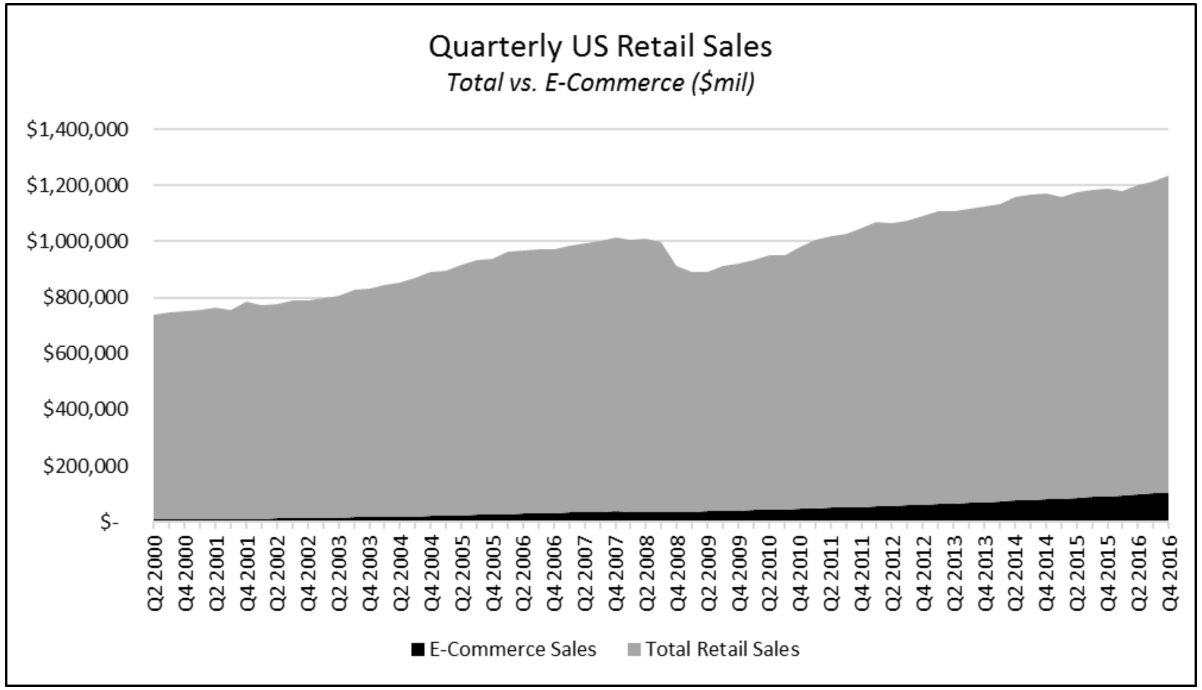
- E-Commerce will increase card penetration as most payments are in card-form, and ~none in cash/check
- As E-commerce continues to grow much faster (due to reliability, convenience, options, ability to compare price, fast shipping) than physical commerce, card penetration will increase
- E-commerce in US, as a percentage of total retail sales, is **~8%**
- Globally, estimates of 8-10% penetration of total PCE are e-commerce/ m-commerce ($2.5T - $3.0T)
- What also drives continued e-commerce growth?
  - Increases in global broadband penetration
  - Increased global broadband speeds
  - 4G buildout, eventual 5G
  - Small cell sites enable more reliability
  - Improved payment capabilities and innovation – one touch, biometric, order ahead/ pick-up (coffee, groceries, etc.)

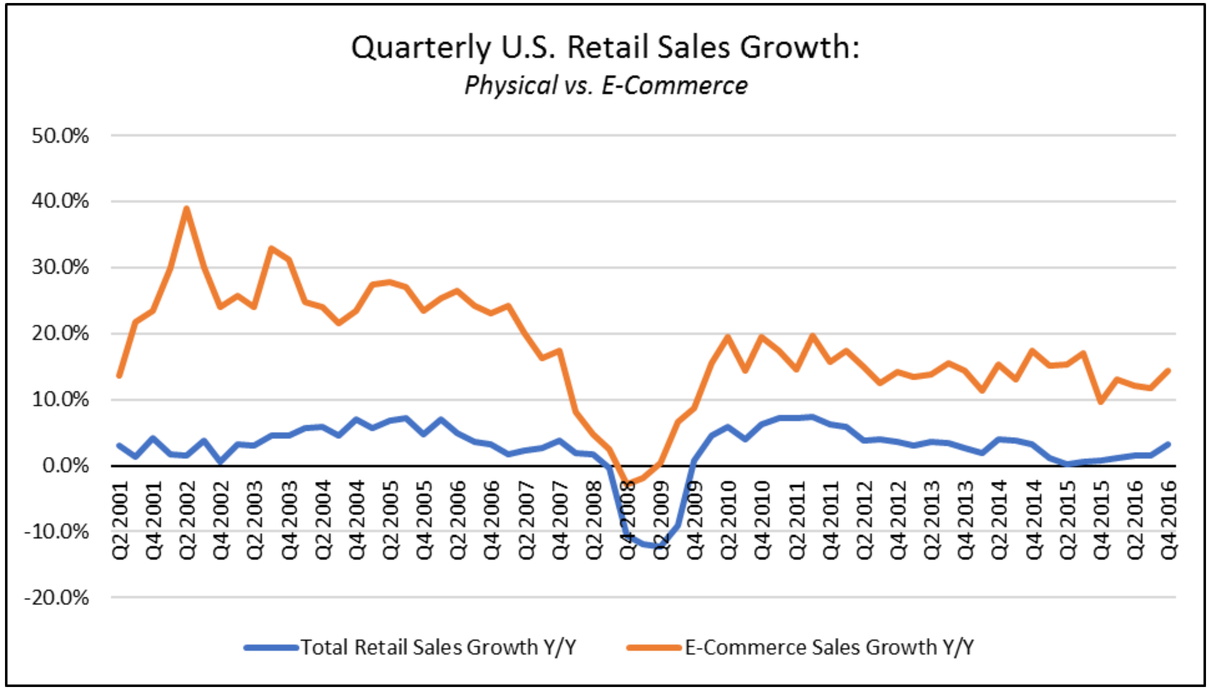
Non-store retailers (includes AMZN, internet) growing double-digits % *versus* department stores -5%

From WSJ 5/12/2017



E-Commerce: Helping Increase Card Penetration



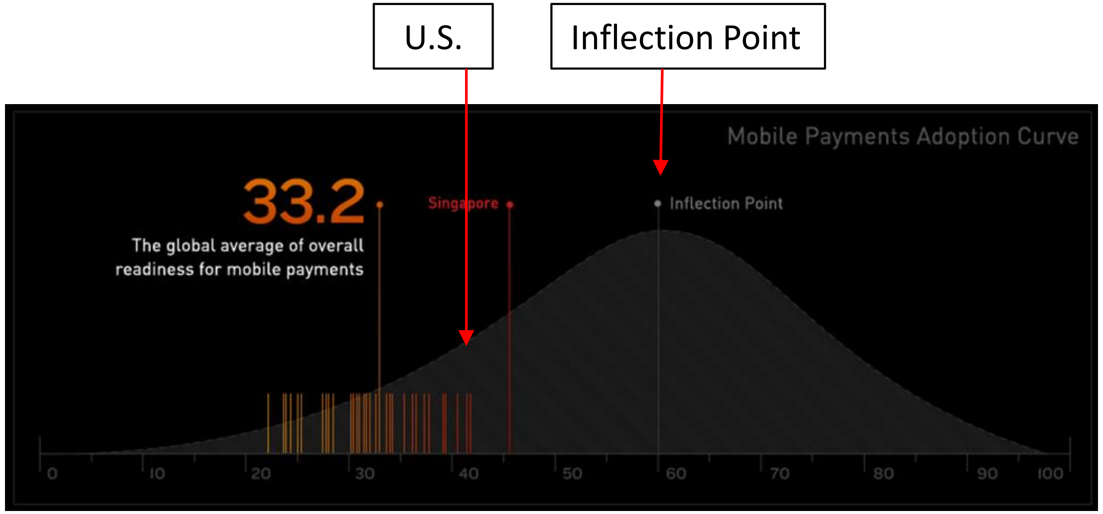


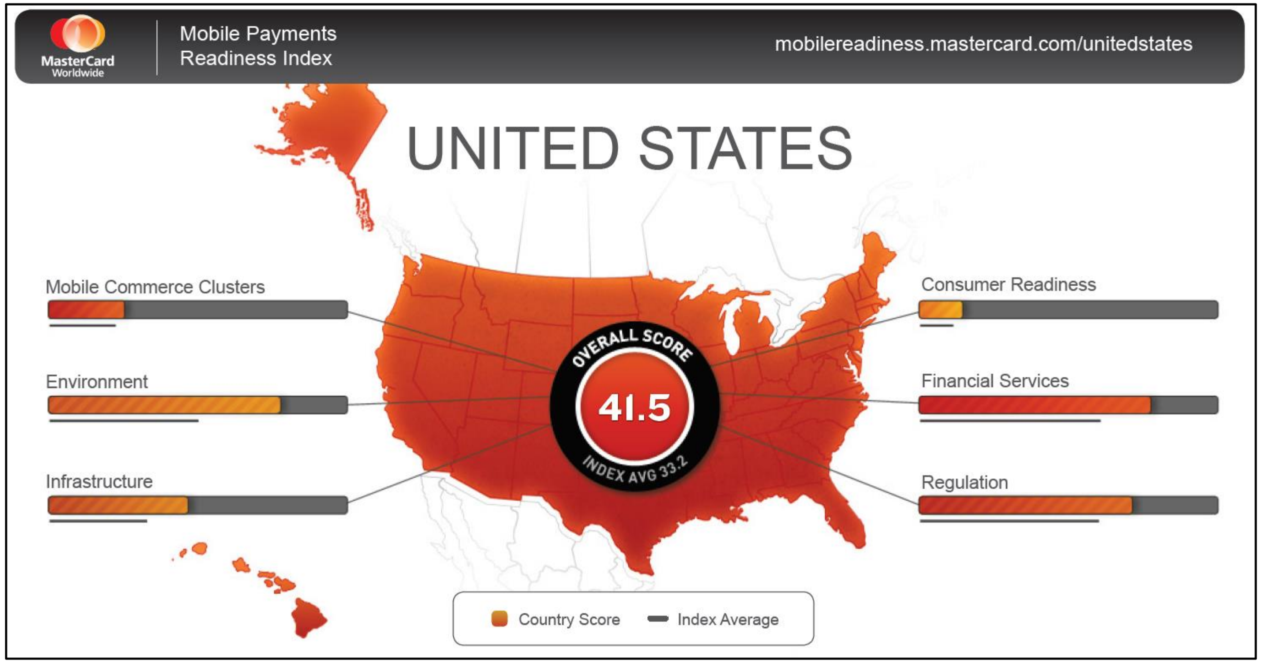
E-commerce is ~8% of total US retail sales, but has been growing much faster than physical sales

E-commerce is growing 3-4x the rate of physical retail sales, and has been constantly above 10%, versus physical sales in low single digit growth

M-Commerce: Growth in Mobile Payments

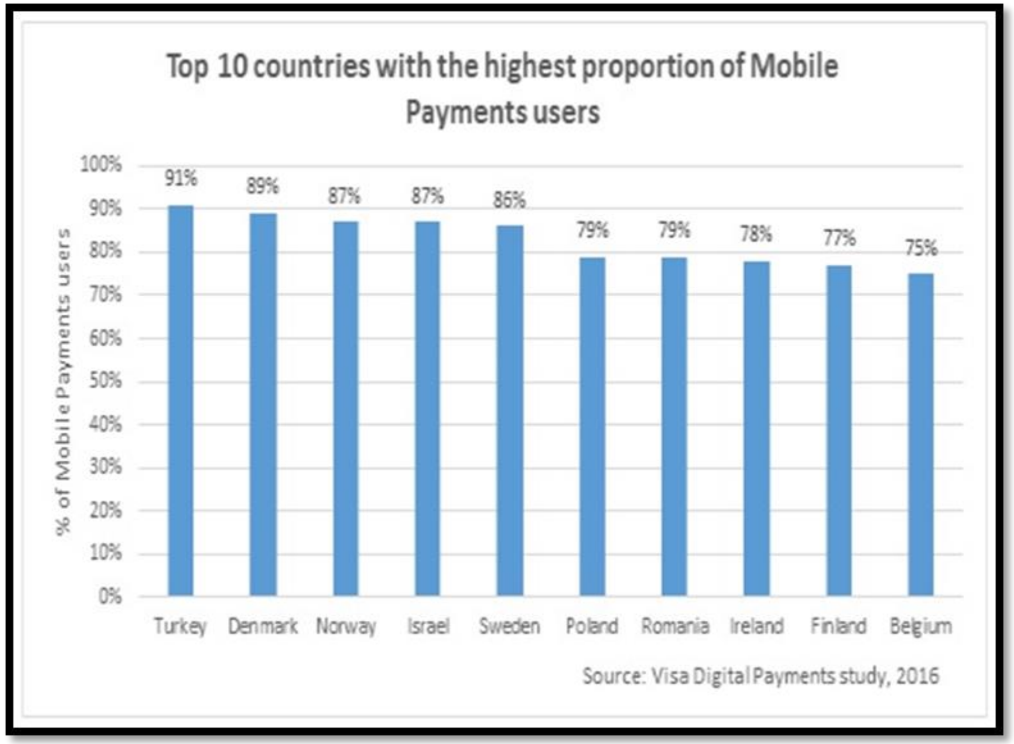
- MasterCard believes mobile payments readiness is still in early stages
- The US is still behind in "readiness" of adoption in mobile payments largely due to the "chicken and egg" concept of: what comes first, consumers adopting it, merchants accepting it..?
- Must be some combination of both, as well as a change in habit





M-Commerce: Growth in Mobile Payments

- Mobile in Europe/ UK
  - Number of Europeans regularly paying using a mobile device for payments has tripled since 2015 (54% vs. 18%)
  - 74% of British are Mobile Payments users – people who manage their money or make payments using mobile device
  - Fastest growth rate for mobile banking adoption is 55-64 YO
  - Users say they are more comfortable making more expensive purchases on mobile devices than everyday payments
- From Visa, the top 10 countries with the highest proportion of mobile payments users are all non-needle movers in terms of the economics for the card networks, payment volume, transaction volume

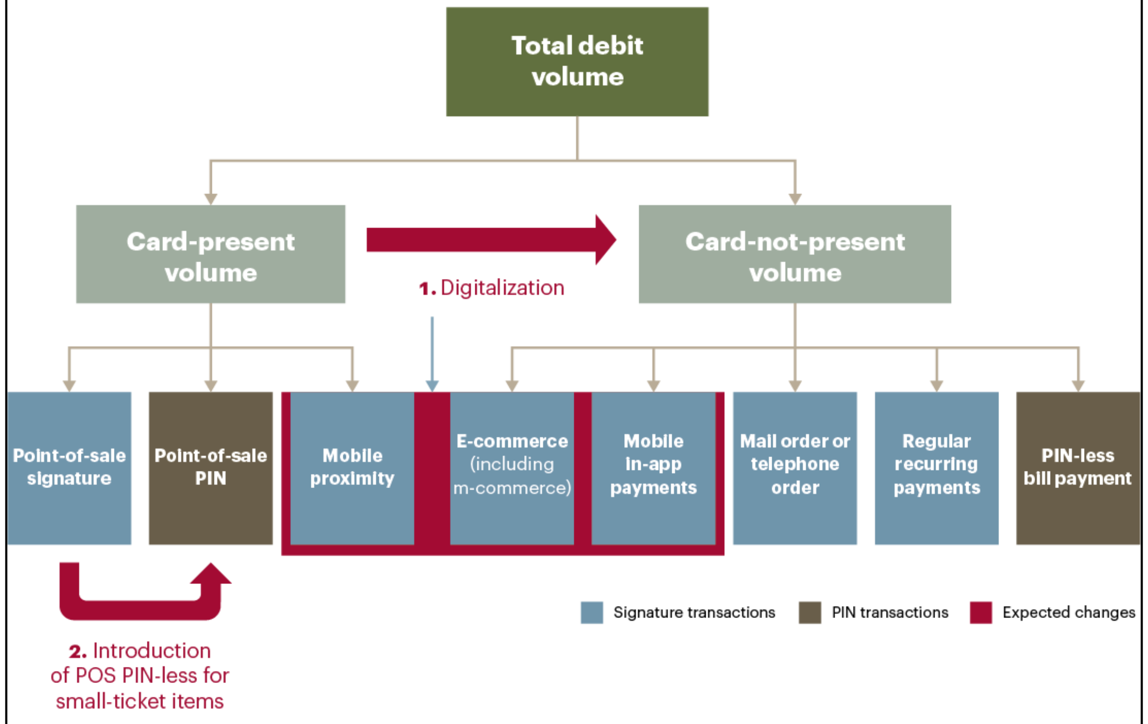


M-Commerce: Growth in Mobile Payments

- As e-commerce and m-commerce continue to grow faster than physical sales, the economics of the transaction are improved as well
  - Visa Signature volume yields are much higher than Visa Interlink PIN yields
  - Digitalization favors card-not-present transactions (Signature)
- See the chart (right) illustrating how digitalization will change the mix of volume between PIN and Signature

Figure 3

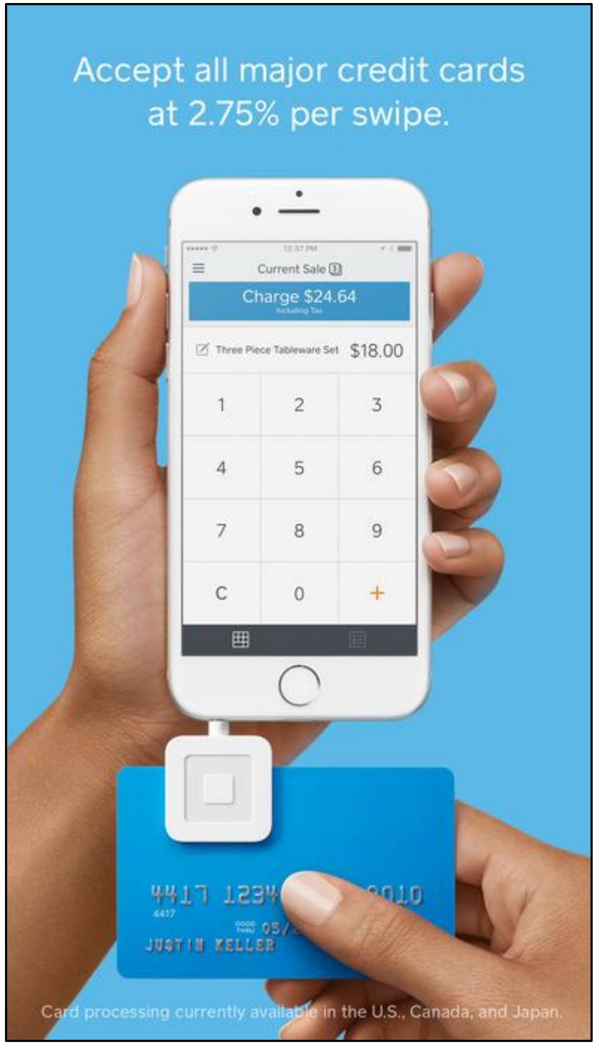
Digitization and PIN-less point-of-sale will drive the evolution of debit transaction mix and revenues



Source: A.T. Kearney analysis

Lower Cost POS Infrastructure: Increasing Card Penetration

- Companies like Square (SQ) are offering merchants lower cost payment infrastructure
    - iPad stand, contactless and chip reader = $169
    - Mag stripe reader = free + free POS app
- Over 330 companies globally selling this type of low cost hardware
- PayPal
    - Chip card reader = $79
    - Mobile card reader for mag stripe = $14.99



Summary: Conversion from Cash to Card

- Still large number of transactions and payment volume globally done in cash/check
- Still ample opportunity in some of the larger markets, including the US and more so in Europe
- Globally, card penetration varies, but in some countries (such as India), the opportunity is large (but will take some time, and payment volume is a fraction of other developed countries)
- Continued shift from physical payment transactions to E-commerce/ m-commerce will drive card penetration
- Improvements in technology and security will encourage card adoption for both merchants and consumers
- The underbanked will have more options with improvements in products, including prepaid
- Lower cost merchant acceptance infrastructure makes it less costly for small merchants to accept payments
- New FinTech players are spending heavily on marketing their technology, convenience of their products, which helps bring continued awareness of electronic payments
- Mobile technology, infrastructure improvements will increase access and spends, making e-com/m-com growth continue
- Similar as above, but with home broadband penetration and speeds

Global Payment Volume Estimates

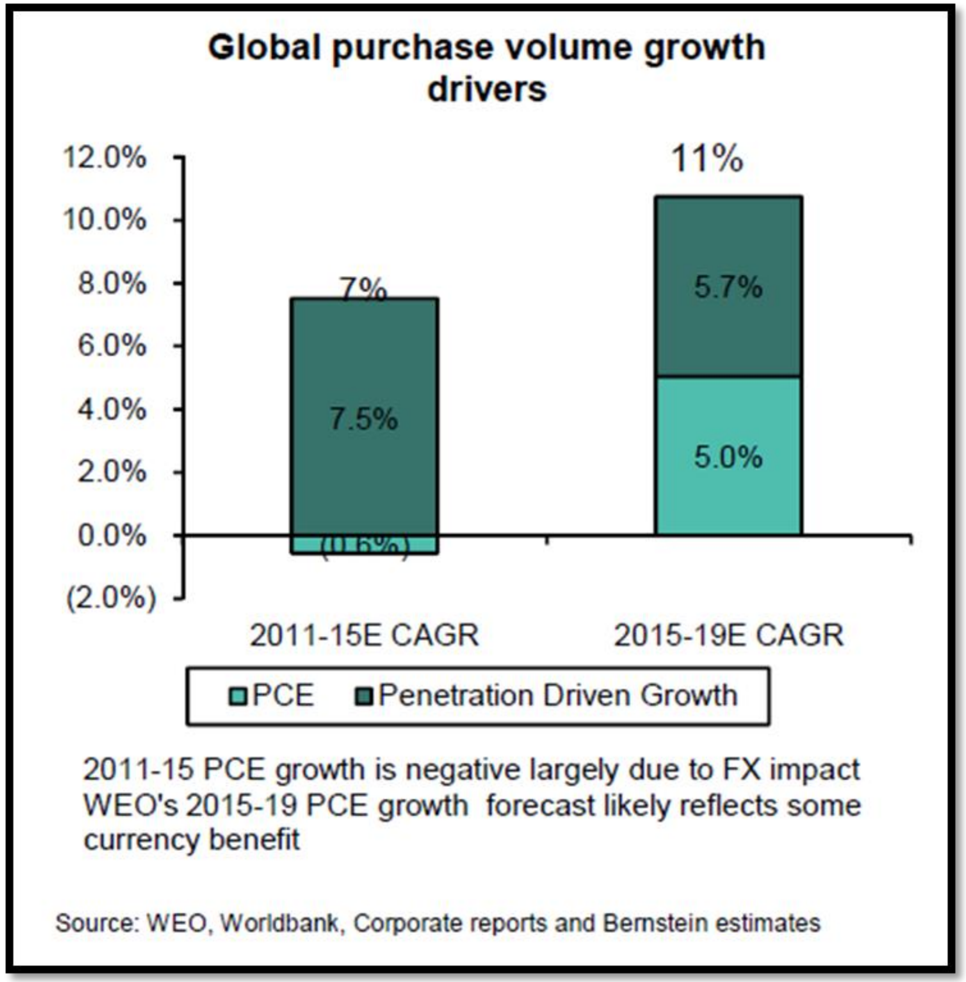
Growth in: Payment Volume

Macro	*Secular*	*Specific to Company*
Growth in: Personal Consumption Expenditure that *could* be paid with cards	Growth in: Card payments as method of payment vs. cash / check	Growth in: Market share gains of gaining merchant/issuer business
2%+ for Real GDP Growth *2%+ for inflation globally*	*4-6%+ for card penetration growth CAGR*	*???? Specific to the company*

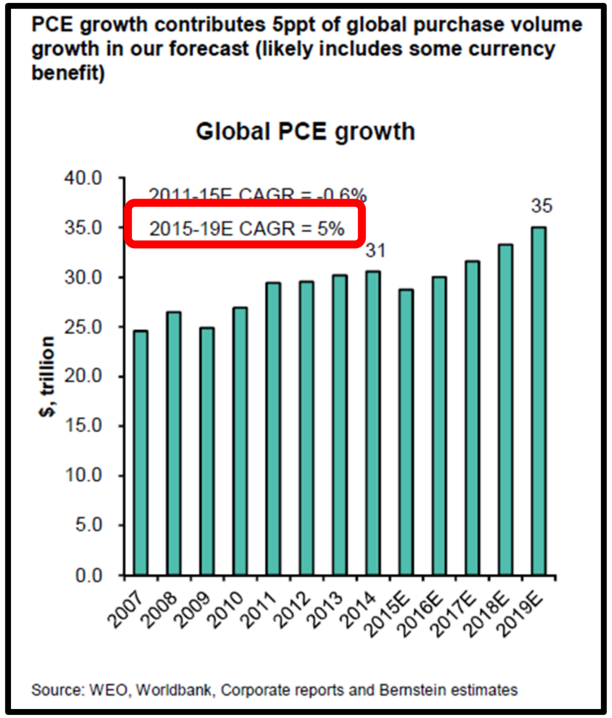
Global Volumes = 10%+ for foreseeable future

Summary: Payment Volume Estimates

- Using the combination of PCE growth + Card Penetration, it is not hard to see how at least high single digit payment volume growth is likely for the foreseeable future
- As growth picks up, PCE improves, the card payment volume improves and flows through to the networks economics
- A large part of the bull thesis for owning the card networks rests on the continuation of the conversion from cash/check to electronification
- Bernstein estimates volume growth of ~11% from 2015 – 2019 (See chart to the right)
- This seems reasonable, given the levels of card penetration and economic growth estimates



Summary: Payment Volume Estimates



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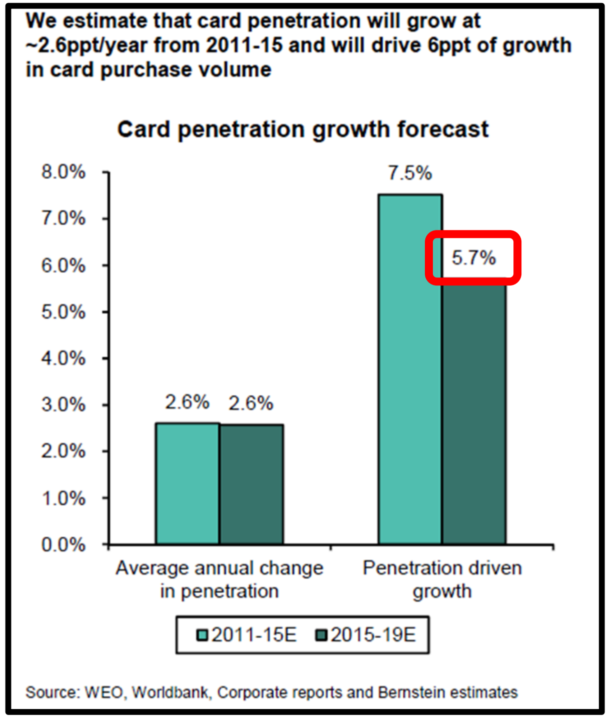

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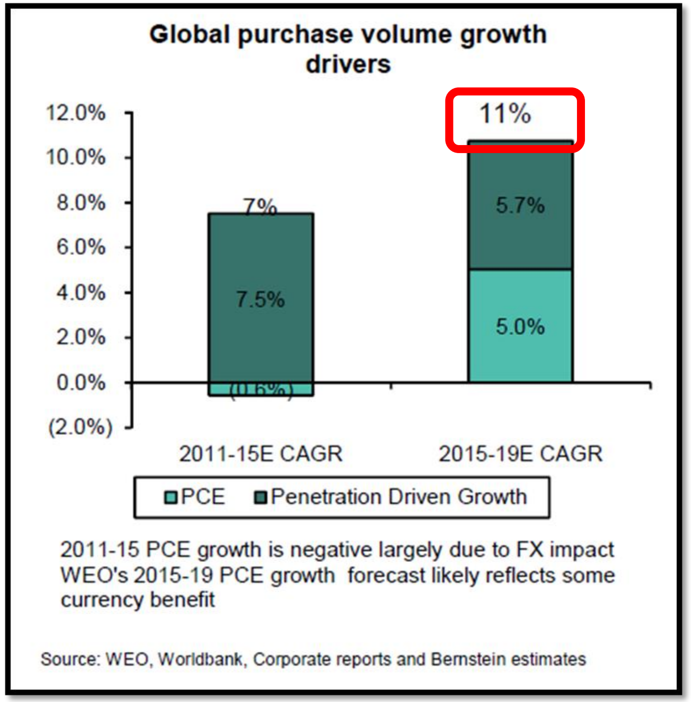


What is Interchange?

How Does Interchange Work?

- How does interchange work?
  - Interchange is the fee paid from the merchant acquirer to the issuer, through the payment network (V/ MA)
  - Debit interchange is less than credit due to the types of transactions typically done by debit cards, the size of those transactions are smaller on average, and there is no credit risk by the issuer vs. credit cards
  - The merchant discount rate is what the merchant pays the merchant acquirer
  - The interchange fee is what the merchant acquirer pays the issuer, which is a portion (60-70% or so) of the MDR
  - **Networks do not directly receive fees from interchange**
  - Networks get fees from issuers and acquirers *independent* of interchange in the form of assessment fees (% of payment volume) and data processing fees (flat fee typically)

What If Merchant Is Dissatisfied with Merchant Discount Rate?

- If merchant is not satisfied with acceptance costs with the merchant banks, can do a few things:
  - Provide discounts to customers paying cash or check
  - Negotiate different MDR with merchant bank
  - Switch to another merchant acquirer with better pricing
  - Not accept MC or Visa cards
- In the following slides, I will cover the interchange rates and MDR for Visa / MasterCard/ AMEX, as of April 2016 tables
- Important to know that V and MA have different categories/ card types, which have different interchange rates. You can do you own work and choose categories that you prefer if you dislike my selection.

Visa: Interchange

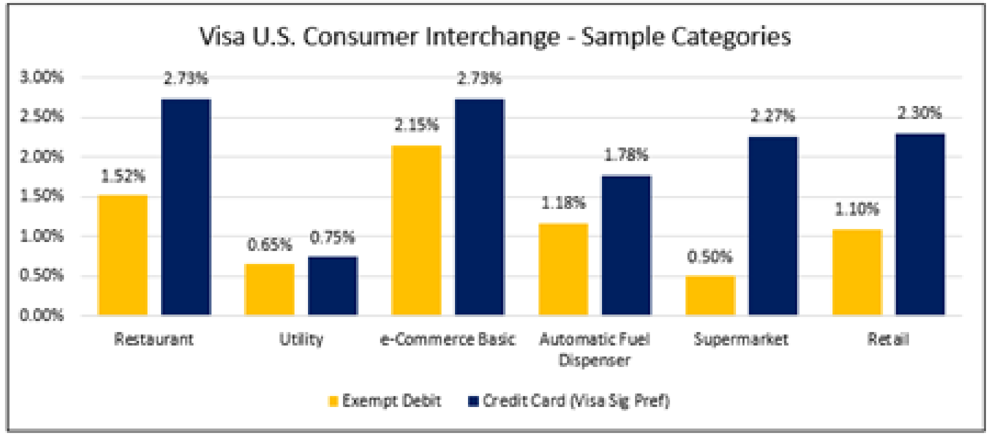
Interchange Fees	Cost	Exempt Debit Base	Exempt Debit Additional	Exempt Debit Interchange Cost	Exempt Debit As A % Cost	Credit Card (Visa Signature Preferred) Base	Credit Card (Visa Signature Preferred) Additional	Credit Card (Visa Signature Preferred) Interchange Cost	Credit Card (Visa Signature Preferred) As A % Cost
Restaurant	$ 30	1.19%	$ 0.10	$ 0.46	1.52%	2.40%	$ 0.10	$ 0.82	2.73%
Utility	$ 100	0.00%	$ 0.65	$ 0.65	0.65%	0.00%	$ 0.75	$ 0.75	0.75%
e-Commerce Basic	$ 30	1.65%	$ 0.15	$ 0.65	2.15%	2.40%	$ 0.10	$ 0.82	2.73%
Automatic Fuel Dispenser	$ 40	0.80%	$ 0.15	$ 0.47	1.18%	1.15%	$ 0.25	$ 0.71	1.78%
Supermarket	$ 60	0.00%	$ 0.30	$ 0.30	0.50%	2.10%	$ 0.10	$ 1.36	2.27%
Retail	$ 50	0.80%	$ 0.15	$ 0.55	1.10%	2.10%	$ 0.10	$ 1.15	2.30%

Signature = highest cost

*** Capped at $0.95 per transaction exempt debit, $1.10 for credit

Source: *https://usa.visa.com/dam/VCOM/download/merchants/visa-usa-interchange-reimbursement-fees-2016-april.pdf*

	Transact Size ($)	*Exempt Debit*	*Credit Card (Visa Sig Pref)*
Restaurant	$ 30	1.52%	2.73%
Utility	$ 100	0.65%	0.75%
e-Commerce Basic	$ 30	2.15%	2.73%
Automatic Fuel Dispenser	$ 40	1.18%	1.78%
Supermarket	$ 60	0.50%	2.27%
Retail	$ 50	1.10%	2.30%



MasterCard: Interchange

Interchange Fees	Cost	Exempt Debit Base	Exempt Debit Additional	Exempt Debit Interchange Cost	Exempt Debit As A % Cost	Credit Card (Enhanced Value) Base	Credit Card (Enhanced Value) Additional	Credit Card (Enhanced Value) Interchange Cost	Credit Card (Enhanced Value) As A % Cost
Restaurant	$ 30	1.19%	$ 0.10	$ 0.46	1.52%	1.73%	$ 0.10	$ 0.62	2.06%
Utility	$ 100	0.00%	$ 0.45	$ 0.45	0.45%	0.00%	$ 0.65	$ 0.65	0.65%
Automatic Fuel Dispenser	$ 40	0.70%	$ 0.17	$ 0.45	1.13%	1.90%	$ -	$ 0.76	1.90%
Supermarket	$ 60	1.05%	$ 0.15	$ 0.78	1.30%	1.48%	$ 0.10	$ 0.99	1.65%

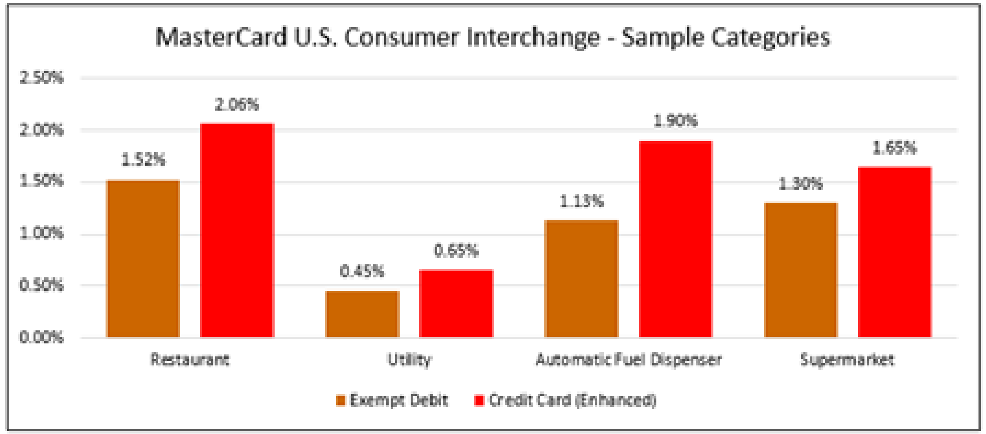
Enhanced Value = highest cost

*** Capped at $0.95 per transaction exempt debit, $1.10 for credit

* $0.35 maximum

Source: *MasterCard*

	Transact Size ($)	*Exempt Debit*	*Credit Card (Enhanced)*
Restaurant	$ 30	1.52%	2.06%
Utility	$ 100	0.45%	0.65%
Automatic Fuel Dispenser	$ 40	1.13%	1.90%
Supermarket	$ 60	1.30%	1.65%



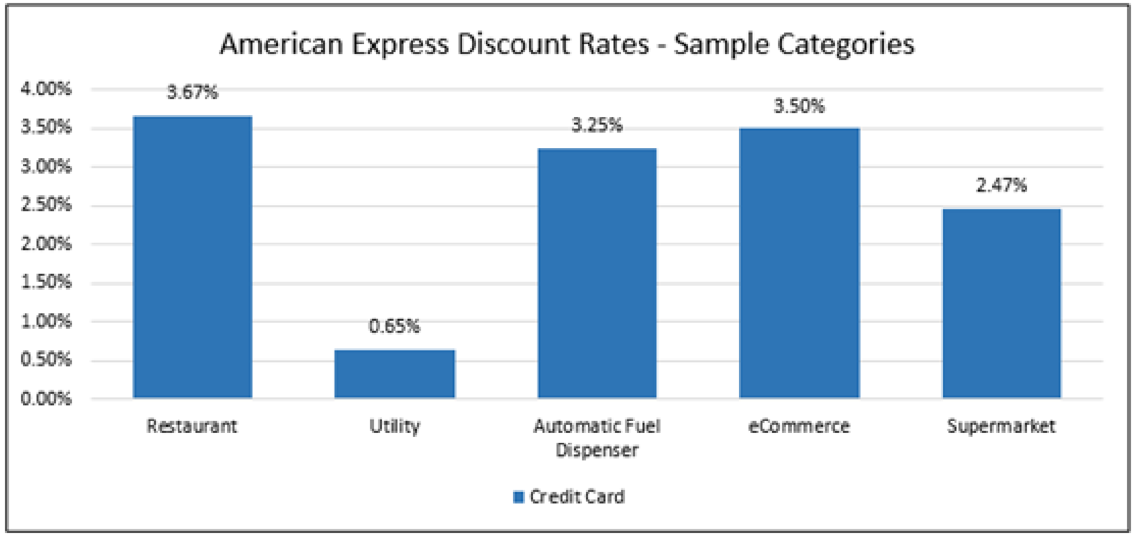
American Express: Merchant Discount Rate

Discount Rate	Cost	Credit Card Base	Credit Card Additional	Credit Card Interchange Cost	Credit Card As A % Cost
Restaurant	$ 30	3.50%	$ 0.05	$ 1.10	3.67%
Utility	$ 100	0.00%	$ 0.65	$ 0.65	0.65%
Automatic Fuel Dispenser	$ 40	3.25%	$ -	$ 1.30	3.25%
eCommerce	$ 30	3.50%	$ -	$ 1.05	3.50%
Supermarket	$ 60	2.30%	$ 0.10	$ 1.48	2.47%

* Card entry is additional cost for all transactions, versus swipe

Source: https://www.cardfellow.com/american-express-discount-rate/

	Transact Size ($)	*Credit Card*
Restaurant	$ 30	3.67%
Utility	$ 100	0.65%
Automatic Fuel Dispenser	$ 40	3.25%
eCommerce	$ 30	3.50%
Supermarket	$ 60	2.47%



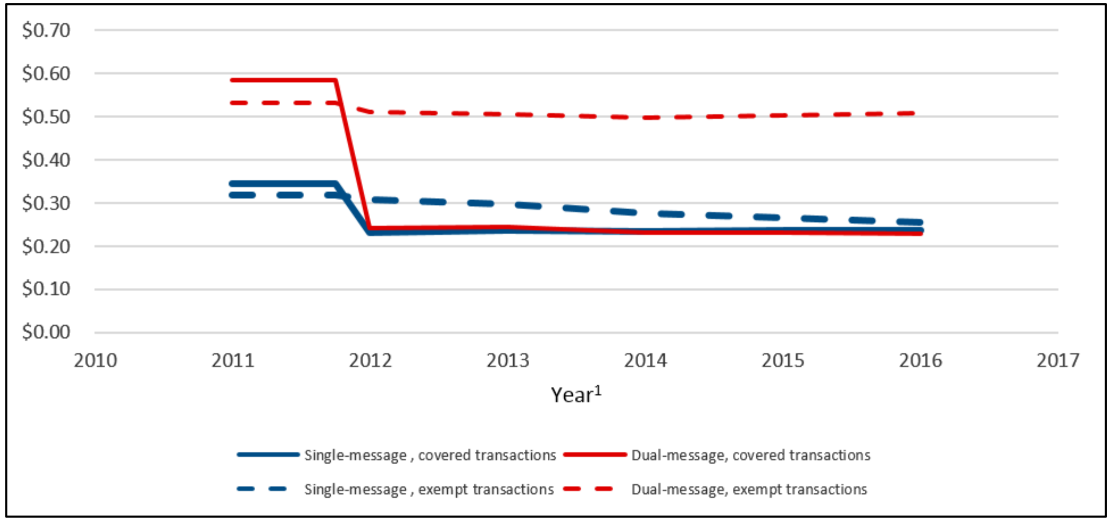
Regulation

Risk: Regulation

- Regulation of the payments industry, specifically the card networks, could impact future economics and/ or the competitive strengths
- United Stated:
  - Debit: Durbin Amendment
  - Credit: None directly
- Europe:
  - Debit: Capped at 0.2% for V/ MA debit cards
  - Credit: capped at 0.3% for V/MA consumer credit cards (pre-IFRS regulation interchange was 0.9%)
  - Business cards exempt until 2018

United States Regulation: Durbin Amendment

- Part of the 2010 Dodd-Frank Act
- Lowered debit card interchange fees substantially
- According to a Federal Reserve paper, banks had $14 billion a year of lost revenue from Durbin
- Instead, they reduced rewards programs on debit cards, began implementing other fees (checking account fees, minimums, check fees, etc.)
- Before the amendment, retailers paid an average of **$0.44** per typical debit transaction (~$38), *now* about **$0.24** for that same amount
- Some definitions:
    - **Exempt transactions:** those done where issuer is not regulated by Durbin (< $10b assets). Thus, look at the average debit card interchange fee, which is $0.51 for dual message (signature) and $0.26 for single message (PIN)
    - **Covered transactions**: the issuer is regulated by Durbin. The interchange fee is $0.23 for dual message, $0.24 for single message.



The cost for interchange for signature went from ~$0.60 to ~$0.24 from 2011 to 2012, based on issuers > $10 billion in assets. PIN interchange for regulated issuers went from ~ $0.35 to ~$0.24 during the same period.

United States Regulation: Durbin Amendment

- **Who was impacted:**
  - On signature, 2/3 of their transactions are with issuers that are > $10b, and thus the interchange is capped by Durbin. The 1/3 that is not regulated has average interchange of $0.48 (see chart)
  - Visa most negatively impacted as their average interchange fee for dual message went from 1.55% per transaction in 2011 to 0.84% in 2015, predominantly due to their mix of issuers
  - MasterCard went from 1.50% in 2011 to 1.06% in 2015

Issuer < $10 billion in assets, not impacted by Durbin

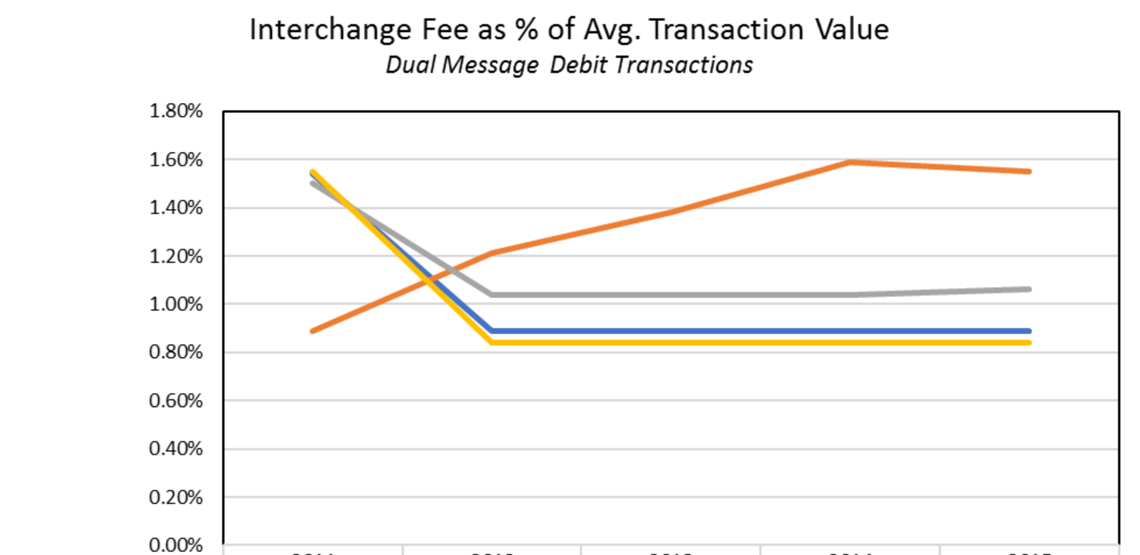
Issuer > $10 billion in assets, impacted by Durbin

Average Debit Card Interchange Fee by Payment Card Network[1]

Network[2]	2015												
	Exempt transactions[3]					*Covered transactions[4]*					*All transactions (exempt and covered transactions)[5]*		
	% of total number of transactions[6]	% of total value of transactions[6]	Average transaction value[7]	Average interchange fee per transaction[8]	Interchange fee as % of average transaction value[9]	% of total number of transactions[10]	% of total value of transactions[10]	Average transaction value[7]	Average interchange fee per transaction[8]	Interchange fee as % of average transaction value[9]	Average transaction value[7]	Average interchange fee per transaction[8]	Interchange fee as % of average transaction value[9]
Dual-message[11]	**38.2%**	**37.0%**	**$36.49**	**$0.51**	**1.39%**	**61.8%**	**63.0%**	**$38.38**	**$0.23**	**0.60%**	**$37.66**	**$0.34**	**0.89%**
Discover	99.6%	99.5%	$41.67	$0.65	1.56%	0.4%	0.5%	$43.38	$0.24	0.55%	$41.67	$0.65	1.55%
MasterCard	50.8%	50.3%	$37.98	$0.57	1.50%	49.2%	49.7%	$38.77	$0.24	0.61%	$38.37	$0.41	1.06%
Visa	34.2%	32.7%	$35.77	$0.48	1.34%	65.8%	67.3%	$38.29	$0.23	0.59%	$37.43	$0.31	0.84%
Single-message[12]	**35.2%**	**35.1%**	**$39.04**	**$0.26**	**0.65%**	**64.8%**	**64.9%**	**$39.36**	**$0.24**	**0.60%**	**$39.25**	**$0.24**	**0.62%**
Accel	93.2%	92.8%	$43.26	$0.21	0.48%	6.8%	7.2%	$45.66	$0.24	0.53%	$43.43	$0.21	0.49%
AFFN	88.3%	86.9%	$34.55	$0.25	0.72%	11.7%	13.1%	$39.48	$0.21	0.54%	$35.12	$0.25	0.70%

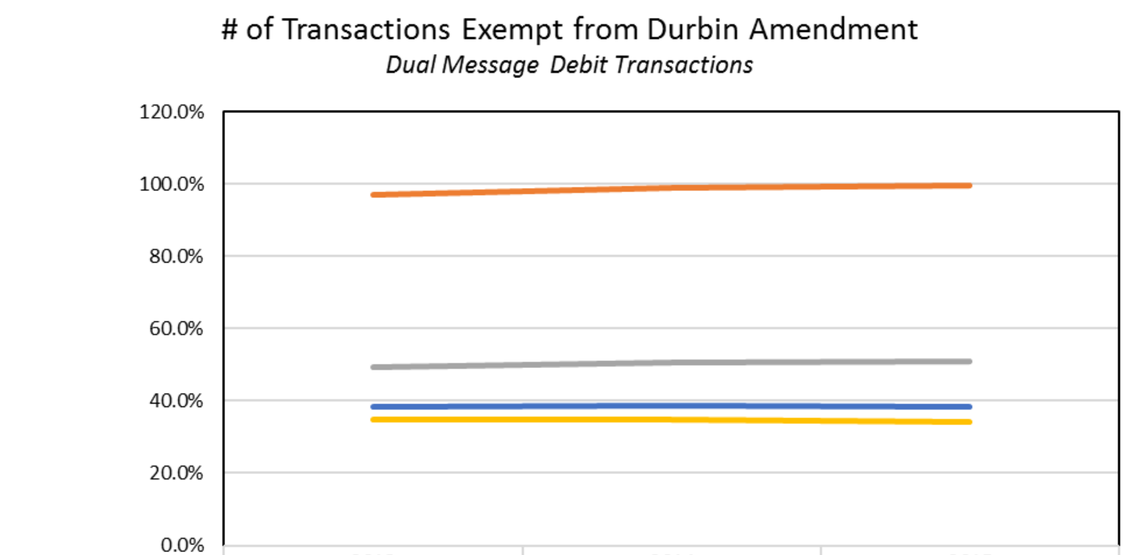
United States Regulation: Durbin Amendment

- Who is regulated and how:
  - Banks with less than $10 billion in assets, which excludes most community banks and credit unions, are not regulated
  - Banks with more than $10 billion in assets are limited for debit interchange fees only
    - 0.05% + $0.21 per transaction



	2011	2012	2013	2014	2015
Dual Message	1.54%	0.89%	0.89%	0.89%	0.89%
Discover	0.89%	1.21%	1.38%	1.59%	1.55%
MasterCard	1.50%	1.04%	1.04%	1.04%	1.06%
Visa	1.55%	0.84%	0.84%	0.84%	0.84%

Dual Message Discover MasterCard Visa

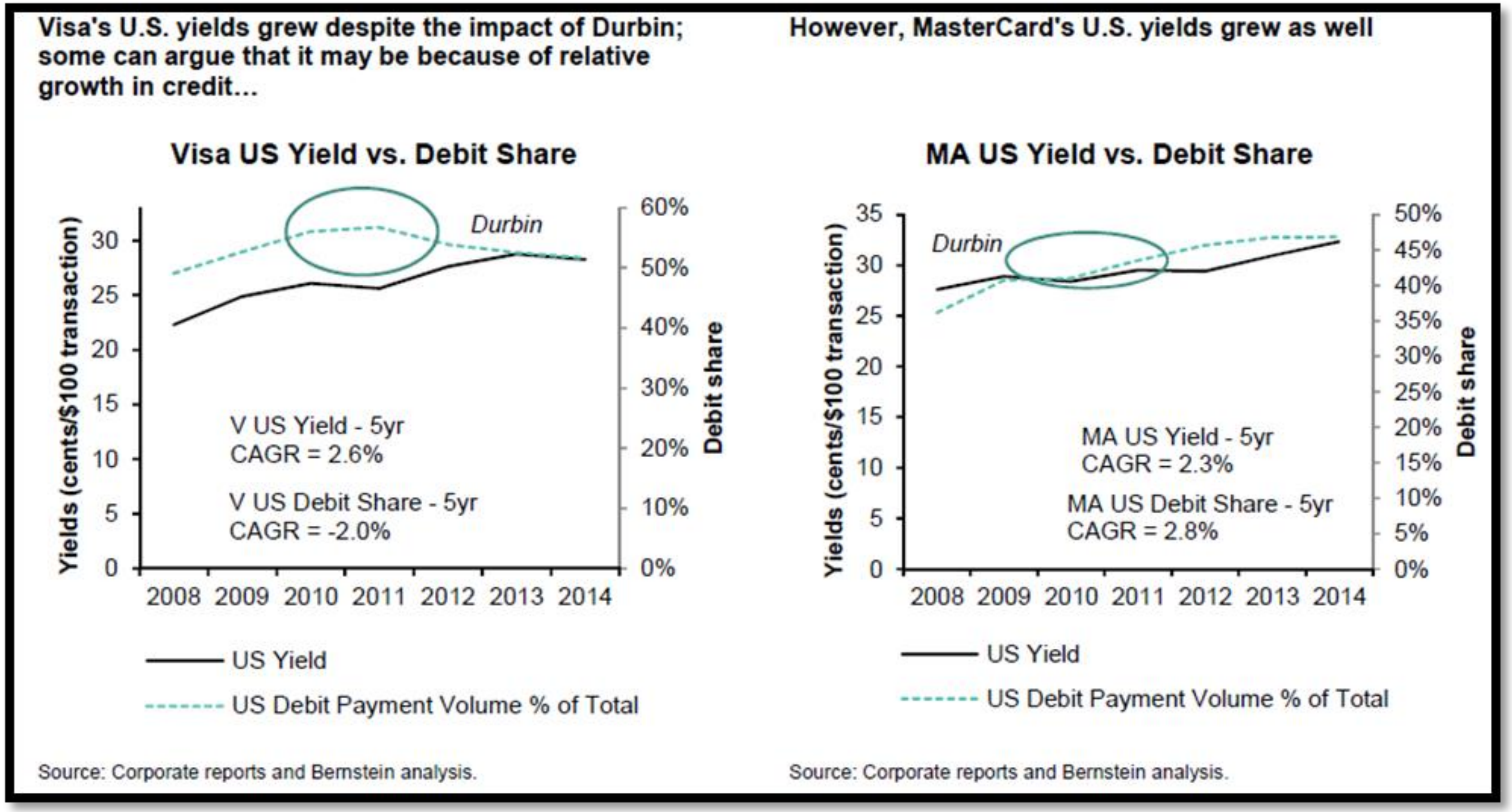


	2013	2014	2015
Dual Message	38.3%	38.6%	38.2%
Discover	97.1%	98.9%	99.6%
MasterCard	49.4%	50.6%	50.8%
Visa	34.9%	34.9%	34.2%

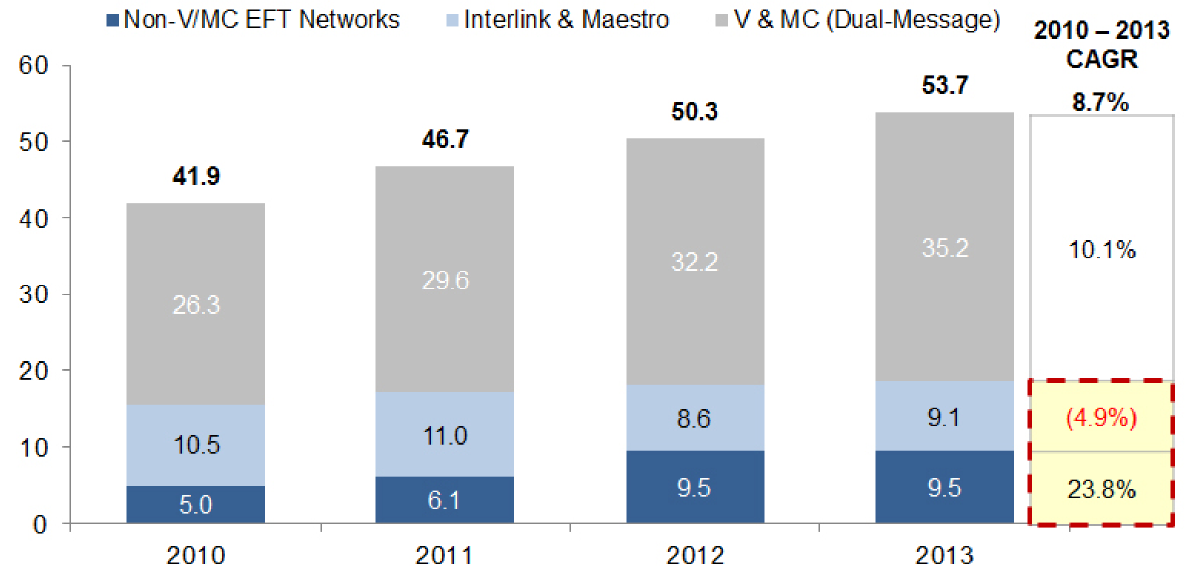
Dual Message Discover MasterCard Visa

United States Regulation: Durbin Amendment

- Although Durbin impacted Visa's market share for PIN debit, Visa's economics were hardly effected – Why?
- PIN debit is the lowest "yielding" product that Visa has (revenue earned per volume)
- Signature debit is far higher yielding than PIN, has similar economics as credit
- Visa adjusted to Durbin by implementing other fees and by encouraging the routing of debit over Signature versus PIN
- The impact on MasterCard was a non-issue, as well



United States Regulation: Durbin Amendment



Year-over-Year Growth Rates

	2010	2011	2012	2013
Interlink & Maestro	19.7%	4.7%	(22.4%)	6.0%
Non-V/MC EFT Networks	(6.1%)	21.0%	57.6%	(0.4%)

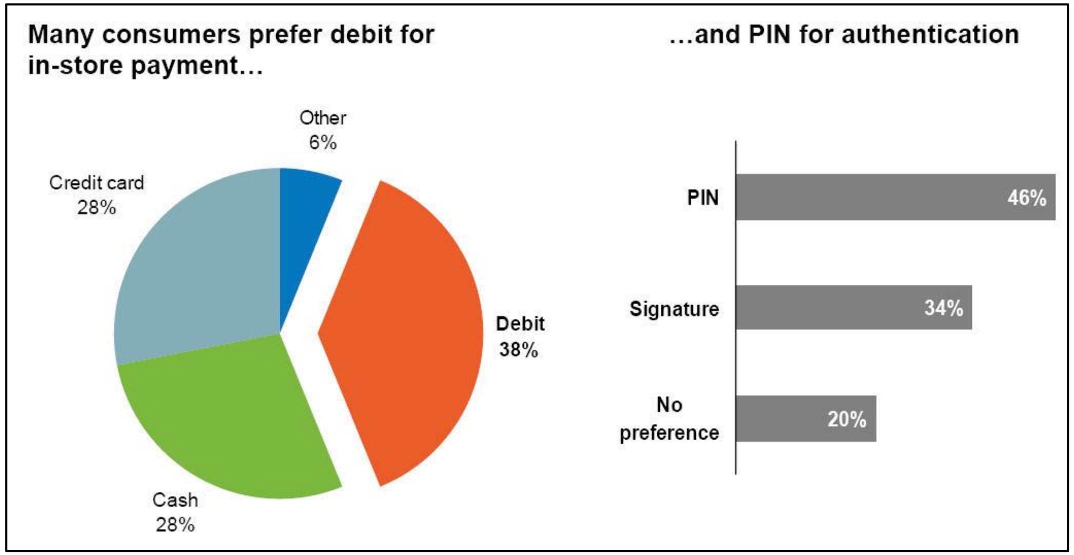
Shift in EFT Network Share

	2010	2011	2012	2013
Interlink & Maestro	67.8%	64.5%	47.3%	48.8%
Non-V/MC EFT Networks	32.2%	35.5%	52.7%	51.2%

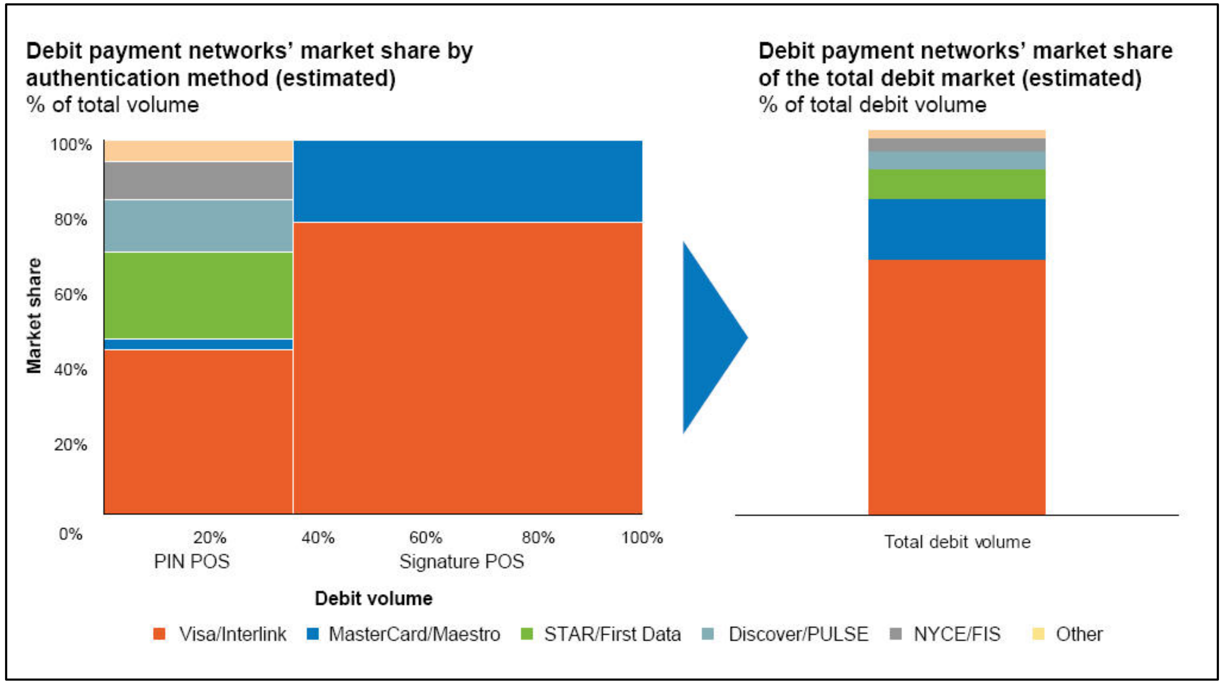
Due to Durbin Amendment:

- MA and V PIN volume declined, with both losing market share
- Visa hurt the most due to their exclusive agreements on PIN cards
- Durbin forced PIN cards to have multiple unaffiliated PIN networks on each card
- Signature debit transactions still did well, growing nicely post-Durbin
- PIN debit revenue yields were much lower than Signature, and thus the overall revenue yields per transaction volume were not impacted
- Furthermore, there are more transactions via debit than credit, so the yields on an equal volume basis are the same, due to multiple fixed processing fees per transaction to be equivalent to a single credit processing fee

United States Regulation: Durbin Amendment



Charts from 2011, prior to Durbin



Prior to Durbin:
- Debit and cash had large market share (66%) on in-store payments
- Debit was used 38% of the time
- PIN debit had the market share with 46% of debit transactions

Prior to Durbin:
- Visa Interlink has > 40% of the market share for PIN, and thus was most impacted by Durbin
- VisaNet (Signature) had about 80% market share on Signature debit transactions
- Combined, Visa had about 70% of the debit market share, with MA another ~15%

Notes on Durbin Amendment

- Implemented by the Federal Reserve in 2011
- According to WSJ, ended up cutting interchange fees in half – from $0.51 to $0.24 per transaction, on average
- While the regulated cap on debit is $0.21 per transaction + 5bps for fraud losses, it is substantially higher than the originally proposed $0.12 flat fee by the Federal Reserve in December 2010
- This ended up costing banks $8 billion - $14 billion *annually* in revenue, according to WSJ (*see chart on the right*)
- The unregulated issuers would be the community banks and credit unions, which a majority fell less than the $10 billion threshold for being regulated by Durbin
- Supposedly cut down PIN debit transaction rates by 19% for those *unregulated* issuers
- Durbin asserted than the regulation would help businesses by lowering costs, as the lower interchange would be passed through as savings to consumers in the form of lower prices at the register (this hasn't worked, however)

Table 1: Annual Revenue Loss for Banks

Revenue Loss Projections for Banks Based on 2009 Data[5]	
Total value of debit transactions	$1,420.6 billion
Number of debit transactions	37.9 billion
Interchange revenue under old rules (1.15% x $1,420.6 = $16.34)	$16.3 billion
Interchange revenue under new rules ($.21 x 37.9 = $7.96)	$8.0 billion
Fraud loss adjustment under new rules (.05% x $1,420.6 = $.71)	$0.7 billion
Total loss of revenue ($16.34 -7.96-.71 = $7.67)	$7.7 billion

Problems with Durbin Amendment

- Regulated only a portion of the industry
- Left credit card interchange unregulated, and left issuers with < $10 billion in assets unregulated on debit interchange
- So what happened post-Durbin?
  - Costs for retailers have not fallen, as stated they would
  - According to the Federal Reserve, only 11% of merchants have seen card acceptance costs fall due to Durbin, but 3x as many merchants (mostly smaller merchants) reported cost increases
  - Only 1% of merchants reported a reduction in prices, while 20% raised prices
  - Durbin ignored that banks would recoup lost revenues in other ways
  - Free checking accounts as banks has fallen from 76% to 38% since 2008
  - On most accounts, the maintenance costs per month have doubled
  - Increased the mandatory minimum to qualify for free checking from $109 in 2009 to $670 in 2016
  - Banks have essentially eliminated all rewards programs on debit cards
  - All things considered, banks recouped roughly 30% of lost interchange just in the form of higher fees charged to customers
  - Wealthier individuals have mitigated the impact by having more rewards-rich cards and higher minimums in accounts to avoid monthly maintenance costs, but lower income individuals have been hurt the most
  - WSJ estimates that $1b to $3b per year in higher out of pocket costs to lower-income consumers since Durbin

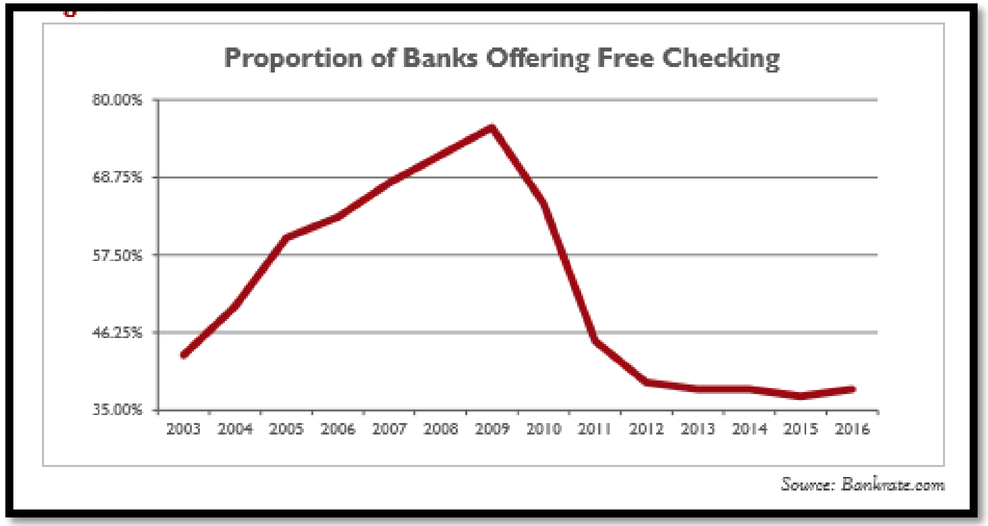
Smaller Ticket Items Heavily Impacted by Durbin

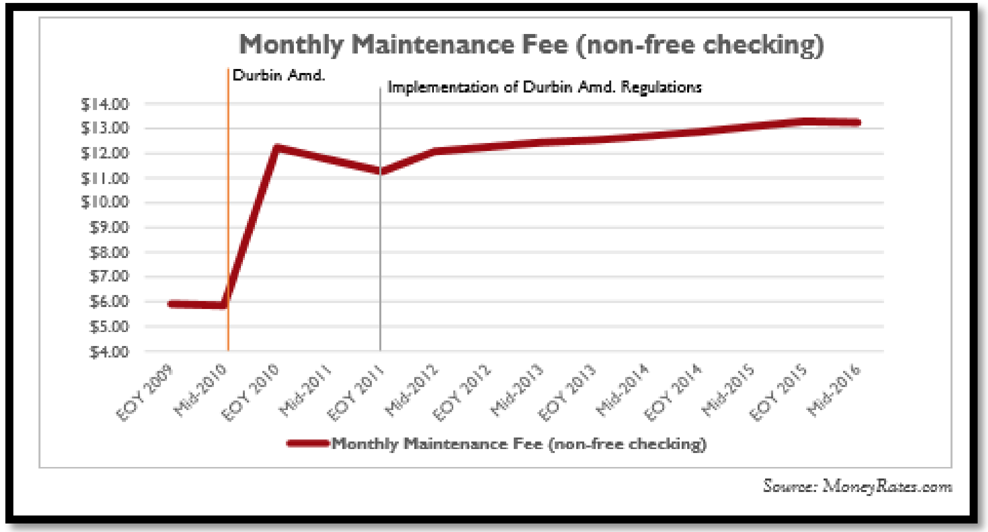
- Since Durbin imposes a minimum $0.21 interchange fee, this impacts small ticket items that would have a cost of less than $0.21 based on non-regulated interchange fees
- Studies have found that under Regulation II, the fee on the average small transaction of $7.50, as a share of the transaction, exceeds the profit margins on such transactions for six industries that depend on small purchases, including supermarkets, groceries, convenience stores, gas stations and pharmacies
- According to the Richmond Fed, 31.8% of merchants said smaller ticket item debit costs have risen, and only 2.8% said they had fallen
- For example (ICLE study):

> Consider the effect of the Amendment on the interchange fees charged for small ticket items. Prior to the Durbin Amendment, the interchange fee for signature debit purchases set by Visa and MasterCard on transactions of $15 or less was 1.55% of the transaction value, plus $.04.[75] Thus, the interchange fee for a $5 purchase was $.11. After the implementation of Regulation II, however, this more than *doubled* – to $.23 (*i.e.*, $0.21 + $0.01 + 0.05%).[76] As one commenter noted, reviewing the card processing statement from a café in October 2016, "[u]nfortunately, the capped rate's $0.22 transaction fee is much higher than the uncapped $0.04 fee. This difference increases processing costs substantially for small ticket merchants."[77] As he concludes: "Unfortunately, businesses that routinely process small transactions will be negatively affected by the Durbin Amendment."[78]

April 2017 Study by 'ICLE' on Durbin

- Hundreds of thousands of low-income households have chosen, or been forced to exit the banking system due to higher costs at banks
- The unregulated issuers, with less than $10 billion (community banks, credit unions) are now seeing adverse impact, which flows through negatively to their customers
- Attempted price controls through Durbin reduced interchange fees but created additional fees for consumers
- Durbin actually helped higher-income earners with better credit card rewards programs, and they have been able to avoid most of the pass-through bank fees
- Banks rapidly reduced free checking accounts (*see chart right*). Went from ~75% of accounts were offered free checking to currently < 40% are offered this
- Banks increased monthly maintenance costs on savings accounts (*see chart right*)





April 2017 Study by 'ICLE' on Durbin

- Based on a sample of 1,000 small and medium size businesses in 23 sectors, ICLE found that the interchange rate fell but the MDR remained unchanged
- Thus, the cost savings from lower interchange was actually captured by the merchant acquirer, and far less so the actual merchant
- Average per transaction MDR fell from 1.99% to 1.97%
- The average interchange fee fell from 1.07% to 0.74%
- 93% of the reduction in interchange was captured by the merchant acquirer and only 7% passed on to merchants
- A recent survey by Javelin Strategy found that small merchants with less than $10 million in annual revenues were paying an average MDR of 2.3%, suggesting the lower interchange rate was not being passed through to merchants

	Before the Durbin Amendment	After the Durbin Amendment
Price of goods sold	$100	$100
Issuer debits from accountholder	$100	$100
Issuer remits to acquirer	$99	$99.73
Acquirer remits to merchant	$98	$98.02

Economics of Interchange Price Control (ICLE)

- Interchange fee price efficiency is rather complex
- French economist Jean Tirole was awarded the Nobel Prize in economics in 2014 for his pioneering analysis of the complex economics of such "two sided markets such as payment card interchange fees"
- Economists have trouble finding the right level of price control; results often can be too low, too high, or just right, but depending on the assumptions regarding retail and bank structures, and other factors
- Can also vary dramatically across countries, within the same country over time, and among different industries
- Thus – "one blanket cost structure" will not work
- For most part, economics find that price controls on payment card interchange fees will result in higher prices and lower services for card users
- They note that the general reason countries impose interchange price regulation is specifically for higher prices and reduced services for card users

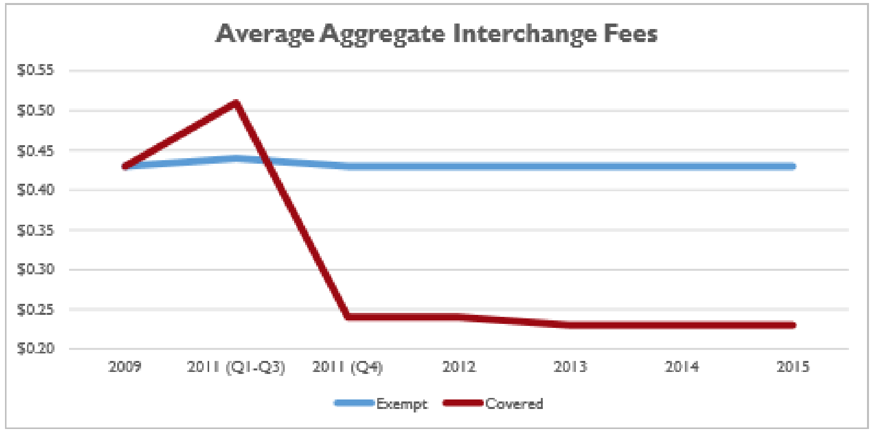
Economics of Interchange Price Control (ICLE)

Debit card interchange is part of a complex, interdependent financial ecosystem. By imposing price controls on one part of this ecosystem, the Amendment has driven predictable but (presumably) unintended changes elsewhere in the ecosystem, with various troubling effects.

Immediately prior to the implementation of the Durbin Amendment by Regulation II, from January to September 2011, the average interchange fee charged by all issuers was $0.48 per transaction, and the average fee charged by banks that would become covered by Regulation II (i.e., those with assets over $10 billion) was $0.51, and for banks that would remain exempt, $0.44.[15] After the implementation of Regulation II, the average fee charged by issuers covered by the rule fell by more than 50% to $0.24 per transaction, and has remained at about the same level since.[16] And despite Congress's purported effort to protect smaller banks from the effects of the regulation, during that same period the average interchange fee for exempt banks also fell – from an average of $0.53 per signature-authenticated (Visa, MasterCard & Discover) transaction in 2011 to $0.50 per transaction in 2015, and from $0.32 per PIN-authenticated transaction in 2011 to $0.26 per transaction in 2015.[17]

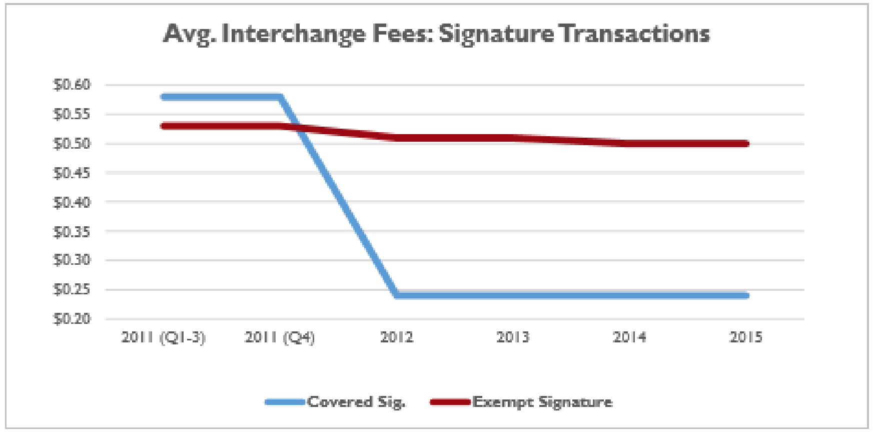
Excerpt from ICLE Durbin Analysis – April 25, 2017

Figure 1



Source: Federal Reserve

Figure 2



Source: Federal Reserve

My Opinion/ Thoughts on Durbin:

- It is difficult to change behavior once it is habit
- The implementation of Durbin did not have the desire impact
  - Banks recouped the lost revenues through additional fees
  - Merchants still had higher credit card interchange to pay, and thus couldn't lower costs simply because a portion of their payments saw "lower costs"
  - If consumers are already used to paying certain prices, unless there were some price war versus other merchants, the cost savings by the merchant that is supposed to flow through to the customer is more likely to be saved by the merchant and not passed through
- Any repeal of Durbin will likely not have the desired reverse impact
  - Banks will likely still have these other fees
  - Banks may change certain thresholds to offer free checking, but doubt it will be as it once was pre-Durbin
  - Credit cards will still likely have the bulk of the rewards programs, as issuers earn additional revenue streams on credit cards that they don't on debit cards (net interest income)
  - Some issuers would likely offer rewards on debit, simply as it would be "new" to consumers at this point, in an attempt to entice customers to switch banks
- Who would likely benefit from any repeal of Durbin?
  - Likely the issuers, the acquirers, and the card networks
  - Visa would be more benefited than MasterCard due to their debit mix of how much debit is regulated vs. unregulated

Europe IFRS Regulation

- European Interchange: “Interchange fees for Consumer Card-Based Payments (IFR)”
    - *Early 2015, European Council enacted regulation that permanently capped cross-border interchange fees at 0.20% of total transaction value for debit cards and 0.30% for credit cards within Eurozone*
- Regulation meant to help develop an EU-wide market for payments
- Secure, efficient, competitive and innovative electronic payments are crucial for internal market in all products and service, this has increasing impact as world moved beyond brick and mortar trade towards e-commerce
- Argue that higher interchange fees paid by merchant acquirers get passed to merchant, who passes it to customers in form of higher prices for goods and services
- “Competition between card schemes appears in practice to be largely aimed at convincing as many issuing payment service providers as possible to issue their cards, which usually leads to higher rather than lower fees, in contrast with the usual price disciplining effect of competition in a market economy.”
- The use of incentivizing practices by issuing banks, in the form of bonuses, cash back, rewards, etc. steers consumers towards the use of payment methods that generate the most fees
- The “Honor All Cards Rules” doesn’t allow merchants to discriminate against higher cost cards, which can hurt how they price products for customers
- Merchants were in favor of removing the Honor All Cards rule, allow for steering of the customer to less expensive payment methods, but were not in favor of surcharges, as it would hurt business if it appeared credit/debit usage was more costly

The Payments Ecosystem:

Issuers
Card Networks
Merchant Acquirers
“Other”

The Issuers

Issuers

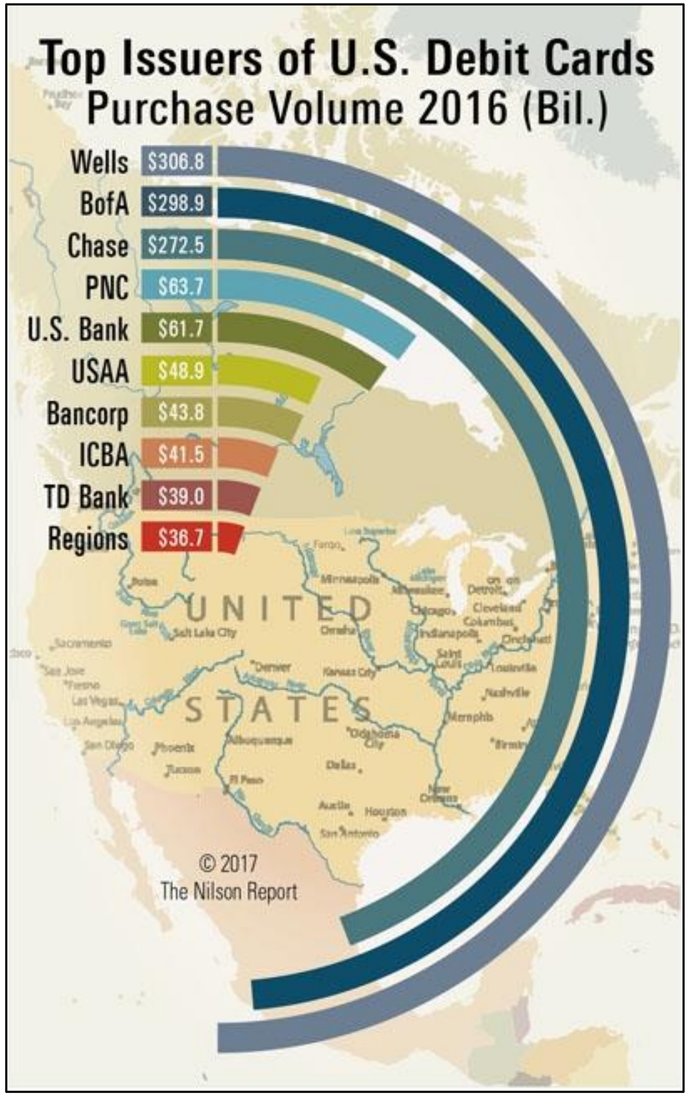
- On the consumer-facing side of the value chain
- Functions such as customer acquisition, consumer credit, debit, front and back-end processing, and assume consumer risk
- The financial institutions that issues the card to the customers
- Most common are debit and credit cards
- Earn interchange fees from merchant acquirer in the typical payment transaction
- They earn the most revenue in the transaction (credit) due to them being the primarily relationships and they bear credit risk with each credit transaction
- Some revenue sharing agreements to earn additional fees from networks
- Can revenue share for larger merchants (see: Costco) due to payment volume, quality of customers, amount of customers

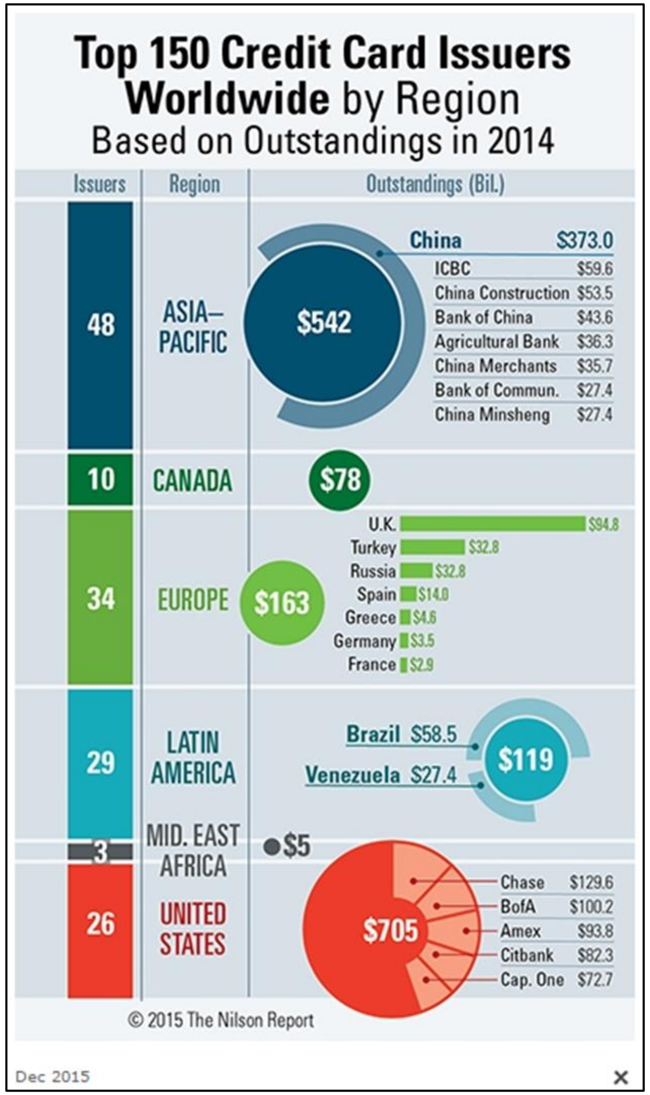
Issuers Compete On:

- Rewards
- Interest rates
- Service
- Reputation
- Brand (AXP)
- If through full service bank, its as a means of integrating the customer more
- Issuers compete at different FICO scores (different credit risk profiles)
- The customers offer different value propositions
  - Lower credit score, less spending capability, lower quality on volumes, more potential on retaining the loan, earning net interest income on outstanding loan amounts (revolving)
  - Higher credit score, more likely to pay off, more potential on volumes, more potential on higher payment amounts
- As consumers become more comfortable with using internet for activity, they are becoming more comfortable with using digital means to sign up for credit cards (see chart)
  - I think this means it becomes more competitive, as historically the bank representative would help during a face to face with customer, was sticky and easy
  - Now, customers shopping more, using internet to compare, more concerned about the value they get

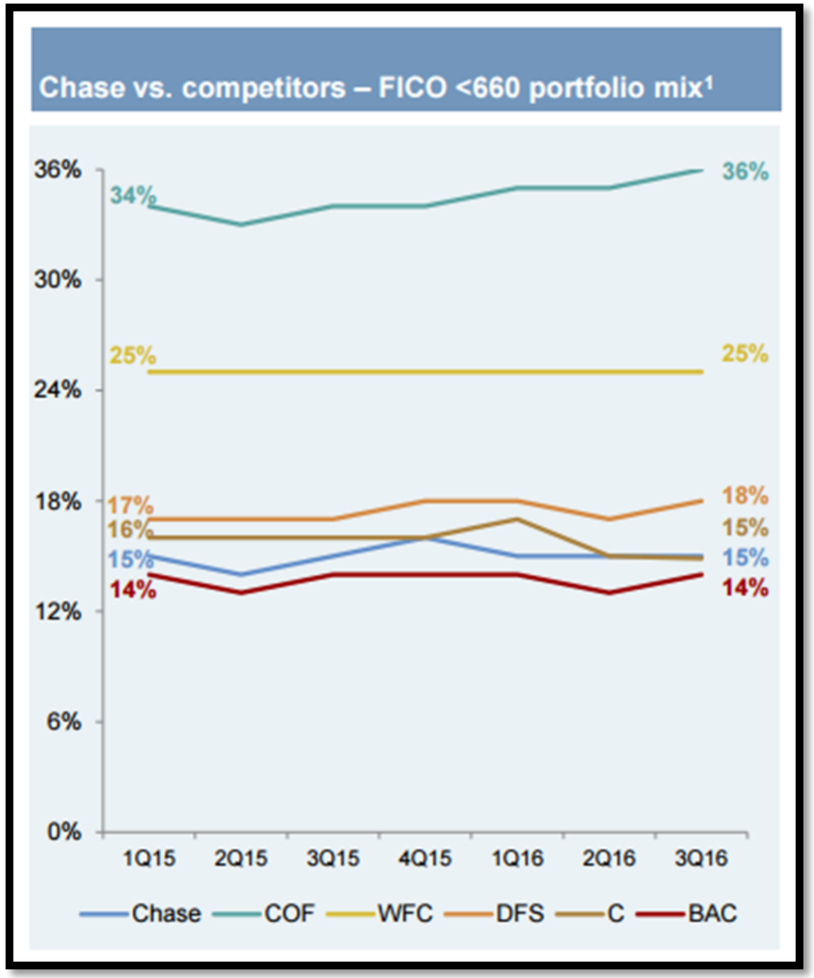
Issuer Concentration of Market Share:

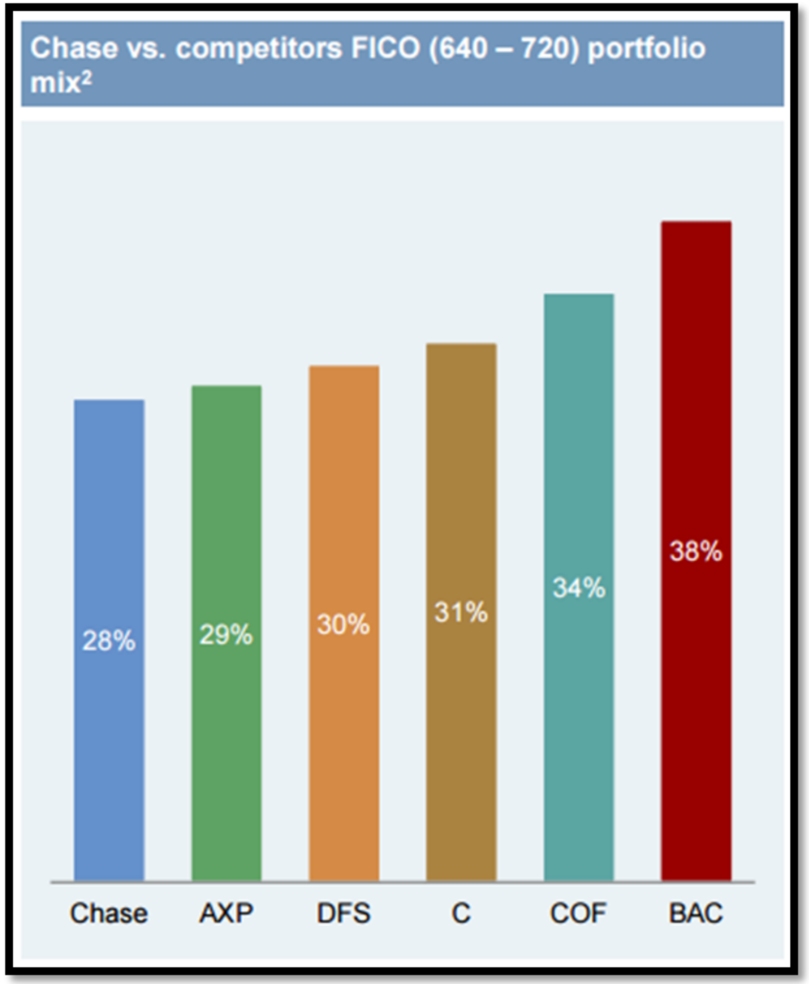
- Issuer Concentration:
  - In the US – the top 5 issuers account for ~2/3 of the outstanding credit card balances
  - Globally, the top 10 account for < 50% of the outstanding balance
  - Limited overlap based on purchase volume of issuers across different regions





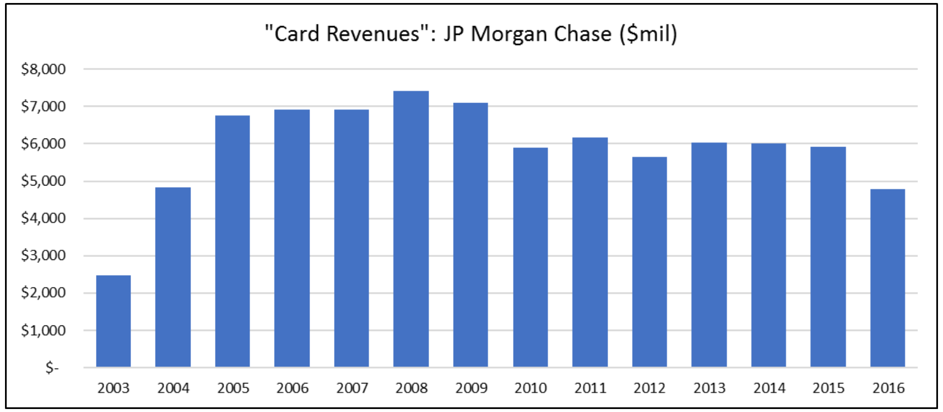
Competing on Credit Score: United States

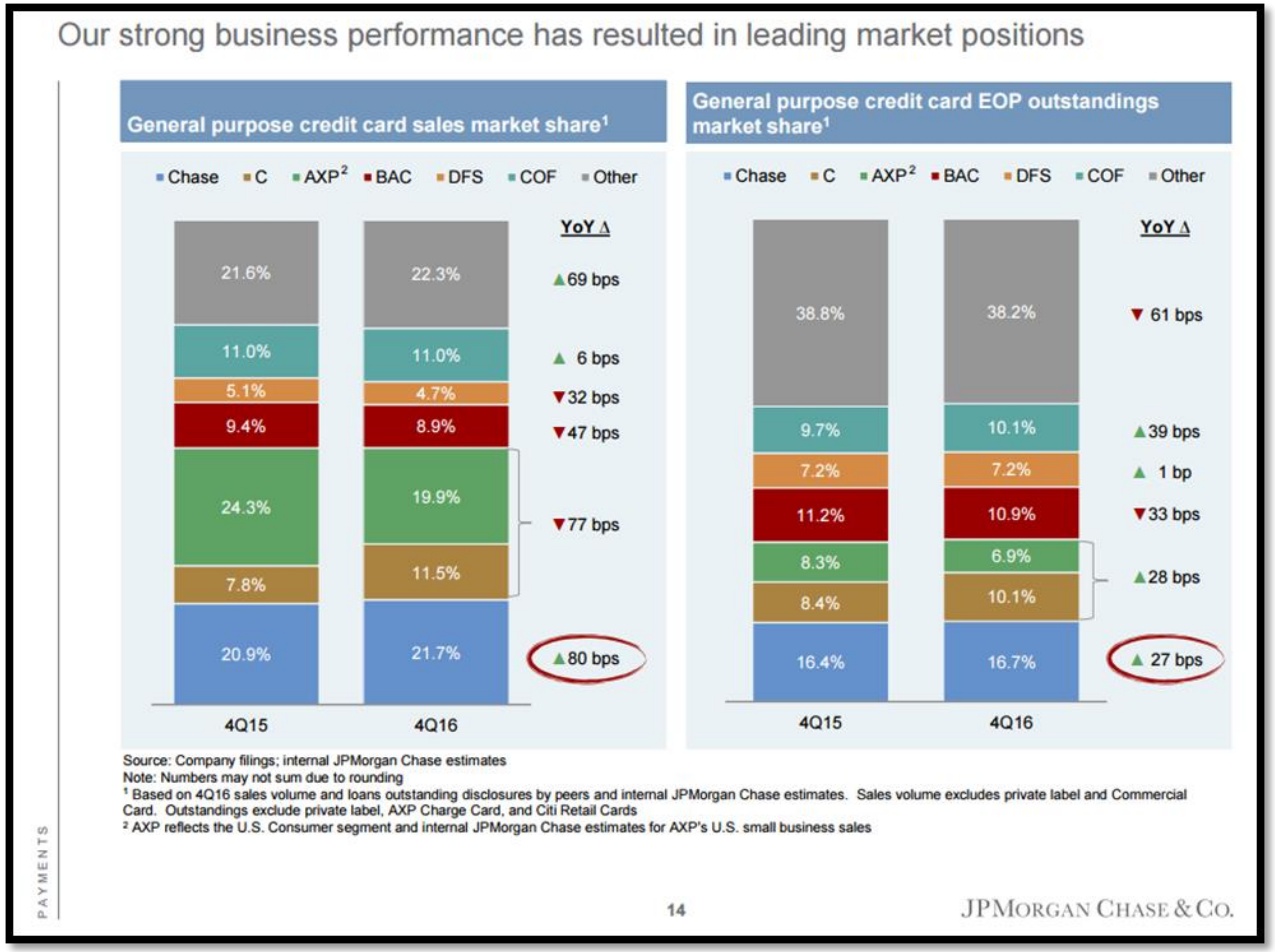




Issuer: Market Share in U.S.

- Tables on the right, from JP Morgan Chase, illustrates market share in US
- Top 6 take about 80% of the market in terms of credit card sales
  - Chase
  - Citi
  - American Express
  - Bank of America
  - Discover Financial
  - Capitol One



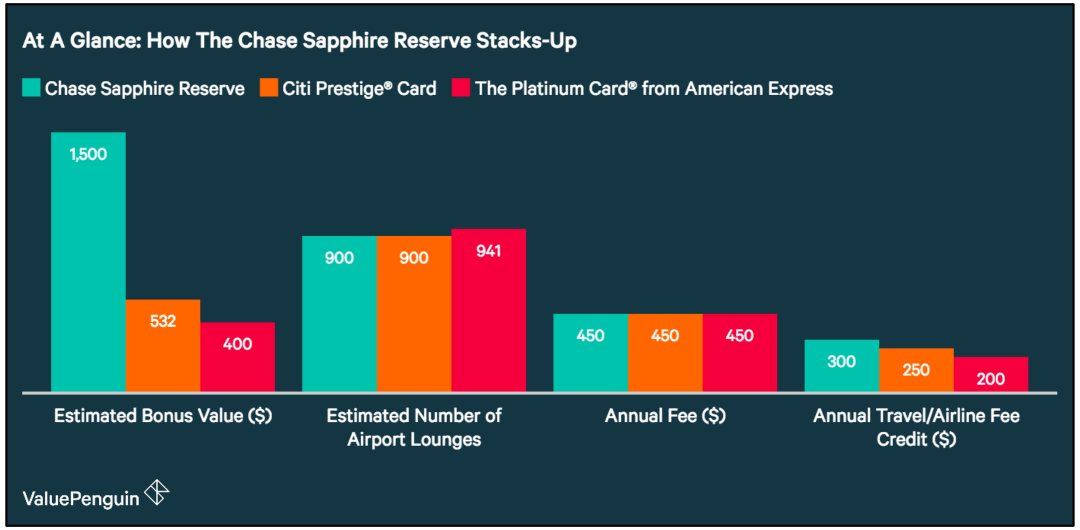


Recent Trends with Issuers

- Issuers (banks and 3-party schemes) competing more on **rewards**
- From a customer standpoint, they care less so about the network as Visa, MasterCard are ubiquitous
- Customer more active in the issuer and the rewards programs
- Example: Chase Sapphire Reserve
  - Chase bragged about the attractive customers from the new card program
  - Card program was expensive, they tapered back rewards due to strong demand
  - But end game, the customer is attractive for cross selling for the issuer

Chase Sapphire Reserve

- Released in August 2016, initially a 100,000 point sign-up rewards
- Essentially copied the American Express playbook of targeting higher-end up-and-comers
- According to a NY Times article, an AMEX top executive stated: “I am deeply paranoid about these types of competitive assaults on our customer base.”
- Competitors of American Express credit hiring former executives from AMEX to implement similar strategies
  - Head of Citibanks’s credit card division + head of branded cards, global rewards, customer acquisition, proprietary products and analytics all came from AMEX
  - Individual who created the Chase Sapphire Reserve came from AMEX, as did her boss and two other top colleagues at Chase
- In the 7 months since being releases, Chase signed up > 1 million cardholders, ~50% are under 35 years of age



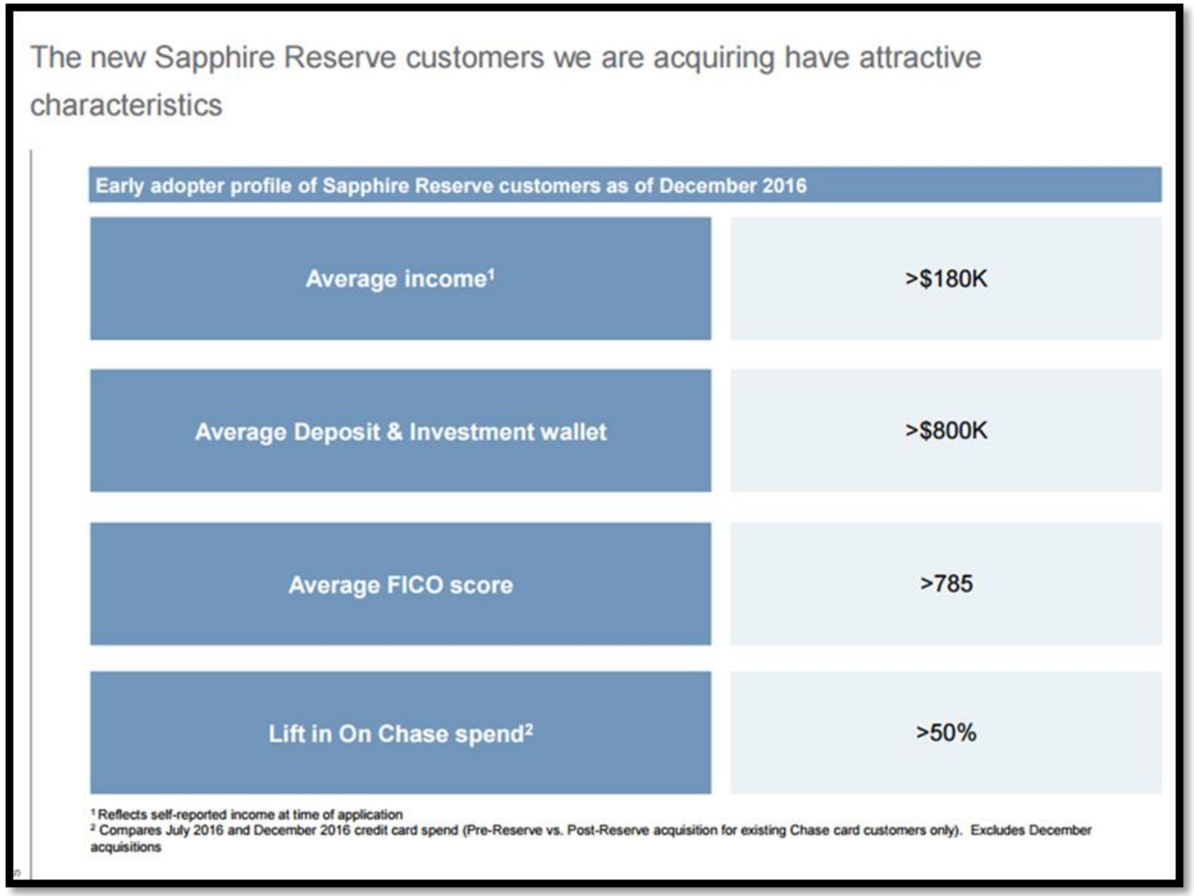
Chase Sapphire vs. Citi Prestige vs. AMEX Platinum

- In almost all blogs and reviews, the Chase Sapphire Reserve card receives the highest praise
- Citi Prestige uses MasterCard
- Chase Sapphire Reserve uses Visa
- Chart on right from: http://www.doctorofcredit.com/premium-cards-compared-chase-sapphire-reserve-american-express-platinum-citi-prestige/

	American Express Platinum	Chase Sapphire Reserve	Citi Prestige
Annual fee	$450.00	$450.00	$350*/$450
Sign up bonus	40,000 points after $3,000	100,000 points after $4,000	40,000 points after $4,000 (50,000 points after $5,000)*
Travel credit	$200 (airline incidentals only)	$300 (any travel purchase)	$250 (any airline purchase)
Redeeming Points For Travel	1¢ per point	1.5¢ per point for all travel	1.6¢ per point for AA^, 1.25¢ for all other airlines
Lounge access	American Express Centurion, Delta Sky Club + Priority Pass Select	Priority Pass Select	Priority Pass Select + Admirals Club^
Global Entry/TSA PreCheck	Yes	Yes	Yes
Travel Partners	18 airlines and 4 hotels		11 airlines and 1 hotel
Earning rate on airlines	2x per $1 spent (amextravel.com)	3x per $1 spent	3x per $1 spent
Earning rate on hotels	2x per $1 spent (amextravel.com)	3x per $1 spent	3x per $1 spent
Earning rate on other travel	2x per $1 spent (amextravel.com)	3x per $1 spent	1x per $1 spent

Recent Trends with Issuers

- With the ancillary benefits of having desired cardholders, I expect the rewards competition to continue to increase
- Reminds me of the desire to have wireless bundled in with the traditional cable bill: not necessarily NPV positive on the wireless revenue, but more so on the decreased churn and use of scale on expenses
- Chase remarks that the Sapphire Reserve cardholder characteristics are very attractive, which are beneficial to their other product offerings and services
- At the end of the day, the true beneficiaries are the card networks (increased volume/ increased reliance on credit card reward programs/ makes credit cards top of the wallet) and the cardholders (increased rewards)



The Merchant Acquirers

Merchant Acquirers

- On the *merchant-facing* side of the value chain
- Acquirer sits in between the network and the merchant
- Serves as the transaction link between the two by routing card information and transaction details to the network
- Predominant function for acquirer is to handle the merchant side of the payment equation
- Top merchant acquirer in US is Vantiv, #1 for first time since 1996 that a new company is #1
- In a closed loop model (3 parties) the issuer and acquirer is same entity
    - ChaseNet
    - American Express
    - Discover Financial
- ChaseNet has $1,063m in total processing volume in 2016, which is a 13% CAGR from 2012 ($655m)
    - Leveraging internal relationships, as <55% clients are internal sources
- BofA, Vantiv, Chase, FirstData some of largest global acquirers with combined share of 33% of all card purchases globally in 2014

Merchant Acquirer: Functions

Acquirer Functions and Offerings

Merchant account services	Checkout and acceptance method selection and integration	Front-end processing (authorization)	Back-end processing (clearing and settlement)	Chargeback management and advocacy
Acquirers are the banks with whom merchants maintain their merchant accounts, allowing merchants to accept card-based payments. Functions include managing account and balances, managing customer data (e.g. card-on-file data), providing working capital / lines of credit, and other reporting and analytics.	Acquirers set merchants up with POS terminals and / or gateways. POS terminals are the physical hardware that enables an offline merchant to accept payments. These devices capture and route card information and transaction details to the acquirer. Gateways provide the same function for online merchants.	The acquirer routes the authorization request through the appropriate card payment network (i.e. V/MA, debit networks, etc.). The transaction is then authorized by the issuing bank if the account is in good standing / has available funds, etc. and routed back through the acquirer to the POS terminal. These authorizations take place in real-time (within a few milliseconds).	Acquirers also clear and settle transactions for merchants, typically in batches every 1-2 days. An issuer sends the funds to the acquirer (minus the issuer's fee), which the acquirer then credits to the merchant account, net of its own fees and the network's fees.	Payments disputes occur when a merchant or cardholder does not agree with or does not recognize a transaction. Acquirers are responsible for managing these disputes, including processing chargebacks (cardholder refunds).

Source: Company reports, Bernstein analysis

Types of Merchant Acquirers

- "Merchant Acquirer" is general term, but actually there are:

1. **Merchant Banks**
    - Chase Paymentech, Vantiv, BofA Merchant Services, Wells Fargo Merchant Services
    - Underwrite and service merchant accounts
    - Provide front and back end processing of card based payments
    - Often outsource certain aspects to third-party processors
2. **Integrated Processors**
    - Third-party processors typically hired by banks to handle front and back end processing
    - They are not financial institutions
    - First Data, Heartland/ Global
3. **ISO only**
    - Independent Sales Organization
    - Commissioned by merchant bank to source and develop merchant relationships
    - Soliciting merchant customers, selling / leasing / installing equipment
    - Service customers

How Merchant Acquirers Make Money:

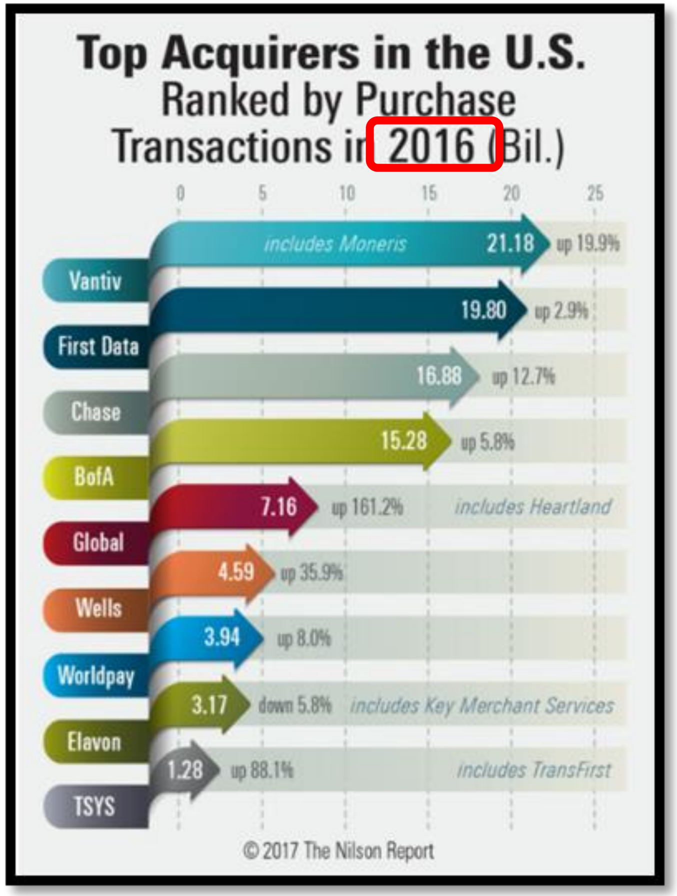
- **How do Acquirers make money:**
- Merchant Discount Rater (MDR)
  - The fee acquirer charges the merchant for processing a transaction
  - Quoted as interchange (fee acquirer pays issuer of card) and network assessment fees
  - Typically flat rate per transaction + % of value of transaction
- Monthly fees
  - From other small services
  - Only a minor portion of their revenues
- Interest on “float”
  - By money paid to acquirer by issuing bank, but not yet paid to merchant yet in the 1-3 day period
  - Another small revenue source

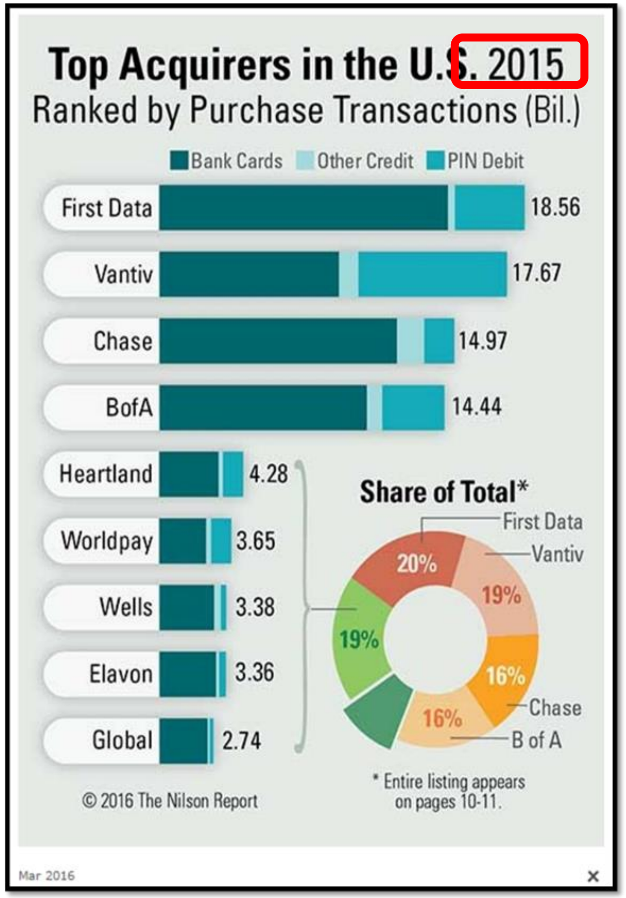
Trends for the Merchant Acquirers:

- Trends for the Acquirers:
  - Shift from physical sales to more e-commerce/ card not present
  - More in-store mobile payments
  - More mPOS systems and merchant aggregators (SQ/ PYPL) who offer less expensive infrastructure and enable smaller merchants to have access
  - EMV chip technology
- Strong/ growing:
  - Vantiv
  - Chase

Merchant Acquirer: Market Share in U.S.

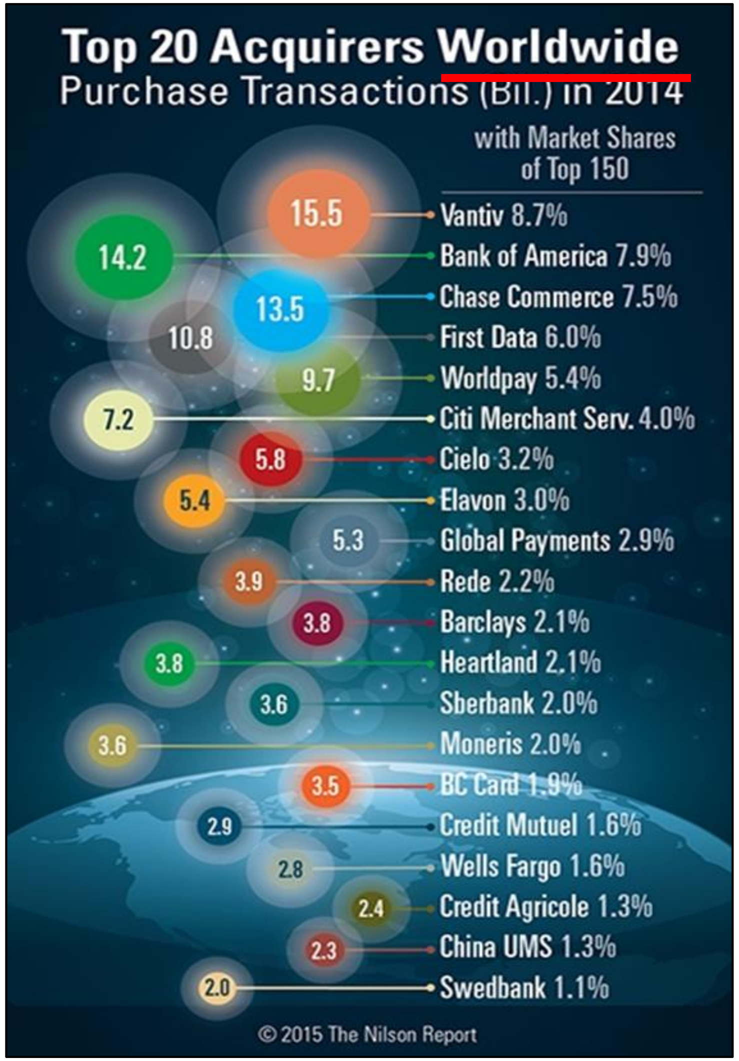
- Vantiv has been growing strong due to acquisitions and their business model
- Chase has been growing, leveraging their scale and sales organization
- The industry in US is consolidating
  - Global / Heartland
  - Elavon / Key Merchant Services
  - TSYS /TransFirst





Merchant Acquirer: Market Share Globally

- Key to note that the merchant acquirer industry is fragments on a global scale
- What is strong in the US is ~ non-existent outside the US
- Still, there is some decent market share for the top 4-5 players, which = ~65% of global market share, based on purchase transactions



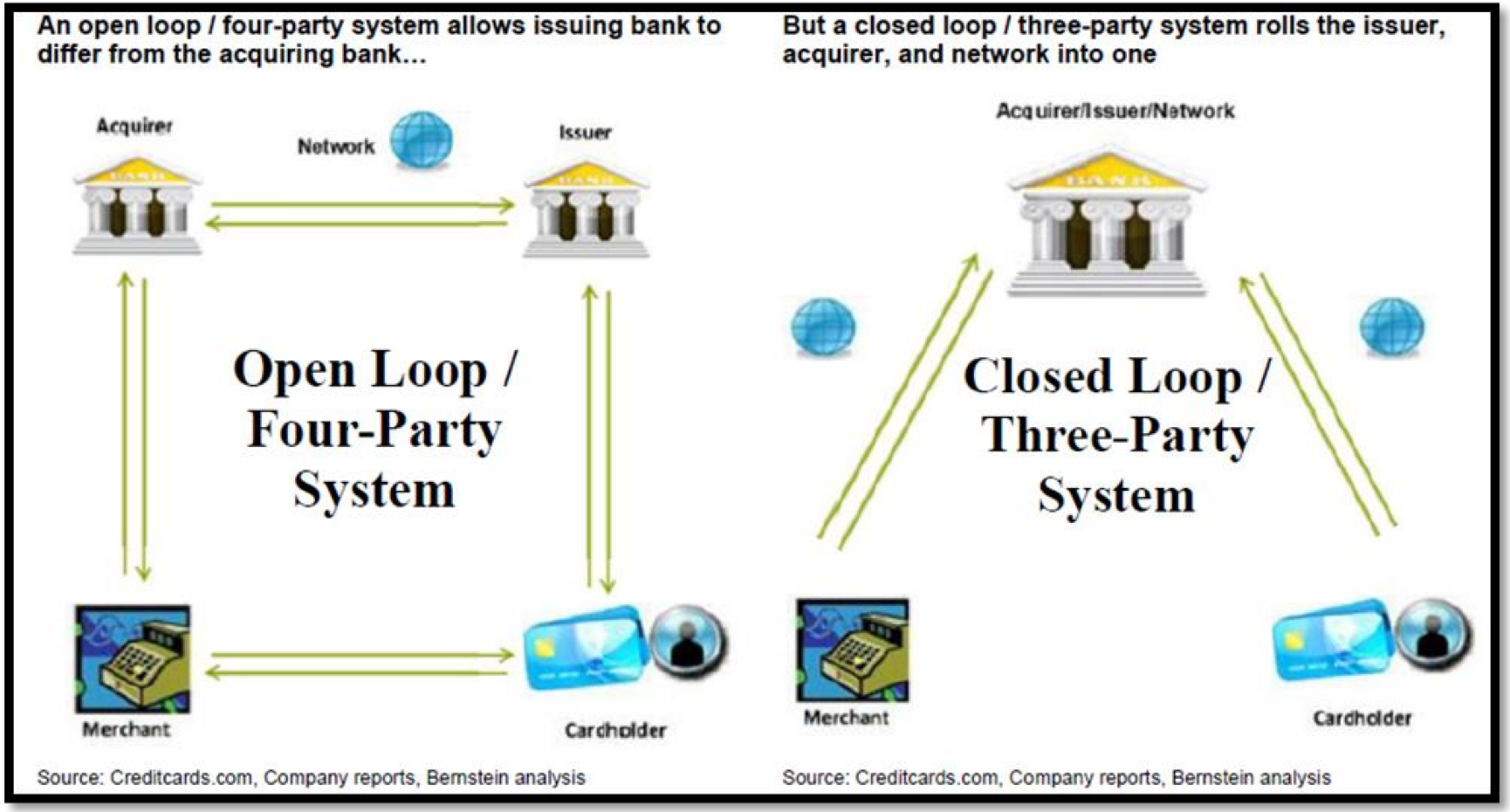
The Card Networks

The Card Networks

- 4 party scheme, where the parties involved are the merchant acquirer, the merchant, the cardholder, and the issuer
- The network allows the merchant bank and the issuing card bank to differ
- Called an “open loop” network

- 3 party scheme, where the parties involved are the merchant acquirer/issuer being the same entity, the merchant, and the cardholder
- The bank issuing the cards are often the same bank that has the relationship with the merchant
- Called a “closed loop” network

Card Networks: 3 vs. 4-Party Scheme



Card Networks: Purpose

- Provide real-time, flawless availability for authorization of transactions, transaction switching between issuers and acquirers, as well as fraud detection, analytics, setting of rules
- Serve as the rails that enable data transmission, connecting the other parties involved in the transaction; the merchant to the merchant acquirer to the issuer
- The brand that consumers see implying acceptance of the credit cards in a secure transaction
- The physical network infrastructure between the parties involved
- Analytics for credit card fraud (identity theft, geolocation, purchase patterns, etc.)
- Innovating to improve security in the transactions
- Set operating rules for parties involved to facilitate acceptance

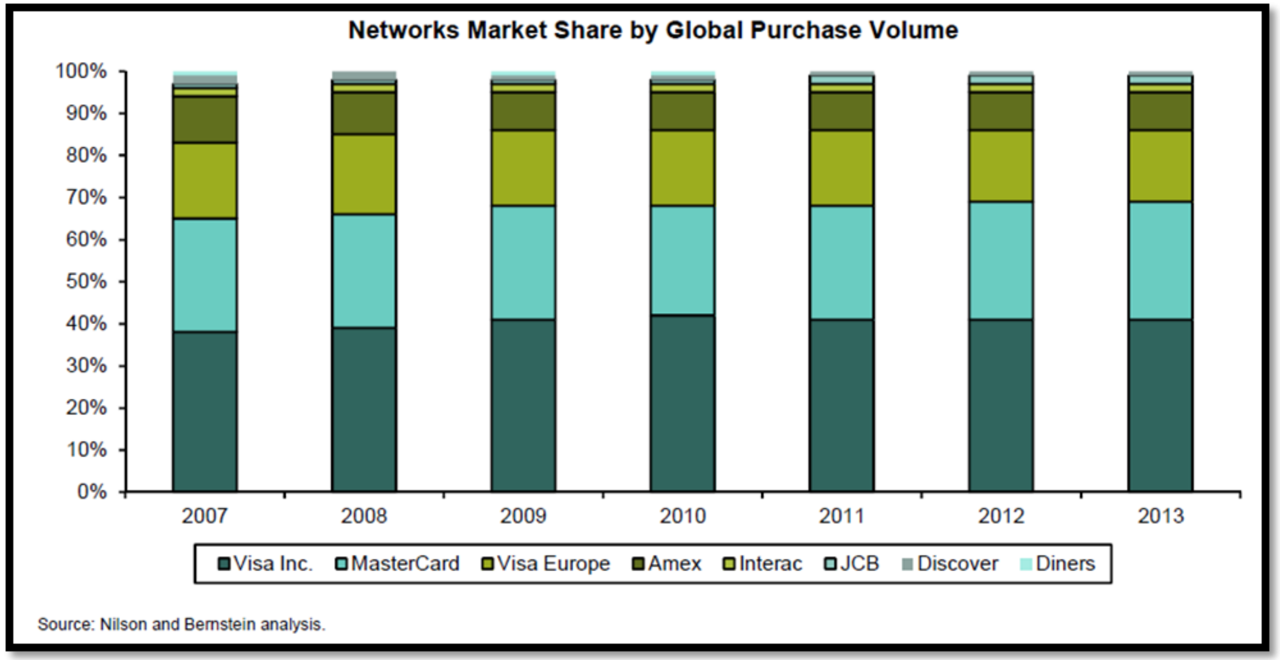
The Role of a Closed-Loop System (AXP…)

- Handles every step of the card payment
- Claims the entire merchant discount rate as revenue
- Does not participate in the interchange system
- Has to issue cards and add merchants onto networks to grow footprint
- Due to their differences versus the open-loop system, their business model is very different versus Visa/ MasterCard
  - V/MA look to partner with banks in order to be the network (thus, V/MA emphasize their new issuer relationships and partnerships established during earnings call and in presentations)
  - Closed-loop issue the cards, take on the credit risk, also earn credit card membership fees, late fees, interest income
  - Closed-loop has more data on their customers as they are more entrenched as a financial services player
  - Closed-loop is more of a spend-centric business model, tied to payment volumes, where as V/MA desire both high levels of payment volumes and transactions

Market Position of Card Networks

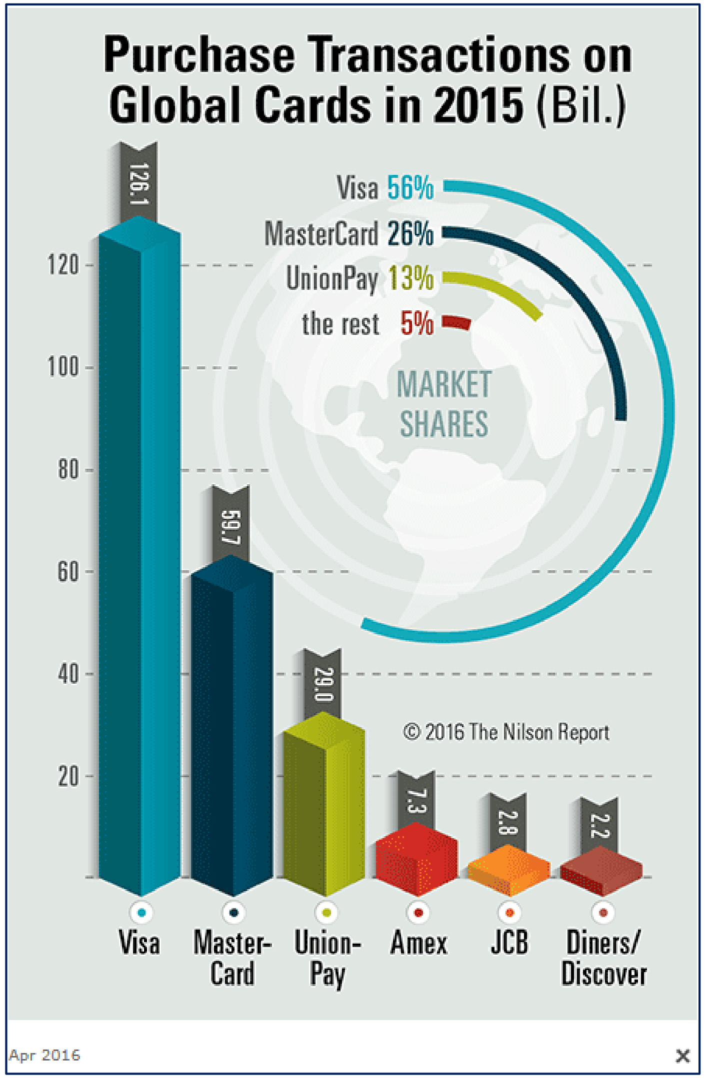
From 2010 – 2014:

- Among global players, MasterCard is gaining share at 50bps per year
- MA has gained 2% of share since 2010 (average of 50bps per year to 28% in 2014) but less so in 2014 to 35bps, probably due to ChaseNet
- Visa has lost 80bps per share since 2010, now has 41% of purchases globally
- AXP has gained 14bps per year in core market (US credit) since 2010, now at 26% market share in US credit, but has lost 6bps per year globally, now at 9% share



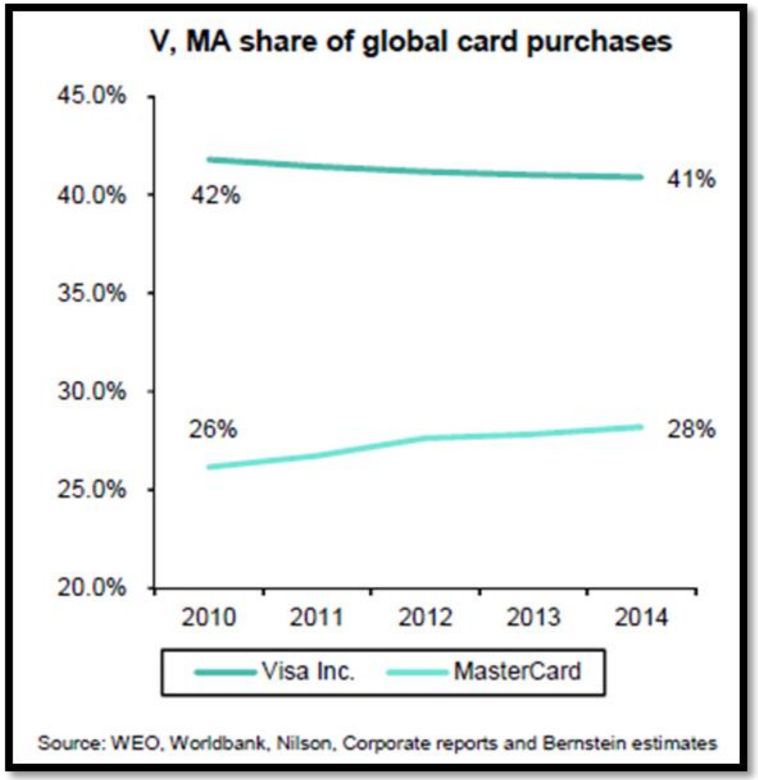
Market Position of Card Networks

- Based on purchase transactions on a global basis using global cards, Visa and MasterCard have a > 80% market share
- This includes UnionPay (CUP China)
- Continual theme of Visa being the dominant force in the industry on a global basis (not just in China, as CUP essentially is).



Market Position: Visa vs. MasterCard

- Visa and MasterCard operate in a duopoly globally, with both combining for ~70% of *payment volume*
- According to Bernstein, Visa has lost 1pp since 2010 in global market share, while MasterCard has gained 2pp
- Based on global market share, one can infer that the card network industry is:
  - Dominated by 2 players
  - Stable
  - Must be some barriers to entry in order for the market shares to be as steady as they are
  - Visa is the clear dominant leader
  - MasterCard continues to be the aggressive #2, playing catch up to Visa
- Despite the market shares being stable, it doesn't imply the future market share/ business is immune from new competition or technological changes



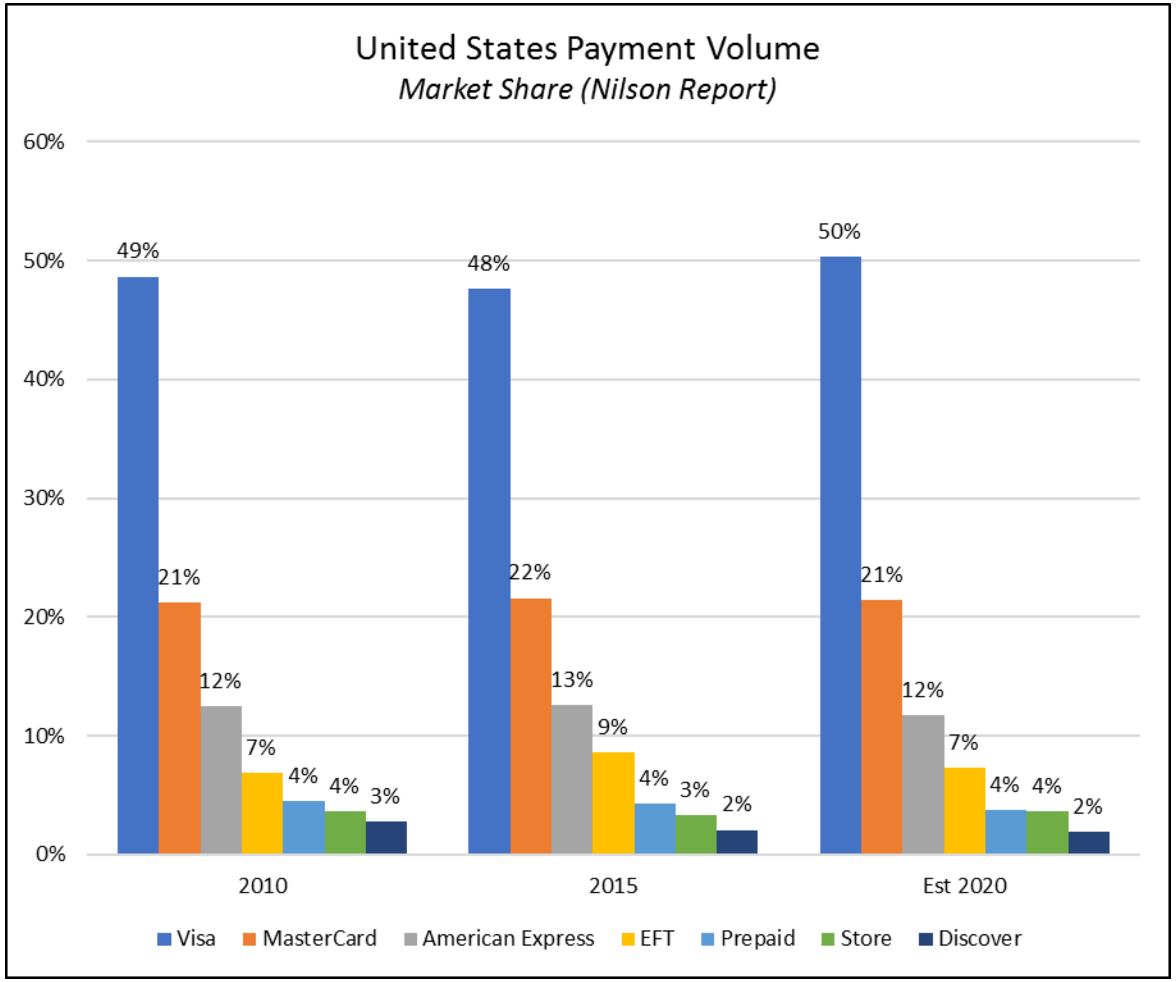
Market Position: United States

- Visa and MasterCard combine for ~**70%** of the market in US
- In 2015, combined for ~$4 trillion in payment volume, expected to be about $5.9 trillion in 2020
- According to Nilson, they believe V/ MA will grow payment volume the *fastest* of all the card networks from 2015 - 2010

US Payment Volume (Nilson Report)

	2010	2015	Est 2020	10 - '15	15 - '20
Visa	$ 1,863	$ 2,718	$ 4,098	*7.8%*	*8.6%*
MasterCard	$ 812	$ 1,233	$ 1,744	*8.7%*	*7.2%*
American Express	$ 476	$ 717	$ 955	*8.5%*	*5.9%*
EFT	$ 262	$ 491	$ 593	*13.4%*	*3.8%*
Prepaid	$ 172	$ 244	$ 303	*7.2%*	*4.4%*
Store	$ 138	$ 189	$ 296	*6.5%*	*9.4%*
Discover	$ 106	$ 118	$ 152	*2.2%*	*5.2%*
Total	$ 3,829	$ 5,710	$ 8,141		

Market Share:	2010	2015	Est 2020
Visa	49%	48%	50%
MasterCard	21%	22%	21%
American Express	12%	13%	12%
EFT	7%	9%	7%
Prepaid	4%	4%	4%
Store	4%	3%	4%
Discover	3%	2%	2%



Competition Amongst the Card Networks:

- Late 2015, USAA (one of the largest issuers of debit and credit cards) switched from MasterCard to Visa
  - MA was a partner with USAA for roughly 30 years
  - "Visa deal provides USAA the opportunity to provide more benefits, including the elimination of foreign transaction fees for all USAA Visa credit cards in 2016"
  - USAA was the 10th largest issuer in the US, had $17.5 billion in outstanding card loans as of mid-2015
  - MasterCard said it pursued keeping the business until "it reached a point where the economics did not make sense"
  - USAA was MasterCard's largest debit card issuer, with $26 billion in purchases made on its cards in 2015. 2nd largest issuer of MA debit cards is Fifth Third Bancorp with $20 billion of volume.
- Costco switched from AXP to Visa/ Citi in March 2016
  - AXP said they tried to win the business but was "unable to agree to terms that would have provided attractive returns for our company and our shareholders."
  - Costco generated about 8% of AXP worldwide billings in 2014
  - Over 70% of the billings occurred outside of Costco
- JetBlue switched from AXP to Barclays' MasterCard
  - AXP and JetBlue were partners since 2005
  - JetBlue hired a new CEO in 2015, which was likely some of the reason for the change (i.e. increase profits, decrease costs)

How the Card Network Make Money

- This is based *solely* on the card networks, not on ancillary revenues, such as from closed-loop networks, interest income, late fees, annual membership fees, etc.

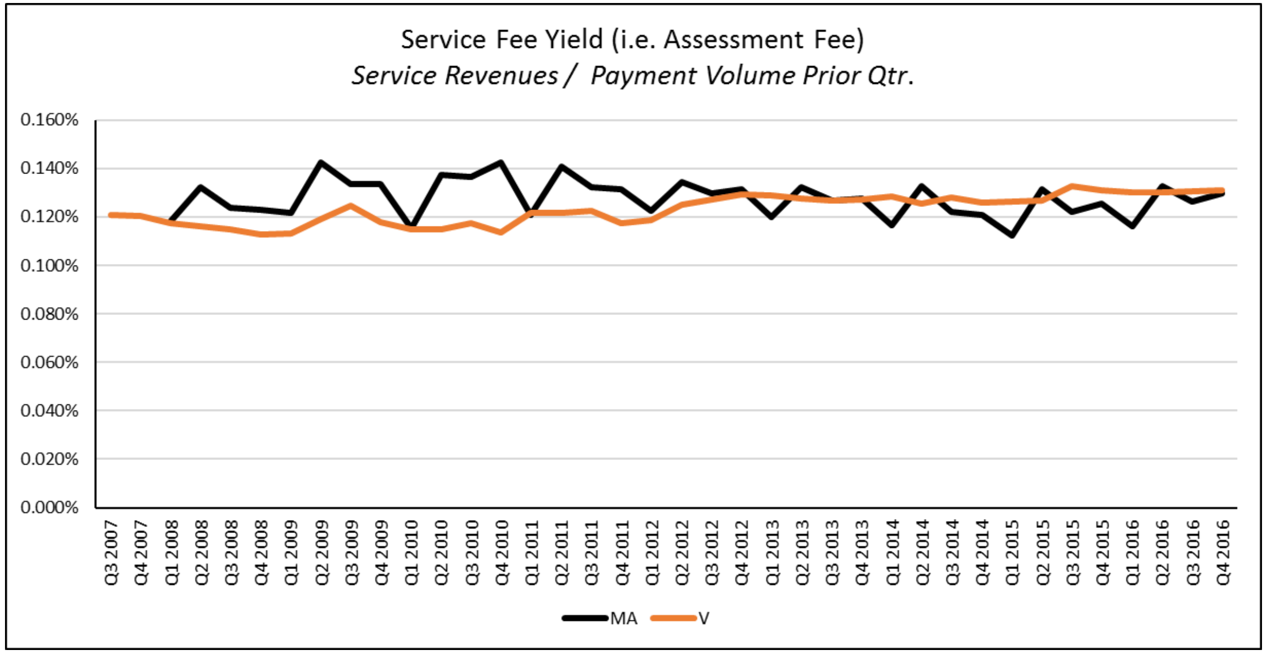
How they make money:

- ***Assessment fees***: "acceptance fees", a portion of the MDR paid to networks for facilitating the acceptance of the transaction. Typically a % of transaction volume.
  - Based on transaction (card) volume, and NOT the processed volume
  - Does not require payment to actually be routed and processed through a given network
- ***Processing fees***: for the actual switching/ communication between issuers and acquirers. Usually a flat fee per transaction, regardless of volume amount.
- ***Cross-border volume fees***: charged on cross-border transactions, which is significantly higher than domestic fees.
  - Example: Card issued in US and a European merchant. Visa Europe would get this cross border fee.
  - The issuer and the merchant are in different countries, and thus a cross-border fee is added to the transaction
- ***Other***

Note: If a consumer brings there Visa credit card to a foreign country, if it is processed by local credit card network, Visa does <u>not</u> collect the processing fee, but does collect the assessment fee

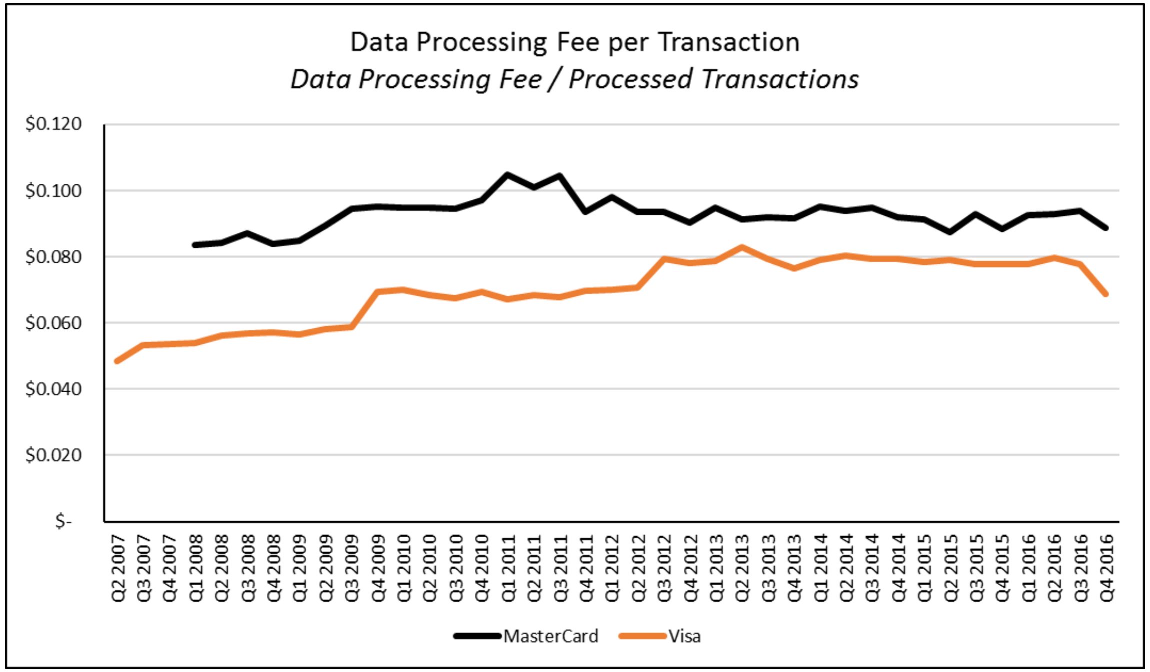
Assessment Fee: “Service Fee Yield”

- Based on the service revenues generated, which is a product of the payment volume
- Service Fee Yields:
  - *Visa*: **0.131%** prior to Visa Europe. Including Visa Europe, the service fee yield drops to **0.111%** due to the lower assessment pricing (some to do pricing, some due to “rebates” Visa offered).
  - *MasterCard:* **0.129%**, which is very similar to Visa pre-Europe transaction
- If Visa increased their Visa Europe assessment pricing to be equivalent to their historical pricing of 0.13% per payment volume, their service revenues would increase by ~ $250m per quarter ($1b/ yr.), which is about 12-13% higher than current revenues.
- If Visa made Visa Europe pricing on par, the additional $1b in service revenues would largely flow straight to operating income, excluding some additional incentive costs dependent on payment volume. All other expenses could be leveraged.
- Service fee can move based on a number of things, including foreign exchange, merchant consolidation impact on pricing, lower pricing in exchange for higher volume (Costco partnership?)
- Overall, it looks like the assessment fee pricing is, more or less, stable, and the incremental growth will not come from increases in pricing in the service fee yield, but more so in data processing fees and payment volume on the networks



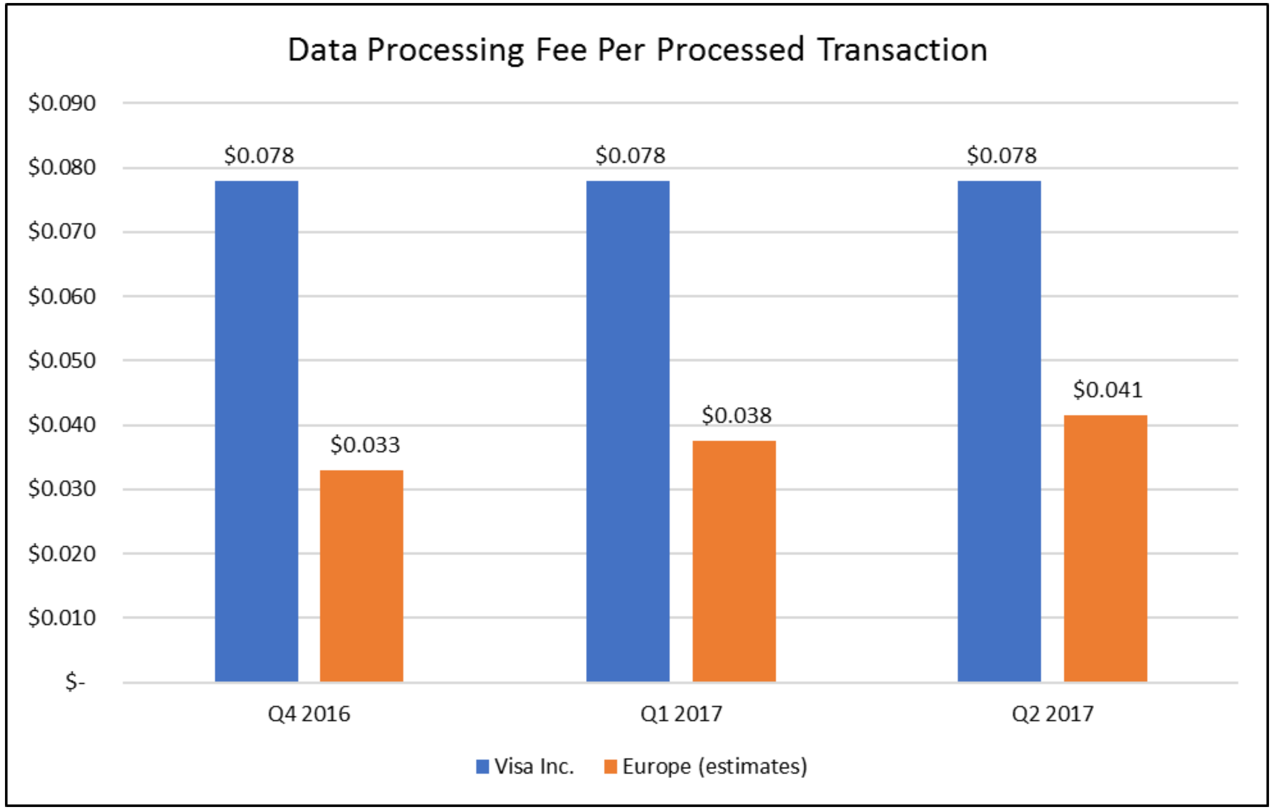
Processing Fee

- A function of the transaction processed, regardless of the payment volume amount
- Data processing fee:
  - *Visa*: prior to Visa Europe, was **$0.078** per transaction; inclusive of Visa Europe, it drops to **$0.07** per transaction
  - *MasterCard:* about **$0.09** per transaction
- Currently, Visa's processing is at a 20% *discount* to MasterCard
- Prior to Visa Europe, Visa's pricing was at a 12% *discount* to MasterCard on processing fees
- If Visa could increase processing fee pricing in Europe to normal Visa levels (~ $0.08) then processing fee revenues would increase by about $800m per year currently



Visa Europe *vs.* Visa Inc. on Pricing

- Since the Visa Europe acquisition, Visa's pricing metrics have declined quite a bit
- Largely due to Visa Europe being bank-owned, not run as a for-profit entity
- This is similar to when Visa IPO'd in 2008 as processing fees were less than $0.05 per transaction, which were increased by about 40% from 2007 to 2010
- If Visa Europe could price similar to historical Visa, then:
    - Service revenues would increase by about $1 billion
    - Data processing revenues would increase by about $800m

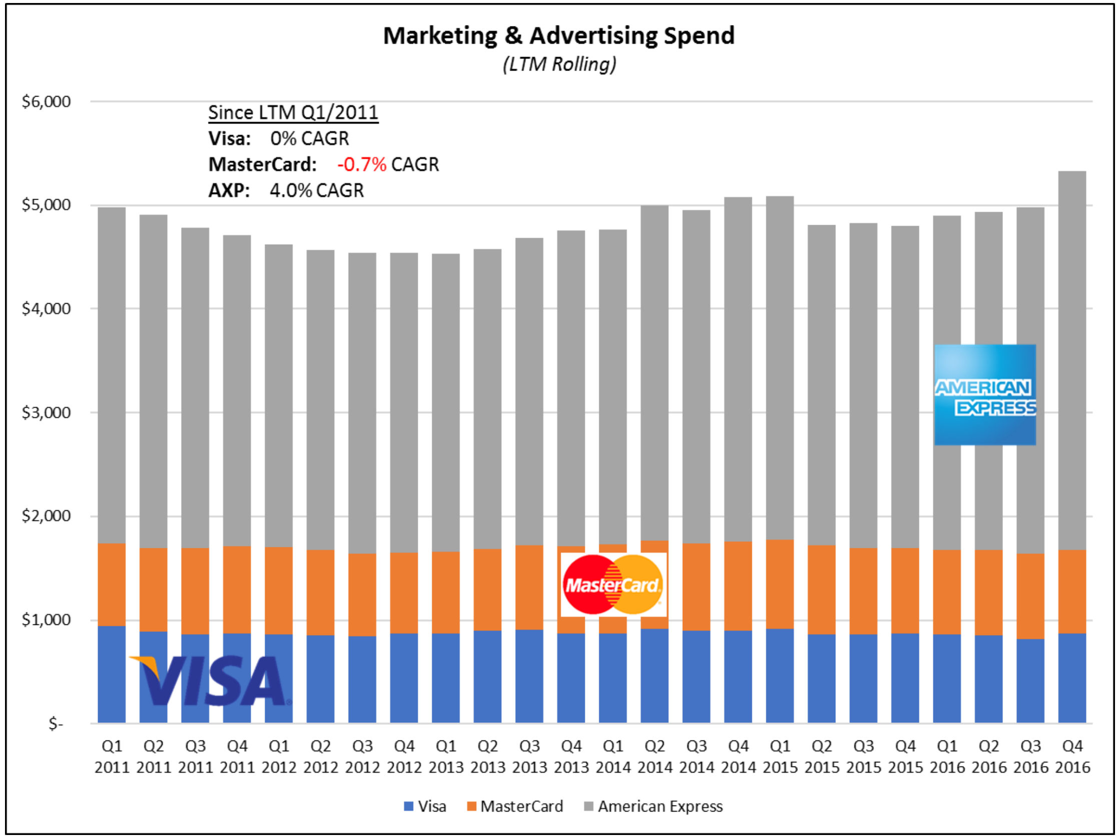


How do Card Networks "Grow"?

- Advertising and marketing their brand, being the recognizable brand of "accepted payments that are secure" by consumers and merchants
- Using this brand and partnering with banks to issue cards to consumers
- Card networks rely on "network effects" (no pun intended) through increased acceptance
- Merchants will **offer** their consumers a payment method if they know plenty of their consumers will want to pay with this method
- Consumers will want to **pay** with a payment method if they feel confident it is accepted at almost every merchant they purchase from
- Issuers want to **partner** with a card network that is recognized by both the merchants and consumers, and thus has the scale effect through mass adoption
- This has been the issue with Apple Pay and other wallets – consumers don't see the reason to use yet, and thus merchants don't see too much incentive to offer, and since many merchants don't offer Apple Pay (or other wallets) then the consumers don't feel confident in using it frequently….it creates a virtuous or un-virtuous cycle
- The issuers are advocated of the network brand, as the network pays them incentives to use their network, and banks earn a tremendous amount of fees from cards
    - Interest income
    - Overdraft fees
    - Annual membership fees
    - Interchange fees
    - Incentives from networks
    - ….and it makes it more sticky for the bank with their customers (bill pay, online portal, etc.)

A Consumer Brand?

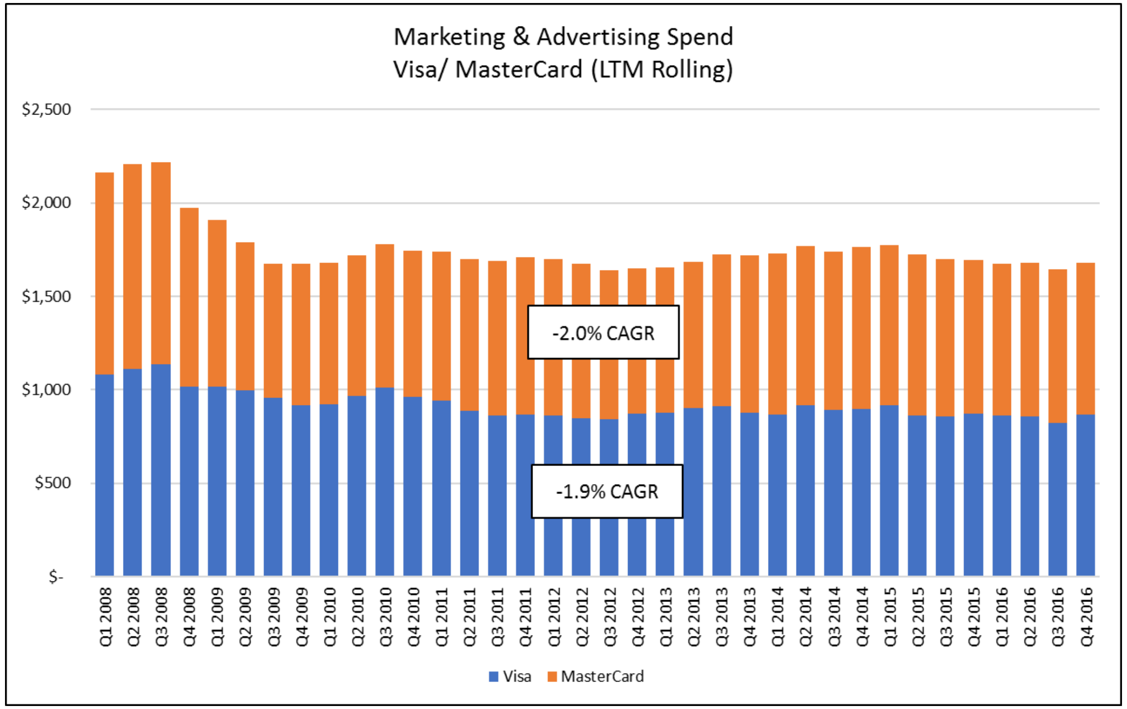
- What is important for the networks:
  - Brand image is important, thus they spend a lot on marketing/ advertising of their logo (see chart on right)
  - Difficulty in disruption is based on scale: need consumers to have the card for the merchants to see the potential for it to be used, and vice versa. Needs to have broad merchant acceptance for the consumer to see benefit of having the card. I.e. needs to be as accepted as cash, which is essentially everywhere you go.
  - Difficult for other companies to gain traction because the merchants don't see the benefit yet, and consumers also don't see the benefit of it as it is not as ubiquitous as current methods and don't see as much adoption/awareness by merchants.
  - The competitive advantage is based on the virtuous cycle between acceptance by the merchants and the consumers.
  - The more "top of the mind" their cards are, the more likely customers will pay with their cards and have confidence in the strength of the brand when making payments



American Express has a different business model than Visa/MasterCard, which partially explains their heavy marketing spend versus the networks

Marketing & Advertising

- Visa and MasterCard collectively spend ~$1.7 billion per year on marketing and advertising
- Being an ever present brand in consumers minds is important for the card networks, as they want to be perceived as accepted everywhere you want to purchase something
- By looking at the aggregate spending, it is clear that they leverage this spending, as payment volume and transactions have grown substantially, yet marketing spend has remained flat since 2009.



Winning Issuer Business

- In order for the card networks to grow, they need to expand through partnering with issuers (banks, credit unions) to be the underlying card network in each card transaction
- This is why MA and V discuss their new issuer partnerships at the beginning of each quarterly call – as this is a large way they grow
- The issuers offer their bank customers credit/debit cards which have V/MA as the network for processing, routing information, providing analytics, fraud prevention, etc.
- A tremendous amount of payment volume is due to partnering with issuers than have a large customer base that uses credit or debit cards

An example of MasterCard sharing some of their large issuer partnerships at their investor day in 2017

Disrupting the Card Networks

Can the networks be disrupted?

- Possible, but difficult to do. ChaseNet could have their own network between their own card transactions, but it is difficult to scale this as consumers use other banks as well, would be difficult to scale this outside of US where Chase is as not dominant as an issuer
- Difficult to do due to the virtuous cycle of acceptance between consumers and merchants
- Predominant ways card networks could get disrupted (in my opinion):
  - Regulation on interchange, or Signature debit, or credit card interchange (impacted rewards)
  - Merchants pushing for regulation on alternative payment methods, that are far less expensive (possible direct ACH from banks?)
- Their brands are global, but issuer and acquirers are less so
- They have strong value proposition for both issuers and acquirers
- They are trusted by all parties involved in the transaction
- Potential for disruption on some local levels due to issuers creating own network, or government creating closed loop network to reap the economics and data from transactions
- The network economics are high margin, but are the smallest portion in the payment transaction fee ecosystem. Issuers and acquirers earn more of the lion's share.
- If interchange is ~2.0% +/-, networks earn around 10-15 bps
- Behavior by consumers is difficult to disrupt, if people prefer using cards, difficult to change
- Many don't see value proposition of using alternative methods yet (cell phone) vs. taking the minimal time to pull out credit or debit card. Possible that paying by card is faster, as cell phones are password protected oftentimes.

Why are Visa/ MasterCard Difficult to Disrupt?

Why are Visa and MasterCard difficult to disrupt?

Ubiquity of acceptance networks	Technological sophistication of physical networks	Value proposition to issuer and acquirer customers	"Trusted Steward" role in the payments system
• V and MA have 2.2 billion and 1.3 billion cards in circulation, respectively • Each network has >30 million merchant acceptance locations around the world, and tens of thousands of member banks • To the customer, widespread acceptance makes the card more valuable; to the merchant, more cardholders means more incentive to accept the card brands	• VisaNet processes on average 150M transactions / day, at 24,000+ transactions /second; MA maintains 99.9% availability, 24/7 • V and MA continue to invest in advanced technology (tokenization, biometrics, etc.) • V and MA enjoy high barriers to entry given the low marginal cost, scale-driven nature of their physical networks	• Visa and MasterCard set operating rules including interchange, which standardize a complex operating environment and impact industry profitability • No incentive for disruption within existing ecosystem; Visa and MasterCard account for <10% of credit economics • Sticky customers who favor using credit cards; difficult to steer behavior	• Among the operating rules they set, Visa and MasterCard put in place stringent security standards through the PCI DSS that mandate compliance by all parties involved • Perceived as trusted middlemen by both merchants (who believe they will get paid) and customers (who can rely on chargebacks); help "grease the wheel" through implicit insurance policy

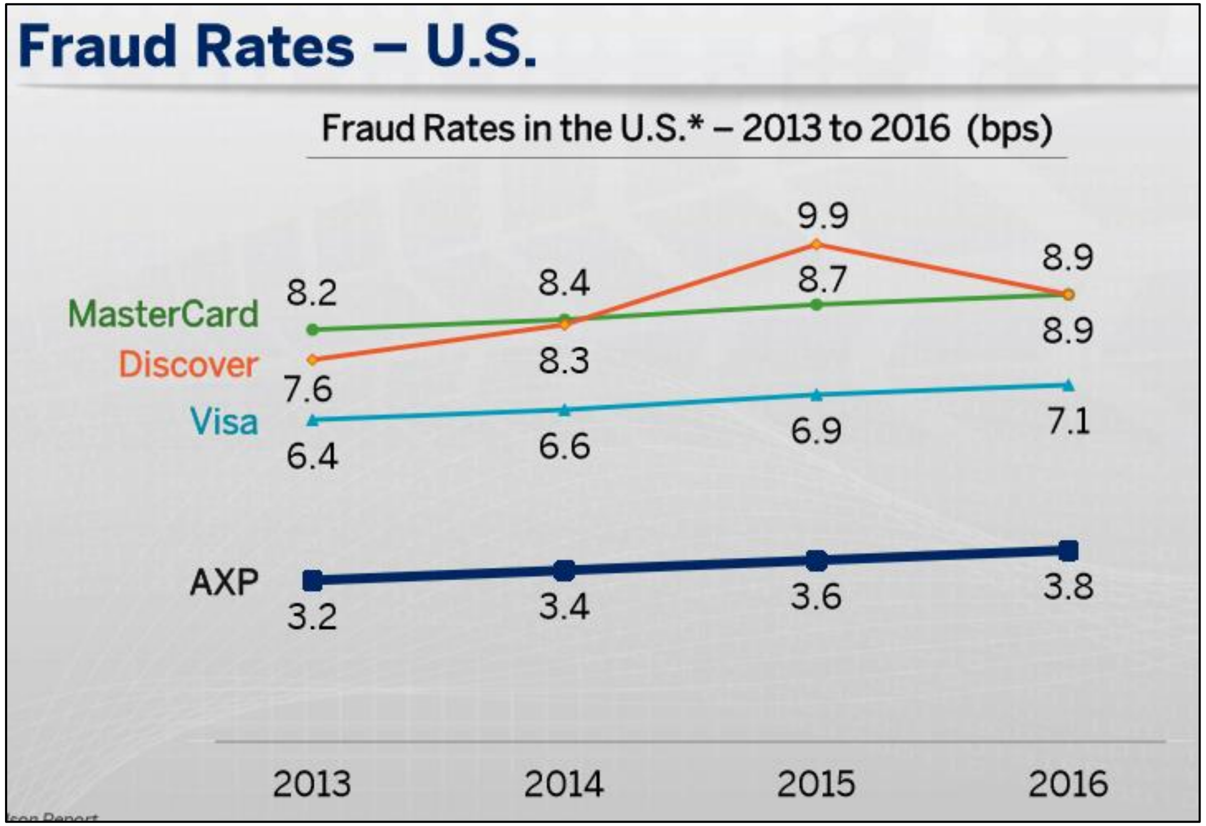
Source: Corporate reports and Bernstein analysis.

Domestic Card Schemes

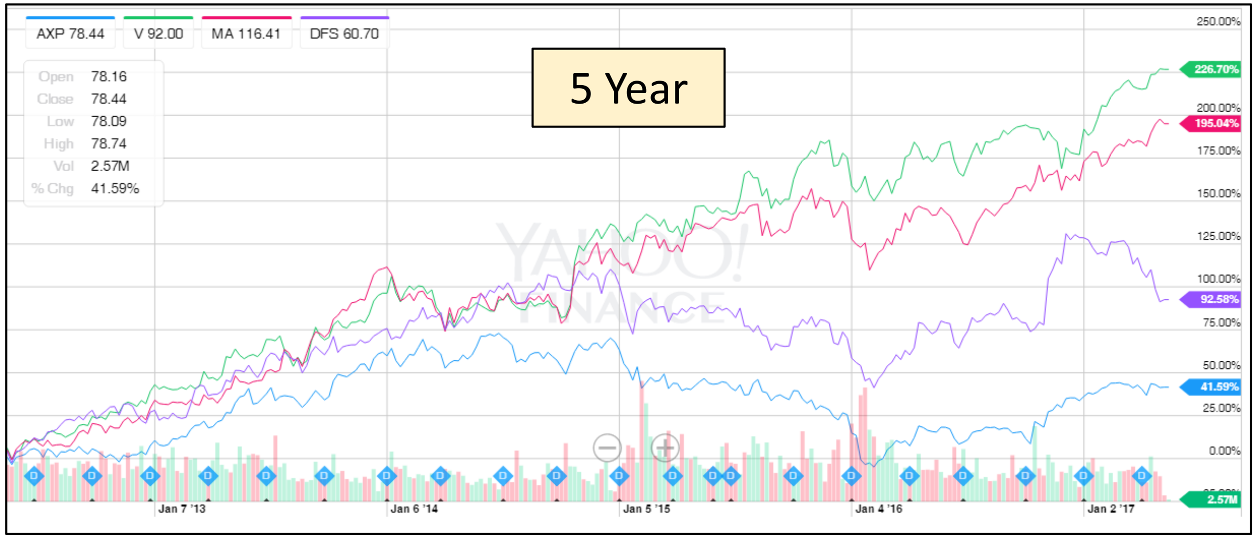
- The government implements a local card network for processing, versus letting Visa/MasterCard be the network
- It is lower priced, which the governments like
- The features and functionality are not near as close as to what V/MA can offer
  - Less information than a traditional model
  - Less capabilities on fraud screening and prevention
  - Can’t help the issuers grow their business as it is in a non-domestic card scheme
  - Some of the debit cards can be accepted at ATMs
  - Some of the cards can’t be used outside of the country
  - Some of those card schemes wont be able to afford the kind of resources to make digital wallets and mCommerce work, as they are too small and/or operate with too low of margins where there isn’t enough available to reinvest back in the networks

Fraud Rates

- According to Nilson Report, AXP's closed loop business model and focus on higher-end consumers results in the lowest fraud rate in the industry
  - AXP 3.8 bps
  - Visa 7.1 bps
  - Discover and MA at 8.9 bps
- Based on improvements in technology (EMV, chip, biometrics, etc.) I expect the fraud rates to decline over time

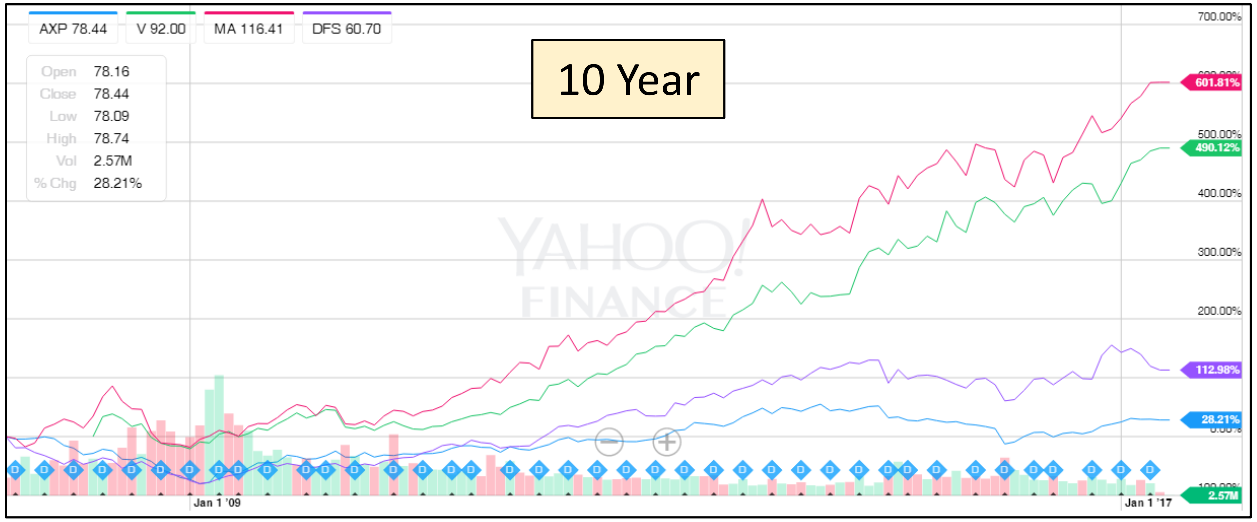


Stock Price Performance



5 Year	
AXP	42%
DFS	63%
V	227%
MA	195%

* *excludes dividends*



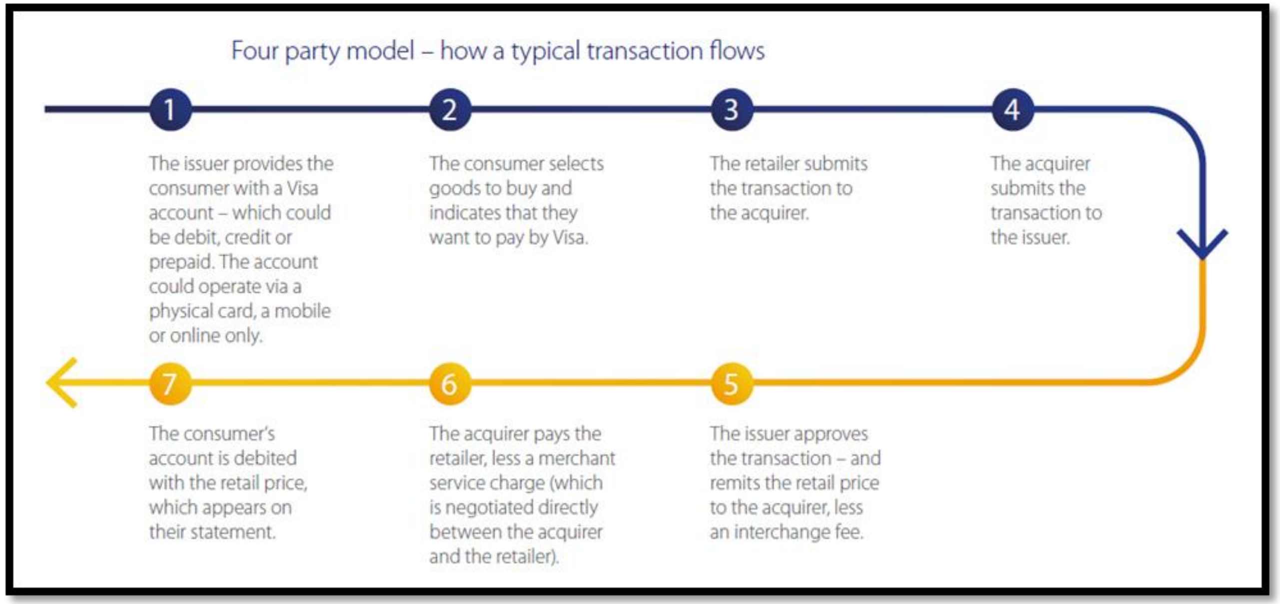
10 Year	
AXP	28%
DFS	113%
V	490%
MA	602%

* *excludes dividends*

Overview of the Card Transaction

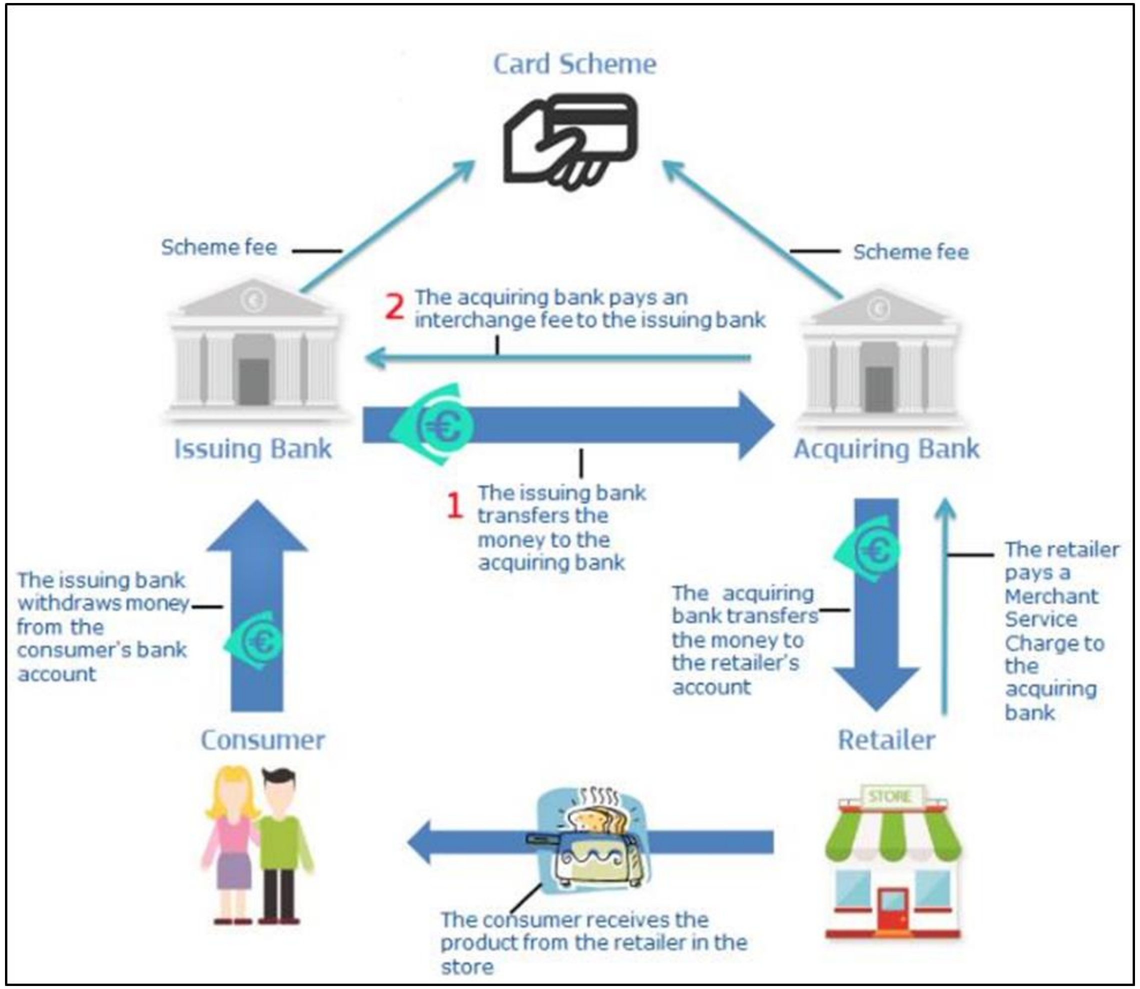
How a Card Transaction Works

- The parties involved, once a consumer requests card payment for a purchase, depends on the card scheme (based on the issuer of the card)
- If the card issuer is American Express/ Discover, most likely the transaction will be routed through AXP's network, and all data will be kept by AXP
- If the card issuer is someone else (Chase, BofA, Citi, etc.) then once the card is swiped, the data first goes to the merchant acquirer
- The merchant acquirer, through the card network, submits the data to the issuer of the card (Chase, etc.)
- The issuer approves the card, back through the card network, to the merchant acquirer, who then approves the transaction for the merchant
- See the illustration on the right, from Visa's reports (4-party scheme)

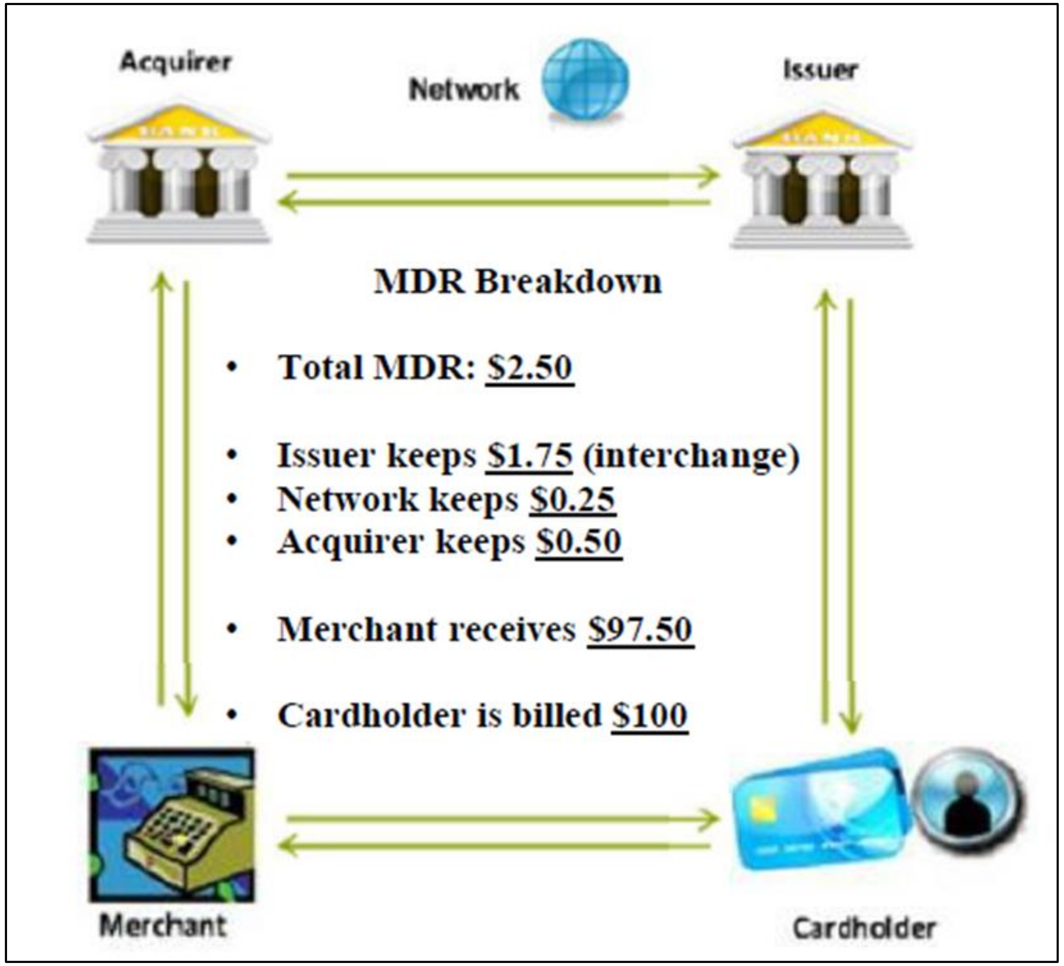


The Flow of Money from a Transaction

- Card Networks
  - Assessment fees
  - Processing fees
  - Fees collected from both issuer and merchant acquirer, regardless of the interchange rate; however, the MDR and interchange will be higher than the fees Visa/ MA collects, as these are essentially the ceiling on the pricing they can obtain as the gross revenue is shared amongst the parties
- Merchant Acquirer
  - Merchant Discount Rate, which is the highest rate in the overall transaction
  - MDR is essentially divvied up to the interchange rates and card network fees, with the acquirer keeping the remining amount
  - Acquirer deposits the gross sale amount, minus the MDR, in the merchants bank account
- Issuer
  - Interchange fee
  - Interchange is set by the card networks, is paid by the merchant acquirer to the issuer
  - The card networks do not get any of the interchange directly

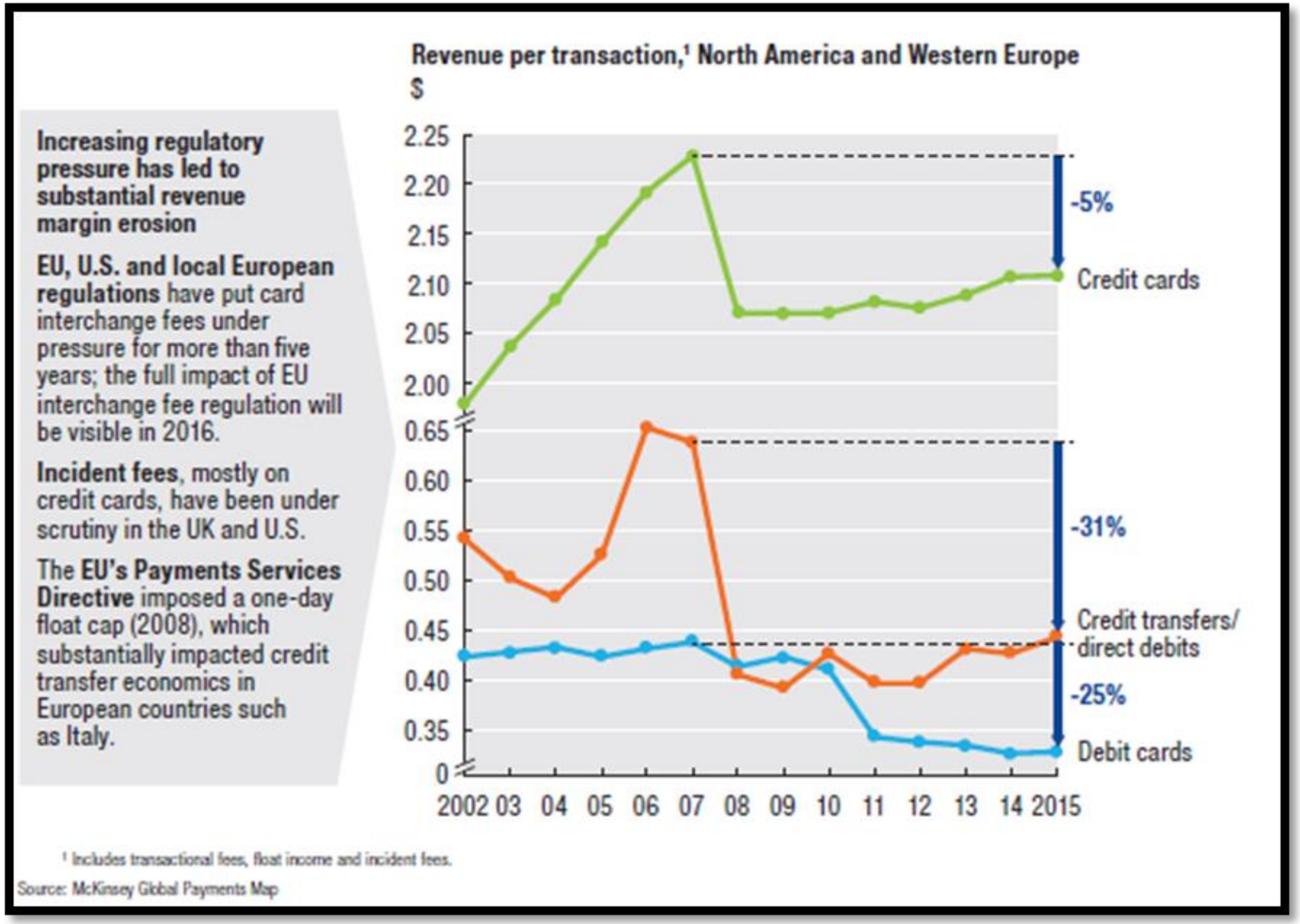


Sample Economics of a Transaction



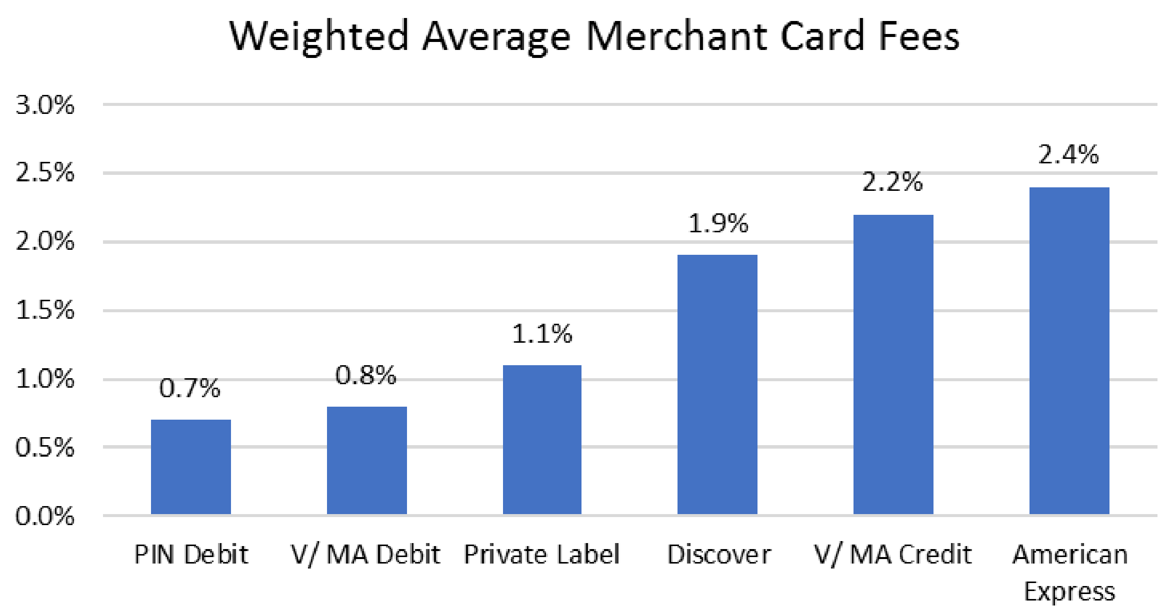
Revenue per Transaction

- Continued regulation around interchange has impacted the revenues per transaction for all card payment types
- There will continue to be some pressure on interchange, especially from the merchants standpoint
- Concerns around the actual impact of Durbin will be highly discussed during Trump presidential term
- Europe IFRS capped interchange at 0.3% for credit, 0.2% for debit, an attempt to decrease rewards and services for card holders. This would likely result in increased prices as issuers will find alternative ways to make up for lost revenue (just look at what happened post-Durbin in the US)



Average Merchant Card Fees

- Merchant fees vary based on payment type
- Merchants have loathed signature debit, as the fees charged by the acquirers are higher than for PIN debit
- Durbin largely impacted PIN debit routing, which in term impacted Visa's Interlink (PIN) routing market share
- Visa responded with FANF and PAVD, which were incentives for issuers and merchants, lower variable costs per transactions, but let merchants route PIN debit over VisaNet (signature)
- American Express (closed loop system) has always been the most expensive, as their model is spend-centric/heavy on rewards, which is also why many smaller merchants do not accept AXP credit cards

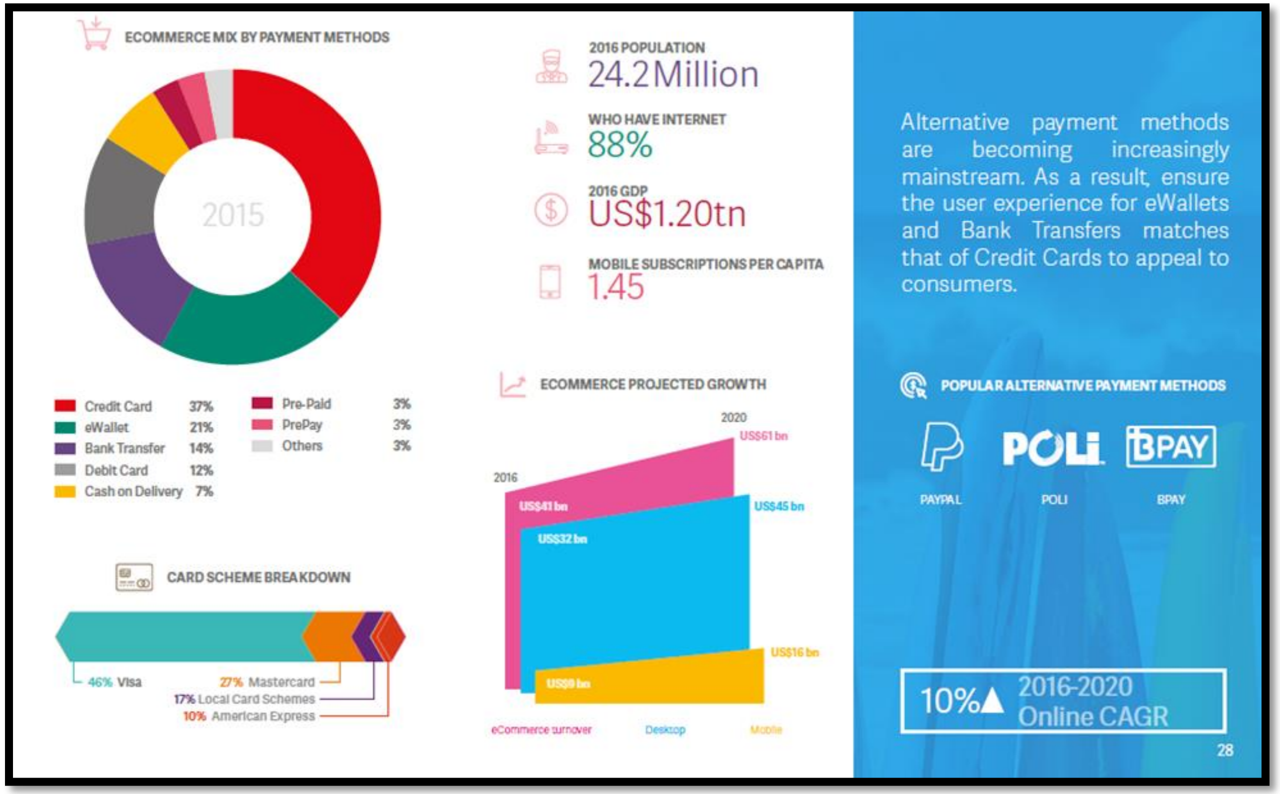


Source: Nilson, Bernstein July 2015 Report

Country-by-Country Overview of Payments

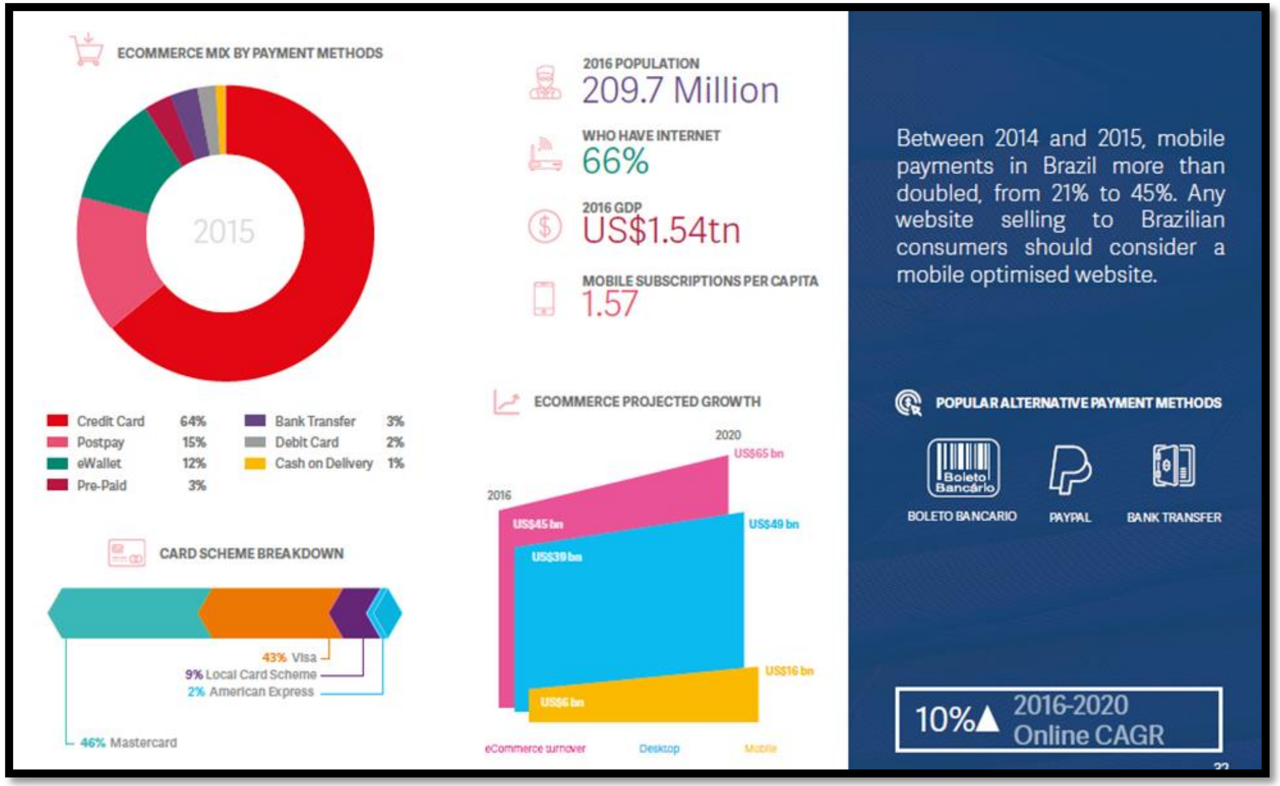
Australia

- Of the ecommerce card market, Visa and MasterCard have a 73% market share
  - Visa 46%
  - MasterCard 27%
- Australian Central Bank regulates interchange fees, why?
  - Purposely to increase the costs to credit card consumers
  - To make credit card rewards less generous
- Visa has said that despite Australia being regulated for ~15 years, the net revenue yield is about the **same** as overall net revenue yield; "interchange is the bank's revenue and it goes to the bank; it doesn't flow to us. Our revenues come from the transaction going through our network and we get paid for that transaction. We get paid a brand fee for that. So that varies market by market, but it's not directly tied to interchange."



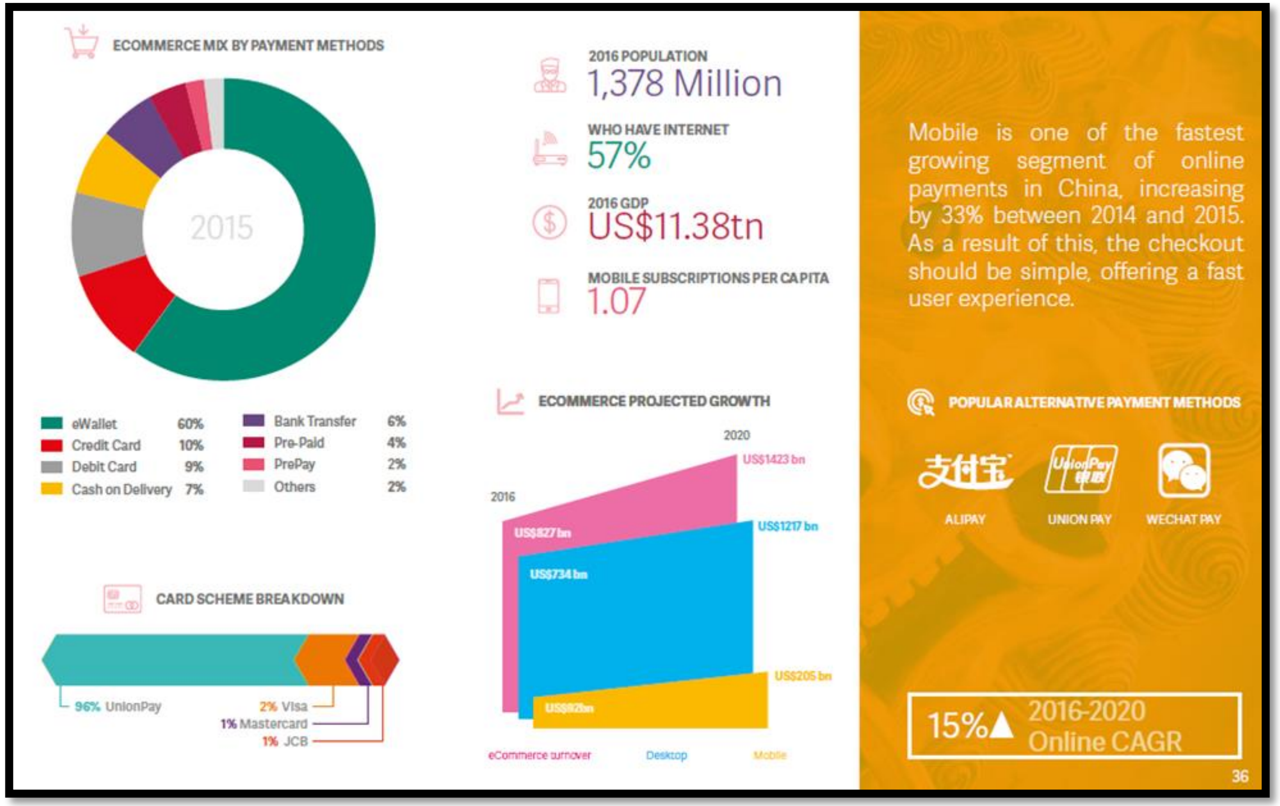
Brazil

- Of the ecommerce card market, Visa and MasterCard have a 89% market share
    - Visa 43%
    - MasterCard 46%
- Debit and credit cards were used in 37% of all payment transactions in 2013
- More than 106 million debit cards and 87 million credit cards in Brazil at E2013
- Debit and credit card growth has been strong
    - Debit cards BRL 300 billion +22.5% from 2012 to 2013
    - Credit cards BRL 553 billion +15% from 2012 to 2013
    - 9.9 billion transactions, a 14% growth rate from 2012 to 2013
- There are 15 different card networks in Brazil
- Estimated that 57% of all payments in 2014 are non-cash



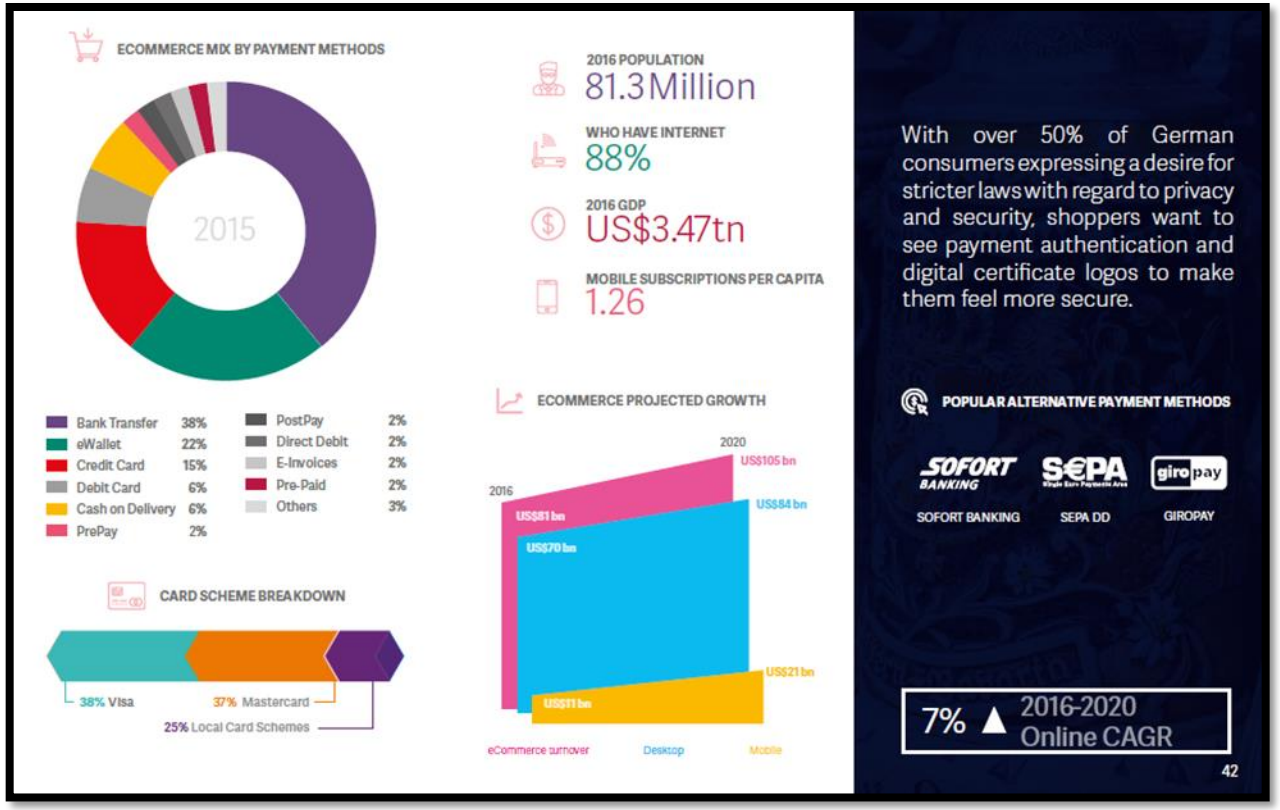
China

- Of the ecommerce card market, Visa and MasterCard have a 3% market share
- UnionPay has a 96% market share
- 10% of global PCE is from China
- \$2 - \$2.5 trillion in card purchases for consumers
- Card penetration of purchase PCE is about 60%
  - Visa said in 2013 investor day, 38% of purchase PCE was cash and check in 2012
  - Implies electronic payment penetration is 62%
- Estimates from China UnionPay (China's domestic card network) has volumes around \$7 trillion, which is much higher than card purchases for consumer; difference is likely government and commercial



Germany

- Of the ecommerce card market, Visa and MasterCard have a 75% market share
  - Visa 38%
  - MasterCard 37%
  - Local card scheme 25%
- 5th in world in online sales volume
- 3rd in world in cross border eCommerce, with 50% online purchases made via international website
- Credit Cards used by relatively small proportion of online purchasers, 9.1% of men, 5.8% women, expected to decline further by 2020



Germany

- Cash remains the primary payment option for routine purchase in Germany, far more than European counterparts
- 72% of Germans consider cash as a safer payment form
- In 2015, Germans used €648.4 billion in cash, compared to €278.6 billion through cards
- Germans tend to use cash so frequently because they carry more of it. On average, Germans keep about $123 in cash on hand, and the average withdrawal amount from the ATM is more than $250
- Total cash use in Germany is expected to decrease from €648 billion in 2015 to €631 billion in 2020
- About 40% of purchases greater than $40 are made in cash versus less than 20% in the U.S.
- One reason consumers prefer cash is the low card acceptance by merchants, far lower than in Austria, France, Netherlands and U.S.

Figure 3: Historic and projected cash share with logarithmic trend

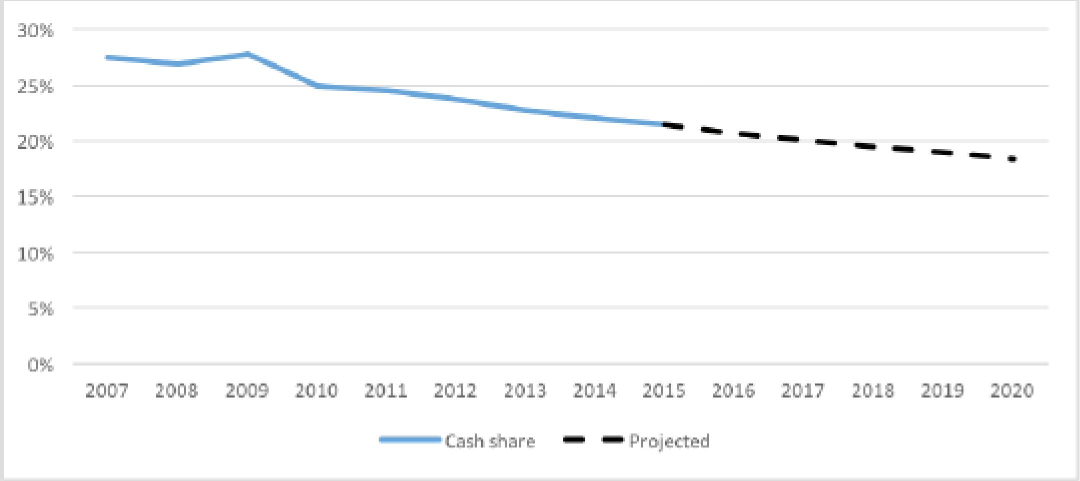
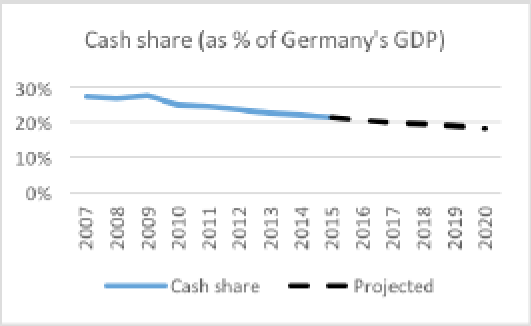


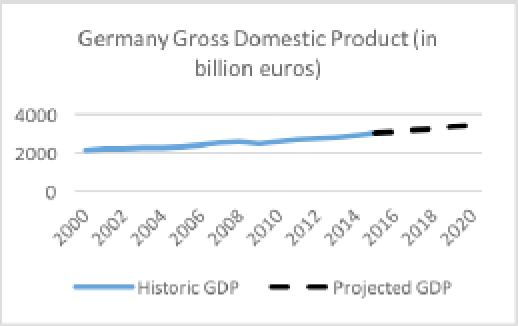
Table 1: GDP and Cash Usage Data for Germany (in billions euro)

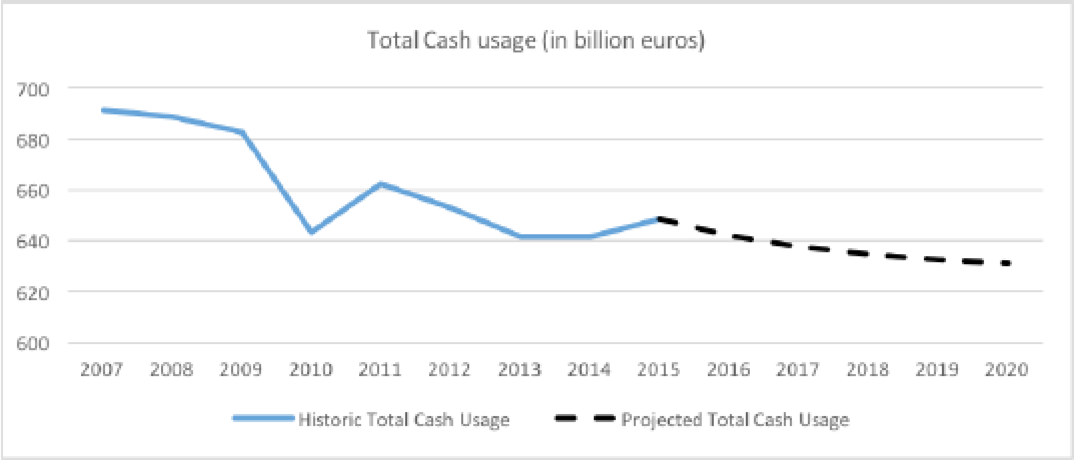
Year	Nominal GDP	Cash usage			ATM share	OTC share	Cash share
		Cash usage	Cash usage	Cash usage			
2007	2,513.2	298.8	392.5	691.3	11.9%	15.6%	27.5%
2008	2,561.7	311.2	377.3	688.5	12.1%	14.7%	26.9%
2009	2,460.3	317.4	365.1	682.5	12.9%	14.8%	27.7%
2010	2,580.1	315.5	327.6	643.1	12.2%	12.7%	24.9%
2011	2,703.1	333.1	329.5	662.6	12.3%	12.2%	24.5%
2012	2,754.9	342.3	310.8	653.1	12.4%	11.3%	23.7%
2013	2,820.8	345.4	296.1	641.5	12.2%	10.5%	22.7%
2014	2,915.7	355.7	285.7	641.5	12.2%	9.8%	22.0%
2015	3,029.9	372.7	275.7	648.4	12.3%	9.1%	21.4%

Germany

- Smartphone penetration will push increased adoption of card payments
- 2015, 42.3 million Germans (52% of population) has smartphones, compared to 29.6 million (37% of population) in 2013
- Expected that by 2019, around 69% of German population (83% of adults) will have smartphones
- The lack of infrastructure and perceived lack of security around contactless payments encourages cash usage, but this should change in the next few years
- Financial inclusion has NO impact on the reasoning for low card payment usage, as only 1.9% of Germans over 15 are unbanked

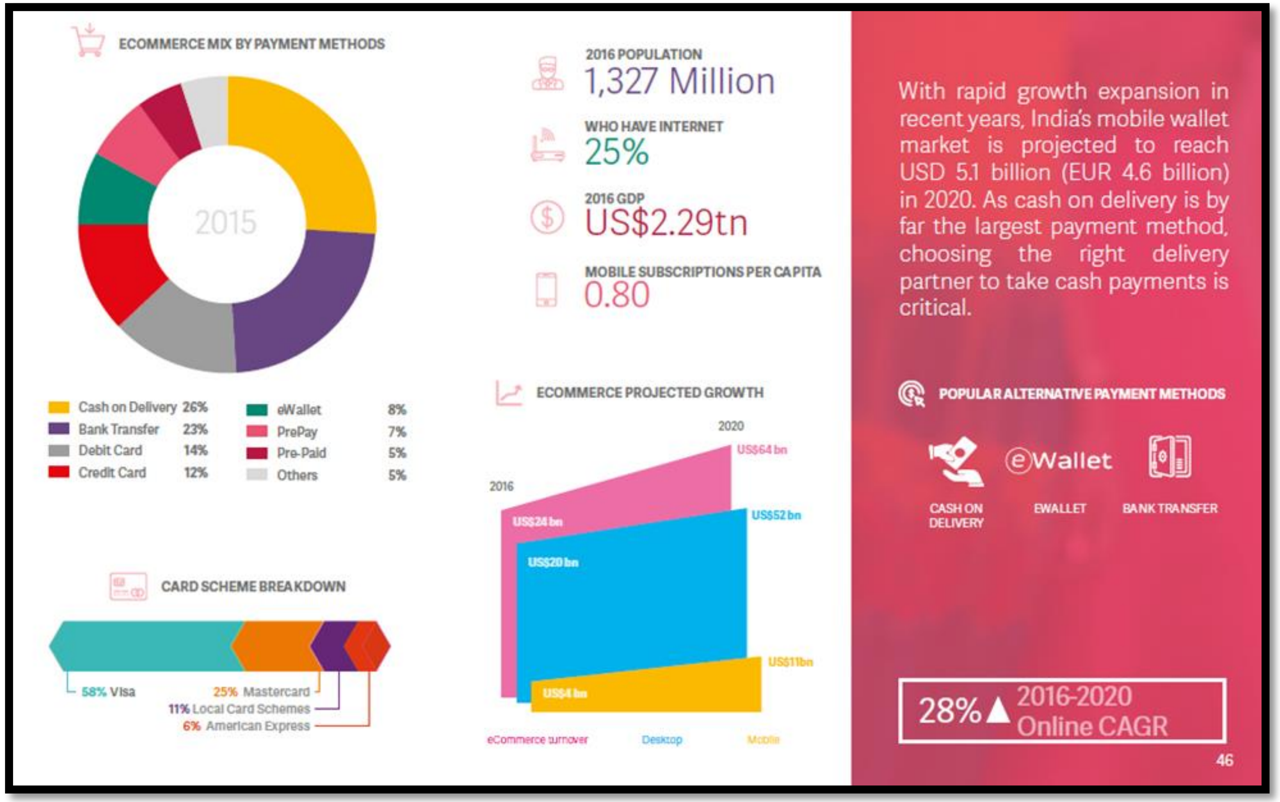






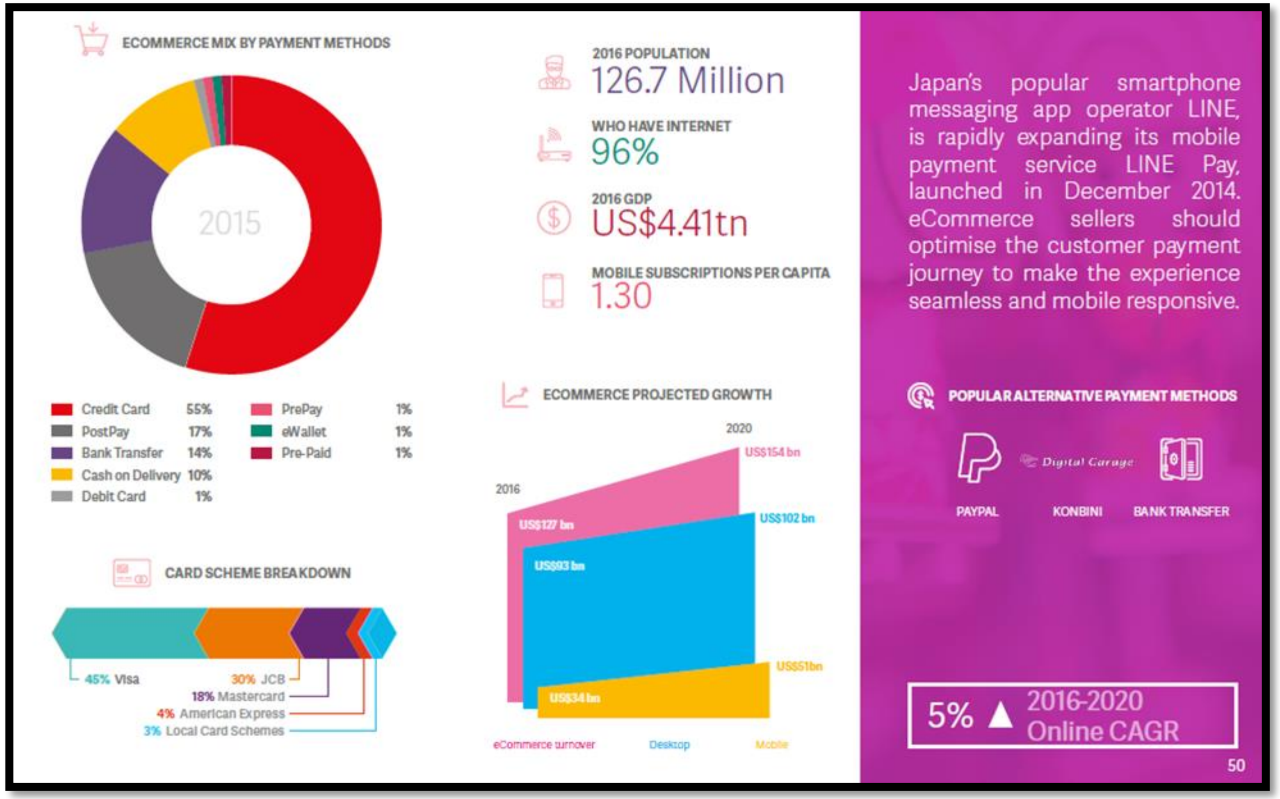
India

- Of the ecommerce card market, Visa and MasterCard have a 83% market share
    - Visa 58%
    - MasterCard 25%
- eCommerce supposed to quadruple by 2020
- Popular use of cash due to underdeveloped payment infrastructure
- Around 75% of population does not have a way to pay online



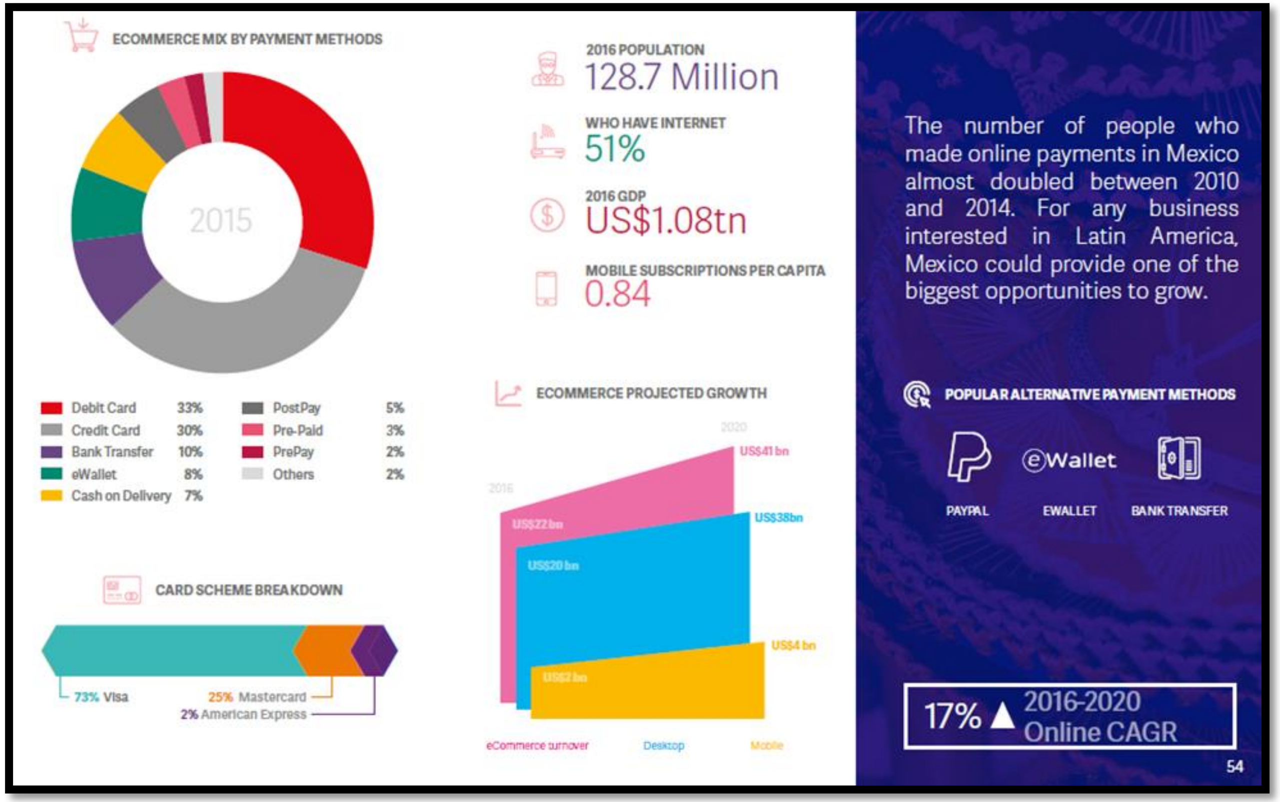
Japan

- Of the ecommerce card market, Visa and MasterCard have a 63% market share
  - Visa 46%
  - MasterCard 18%
  - JCB 30%
- Second largest eCommerce market in Asia in terms of sales
- 4th largest in the world in terms of eCommerce sales



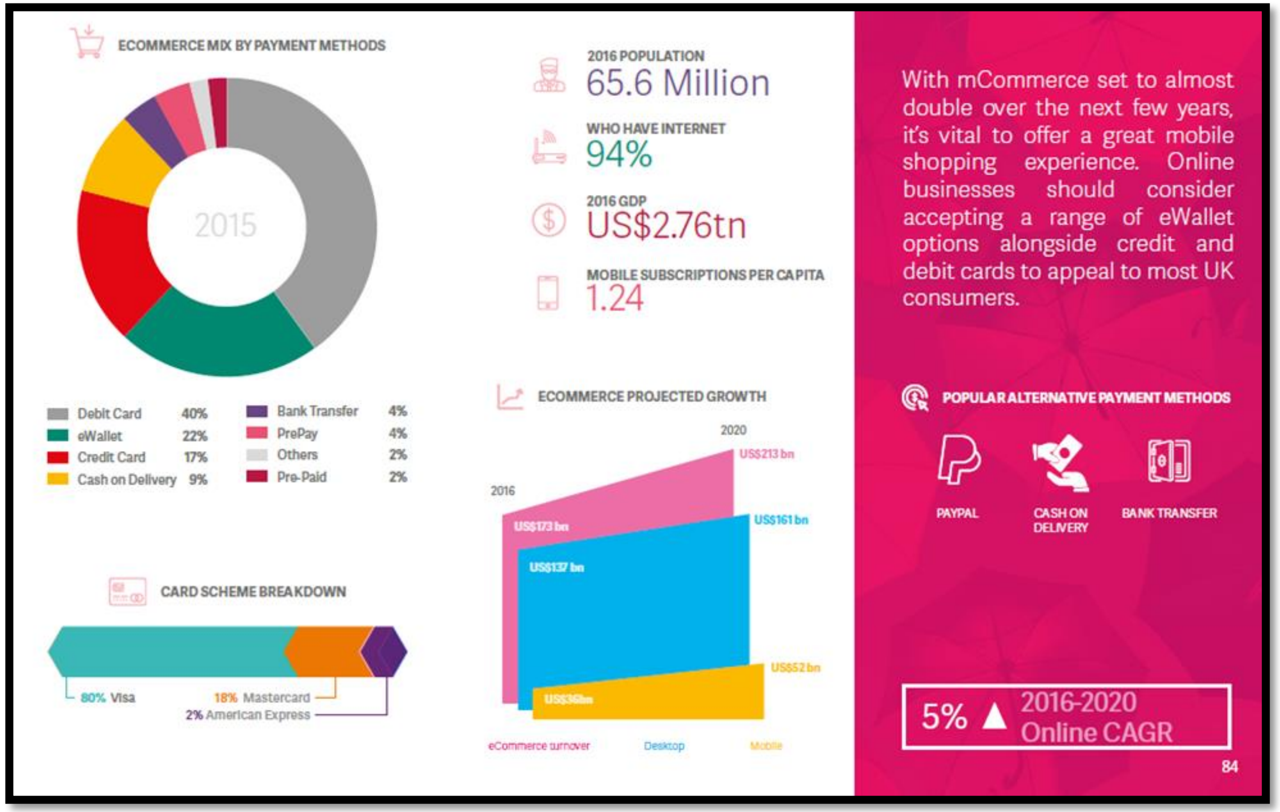
Mexico

- Of the ecommerce card market, Visa and MasterCard have a 98% market share
    - Visa 73%
    - MasterCard 25%
- Level of online purchases doubled between 2010 and 2014
- High adoption rate of mobile technology, making it largest mCommerce market in Latin America
- Many Mexicans do not have a bank account, thus cash still used

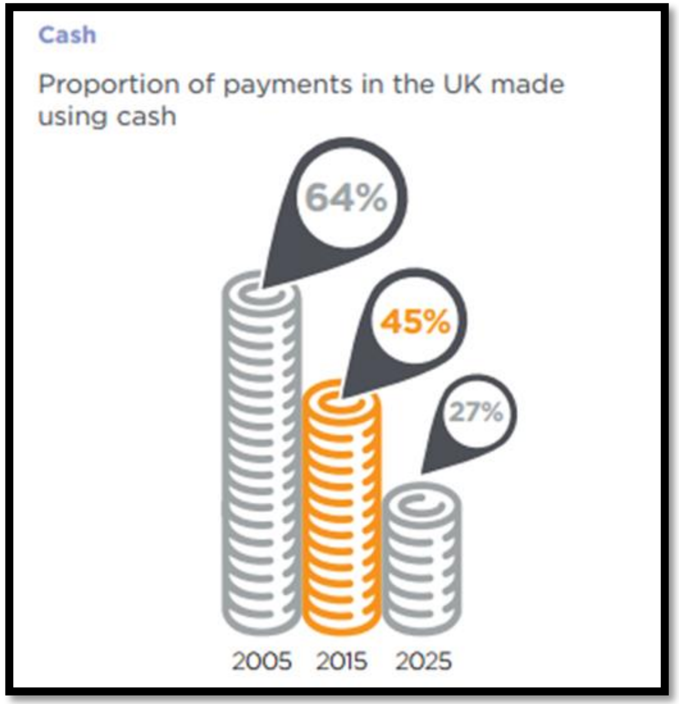


United Kingdom

- Of the ecommerce card market, Visa and MasterCard have a 98% market share
  - Visa 80%
  - MasterCard 18%
- Smartphone penetration is high
- mCommerce expected to double in next few years
- Number of cards expected to decline over next few years



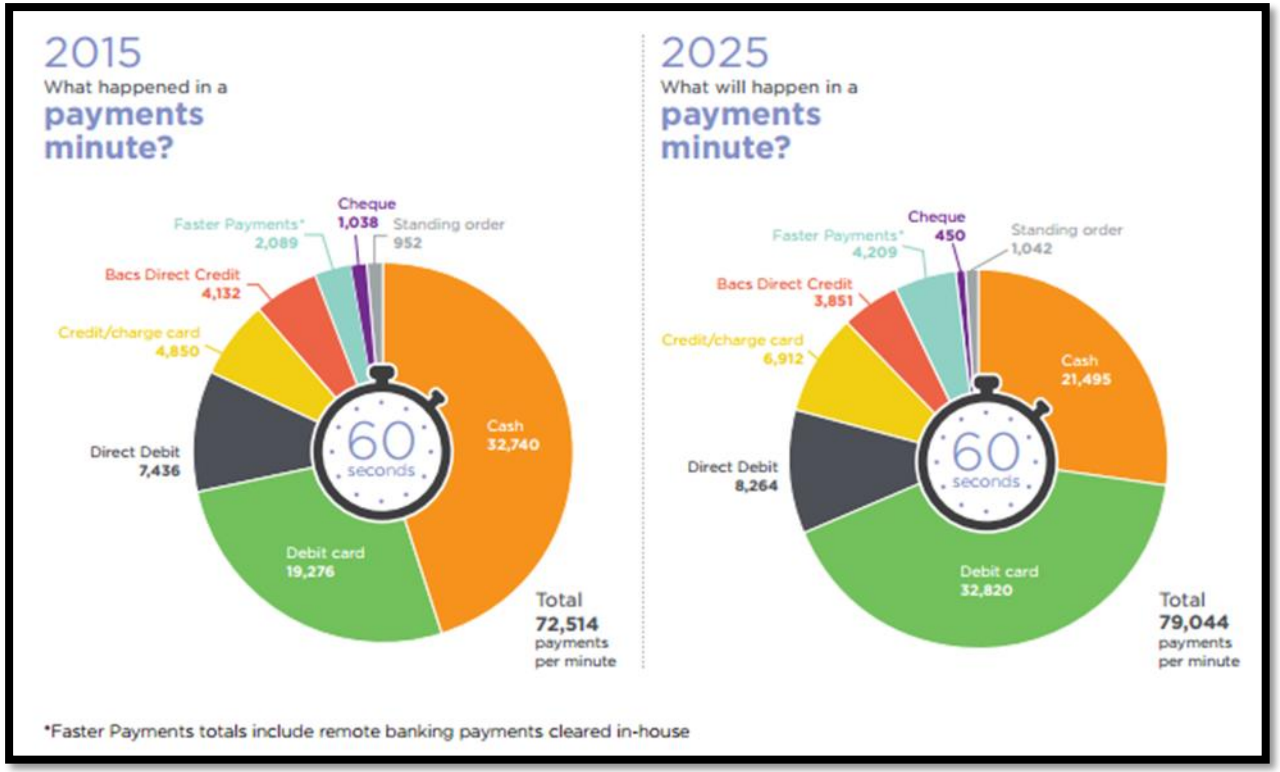
United Kingdom



Cash is still most popular method, but is trending downwards

A lot of variation:

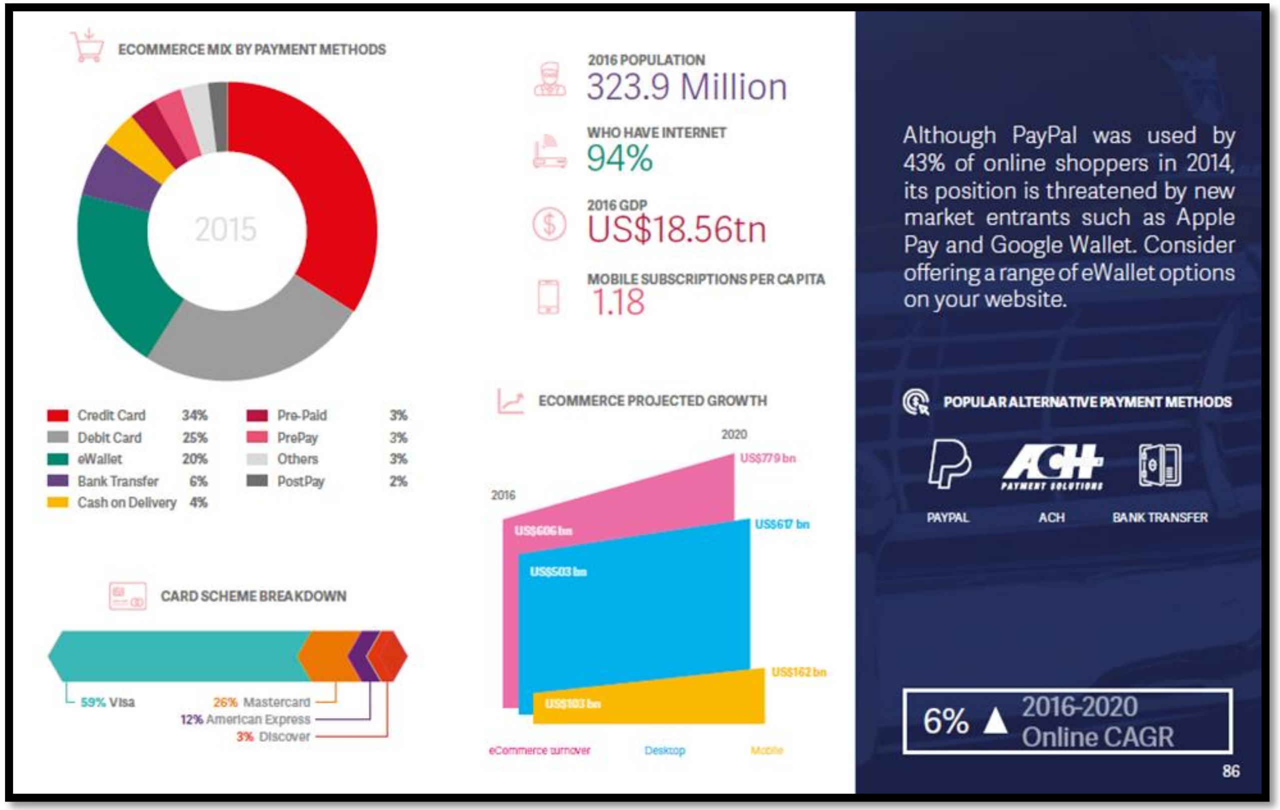
- 2.2 million consumers rely heavily on cash
- 2.7m almost never use cash



Cash usage is expect to increase by about 50% from 2015 to 2025 in UK, with debit cards being a large contributor as well, growing 70% from 2015 levels

United States

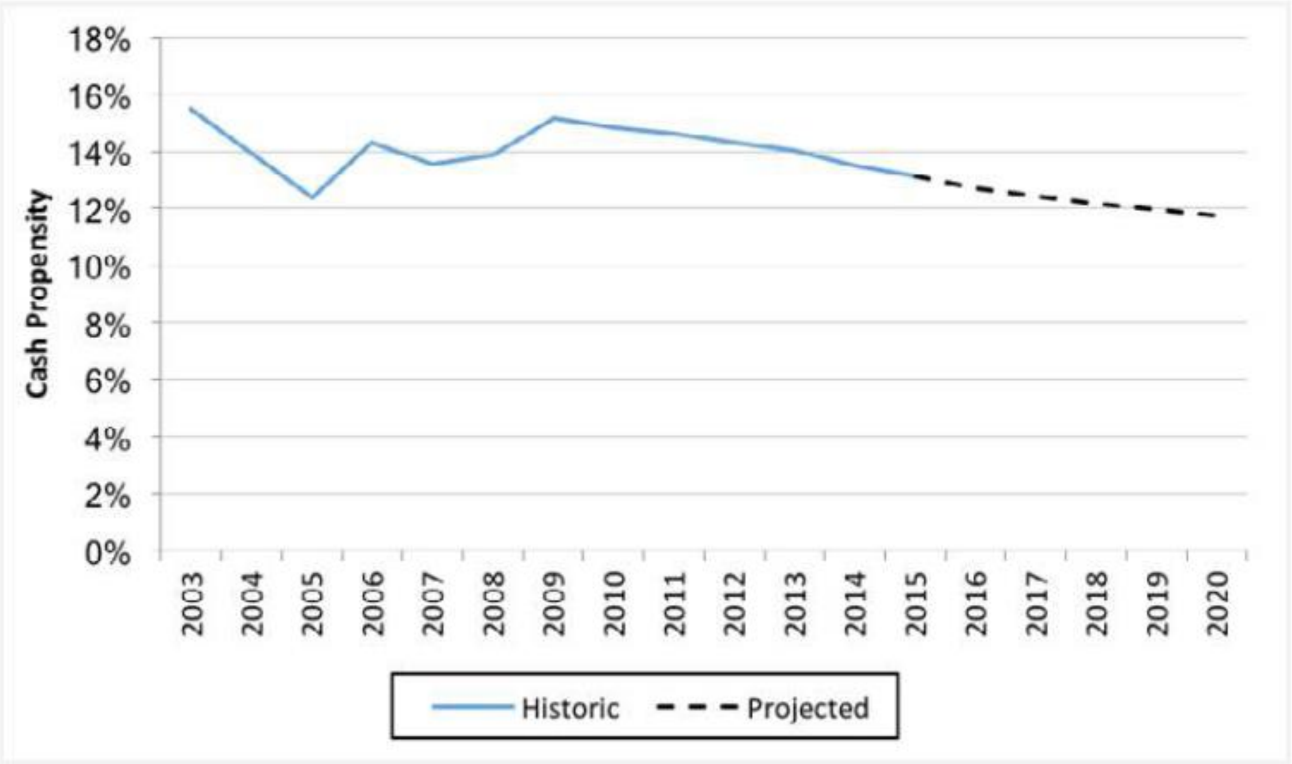
- Of the ecommerce card market, Visa and MasterCard have a 83% market share
  - Visa 59%
  - MasterCard 26%
- 59% of online payment is cards – debit/credit
- Expected to fall as % due to alternative methods of payments and user confidence in these methods
- eWallets such as PayPal has high interest, due to higher levels of perceived security



United States

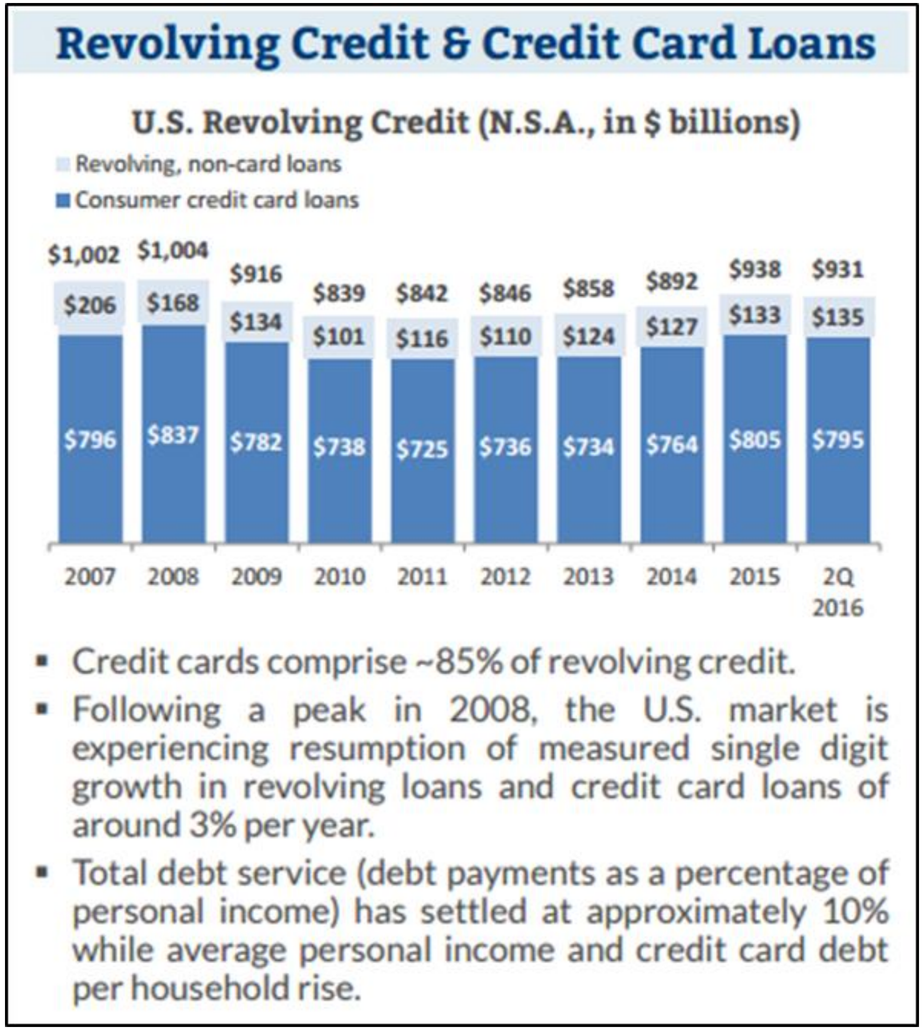
- US is still a cash-intensive economy, but far less intensive than use of credit and debit card payments
- In 2015, Americans spend $2,359 billion in cash and $5,527 billion with cards
- Cash usage is still higher than in Western European countries
  - 2015: US cash usage at 13.1% of GDP
  - Finland 7.7% of GDP
  - France 7.1% GDP
  - Netherlands 7.4% GDP
  - Sweden 5.6% of GDP
  - Switzerland 4.5% of GDP
  - UK at 11.6% of GDP
- Estimated cash usage to decline to 11.7% of GDP by 2020

Figure 1. Historic and Projected GDP for the United States, 2000-2020 (Nominal in Billion Dollars)



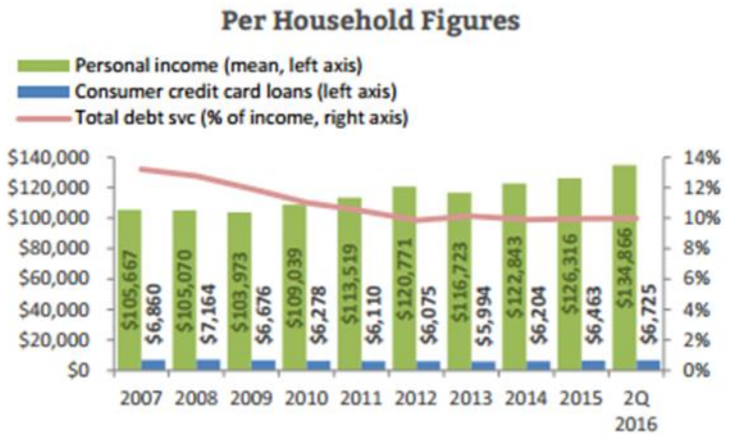
The US Credit Card Market

- Revolving credit from credit cards is still less than 2008 levels, but has remained fairly steady from 2009 to 2016
- About $800 billion in revolving credit card loans
- Credit cards comprise of ~85% of revolving credit in the US
- Total debt service (debt payments as % of personal income) is about 10%



The US Credit Card Market

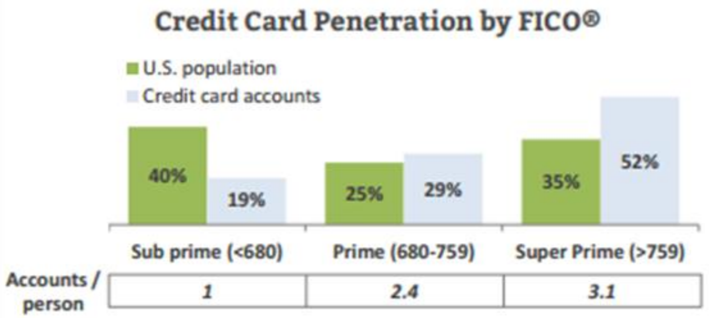
Per U.S. Household Figures



- Owed by households (*carrying type of debt in 2016*):

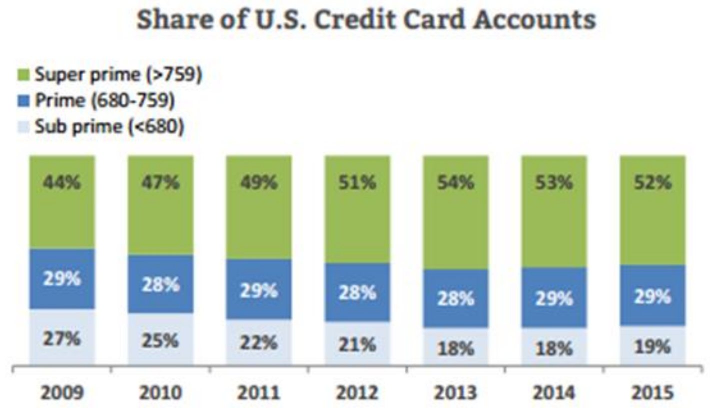
$15,675	credit cards
$172,341	mortgages
$27,865	auto loans
$48,591	student loans

Sub Prime - On the Rebound?



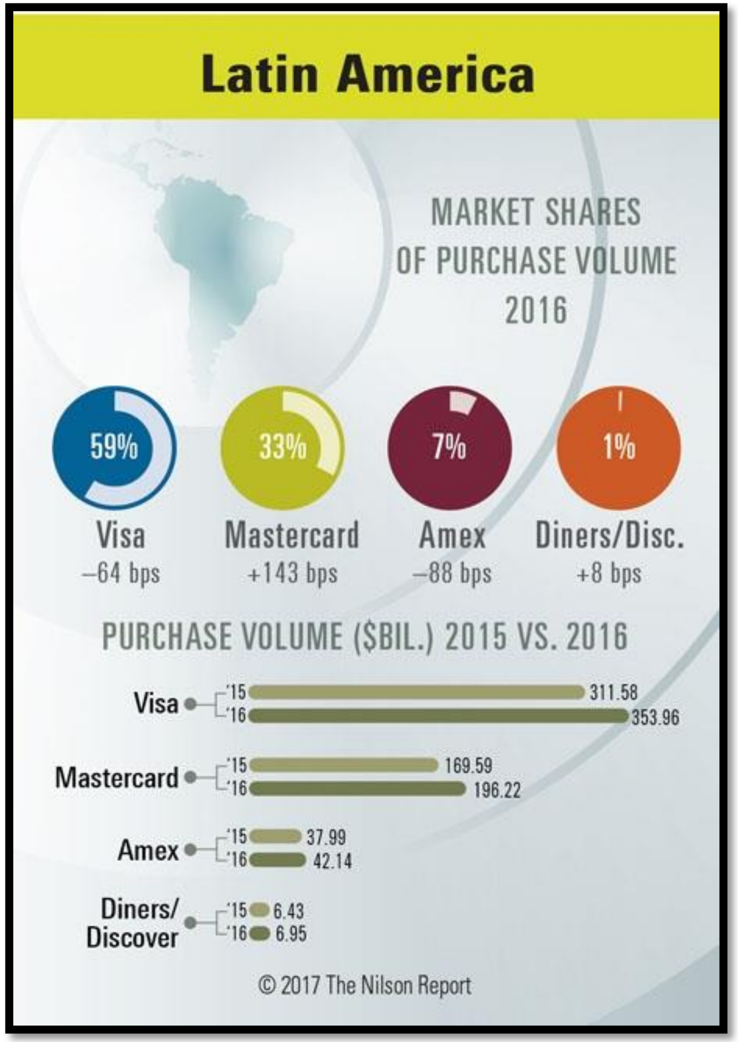
- ~80 million U.S. adults have a credit score below 680. An equivalent number of credit card accounts have similar scores.
- If accounts per person for sub prime increased to 1.5x (i.e., two-thirds of accounts/person ratio for Prime), 40+ million new credit card accounts could be originated.

Credit Risk Composition For Cards



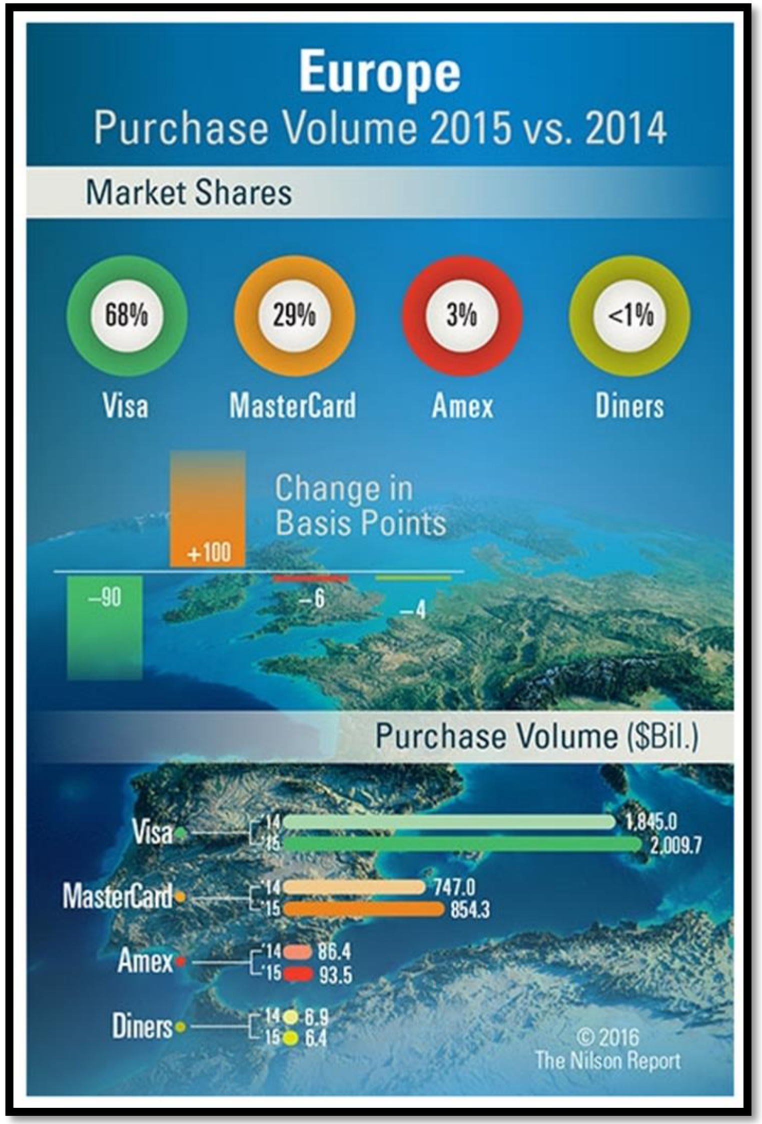
- Following a substantial increase in credit bureau scores for credit card accounts, current trends indicate stabilization in sub prime with a recent slight uptick in sub prime share of card accounts.

Purchase Volume Market Share



Europe

- Total number of non-cash payments in the EU increased by 8.5% in 2015 to 112.1 billion
- Card payments = 47% of all transactions
    - Credit Cards = 26%
    - Debit cards = 21%
- 781 million cards issued, or 1.5 per EU inhabitant
- About 51 billion transactions were processed by retail payment system in the EU, total of €41.1 trillion
- Credit card payments increased by 6.4% to 28.8 billion
- "The importance of paper-based transactions continued to decrease, with the ratio of paper-based transactions to transactions initiated electronically standing at around one to eight." (ECB, 2015 Report)
- Cards-in-force increased to 781 million, a 1.8% improvement Y/Y (total Euro population of 510 million)
- Number of card transactions rose by 11.5% to 53.0 billion, total value of €2.6 trillion, which is average value around €49 per card transaction



Europe

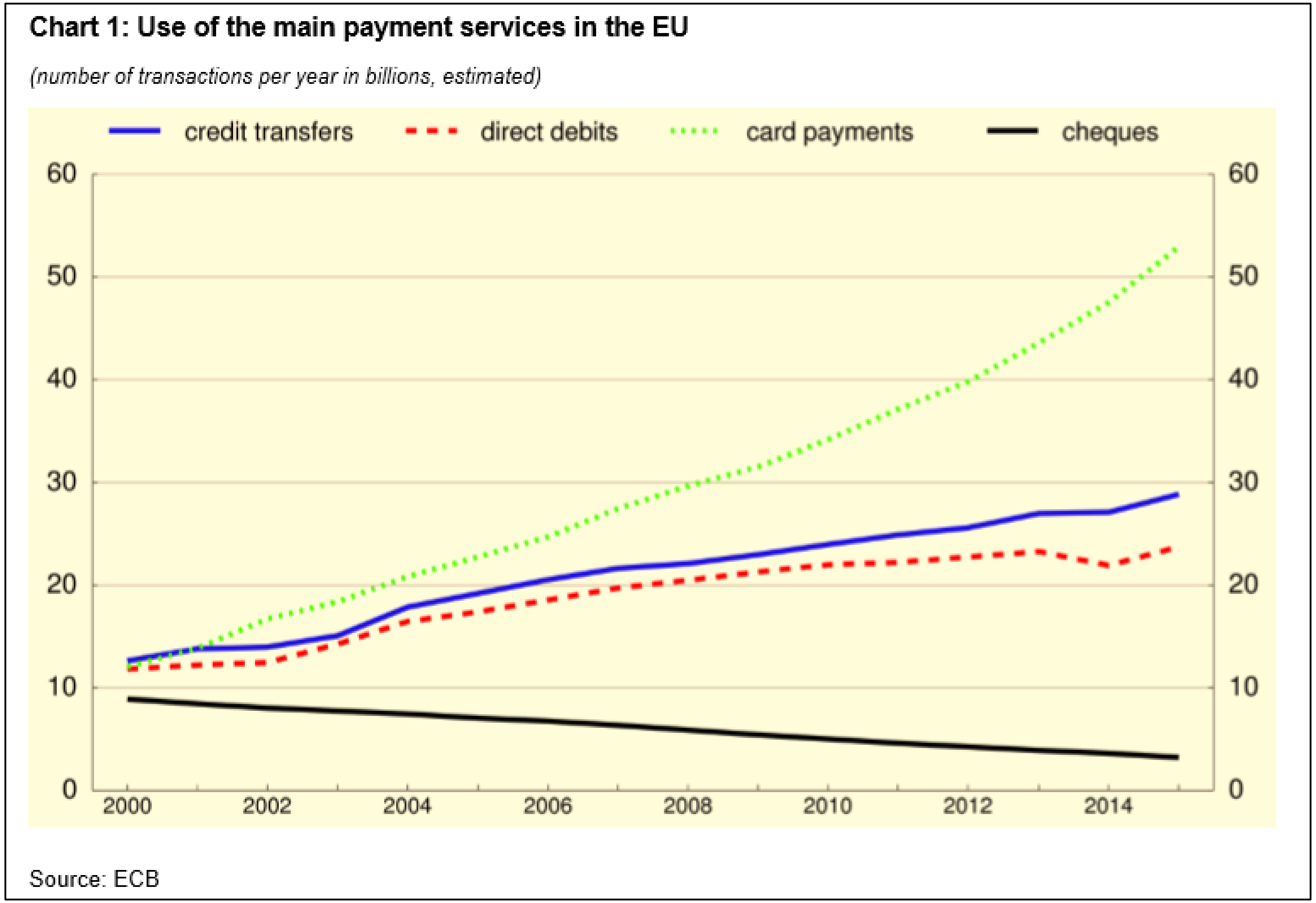
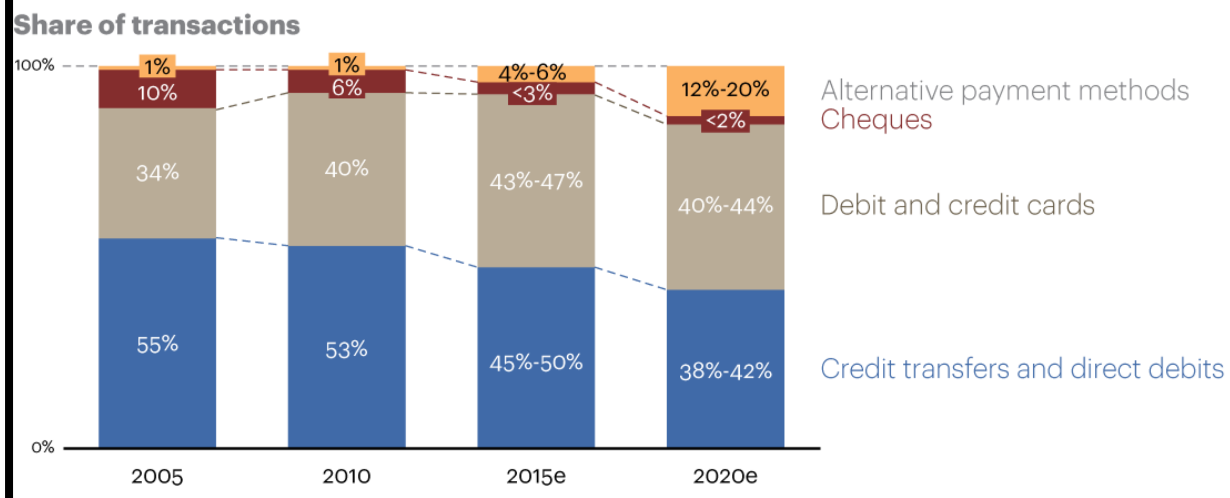


Chart 1: Use of the main payment services in the EU
(number of transactions per year in billions, estimated)
credit transfers
direct debits
card payments
cheques
60
50
40
30
20
10
0
2000
2002
2004
2006
2008
2010
2012
2014
Source: ECB

Europe

Figure 4

Alternative payments will account for up to one-fifth of non-cash transactions in Europe

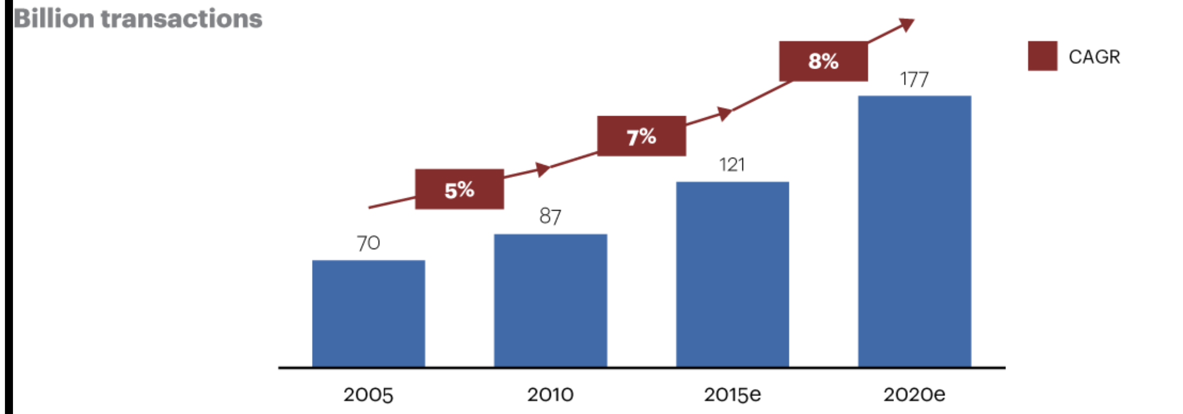


Notes: ATM transactions are not included. Alternative payment methods include payments not initiated through a bank current account.

Sources: A.T. Kearney European payment market model, which builds on as-is data from the European Central Bank, Retail Banking Research, and other sources

Figure 1

Non-cash transactions in Europe



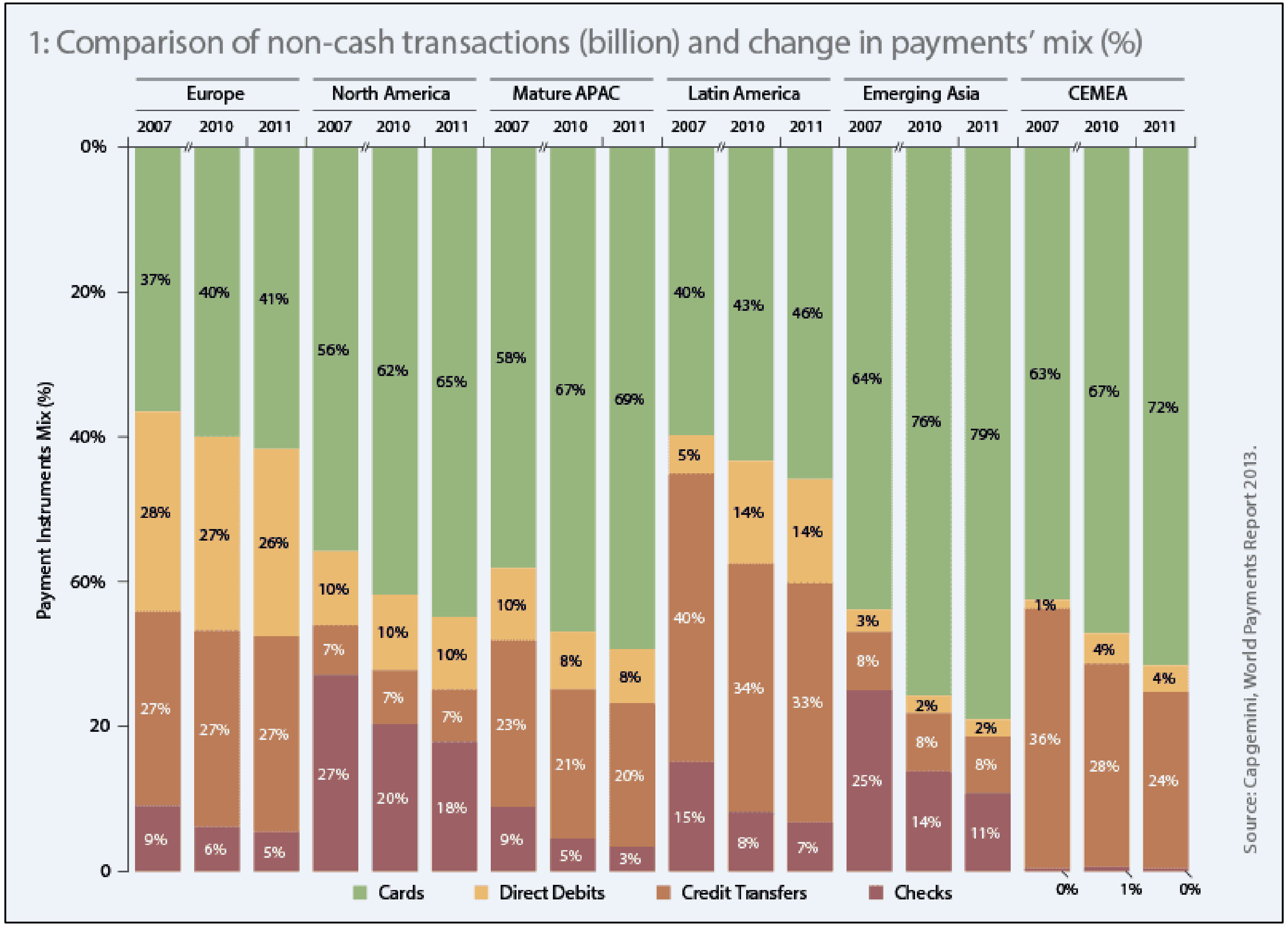
Share of cash transactions in retail	82%	78%	71%	60%

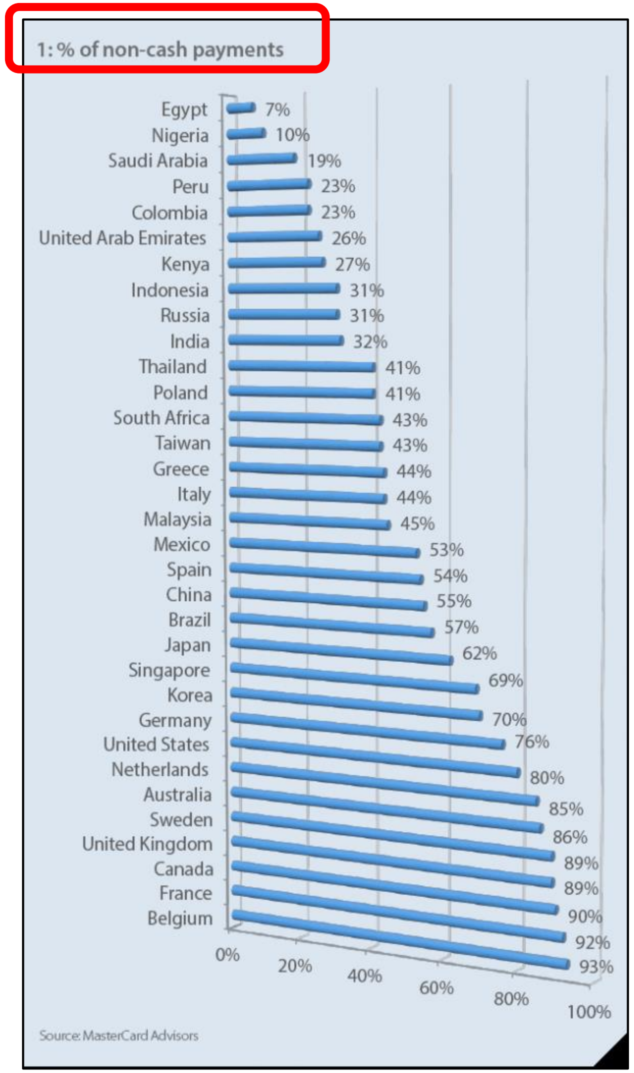
Note: ATM transactions not included.

Sources: A.T. Kearney European payment market model, which builds on as-is data from the European Central Bank, Retail Banking Research, and other sources

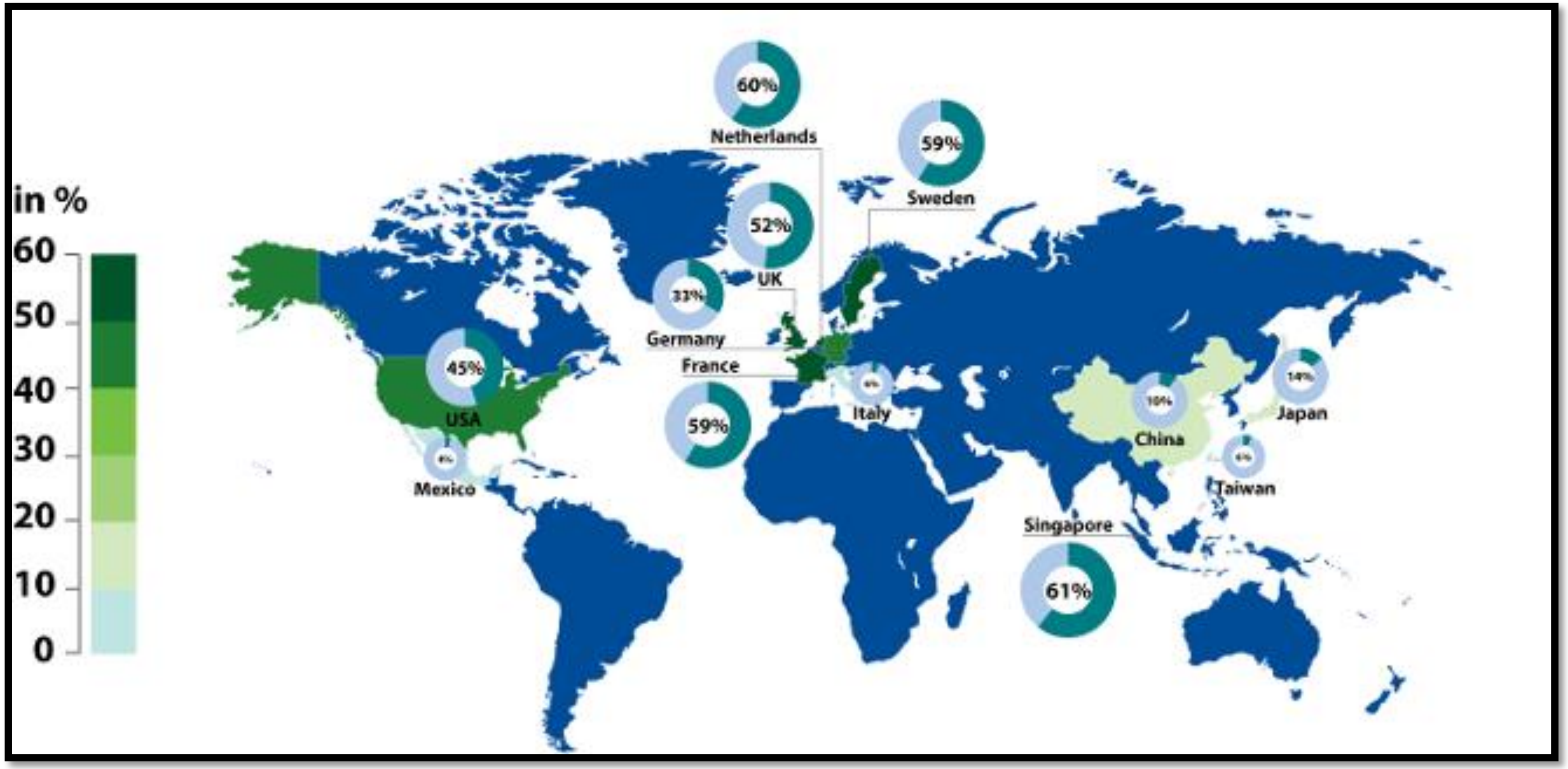
Expectations of accelerating growth in non-cash transactions due to a virtuous cycle of acceptance, e-commerce, and trust by consumers

Payment Trends: MasterCard Advisors Data



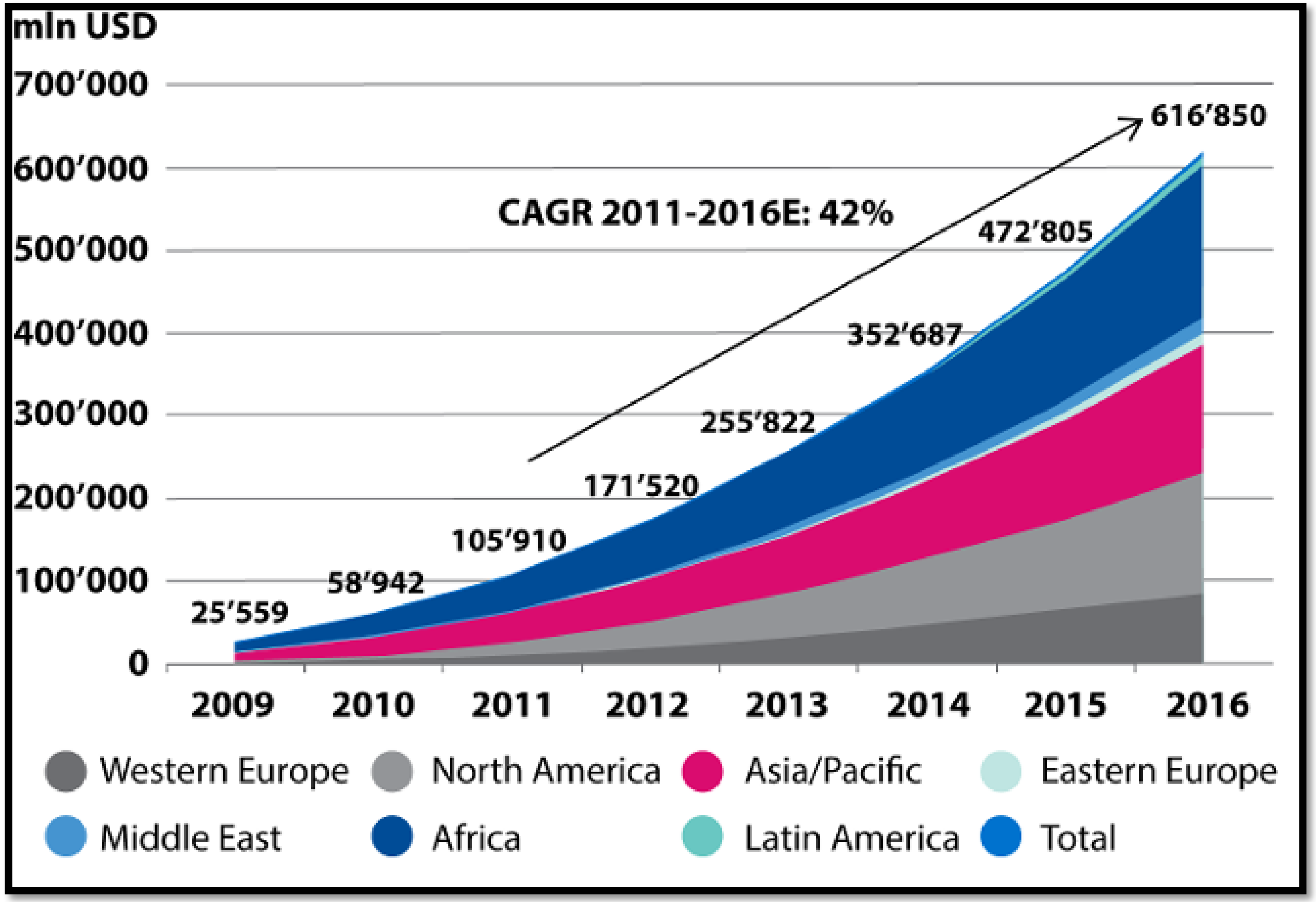


Payment Trends: MasterCard Advisors Data



2013 MasterCard Advisors study on non-cash payment *transactions* (in percentages)

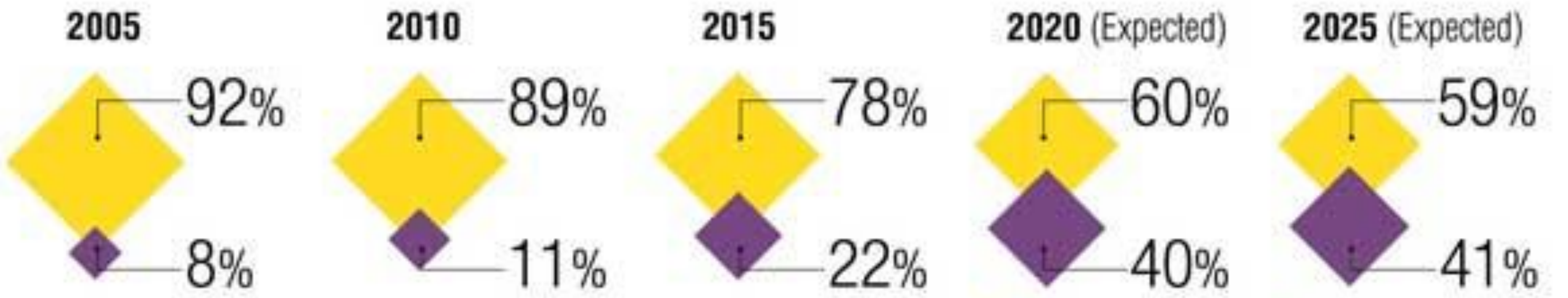
Payment Trends: MasterCard Advisors Data



2013 MasterCard Advisors study on non-cash payment *transactions* and by number (in percentages)

Payment Trends:

INDIA'S CASH AND NON-CASH TRANSACTIONS: PAST AND FUTURE



Value of Consumer Payments- % Cash vs. Non-Cash (Paper, Card and Digital)

Cash Transaction ◆ Non-Cash Transaction

India's non- cash transactions which are currently less than 1/4th of total are expected to surpass cash transactions by 2023

PAYMENT INSTRUMENT MIX OF COUNTRIES, 2015

DEVELOPED MARKETS

	CARD	DIGITAL	OTHER PAPER	CASH
Australia	53.00%	37.00%	1.00%	9.00%
France	42.00%	21.00%	16.00%	22.00%
US	49.00%	15.00%	13.00%	24.00%
Germany	18.00%	57.00%	1.00%	24.00%
UK	59.00%	14.00%	2.00%	25.00%

EMERGING MARKETS

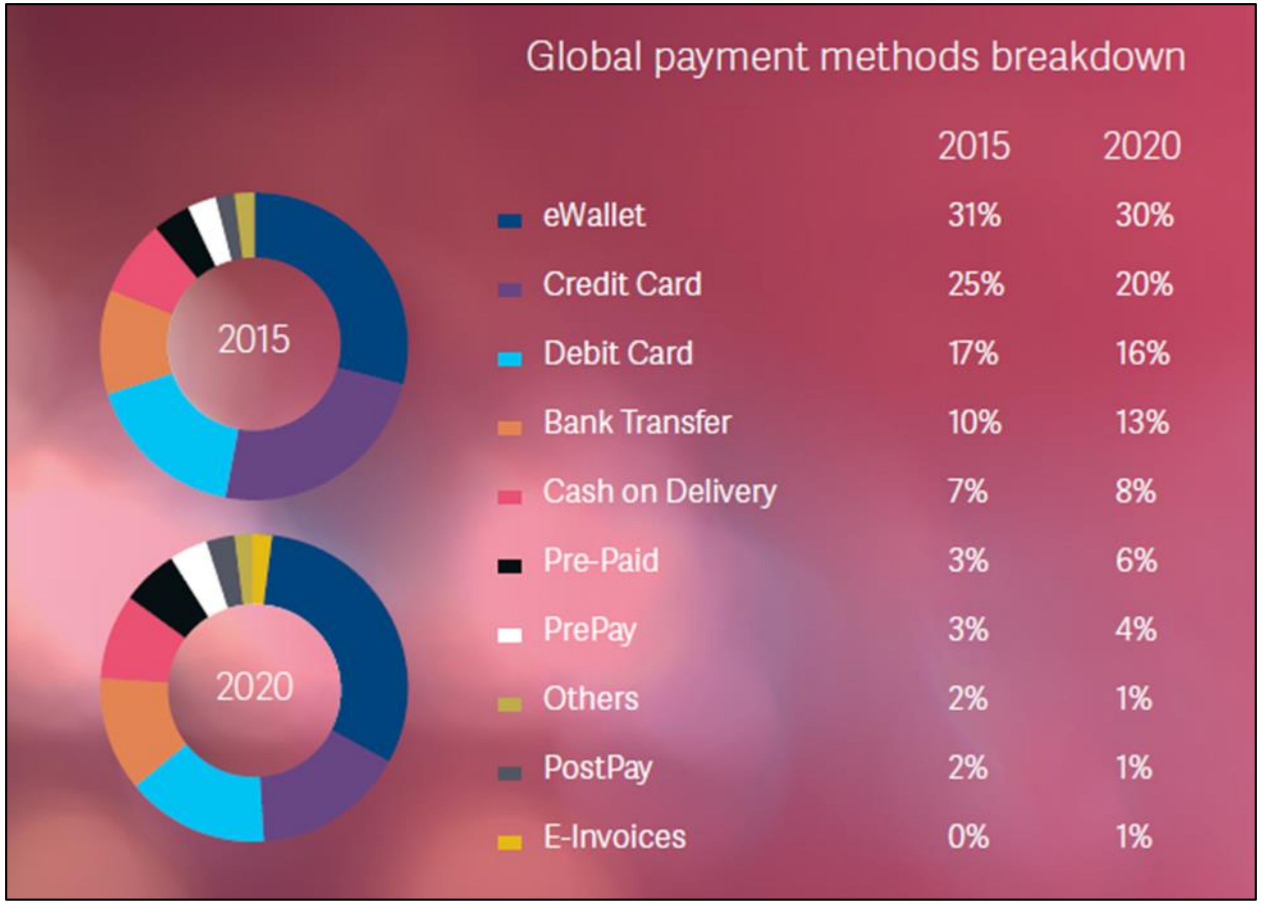
	CARD	DIGITAL	OTHER PAPER	CASH
Brazil	39.00%	13.00%	4.00%	44.00%
China	25.00%	27.00%	2.00%	47.00%
Turkey	25.00%	5.00%	10.00%	60.00%
Russia	28.00%	3.00%	0.00%	69.00%
India	7.00%	13.00%	2.00%	78.00%

Source: BCG and Google

Longer-term opportunity is in emerging markets, such as Brazil, China, India in terms of moving to greater card penetration over cash. However, these markets will be difficult for Visa/MasterCard due to politics.

Payment Trends: WorldPay Data

- The breakdown can be a bit misleading, as eWallet, Pre-Paid, PrePay could also be done with credit and debit cards
- Interestingly, WorldPay still believes bank transfer will be strong, actually increasing from 10% of payments to 13% in 2020
- Essentially, they believe "cash/check/ACH" will go from ~17% in 2015 to 21% in 2020
- I believe some understanding of the definitions is important in order to not overvalue this information



Payment Technology

Some Payments Technology:

- EMV
- Chip Cards
- Magnetic Stripe
- Tokenization
- QR codes
- NFC
- ACH
- Biometrics

EMV

- EMV cards, aka “chip cards”
- EMV = **E**urope, **M**asterCard and **V**isa, as they created the standard originally
- The standard is now managed by EMVCo, with control split between Visa, MasterCard, JCB, American Express, China UnionPay and Discover
- Store their data on integrated circuits in addition to the magnetic stripe
- Growth in counterfeit card fraud continues to motivate the payments industry to improve security
- Thus, the movement to chip technology for bank card, and develop EMV specification for cards based on chip technology
- EMV is a global interoperable standard for smart chip-based bank cards
- Magnetic stripes have static card data, which is used to authenticate the card to authorize transactions
- The issuer validates and authenticates the card based on the static card security code
- But, at this stage, the issuer cannot assume the card is present or is authentic
- Benefits are largely due to increased security and more control of offline credit card transaction approvals

Tokenization

- Tokenization replaces the 16 digit card number on the front of cards with an encryption that is more secure, called a “token”
- Two different types of tokens:
  - Ones that are used as mechanism for authentication your purchase
  - One as an item than can be mapped to your card on file, or bank account
- If consumer pays with EMV chip card, or NFC enabled at POS, the device generates a unique authentication token (“cryptogram”) which masks the information
- The tokens can only be tied back to the information kept on secure servers called “the vault” and without access to the vault, the numbers are useless
- Tokens do not replace EMV but complements for mobile payments

<u>Tokenization: V/MA vs. PYPL/ Other:</u>

- V/MA is issuer-backed and PYPL is not
- Thus, V/MA tokenization payments likely will have lower fees, and/or higher security profile versus others
- PYPL partnering with V/MA gave them the tokenization access
- V/MA tokenization means issuers authenticates the transactions, similar to onboarding a card

Concerns with Tokenization

Concerns with tokenization:

- Does not carry throughout entire transaction
- Still loopholes for potential data compromise
- Thus, many retailers (WMT, Best Buy) have opted out for tokenization
- Another limitation is the technological infrastructure, as they must be built to support tokenization
- Costs for merchants is a barrier, to install and purchase new infrastructure
- Tokenization doesn’t make it more difficult to steal, just very difficult to use once stolen

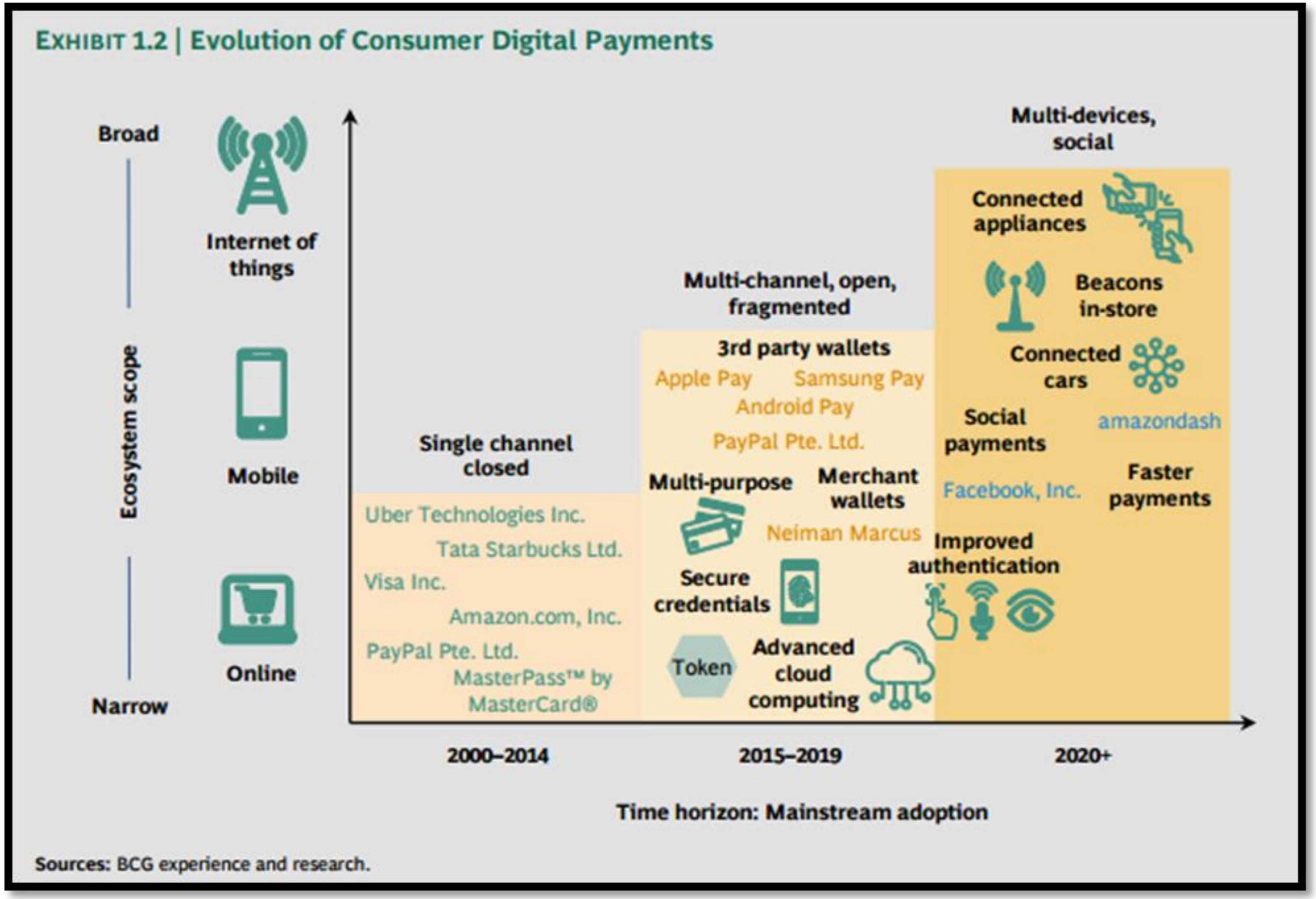
NFC

- NFC = near field communication
- Allows two devices (such as a phone and payments terminal) to talk to each other when they're close together
- NFC enables contactless payments
- Some examples: Apple Pay, Android Pay, Samsung Pay
- The technology is by using RFID, radio wave frequency, similar to scanning items in grocery stores

ACH Payments

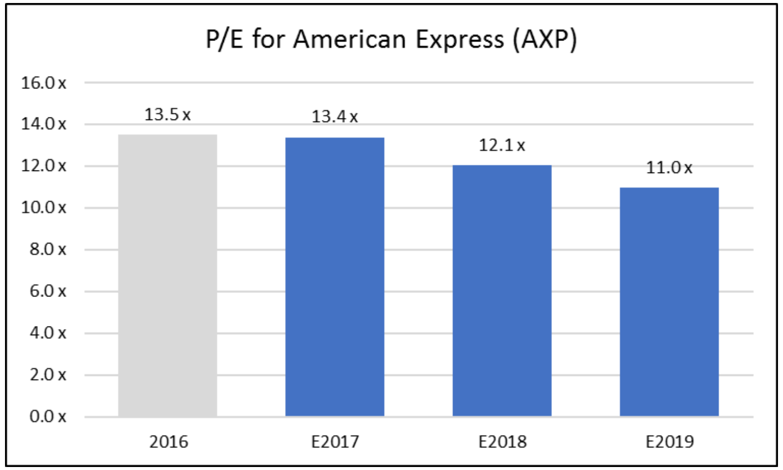
- Automated Clearing House, enables payment by directly debiting customers checking or savings account from their financial institution
- Most common ACH:
  - Online bill payment
  - Mortgage and Loan repayments
  - Direct deposit of payroll
- Less costly than card networks, can be more efficient
- Unable to provide real time authorization of funds like the card networks

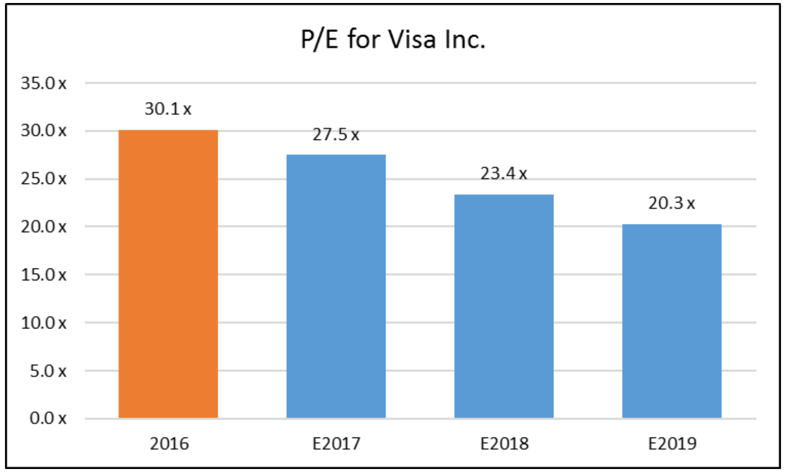
The Future of Payment Technology

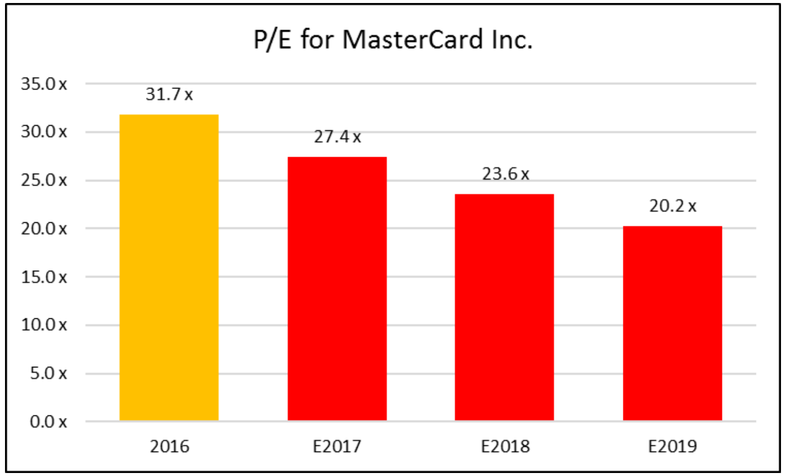


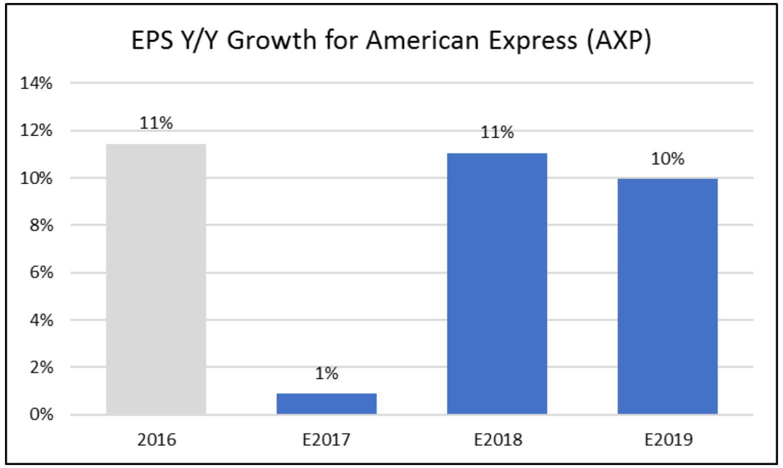
Analysis of Card Networks:

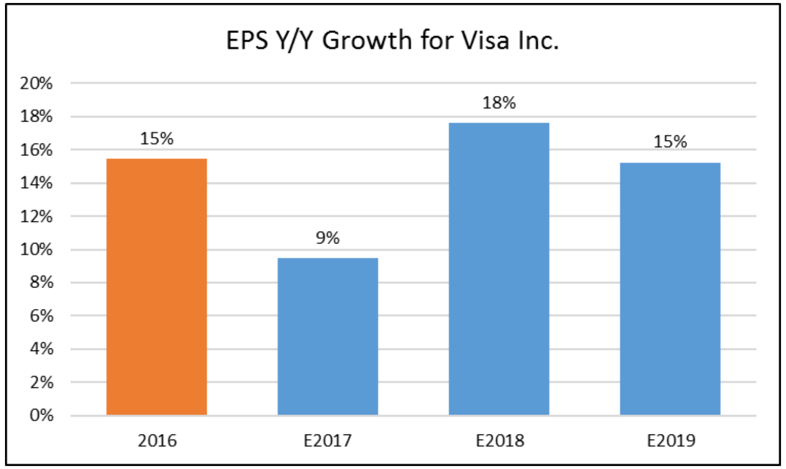
Valuation Overview of Card Networks

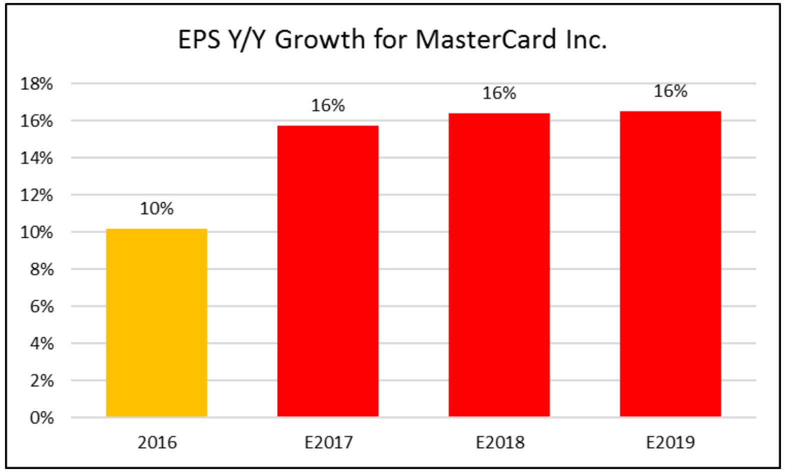












Overview of Card Networks

	CAGR (%) 3 Year	5 Year	8 Year
Revenue			
Visa	9%	10%	11%
MasterCard	9%	10%	10%
American Express	-1%	1%	2%
EBIT			
Visa	10%	12%	16%
MasterCard	8%	11%	15%
American Express	2%	3%	11%
EPS			
Visa	13%	15%	20%
MasterCard	12%	14%	20%
American Express	5%	7%	12%

Revenue Overview ($ billions)

Revenue (Consolidated)		
Visa	$ 16.83	
MasterCard	$ 11.06	
American Express	$ 31.92	
Revenues from Card Networks *only*		
Visa	$ 16.00	*95%*
MasterCard	$ 8.57	*78%*
American Express*	$ 26.23	*82%*
United States Revenue Mix		
Visa	48%	
MasterCard	38%	
American Express	75%	

** Net of Interest Expense, Pre-Provision*

	2010	2016
EBIT Margin		
Visa	57%	66%
MasterCard	50%	55%
American Express		
EBT Margin		
Visa	57%	66%
MasterCard	47%	50%
American Express	24%	27%
Net Income Margin		
Visa	40%	45%
MasterCard	33%	35%
American Express	16%	18%

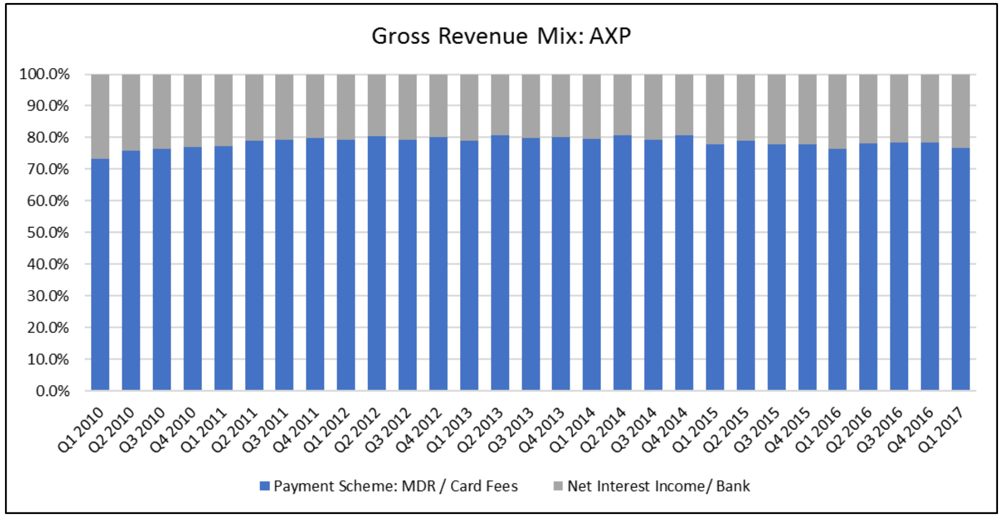
	2010	2016
Invested Capital (Total)		
Visa	$ 25,443	$ 37,848
MasterCard	$ 941	$ 1,077
American Express*	$ 16,230	$ 20,501
Invested Capital (Tangible)		
Visa	$ 2,518	$ (4,452)
MasterCard	$ (266)	$ (1,401)
American Express	$ 12,930	$ 16,706

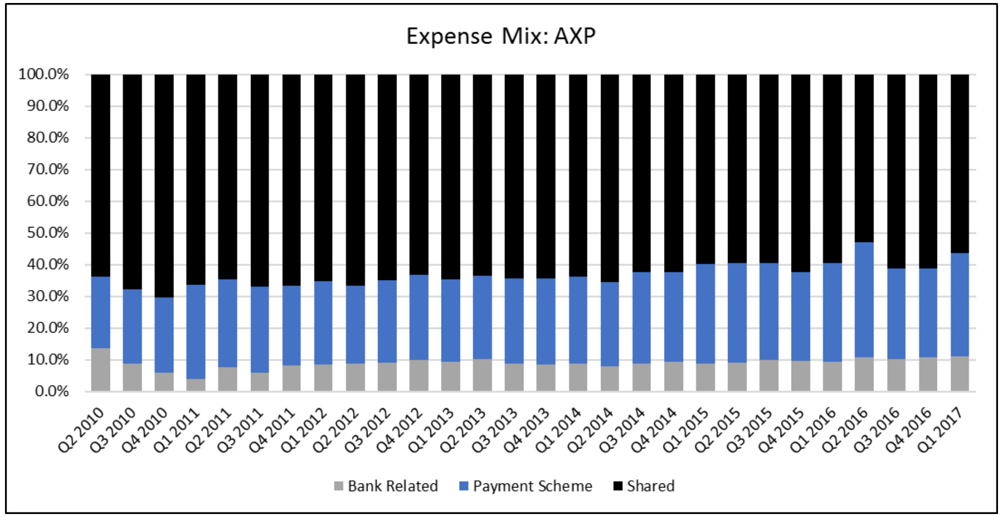
** Invested Capital is S/H Equity*

American Express (AXP)

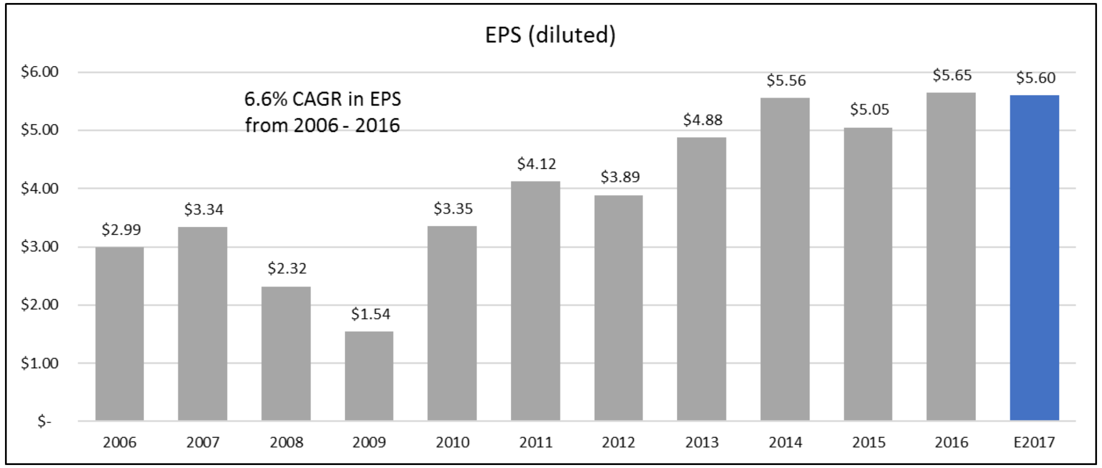
American Express: Business Model

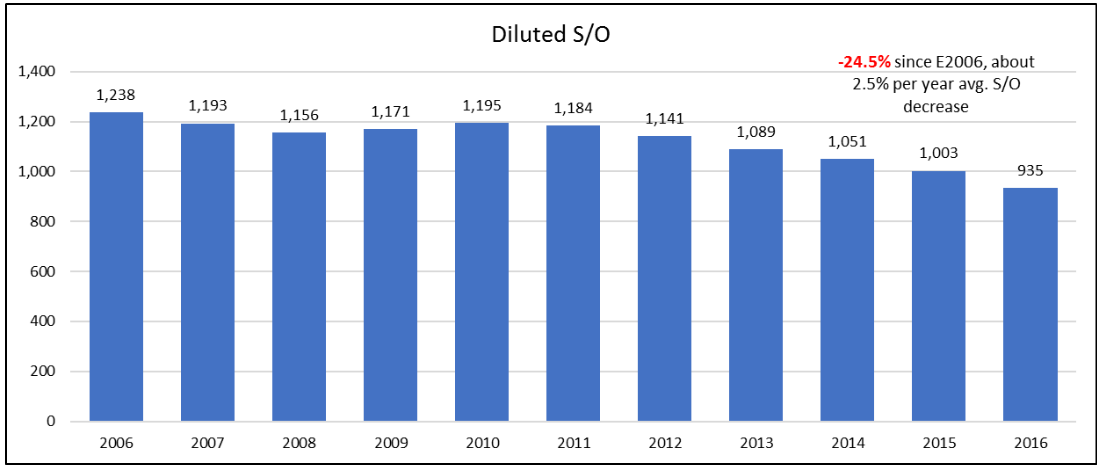
- **Closed-loop** payment system, as they desire to be the card issuer and merchant acquirer in order to handle all key aspects of the transaction
- This model allows them to have more data so they can build algorithms and analytical tools to underwrite risk, improve security and fraud, target market better, and provide better data to merchants
- Very **spend-centric model**, which is where they derive 75 – 80% of their gross revenues from and ~30% direct expenses (~60% of expense base is "shared" between payment scheme and issuer/bank model)
- Targeting more spending on their cards due to their model, which they hope benefits their merchants in the form of larger volume, and benefits the cardholders through more reinvestment in rewards programs

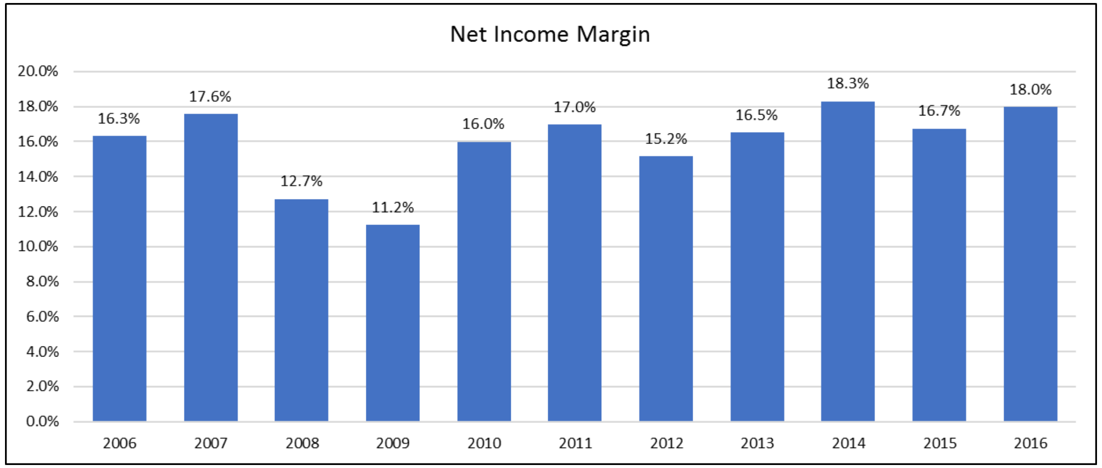


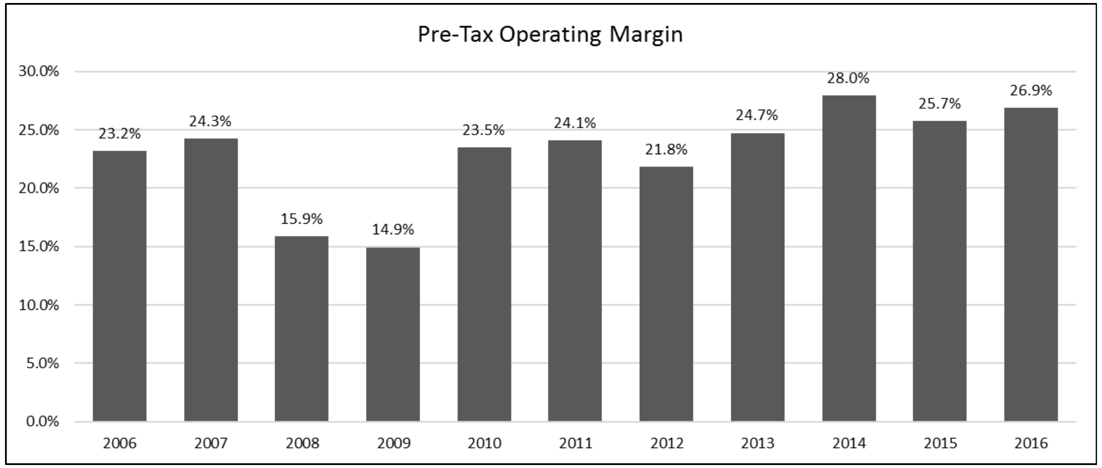


American Express: Financial Overview

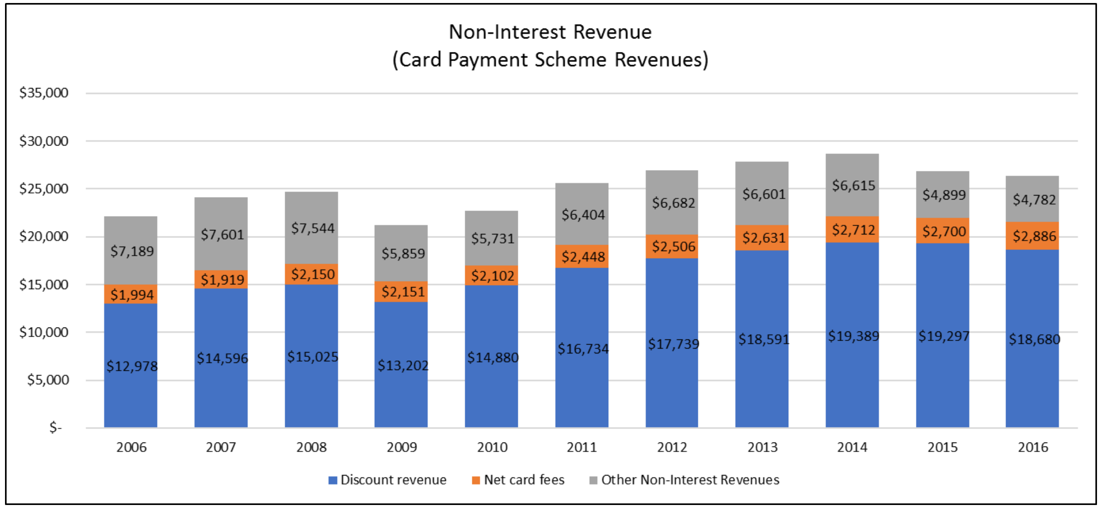


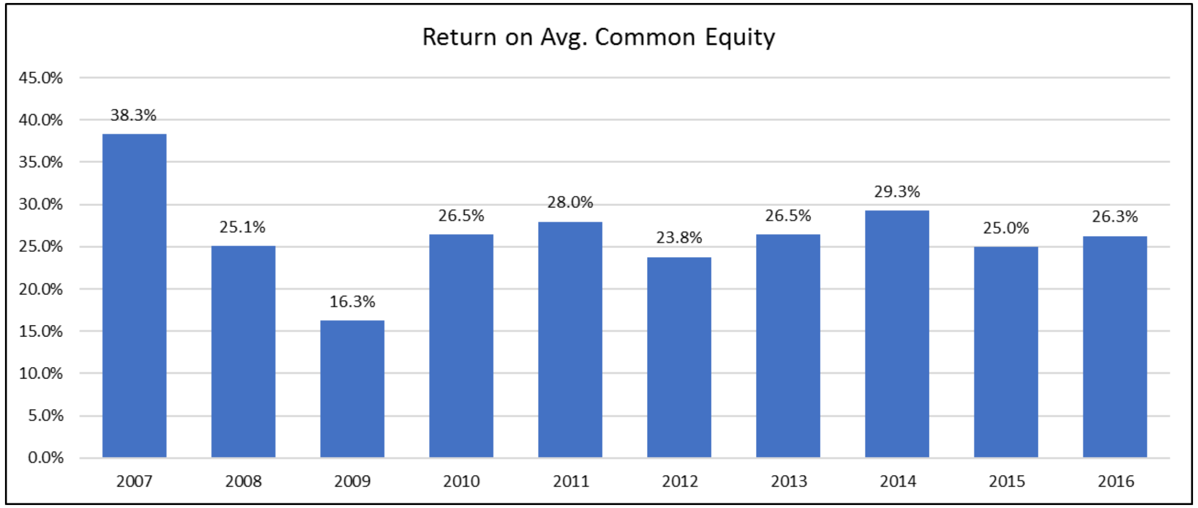


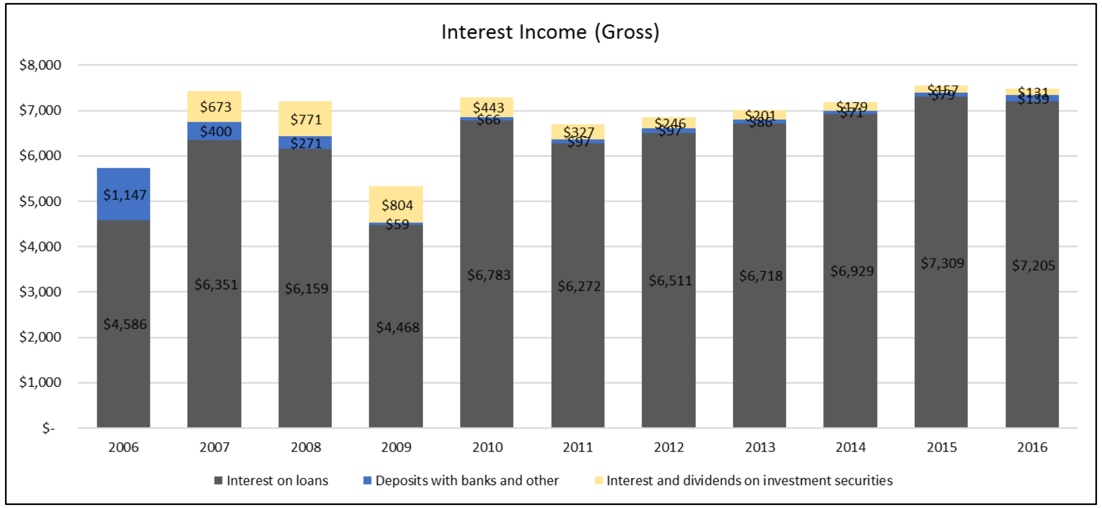


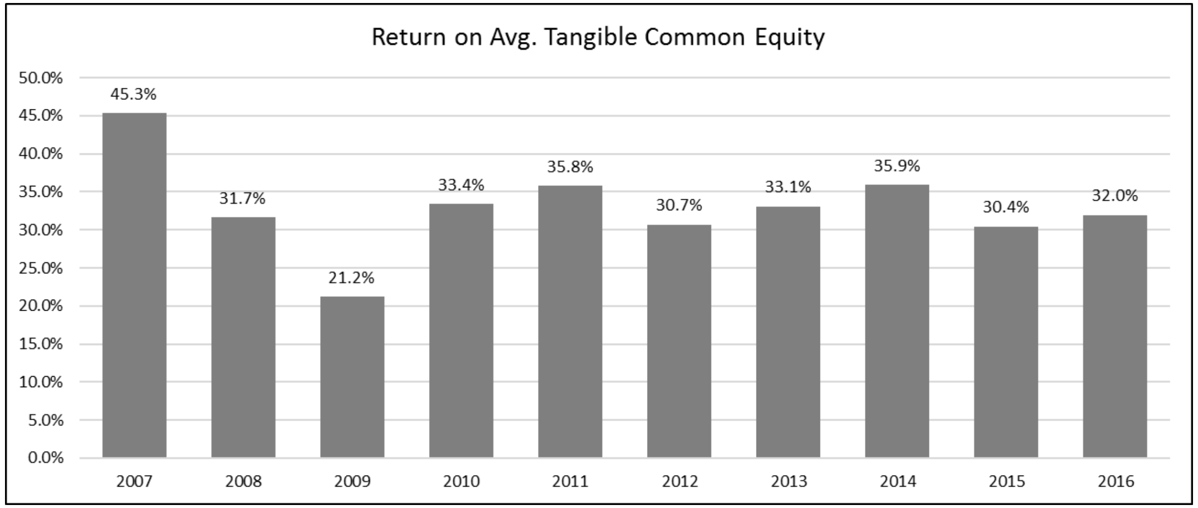


American Express: Financial Overview



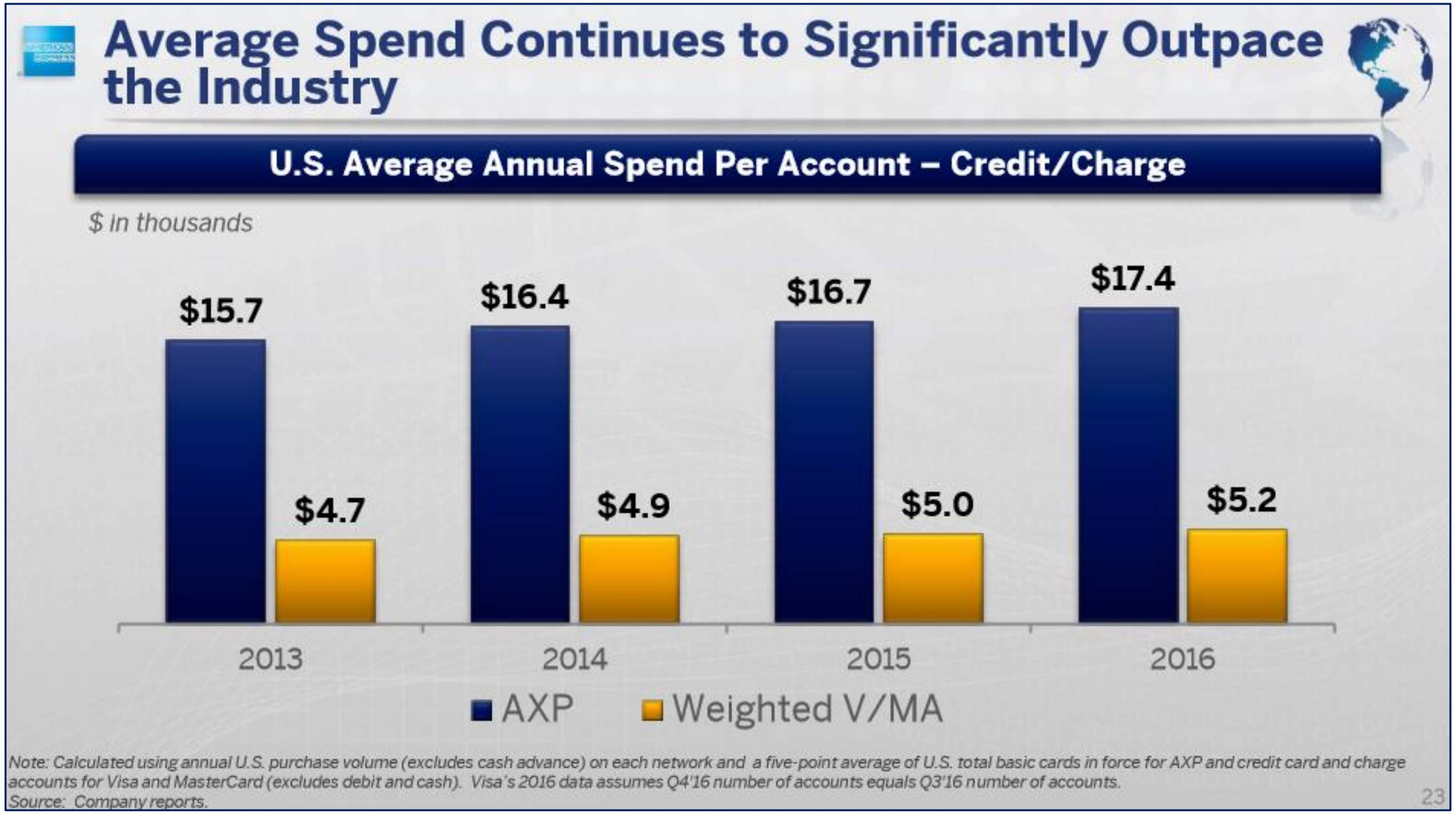






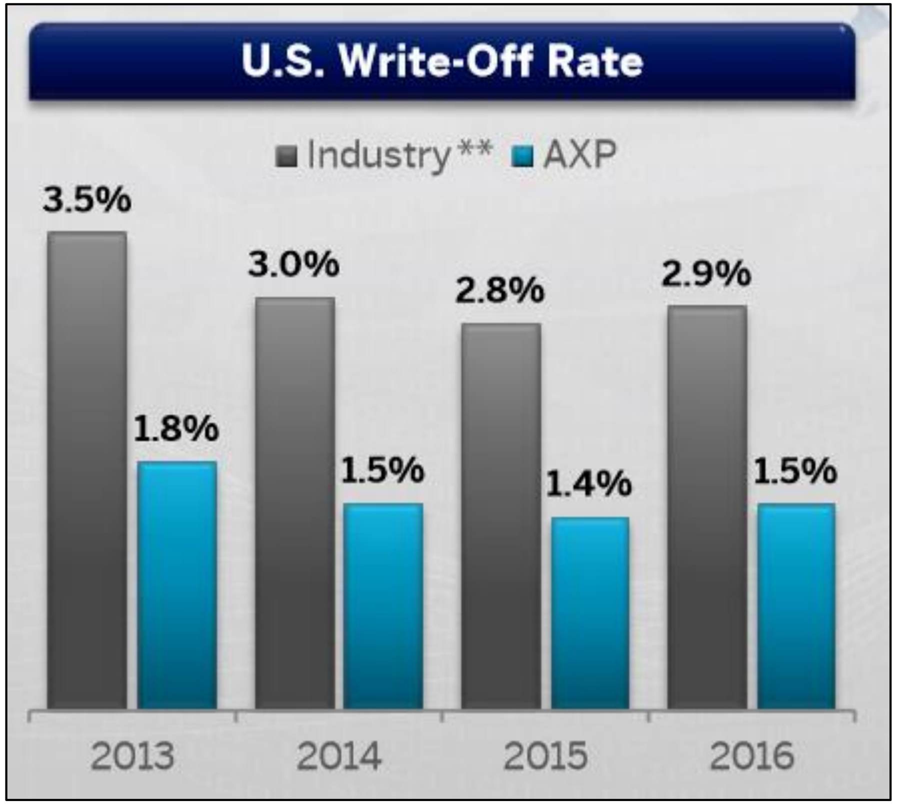
American Express vs. Visa/ MasterCard

- American Express wants:
  - More spending per card, as they earn revenues through the MDR
  - Transaction volume, for AXP, is only a metric to help dollar spend per avg. transaction
- Visa/ MasterCard want:
  - Payment volume, whether it is small dollar or large dollar amounts
  - To be top of the wallet for all transactions
  - Transaction volume is important metric
  - Less focused purely on average spend per account, in aggregate



American Express: Business Model

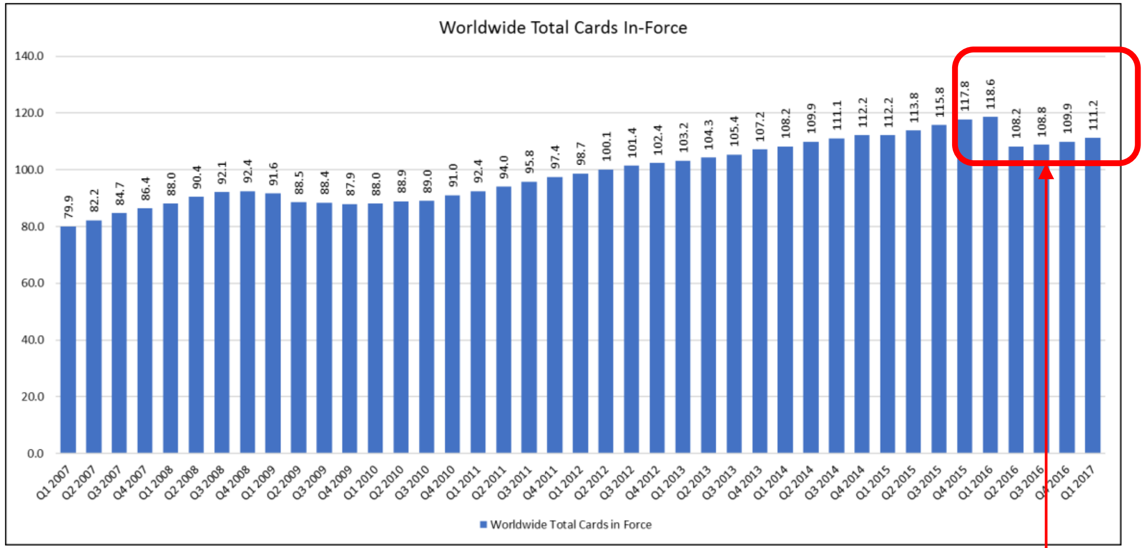
- By being a closed-loop system, they have more data on their customers
- This is beneficial as they also underwrite the **credit risk**. More data enables them to be superior is targeting who they want as their customer, which should result in lower-risk profiles vs. credit card issuing peers (see chart on right)
- Their target market are affluent, higher-income earners, slightly geared towards males and those who travel more often (see: airline partnerships, rewards, hotels, etc.)

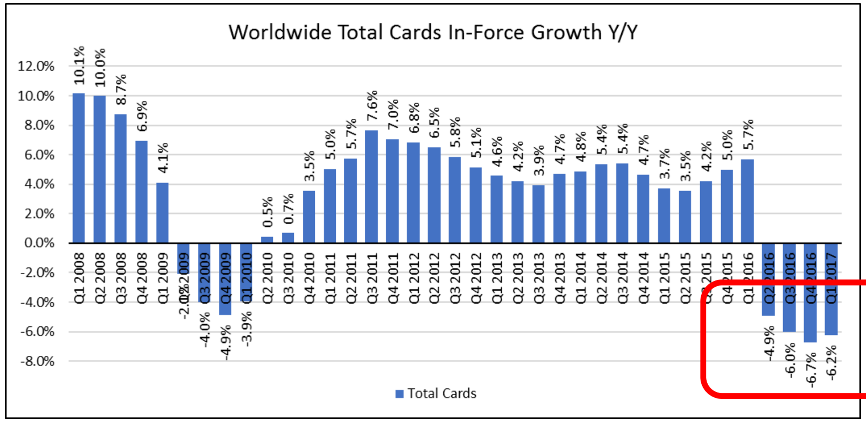


Write-off of credit losses is ~50% of the credit card industry, an illustration of their data and target market offering lower credit risk vs. peers

American Express: Volume Metrics

- Metric: **Cards-in-force**
- If billed business (payment volume) is AXP's top metrics, could be broken down based on:
  - Number of cards-in-force
  - Electronification secular shift +/- adding new customer +/- market share gains in co-brand partnership space
  - Growth in PCE / GDP
  - Growth in share of customers payment wallet method
- If AXP cannot increase the number of customers that use their credit cards, they will predominantly be limited to growing revenues through:
  - General increase in consumer spending, assuming their customers increase spending due to economic growth
  - Their customers choosing to use their AXP card more than currently
  - Increasing the fees they charge merchants
  - Increasing the card fees for current customers (annual membership, late payment fees)
  - The net interest income on existing loans outstanding
  - Could include increase credit limits (due to increases in consumer spending, PCE, wallet share, or some combination) which flows through to higher loans outstanding
- Growing through an increase in customers is important if AXP is still considered a "growth company"

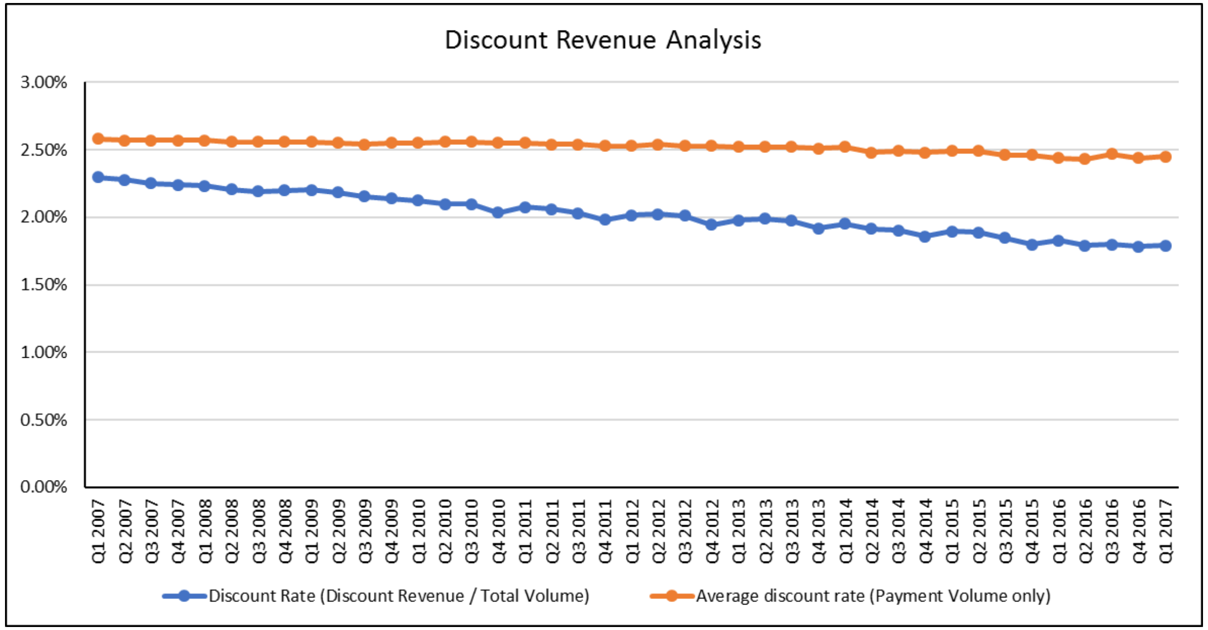




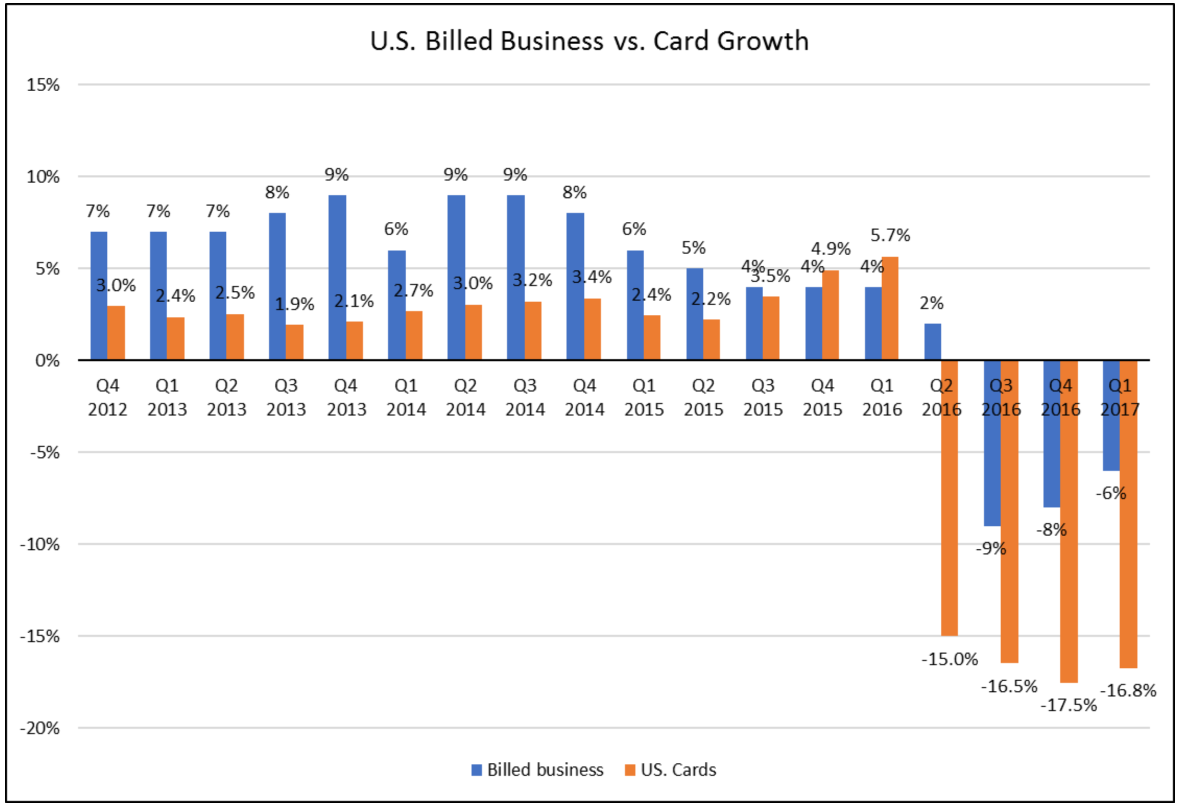
Largely related to losing Costco cobrand partnership ending March 31, 2016

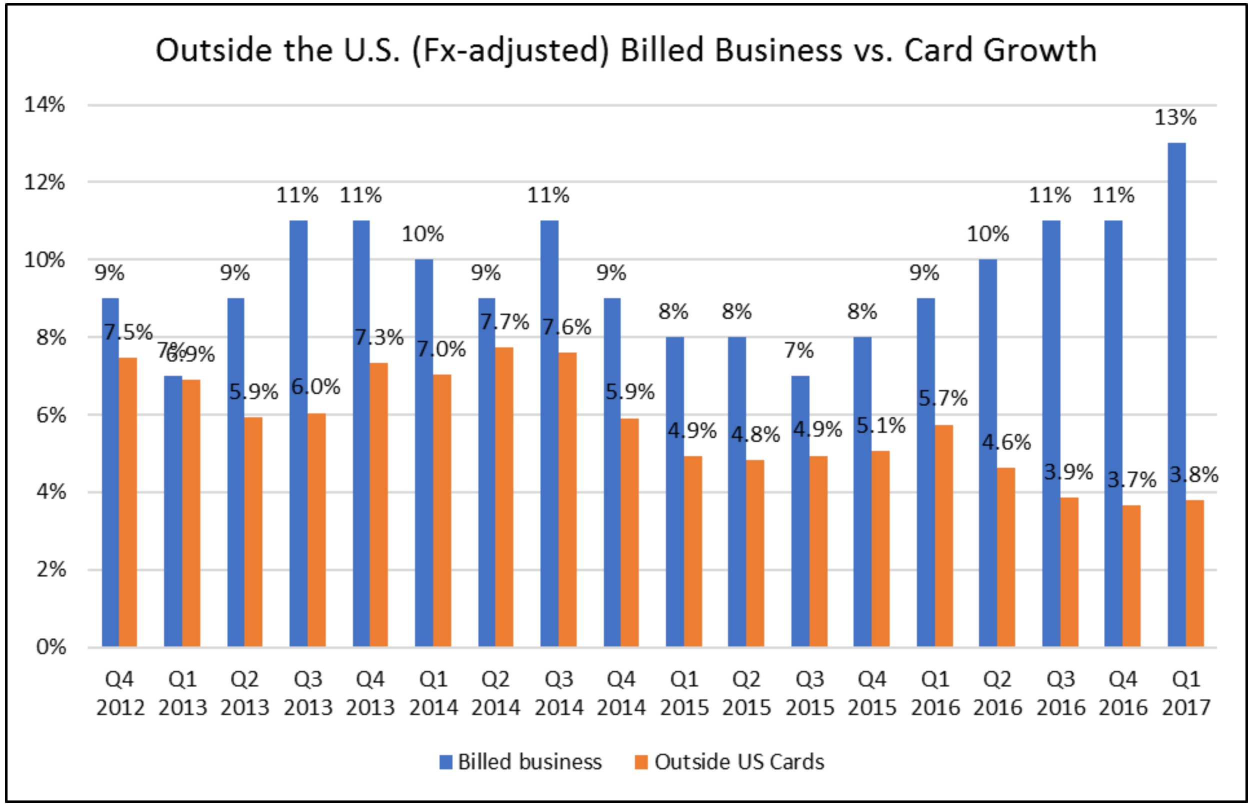
American Express: Average Discount Rate

- Metric: **Average Discount Rate**
  - Discount Revenue vs. Payment Volume
  - Losing the Costco co-brand improved the discount rate % as Costco was a large merchant that negotiated lower fees in exchange for the volume
  - Going forward, the largest impact on the discount rate will be:
    - **OptBlue program**
    - Europe merchant negotiations
    - Any potential future pressure by merchants on credit interchange, which could impact merchant acquirers and the MDR
    - Negotiations on co-brand space



AXP: Card Growth vs. Billed Business Growth

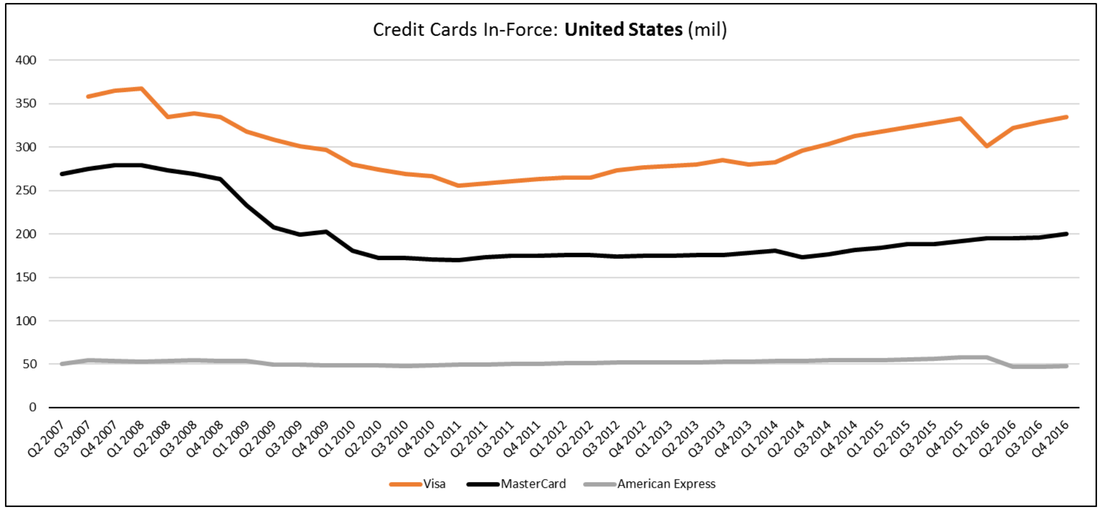




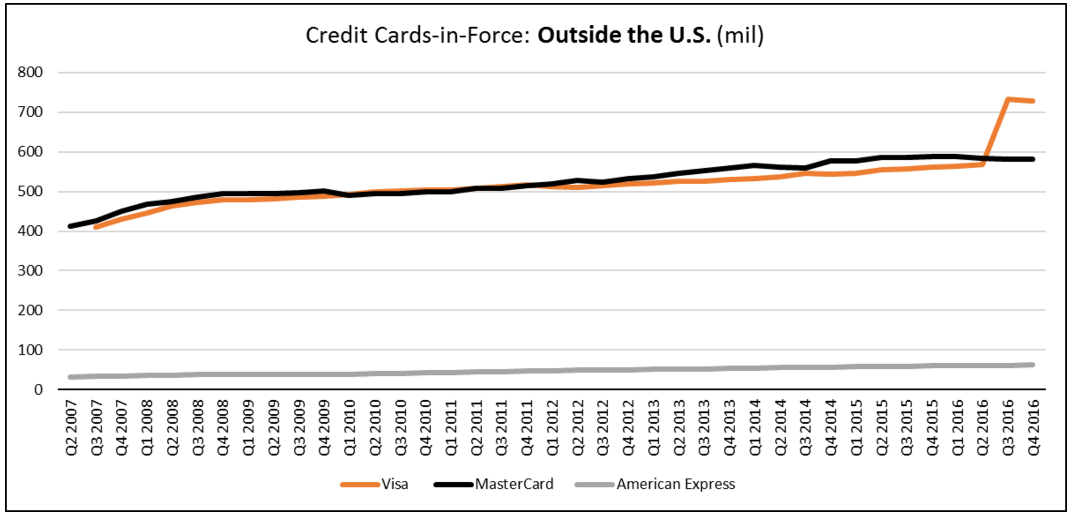
@Find_Me_Value

Cards-In-Force: V / MA / AXP

- **In the U.S.:**
  - Visa: 335m credit cards in-force
  - MasterCard: 200m (as of 12/31/16)
  - American Express: 48m cards-in-force



- **Outside the U.S.:**
  - Visa: 728m credit cards, including ~150m in Europe
  - MasterCard: 581m cards
  - American Express: 63m cards



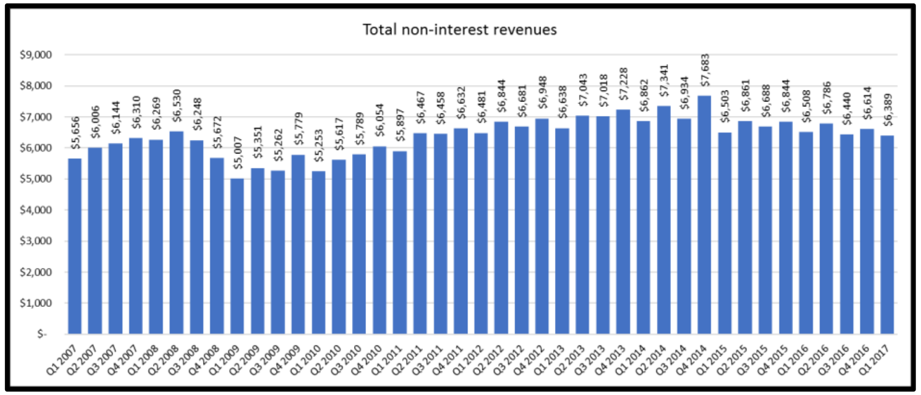
Income Statement: Non-Interest Revenues

Discount Revenue:
Fees charged ("merchant discount rate") as AXP doesn't participate in the interchange fee system the open-loop networks do. It is *reduced* by incentive payments made to merchants, payments to third-party card issuing partners, cash back rewards costs and statement credits, and corporate incentive payments. Consistently between *65-72%* of Non-interest revenues.

Net Card Fees:
Revenue from annual card membership fees, vary based on card type. Platinum increased from $450 to $550. AXP touts Platinum, Gold, and Delta card growth.

Other Fees and Commissions
~85% of this revenue comes from Delinquency Fees, FX currency conversions fees, loyalty coalition-related fees, and travel commissions

Other Revenues
About 1/3 from 'Global Network Services Partners', the remaining 2/3 from cross-border spending fees, merchant related fees, prepaid card fees, and Travelers Checks revenues



Three Months Ended March 31 *(Millions, except per share amounts)*	2017	2016
Revenues		
Non-interest revenues		
Discount revenue	$ 4,519	$ 4,643
Net card fees	748	699
Other fees and commissions	713	680
Other	409	486
Total non-interest revenues	6,389	6,508
Interest income		
Interest on loans	1,860	1,938
Interest and dividends on investment securities	23	36
Deposits with banks and other	60	31
Total interest income	1,943	2,005
Interest expense		
Deposits	149	150
Long-term debt and other	294	275
Total interest expense	443	425
Net interest income	1,500	1,580
Total revenues net of interest expense	7,889	8,088
Provisions for losses		
Charge card	213	169
Card Member loans	337	227
Other	23	38
Total provisions for losses	573	434
Total revenues net of interest expense after provisions for losses	7,316	7,654

"Non-Interest Revenues"
Payment scheme related revenue constitutes about 75-80% of AXP's gross revenue, *prior* to interest expense

Income Statement: Interest Revenues/ Expenses

Interest on Loans
Based on loans outstanding and the gross interest yield on those credit card loans outstanding

Deposit Expense:
Based on the customer deposit base, which is currently $53.8 billion as of the end of Q1 2017. 99% of customer deposits are US interest bearing, with ~60% being in retail savings accounts by customers, ~12% in third-party CDs, and ~8% in retail sweep accounts by third-parties. Avg. CD maturity was 47 months, avg. interest rate of 1.96%.

Long-term Debt and Other:
A function of the long-term debt outstanding, the rates and maturities of those, also a function of the credit rating of AXP by the credit rating agencies. Currently AXP has $51.6 billion in LT debt and $3.6 billion in ST debt.

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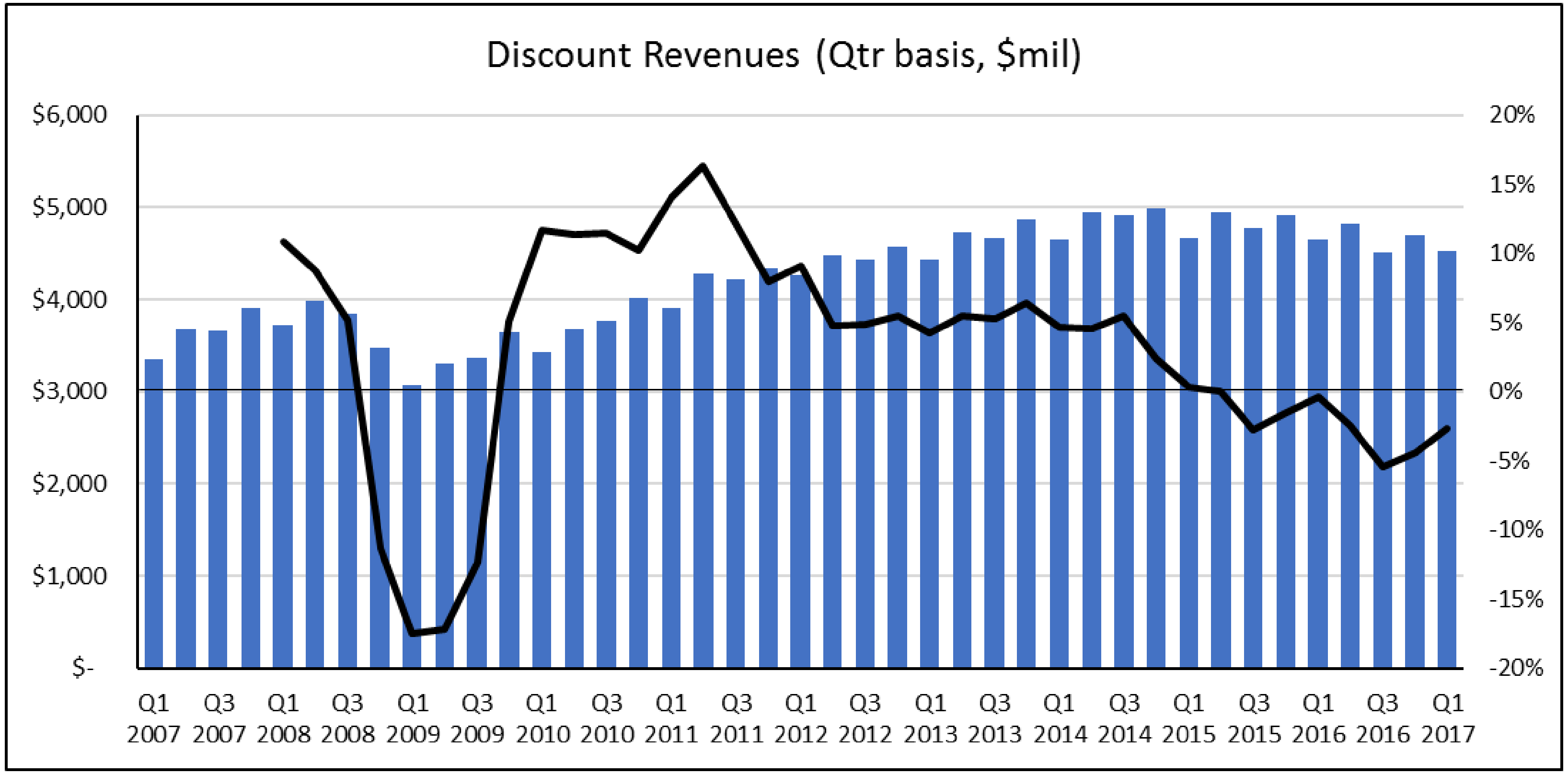
<u>Impact from Higher Interest Rates:</u>
A hypothetical 100 bps increase in market interest rates would result in a decrease of annual net interest income by ~ $193 million as of 12/31/2016. This is equivalent to ~ 3% of current net interest income and <1% of LTM revenues, net of interest expense.

"Net-Interest Revenues"
Interest-related revenue constitutes about 20% of AXP's net revenue, including expenses on deposits and interest payments on debt outstanding.

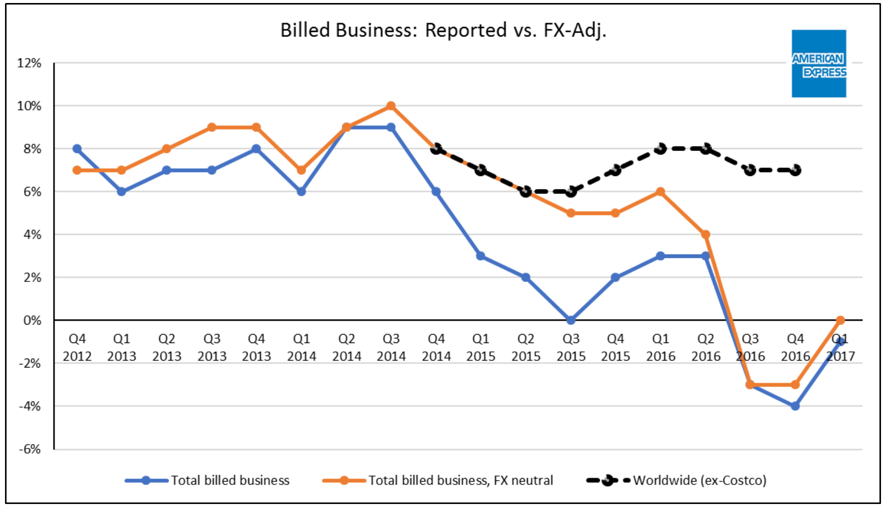
Discount Revenue

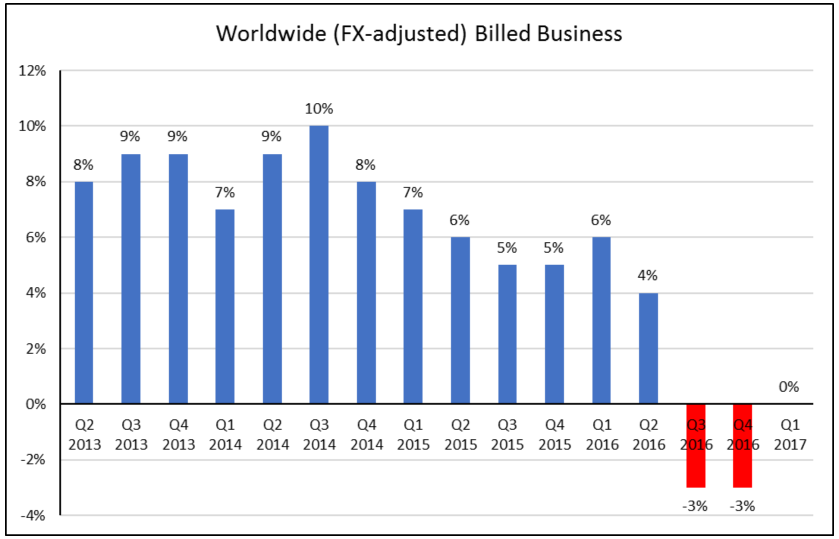
- The fee paid by merchants as a percentage of billed business
- Consistently between 65-72% of non-interest revenues of AXP



Discount Revenue

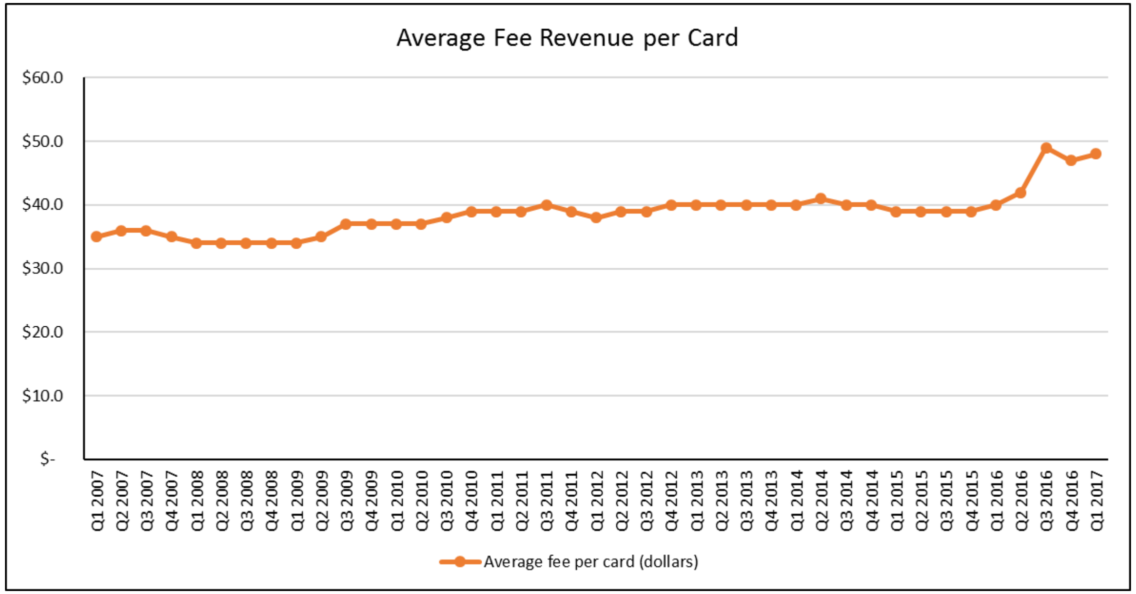
- Discount revenue is a function of:
  - Mix of merchant (larger merchant = lower fee rate per billed business)
  - Incentives paid to merchants
  - OptBlue program in the US (which has lower rates than historical %)
- The discount revenue can increase Y/Y even if the MDR as a % of billed business declines, as the increase in billed business more than offset the pricing
- Many investors have soured on AXP due to Costco lost partnership, concerns over Chase Sapphire taking customers, AXP's above-average pricing rates towards merchants, merchants continual pushback on high processing costs (at which AXP is near the highest)
- However, despite this:
  - AXP's core business (billed business) has been growing 6-8% ex-Costco
  - Their merchant discount rate has remained fairly stable
  - AXP believes OptBlue program progress with small businesses will them to penetrate small businesses and bring their merchant acceptance coverage to parity with Visa and MasterCard in the US by the end of 2019 (from 2017 Investor Day)

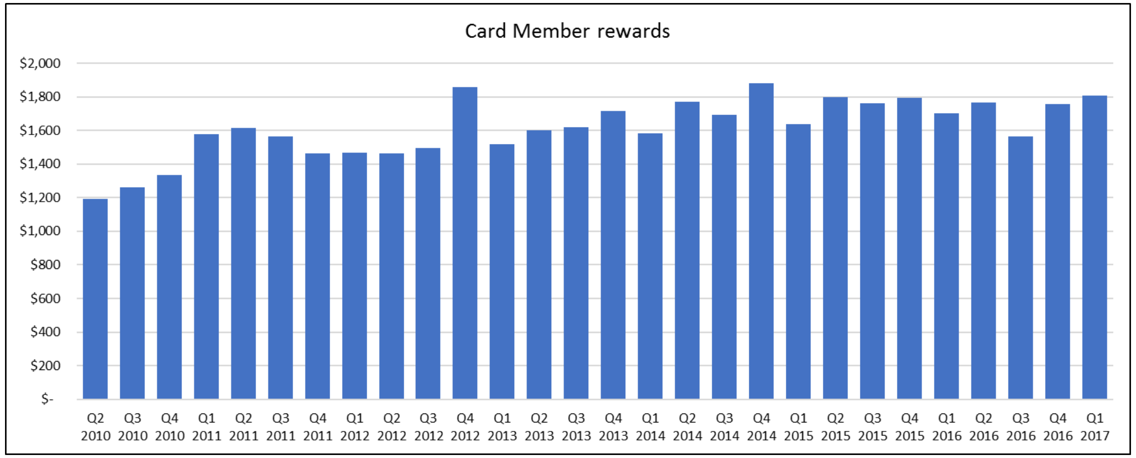




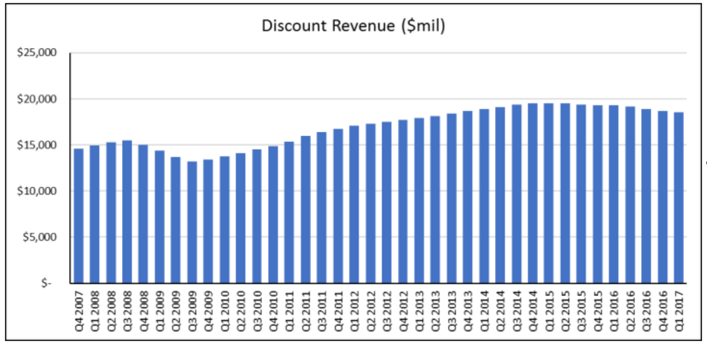
Card Fee Revenue

- Card Fee Revenue is a function of:
    - Mix of card type (Platinum, Every Day, Gold, Delta, Starwood, etc.)
    - Cards-in-Force (proprietary)
- As more consumers recognize the value proposition of AXP's cards, as well as the value proposition of the higher-end cards, the more card fee revenue will increase
- Cards-in-force would remain the same but card revenue declines if the mix shifts from less higher-fee cards to lower fee cards (less Platinum, Gold…)
- Based on the average fee revenue per card statistics, it is clear that:
    - Consumers still value AXP's cards and are willing to pay an annual membership for them
    - The increase in the last few quarters is due to AXP increasing the Platinum annual fee from $450 to $550
    - AXP increased the rewards in order to increase the fee on the Platinum card





AXP Revenue: LTM



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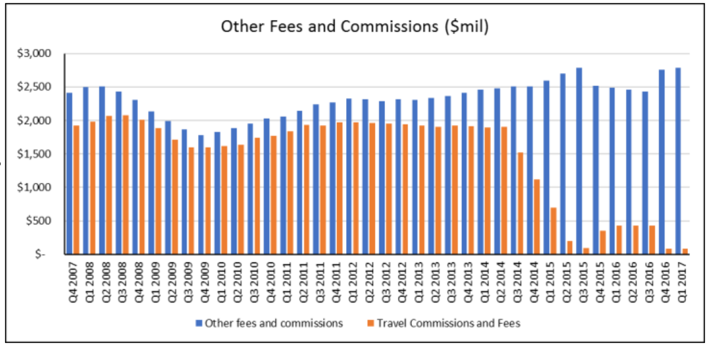

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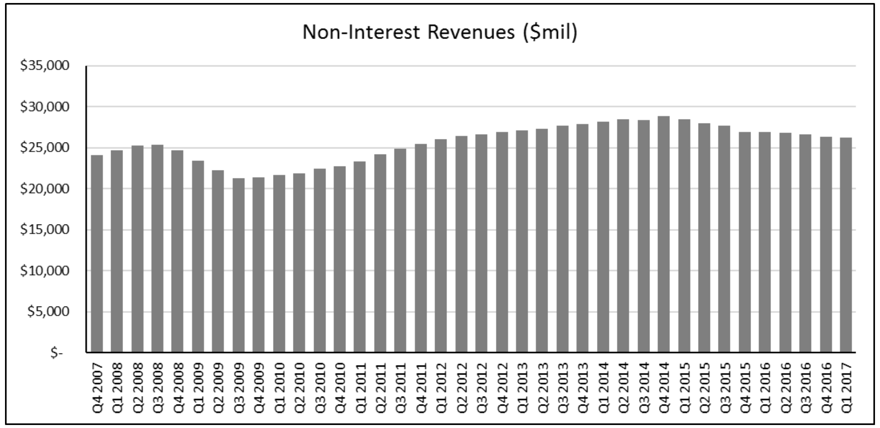

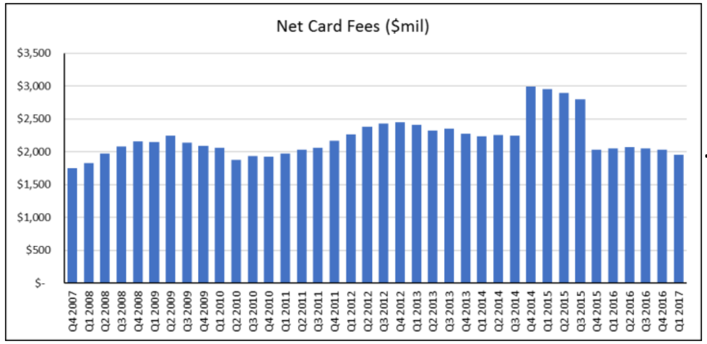

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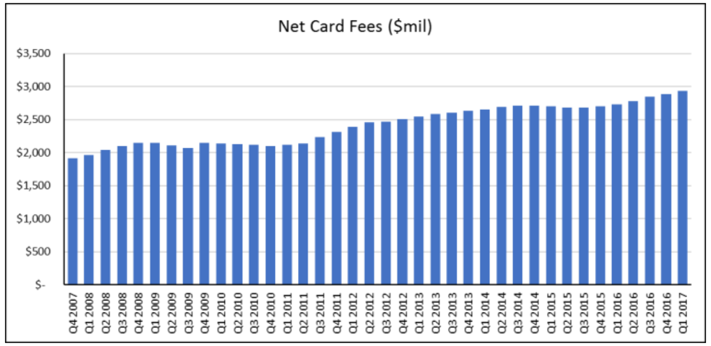
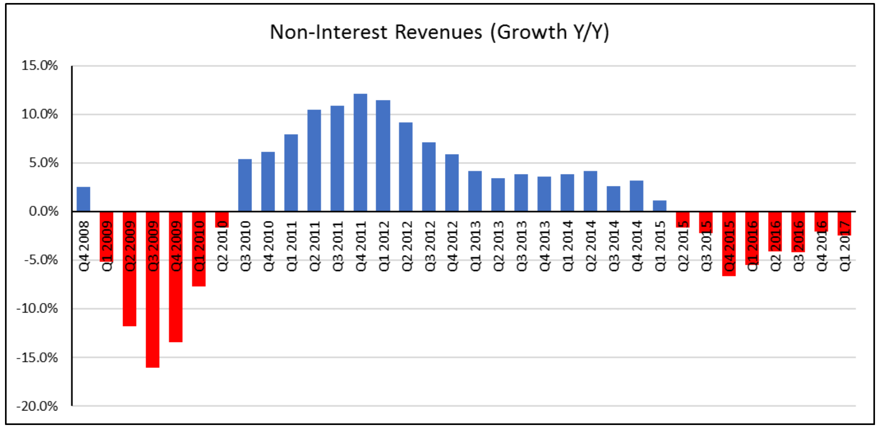
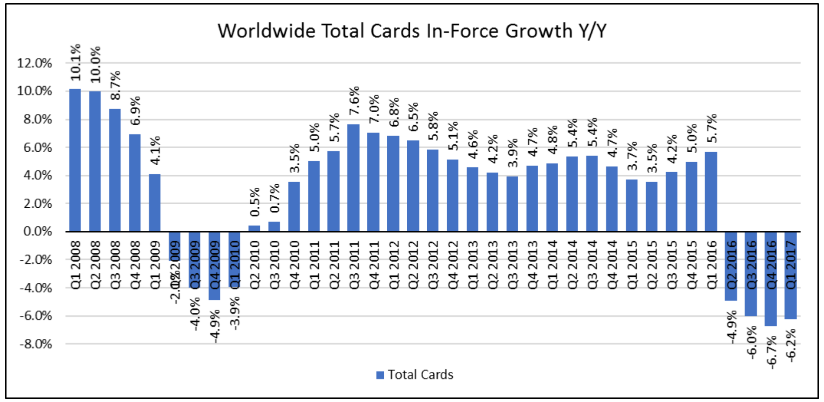
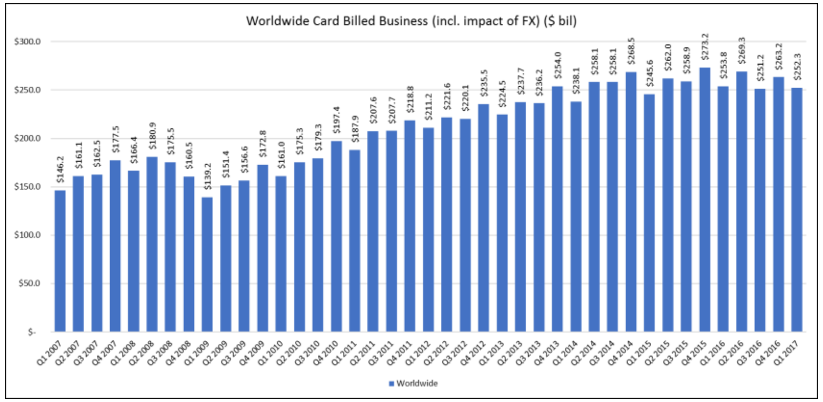




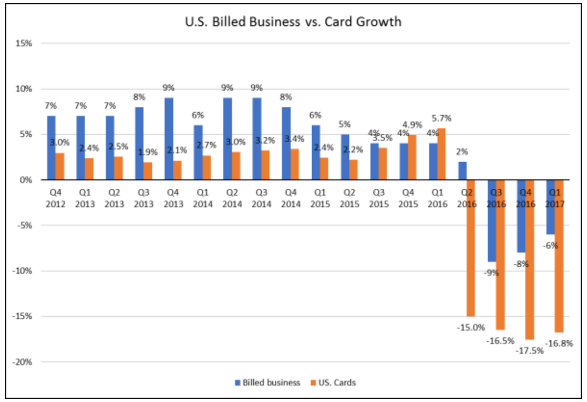
What The "Bears" Focus on with AXP



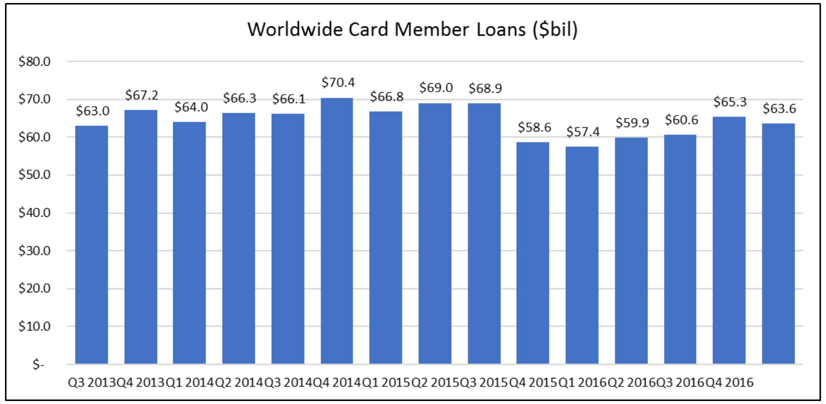
Cards-in-force (the volume) is under pressure due to Costco relationship, JetBlue, and this may be an omen for future growth as larger merchants are more price-conscious and choose V/MA over AXP on an acceptance + fees charged basis



Cards-in-force pressure can directly impact the billed business volume, as less cards-in-force means less spending overall, unless cardholders meaningfully increase their spending-per-card. If billed business is under pressure, then discount revenue will be under pressure.



Cards-in-force and billed business in the US saw declines over the last 4 quarters, due to losing the Costco business. However, billed business saw far less declines than actual cards-in-force declines, implying AXP potentially saved some of those customers outside of losing Costco.



If cards-in-force are declining, there will be a likely decline in card loans outstanding, which will put pressure on net interest income from the card loans

.....AXP stock has been "dead money" since the end of 2013, which is ~3.5 years.

What The "Bears" Focus on with AXP


BUSINESS DAY

Amex, Challenged by Chase, Is Losing the Snob War

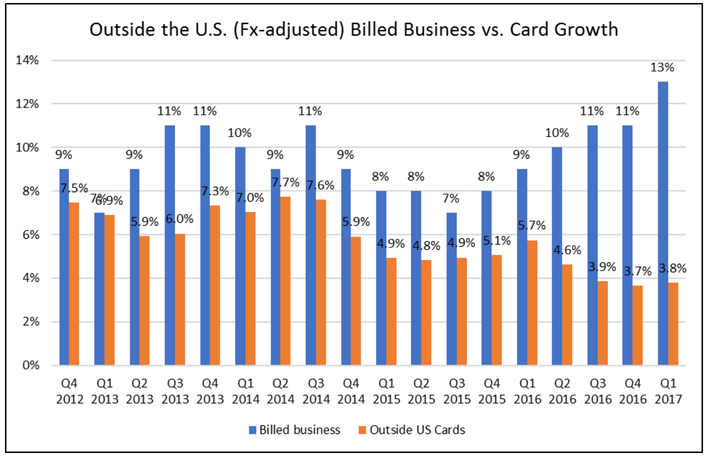
Charles Duhigg
ADVENTURES IN CAPITALISM APRIL 14, 2017

Popular Cards Among Reserve Cardmembers

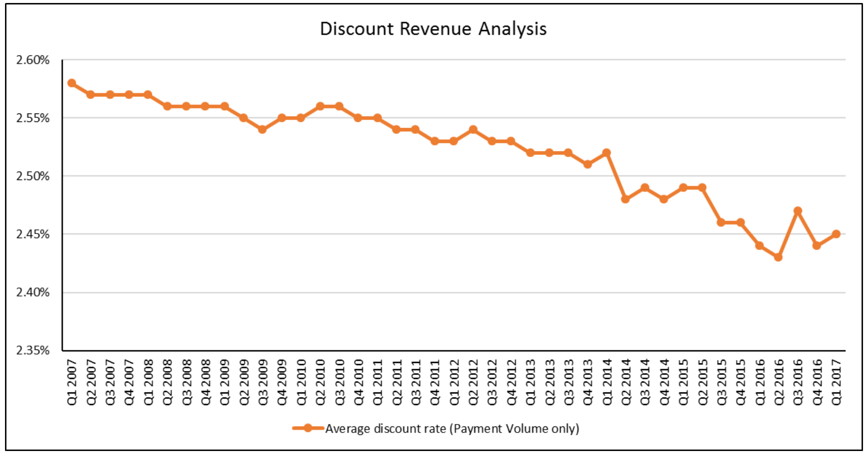
Cards Held Prior to Approval for the Chase Sapphire Reserve

Rank	Cards	%
1	Chase Sapphire Preferred	53.1%
2	Chase Freedom	43.7%
3	Amex Platinum (Standard)	11.2%
4	Amex Premier Rewards Gold	8.7%
5	Chase Freedom Unlimited	8.6%
6	Citi Prestige	8.3%
7	Capital One Venture	6.6%
8	Barclay Arrival+	6.2%
9	Citi AA Executive	4.0%
10	Amex Platinum (Other Variation)	3.7%
11	Chase Ritz-Carlton	0.7%

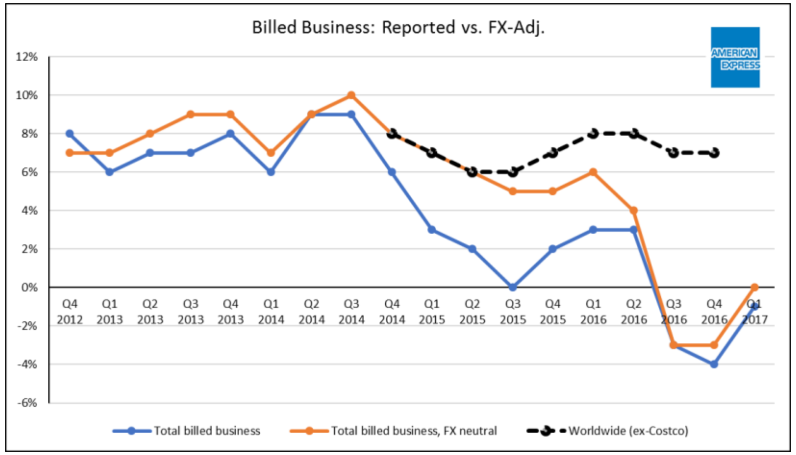
What the "Bears" *May* Be Missing with AXP



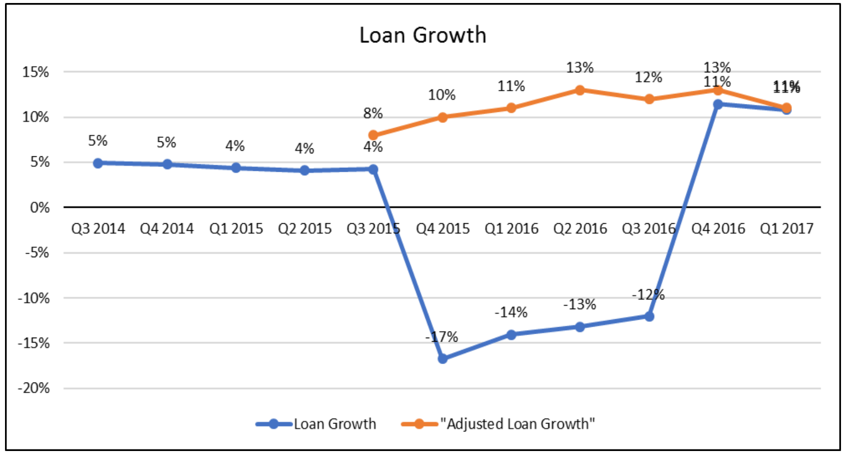
Growth outside of the US is still strong, on both cards-in-force (~4% growth) and billed business (double digit), which are encouraging for discount revenues, net interest income, loan growth



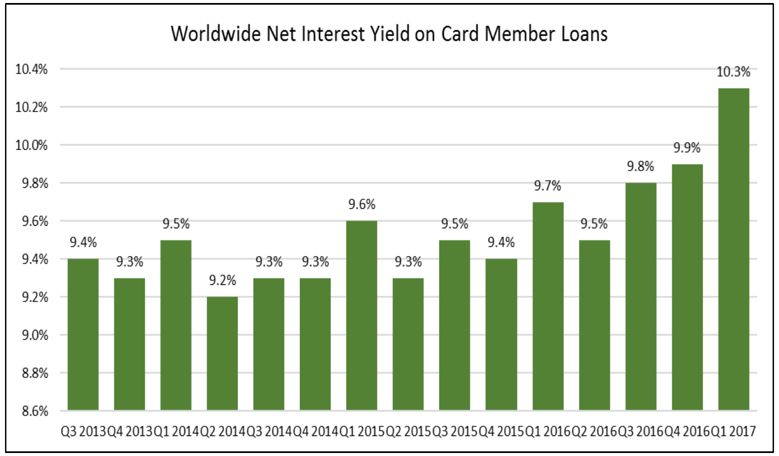
Despite the pressures from Durbin Amendment on interchange fees on US debit, AXP merchant discount rate has remained fairly steady. Recent drivers have been: Costco partnership end (rate ↑), OptBlue Program (rate ↓).



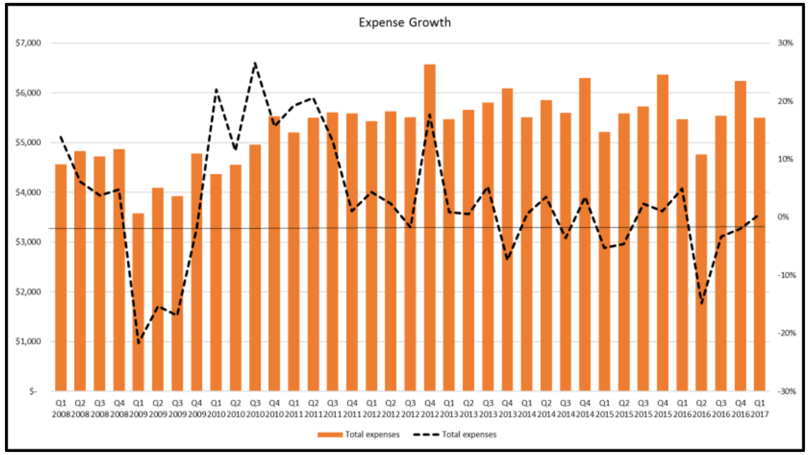
Many are focusing on the loss of Costco; however, the "core" business excluding Costco is still growing 6-8% on billed business basis, FX adj.



Excluding the impact of Costco partnership loss, loan growth (a driver of net interest income, excluding LT debt interest cost) has remained double digit growth.

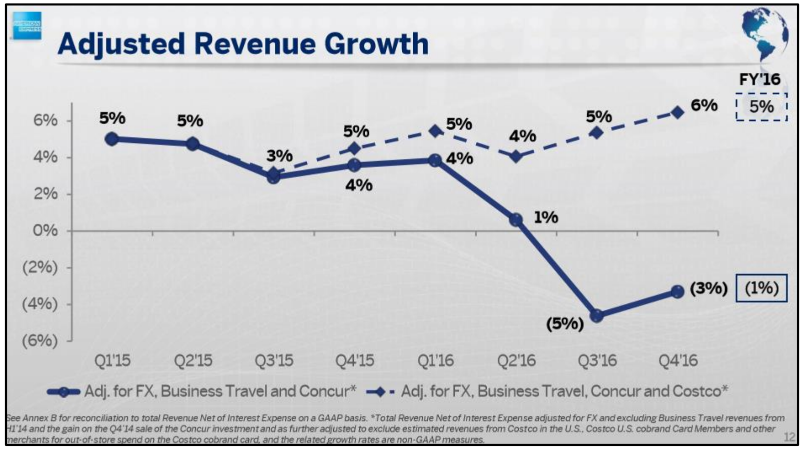


The yields on card member loans has been improving, despite the cost on deposits has not escalated as much, as of yet.



Managing expenses, in the face of lower revenue and the loss of Costco. AXP is looking to take out ~$1b in expenses by the end of 2017.

What the “Bears” *May* Be Missing with AXP



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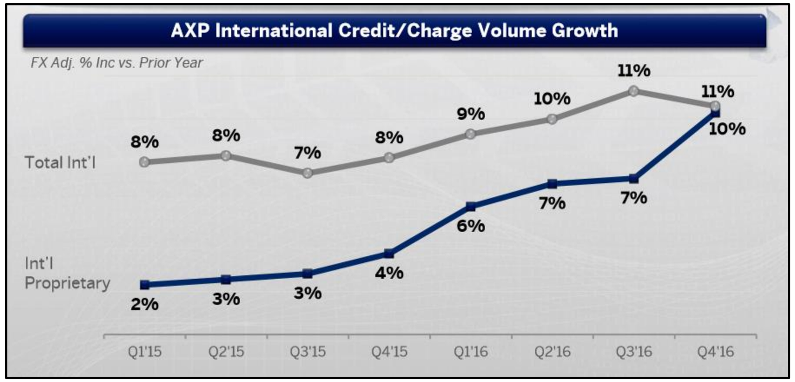
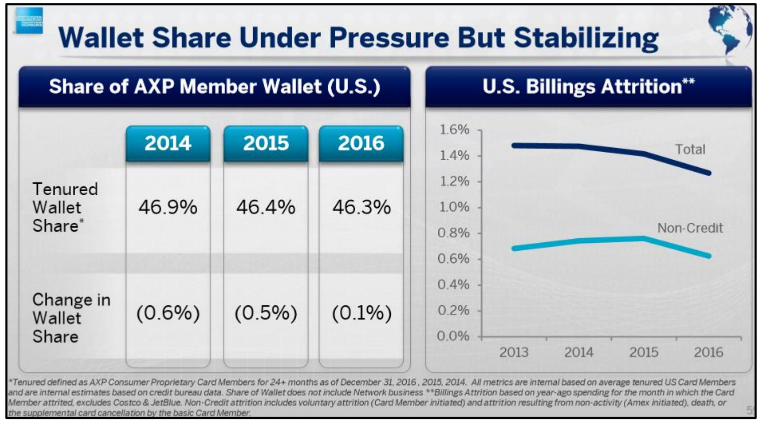


International billed business growth rate is accelerating, and international revenues are 1/3 of total but improving.

Many are focused on the US Consumer Services business, but this segment only represents:

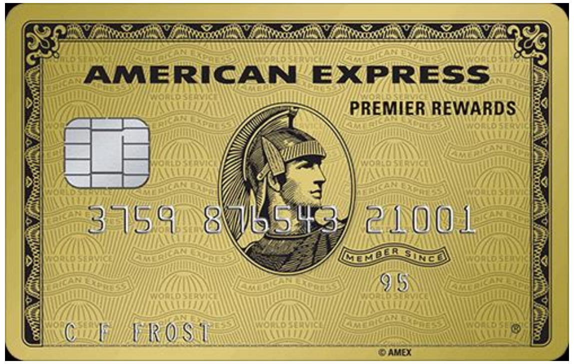
- 31% of billed business
- 30% of total cards in force
- 26% of basic cards-in-force
- 23% of total card member receivables
- ….but represents about 73% of card member loans



Seems to be the belief that AXP is really losing market share in the US. Based on AXP estimates from credit bureau data, the share of AXP wallet is barely declining, and stabilizing, contrary to consensus beliefs.

Card Membership Fees: *Some Examples*

$550 Annual Fee
No interest charged as balance is due in full each month



$0 Annual Fee Yr. 1/ **$195** Year 2+
No interest charged as balance is due in full each month

$0 Annual Fee Yr. 1/ **$95** Year 2+
APR is 16.49% - 25.49%

$0 Annual Fee Yr. 1/ **$95** Year 2+
No interest charged as balance is due in full each month

$0 Intro Annual Fee/ **$160** Yr. 2+
No interest charged as balance is due in full each month

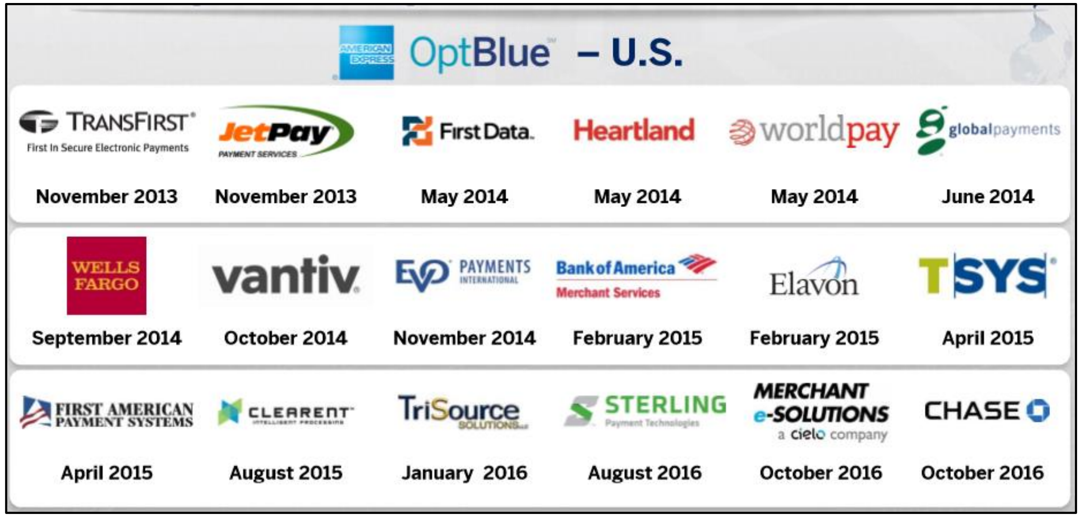
$0 Annual Fee
APR after 12 months is 13.74% - 24.74%

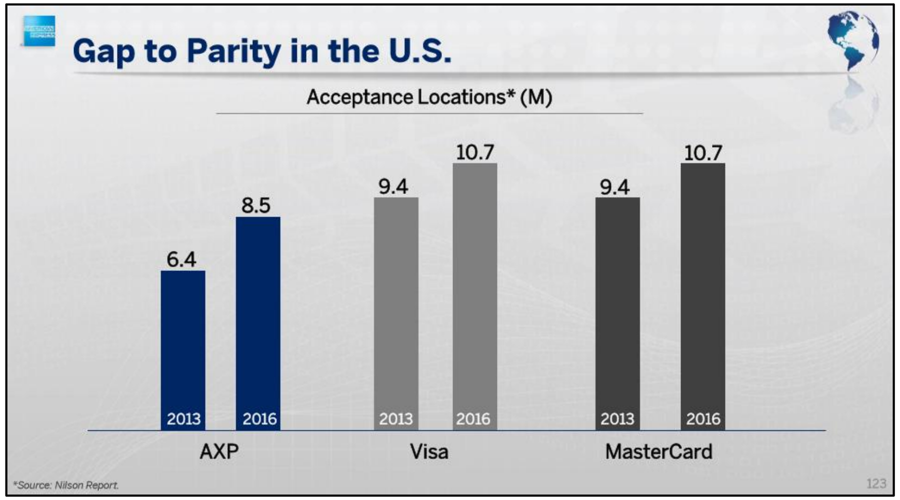
$95 Annual Fee
APR after 12 months is 13.74% - 24.74%

$95 Annual Fee Yr. 2+
APR is 15.99% - 19.99%

OptBlue Program

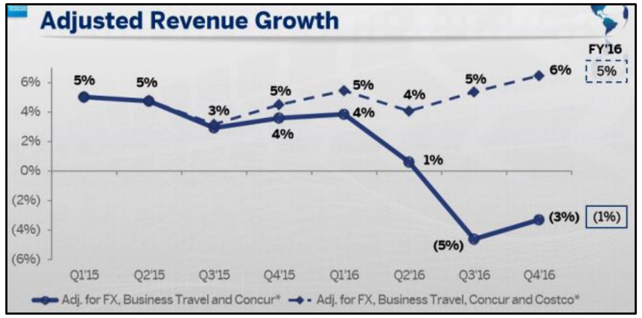
- U.S.-based program for merchant-acquiring, announced February 2014
- Initially designed to expand acceptance among small businesses in the US, allows third-party acquirers to contract directly with US small merchants for AMEX card acceptance
- US small merchants who sign up through OptBlue have the convenience of working with a single source, the third-party acquirer, who sets the price and can give a single statement, one settlement process, one contract for serving for all the major card networks
- Also provides relevant merchant data back to AXP to maintain the AXP closed-loop of transaction data
- Based on Nilson Report, AXP has been closing the gap in the US on acceptance, but still trails V/ MA by about 2.2 million locations.
- Over 100,000 restaurants started accepting AXP cards in 2016, and over 1 million more merchants in 2016 alone

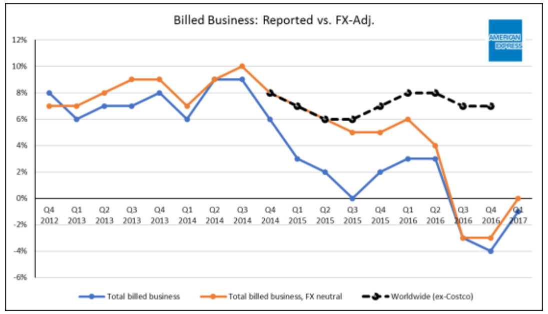




Financial Goals / Possibilities for AXP

- AXP believes they can achieve 10% + EPS growth with mid-single digit revenue growth
  - Currently, excluding Costco, revenues have been growing mid-single digits %
  - Excluding Costco, billed business has been growing 6-8%, FX-adj.
  - The 6% revenue growth seems reasonable, also considering the increase in Platinum annual membership fee
  - OptBlue progress may lower discount rate but should increase billings as acceptance improves
  - Share repurchases, which range from 3-7% of the diluted shares outstanding from prior year (of course, based on the share price purchased)
- Potential, given actual numbers:
  - Revenue +4-6%
  - Improved margin + 0.5% - 1%
  - Share Repurchases 3-6%
  - Dividend Yield ~ 1.5%
- **Possible that AXP total return ~10%-15%**.... *if*:
  - OptBlue continues to progress, narrowing gap in US merchant acceptance
  - Execution on expense management
  - Share price remains low (~8% FCF yield, ~100% payout ratio)
- Potential catalysts could be:
  - Lapping of the Costco business results, and thus investors see the core is still doing okay
  - Investors realize the US Consumer business ≠ entire AXP
  - Firing of Kenneth Chenault?
  - OptBlue results continue to do well
  - Less FX impact on results

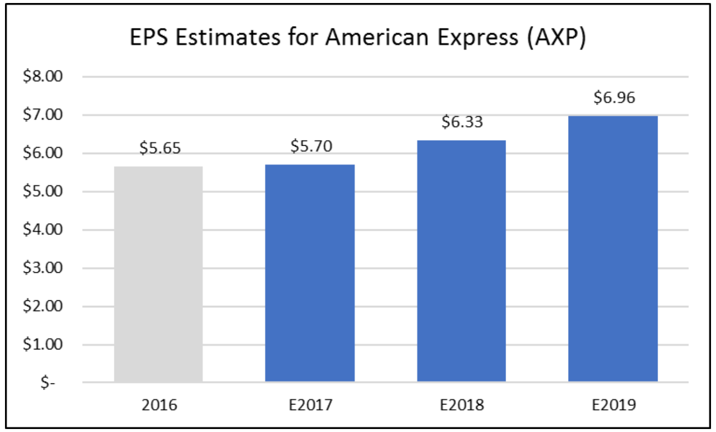


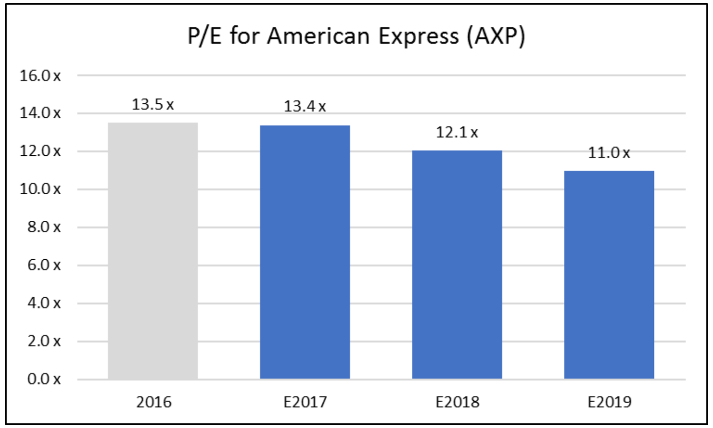


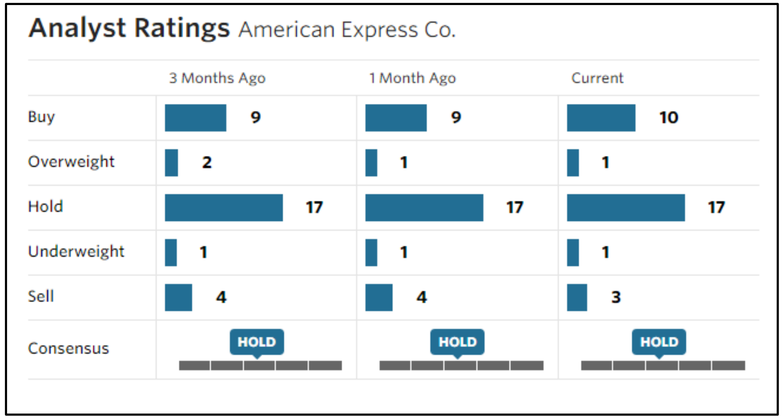
Summary: American Express (AXP)

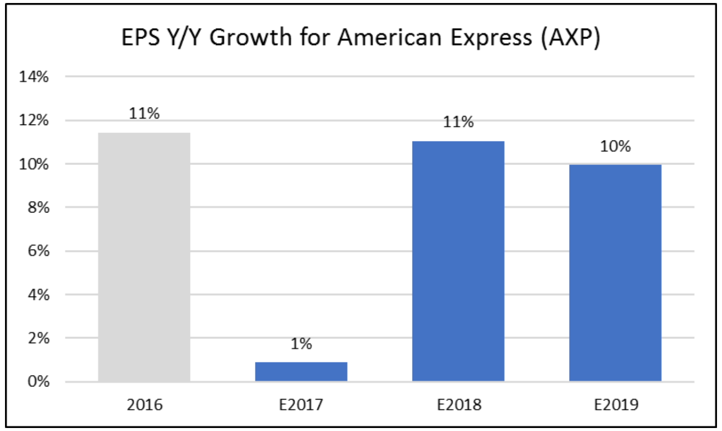
- American Express has a different business model than the card networks – Visa / MasterCard
- AXP is primarily focused on consumer credit card spending, where they earn the merchant discount rate (as AXP does not participate in the interchange fee system)
- Their acceptance rates, paid by merchants, are some of the highest in the payments ecosystem
    - This has both pros and cons
    - Allows them to pass through some of this additional fees in the form of higher rewards programs for their card members, which they hope entices them to stay with AXP and to spend more, created a virtuous cycle
    - Higher cost makes it a barrier to enter smaller merchants, who do not want to pay the higher costs
    - OptBlue program addresses this, is an attempt to close the acceptance gap in the US with V/ MA
- AXP has been having brand issues over the last couple of years
    - Younger higher-income earners are less interested in the American Express image, desire more of a new and interesting feel in terms of choosing their cards
    - Continued growth in internet lets people compare rewards programs more easily, versus just the brand, and thus they are more of a commodity in terms of rewards in some departments
    - Large issuers that have the capital to deploy and incentives to have the same customers AXP wants, can incentive these customers were similar or better rewards, as they have more revenue opportunities versus AXP to make up for the increased cost of the rewards programs (see: Citi, Chase)
    - However, card growth and billed business growth has still been decent, despite the consensus perception
- AXP has lost some large business volume, specifically Costco and JetBlue, and risk losing more co-brand partnerships due to their higher costs, competition from the card networks having far more acceptance (merchants, card holders) and lower transaction costs, and large issuers throwing capital at the space to incentive churn from AXP
- Due to competition in the core-AXP space, they are looking at ancillary revenue opportunities, such as increases in loans
    - This is more capital intensive
    - More cyclical than traditional business
    - Lower quality than the payments business
- AXP is focusing heavily on managing expenses despite lower top line growth, in order to improve equity shareholder returns
- Still, at 14.0x estimated 2017 EPS, given their payout, there is potential for > 10% rate of returns on AXP based on dividend (1.6%) + share repurchase + mid single digit revenue growth. This is further possible given severe lag of AXP's shares over the last 4 years.

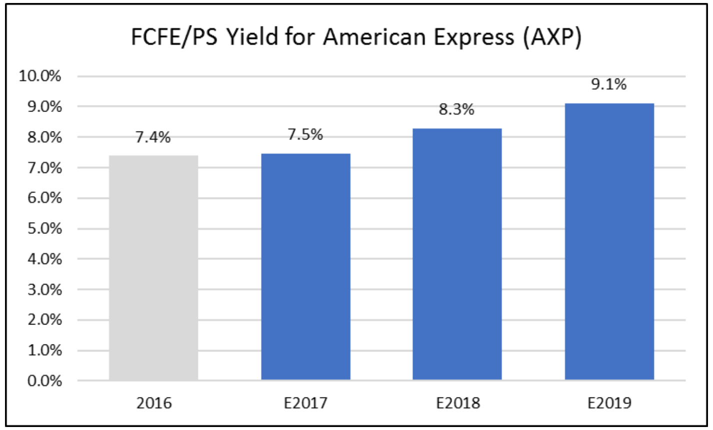
Valuation: AXP











Stock Price Target AXP

High	$95.00
Median	$85.00
Low	$63.00
Average	**$83.33**
Current Price	$76.30

Visa Inc:

Overview of Analysis: **Visa Inc.**

- What is their business model?
- What are the important drivers of their business?
- What are the good/bad characteristics of Visa?
- How does the industry secular trends impact Visa?
- Visa Europe transaction
- How is their market share versus competitors?
- Valuation thoughts
- Balance sheet brief overview

Business Model

- To be the brand/partner of choice for all parties involved in the payments ecosystem
  - **Issuers**: financial institutions who issue credit card, partner with Visa to be the network and brand
  - **Merchant acquirers:** Have to partner with Visa to allow for transactions to go over Visa's network
  - **Consumers**: Trust the brand, feel confidence in the massive level of merchant acceptance, can pay almost anywhere with one of their products, and it is secure
  - **Merchants:** Want to accept Visa as they have 3.1 billion cards-in-force globally, and consumers expect merchants to accept Visa cards
- Due to their scale, global acceptance, Visa tries to participate in the growth of global payments, encourage increased penetration of card usage over paying with cash/check, and innovate to improve fraud rates to benefit all parties
- Low fixed cost, minimal incremental cost per transaction leads to industry leading margins and excess cash flow
- Excess cash flow returned in the form of a dividend and share repurchase, or M&A is appropriate

Shareholder value maximized by growing core business and returning excess cash

Grow Core Business	Return Excess Cash to Shareholders
• Capture secular growth • Fund new products • Pursue selective acquisitions	• Dividends • Share repurchases

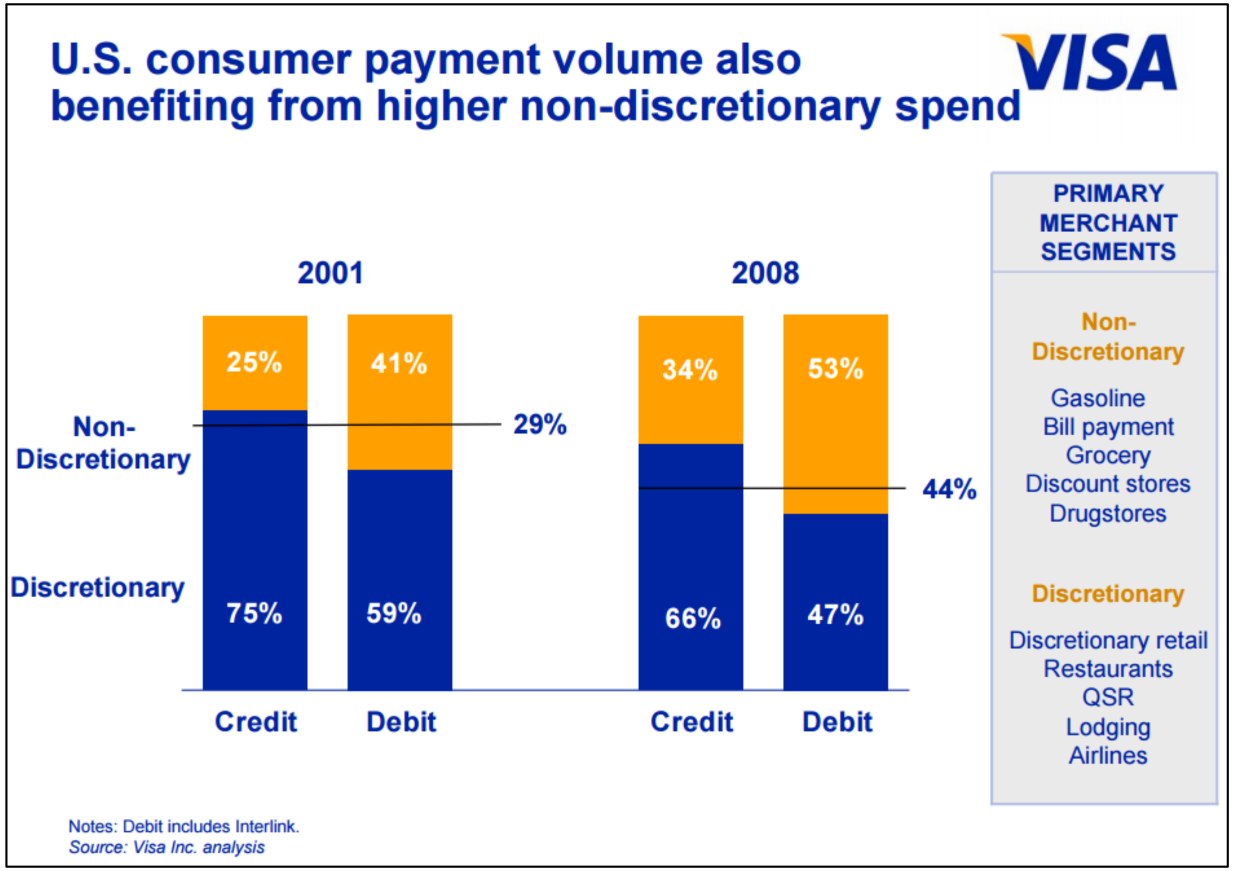
Goldman Sachs Conference (Feb 2009)

- Maintain capital management philosophy
  - Invest in growing the business organically
  - Fund appropriate M&A
  - Return excess cash to shareholders through dividends and stock buybacks

2013 Investor Day

Business Model

- Offers a multitude of products, predominantly credit, debit, and prepaid cards
- The ability for Visa/ MasterCard to offer multiple products:
  - Is a growth driver, as both credit, debit, and prepaid have growth opportunities
  - Differentiates them from American Express (no debit cards)
  - Limits cyclicality, as the products are used in different manners
    - Credit: more discretionary, such as discretionary retail, restaurants, QSR, lodging, airlines
    - Debit: more non-discretionary, smaller value items, used more for gasoline, bill payment, grocery stores, discount stores, and drugstores
- Multiple products means that consumers will tend to use them everyday (top of the wallet) as they can pay for different things with the same card network



Despite chart being 7 years old, still relevant in illustrating the power of offering both debit and credit products

2009 Goldman Sachs Conference

Visa: *Market Share Leader*

- Global:
    - 56% of global transactions on global cards (**#1**) (2015) (MA with 26%). Had 58% in 2014 (lost share since), MA had 26% (steady share). Had 60.4% market share in 2013 (Visa Debit had 38.3%/ Visa Credit had 22.1%) which has decline. MA had 26.8% market share in 2013 (Credit 14.4%/ Debit 12.4%)
    - 16% of worldwide cards in circulation as of 2015 (**#2** behind UnionPay); MA with 9%
- United States
    - 47% of US payment volume on payment cards in 2015 (**#1**); MA had 21%
    - #1 Cards-in-force
    - #1 total volume
    - #1 payment volume
    - #1 processed transactions
- Europe
    - 68% of purchase volume (**#1**) in 2015; MA has 29%
- Latin America
    - 59% of purchase volume market share (**#1**) (2016), down from 60% in 2015 (MA with 33%, up from 31% in 2015)
- Asia Pacific
    - 13% of purchase volume (**#2** to UnionPay, who has 77% due to China); MA has 7%. 15% market share of purchase volume in 2014, UnionPay had 73%, MasterCard had 8%. CUP has gained share over both V/MA

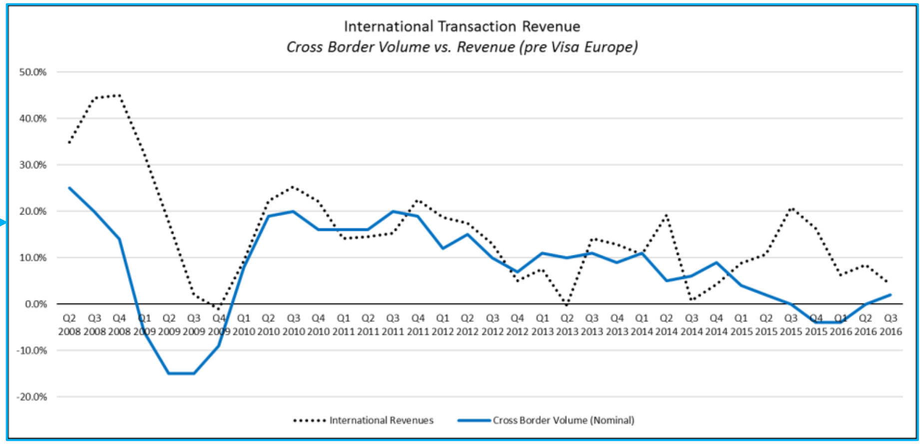
Important Metrics

Pre Visa Europe (2008 - 2016)	3 Yr	5 Yr	8 Yr
Service Fee Revenue	*8.0%*	*9.6%*	*10.4%*
Data Processing Fee Revenue	*10.6%*	*12.5%*	*14.8%*
International Transaction Revenue	*12.2%*	*11.7%*	*13.2%*
Total Revenue	*8.6%*	*10.4%*	*11.6%*
Operating Expenses	*4.4%*	*6.7%*	*0.3%*
EBITDA	*10.9%*	*12.7%*	*27.8%*
EBIT	*11.1%*	*12.7%*	*29.8%*
Total Volume	*3.6%*	*5.3%*	*7.2%*
U.S.	*8.9%*	*7.4%*	*6.7%*
Outside U.S.	*-0.1%*	*3.7%*	*7.7%*
Payment Volume	*7.3%*	*7.6%*	*8.6%*
U.S.	*9.6%*	*7.8%*	*7.4%*
Outside U.S.	*4.6%*	*7.3%*	*10.3%*
Processed Transactions	*10.0%*	*8.8%*	*9.8%*
Account Growth	*6.5%*	*6.5%*	*6.5%*
Card Growth	*5.6%*	*6.0%*	*5.6%*
Credit Cards	*5.2%*	*4.1%*	*1.9%*
Debit Cards	*5.9%*	*7.1%*	*8.3%*

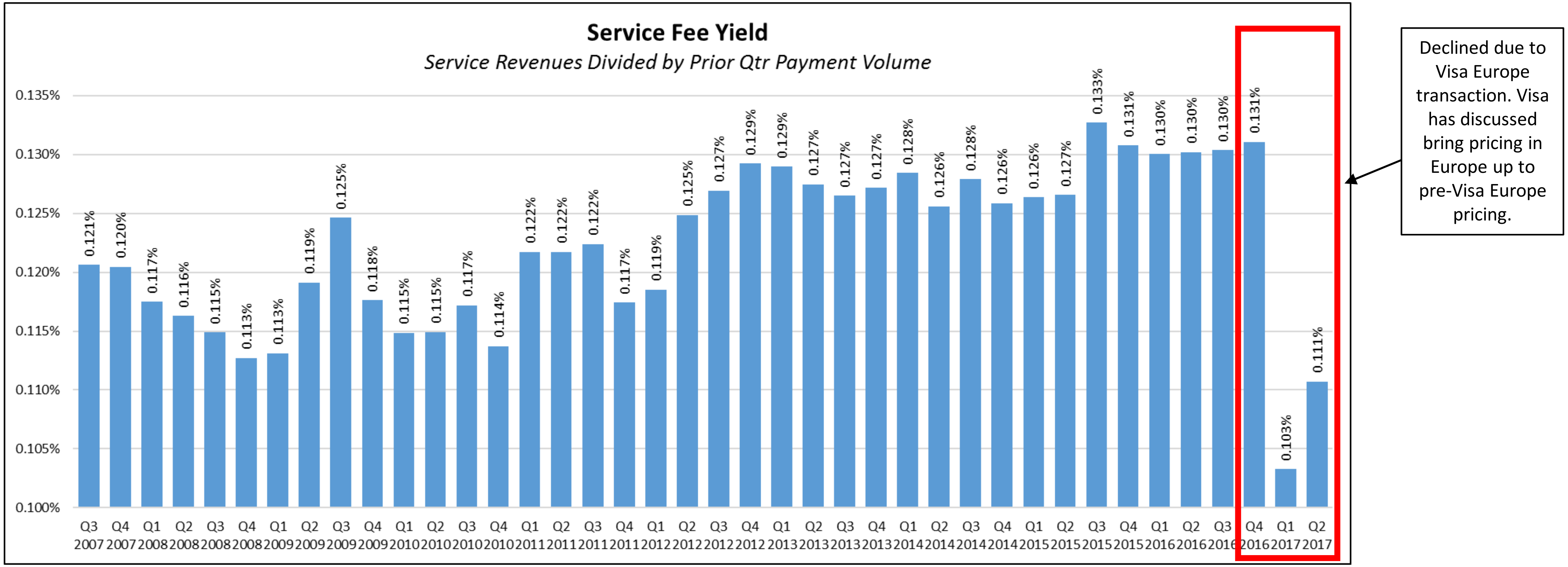
A reflection of payment volume, service yield % on that payment volume, debit/credit mix. As payment volume increases, service fee revenue will increase. Pricing and product mix will determine +/- from payment volume. Currently **0.11% per payment volume**, but should increase to 0.13%+ once Visa Europe re-prices.

A reflection of the transactions processed over Visa's network, whether it be debit, credit, or prepaid. It is a *fixed fee per transaction*, regardless of the payment volume size. Currently at **$0.07 per transaction**, but should increase to $0.08 once Visa Europe re-prices.

A reflection of the cross-border payment volume (see **blue** line below in chart), which correlates closely to international transaction revenue growth. Primary differences are FX-related. Revenues are derived by a consumer paying with a card where the merchant and issuer are not in the same geography, could be physical or e-commerce related.



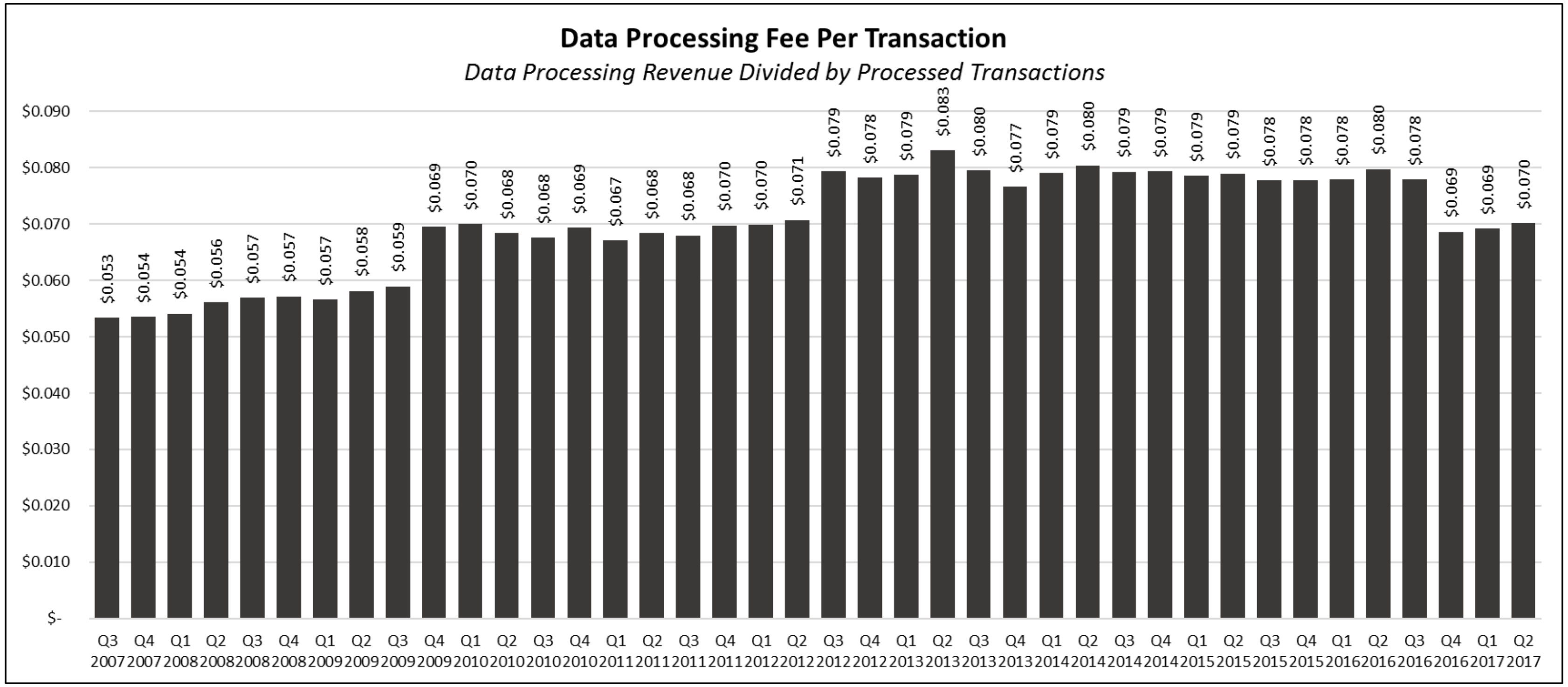
Important Metrics: Service Fee Yield



Service Fee Revenue:

- Represents about 35% of gross revenues
- A derivative of the payment volume used by Visa cardholders
- Visa takes a percentage of the payment volume; as volume increases, service fee revenue will increase (all things being equal on price, mix)

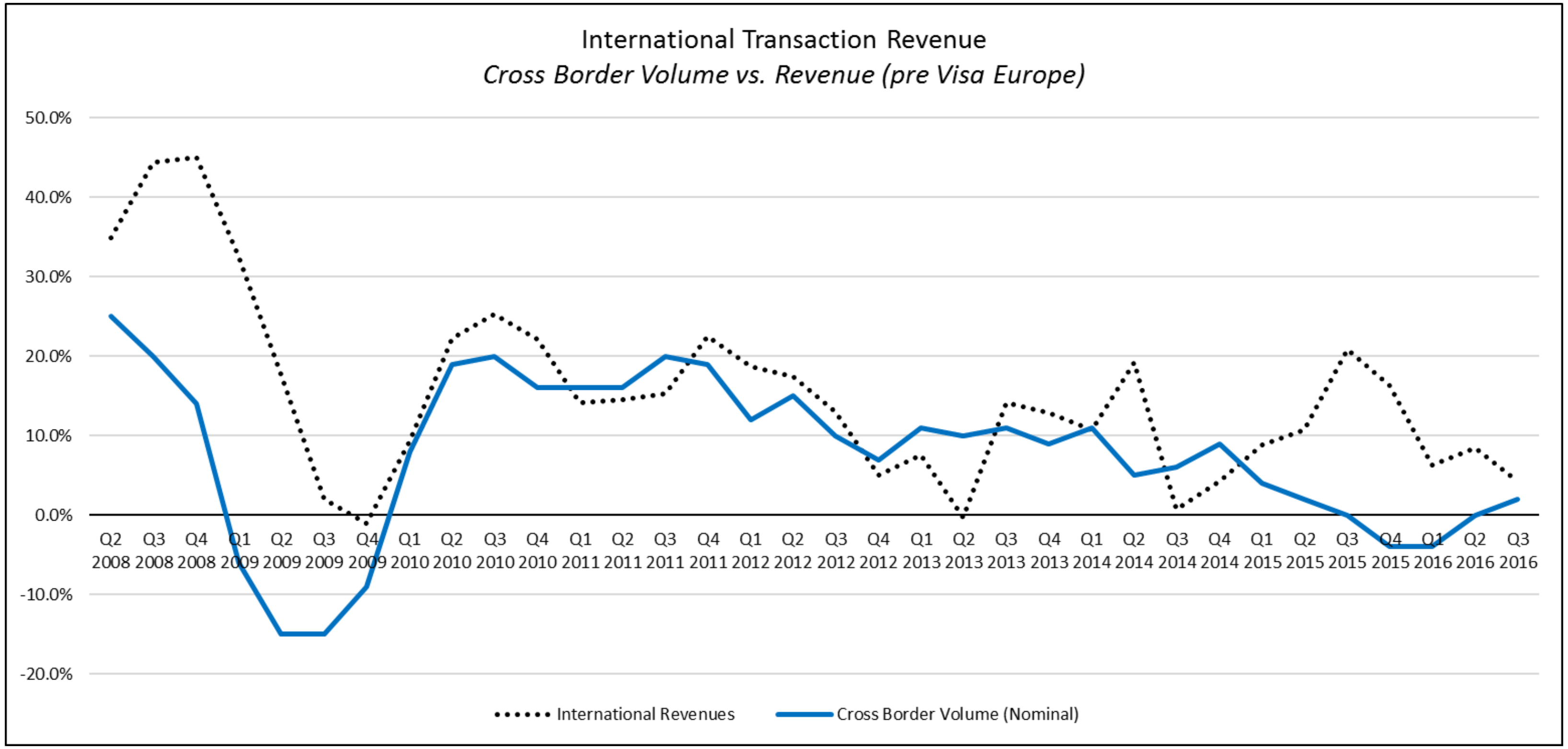
Important Metrics: Data Processing Fee



Data Processing Fee per Transaction:

- Represents about 35% of gross revenues
- A derivative of the amount of processed transactions through Visa's network
- Visa takes a fixed fee (~ $0.07) on the transaction, regardless of the payment volume

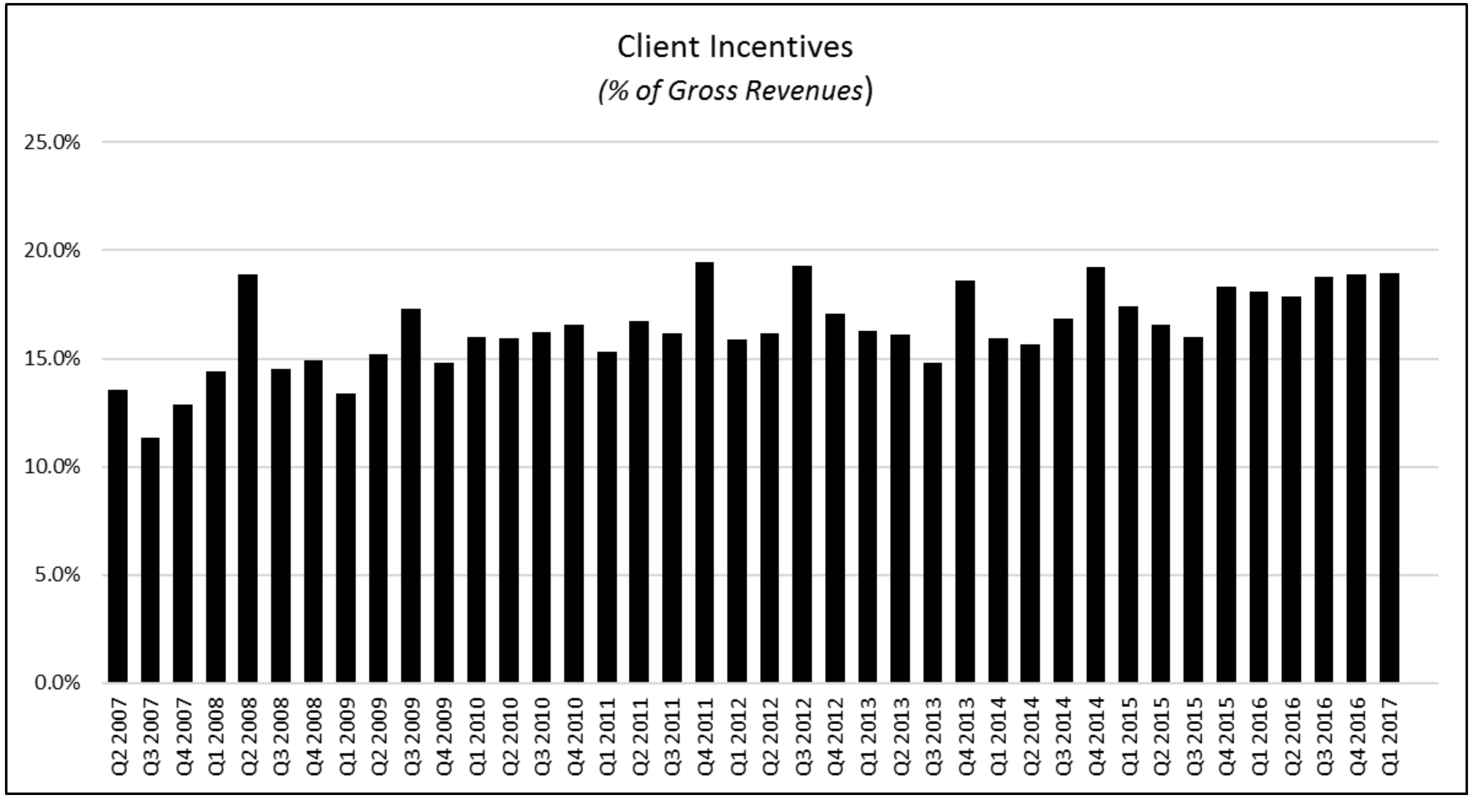
Important Metrics: Cross-Border



International Transaction Revenue:

- Represents about 25% of gross revenues
- By far the *highest* yielding product Visa has
- Earns about 10x the processing fee for cross-border transactions (est. ~ 100bps)

Important Metrics: Client Incentives



Client Incentives: (Expense)

- Represents about 18%+ of gross revenues
- Contra revenue, Visa subtracts incentive costs to get to “net revenues”
- Has been increasing due to competitiveness with issuers, co-branding, large merchant negotiations

Incentives

Visa CEO 3/11/10: On Comparing Visa and MasterCard incentives

- As it relates to their incentives, once again, I don't know how -- I don't know how they're structured. But from what I can garner from what Byron's told me, what I can garner from looking at their financial statements, **they do things very differently than we do**. And I think it is very problematic to compare what they pay versus what we pay**. I think that the better way to look at it is the net revenue**. Just because they do it one way, we do it another way, but it comes out on the net revenue. And I think, frankly, that's what Byron just said, which is whatever -- the incentives will be what they will be. But it's the net revenue that you're really looking at and that's what we're really concerned about. So, however we set up a contract with somebody, no matter how we do it, it's the bottom line, it's the net revenue line that we're managing to.

In other words – comparing incentive expenses for Visa and MasterCard isn't quite helpful due to how it is calculated

Byron Pollitt Visa Inc. – CFO

I think it is fair to say that competition is alive and well in this space and that you can't compete for a major account, if Visa is in one room and MasterCard is in the other. There is a very healthy competition between the two networks. Any large issuer knows that the winning bid is a function of the losing bid. So we are constantly put in competition with each other, and as a result there is always pressure on price.

And I think the other element to consider here as it relates to incentive is that it is difficult for these contracts to run very few or at three -- most are at four and five and six years, that pricing is set and an agreement is done with a portfolio at a given size. If a financial institution has been successful, they will have grown that portfolio over the preceding four or five years.

And it is customary in our business, not surprisingly that the more payment volume you bring to bear in a contract negotiation, the better pricing you get. And our industry has always operated on the basis that if you grow the pie, then everybody wins. The issuer wins with lower rates and they get to a lower rate through lower incentives. And because the pie grows, the networks operator processes more transactions and they make more.

And so it is as natural as the day is long that as accounts grow in size and grow in purchase volume that they get better rates. And there would be -- there would be a much more serious issue if rates -- if incentives didn't grow in size because it would basically say the industry is not healthy. And so incentive growth is con -- in our view, it's very consistent with the healthy growth in the business.

Credit Suisse, 12/01/2010

MasterCard vs. Visa: Winning Partnerships

Byron Pollitt Visa Inc. – CFO

So, we get a lot of questions about margin. I think the most important economic reality to realize here is that our pricing on large accounts, our pricing is completely a function of head-to-head competitive negotiation, primarily with MasterCard.

So when a client is negotiating -- when a client wants to establish a new contract, they typically put out an RFP. MasterCard and Visa are invited, and we do battle. For as long as I have been at Visa, this has been a hotly contested battle between the two companies. Our pricing is completely a function of market rates established in market competition.

So, the notion that a bank would turn around and say "just reduce your rates", that's not how it works. They hold a market competition, and that's how the rates are set.

I think it's also important to realize that we have a very high fixed-cost business. We have over 16,000 financial institutions that issue our cards. We make a little on a lot of transactions, and our ability to leverage a very large number of clients over a relatively fixed-cost base is what is generating these margins.

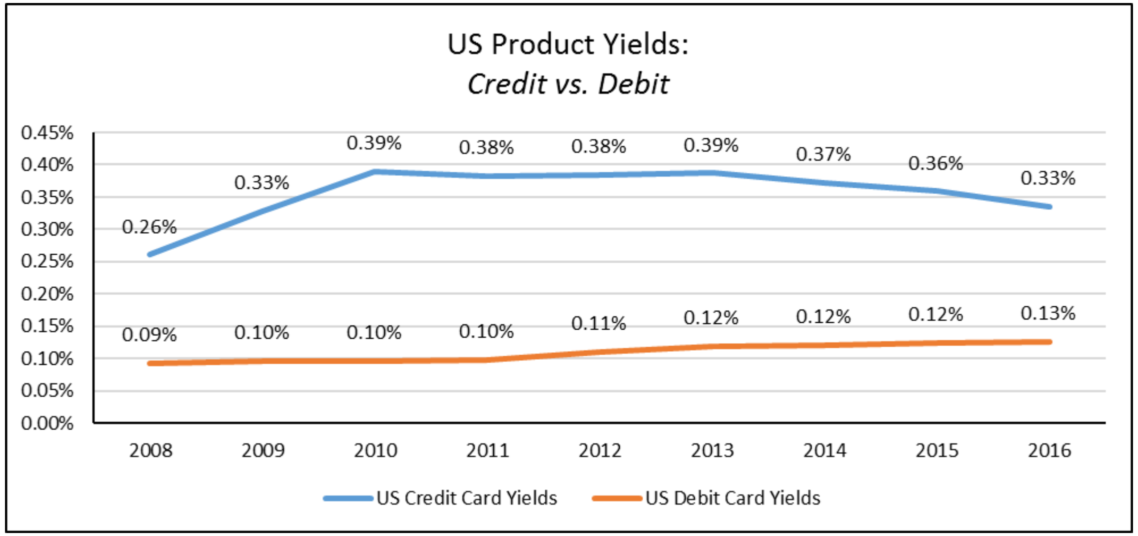
Having said that, we don't manage to margins. We are just about finished with our budgets for the year to come, because we are a September-ending fiscal year. We don't set margin targets. Margins are an outcome, because we are an MPV-driven company is fully prepared to invest in order to drive shareholder return the old-fashioned way, which is good returns for the risk incurred. So margins become an outcome. If they go down but shareholder value goes up, then that's how it is supposed to work.

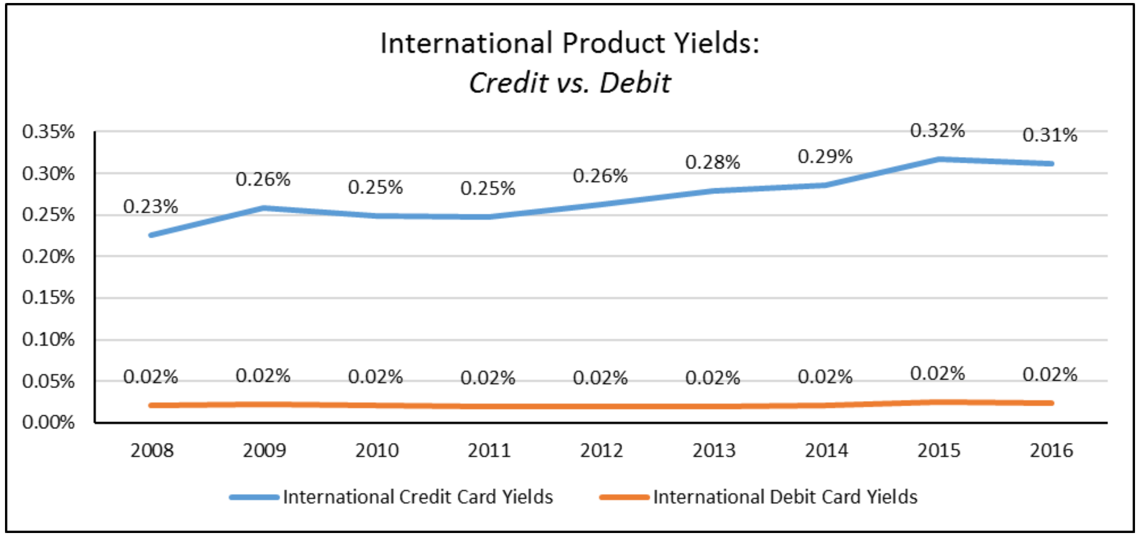
So, to repeat, margins are an outcome. We don't defend them. We just make sure they are supported with strong returns on capital.

From 9/14/2010 at Barclay's

Yields per Product/ Geography (*estimated*)

Based on this commentary:
- 20% net revenues are debit (2010)
- 16% net revenues are US debit (2010)
- 2% of net revenues are PIN US debit (2010)
- 40% of transactions in US debit are PIN
- 60% of transactions in US debit are signature
- Yields are based on "total volume" and not payment volume





US product yields:
- Credit revenue yields are ~3-4x higher than debit
- Visa started moving some PIN debit volume to Signature post-Durbin, which improved the debit yields
- Debit takes ~3x transactions to = 1 credit transaction, so $100 spent on debit or credit roughly has the same overall economics

International product yields:
- Credit revenue yields are substantially higher than debit
- International credit yields are similar to US credit currently

Visa: *The Good*

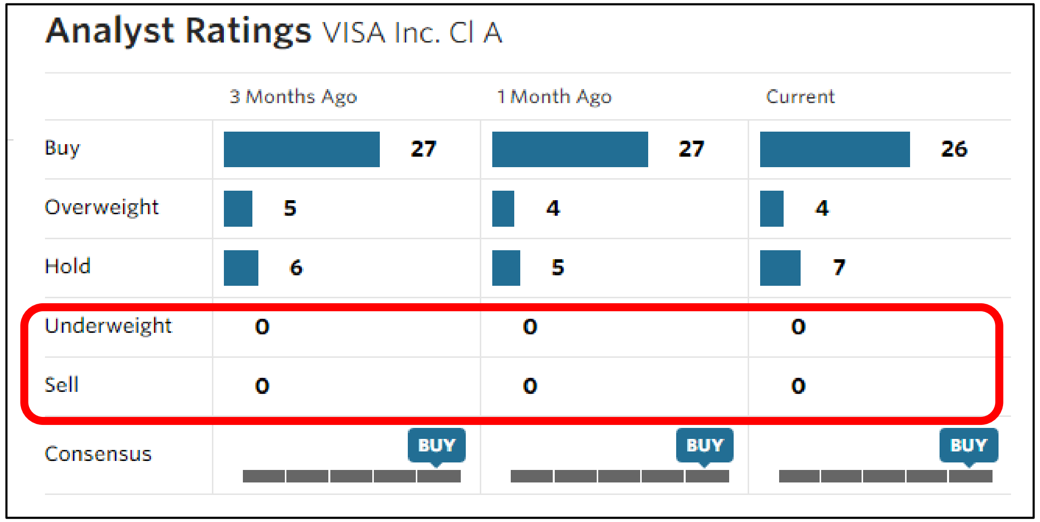
- Geographical benefits by being a global company
  - Not entirely dependent on just the US, where they generate about half of their revenues
  - Different markets are in different stages, in terms of growth, credit/debit mix, and card penetration
  - International market expected to have higher growth rates in the next 5-10 years over the U.S.
- Conservative balance sheet, with only ~ $3.8 billion of net debt (as of March 2017) which is *1.2x* Debt-LTM EBITDA
- Cost structure benefit of scale
  - Operating expenses have grown only 0.3% since 2008, and 6.7% since 2011, trailing the 5 year revenue CAGR of 10.4%
  - Marketing and Professional Fee Expenses are essentially “fixed”, and they make up about 20% of the total expenses for Visa
  - Only G&A grows in relative unison with operating revenues, which is about 10-15% of their net cost structure
- Visa Europe
  - Revenue synergies: increased pricing to more align with core Visa Inc. as well as MA’s pricing in Europe
  - Cost synergies, estimated to be ~ $200m/ yr.
  - Increased reinvestment in the brand, and innovation, should improve relationships with all parties involved in Europe
  - More cross-border revenue capture, as outbound travel to Europe was captured by Visa Europe, not Visa Inc.
- Largest payments player in the industry, based on all metrics
- Global acceptance creates virtuous cycle
  - Chicken and egg concept
  - Merchants will accept if customers continue to request paying with it
  - Customers will want to pay with it if they trust the brand and security of the transaction, know merchants will accept it, transaction is seamless
  - Issuers want to partner with Visa as it helps their bank customers: stickiness in bank model, increased revenue through interchange/ net interest income

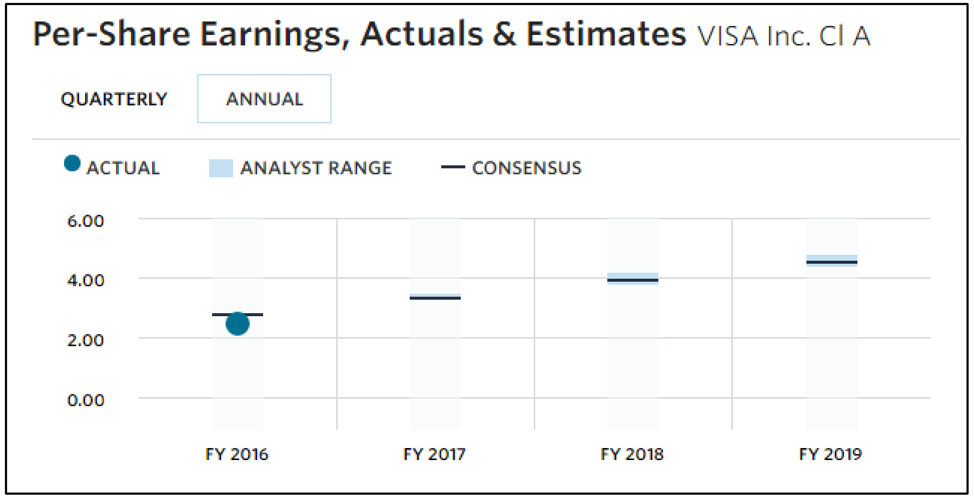
Visa: *The Good*

- Less cyclical than American Express, Discover, Capitol One
- Multiple product offering differentiate from some competitors, keeps Visa “top of the wallet” (top of the mind for card usage)
- No credit risk
- Plenty of competition throughout the space, but Visa and MasterCard are beneficiaries of it
  - Amazon and Costco competing on rewards cards, yet both have partnered with Visa
  - Chase Sapphire competing with American Express Platinum card, and Visa is partnered with Chase
  - Retailers pushing to increase e-commerce presence, which increases card penetration
  - Merchants recognize the necessity of accepting cards but want better terms, negatively impacting AXP with the larger merchants
- “inflation-proof” model
  - Minimal capital cost needs
  - Revenues grow in line with transaction volume, a function of economic growth
- Capital light, high margin business model leads to excess free cash flow, where Visa pays out essentially 100% of FCFE in the form of a dividend and share repurchase program
- Secular tailwinds
  - Mobile growth = more card penetration
  - E-commerce growing faster than physical retail = increased card penetration, more transactions
  - Global card penetration over cash/check
  - Improved global infrastructure, resulting in more smartphone/broadband usage, which will help e-commerce and thus more card penetration

Visa: *The Risks*

- Very consensus "long"(30 analysts out of 37 rate as "buy", zero "sell")
- Analyst expectations for growth are achievable, but high
- Early on in the Europe IFRS regulation on credit and debit interchange fees
- Cross border (~25% gross revenues) are very high margin, but excessive fees. Regulation? Competition?
- China opportunity likely many years away, and overblown
- India opportunity likely overblown, and transaction volume is low (low yielding market)
- Company rarely trades at "value investor" multiples
  - Investor base seems to be growth-oriented, long-term focused investors that seek our high quality businesses
  - Many investors seem to like the business but are afraid to purchase at "expensive valuations"
- Client incentives have been increasing faster than gross revenues, as Visa looks to continue to win business from issuers and large merchants
- If secular growth slows, potential for MasterCard, issuers, merchant competition to increase, putting pressure on their economics





Visa: *The Risks*

- Domestic card schemes, similar to RuPay (India), CUP (China), France, Mexico, and other countries
  - These domestic card networks are far lower cost than Visa/ MasterCard
  - But the security, fraud, and data analytics are inferior to V/ MA
- Pressure on interchange => increases pressure on the merchant discount rate => increases pressure on V/MA fees
- Credit Card regulation in the U.S. would create issues
- What are JP Morgan Chase's true intentions with ChaseNet, Curren-C?
- Blockchain unknowns?
- Lawsuits with larger merchants who want to use PIN debit, but Visa is pushing for more signature debit (higher yielding product)

Cross-Border Fees: *At Risk?*

- The cross-border fees are excessive
- The highest yielding product that Visa has
- Example (right) is where UK merchants sued Visa for overcharging cross-border interchange rates
- Visa settled a case with the European Commission in 2010, agreeing to a 30% reduction on the fees they charged on domestic and cross-border debit transactions, but Visa still responsible for any lawsuits
- Visa still has at least 24 other claims in the UK court over cross border debit interchange fees
- MasterCard was also sued in the UK over the same debit cross-border interchange; MA won January 2017, where the judge ruled the fees were below the maximum allowed, they are not anti-competitive, and the costs are of necessity for MA to run their business

03.01.17

Visa Settles with U.K. Retailers in Interchange Lawsuit

The war between payments networks and retailers regarding interchange might not be over, but one battle was averted. Visa Inc. has settled a lawsuit with all but one of the U.K. retailers that were seeking £500 million (US$627 million) in antitrust damages stemming from the payments network allegedly overcharging for cross-border interchange.

The 13 retailers in the Feb. 16 settlement included Arcadia Group Brands Ltd., Asda Stores Ltd., B&Q PLC, Comet Group Ltd., Debenhams Retail PLC, House of Fraser Ltd., Iceland Foods Ltd., New Look Retailers Ltd., Next Retailers Ltd., Record 2 Shop Ltd., WM Morrison Supermarkets PLC, Argos Ltd., and Marks and Spencer PLC. Sainsbury's Supermarkets Ltd., listed as one of the plaintiffs, didn't settle with Visa, according to *Law360*, and a 15th retailer, Tesco PLC, settled with Visa in November before the High Court trial began. Two retailers confirmed a settlement had been reached with Visa, but told *Law360* the terms of the deal were confidential.

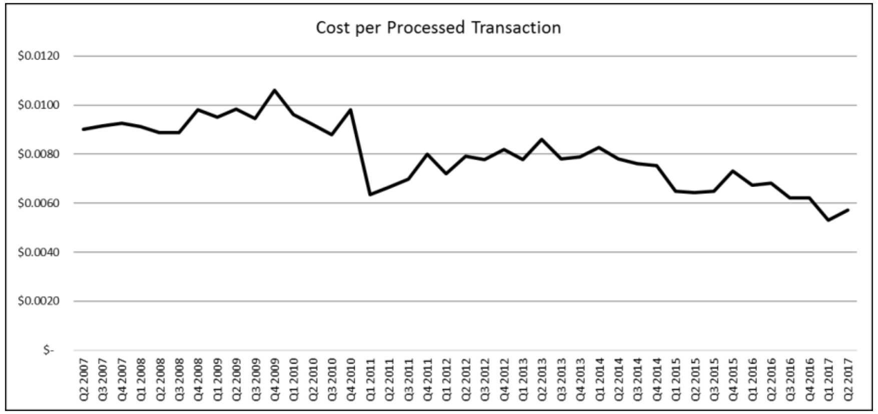
US Merchant Lawsuits: PIN vs. Signature

- On-going lawsuits between the card networks and the merchants
- Wal-Mart and Kroger both sued Visa in 2015
- Visa wants retailers to install upgraded terminals to accept chip technology, rather than just the magnetic stripe
- Chip-enabled cards are considered safer than traditional type, and the issuers want the retailers to adopt these new terminals, and Visa is enforcing by indemnifying the issuers in case of fraud if the merchant doesn't adopt the new POS systems
- Kroger and WMT sued after Visa informed them the configuration of the new terminals didn't comply with Visa's rules
- WMT and Kroger want their customers to verify debit-purchases via PIN (far lower cost to merchants) versus Signature (higher cost for merchants)
- Visa's rules require merchants to allow customers to choose between a PIN and signature verification; WMT/ Kroger believes this would increase costs substantially due to the higher fees for signature authentication
- Both Kroger and Wal-Mart say PIN-debit is more secure than signature, which studies have shown to be true in most cases
- PIN transactions are also cheaper due to Durbin rules, where the merchant has a choice of routing the transaction among a number of competing networks
- In 2015, Kroger said they rang up $29 billion in Visa debit card transactions and the lawsuit that cutting off its ability to accept Visa debit cards "threatened catastrophic consequences for Kroger's business."

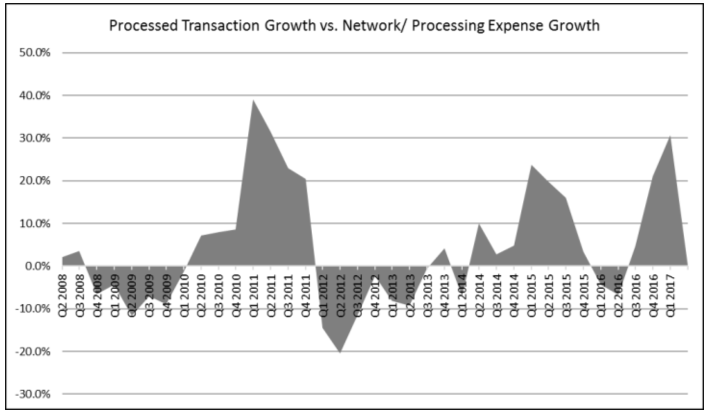
Catalysts for Visa Inc.

- PayPal is no longer viewed as a competitor due to their partnerships, which are beneficial to both
- Visa Europe:
  - Synergies, possibly higher than normal on both cost and revenue
  - Improvements in business have positive response from Euro issuers, merchants
  - Potential to take market share due to innovation, improvements
- FX has been a headwind on volume; most recent Qtr was first time FX wasn't a headwind since 2011
- Cross-border revenues improving
- Processed transactions, on a normalized basis (excluding recent Europe additions that skew the growth rates) are accelerating from 8-9% in late 2015/ early 2016 to 12-13%
- Durbin Amendment gets repealed, and thus debit yield improve (I don't see this as likely to happen, for what it's worth)
- Any lawsuits in Europe reduces the Preferred Shares equity value, "Assuming sufficient collateral is available to pay all claims, this indemnification will fully offset any litigation expense flowing through Visa Inc.'s earnings with respect to the claims covered."
- Visa Europe indemnified from lawsuits across Europe
- Visa Europe indemnified from lawsuits in UK, signed by the largest 11 UK members, for up to €2.5 billion related to UK domestic interchange fees

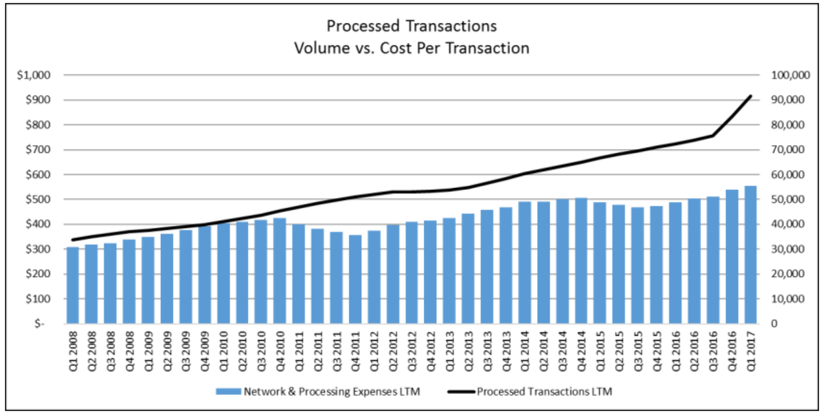
Scale + Strong Business Model



Due to the minimal incremental costs to process each transaction, as more volume flow through Visa's network, the lower the cost-per-processed transaction. Currently it costs about $0.006 per processed transaction.



The chart above illustrates the delta between processed transaction growth and the expense growth for network and processing. When the chart is > 0%, processed transaction growth exceed the cost growth to process those transactions.



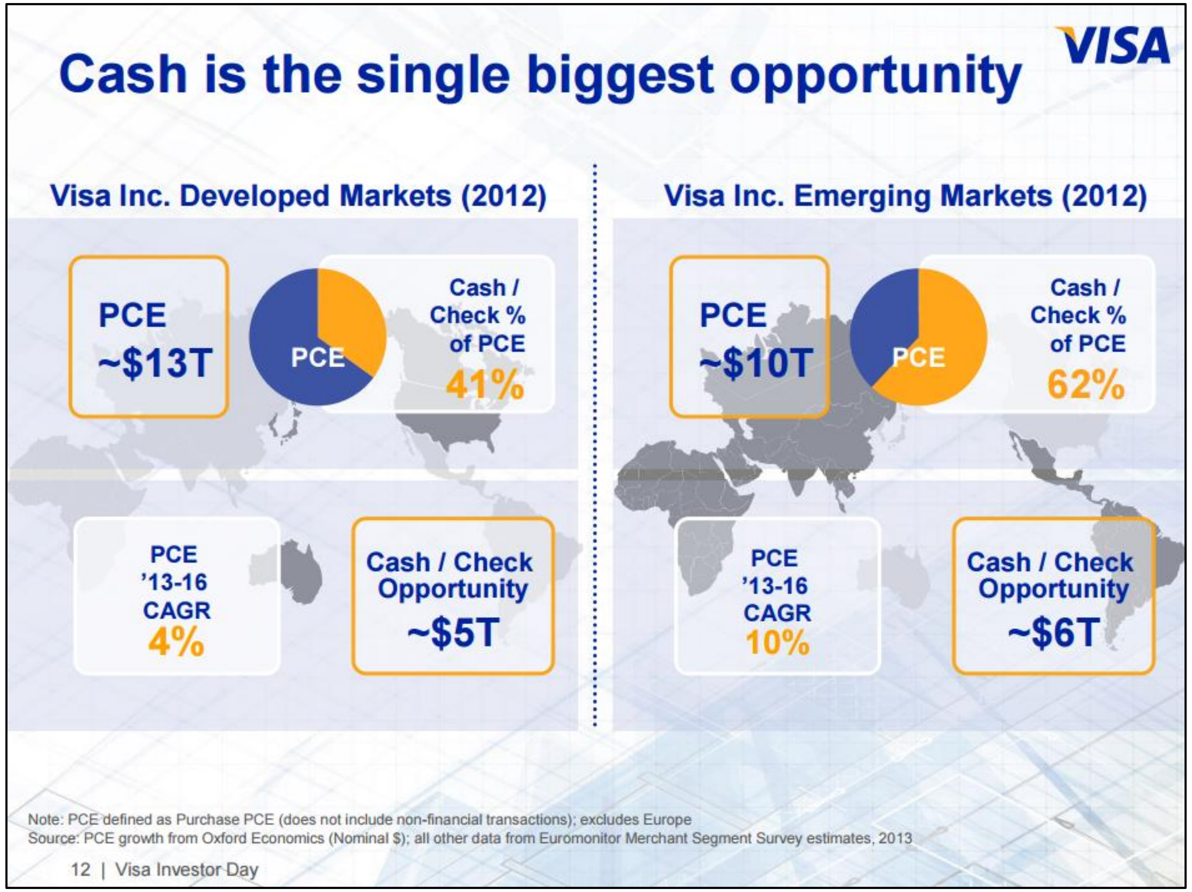
Prior to Visa Europe, processed transactions grew at a 8.8% CAGR but the costs to process those transaction only grew at a 5.4% CAGR.

Overview: Secular Growth (Card Penetration)

- Chart from 2013 Investor Day, which still holds true today "cash is the single biggest opportunity"

Visa CFO from 9/9/2008:

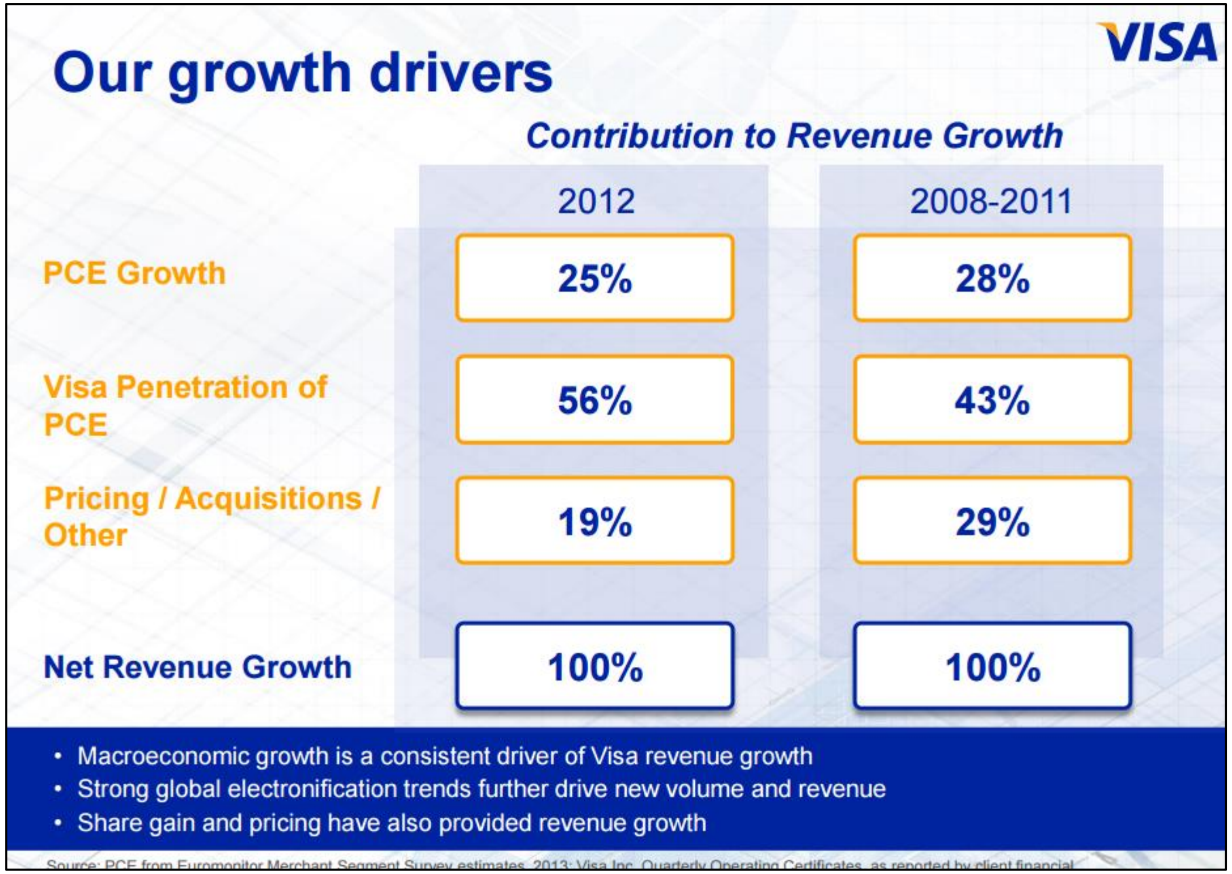
- If you fast-forward to 2007, PCE has grown to $21 trillion, Visa's share has grown to 15%. But what is interesting is to focus on cash and check. Cash and check six years previous was 74% of the mix; today, or in 2007, the mix has dropped to 57%, a significant loss in the total share. But the absolute amount of cash and check has increased. It's gone from $10 trillion to $12 trillion. And this is perhaps the best example of what kind of growth runway we have. When we look and talk about who is our chief competitor, it's cash and check. It's the disintermediation of cash and check on a global basis. And even though the mix is shrinking the pie that we are targeting, it's continuing to grow. **An interesting metric, for every 1% of additional PCE penetration that Visa captures, it's an additional $500 million in net revenue. So, Visa is growing at twice the rate of PCE.**



2013 Investor Day Presentation

Overview: Growth Drivers

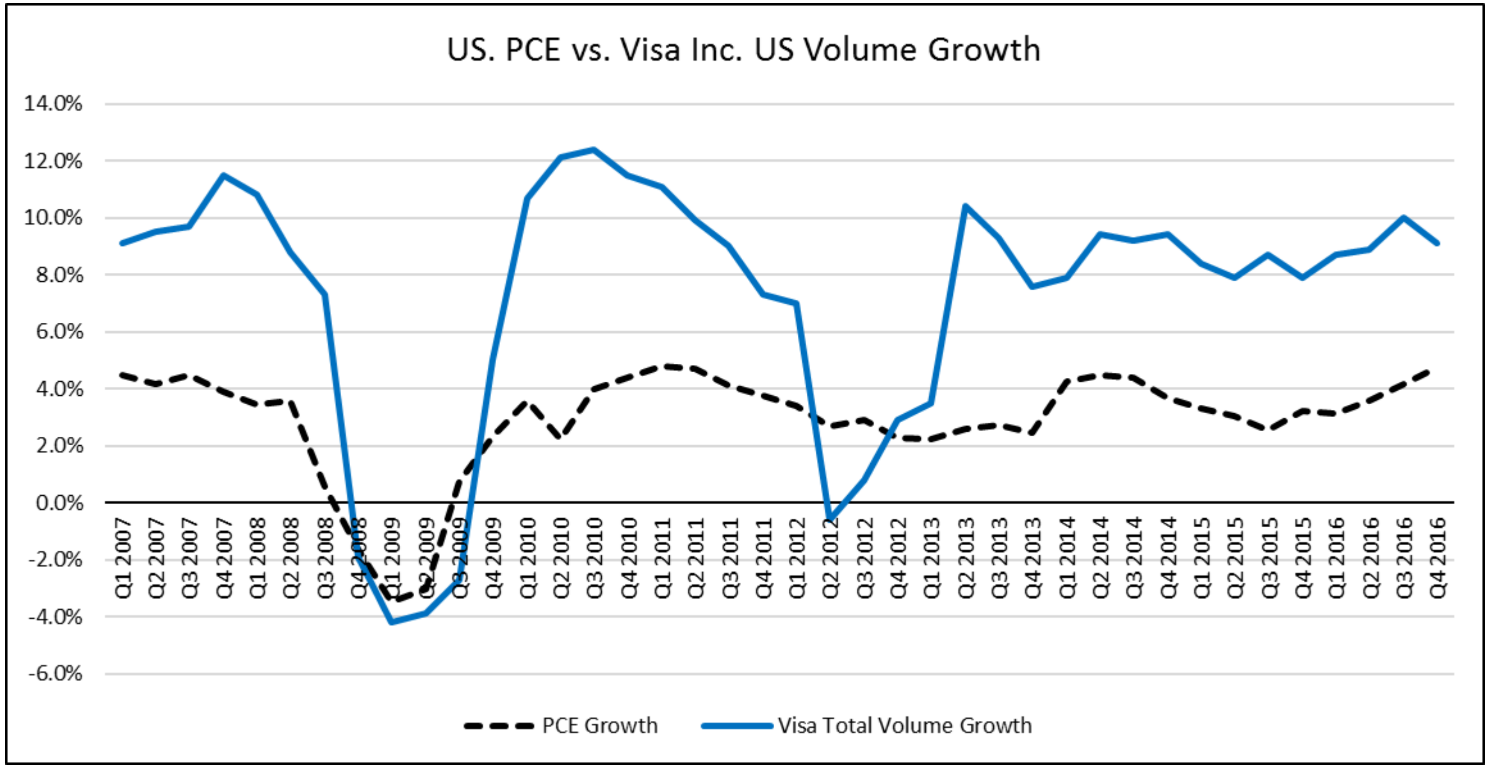
- Chart from 2013 illustrates the different growth drivers for Visa
  - Macro (“PCE Growth”) accounts for about 25% of their revenue growth
  - About 50% of their revenue growth is tied to the actual penetration Visa has, which is largely card penetration over cash/check in payment transactions (“Secular”)
  - The remaining 20-25% is from pricing, acquisitions, or mix of product usage
- Reasonable to think that if card penetration came to a complete halt, Visa could still grow revenues mid-single digits (all things being equal) based on PCE growth + pricing



2013 Investor Day Presentation, slide 11

United States: *PCE vs. Visa Volume*

- US PCE has grown 2-4% since 2009
- Visa's U.S. volume has grown 8-10% over that same time period
  - Increased card penetration in the US
  - Resilient business model of offering both credit and debit products
  - Market share gains from some competitors (except MA)
  - Market share gains from cash/check
  - Winning partnership agreements with large merchants and large card issuers



@Find_Me_Value

Income Statement: **Revenues**

Service Revenues	~$6.7B	Earned for services provided in support of client usage of Visa products.
+	+	
Data Processing Revenues	~$6.3B	Earned for authorization, clearing, settlement, network access and other maintenance and support services that facilitate transaction and information processing among our clients globally.
+	+	
International Transaction Revenues	~$4.6B	Earned for cross-border transaction processing and currency conversion activities.
+	+	
Other Revenues	~$800M	Includes license fees for use of the Visa brand, revenues earned from Visa Europe prior to the completion of the Visa Europe acquisition, fees for account holder services, certification, licensing and other activities related to our acquired entities.
=	=	
GROSS REVENUE	~$18.5B	
−	−	
Client Incentives	~$3.4B	Paid to financial institution clients, merchants and strategic partners to build payments volume, increase Visa product acceptance, win merchant routing transactions over our network and drive innovation.

	For the Years Ended September 30,		
	2016 [1]	2015	2014
	(in millions, except per share data)		
Operating Revenues			
Service revenues	$ 6,747	$ 6,302	$ 5,797
Data processing revenues	6,272	5,552	5,167
International transaction revenues	4,649	4,064	3,560
Other revenues	823	823	770
Client incentives	(3,409)	(2,861)	(2,592)
Net operating revenues	15,082	13,880	12,702

	CAGR (Prior to Visa Europe)		
	3 Yr	5 Yr	8 Yr
Operating Revenues			
Service Revenues	*8.0%*	*9.6%*	*10.4%*
Data Processing Revenues	*10.6%*	*12.5%*	*14.8%*
International Transaction Revenues	*12.2%*	*11.7%*	*13.2%*
Other Revenues	*4.8%*	*4.7%*	*4.7%*
Client Incentives	*13.7%*	*12.6%*	*14.4%*
Total Operating Revenues	*8.6%*	*10.4%*	*11.6%*

Income Statement: **Expenses**

- Personnel
  - Increased in 2016 by $110m due to severances in Europe ($72m post-tax)
  - Salaries, employee benefits, incentive compensation, share based compensation, severance charge
  - Has doubled since from 2007-2016
- Marketing
  - Advertising, marketing campaigns, sponsorships
  - Have remained essentially flat since the IPO in 2008, around $800 - $900m/ year run rate
- Network and processing
  - Operating the processing network, including the maintaining of equipment, and other data processing services
- Professional Fees
  - Fees for consulting, legal and other professional services
  - Around $300 - $350m/ year run-rate (2016 elevated by $60m from Visa Europe one time)
- G&A
  - Transaction costs related to certain items, including Visa Europe, product enhancements, travel, FX gains and losses, corporate expenses
  - Has doubled from 2007 – 2016 (excl. Visa Europe $92m UK one time)

Operating Expenses			
Personnel	**2,226**	2,079	1,875
Marketing	**869**	872	900
Network and processing	**538**	474	507
Professional fees	**389**	336	328
Depreciation and amortization	**502**	494	435
General and administrative	**796**	547	507
Litigation provision (Note 20)	**2**	14	453
Visa Europe Framework Agreement loss (Note 2)	**1,877**	—	—
Total operating expenses	**7,199**	4,816	5,005

Operating Expense			
Personnel	4.8%	8.8%	8.0%
Marketing	-0.3%	0.0%	-1.9%
Network and Processing	4.8%	8.5%	5.9%
Professional Fees	-1.9%	2.9%	-1.5%
Depreciation and Amortization	8.1%	11.8%	9.8%
General and Administrative	20.8%	14.0%	11.6%
Litigation Provision	-12.6%	-22.2%	-56.2%
Visa Europe Framework Agreement Loss			
Total Operating Expenses	16.6%	14.0%	4.6%

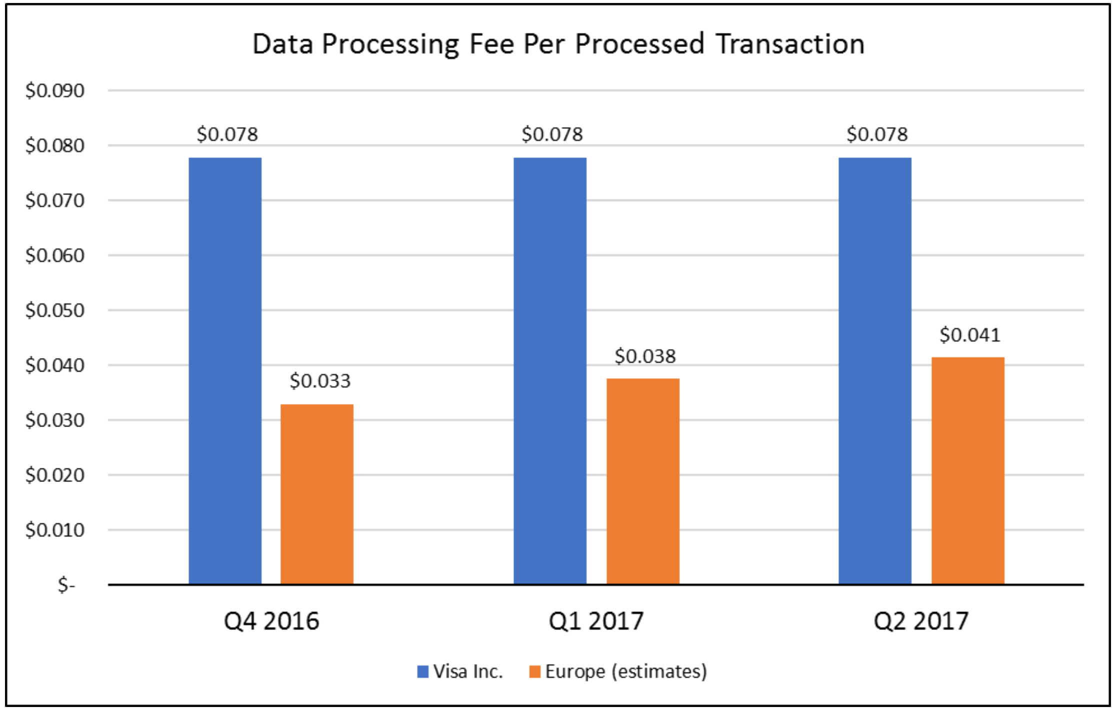
Balance Sheet

- Restricted cash: sole purpose is for making payments related to US covered litigation matters/ lawsuits
- Visa had about $8.4 billion in undistributed earnings held outside of the U.S., of the total $13 billion in cash and investment securities
- Settlement Receivable: through course of business, some funds not settled within same day, remain outstanding for one to two business days (due to and from clients)
- Litigation: a charge is recorded when loss is deemed to be probably and reasonably estimated

	September 30, 2016	September 30, 2015
	(in millions, except par value data)	
Assets		
Cash and cash equivalents	$ 5,619	$ 3,518
Restricted cash—U.S. litigation escrow (Note 3)	1,027	1,072
Investment securities (Note 4):		
Trading	71	66
Available-for-sale	3,248	2,431
Settlement receivable	1,467	408
Accounts receivable	1,041	847
Customer collateral (Note 11)	1,001	1,023
Current portion of client incentives	284	303
Prepaid expenses and other current assets (Note 5)	555	353
Total current assets	14,313	10,021
Investment securities, available-for-sale (Note 4)	3,931	3,384
Client incentives	448	110
Property, equipment and technology, net (Note 6)	2,150	1,888
Other assets (Note 5)	893	778
Intangible assets, net (Note 7)	27,234	11,361
Goodwill	15,066	11,825
Total assets	$ 64,035	$ 39,367
Liabilities		
Accounts payable	$ 203	$ 127
Settlement payable	2,084	780
Customer collateral (Note 11)	1,001	1,023
Accrued compensation and benefits	673	503
Client incentives	1,976	1,049
Accrued liabilities (Note 8)	1,128	849
Accrued litigation (Note 20)	981	1,024
Total current liabilities	8,046	5,355
Long-term debt (Note 9)	15,882	—
Deferred tax liabilities (Note 19)	4,808	3,273
Deferred purchase consideration (Note 2)	1,225	—
Other liabilities (Note 8)	1,162	897
Total liabilities	31,123	9,525

Visa Europe

- Owned by 3,000 banks from 38 different countries, prior to selling to Visa Inc.
- Acquired
- Changes since acquisition:
- Company has notified customers that rebates will be canceled as of fiscal 2017
- Moving to a commercial incentive structure
- Working on bringing Visa Inc's programs – Visa Checkout, Visa Token Service, consulting – to Europe business
- Pricing improvements as net yields were around 7-8 bps in Europe, and MasterCard was in the 15-20 bps range in Europe ("high teens")
- Running it as a for-profit entity, whereas prior it was just an association owned by banks
- Initial acquisition pricing looks expensive
  - $23.3 billion in USD all-in, including initial upfront consideration + earn-out + interest
  - 2014 revenues of €1.298 billion = 16.3x revenues
  - 2014 EBIT of €343 million = 61.8x EBIT
- Cost synergies + leveraging scale + pricing improvements
  - Cost synergies of ~ $200m pre-tax by 2020
  - If Visa Europe had Visa Inc. operating margins, would add an additional €525 million
  - If data processing fees per transaction were similar to Visa Inc., Visa Europe would have ~ $225 million in revenue (based on



Visa Europe: Transaction Overview

Transaction Overview

Visa Inc. announces a definitive agreement to acquire Visa Europe from European member banks

Purchase Price	• €16.5B upfront consideration consisting of cash and preferred stock • Up to €4.0B earn-out and €0.7B in interest on earn-out
Upfront Consideration	• €11.5B cash • Preferred Stock convertible into class A common shares valued at ~€5.0B (“Preferred Stock”)*
Earn-out	• Based on achievement of net revenue targets during the 16 quarters following close • Payable following the 4th anniversary of close (up to €4.0B) • Interest compounded annually at a rate of 4% (up to €0.7B)
Financing	• $15B to $16B in senior unsecured debt expected to be raised prior to closing • Fund upfront cash consideration • Offset effect of issuance of preferred stock with increased stock buybacks in FY16 and FY17
Leverage	• Leverage at close of 1.4x-1.5x gross / 0.3x net debt to EBITDA • Long term target of 1.1x-1.5x gross debt to EBITDA • Expect to maintain current investment credit ratings (A+ / A1)
Approvals	• Subject to customary closing conditions and regulatory approvals • Visa Inc. and Visa Europe shareholder vote not required
Expected Closing	• Not before April 1, 2016, unless both parties consent • Put option has been amended to reflect agreed-upon purchase price and timing

* At the initial conversion rate, the shares of Visa Inc. preferred stock issued in the transaction will be convertible into an aggregate of 78,654,400 shares of Class A common stock, valued at approximately €5.0 billion based on the average trading price of the Class A common stock of $71.68, and the average Euro/Dollar exchange rate of 1.12750, each for the 30 trading days ended October 19, 2015.

3

VISA

Visa Europe

Transaction Rationale

Strategically Important – *for Visa Europe*

- Provides direct access to industry-leading products, services, capital and talent
  - Technology and marketing investments
  - Fraud and risk solutions
  - Insights and analytics platform
  - State of the art security protecting VisaNet
- Prioritizes Europe in the allocation of Visa resources
- Delivers strong set of digital capabilities to European clients

Strategically Important – *for Visa Inc.*

- Creates a truly integrated global leader
- Capitalizes on strong growth opportunities in a highly attractive region
- Creates substantial value through revenue opportunities and cost savings
  - Utilizes Visa Inc. operational experience of transitioning to a commercial model
  - Ability to execute builds on strength of historical business relationship
- Enables Visa to serve global clients and digital commerce seamlessly

Financially Compelling

- Balanced consideration consisting of a mix of cash, stock and an earn-out
- Expected to be accretive to VI's stand-alone revenue and EPS growth before one time integration costs beginning in FY17 (first full year)
- Establishes a long-term capital structure and takes advantage of historically low interest rates
- Preferred shares offer current VE members a continuing ownership stake in Visa Inc.
- Legal liability protection through preferred share structure and loss sharing agreement with key UK banks
- Earn-out provides additional upside potential for both parties if net revenue targets are achieved

Visa Europe

Payment Volume:
- $3 trillion by cards
- $3.3 trillion in cash and check *still*

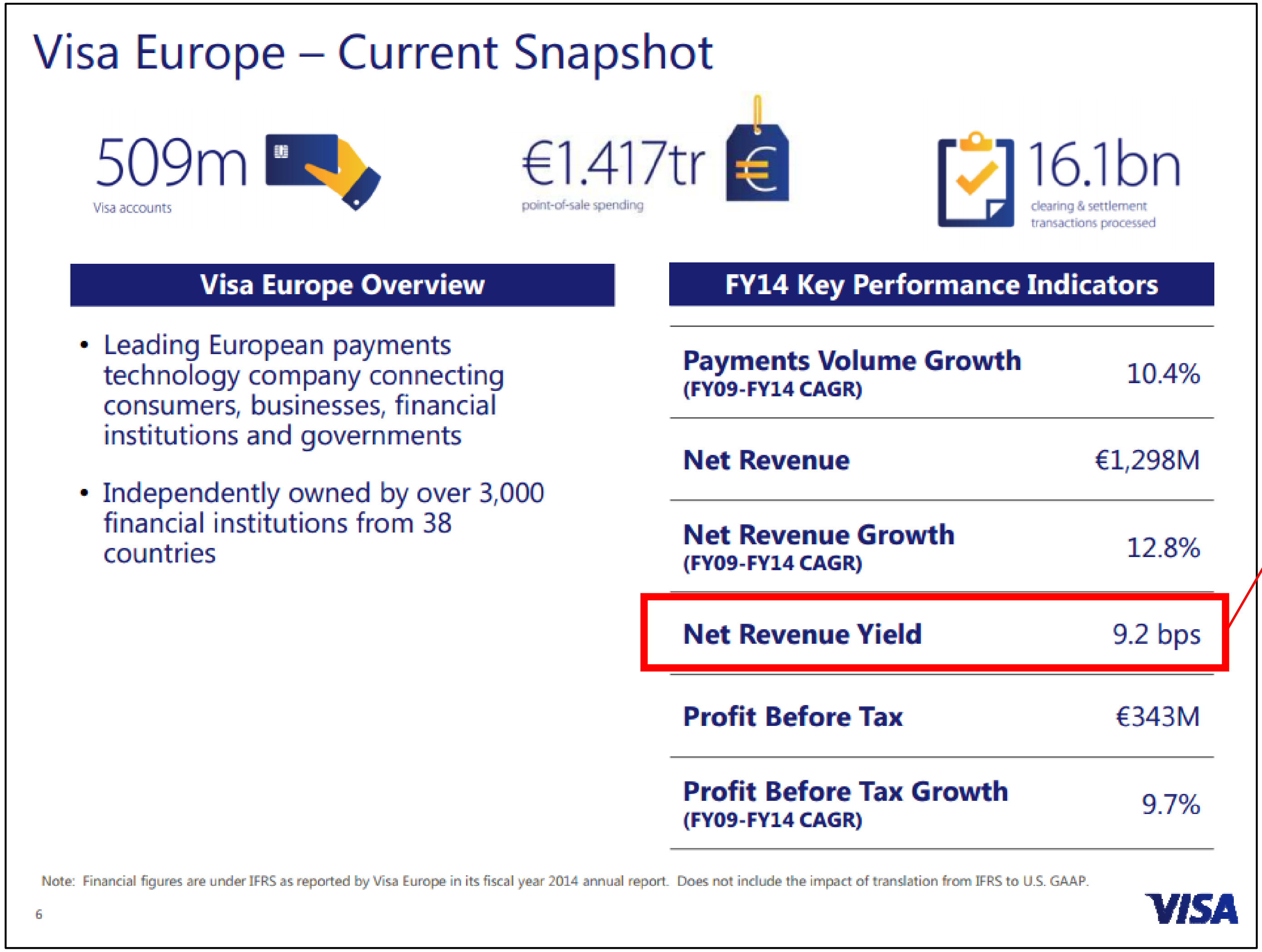
Attractive Growth Opportunity

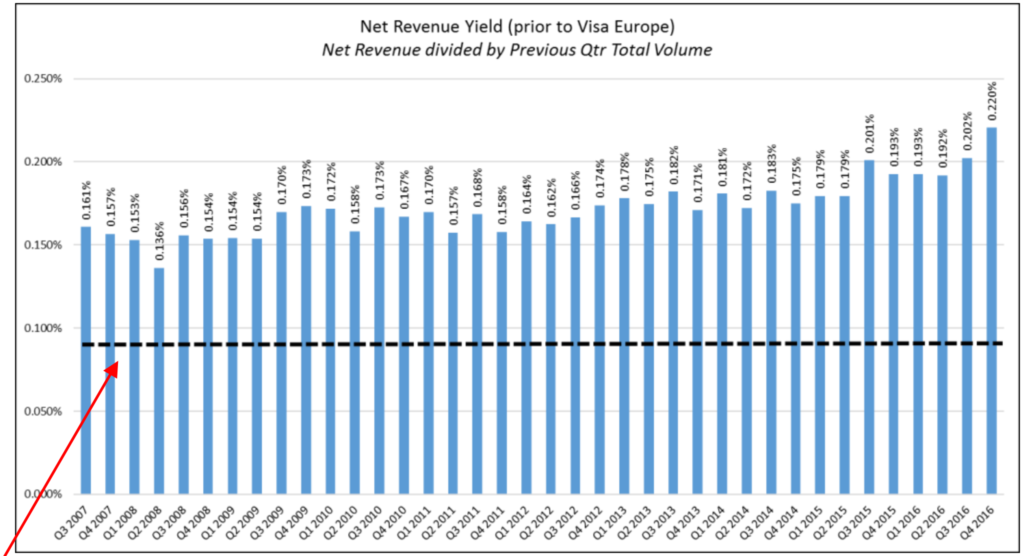
European Payments Landscape

- Territory includes 38 countries with over $3 trillion total card industry payments volume in aggregate
- Cash and check represent a $3.3 trillion growth opportunity
- Strong growth in payments even in challenging economic environment
- Diverse mix of developing and developed payment environments
- Country payment growth rates between low-single digits and high-teens

VE's Geographic Footprint

Visa Europe





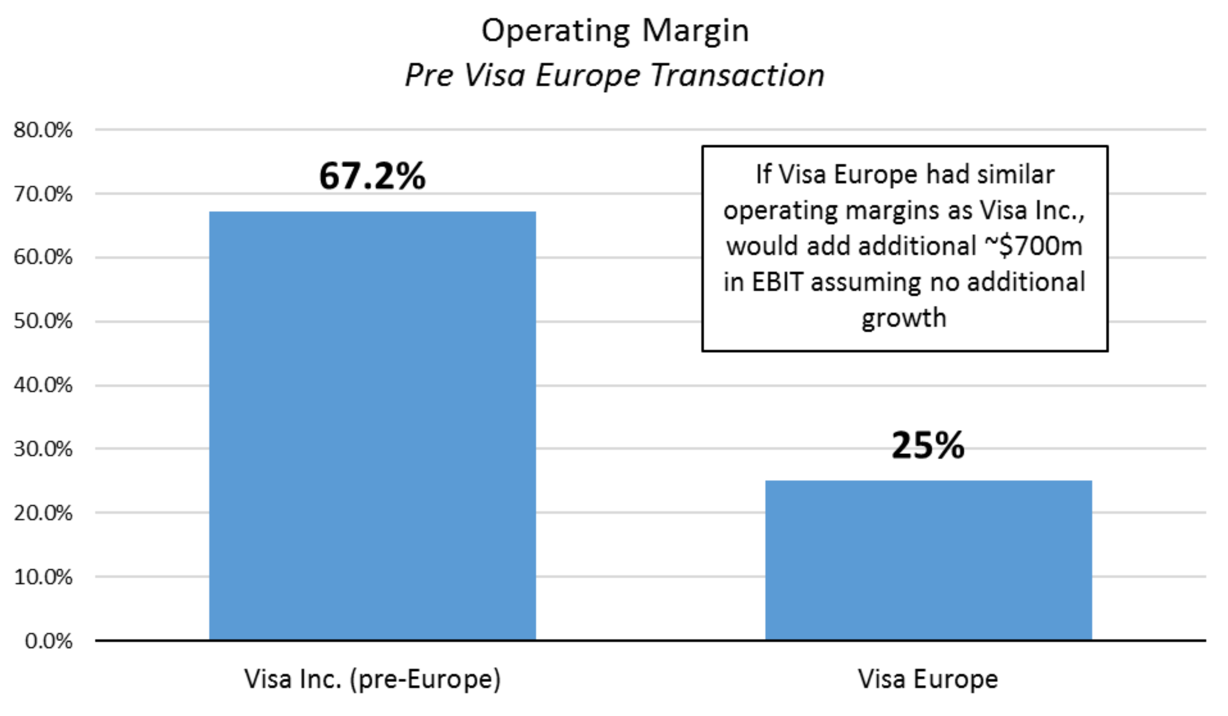
Visa Europe had a “net revenue yield of **0.0092%**”

Visa Inc. (prior to Visa Europe) had a “net revenue yield of ~ **0.0020%**”, which is more than *double* Visa Europe.

This represents tremendous opportunity just for repricing. When Visa became a public entity in March 2008, they were operated similarly as current-state Visa Europe, i.e. less focus on profit maximization.

Visa Europe

- Visa Europe represents opportunities on a number of levels
    - Revenue synergies
    - Cost synergies
    - Profit maximization through re-pricing initiatives
    - Improved technology through leveraging Visa Inc. R&D
    - Cross-border revenue capture
- Visa Europe had a substantially lower margin profile than Visa Inc., largely due to inadequate pricing of their products
- If their margin profile improved to Visa Inc. (ex-Europe), it would add about $700 million in EBIT, which is an additional ~7% increase from pre-Europe
- Given the EBIT margin step-up since the acquisition was completed, as well as other data points (see: service fee yields and data processing fee improvements), I think some of this incremental opportunity has been captured already



Based on Q2 2016 Visa Inc EBIT margin, using slide 7 of Visa Europe 11/2/2015 presentation with $1.6b net revenue and $400m EBIT

Visa Europe

Post Acquisition Plans

Focus	• Clients in Europe will benefit from deeper commercial relationships
	  • Innovative products and services
	  • Competitive mindset
	• Maintain strong European presence
	  • Empowered European leadership team and in-country resources
	  • Local data center
	  • Differentiated country and regional strategies

Innovation	• Deliver enhanced digital offering using Visa Inc. capabilities • Accelerate implementation of Visa Checkout and other digital platforms • Expand Visa Inc. efforts to open technology platform to Europe, enabling collaboration and co-development
Scale & Efficiency	• Access Visa Inc.'s scale on infrastructure, products, and corporate services • Fully integrate Visa Inc. and Visa Europe systems (expected 3-4 year program) • Streamline operating structure • Position London as a robust regional hub
Pricing	• Align pricing with client value, competitive market, and regulations • Establish roadmap and implement market-based pricing over time

European Market

Some interesting commentary on the payments landscape in Europe: *(03/2014)*

- Chip and PIN are basically the standard in Europe, as a direct consequence of uneven infrastructure that Europe started with
- Europe has huge issues with counterfeit (chip), lost and stolen (PIN)
- Early days there was little real time information, so batching was in evening, but could have been fraud in the morning that wasn't picked up until after the batch processed the next day
- Fraud rates were exceptionally high and infrastructure was complicated, uneven, spread across numerous countries
- Europe decided to tackle PIN and chip better to improve fraud
- US has counterfeit and PIN issues, but also has incredible fast real-time infrastructure that could implement fraud algorithms that kept fraud under control for signature basis
- Pre-Durbin, a PIN transaction would have been less expensive than a signature-type debit

Byron Pollitt Visa Inc. – CFO

Okay. So as many of you may know, chip and PIN is basically the standard in Europe. And that was a direct consequence of what was a very uneven infrastructure that Europe started with.

They had huge issues in counterfeit, they had huge issues, and you should think chip, they had huge issues on lost and stolen, think PIN. And in the early days, there was very little real time particularly as you moved out of the major cities and they often relied on more batch processing, which meant that there could be fraud in the morning and you may not pick it up until the next day after a batch was processed.

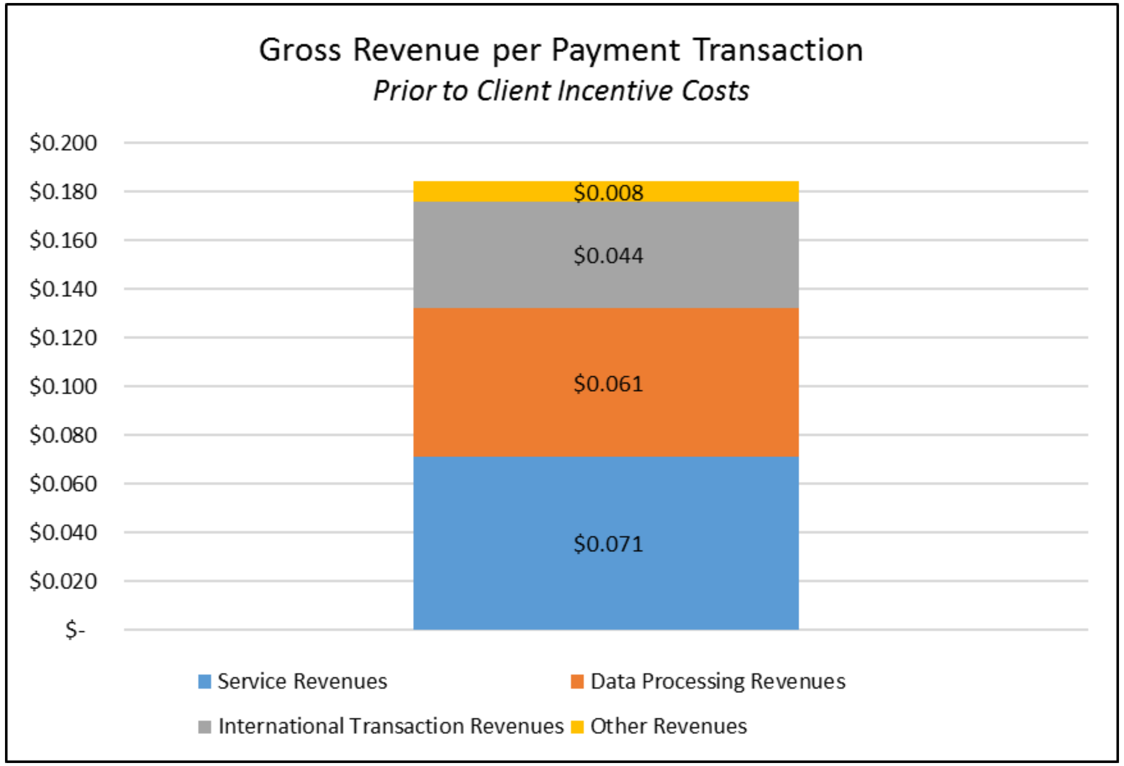
So the fraud rates were unsustainably high and the infrastructure complicated, uneven, spread across numerous countries. And so they made a decision, there was a decision early on to just tackle both with chip and PIN. And that brought the fraud rates, there is no question that brought the fraud rates down to a much more acceptable level.

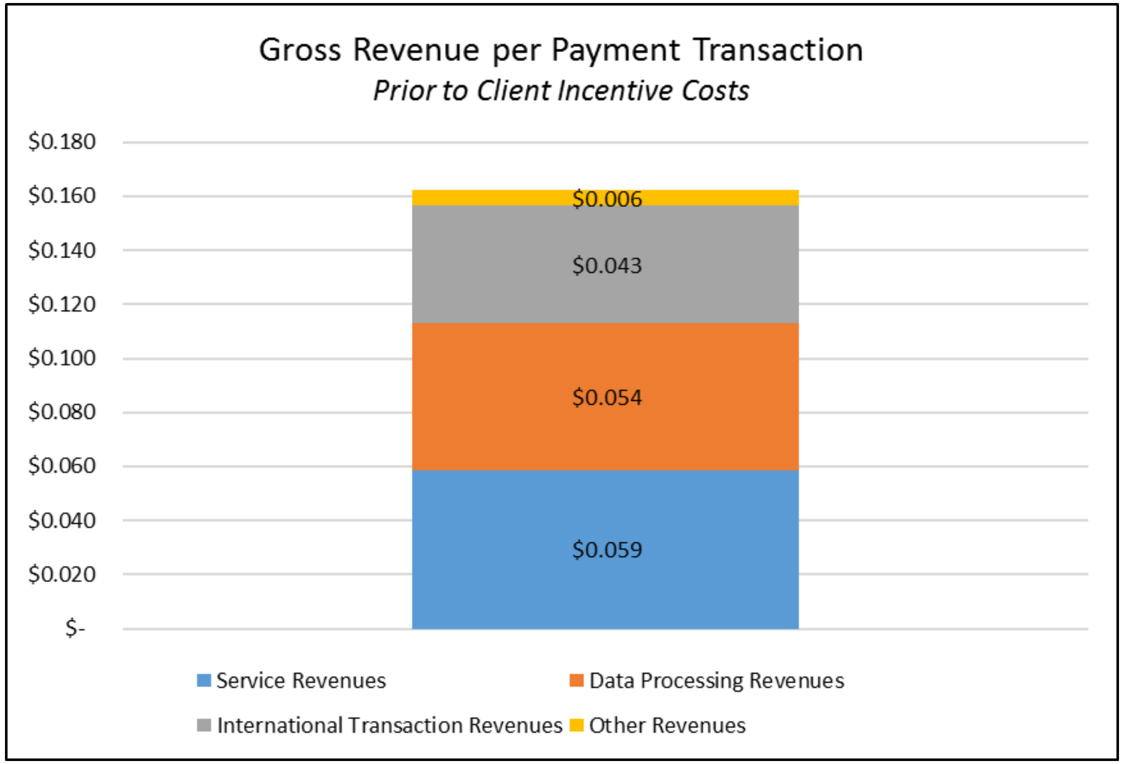
In this country, as example, we too have counterfeit and we have PIN but we also have an incredibly fast, for the most part, real-time infrastructure where we were able to implement fraud algorithms that kept fraud under control on a signature basis, and it never -- signature is a bit of a misnomer. We call it signature. It had nothing to do with the signature, it had to do that when you did a transaction and you signed for it, what was really happening behind the scenes were incredibly sophisticated real-time risk scoring algorithms that were determining whether or not this was a counterfeit card or whether it was actually you at the POS making the transaction.

PIN in this country really began with ATM, so the precursor to a debit card was an ATM card. Multiple networks were built up to service the PIN environment and it morphed into what is today PIN debit.

In PIN debit the lost and stolen fraud rate is lower because the PIN gives, as long as the PIN is not stolen, presumably you're the only one that knows the PIN. So that experience was better and historically in the pre-Durbin world, a PIN transaction would have been less expensive than a signature-type debit transaction. Yes, follow on?

Economics per Payment Transaction: *Revenue*

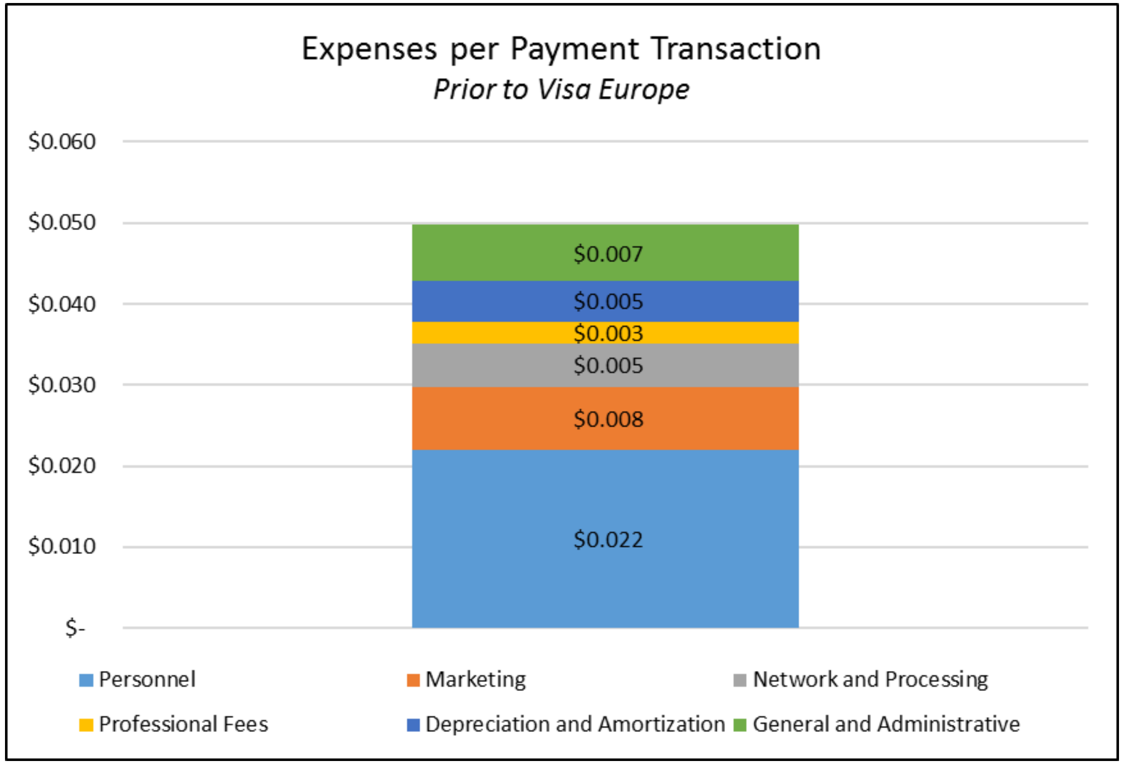


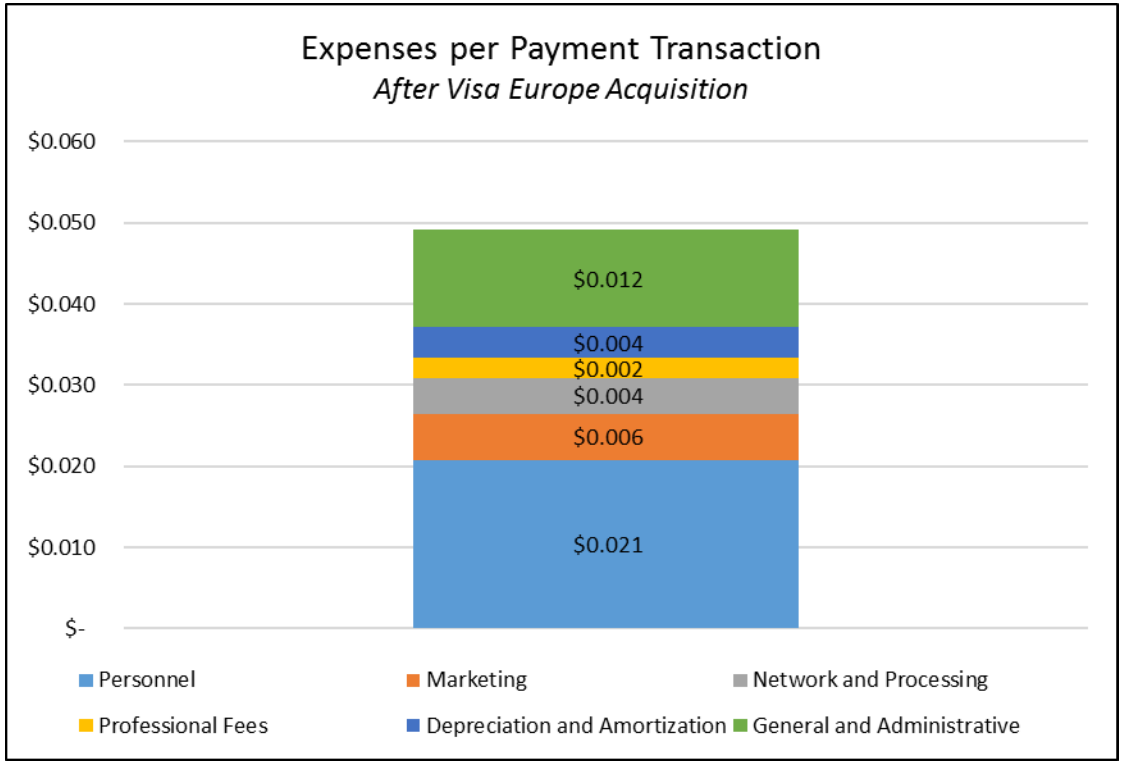


<u>Pre</u> Visa-Europe acquisition, they were earning about $0.184 per payment transaction, about $0.033 would be deducted for client incentives = **$0.151** per payment transaction

<u>Post</u> Visa-Europe acquisition, they are now earning about $0.162 per payment transaction, about $0.030 would be deducted for client incentives = **$0.132** per payment transaction

Economics per Payment Transaction: *Expenses*

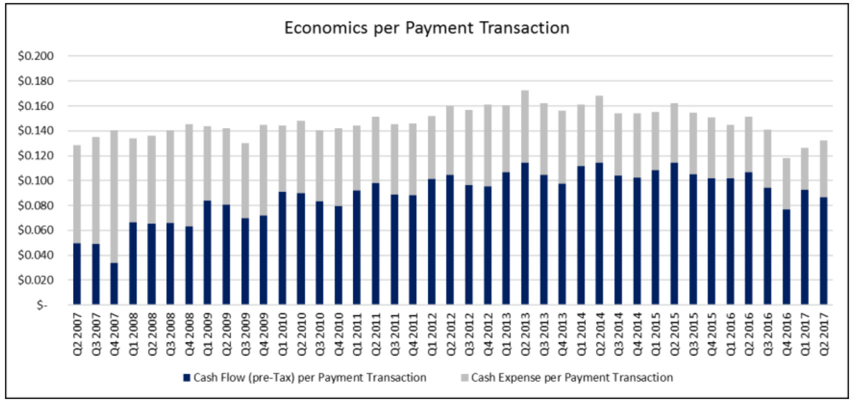




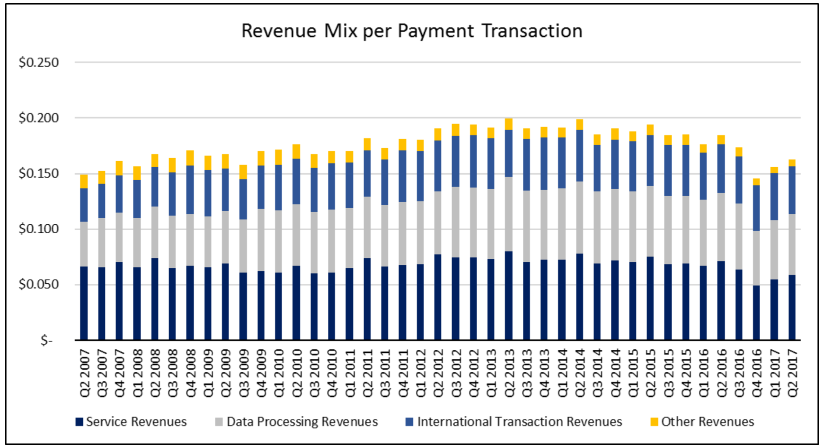
<u>Pre</u> Visa-Europe acquisition, they were spending about $0.050 per payment transaction

<u>Post</u> Visa-Europe acquisition, they are now spending about the same. Important to keep in mind there are some integration costs built in, so likely the scale effect is not prevalent in financials as of yet.

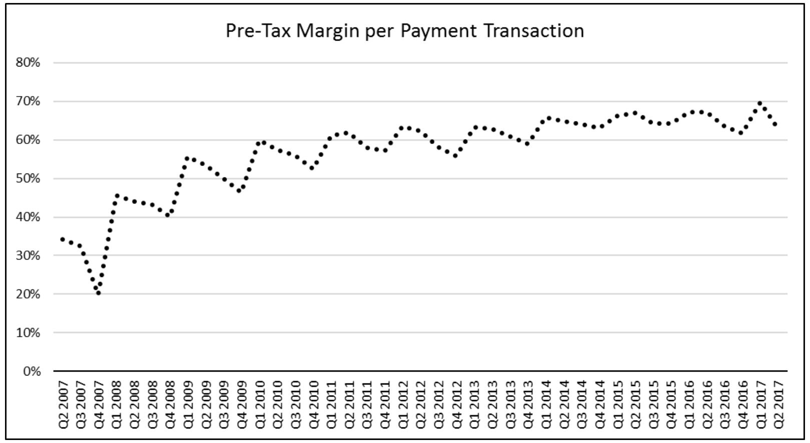
Economics per Payment Transaction:



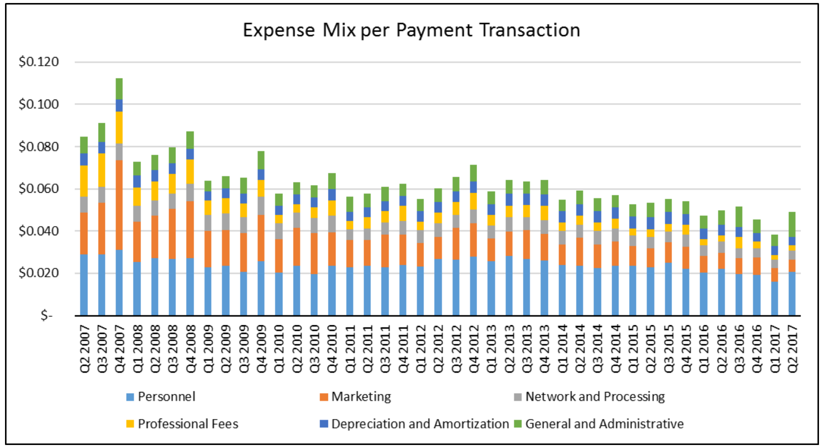
Pre-tax cash flow per payment transaction has increase from $0.05 in 2007 to ~$0.10 (prior to Visa Europe)



Revenue mix per payment transaction (*not to be confused with processed transaction*) is: $0.06 for assessment fee, $0.05 for data processing, $0.04 international. Total = $0.16 per payment transaction.



Pre-tax margin (including D&A) about 65% (and increasing), a testament to their capital-light, low incremental cost per transaction

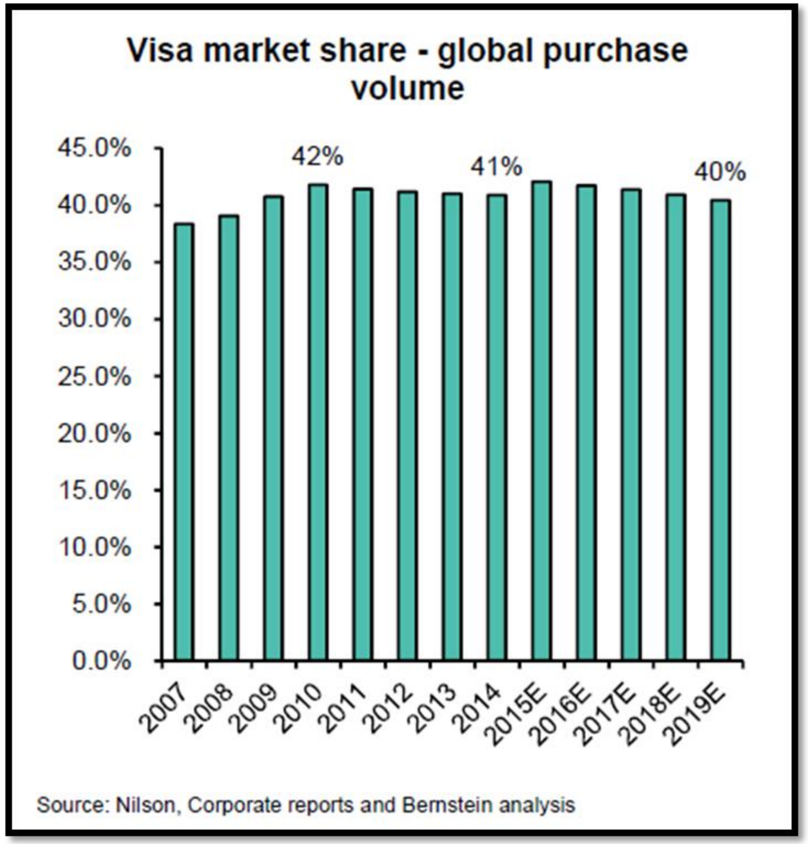


Expense per transaction continues to decline, is dominated by personnel and G&A expenses, which make up 2/3 of per-transaction expenses.

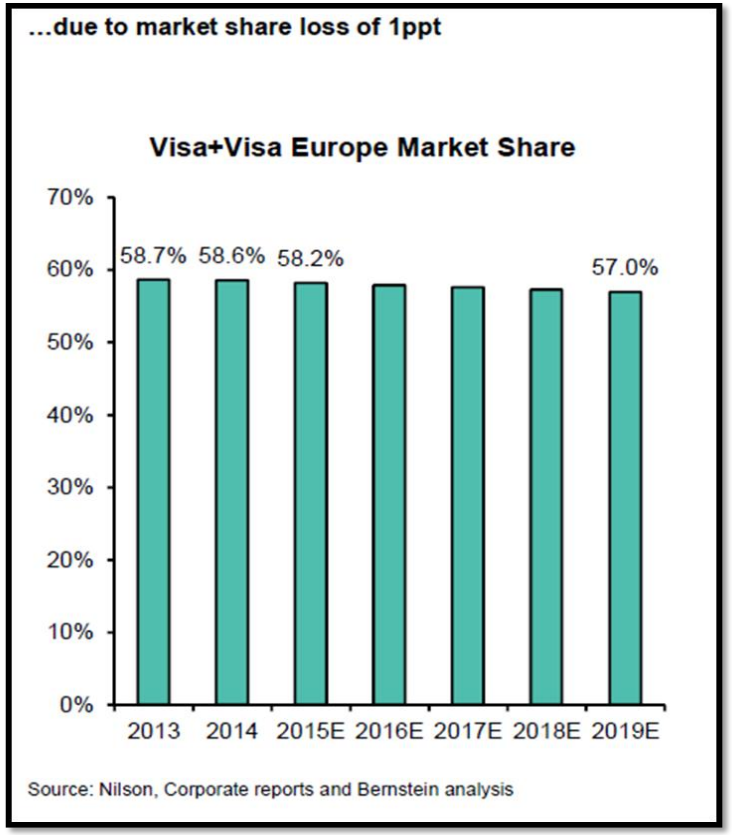
Market Share: (2016)

	Visa Inc.[2]	MasterCard[3]	American Express[3]	JCB[3]	Discover | Diners Club[3]
Payments Volume ($B)	$6,843	$3,360	$1,028	$200	$144
Total Volume ($B)	$9,905	$4,564	$1,040	$207	$154
Total Transactions (B)	148.5	69.5	7.4	2.9	2.3
Cards (M)	3,009	1,574	118	94	58

Market Share: Global Purchase Volume



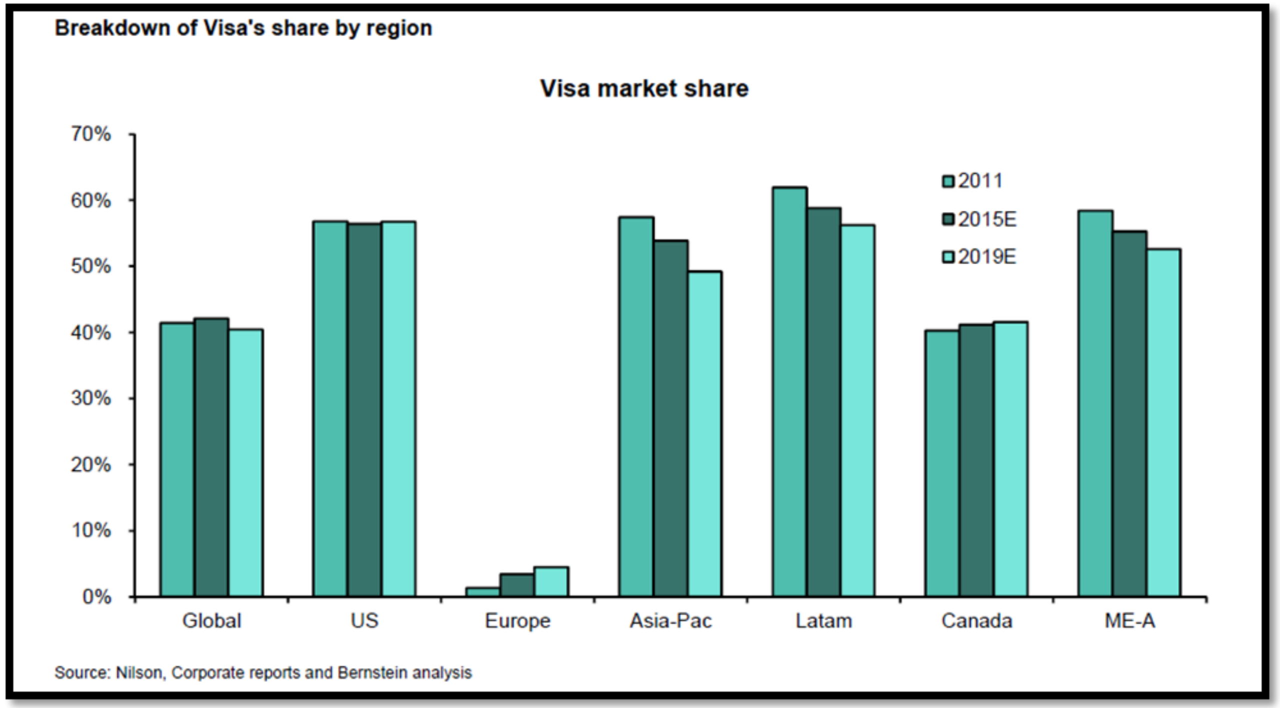
"Legacy" Visa Inc. has ~40% global market share, based on purchase volume



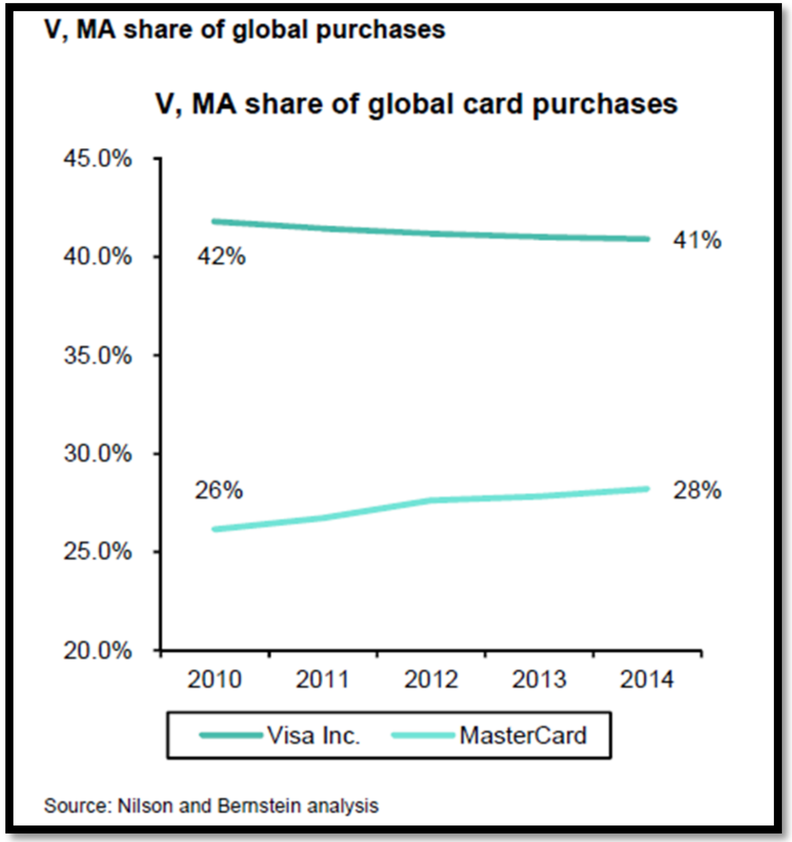
Current Visa Inc. has ~58% global market share, including Visa Europe, based on purchase volume

Market Share by Geography

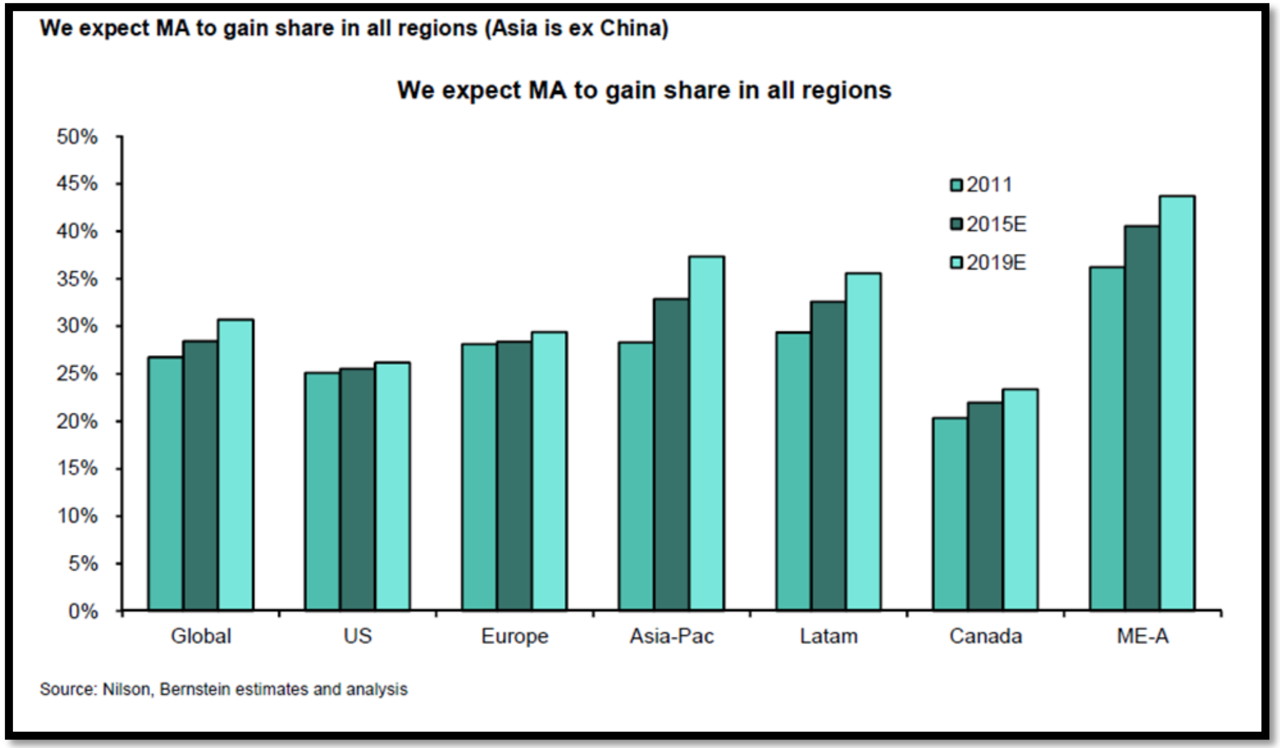
- Visa's market share (prior to Visa Europe acquisition)
- In most regions, Visa is the most dominant payment network
- Expected to decline somewhat due to outside competition (UnionPay, MasterCard)
- Still, across the large geographies, Visa has > 50% market share (inclusive of Visa Europe)



Market Share: Visa *vs.* MasterCard



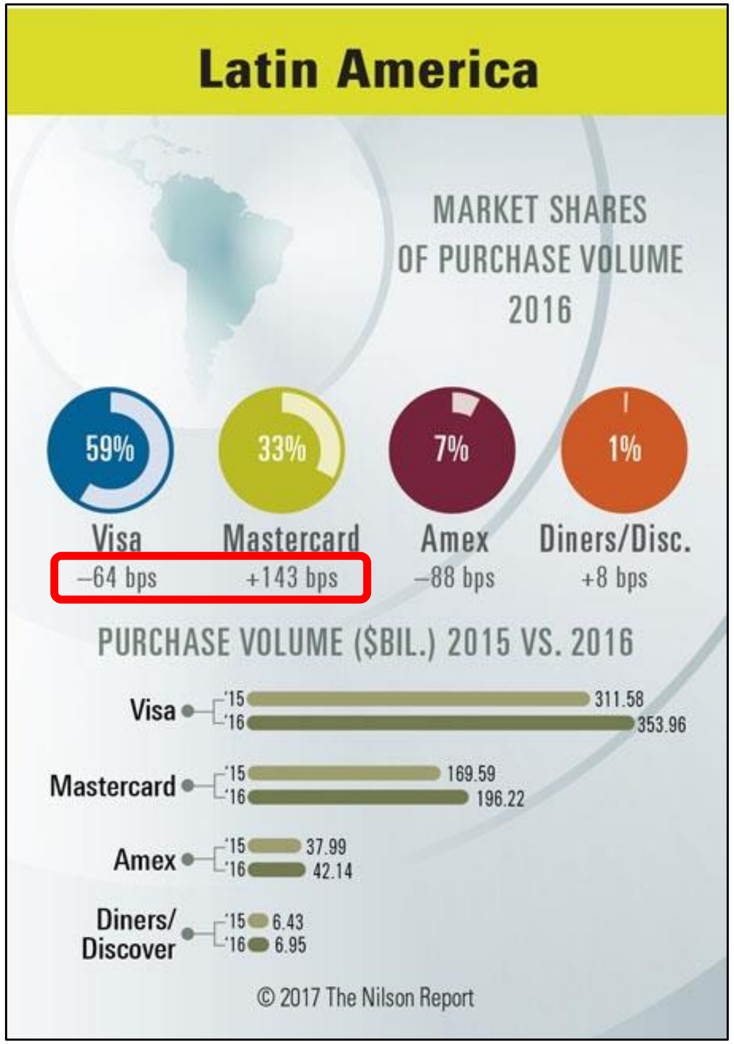
"Legacy" Visa Inc. has ~40% global market share, based on purchase volume, whereas MasterCard has about 28%, which has gained slightly since 2010



Bernstein estimates that MasterCard will **gain** market share from V in all regions. This is one of the large reasons investors prefer MA vs. V (*market share gains, smaller than V, slightly different business model with ancillary services*)

Market Share: Visa *vs.* MasterCard

- Part of the bull thesis for choosing MA as an investment over V is that MA has been (supposedly) taking market share from Visa
  - MA grew market share in Latin America in 2016 from 2015, going from 31% to 33%
  - Visa lost market share, going from 60% to 59% of payment volume
- From 2010 to 2015:
  - Visa grew purchase volume in US by 46%
  - MasterCard grew purchase volume by 52%
  - MasterCard grew some market share, at Visa's expense, from 2010 to 2015
  - However, expectation of Visa regaining market share strength following Costco/ USAA deals in 2016



Important Metrics: Visa *vs.* MasterCard

Visa Inc.

Pre Visa Europe (2008 - 2016)	3 Yr	5 Yr	8 Yr
Service Fee Revenue	8.0%	9.6%	10.4%
Data Processing Fee Revenue	10.6%	12.5%	14.8%
International Transaction Revenue	12.2%	11.7%	13.2%
Total Revenue	8.6%	10.4%	11.6%
Operating Expenses	4.4%	6.7%	0.3%
EBITDA	10.9%	12.7%	27.8%
EBIT	11.1%	12.7%	29.8%
Total Volume	3.6%	5.3%	7.2%
U.S.	8.9%	7.4%	6.7%
Outside U.S.	-0.1%	3.7%	7.7%
Payment Volume	7.3%	7.6%	8.6%
U.S.	9.6%	7.8%	7.4%
Outside U.S.	4.6%	7.3%	10.3%
Processed Transactions	10.0%	8.8%	9.8%
Account Growth	6.5%	6.5%	6.5%
Card Growth	5.6%	6.0%	5.6%
Credit Cards	5.2%	4.1%	1.9%
Debit Cards	5.9%	7.1%	8.3%

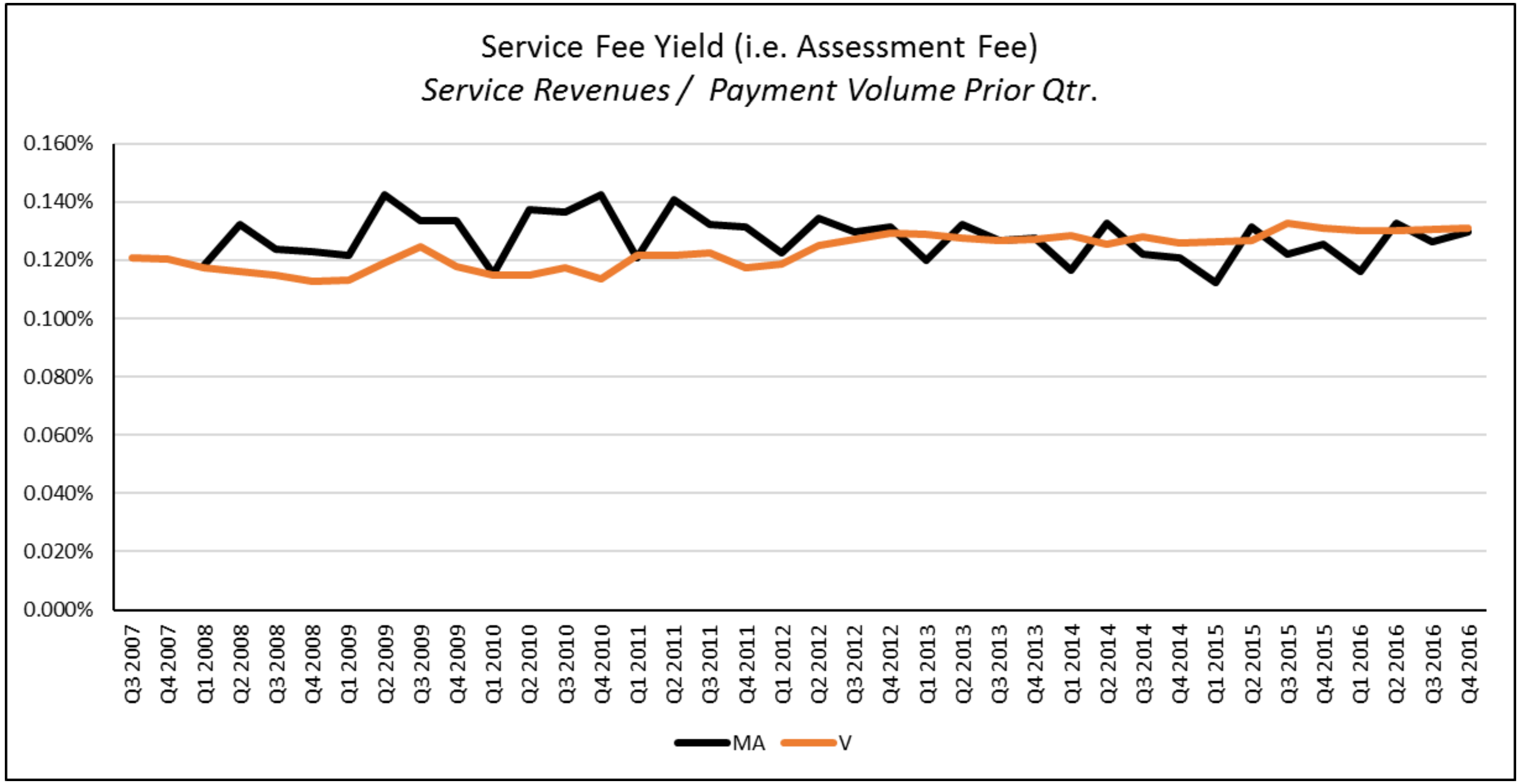
MasterCard

2008-2016	3 Yr	5 Yr	8 Yr
Service Fee Revenue	6.8%	7.4%	8.5%
Data Processing Fee Revenue	13.2%	13.1%	14.5%
International Transaction Revenue	9.3%	12.0%	11.8%
Total Revenue	8.7%	9.7%	10.5%
Operating Expenses	10.6%	9.1%	7.1%
EBITDA	7.7%	6.8%	4.3%
EBIT	7.4%	10.2%	14.6%
Total Volume	5.0%	7.6%	8.8%
U.S.	6.7%	6.9%	5.1%
Outside U.S.	4.2%	7.9%	11.0%
Payment Volume	5.0%	7.1%	8.4%
U.S.	7.1%	7.3%	5.8%
Outside U.S.	3.7%	7.0%	10.3%
Processed Transactions	13.5%	14.9%	13.4%
Card Growth	9.4%	9.3%	7.3%
Credit Cards	1.6%	2.4%	0.9%
Debit Cards	17.4%	18.6%	18.8%

Important to note some of the “outside US” numbers are impacted by recent regulation in Europe

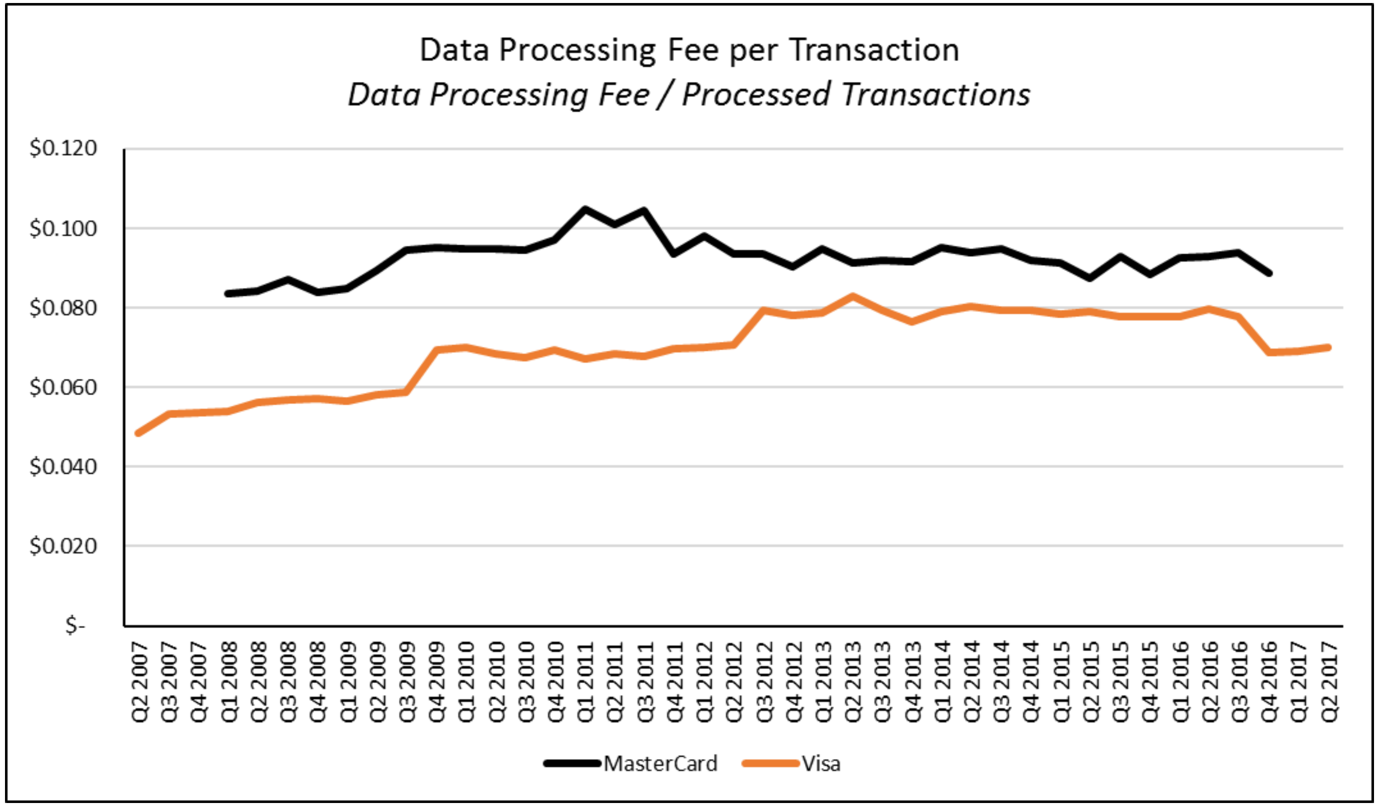
Visa vs. MasterCard: *Assessment Yields*

- Based on the service fee revenues as a percentage of payment volume
- The card networks earn a fee based on the volume of the transaction size; the higher the volume, the larger the service fee
- There may be some accounting noise in MA's reporting, which is why it appears a bit choppier than Visa
- **Point is**: both Visa and MasterCard earn about 0.13% per payment volume, with neither earning substantially more or less than the other
- Service fees are ~35% of Visa's gross revenue
- Service fees are ~30% of MasterCard's gross revenue



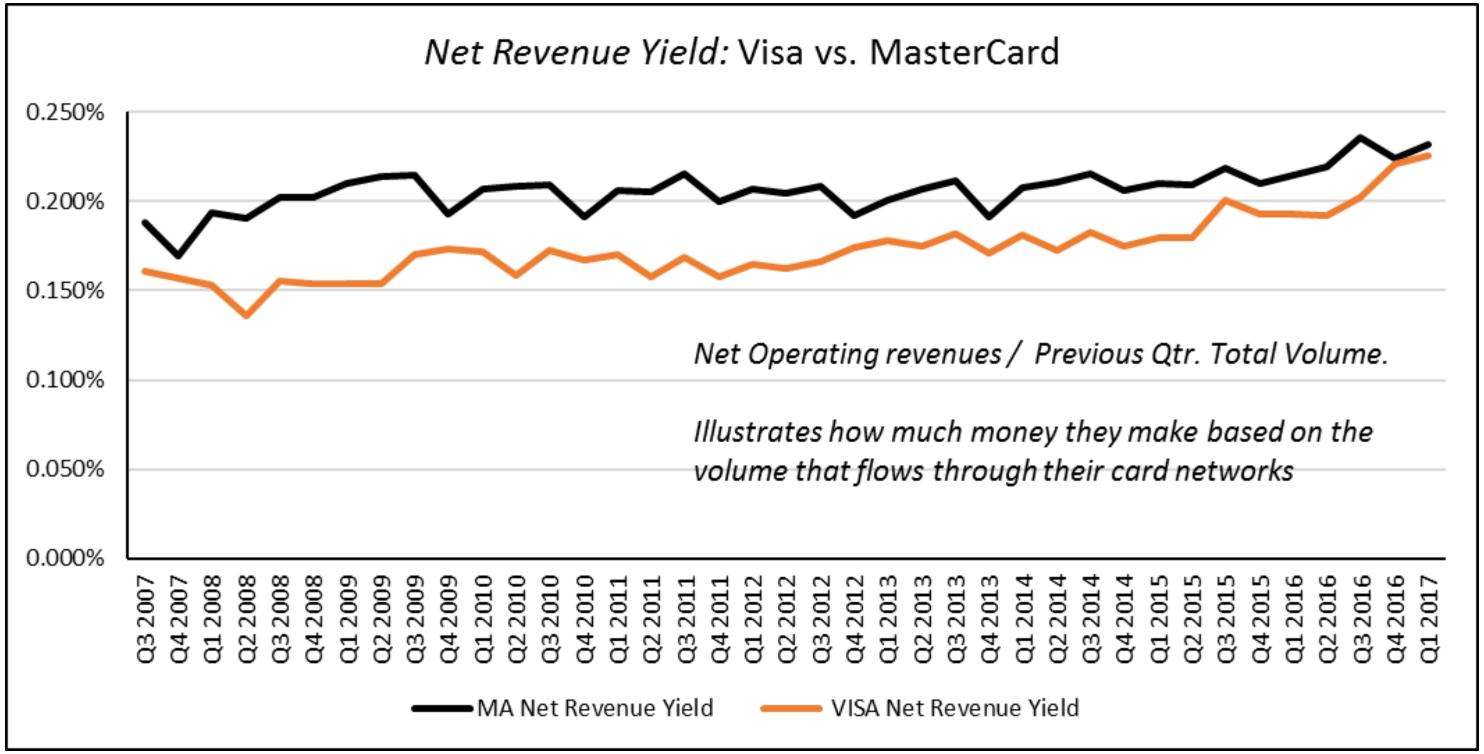
Visa vs. MasterCard: *Data Processing Fees*

- Based on the fixed fee earned per transaction processed over their network
- Visa earns about $0.07 per processed transaction, which is down from about $0.08 prior to the Visa Europe transaction
- Visa Europe had lower pricing than Visa Inc. (ex Europe)
- MasterCard earns about $0.09 per processed transaction, a premium to Visa
- These fees are agnostic to the payment volume
- All that matters is that the transaction, whether it be $1 or $5,000 (or more) is processed over their network
- This fee explains the economics behind debit and credit
  - Debit volume is much less than credit, on a per transaction basis
  - However, on equivalent volume terms, the economics are similar as there are multiple transaction processing fees to get a comparable volume amount of the credit transaction



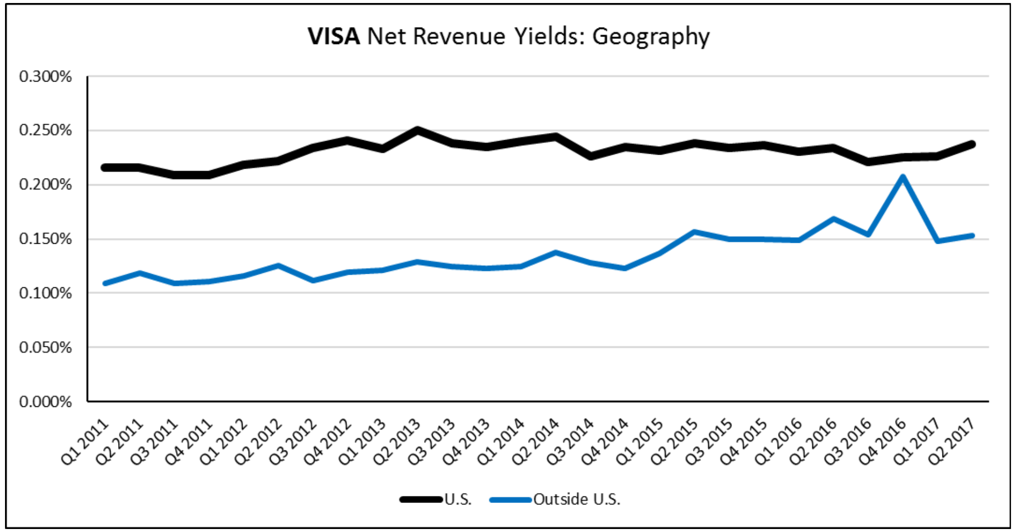
Visa vs. MasterCard: *Net Revenue Yields*

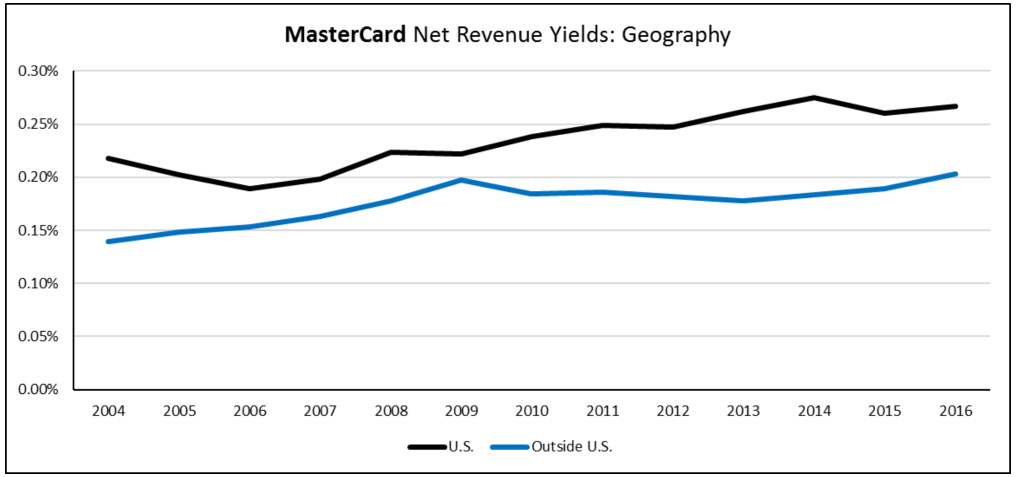
- Net Revenue Yield compares the total net revenues generated from the total volume that flows on their networks
- This is based on a number of things:
  - US versus International mix
  - Credit versus debit mix (credit yields much higher than debit)
  - Debit mix: PIN vs. Signature (Signature yields much higher than PIN)
  - Cross border mix/ international revenues (cross border fees are highest yielding of all products)
  - Payment volume vs. cash volume
  - Pricing
  - Any other revenue products or services than are not tied to total volume (consulting)
- Visa has been catching up to MA with winning the Costco and USAA portfolios, which are credit related, and thus higher yielding
- Visa has also seen strong cross-border



Visa vs. MasterCard: *Net Revenue Yields (Geography)*

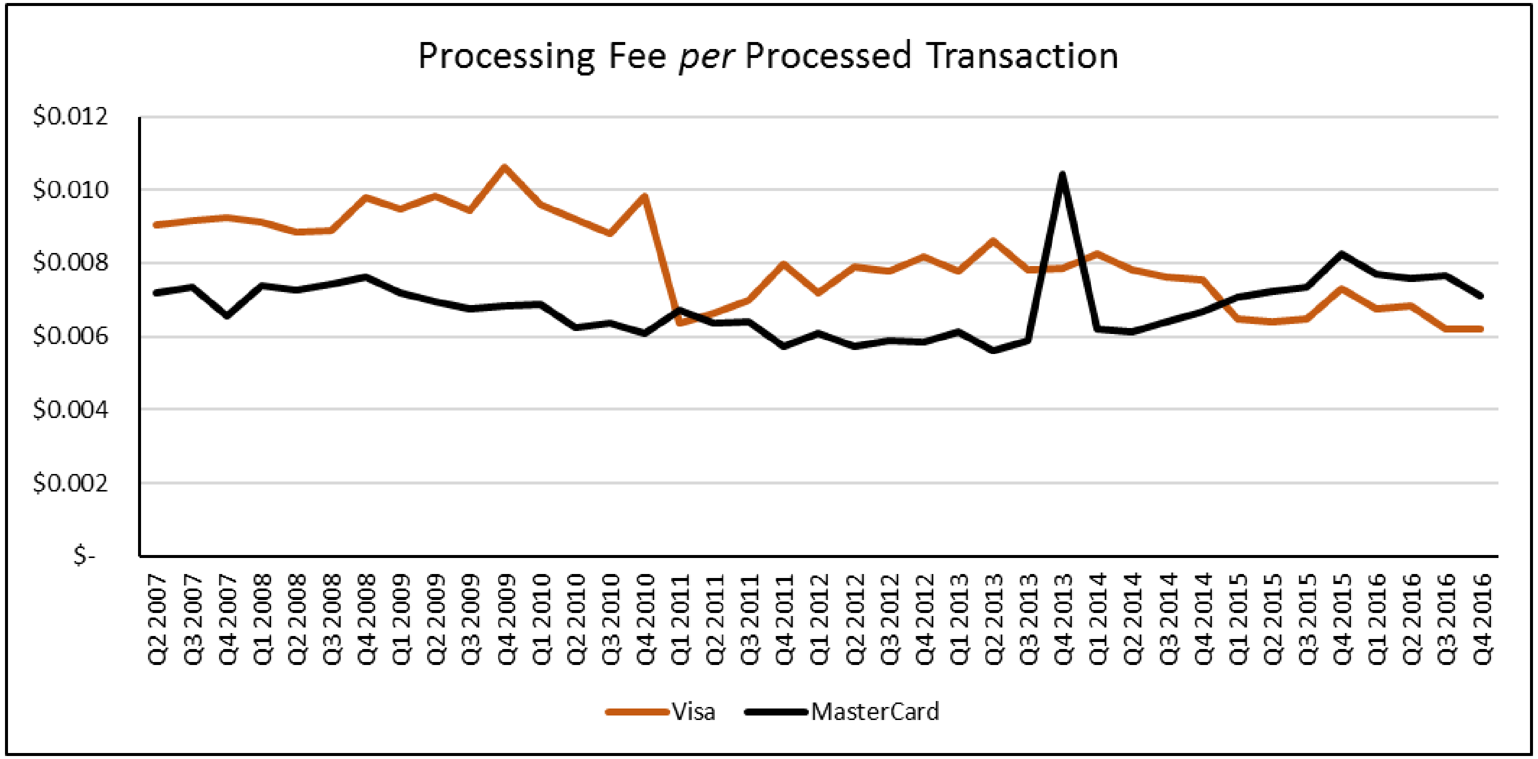
- Net Revenue Yield is based from footnotes in the back of:
  - MasterCard's 10-Ks
  - Visa's 10-Qs
- Revenue per geography as a % of total volume
- Both Visa and MasterCard have higher yields in the U.S. versus outside of the US
- Why is U.S. higher than outside the U.S.?
  - Is it based on payment volume – more credit as a mix versus debit in U.S.?
  - For Visa, prior to Visa Europe credit comprised of ~80% of payment volume, versus about 50% in the U.S. (credit = higher revenue yields)
  - Its possible that it is due to the higher mix of debit payment transactions (~2x in U.S. versus outside U.S. as a mix of credit vs. debit).
  - If U.S. has 2x as many debit transactions as credit, compared to about 60% credit/ 40% debit outside of the US, then the US (compared to outside US) gets more data processing fees, which ***may*** be some of the reasoning for U.S. yields being > than outside U.S.
- Seeing the mix of debit vs. credit transactions shift to more debit post-Visa Europe (and even prior to acquisition), which should increase overall yields outside the U.S.
- MA has higher yields than Visa in the U.S. and outside the U.S.





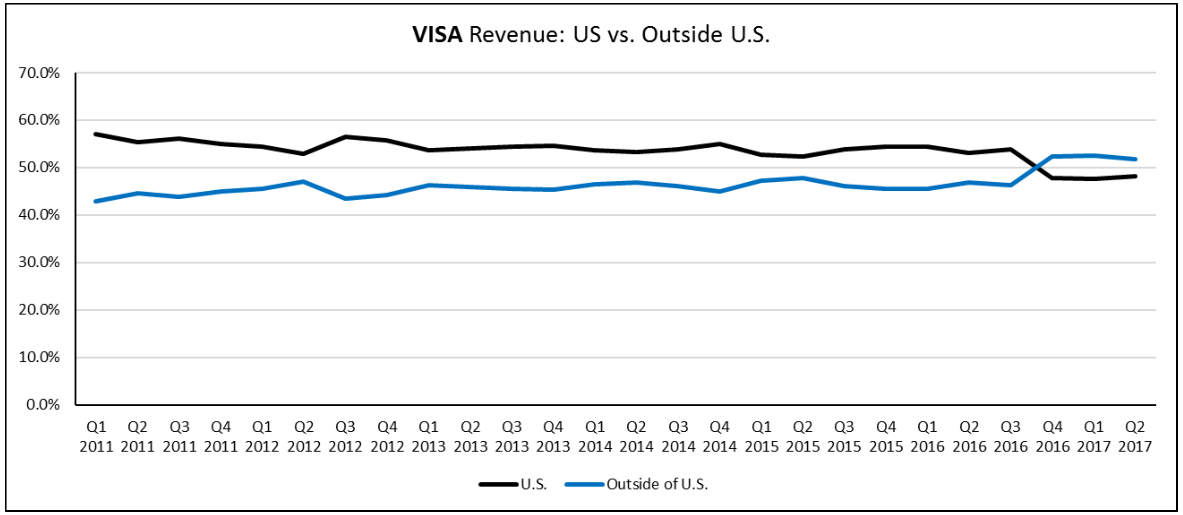
Visa vs. MasterCard: *Processing Fee per Transaction*

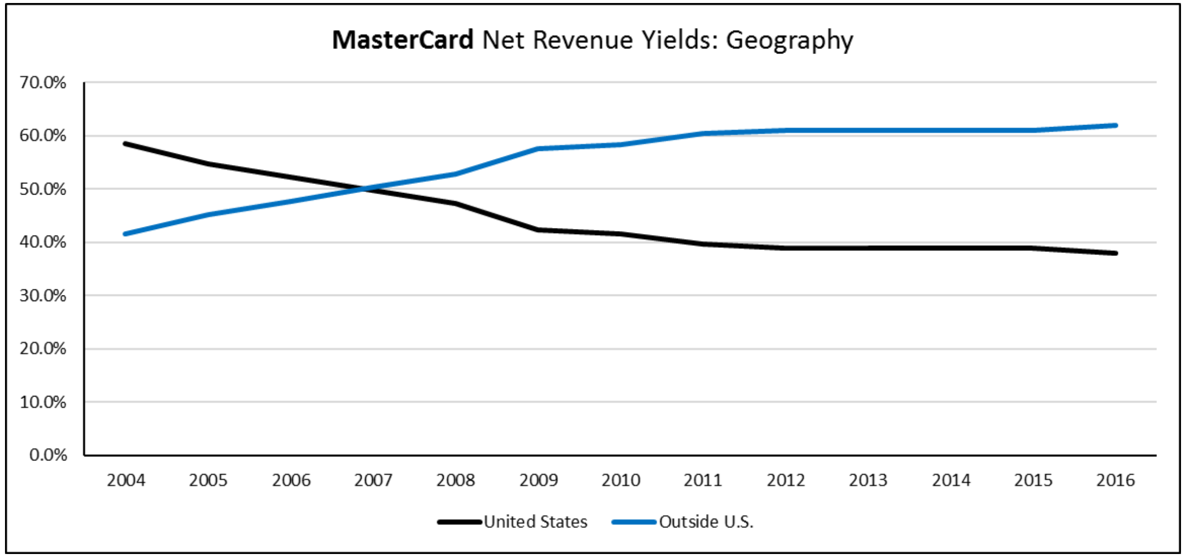
- Based on process transactions and processing expenses
- Their may be some *noise* in the “data processing costs” expense line
- However, what is important to know is:
  - Each incremental transactions processed has minimal costs for both V/MA
  - The costs to process the transaction are minimal (less than a penny each)
  - Visa generates about $0.13 per payment transaction, and it costs them less than a penny to process it



Visa vs. MasterCard: *Revenue by Geography*

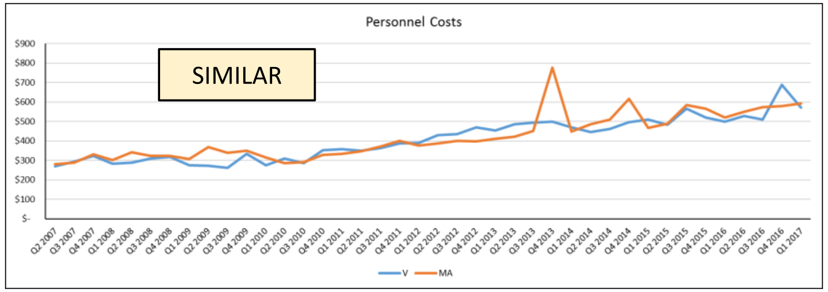
- Based on the location of:
  - The issuers of the card
  - The location of the merchant acquirer where the card is being used
- MasterCard
  - No single country outside US generates >10% of revenue
  - Not one customer generated greater than 10% of net revenues
  - MA is far more of an international company than Visa, revenue-wise
  - About 62% of revenues are outside the U.S. vs. 38% in U.S.
- Visa
  - Prior to Visa Europe, generated **54%** of revenues in US/ **46%** outside US
  - With Visa Europe, now **52%** of revenues are outside US

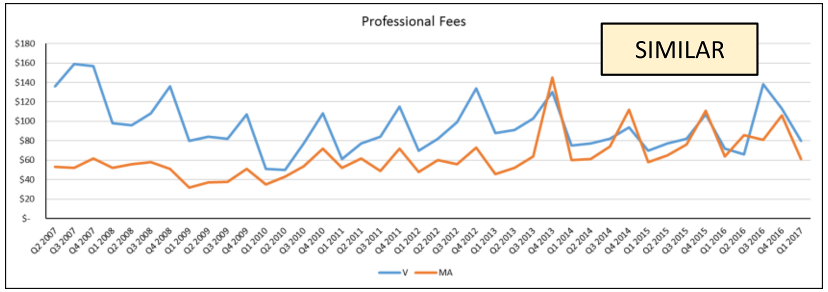


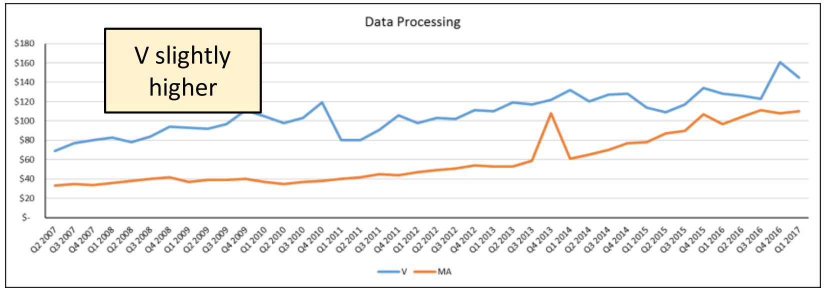


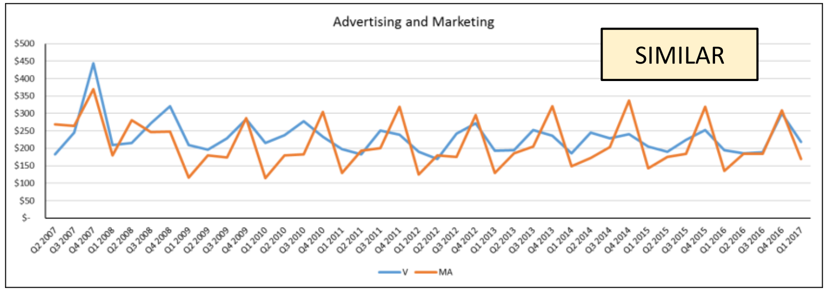
Visa vs. MasterCard: *Expenses*

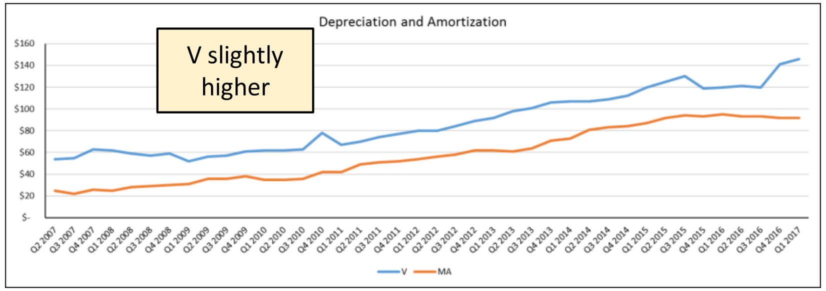
- There is some differences in definitions, sure, but interesting conclusions can still be made
- The only major expenses that are not included are:
  - Litigation (for both)
  - G&A (for Visa) which includes some one time items, as well as FX (which MA breaks out separately) and some corporate expenses
- Given the amount of volume that Visa has, I would presume that some of the corporate expenses get lumped in to the client incentives line item for MA
- Conclusions:
  - **Scale matters**
  - Personnel costs are same
  - Professional fees about the same
  - Data processing – Visa slightly higher, despite substantially more transactions processed (100 billion vs. 58 billion LTM)
  - Advertising expenses are same
  - D&A has V slightly higher, due to some additional expenses on technology, software
  - MA has higher client incentives, but this is likely due to how they define it
- G&A for Visa = additional ~ $500m/yr.

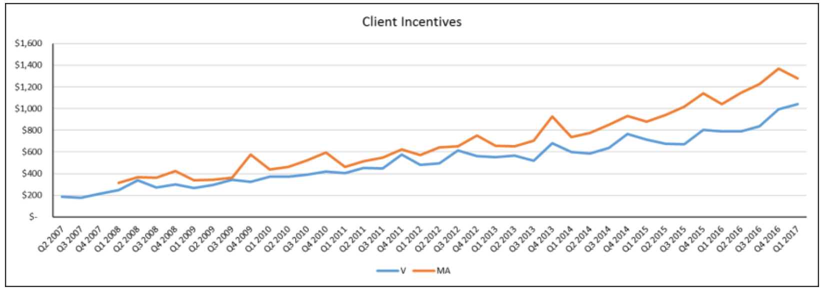






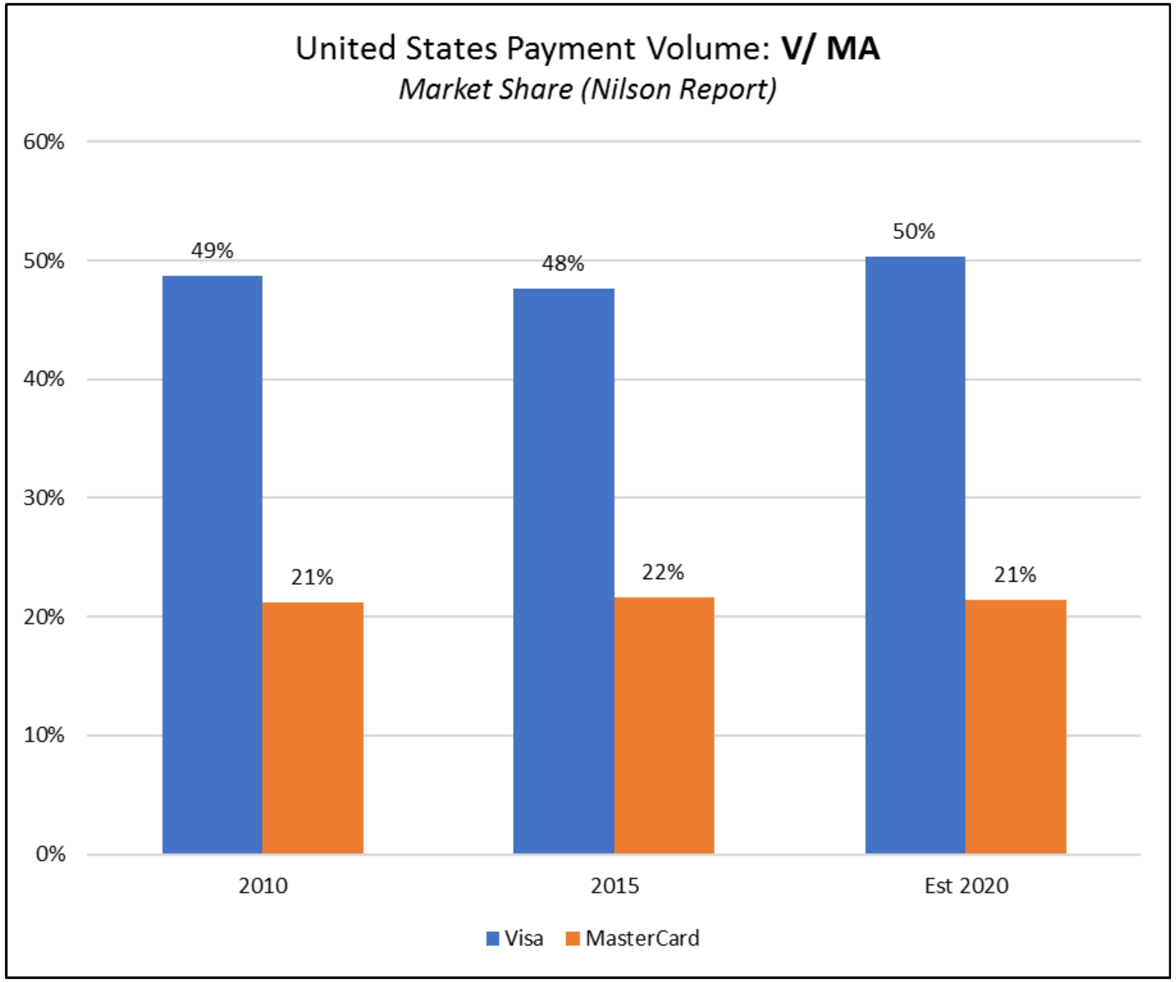






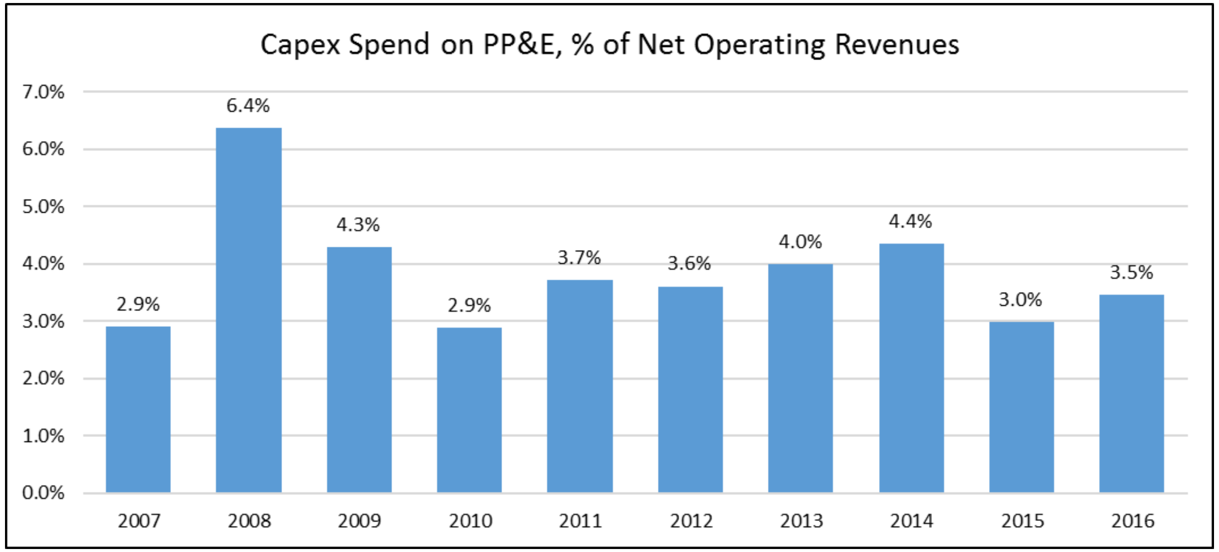
Visa vs. MasterCard: *US Payment Volume Market Share*

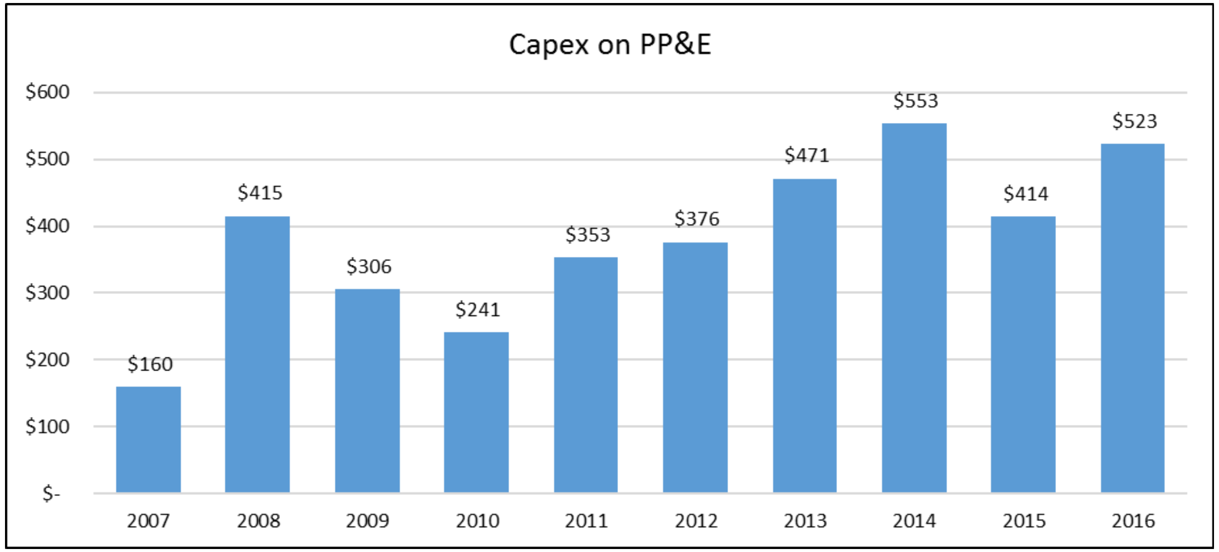
- Based on non-cash payments, Visa and MasterCard operate essentially in a duopoly
    - Combined market share is ~70%
    - Visa with commanding lead at ~48%
    - MasterCard at ~22%
- Expected growth in market share for Visa over MasterCard due to recent activity in partnership (Costco/ USAA)
- Interesting to note that the estimate market share in 2020 doesn't imply much market share gains over competitors
- In other words, the strong tide is lifting all boats, but isn't much market share improvement among the players involved



Capital-Light Economics

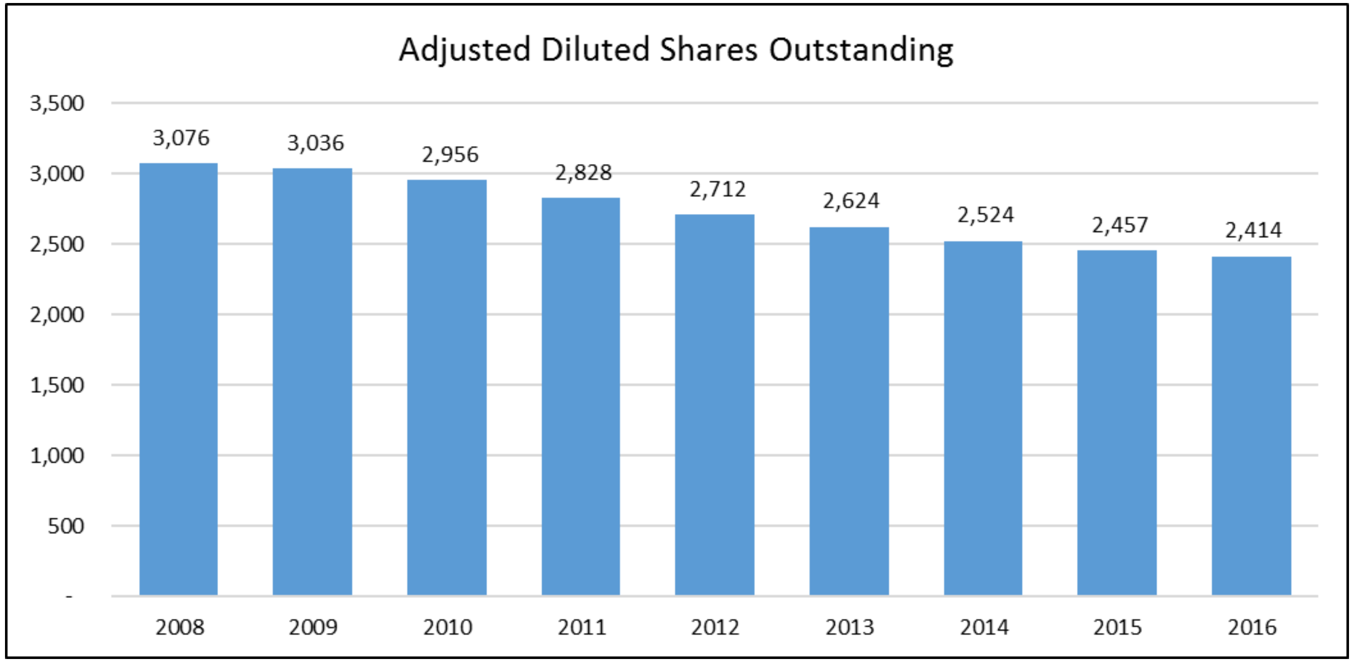
- Visa is a very capital-light business
- About 3-4% of net operating revenues (gross revenue subtracting client incentives, which are about 18-19% of gross revenues)
- On a gross revenue basis, Visa has spent an average 3.2% on PP&E from 2007 – 2016
- While capex spend on PP&E has gone from $415 million in 2008 to $523 million in 2016 (26% increase), Operating Income has increased from $1.5 billion to $9.7 billion (5.5x increase)
- Obvious that the business model does not rely on capital spend to fuel increases in cash flow
- The bulk of the "reinvestments" come in the form of:
    - Market and advertising (P&L)
    - Client incentives (P&L)
- Excluding any litigation costs, the capital-light business model allows excess cash flow, and Visa pays out ~100% in the form of a dividend and share buybacks





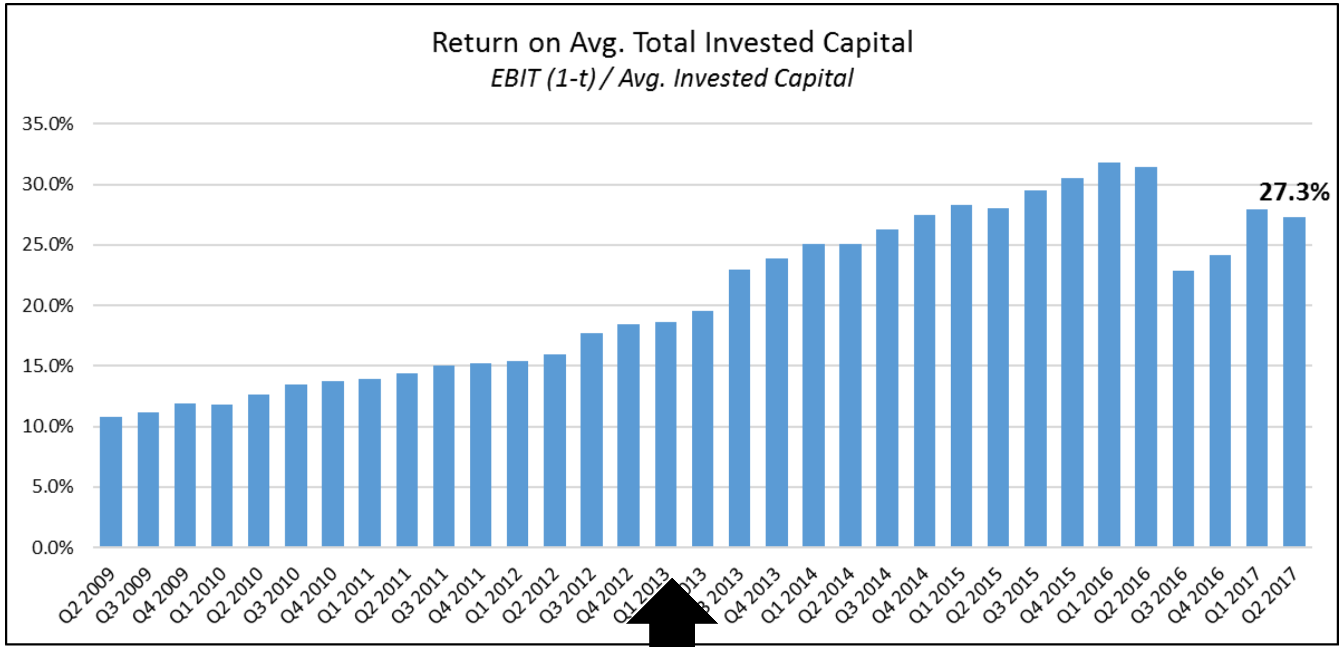
Capital-Light = Excess FCF

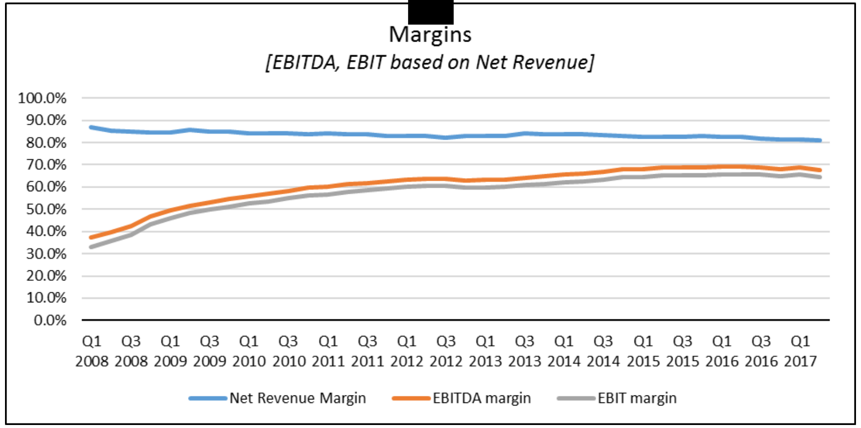
- Visa's capital light model results in excess FCF
- In 2016 Visa returned $8.4 billion in excess cash to shareholders (dividend + share repurchase)
- Return of capital in the form of:
  - Dividend
  - Share Repurchase
- Average share decline since 2008 is 2.98% of prior years' diluted S/O
- Repurchased **22%** of shares since 2008 (compared to 17% for MasterCard over same time period)



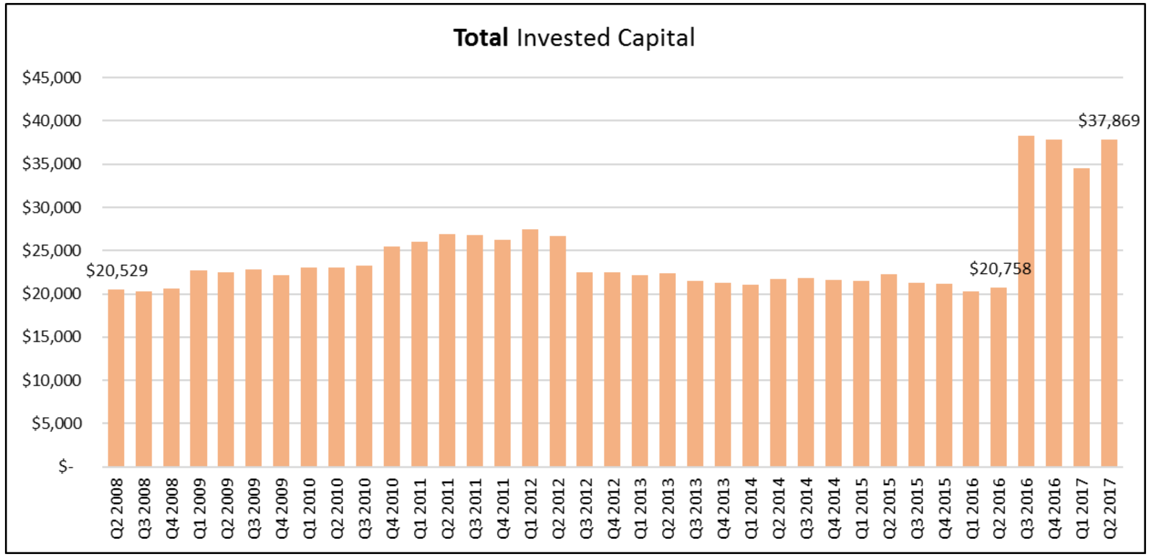
Invested Capital/ ROIC

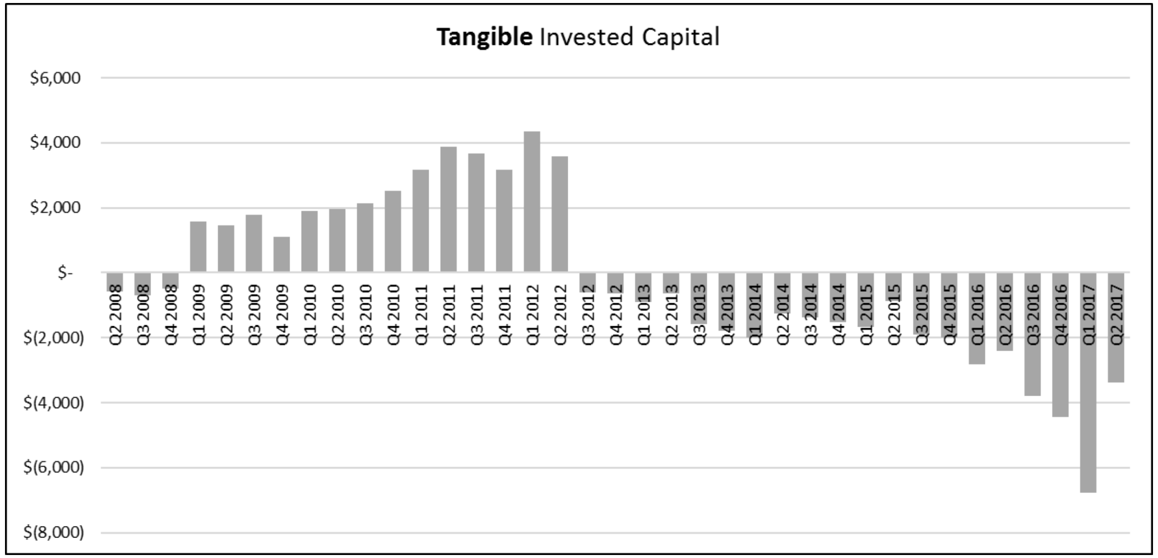
- From 2008 to 2016, total invested capital remained essentially flat at around $20.5 billion
- ~100% of the invested capital in the business is in the form of intangible assets and goodwill, with only $2.1 billion in physical assets
- Visa has been able to increase its ROIC due to:
  - Low fixed cost base
  - Very high incremental margins per transaction
  - Minimal capital needs per additional transaction
  - Visa is a capital-light business, where PP&E went from $1 billion in 2008 to $2.1 billion in 2016
- Visa grows with minimal capital needs
- Most of their reinvestment runs through the P&L
  - Incentives for issuers and merchants
  - Marketing and advertising
- Despite this reinvestment through the P&L, Visa still maintains a 65% EBIT margin and 47% net income margin





Invested Capital

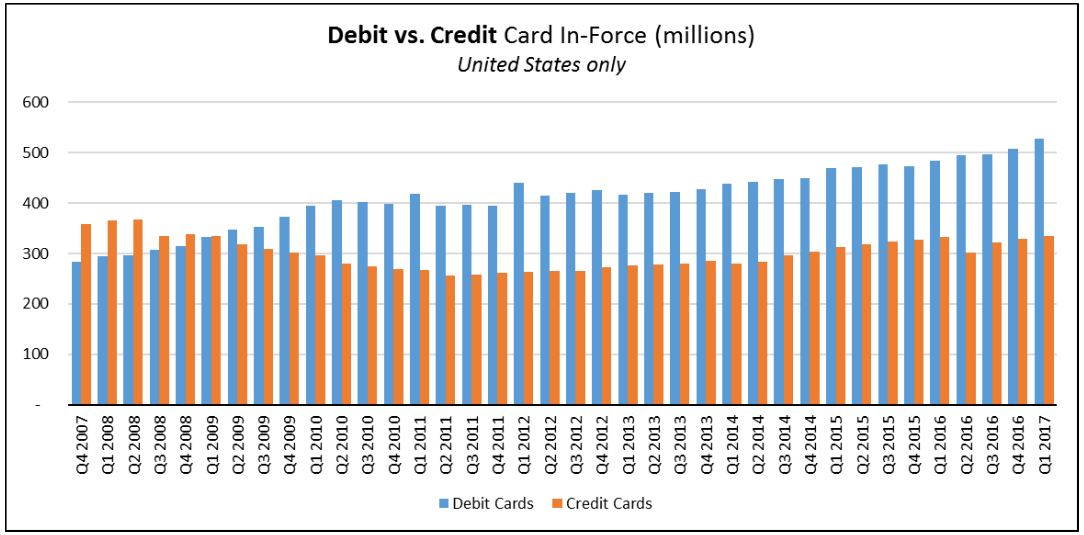


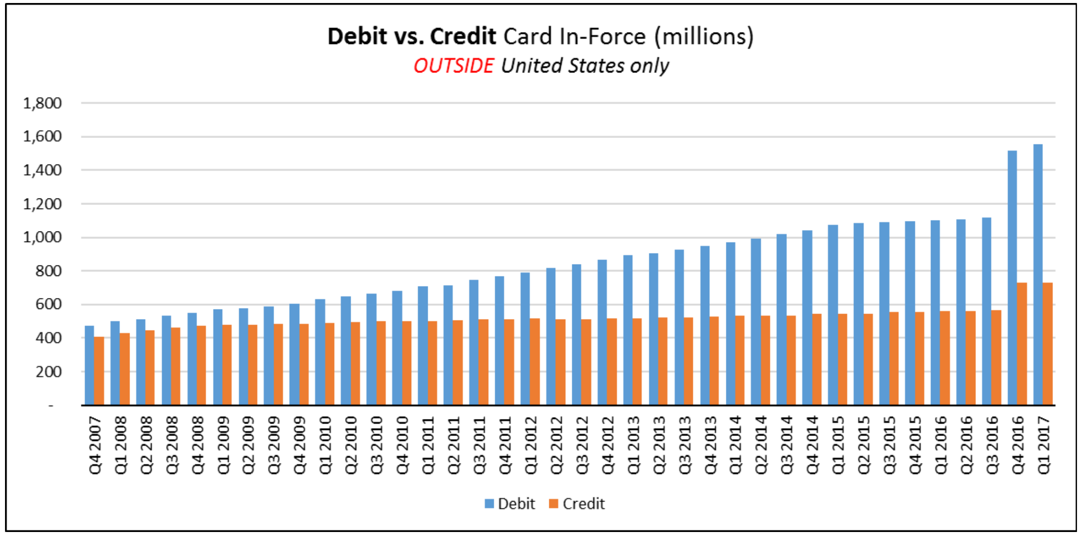


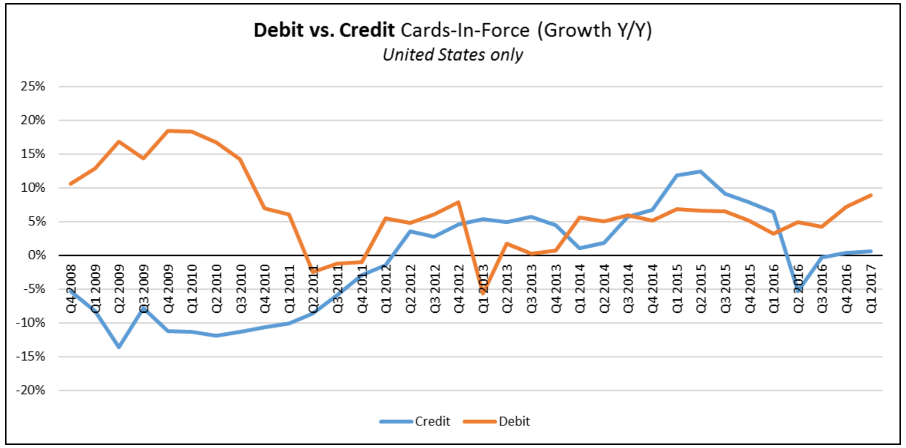
Takeaways from Invested Capital

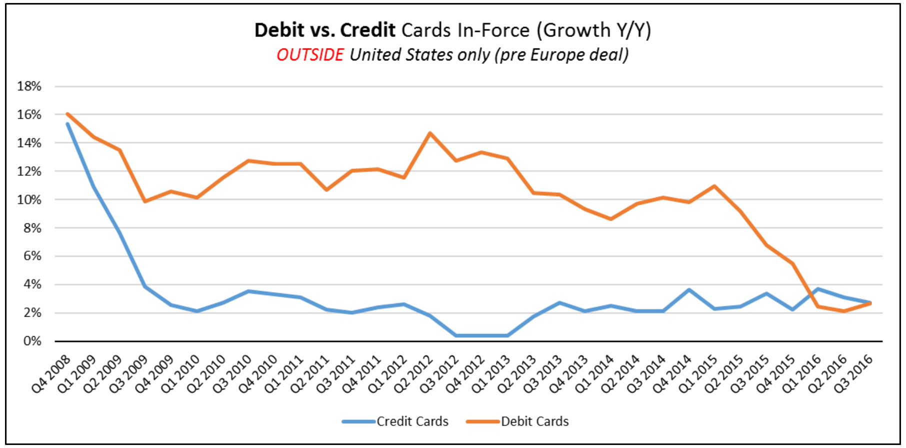
- > 100% of the invested capital is in the form of goodwill and intangibles
- Visa is a very capital-light business, with around 3-4% of net operating revenues spent on tangible capex per year
- Due to the high margins and capital-light economics, they have excess FCF that they utilize to repurchase shares
- The share repurchases reduce shareholder equity

Cards: Debit vs. Credit

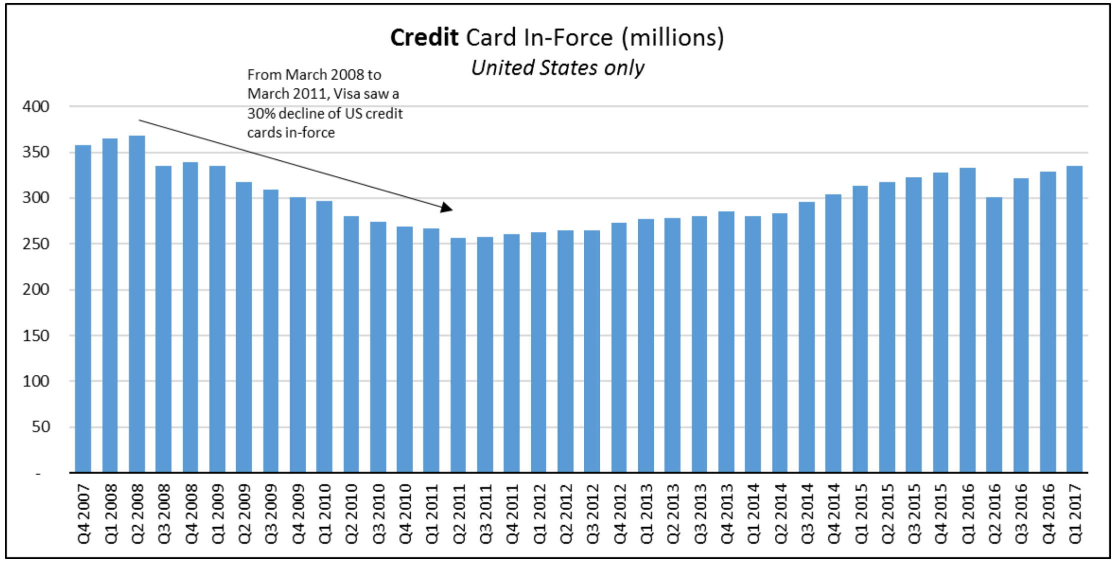


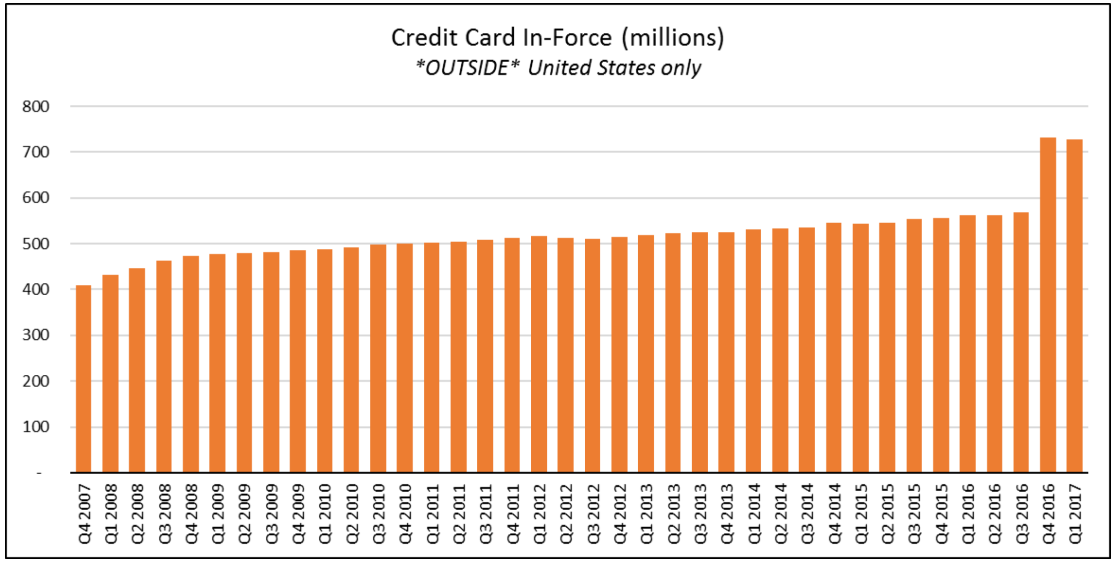


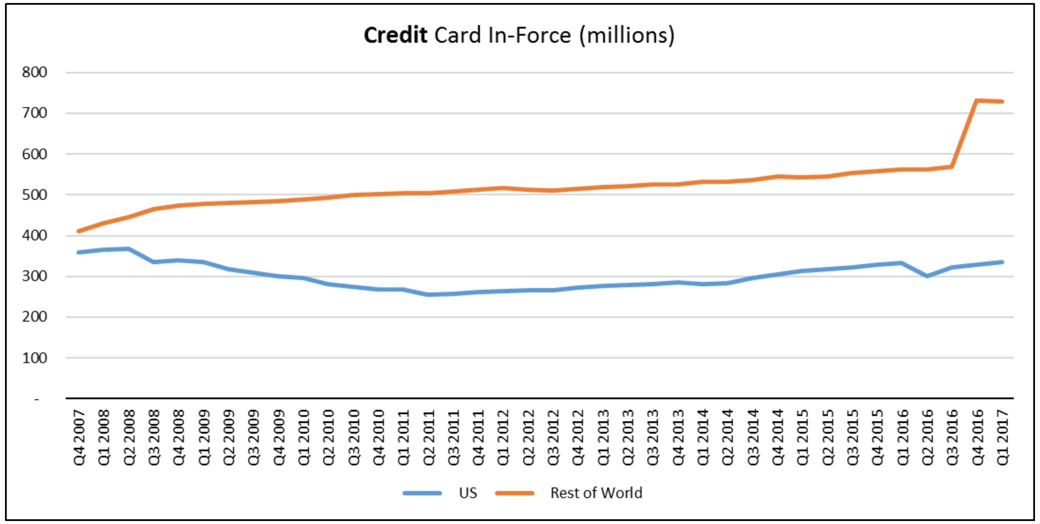




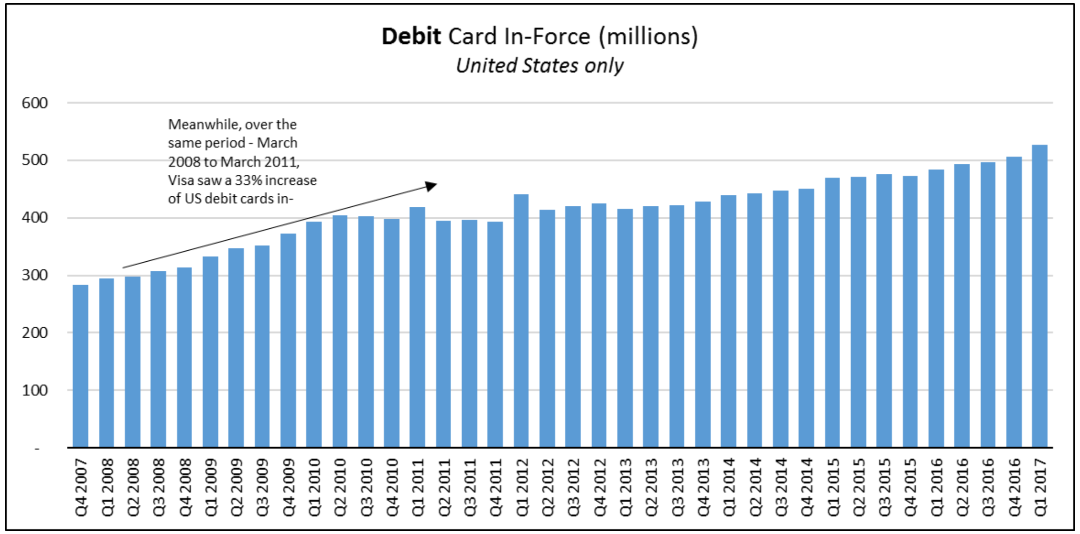
Cards: Credit

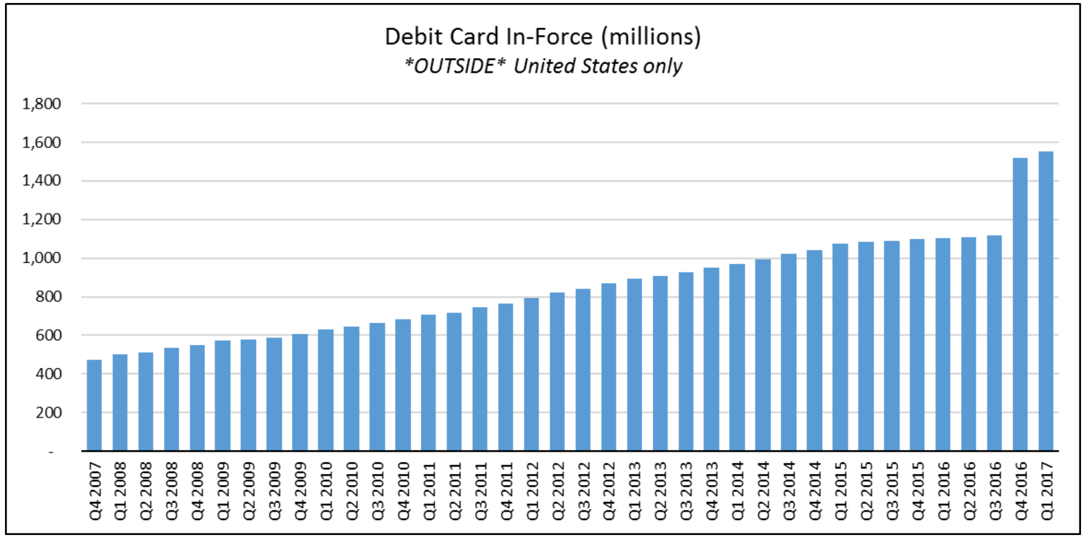


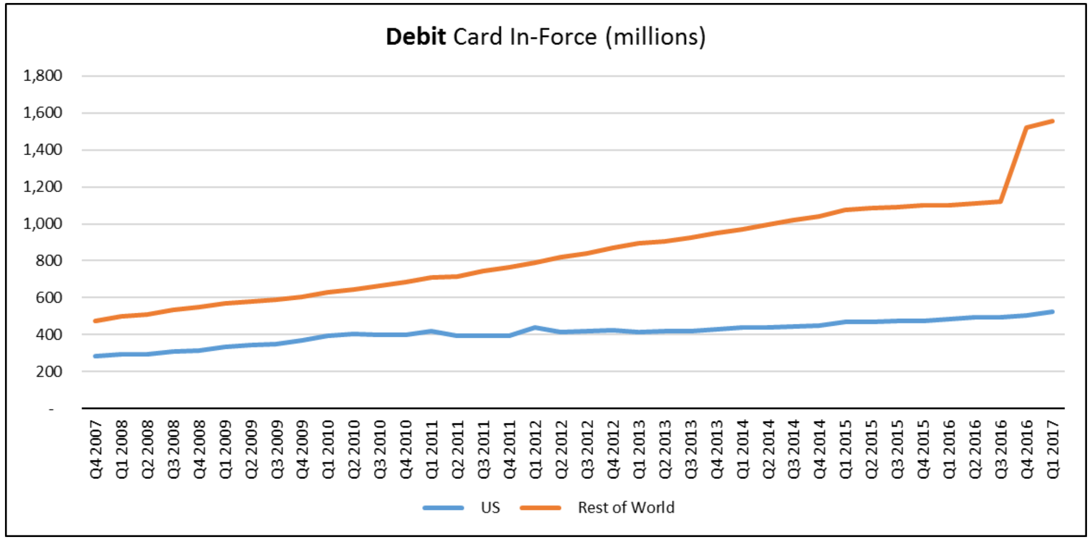




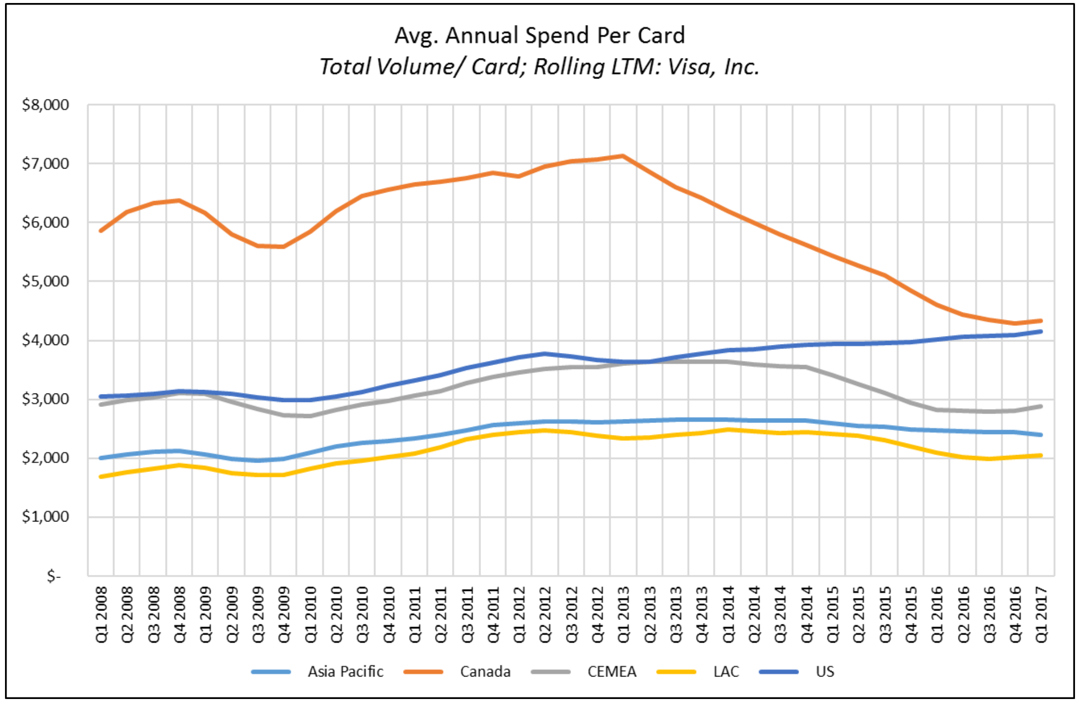
Cards: Debit

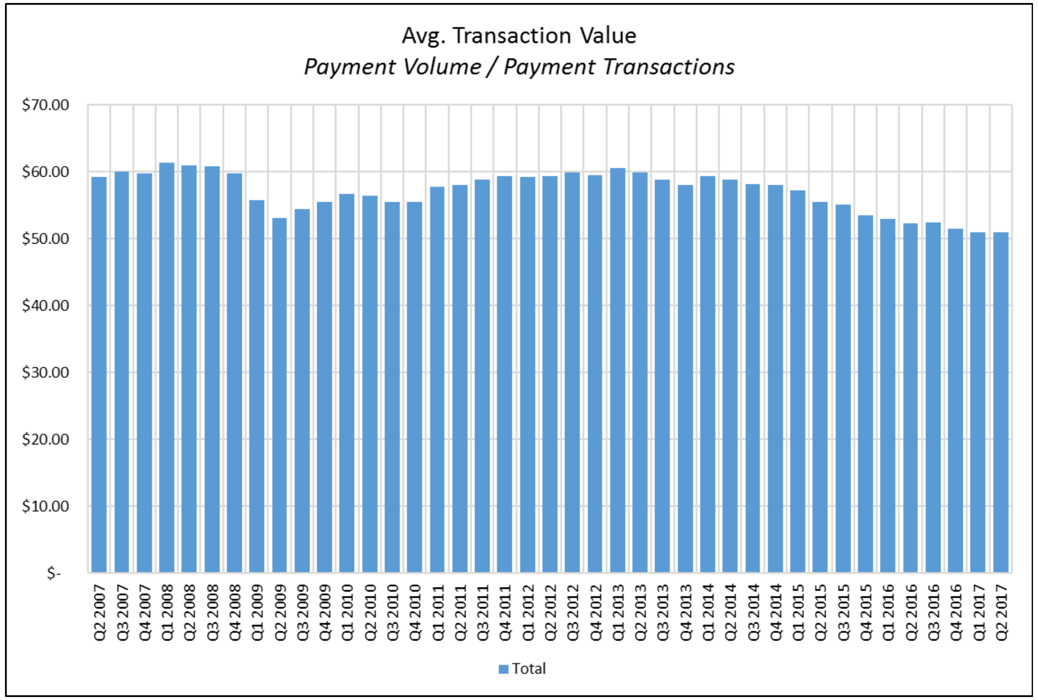

Debit Card In-Force (millions)
United States only
Meanwhile, over the same period - March 2008 to March 2011, Visa saw a 33% increase of US debit cards in-


Debit Card In-Force (millions)
**OUTSIDE* United States only*


Debit Card In-Force (millions)
US
Rest of World

Card Spend

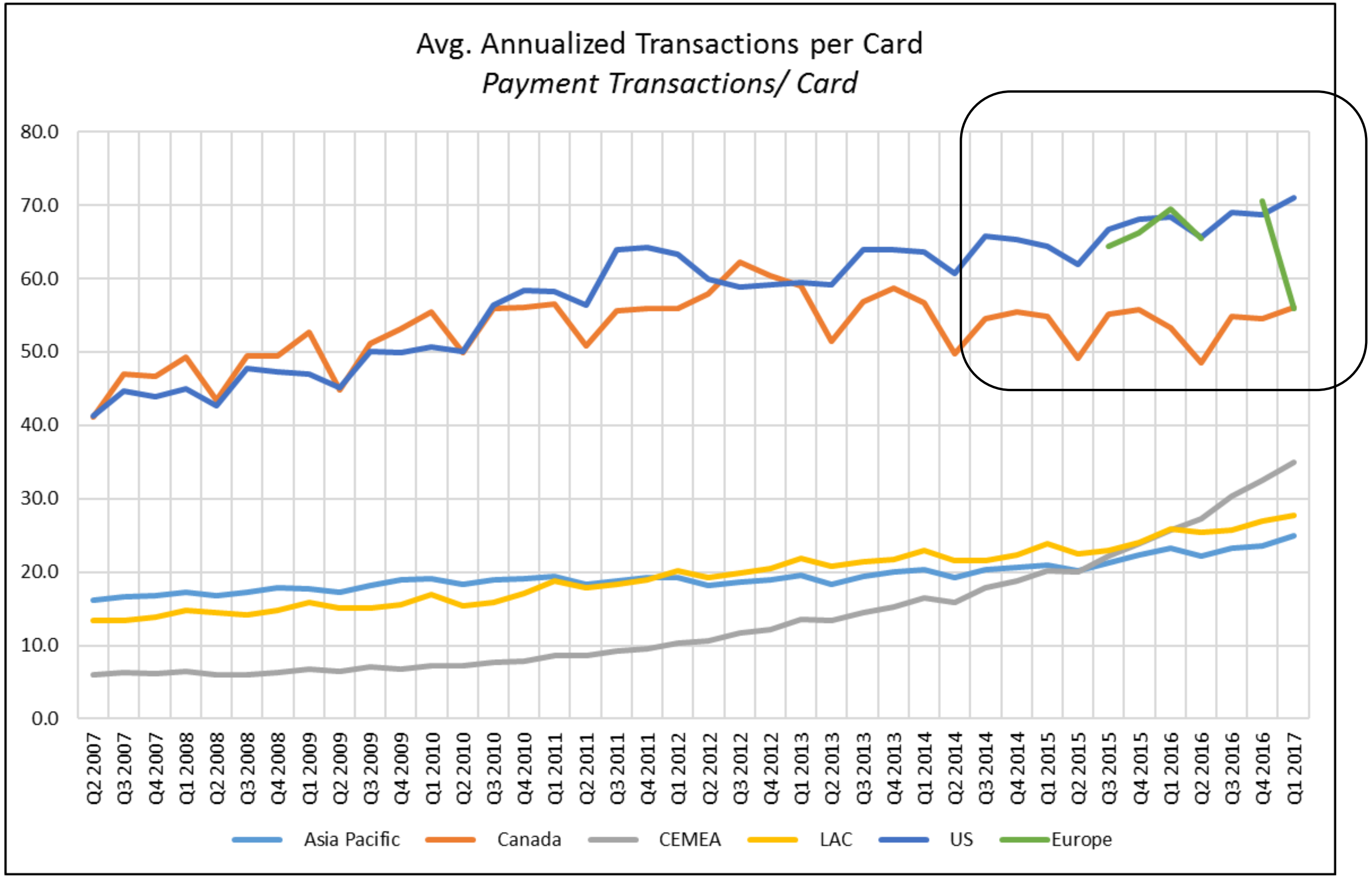




Takeaways from Card Spend

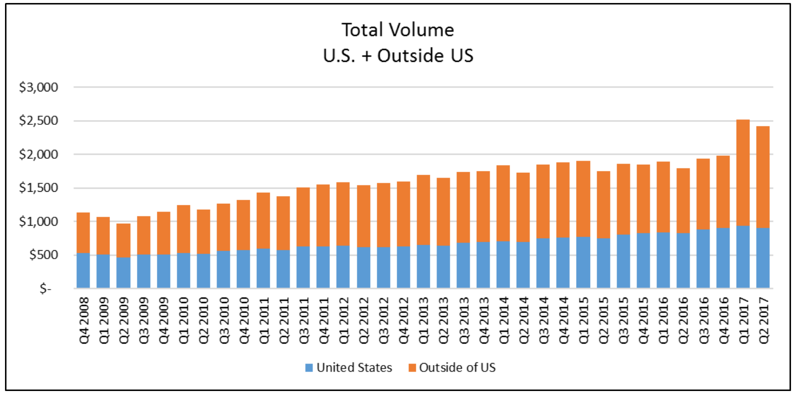
- North American card spend is higher than any other region (prior to Visa Europe transaction)
- Canada card spend began declining around the time oil prices declined
- US spend per Visa card has increase by about 35% since 2008
- The average transaction size has been declining, largely due to international growth, which has a preference for debit (lower transaction volumes)

Card Usage by Geography

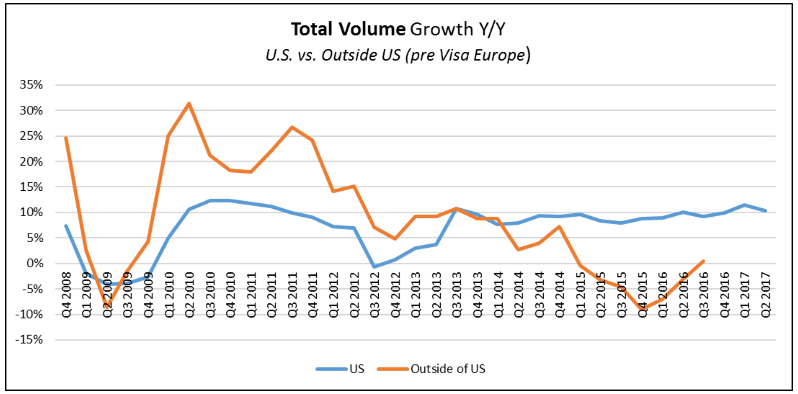


U.S., Canada, and Europe transact more in cards, at about 1.5x to 2.5x other regions. However, other regions are slowly increasing their usage, which will result in a virtuous cycle.

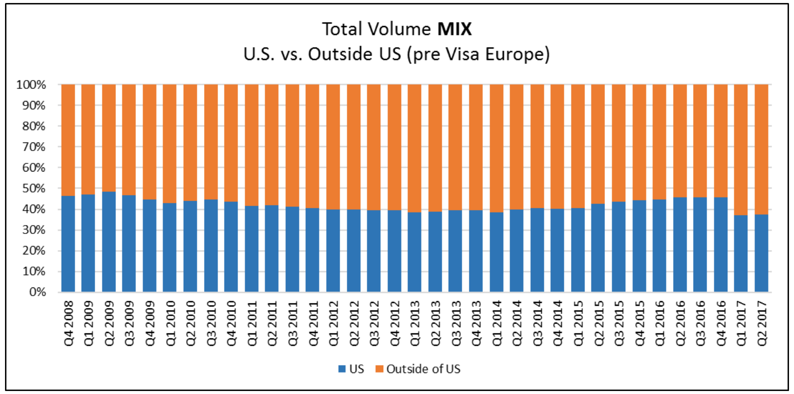
Total Volume



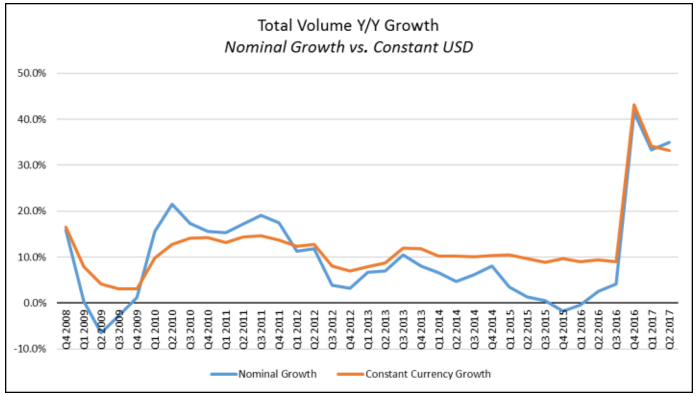
Total



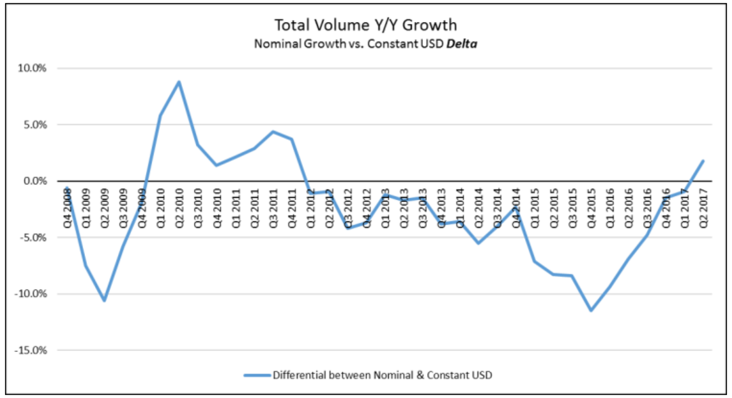
Growth



Mix

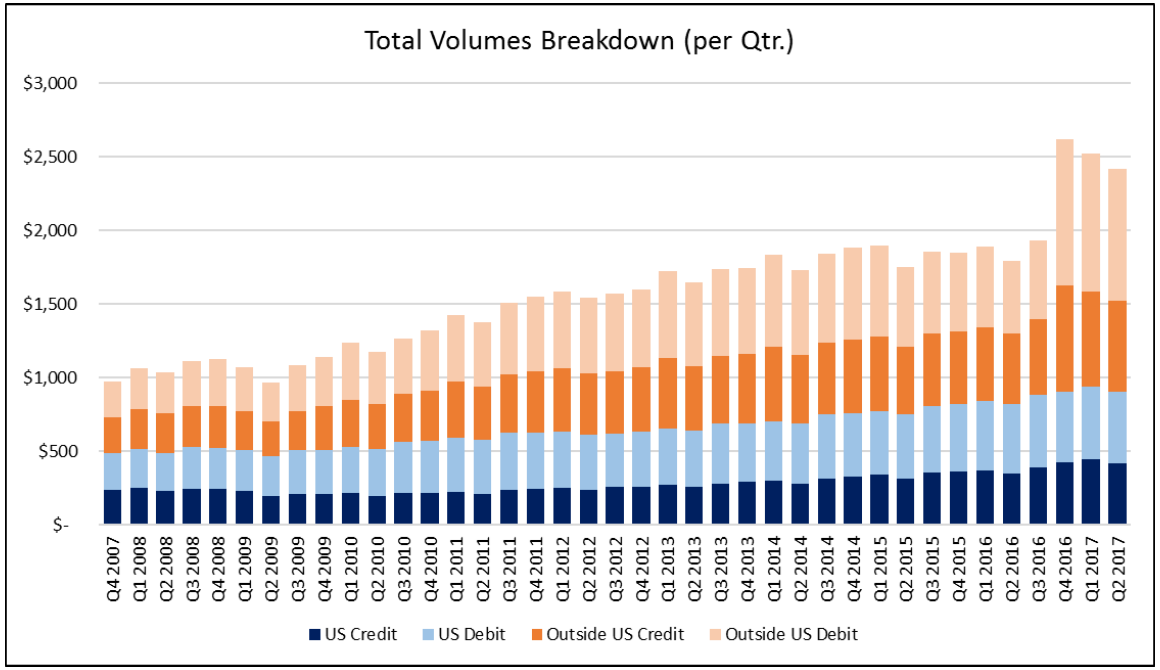


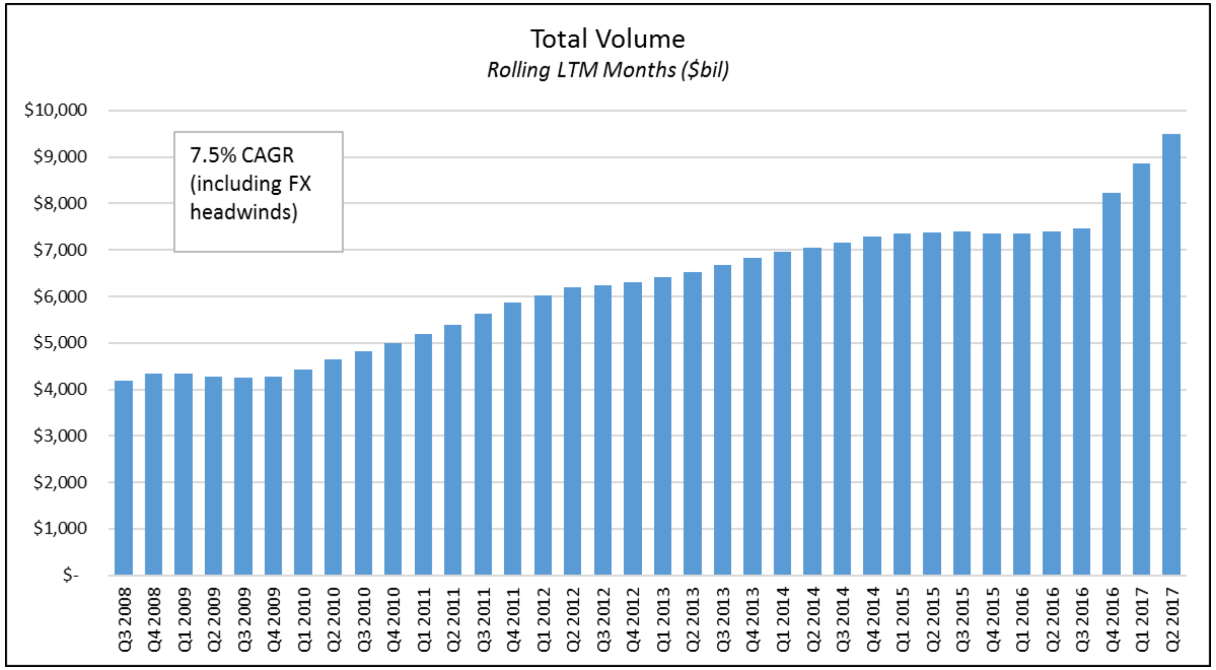
Nominal vs Constant USD



Delta between

Total Volume



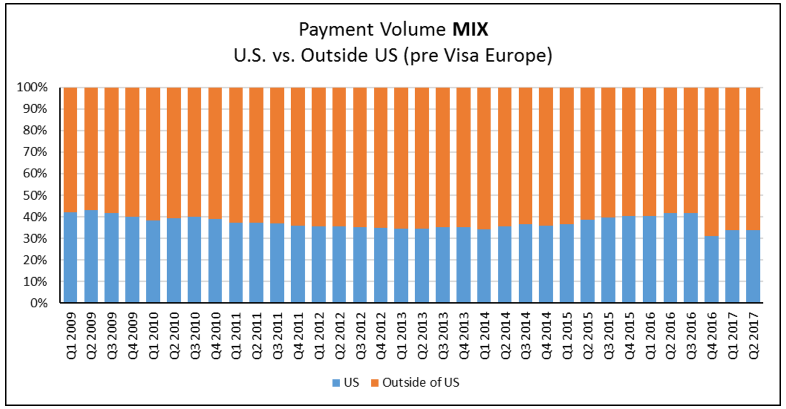


Takeaways from Total Volume (payment + cash)

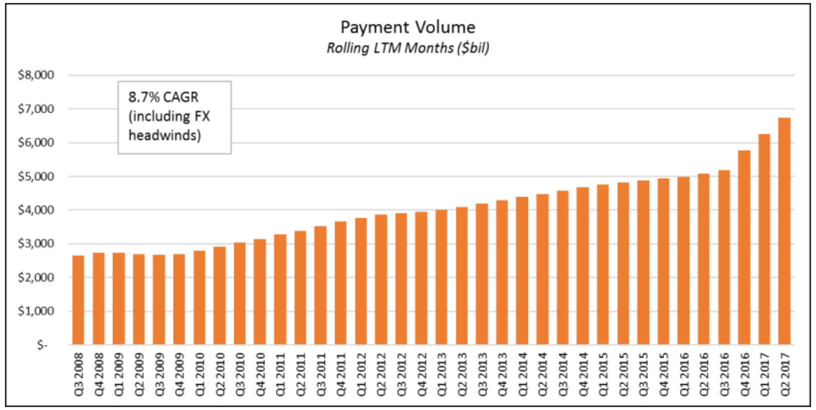
- Prior to Visa Europe, total volume grew at a 7.5% CAGR, including the headwinds from FX
- Total volume is ~ $9.5 trillion, a staggering number
- ~ $4 trillion in US, remaining ~ $5.5 trillion outside the US
- Credit growth has been a nice driver of total volume
- On the same transaction volume amount, credit and debit have similar yields due to the fact that debit transaction volumes are smaller, and thus it takes about 3x the number of debit transactions to equal the size of a typical credit (from Visa commentary), yet Visa earns processing fees on each of those debit transactions

Payment Volume

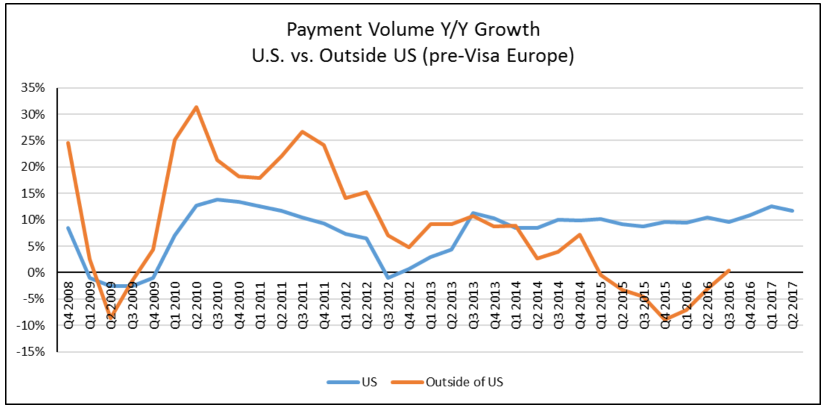
Mix



Volume Amount ($)



Growth

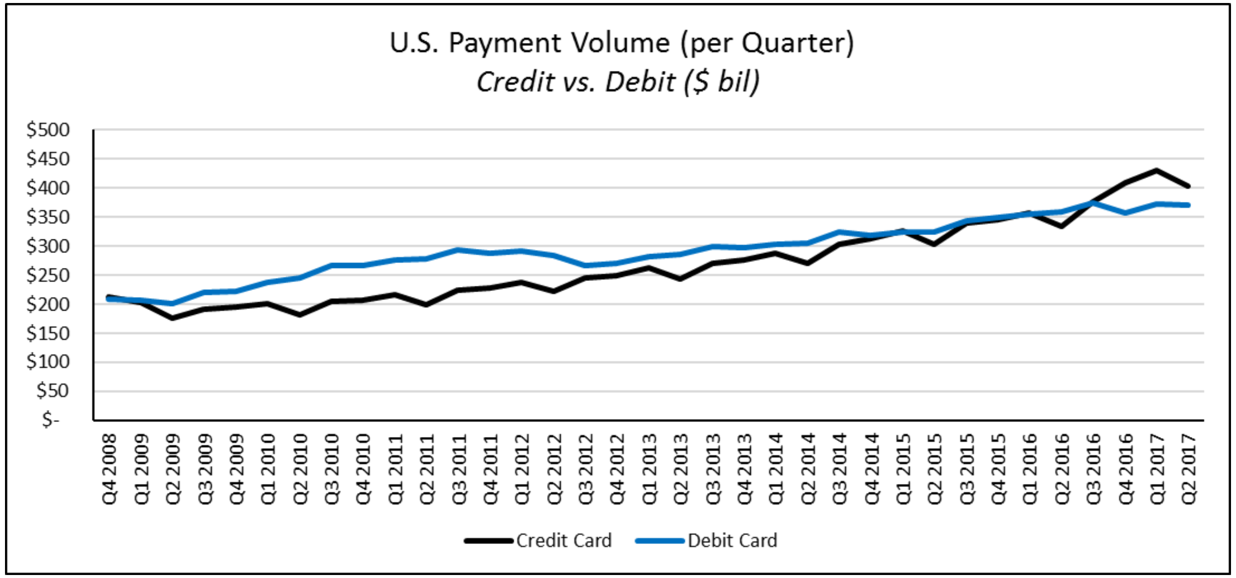


Takeaways from Payment Volume:

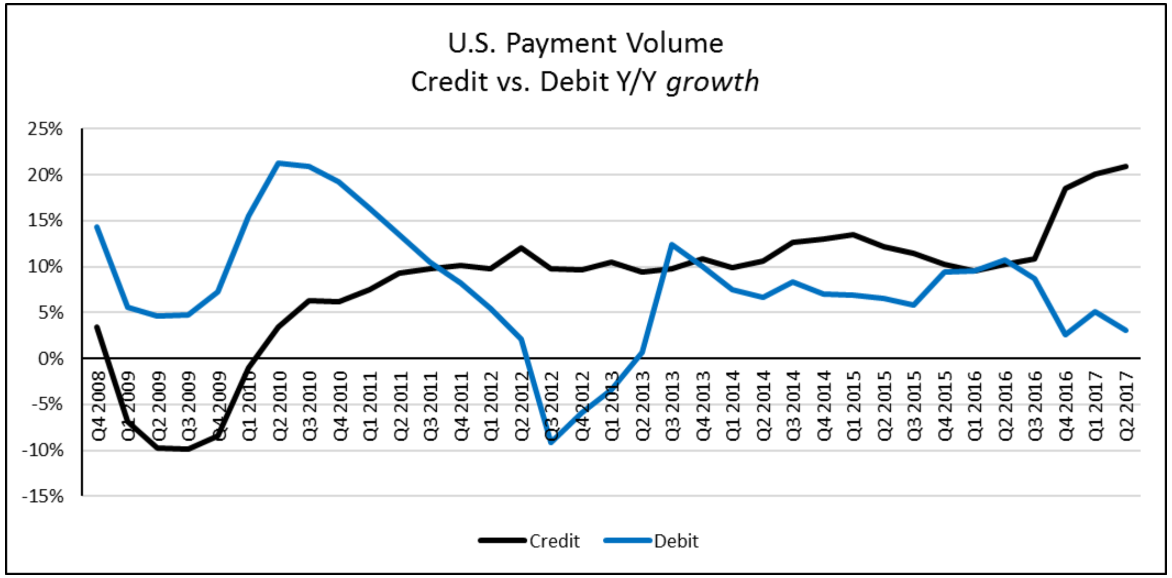
- Payment volume is just under $7 trillion
- Prior to Visa Europe, payment volume grew at a 8.7% CAGR, including the headwinds since 2011 in foreign exchange
- The US only accounts for mid-30% of payment volume/ outside US is ~65%
- The US has been growing faster than outside-US, but most of this is FX related
- The US has been growing ~10%+ since 2013, largely due to strong credit (credit revenue yields are > than debit yields)
- The hiccup around 2012 was due to Visa's debit due to Durbin, which saw a lot of PIN debit business decline; however PIN was only 2% of revenues (limited impact)

Payment Volume: U.S.

Credit vs. Debit



Credit vs. Debit Growth Y/Y

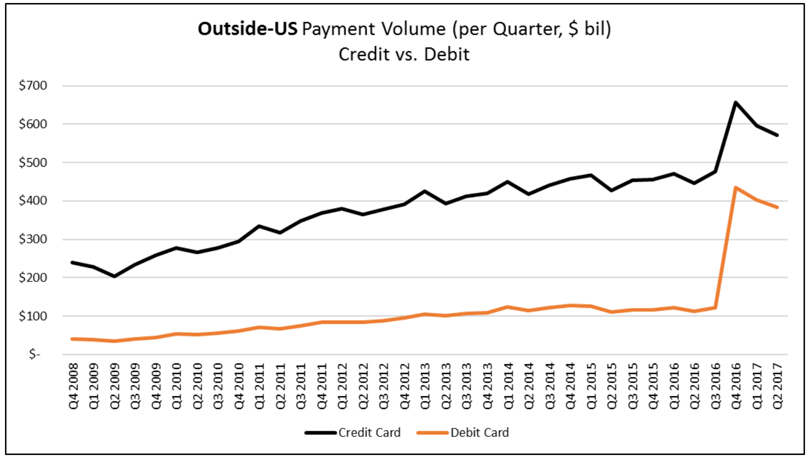


Takeaways from Payment Volume in the U.S.:

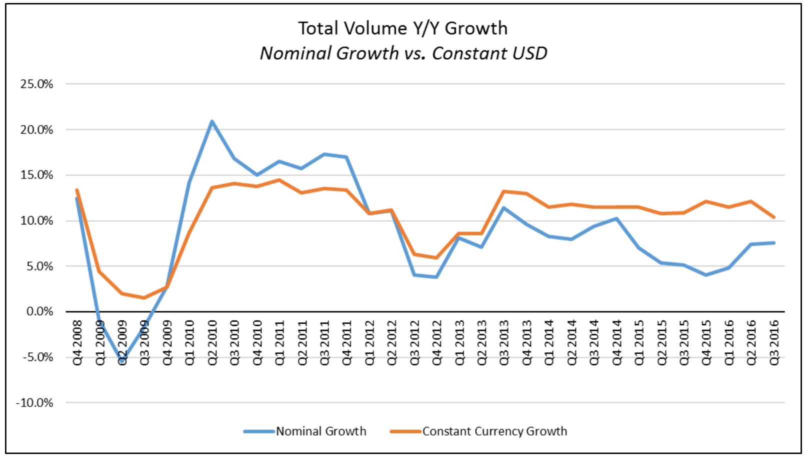
- Credit and debit volume are not too dissimilar in the US
- Credit outpaced debit in the last few quarters due to partnerships with Costco and USAA
- Debit volume, for Visa, was mostly impacted by Durbin, and credit volumes were mostly impacted by decline in discretionary purchases by the US consumer following the US recession
- Credit volumes, despite the US recession, were only negative for a year, and have been above 10% since 2011
- The factors impacting the usage of debit and credit is something that makes Visa (and MasterCard) attractive, as they are less impacted by the consumer spending habits on one product type

Payment Volume: Outside-U.S.

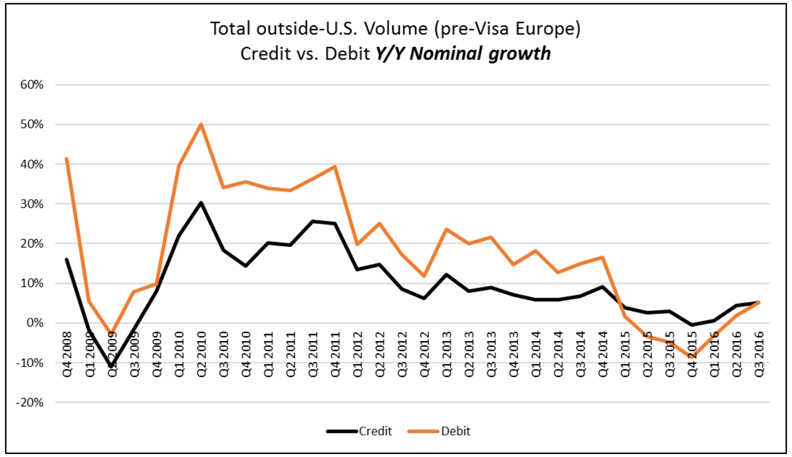
Mix: Credit vs. Debit



Growth: Nominal vs. Constant USD



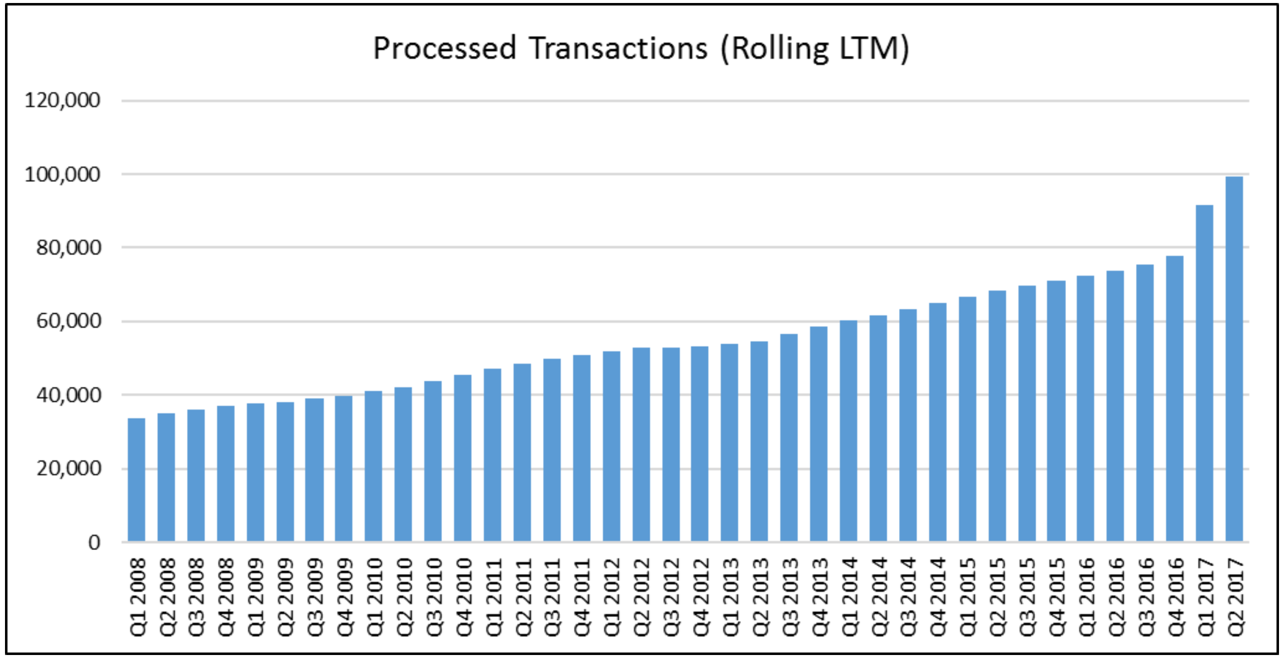
Credit vs. Debit: Nominal Growth



Takeaways from Payment Volume outside of the US:

- Credit payment volume was 4.5x debit, prior to Visa Europe
- Since late 2011, nominal payment growth has trailed constant USD growth due to FX headwinds
- Constant USD payment growth internationally continues to grow > 10%
- Payment volume during the U.S. recession hurt international volumes, but they still remained positive throughout
- 2015 was the first year credit volume growth outpaced debit, on a nominal basis

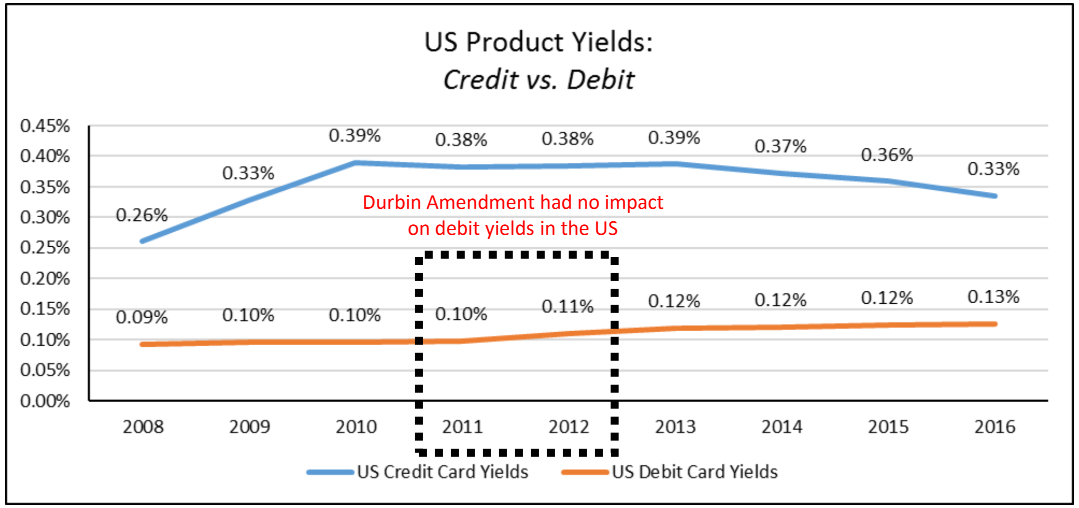
Processed Transactions

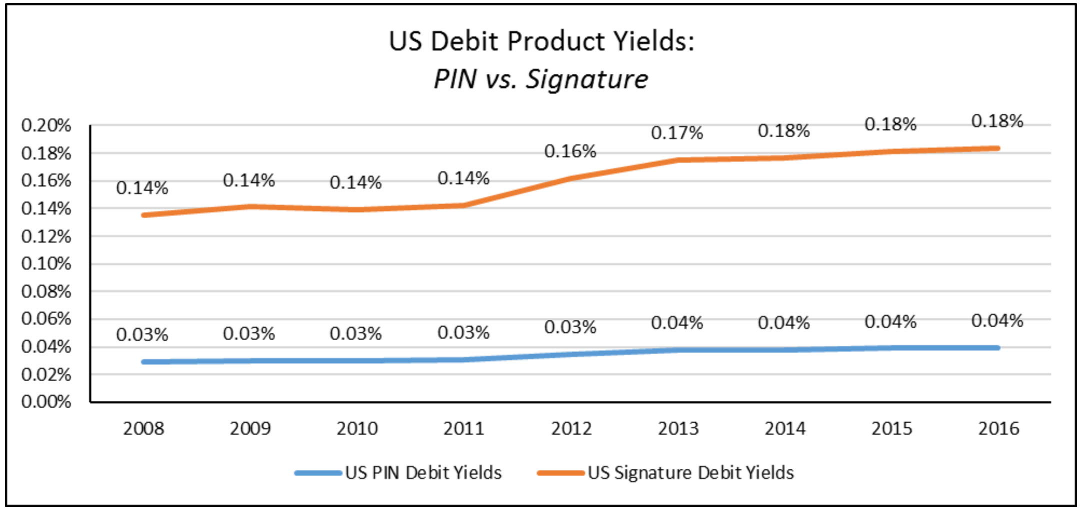


Takeaways from Processed Transactions:

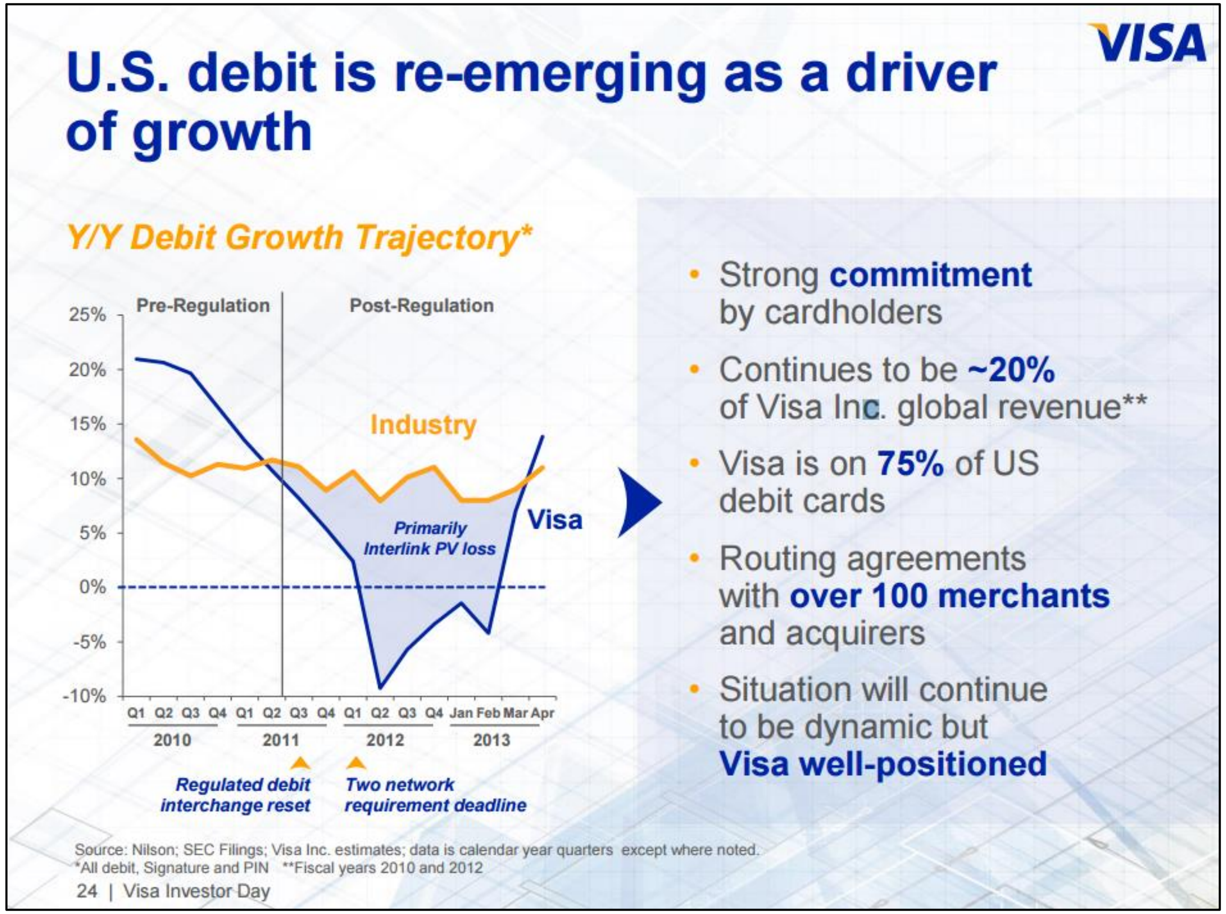
- At this point, over 100 billion transactions have been processed by Visa over the last 12 months, run rate > 120 billion/yr.
- *Prior* to the Visa Europe transaction, here are the CAGRs:
    - 3 year = 10.0%
    - 5 year = 8.8%
    - 8 year = 9.8%
- Processed transactions are the primary metric that determines data processing fees, where Visa earns a fixed fee of around $0.07 per transaction processed

Impact from Durbin Amendment





This are my estimates, based on Visa historical commentary



Visa: Competitive Advantages

- **Scale** Advantage: High fixed cost, low variable cost business where each incremental transaction is ~zero incremental cost

John Partridge Visa Inc – President

Well, like you said, we don't really manage to a margin. We really -- the metrics that we really are most interested in managing to are our revenue growth and our earnings per share growth. While our incremental margin is higher than our operating margin, we run a scale business and so when you add a transaction to a scale business that marginal cost is going to be significantly lower than your average cost.

But we have to fund investments in our products and services. We have to [incentivate] customers through our marketing programs and our marketing spend. We have to work and [incentivate] issuers to issue those cards and so there is just a lot of input that goes into the equation for our operating margin.

So I am not going to speculate that it will go up higher. It's just we don't manage to that but there is a lot of input that goes into that.

6/12/12 William Blair Conference

Bill Sheedy Visa Inc. – Group President Americas

It's doing it today. And as much as people talk about the fixed acquirer network fee, FANF, people lose sight -- the industry has lost sight of the fact that we reduced the variable fees, the authorization fees at the same time.

So merchants and acquirers with whom we've now been having discussions look at that and say, all right, so now I have an incentive to drive more transaction volume onto the network because I've got a lower unit price. And the thing that I think you all ought to feel good about is that the unit pricing that we've got with that lower variable fee, which is roughly about 25% discount, is still well, well north of our marginal costs of processing that next transaction, which are close to zero.

5/17/2012 JP Morgan Chase TMT Conference

- **Brand** Advantage: merchants, issuers, governments are aware of the brand and want to utilize the brand to increase their own business/ economy

And then relative to us versus our competitors, I've spent a fair amount of time traveling around outside the country since I have been in the role, and I tell you it has been really surprising to me just how much the conversation is not about me selling Visa; it is about them talking about how they want Visa to be a meaningful player locally. It is Visa, it is the power of the brand.

It is the knowledge that we have, it is the quality of our network in even places where there are national payments networks like China, which we can certainly talk about. They, including the government, understands that we can do things and we've got knowledge that people want us to participate locally in those marketplaces.

3/20/2013 Charlie Scharf at Barclays

Metrics: Yields on Volume and Transactions

- Durbin caused Visa to make adjustments, including the FANF fee (captured in data processing fee) and reduced variable transaction fees (included in data processing)
- Introduced an incentive offset based on volume, which shows in service fees
- These changes made "*data processing yield*" increase, but Visa thinks the "*net yield*" for Visa is a <u>better</u> indicator
- The lowest yielding product is Interlink (which is PIN debit) which took the largest hit with Durbin, due to regulation on cards having multiple unaffiliated card networks for PIN routing, whereas prior to Durbin Visa signed a tremendous amount of exclusive PIN debit routing deals
- As the volume for PIN debit declines (which is part of the denominator in calculating 'data processing yields') then the DP yield increases
- What influences "Data Processing":
    - Debit, including Interlink (PIN) and VisaNet (Signature) volume and yields
    - CyberSource is in the DP line
- Joe Saunders (10/31/2012): "I'd say our growth in the **United States** -- particularly in the **credit** business, which is our **highest yielding business** -- is significantly stronger from any of our competition, and it continues to grow."
- What is the strongest near-term driver for Visa: "Number 1, US credit card volume growth; number 2, US debit volume growth; number 3, international credit card. Then comes international debit, followed by cross-border volume growth. International credit card." (03/2013)
- Greatest emerging payment growth driver for Visa: "E-commerce, mobile payments in developed markets, mobile payments in developing markets, and pre-paid." (03/2013)

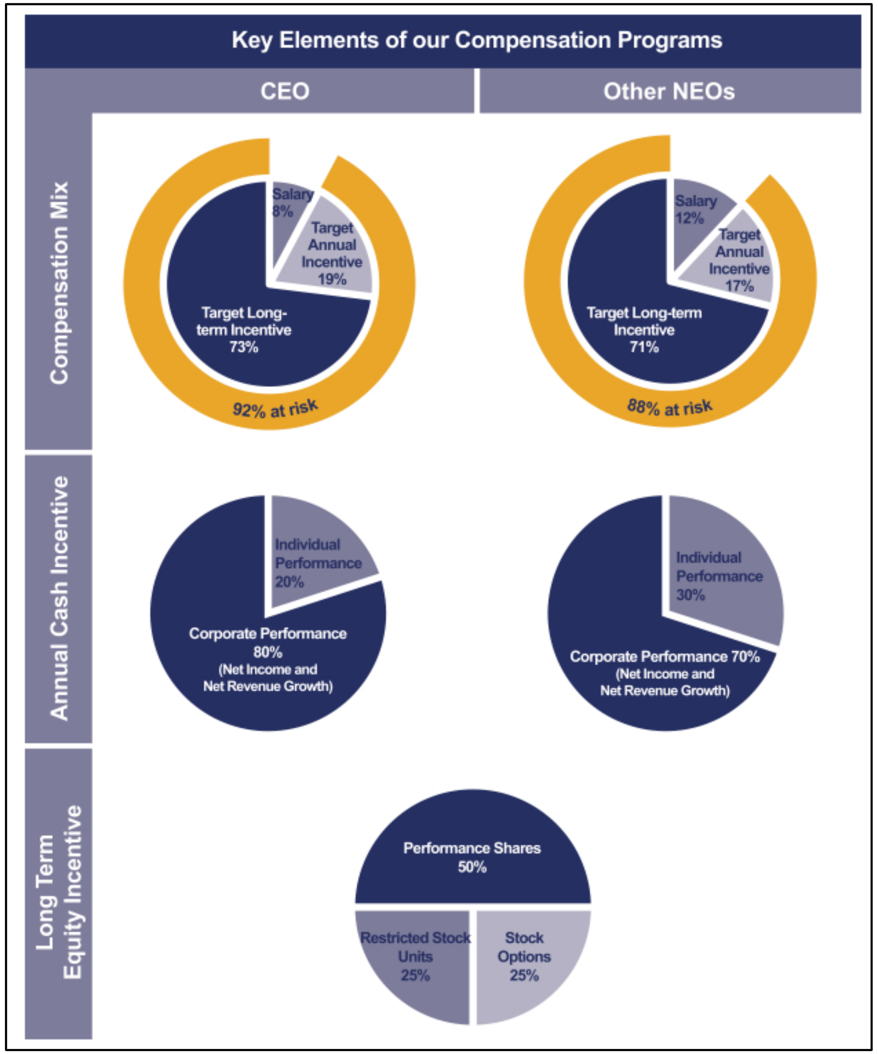
Metrics: Yields on Volume and Transactions

- Near-term focus for Visa: “Revenue growth, operating margin expansion, EPS growth, or returning capital? **Revenue growth number one.**”
- Most significant risk or challenge for Visa: “Number 1 is industry regulation, number 2 is growth in consumer spending, 3 is disintermediation from new and emerging payment models, and then lastly is pricing power.”
- The **highest yielding transaction we have globally is our cross-border transaction**. Roughly speaking, **you have 10 times the yield both in the multicurrency fees and other fees that we charge in those transactions**, as well as the fact that all of our transactions globally when they happen cross-border run over our network. So those yields are very attractive. We like that business very much. But a stronger source of what we consider to be long-term fundamental growth is when we start driving domestic volume and domestic growth
- “Over the long term, we view **debit** as the most compelling way to penetrate cash and check. It's just natural to consumers and all of the market research that we do drives that home.” (06/2013)
- “In the US given that 61% percent of Visa's business is debit, we've done a very nice job of growing that category.” (06/2013)

Executives

- Interesting how little of tenure some of the key executives have with Visa
    - Alfred Kelly Kr (CEO) - joined Visa December 2016
    - Lynne Biggar (Exec VP/ Chief Marketing and Communications Officer) – joined February 2016
    - Ryan McIlnerney (President) – joined May 2013
    - Vasant Prabhu (CFO, Exec VP) – joined February 2015, prior was CFO of NBCUniversal
    - Rajat Taneja (Exec VP, Technology) – joined November 2013
    - Kelly Tullier (Exec VP, General Counsel and Corporate Secretary) – joined June 2014
    - William Sheedy (Exec VP, Corporate Strategy, M&A, Gov't Relations) – Joined 1993
    - Ellen Richey (Vice Chairman, Risk and Public Policy) – joined 2007

- Of the 8 executives lifted in their proxy, the average tenure is about 6 years
- Excluding William Sheedy, the other 7 executives have been at Visa for about 3.5 years



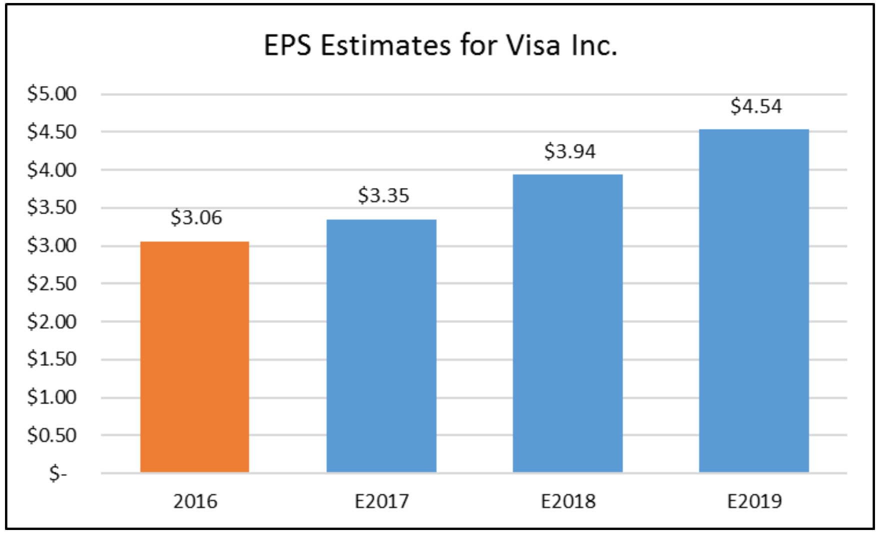
Executive Compensation

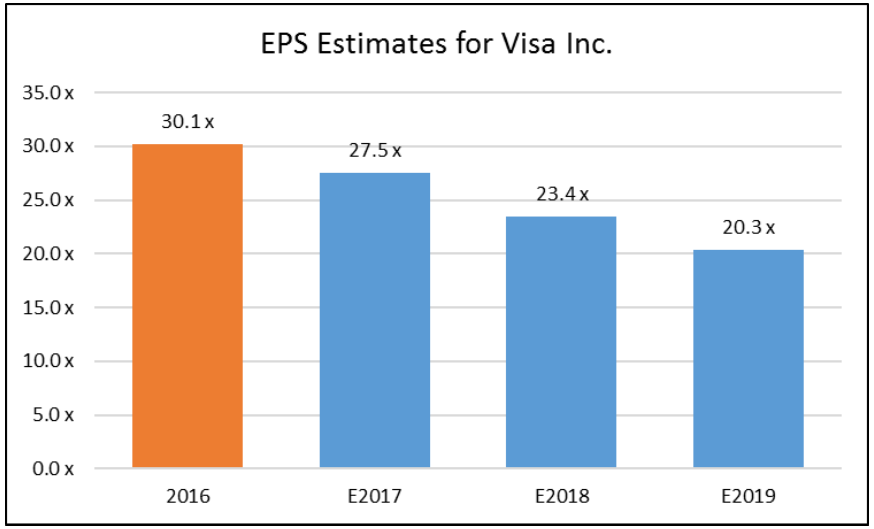
- Annual incentive plan largely (80%) based on corporate performance, versus individual performance
- Based on net income and net revenue growth. Revenue target around 7%, but threshold is 5%, max is 8%
- LT incentive awards based on 3 year total performance (a) annual EPS, and (b) modified based on rank relative to S&P 500
- For performance shares awarded in 2015, 1/3 based on EPS goals for 2016, remaining 2/3 based on EPS for 2017/2018
- Alfred Kelly received a one-time "make whole" equity award of $6.3 million since he forfeited certain bonuses with prior employer
- Visa required their executives to have ownership of Visa stock:

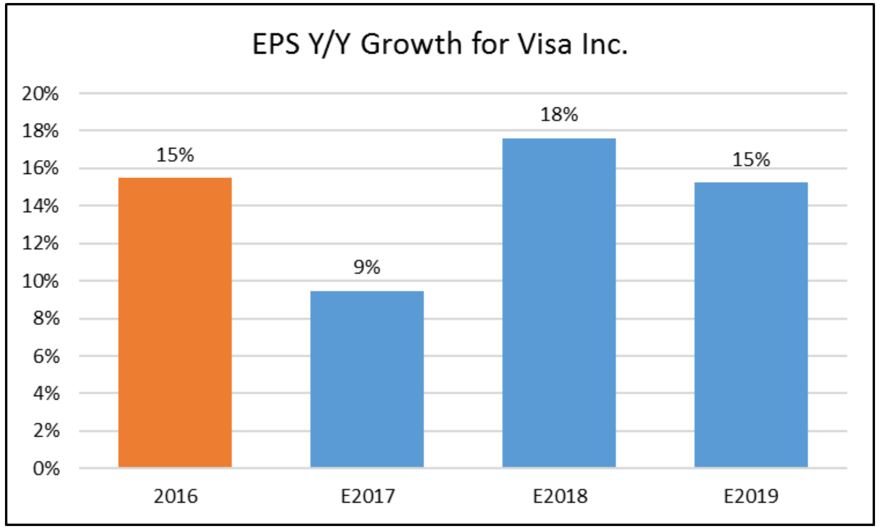
Officer	Stock Ownership Guidelines
Charles W. Scharf	6 x base salary
Vasant M. Prabhu	4 x base salary
Ryan McInerney	4 x base salary
Rajat Taneja	4 x base salary
Ellen Richey	3 x base salary

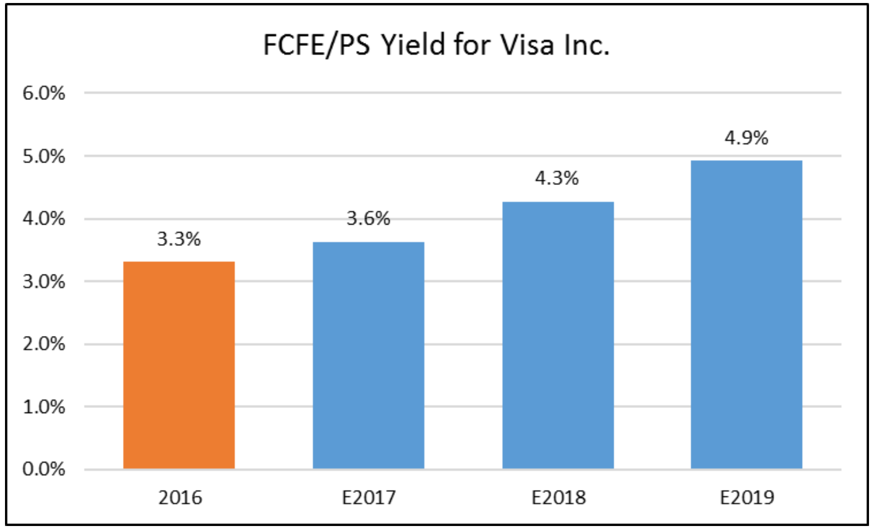
Name and Principal Position	Base Salary ($)(1)	Incentive Compensation: Annual Incentive Plan ($)(2)	Incentive Compensation: Value of Performance Shares (target value) ($)(3)	Incentive Compensation: Value of Stock Options ($)(4)	Incentive Compensation: Value of Restricted Stock/Units ($)(4)	Total ($)
Charles W. Scharf(5) *Chief Executive Officer*	1,250,000	3,087,500	n/a	n/a	n/a	4,337,500
Vasant M. Prabhu *Executive Vice President and Chief Financial Officer*	850,000	1,230,375	2,775,000	1,387,500	1,387,500	7,630,375
Ryan McInerney *President*	750,000	1,153,125	2,875,000	1,437,500	1,437,500	7,653,125
Rajat Taneja *Executive Vice President, Technology*	750,000	960,938	3,100,000	1,550,000	1,550,000	7,910,938
Ellen Richey *Vice Chairman, Risk and Public Policy*	600,000	712,500	1,025,000	512,500	512,500	3,362,500

Valuation









Using share price of $92.21 as of 5/12/2017

Valuation Thoughts

How much would an investor pay for:

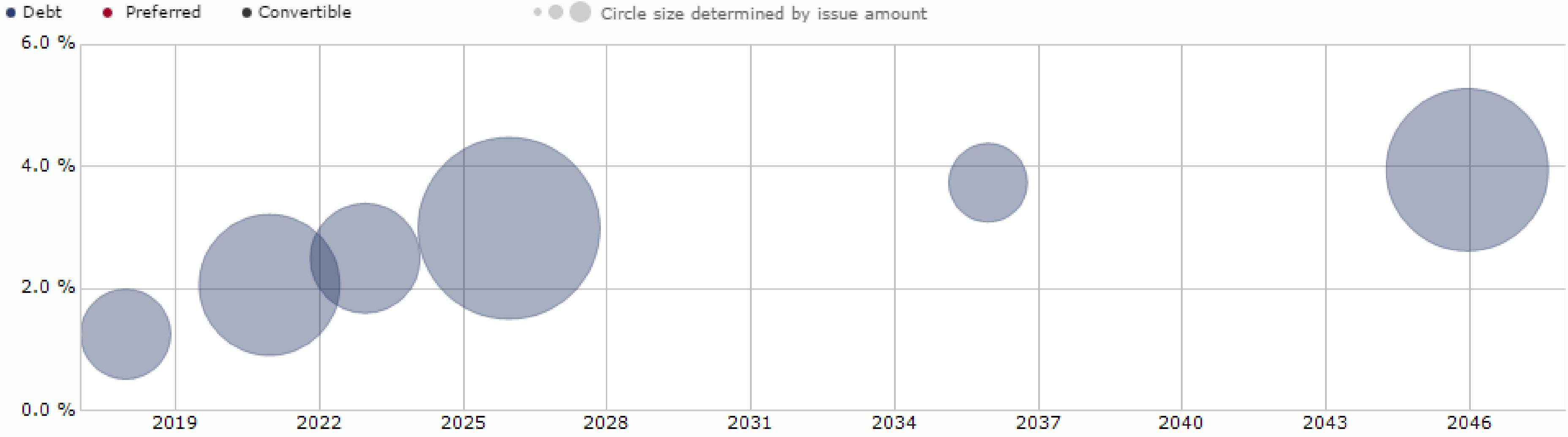
- A company that has multiple drivers for top line growth: macro, secular, industry competitiveness, some pricing power
- Could easily grow revenues 7% + in a low growth environment
- Low fixed cost base, minimal incremental costs leads to continued margin expansion
- Margin characteristics are impressive:
  - 69% EBITDA
  - 45% Net Income
- Very conservative balance sheet, with 1.2x debt-LTM EBITDA, at very low rates
- Operates in a global duopoly structure with MasterCard, where it is *not* winner-takes-all
- Capital needs are ~3% of EBITDA (minimal)
- Almost 100% of FCFE is returned in the form of a dividend + share repurchase

*7% Revenue + 1% Margin Expansion + 0.7% Dividend + 3% Share Repurchase = **~12%+ total return** assuming no multiple expansion, in a 2-4% global GDP environment*

Pre Visa Europe (2008 - 2016)	3 Yr	5 Yr	8 Yr
Service Fee Revenue	8.0%	9.6%	10.4%
Data Processing Fee Revenue	10.6%	12.5%	14.8%
International Transaction Revenue	12.2%	11.7%	13.2%
Total Revenue	8.6%	10.4%	11.6%
Operating Expenses	4.4%	6.7%	0.3%
EBITDA	10.9%	12.7%	27.8%
EBIT	11.1%	12.7%	29.8%
Total Volume	3.6%	5.3%	7.2%
U.S.	8.9%	7.4%	6.7%
Outside U.S.	-0.1%	3.7%	7.7%
Payment Volume	7.3%	7.6%	8.6%
U.S.	9.6%	7.8%	7.4%
Outside U.S.	4.6%	7.3%	10.3%
Processed Transactions	10.0%	8.8%	9.8%
Account Growth	6.5%	6.5%	6.5%
Card Growth	5.6%	6.0%	5.6%
Credit Cards	5.2%	4.1%	1.9%
Debit Cards	5.9%	7.1%	8.3%

Conservative Balance Sheet

Yield to Maturity



Name	Maturity Date	Amount $(Mil)	Credit Quality	Price	Coupon %	Coupon Type (Fixed/Floating)	Callable	Rule 144A	Yield to Maturity %
Visa 3.15%	12/14/2025	4,000.0	---	101.2	3.150	Fixed	No	No	2.99
Visa 4.3%	12/14/2045	3,500.0	---	106.1	4.300	Fixed	No	No	3.94
Visa 2.2%	12/14/2020	3,000.0	---	100.5	2.200	Fixed	No	No	2.06
Visa 2.8%	12/14/2022	2,250.0	---	101.6	2.800	Fixed	No	No	2.49
Visa 1.2%	12/14/2017	1,750.0	---	100.0	1.200	Fixed	No	No	1.25
Visa 4.15%	12/14/2035	1,500.0	---	105.6	4.150	Fixed	No	No	3.73

Summary on Visa Inc.

- Visa operates globally in a duopolistic-type environment (China UnionPay is 99% China/ MA and V are excluded from China currently)
- Beneficiary of global macro growth and secular tailwinds (both current, long-term) of moving from cash/check to cards
- While some markets may be more difficult to capture (India, China) and some markets have cultural preferences for using cash (Germany, Japan), there is still *ample* opportunity for Visa in their current markets
- The Visa Europe transaction will be beneficial, and the expectations are likely under-stated due to:
    - Current political instability and uncertainty across Europe
    - Low growth in Europe
    - FX headwinds from strong USD over last few years masks decent volume
    - Visa now retains cross-border volume that it previously did not
    - Opportunity for re-branding, improving their relationships in Europe, where now they will look to add more value to their partners
    - Cost synergies + re-pricing initiatives
- At ~23.5x (this is an approximate, don't get overly focused on the *precision* of these numbers) 2018 equity cash flow, this likely represents a slight undervaluation of the business
- Execution on Visa Europe + FX headwinds subsiding + additional revenue opportunities = could be some catalysts for earnings growth
- If rates rise = due to increased growth = Visa's model benefits due to increased payments volume being inflationary
- Largest concerns are: cyber security, uncertainty around blockchain, overestimated opportunity in India and China, and regulation around certain fees (cross-border, Signature debit)

Summary on Visa Inc. vs. MasterCard

- In almost all metrics, Visa is about 1.5x - 2x the size of MasterCard
  - $8.8b total volume vs. $4.8b for MA
  - Visa has $5.2b total volume outside US, MA has $3.3b
  - $6.3b in payment volume versus $3.5b for MA
  - Visa has $3.2b LTM outside of US in payment volume, versus $2.2b for MA
  - Visa has 140 billion payment transaction (LTM) versus 69 billion for MA
  - Visa has 3.1 billion cards, MA has 1.7 billion
  - Visa has $20.8b (LTM) in gross revenues, versus $16b for MA
  - Visa has about $8 billion in FCFE vs. $4.2b for MA
- MasterCard earns about $2.5 billion in "other revenues", whereas Visa only earns about $800m in other revenues
  - MA growing this revenue line by 16% CAGR over last 8 years, but has been ramping it up the last 3 years, growing it a 22% CAGR
  - This is one of the larger differentiators in terms of business model between Visa and MasterCard
- As international expected to outpace the US in terms of transaction growth and payment volume growth over the next ~5 years +, MasterCard currently has the advantage as being a more international company
  - MA more leveraged financially to international growth
  - However, Visa could make a larger push internationally with the Visa Europe acquisition
  - Being a global company is beneficial to both companies, as the growth will be more international-based, but can largely benefit only the global players due to the virtuous cycle of merchant/issuer/customer acceptance

Summary on Visa Inc. vs. MasterCard

- MasterCard is far more of an international company than Visa
  - 62% of revenues outside U.S. vs. 52% for Visa (including Visa Europe)
  - 69% of total volume outside US., versus 63% for Visa
  - 63% of payment volume outside US., versus 55% for Visa (prior to Visa Europe, only 45% was outside U.S.)
  - 66% of payment transactions are outside US, compared to 57% for Visa (prior to Visa Europe, Visa had only 43% of payment transactions outside US)
  - 77% of their cards are outside the U.S., compared to 75% for Visa (prior to Visa Europe, 69% of cards were outside U.S.)
- Visa has the scale advantage over MasterCard
  - Very similar operating expense costs, on absolute dollar terms, for a majority of their expenses (personnel, data processing, advertising and marketing, professional fees)
  - MasterCard has the margin opportunity over V due to their margin being lower as they haven’t leveraged the expense base as much as Visa, due to Visa’s scale over MA
  - Both should see margin improvement, but potential for MA is > than V, in my opinion, as MA’s volume growth will result in higher current leveraging of their expenses due to having a higher cost base than Visa

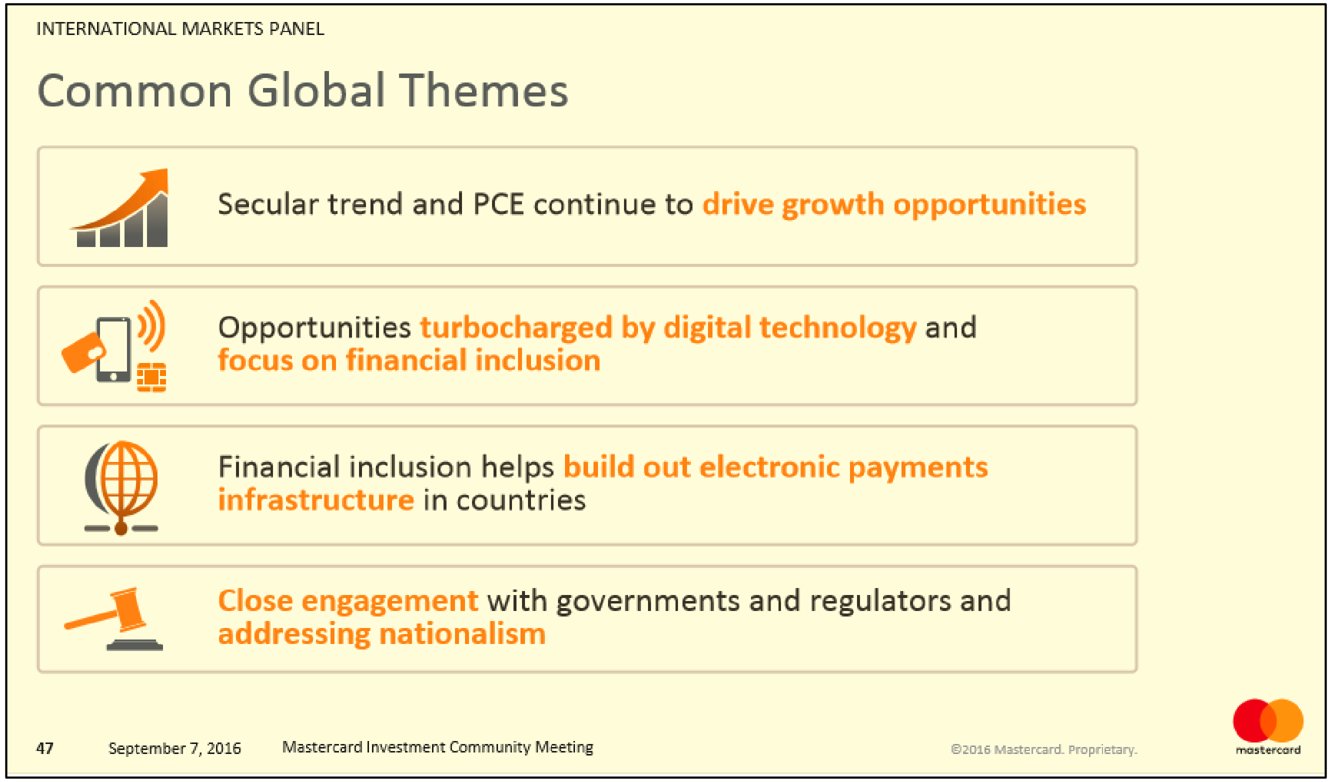
MasterCard (MA)

Overview of Analysis: **MasterCard**

- What is their business model?
- Financial Performance
- Long-term performance targets
- What are the important drivers of their business?
- What are the good/bad characteristics of Visa?
- How does the industry secular trends impact Visa?
- Visa Europe transaction
- How is their market share versus competitors?
- Valuation thoughts
- Balance sheet brief overview

Business Model

- Four party network (like Visa, different from AXP)
- Similar to Visa, with a few exceptions
  - To connect consumers, financial institutions, merchants, governments, and businesses worldwide
  - Enabling them to use "electric payment forms" instead of cash and check
- See the Visa business model slide, as much is overlapped
- MasterCard brands: MasterCard, Maestro, Cirrus
- Offers a multitude of products, predominantly credit, debit, and prepaid cards
- Differences may be in their issuers (financial institutions) are different than Visa, their debit market share is much lower, and they have different business lines versus Visa
  - Advisors
  - Loyalty and Rewards
- Offer safety and security products, information services, consulting

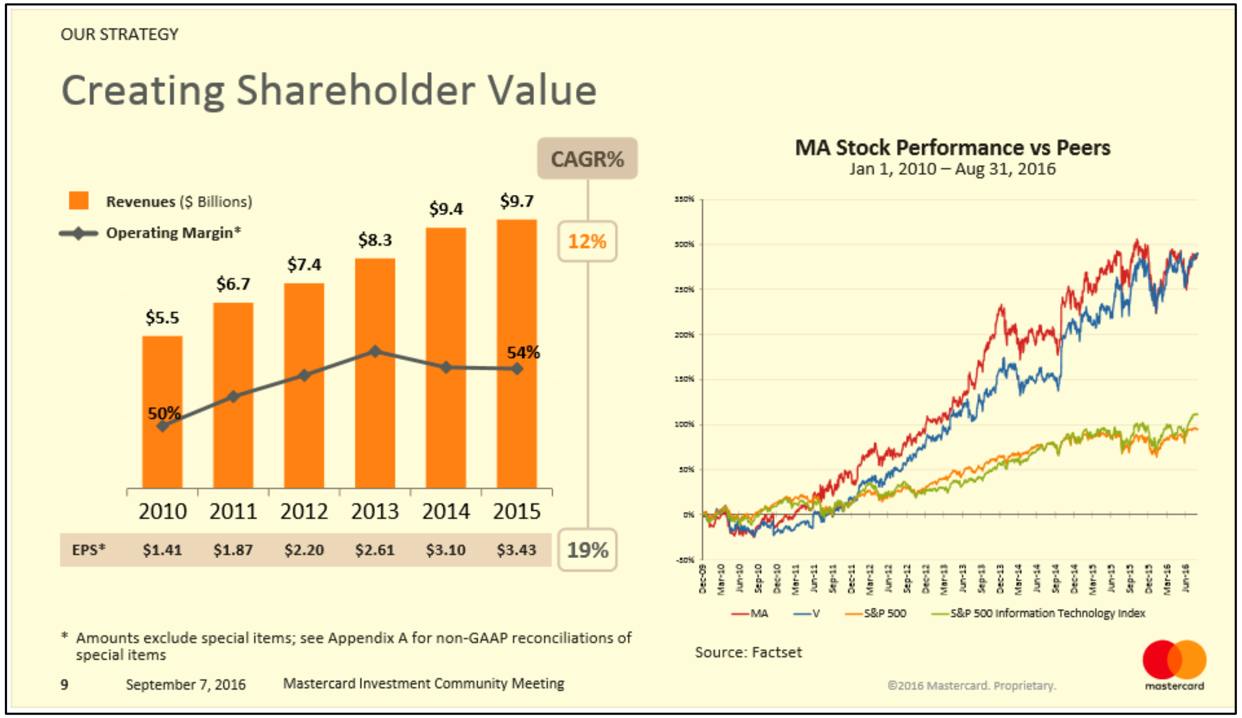


Pillars for growth for MA are similar to Visa: (1) secular growth, i.e. displacing cash with card (2) PCE growth/ macro, (3) other opportunities to increase card penetration such as underbanked, digital and e-commerce, improve infrastructure in emerging markets, and partner with governments

2016 Investor Presentation

Strategy

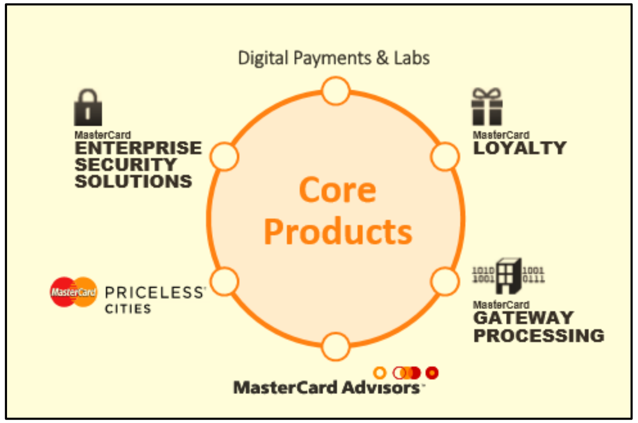
- Strategy is to increase revenues, leverage operating expenses, use cash flow in accretive manner, and it should translate in to strong shareholder performance
  - The business is very similar to Visa's
  - Revenue growth is largely due to macro (GDP + PCE) + secular (conversion of cash to card) and some pricing initiatives
  - Some of their operating expenses are "fixed", and are leveraged with strong revenues
  - Adding their share repurchase program, they have had a 18% EPS CAGR since 2007, and 19% CAGR since 2010
- You can see on the chart (right) how similar V and MA's stock performance has been
  - MA was outperforming due to strong growth, some market share gains, some pricing improvements
  - Overall, both are very similar, though
  - Market opportunity is large enough for both to succeed, and the underlying fundamentals will benefit both businesses

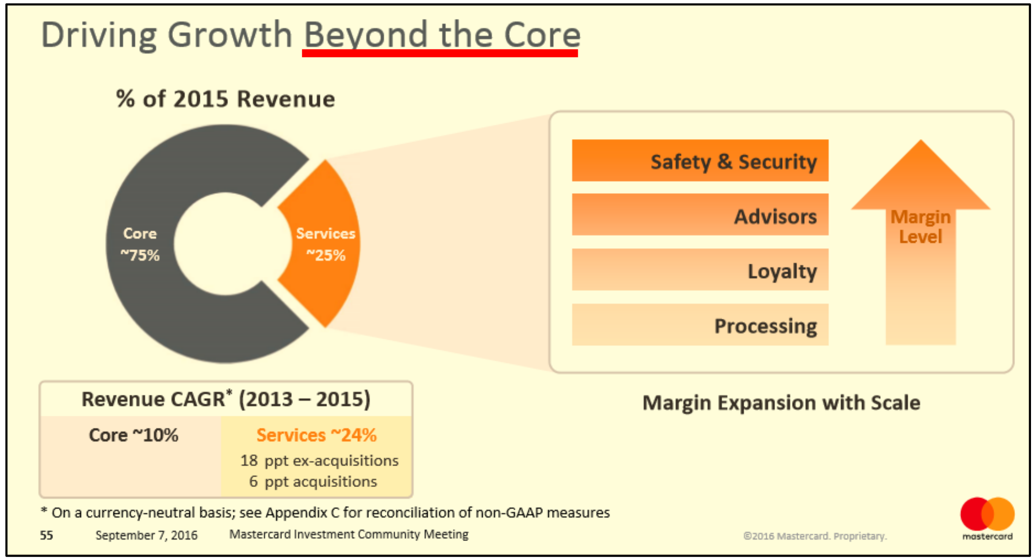


2016 Investor Day Presentation

MasterCard: Other Businesses

- Targeted towards the enterprise customers and enhancing value
- These other businesses are an attempt at "value added" on top of their core business of being a card network, providing fraud security, billing updates, concierge, etc.
- Intent is to drive additional consumer stickiness through "going well beyond the plastic"
    - Self service portals
    - File transfer and delivery
    - Merchant offers
    - Expense reporting
    - Reporting and analytics
    - Account management
    - Enhanced data
- *Other businesses have grown at a 22% CAGR over the last 3 years, about 2x the "core" payment network business*

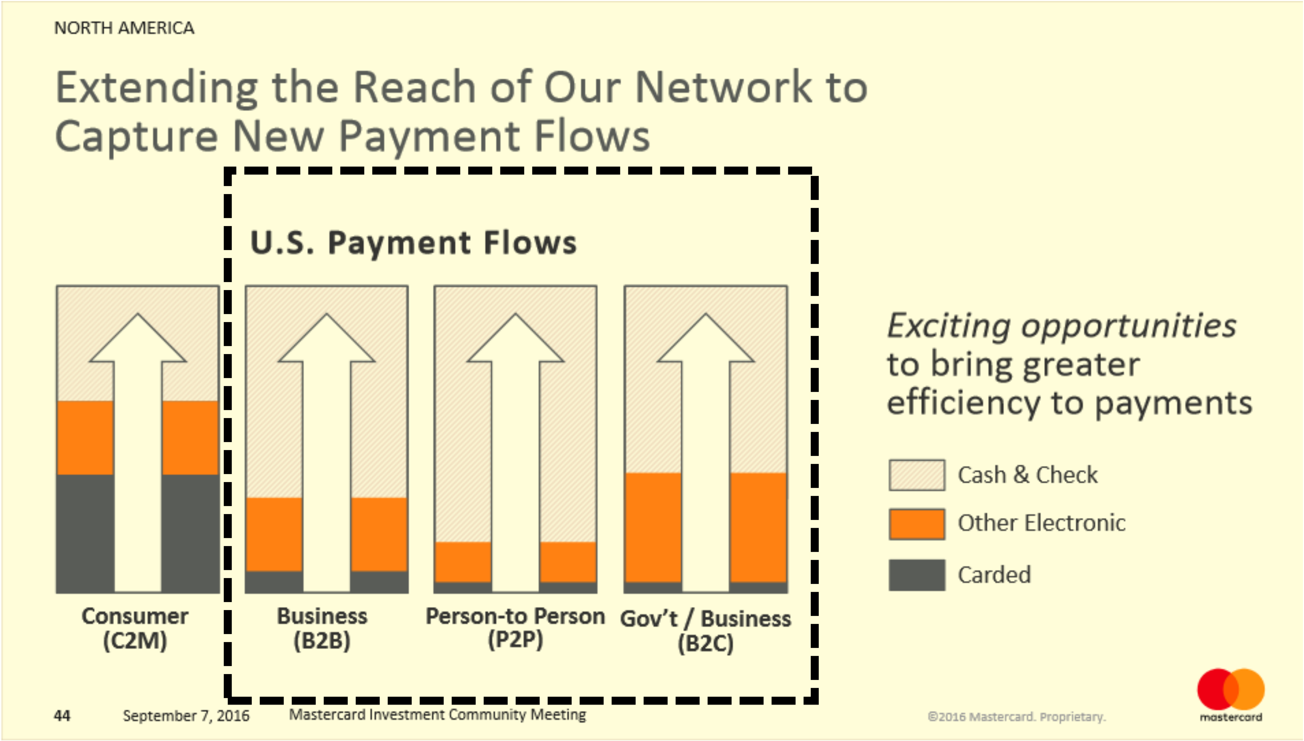




2016 Investor Day Presentation

MasterCard: Other Businesses

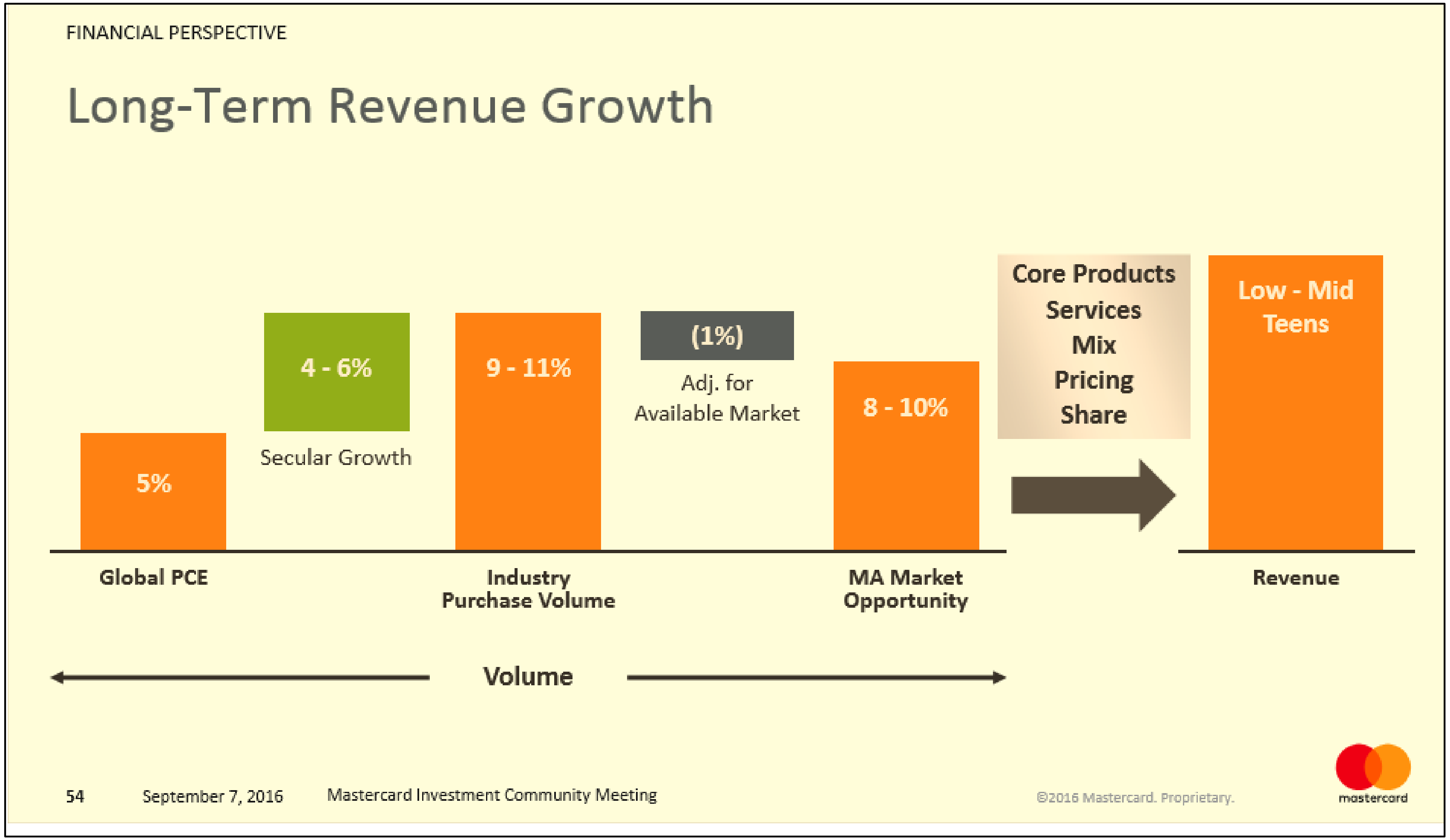
- MasterCard is pushing more to expand to other services beyond C2B
- In other payment flows, cash/ACH is exceptionally high as a % of transaction volume



2016 Investor Day Presentation

MasterCard: Revenue Drivers

- An exceptional illustration by MasterCard of the underlying drivers of revenue growth in the future, which I have discussed
  - Macro = Global PCE
  - Secular = converting more cash and check payments to card
  - Adjust for market opportunity and market share growth
- In my opinion, the <u>largest</u> factors determining an investment in Visa and MasterCard are based on:
  - Card conversion contribution each year + still ample runway
  - MasterCard/ Visa still being the network that benefits from these tailwinds



VocaLink Acquisition (2016)

- For $920 million + earn-out potential of up to $220 million
- VocaLink's shareholder's retained 7.6% of company for at least 3 years
- Meant to break into the P2P segment, as currently some of the main players (PayPal, Venmo) have not found out how to monetize it, yet.
- MasterCard is looking to expand to other payment flow opportunities (P2P, Business-to-Business)
- VocaLink is a leader in ACH payments, allows for real time payments from one account to another
- UK regulator "Competition and Markets Authority" said that VocaLink and MasterCard are two of the three "most credible providers of infrastructure services" to primary ATM network operating in the UK

> That includes the ability for consumers to one day pay for purchases in store in the U.S. directly from their bank account and bypassing the debit card altogether, said Michael Miebach, chief product officer at Mastercard. That technology is currently being used by several banks in the U.K. While this payment option could threaten to cannibalize Mastercard's debit card volume, some analysts view this as an additional payment option at the point of sale that could boost transaction volume further for the network.

From WSJ on 4/11/2017

Important Metrics: Visa *vs.* MasterCard

Copied slide from Visa overview

Visa Inc.

Pre Visa Europe (2008 - 2016)	3 Yr	5 Yr	8 Yr
Service Fee Revenue	*8.0%*	*9.6%*	*10.4%*
Data Processing Fee Revenue	*10.6%*	*12.5%*	*14.8%*
International Transaction Revenue	*12.2%*	*11.7%*	*13.2%*
Total Revenue	*8.6%*	*10.4%*	*11.6%*
Operating Expenses	*4.4%*	*6.7%*	*0.3%*
EBITDA	*10.9%*	*12.7%*	*27.8%*
EBIT	*11.1%*	*12.7%*	*29.8%*
Total Volume	*3.6%*	*5.3%*	*7.2%*
U.S.	*8.9%*	*7.4%*	*6.7%*
Outside U.S.	*-0.1%*	*3.7%*	*7.7%*
Payment Volume	*7.3%*	*7.6%*	*8.6%*
U.S.	*9.6%*	*7.8%*	*7.4%*
Outside U.S.	*4.6%*	*7.3%*	*10.3%*
Processed Transactions	*10.0%*	*8.8%*	*9.8%*
Account Growth	*6.5%*	*6.5%*	*6.5%*
Card Growth	*5.6%*	*6.0%*	*5.6%*
Credit Cards	*5.2%*	*4.1%*	*1.9%*
Debit Cards	*5.9%*	*7.1%*	*8.3%*

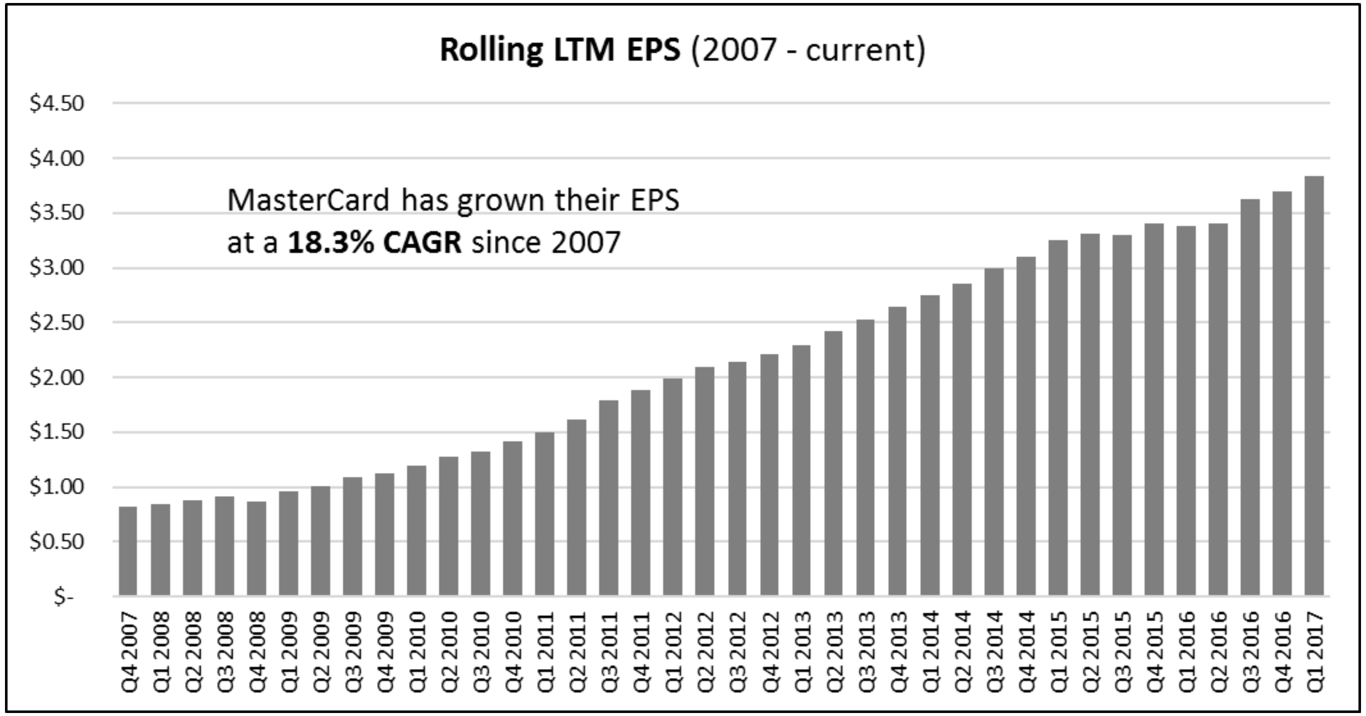
MasterCard

2008-2016	3 Yr	5 Yr	8 Yr
Service Fee Revenue	*6.8%*	*7.4%*	*8.5%*
Data Processing Fee Revenue	*13.2%*	*13.1%*	*14.5%*
International Transaction Revenue	*9.3%*	*12.0%*	*11.8%*
Total Revenue	*8.7%*	*9.7%*	*10.5%*
Operating Expenses	*10.6%*	*9.1%*	*7.1%*
EBITDA	*7.7%*	*6.8%*	*4.3%*
EBIT	*7.4%*	*10.2%*	*14.6%*
Total Volume	*5.0%*	*7.6%*	*8.8%*
U.S.	*6.7%*	*6.9%*	*5.1%*
Outside U.S.	*4.2%*	*7.9%*	*11.0%*
Payment Volume	*5.0%*	*7.1%*	*8.4%*
U.S.	*7.1%*	*7.3%*	*5.8%*
Outside U.S.	*3.7%*	*7.0%*	*10.3%*
Processed Transactions	*13.5%*	*14.9%*	*13.4%*
Card Growth	*9.4%*	*9.3%*	*7.3%*
Credit Cards	*1.6%*	*2.4%*	*0.9%*
Debit Cards	*17.4%*	*18.6%*	*18.8%*

Important to note some of the "outside US" numbers are impacted by recent regulation in Europe

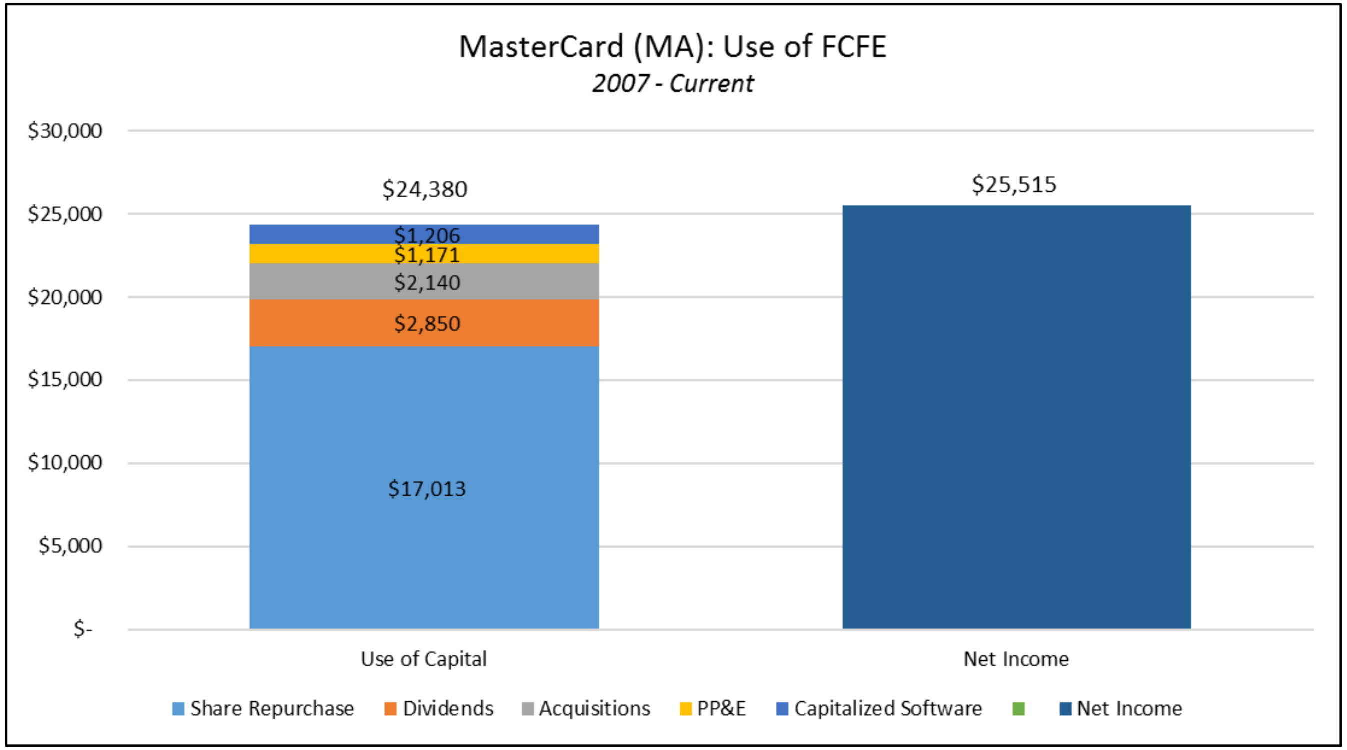
Financial Overview: *EPS Growth*

- MasterCard's ability to grow EPS at a fast rate is due to:
  - **Revenue growth of 8-12% +/-**
    - PCE/ GDP of mid-single digits
    - Secular growth, i.e. card penetration vs. cash/check
    - Other business/ MasterCard Advisors growth
  - **Margin Expansion**
    - Leveraging some "fixed expenses", such as marketing, advertising, and professional fees
  - **Share Repurchases** (~2% per year)
- The combination of revenue growth + margin expansion + share repurchases results in double-digits EPS growth over time



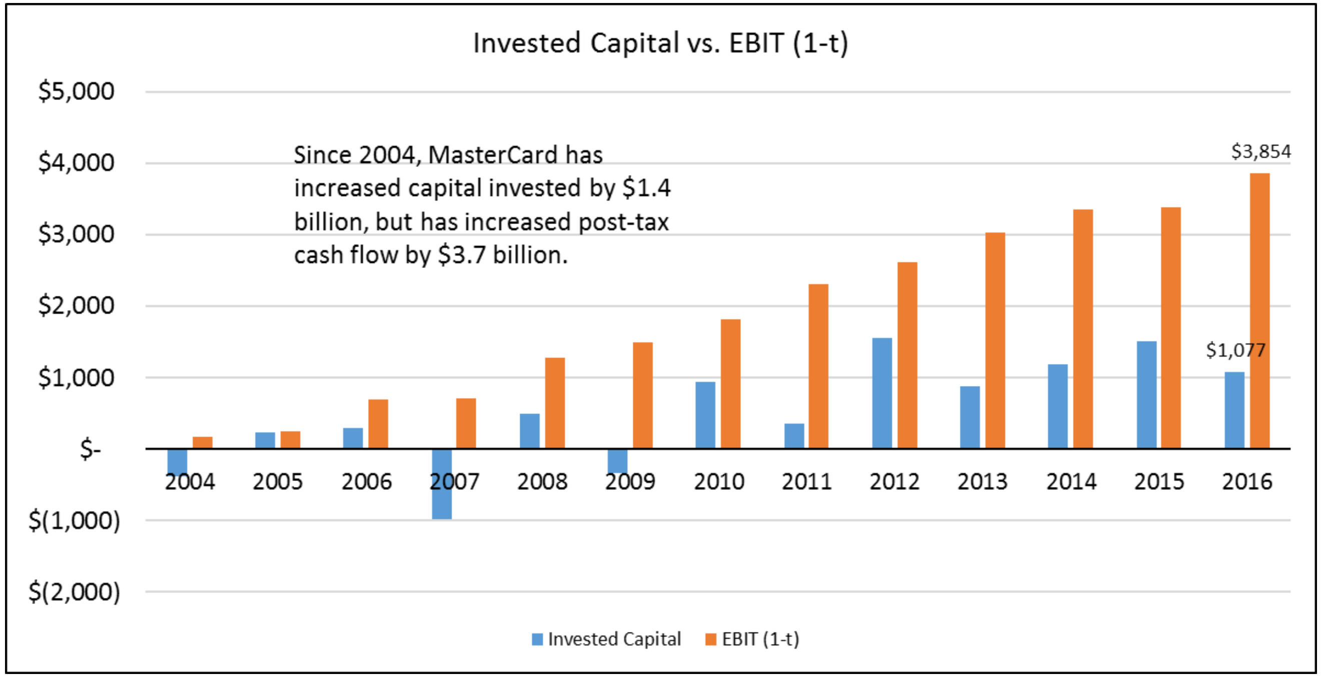
Financial Overview: *Use of FCFE*

- Based on their historical FCF profile (which is similar to Net Income), the bulk of their capital allocation goes towards:
  - Share repurchases
  - Dividends
  - Occasional tuck-in acquisition
  - PP&E/ Software (which is similar to D&A)
- Net Income is a good proxy for FCFE due to:
  - Minimal debt
  - D&A expense similar to PP&E expenses
  - Limited working capital needs
  - Limited historical acquisitions, thus limited intangible amortization



Financial Overview: ROIC

- MasterCard needs very little capital to grow
- Most of their capital is in the data processing facilities
- Their reinvestment expenditures largely flow through the P&L:
  - Client incentives/ rebates
  - Marketing and advertising
  - Technology innovation/ software
- On a tangible capital basis, MasterCard has negative net tangible capital, similar to Visa
- Looking at the chart (right), you can see how their economics improve without the need for increased capital investment



2017 Performance Objectives

Appendix C
Non-GAAP Reconciliation
Full-Year Forecast 2017

	2017 vs. 2016 Increase/(Decrease)	
	Net revenue	Operating expenses
Forecasted growth [1]	Low-double digits	Low-double digits
Special items [2]	—	2%
Acquisitions	(2)%	(6)%
Foreign currency [3]	1 - 2%	1%
Non-GAAP - Excluding Special Items and Acquisitions, Currency-Neutral	Low-double digits	High-single digit

[1] 2017 forecast and 2016 actuals
[2] Impact of Canadian merchant litigation (Q1 2017:$15M pre-tax) and U.K. merchant litigation provisions (2016: $117M pre-tax)
[3] Impact of foreign currency for both the translational and transactional impacts

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Non-GAAP Reconciliation
Thoughts for Full-Year 2017

	2017 vs. 2016 Increase/(Decrease)	
	Revenue	Operating Expenses
Non-GAAP - Excluding Special Items, Currency-Neutral	Low-double digits	High-single digit
Special item[1]	–	(2)%
FX[2]	(2)%	(1)%
As-Reported Growth	High-single digit	Mid-single digit

[1] Impact of the U.K. merchant litigation provision (2016: $117M pre-tax)
[2] Impact of foreign currency for both the translational and transactional impacts

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Most Recent: (May 2017)

- Low double digit revenue growth
- High-single digit expense growth due to VocaLink acquisition expenses

Long-Term Performance Objectives

Non-GAAP Reconciliation
Long-term Performance Objectives

	2016-2018 3-Year CAGR Increase/(Decrease)	
	Net Revenue	EPS[1]
Non-GAAP - Excluding Special Items, Currency-Neutral, Normalized Taxes	Low-double digit	Mid-teens
U.S. Employee Pension Plan Settlement Charge[2]	–	–
Provision for Litigation Settlement[3]	–	–
FX[4]	(1)%	(1)%
Significant Tax Items[5]	–	(4)%
GAAP	Low-double digit	Low-double digit

[1]Based on 2015 proforma diluted EPS utilized to measure 3-year diluted EPS target performance (2016-2018)
[2]Impact of the termination of the U.S. employee pension plan in 2015 ($0.04 per diluted share)
[3]Impact of the U.K. merchant litigation provision in 2015 ($0.04 per diluted share)
[4]Impact of foreign currency for both the translational and transactional impacts
[5]Impact of discrete tax benefits and the tax impact of non-recurring repatriation benefits in 2015 ($0.31 per diluted share)

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FINANCIAL PERSPECTIVE

Longer-Term
*2016 – 2018 Performance Objectives**

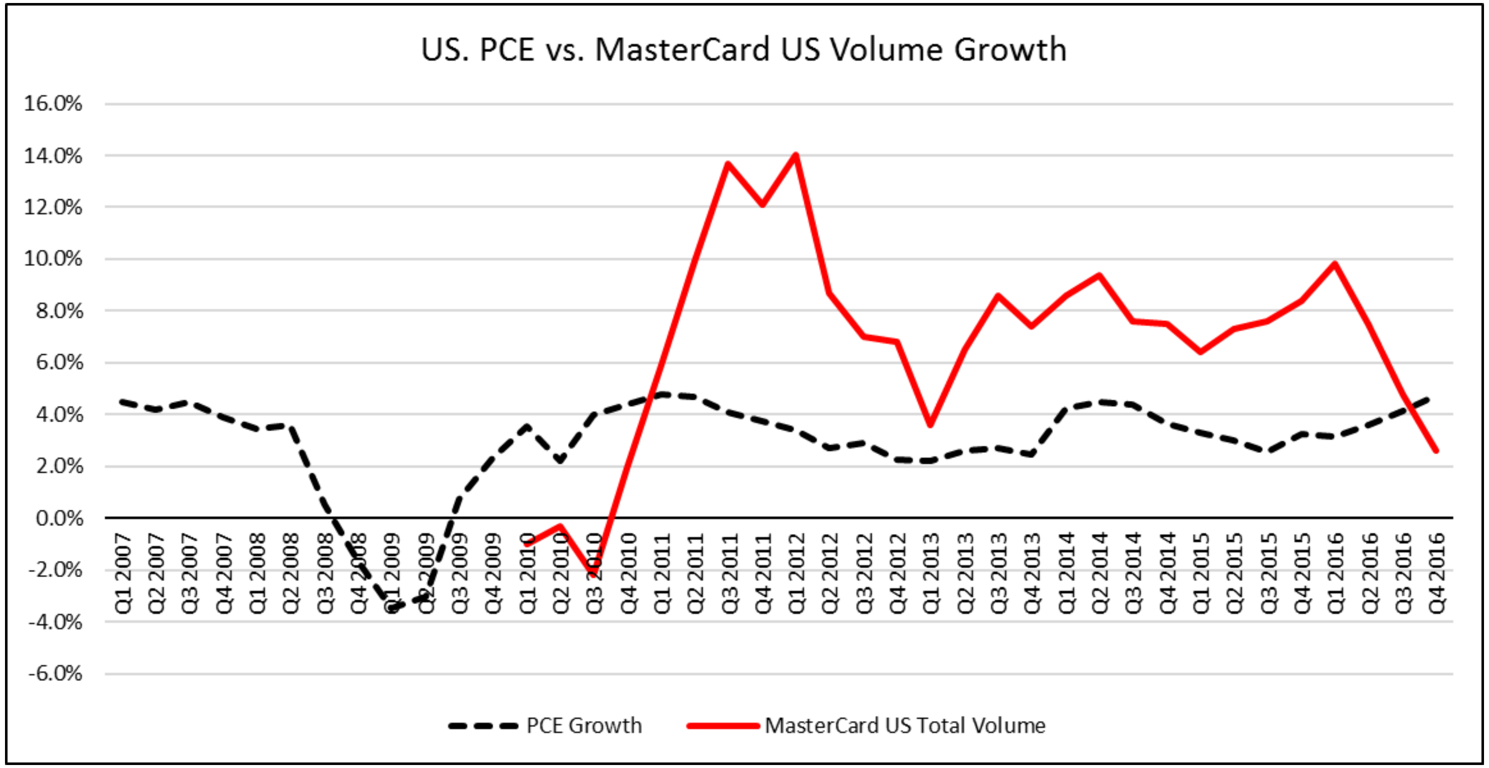
Net Revenue CAGR %	Low double-digits
Operating Margin %	Minimum 50% annually
EPS CAGR % **	Mid-teens

* On a currency-neutral basis and excluding VocaLink & future acquisitions
** See Appendix D for pro forma EPS

56 September 7, 2016 Mastercard Investment Community Meeting

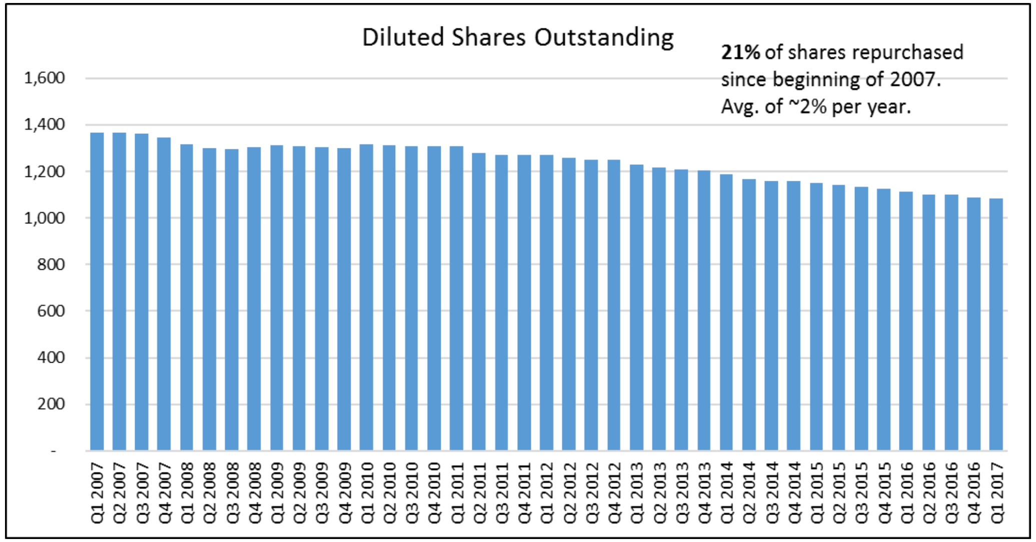
US PCE vs. MasterCard US Volume

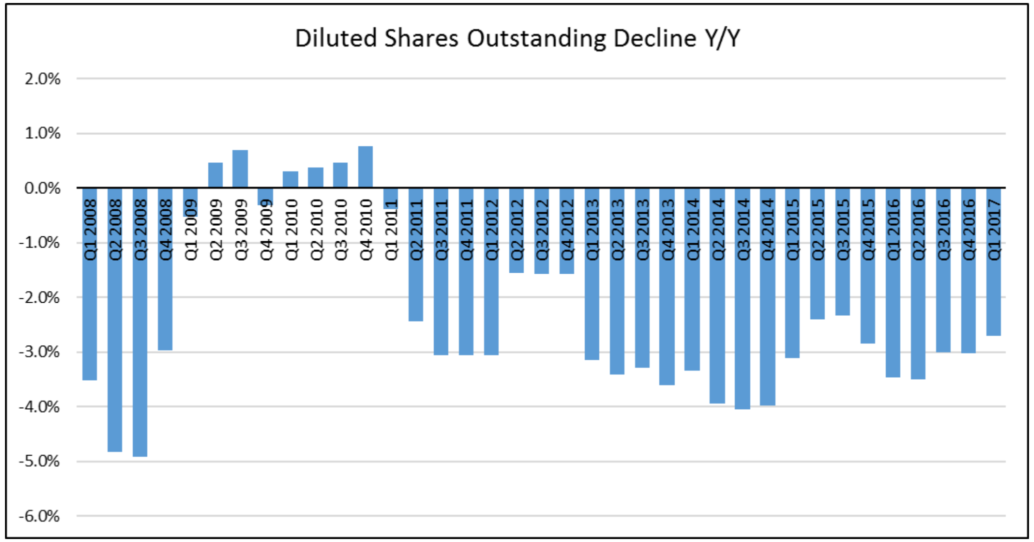
- With the exceptions of some noise, MA consistently grows volumes faster than US PCE
- ***How?***
  - Market share gains
  - Secular tailwinds of increased conversion to card from cash/check
  - E-Commerce
  - M-commerce
  - Slower physical POS sales



Capital-Light = Excess FCF

- Similar to Visa, MasterCard is also very capital-light
- This allows them to pay out a dividend + repurchase shares on a continual basis
- Since the beginning of 2007, MasterCard has repurchased 21% of their shares, an average of about 2% per year (which is slightly less than Visa, which is about 2.5% per year)





Sequoia Fund Commentary on MA

(2007) **Tom Mialkos**:

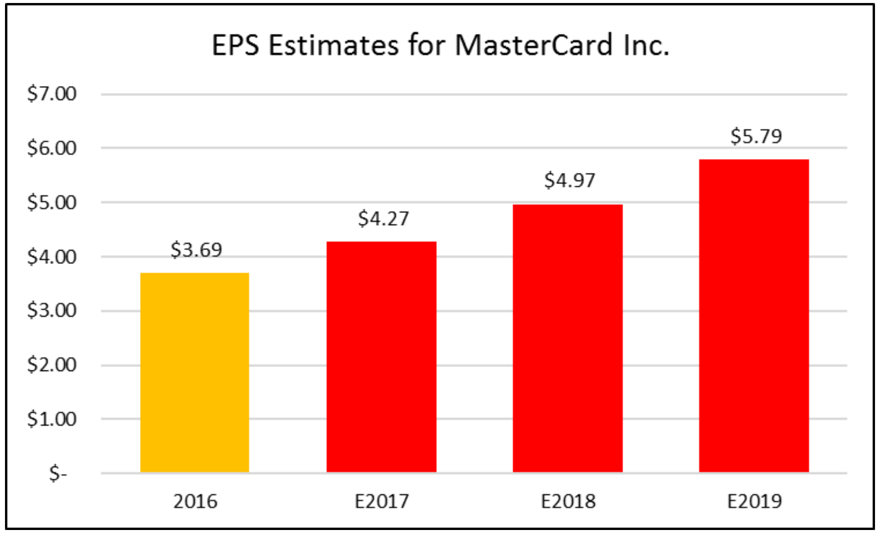
Overall, electronic payments are growing extremely fast both in the US and worldwide. In the US, electronic payments account for 60 percent of the transactions and are taking share from cash and checks. Worldwide, electronic payments have a lower share, but they are growing faster. It's fair to say that MasterCard is like a royalty on worldwide consumption. It's actually geared because electronic payments are also taking share from cash and checks. MasterCard is a slightly different business from American Express. American Express is in the issuing business, which means that they physically issue the card to the customer. Also they acquire cardholders and merchants, and they are the payment network in the middle, whereas MasterCard is only the payment network in the middle. In effect, MasterCard's customers are the banks. With these customers, MasterCard is literally in a duopoly position in most markets with Visa. There's some competition from American Express in this market in the US, Australia, and a few other markets. But it's fair to say that the traditional decision for most banks is whether to pick MasterCard or Visa. So in that respect, MasterCard is in a very good position, having only one main competitor. There are very few substitutes for the banks. There's no third payment association that's viable, especially no third payment association that has an international network. If you have a MasterCard or Visa, you can make transactions all over the world, and that's a very appealing aspect for consumers. The economics of the business are tremendous. As the network in the middle, there's very little capital employed in the business. I would say most of the capital is really sitting in a data center in St. Louis. Most of the transactions actually go through the data center in St. Louis. It's also fair to say that an incremental transaction that goes over the MasterCard network has basically no marginal cost. Most of the incremental cost that comes from increasing the volumes springs from the decision on the part of MasterCard of how much to increase advertising and how much to increase staffing expenses.

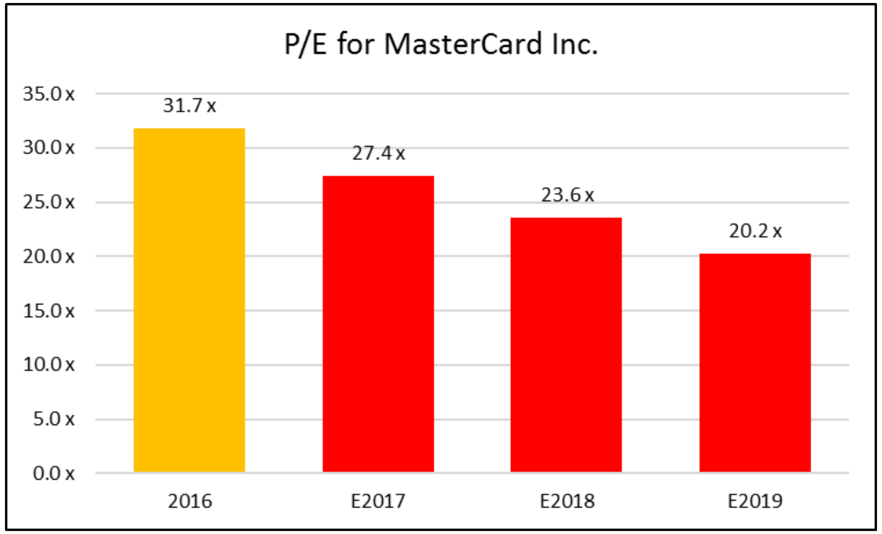
Sequoia Fund Commentary on MA

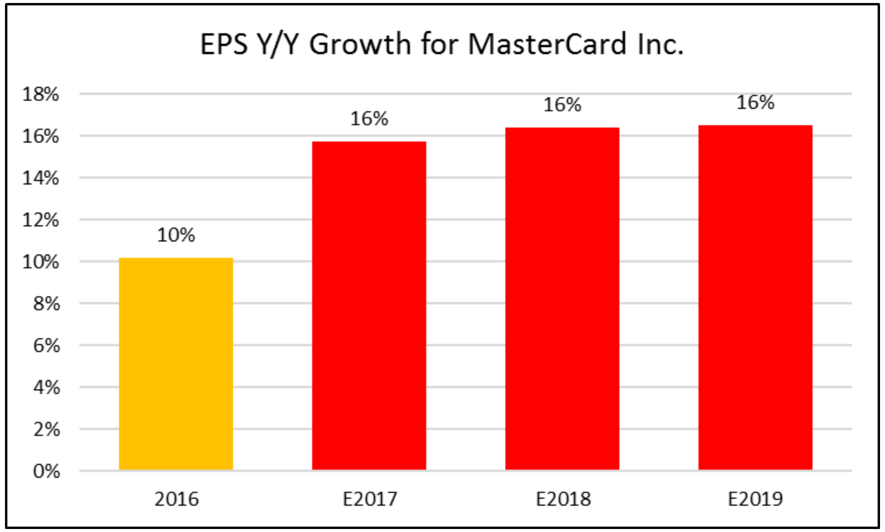
(2007) **Tom Mialkos**:

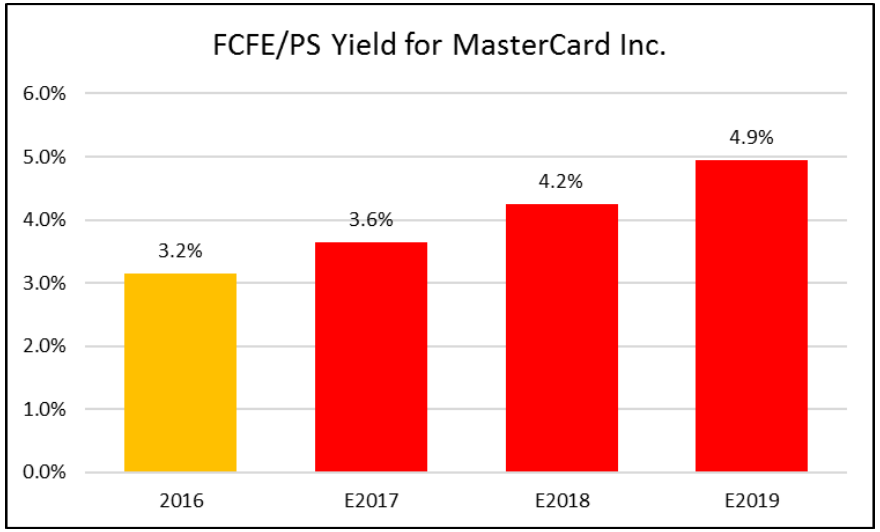
……We made the investment because the electronic payments through MasterCard are growing very quickly. We also thought that there's tremendous operating leverage in the business because an incremental transaction costs so little. Also, MasterCard spends a tremendous amount on advertising and marketing, over $1 billion. That advertising spending is not growing at the same rate as revenues, which means that there's operating leverage and the margins are expanding. At the time of the investment, we were quite optimistic about how much the margins could expand. But we didn't quite expect the margins to expand as quickly as they have. One of the reasons why we thought about a certain rate of margin expansion was because MasterCard cannot price their transactions too much higher than Visa. So in a sense in their pricing and in the amount that they spend also on advertising, they are somewhat related to Visa. This was our initial concern — that they might be limited in terms of the expansion of the operating margin by Visa. As it turns out, they managed to do it very quickly. So as payments, as volumes grew considerably over the past year, there was very little incremental increase in terms of advertising. Also, we were quite optimistic about the pricing power because it's a duopoly situation. There are certain pockets where MasterCard is able to raise prices, and as it turned out MasterCard raised prices tremendously in terms of the international transactions. International transactions are basically at this point the most profitable part of the business, operating at a higher margin than the domestic transactions. Also, the business is global, as I mentioned. Right now roughly half of the transactions are outside the US. Transactions outside the US are growing at a rate that is faster than that in the United States. So it's a global business that's basically recession proof because even if there's a dip in global growth, the share of payments is still growing. So the runway is tremendous and it just so happens that the management of MasterCard executed really well. They managed to increase the operating leverage much quicker than we had expected. And we got it at a very good price.

Valuation: MasterCard









Using share price of $117.13 as of 5/12/2017

Long-term Opportunity:
India

India

- According to Reserve Bank of India:
  - 1.3 billion people
  - Less than 23 million credit cards
  - 640 million debit cards
  - 88% of debit cards used only for getting money out of the ATM
  - Averages just 6.7 electronic transactions per person, versus 249 in Australia, 201 in UK, and 14 in China
  - Only 1.2 million merchants accept
- Modi government handing out $50m to encourage usage of digital money
  - Daily draw, 15,000 winners receiving $15 each, and weekly draw for $75 up to $1,500
  - Around 2 million people could win
  - Indian government banned all existing 500 and 1,000 rupee notes and replacing with new 500 and 2,000 rupees, and made 86% of currency available worthless overnight
  - Estimate of 5% of personal consumptions expenditure in India is digital
  - "Our objective is to make digital payments a huge mass movement in India" said Amitabh Kant, the think tank in Modi government

India: Encouraging Electronification of Payments

- November 2016: the Indian government abruptly scrapped the two largest rupee notes, creating an additional cash crunch
- Unable to pay for certain transactions, millions went to more digital means to pay
- The Modi government rolled out its own mobile payment system earlier in 2016, called Unified Payment Interface (UPI) which allows users to link bank accounts to cellphones through a unique ID
- Visa has said this network is "open" and allows Visa/ MC to be the payment processor and network
- Over 90% of daily transaction take place in cash, even for big ticket items like jewelry and real estate
- Modi government campaigning for more digitalization of payments (see picture)
- Additional reading: India opportunity http://image-src.bcg.com/BCG_COM/BCG-Google%20Digital%20Payments%202020-July%202016_tcm21-39245.pdf

India Opportunity *Overestimated*?

- RuPay is an initiative by the National Payments Corporation of India (NPCI)
- Intended to provide a domestic card alternative to MasterCard and Visa
- Also allows for consolidation of various payment systems in India, similar to China UnionPay
- The rationale for RuPay is that:
  - International payment platforms were considered expensive for the Indian market (V/ MA/ AXP)
  - Most of the credit card and almost all debit card transaction are domestic
- Began in March 2012, RuPay now has more than 320 million cards issued as of January 2017
- The financial inclusion scheme by the Indian government helped the PMJDY to comprise around 70% of all RuPay cards issued, beginning in November 2016 by Modi
  - Number of cards issued grew by 15% in a month after the announcement by Modi
  - The number of transactions rose seven-fold from around 300,000 a day to more than 2.1 million a day, on average
  - The goal is to increase transactions to more than 5 million a day by the end of 2017
- RuPay acceptance:
  - All ATMs (more than 145,000 in India)
  - More than 875,000 POS terminals
  - More than 10,000 e-commerce websites
  - They have an agreement with Discover Financials' global network for international acceptance
- Visa and MasterCard are concerned that RuPay would have an unfair advantage due to its backing by the Indian regulatory body and government
- Additional concerns are that the cost per transaction, by the merchants, is substantially higher than via RuPay
- It is entirely possible that Visa/ MasterCard’s current opportunities in India are **overblown** due to RuPay, unless the WTO (World Trade Organization) steps in and forces the Indian government to be more fair and allow for more competition

Risks:

Risks to Card Networks

- Regulation
  - See Durbin Amendment for debit cards, Europe IFRS capping debit and credit interchange, which influences rewards by issuers, which influences top of the wallet decisions by consumers
- Lawsuits by merchants
- China UnionPay
  - Using their scale to push more globally
- Alipay expansion outside of China
- Expected growth opportunities are far overestimated
- Blockchain
  - Making the processing costs a fraction of current levels, which may encourage merchants, issuers, regulators to seek stronger uptake of blockchain payments
- Card penetration growth slows
  - Most of the growth in the last 5-10 years was "low hanging fruit" and the penetration of card vs. cash/check in the truly desirable regions (U.S., Europe) will slow
  - Thus, payment volume will become more consistent with PCE
  - This is one of the largest arguments for/ against the card networks as an investment thesis
- In the United States: same-day ACH in C2B

Risks to Card Networks

- Merchant strength influences rewards, thus influencing the cost structure for card networks in the form of incentives
- The largest merchants forming their own network (Amazon, Wal-Mart, Costco, Target, Kroger?)
- Brand erosion through growth of mobile/ digital wallets, where the card network logo is less apparent, and thus becomes more of a commodity
- In the United States: ChaseNet offering their own closed-loop model once the deal with Visa is expired, which would hurt US payment volumes for Visa
- Additional tax on foreign goods by Trump administration, as card networks are global companies
- Foreign countries adoption domestic card schemes to retain the data, lower the costs
  - A number of countries currently have domestic debit card schemes
- US Signature debit fees being regulated/ lawsuits around the fees
- Cross-border fees are excessive; cheaper alternatives in the future?

Risk: Creating An Alternative Card Network

Recreating the Card Networks

- A couple of case studies:
  - CurrentC and MCX
  - First Data Net
- History has shown that it is:
  - Difficult to replicate the card networks scale
  - Difficult to change consumer behavior once it is embedded
  - Difficult to get consumers to change if they do not see a valid reason why

First Data Net

- First Data planned on creating a large closed-loop network in 2002, connecting merchants and card issuers
- Visa sued First Data, and the legal dispute lasted 4 years
- First Data would have been the processor both the card issuer and merchant acquirer for the same transaction
- As a part of the settlement, First Data said it would "transition" its customers that are Visa-member financial institutions onto VisaNet, the Visa transaction switch First Data Net was designed to bypass to reduce processing costs. (Payments Source)
- The network First Data was trying to created – Visa estimated that about 15% of its transactions could be eligible for First Data Net system
- Visa’s lawsuit centered around the much higher potential for fraud, if the transactions were to go through the First Data Net
- At 2002, inception year, it was revealed that Bank One Corp. (US largest Visa card issuer) signed on to participate with First Data Net
- MasterCard never joined the lawsuit

MCX

- Created by a group of US retail companies to develop a merchant owned mobile payment system “CurrentC”
- Announced August 2012
- The company is led by merchants such as 7-Eleven, Alon Brands, Best Buy, CVS Health, Darden Restaurants, HMSHost, Hy-Vee, Lowe's, Michaels, Publix, Sears Holdings, Shell Oil Products US, Sunoco, Target Corporation and Walmart.
- CurrentC:
  - Utilizes a smartphone app and digital wallet to make a purchase
  - User scans QR code on cashiers screen, or phone screen
  - Built upon technology developed by Paydiant (now acquired by PayPal)
  - Intentionally does not support credit cards in order to avoid interchange fees
  - Instead, payment is directly debited via ACH from customers financial institution
- Hacked in 2012, consumers could only link checking accounts or private label cards, which frustrated customers
- May 2016: MCx announced they were postponing a nationwide rollout of CurrentC
- June 2016 MCx sent an email to testers saying “We will be concluding our beta test and postponing further releases of CurrentC on June 28, 2016. Therefore, June 28 will be the last day that transactions will be accepted using CurrentC.”
- JP Morgan Chase acquired MCX’s technology behind CurrentC to help expand Chase Pay, in 2017

MCx Troubles

Wal-Mart-Backed CurrentC Wallet Halted in Favor of Chase Service

by Olga Kharif and Olivia Zaleski
June 9, 2016, 12:44 PM CDT

- Merchant Customer Exchange said to cease development of app
- Wal-Mart, Target among retailers backing MCX since 2012

MCX postpones rollout of Apple Pay rival CurrentC, lays off 30, will focus on bank deals

Posted May 16, 2016 by Ingrid Lunden (@ingridlunden)

Risk: UnionPay Outside of China

UnionPay ("CUP")

- Established in 2002, a de-facto monopoly in China
- Bankcard association established under the approval of People's Bank of China
- Is the only interbank network in China that links all ATMs and all banks through the country
- Has about 400 domestic and overseas associate members
- Working on creating an international acceptance network
    - Currently accepted in 150 countries and regions outside of China
    - Actively promotes UnionPay standard card issuance overseas
    - At present, 65 institutions in 17 overseas countries and regions have issued UnionPay cards locally, with a total of more than 10 million cards *(recall that MasterCard has ~1.3 billion cards issued outside the U.S., and Visa as > 2.3 billion outside the U.S.)*
- In 2015, CUP had a 37% market share of the $21.6 trillion in global payments volume, but that is based on a user-base almost entirely Chinese
- *Outside* of China, UnionPay claims just ***0.5% market share***, compared with ~81% for Visa/ MasterCard

UnionPay ("CUP")

- China currently blocks any domestic expansion of Visa and MasterCard within China
- CUP first began expanding internationally due to wealthier Chinese consumers travelling abroad
- In 2012, the World Trade Organization (WTO) ruled that China had unfairly discriminated against the foreign payment companies
- Still to this day, China drags its feet on opening the market to Visa and MasterCard
- In mid-2015, China allowed Visa and MasterCard to seek licenses to clear domestic Chinese payments
- Before 2010, many banks in China issued a dual-currency credit card with both UnionPay and a foreign logo, but this was halted after a dispute in 2010 with Visa and UnionPay where UnionPay was breaching the contract with Visa over processing international transactions for co-branded cards on CUP's network and not Visa's

UnionPay ("CUP")

- My beliefs on China and UnionPay:
  - "China as an opportunity" is a longer term proposition, best to not include in valuations, expectations
  - More opportunity for Visa and MasterCard in China due to CUP's monopoly, the intrigue of new cards, and middle-class and wealthier people's familiarity with the global acceptance of Visa and MasterCard
  - Less opportunity for CUP to expand in same manner outside China, as V/MA inside China once allowed, due to habits, trust in Visa and MasterCard, skepticism of Chinese finances by some Westerners
  - It is hard to disrupt the habits that someone is already accepting and comfortable with, i.e. paying with a Chase Visa card, due to rewards and familiarity
  - CUP will push hard to globalize itself, will use its scale and large customer base as the potential for the issuers and merchants, but it will be more difficult than it seems

Risk: Alipay

Alipay

- Claims to have 450 million users worldwide, but almost the entirety of that is in mainland China
- Ant Financial, the Alibaba spin-off that operates Alipay, announced a deal with payment processor firm "First Data" to allow its service to be used at the POS with more than 4 million retailers in the US
- This is the first deal of its kind in the US for Alipay
- Alipay is pushing to grow outside of China
- Alipay is different in that it settles payments in the absence of a deep network like V/MA and EFTPOS terminals
- Payments can be made from the app on one's mobile phone directly to the recipient, and funds are transferred from one Alipay account to another Alipay account
  - No fees charged to merchants, which is attractive to merchant
  - Many use Alipay vs. cash, credit or debit cards, or ATMs
- Annual transaction value is estimated at $3 trillion
- Alipay's largest competitor is Tenpay, which is Tencent's e-payment platform integrated inside WeChat

Alipay as a Risk to V/MA

- Any concerns about Alipay taking market share from the US consumer should consider that a US citizen cannot pay with Alipay unless (somehow) opening a Chinese bank account to allow for funds to be transferred from that account to another Chinese account
- My personal view is that Alipay / Tenpay are so entrenched in the Chinese consumers life, it will be difficult for V/MA to convince Chinese consumers to use them inside mainland China, if V/MA were able to participate
- There may be some business gained by higher-travelling, wealthier Chinese consumers whom travel to locations that do not have Tenpay/ Alipay accepted by most merchants, and thus V/MA would be the viable option
- ….Time will tell…..

> In China, however, Alipay has evolved to be much more than a way of settling online payments and, in the absence of a deep network of credit card and EFTPOS terminals, has become the way of settling essentially any transaction.
>
> Payments can be made from the app on one's mobile phone directly to the recipient. Setting up an account is straightforward and funds are transferred into and out of one's Alipay account via one's Chinese bank account. The best news for merchants is that no fees are charged, making the system very attractive. What we were continually told by the locals is that there is simply no longer a need to carry cash, ATM cards or credit cards, as everyone from the street vendor of snacks to taxis and organised retailers accepts Alipay. This claim I suspect is somewhat exaggerated and was difficult to test, as, without a Chinese bank account, I couldn't complete my own registration. Alipay claims to have 450 million active users and settles 200 million transactions daily. Annual transaction value is estimated at US$3 trillion.

Alipay as a Risk to V/MA

- Studies estimated that Chinese banks "lost" $23 billion in 2015 alone in potential transaction fees, including UnionPay, but missed due to Alipay and Tencent transaction on bank-to-bank versus credit cards, debit cards, or ACH
- UnionPay only controls about 1.8% of the mobile payment market by transaction volume (i.e. essentially none)
- Yet, from 2014-2015 the Chinese mobile and internet payment market grew more than 40%
- Estimates of lost revenue of $61 billion in 2020 based on continued growth in e-commerce but sustained market share by Alipay and Tencent
- From the Chinese banks point of view, card transaction fees only represent about 5-8% of bank revenue
- Furthermore, the banks lost the billions of transactions through the network, and thus do not get the big data from these transactions. In an Alipay transaction, the only thing that a bank would see is a debit from a user's account going to Alipay and then a credit in the merchant's account from Alipay
- All the data is owned by the third-party providers

Alipay as a Risk to V/MA

- My beliefs:
  - It is far fetched for both Alipay and Tencent to take much market share, if any, from US consumers
  - It is also likely than UnionPay will struggle in competing for the US consumer
  - Far more likely that UnionPay, AliPay, and Tencent will compete with each for mainland Chinese consumer payments, both inside China and for those travelling. This is likely the reason for Alipay's partnership with First Data in expanding in the US. It is not for the US consumer but for the Chinese consumer travelling outbound to US.
  - Alipay and Tencent forgo the banks, and thus the banks

Risk: New Technology

Risks

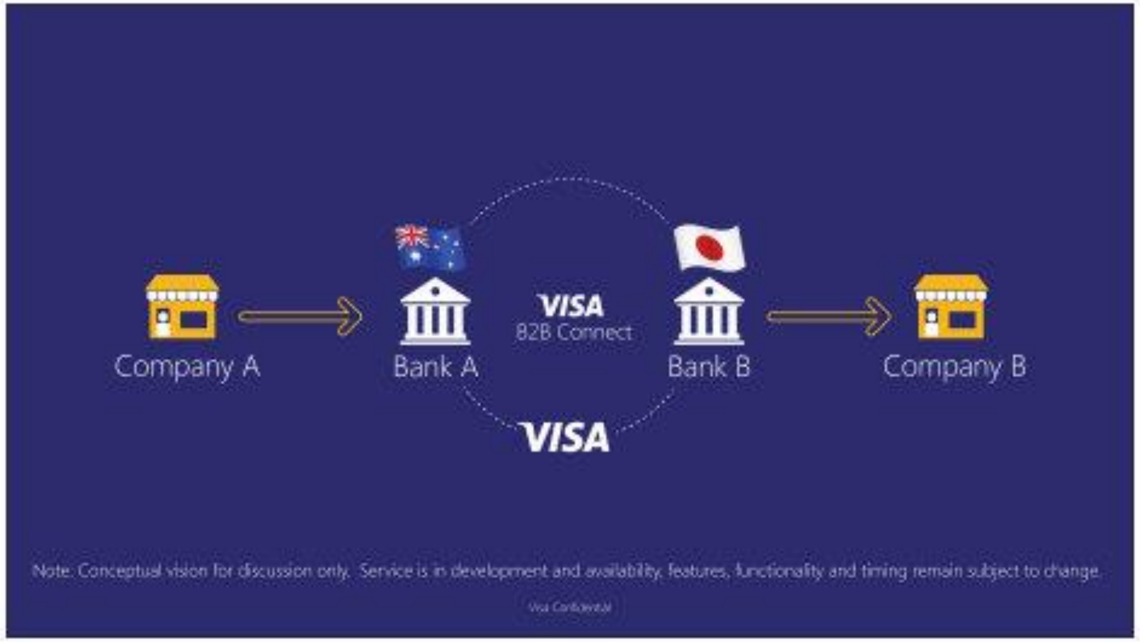
- New technology will disrupt the card networks value proposition in the payments ecosystem
- New FinTech companies will disrupt their model
- Blockchain will make the processing costs far less expensive than current, and will put pressure on card network fees and interchange

Reality: Card Networks Adopt/ Invest in New Technology

- Visa and American Express have invested in Stripe, a company that helps businesses accept nearly all forms of digital payments online
- Visa, Capitol One, Fiserv, and Citi invested in blockchain startup Chain.com
- Visa has an investment in Square (SQ)

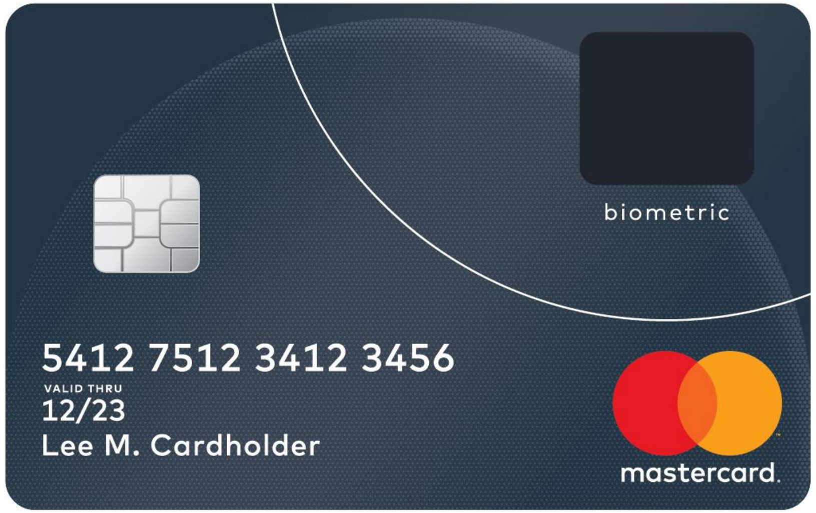
Reality: Card Networks Adopt/ Invest in New Technology

- Visa introduced an international B2B Payment Solution in October 2016 built on Chain.com's Blockchain technology
- Managed by Visa end-to-end
- Facilitate a consistent process to manage settlement through Visa's standard practices
- Offers clear costs for businesses, improved delivery times, visibility into transaction process, and a reduction of investments by banks and their corporate clients to send and receive business payments
- Link: http://investor.visa.com/news/news-details/2016/Visa-Introduces-International-B2B-Payment-Solution-Built-on-Chains-Blockchain-Technology/default.aspx



Reality: Card Networks Adopt/ Invest in New Technology

- April 2017: MasterCard launched a biometric card
- Presents a way to use a fingerprint, instead of a password, and combines EMV chip technology with a fingerprint reader on the front of the card to authenticate the identity of a cardholder at the physical POS
- No PIN is required
- Offers enhancements in fraud protection without the need for a merchant to upgrade the physical POS infrastructure, since all of the authentication is done on the card itself via the chip and existing card readers
- Was originally developed for governments using cards to distribute benefits and public sector pay (*recall that over 60% of payments, according to the Federal Reserve, is done in cash/check by governments and non-profits. This also is an attempt to disrupt ACH payments.)*



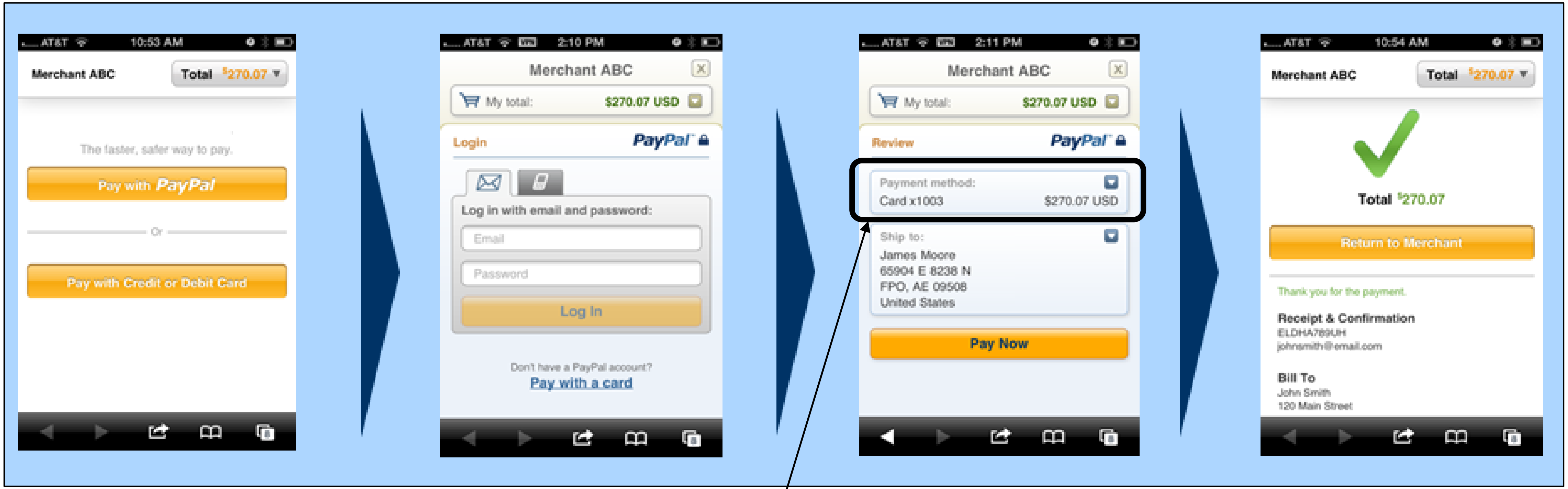
"I think we are really still seeing the beginning of innovating around biometrics — and I think the best thing here is we've shown that you can add innovation without making the card inoperably complex for merchants and users."

Risk: Brand Deterioration with Digital Wallets / Aggregators

Risk: E-commerce & Digital Wallets

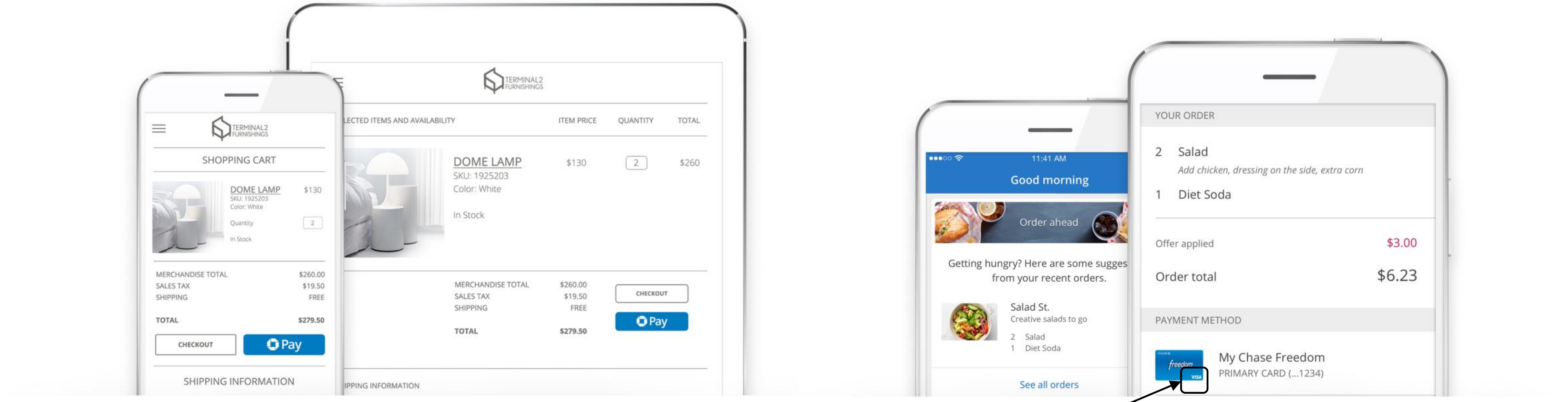
- Visa and MasterCard collectively spend ~ $1.5 billion a year just on marketing and advertising
- They want to be the brand consumers think of, look for, rely on, and trust when making a payment
- They want to be as ubiquitous as possible
- Visa " Everywhere you want to be" slogan
- Problem is that digital wallets, PayPal, etc. can erode the brand recognition of Visa, MasterCard, AMEX through the user interface selectively excluding the brand logo of these cards, or attempting to push their preferred payment method (see: PYPL breaking V/MA agreement by pushing ACH over card)

PayPal Mobile Interface



Visa, MasterCard, AMEX, Discover ???

Chase Pay User Interface



Visa mentioned (look very closely!)

Apple Pay User Interface

ApplePay seems to *encourage* brand awareness of the networks

PayPal and Visa

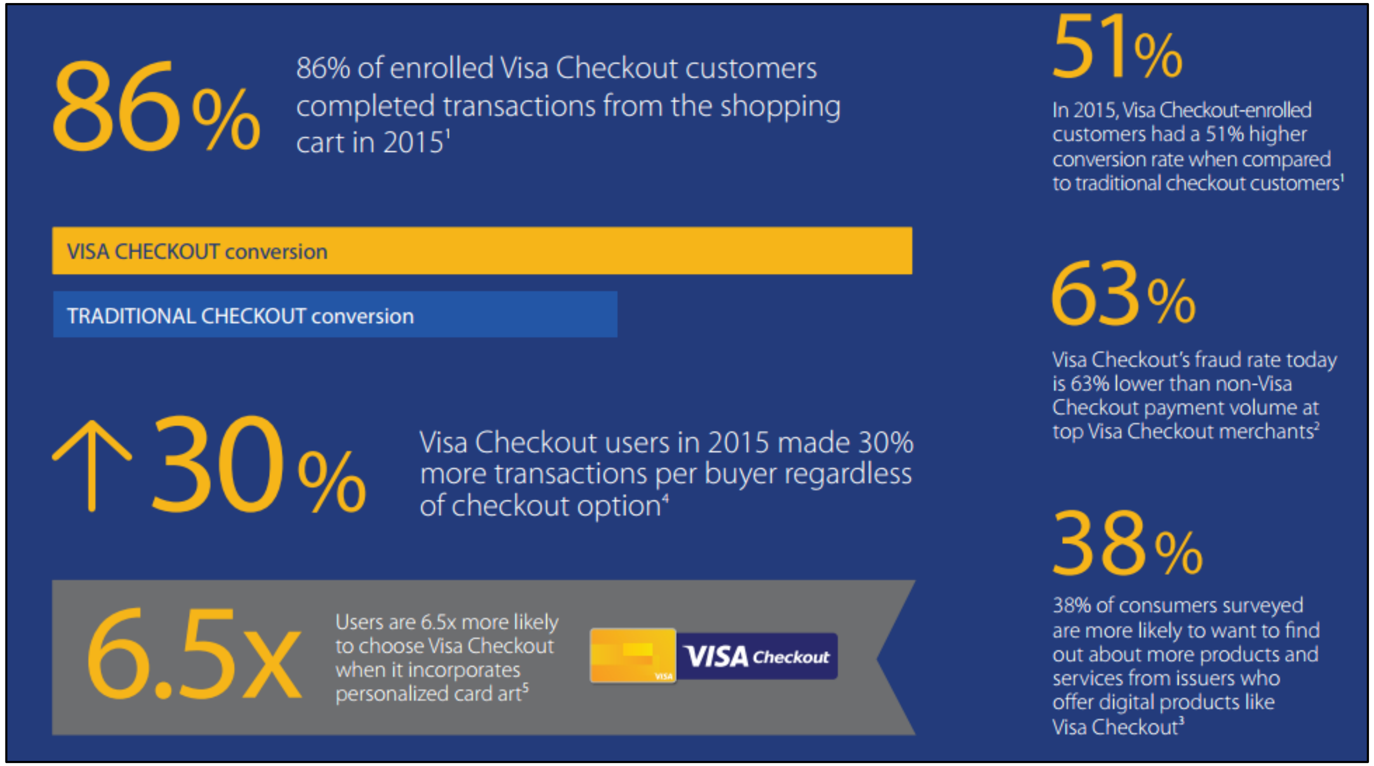
- PayPal is best described as a “frenemy” of Visa and MasterCard
- PYPL used to steer ACH payments over MA/ V cards, which broke the contract between the networks, so PYPL had to make a decision on whether to adjust or exclude all V/MA cards
- Previously, PYPL wanted to have the data on each transaction, would not share with the networks
- July 2016: PYPL and Visa announced a partnership (~12 month exclusive, multi-year total)
    - On the day of the announcement, PYPL shares dropped ~7%, as their costs would increase due to more expenses going to V and MA, whereas ACH transactions were far lower costs
    - PayPal can have access to Visa’s tokenization, which is huge for PYPL because it is issuer backed
    - PYPL will share the data with the networks, just as if a Visa/ MA card were swiped
    - PYPL will equally position Visa with ACH account options at signup
    - PYPL will incorporate digital images of Visa cards into the payments flow so they are prominently featured as top of the wallet
    - Working with issuers to help convert PayPal’s Visa ACH customers to Visa debit customers
    - Venmo users can have instant access to money if they use a Visa debit card, huge incentive for Venmo users and Visa
- Based on my conversations with the networks, V/MA did not lose any of the economics in coming to this partnership; however there are obviously some incentives being extended to PYPL in exchange for some of the increased volume
- Pre-Durbin Amendment, the PYPL vs. V/MA payment mix argument would bear more weight, but post-Durbin, ACH (which PYPL historically prefers) versus debit doesn’t have as wide of fee range as prior
- Visa also has their own “PayPal killer” in Visa Checkout
- For more reading, here is a good article on V/MA and PYPL agreement http://www.pymnts.com/news/payments-innovation/2016/how-will-visa-paypal-shape-the-future-of-payments/

PayPal and Visa

- Despite concerns of PayPal as a threat to the Visa/ MasterCard competitive advantage as the network and brand of choice, it seems as if they are becoming more of partners than anything else
- July 2016 Visa and PayPal partnership, and in April 2017 announced that PayPal and Visa are extending partnership to Asia-Pacific region
- These partnerships benefit both parties
  - Provides some cost certainty for PYPL, since V/MA will share tokenization, which has approval of issuers, and thus PYPL will pass the "card-present" rate structure to the merchant, and PYPL avoids additional fees
  - Also means there won't be some revenue on those transactions, but there won't be any costs as it'll be passed through to the merchant
  - Alleviates PYPL from the issue of steering customers to ACH over V/MA
  - Helps both parties increase transaction volume, benefiting both
  - Helps Visa as it creates more of an ally than an enemy of one of their largest thought-of "threats" in PayPal
  - Puts their image and brand more front of the digital wallet for PayPal, which waters down the bear thesis of brand disintermediation
  - Helps PayPal in certain regions where Visa has issuer relationships, thus increasing PYPL volume
- ***Based on events over the last year, the "PayPal as a threat to Visa/ MasterCard" argument seems to bear less and less weight***

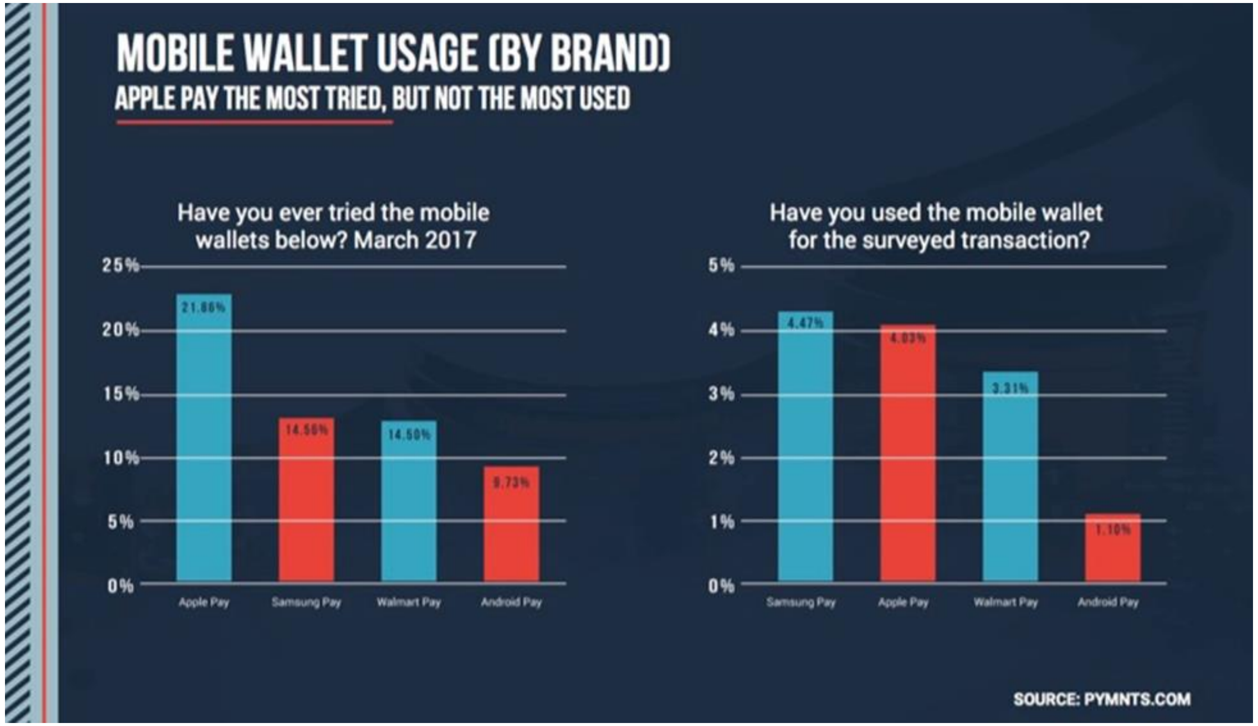
Visa Checkout

- Launched in 2014
- Rolled out in early 2016 as an online digital payment option aimed at making mobile commerce more interactive and faster
- Users see a virtual image of their card on the screen when selecting a digital checkout option
- Over 300,000 merchants using the service
- Users:
  - May 2015: 4 million customers, 125,000 merchants
  - March 2016: 11 million in 16 countries
  - April 2017: more than 20 million enrolled accounts
- March 2017: inked partnership with Samsung that will enable Samsung Pay users in US to link Samsung Pay account with Visa Checkout

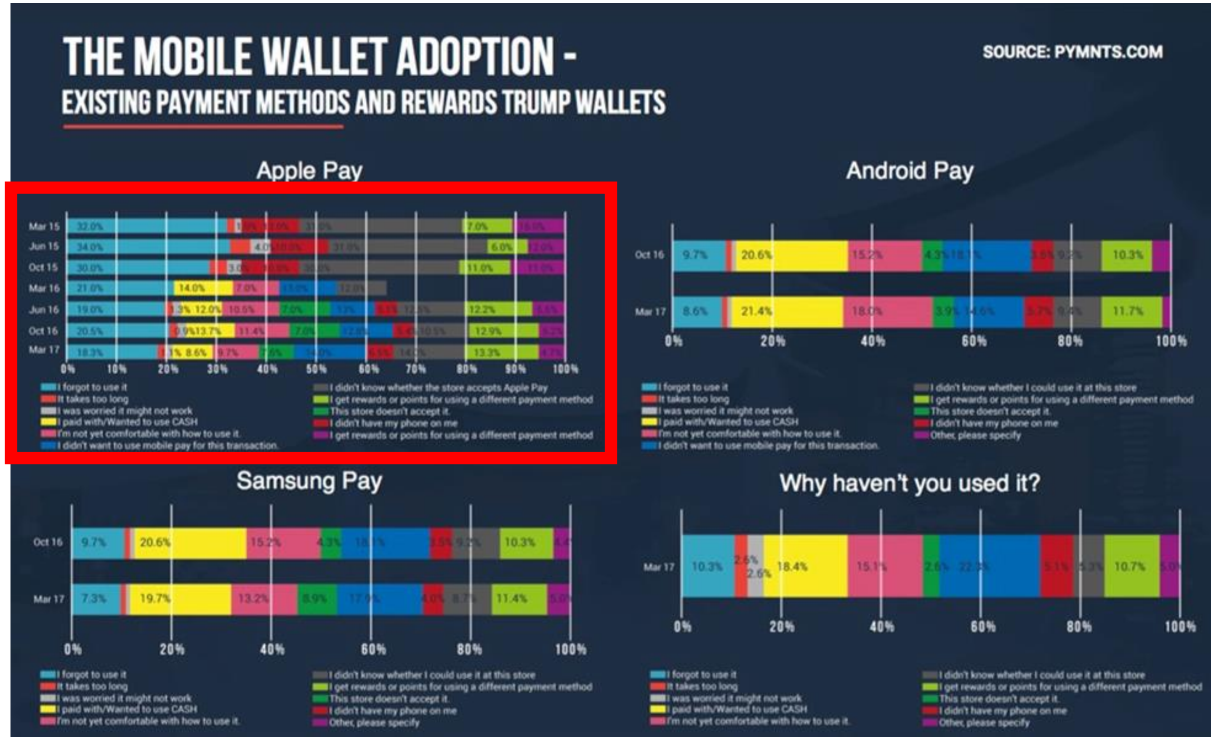


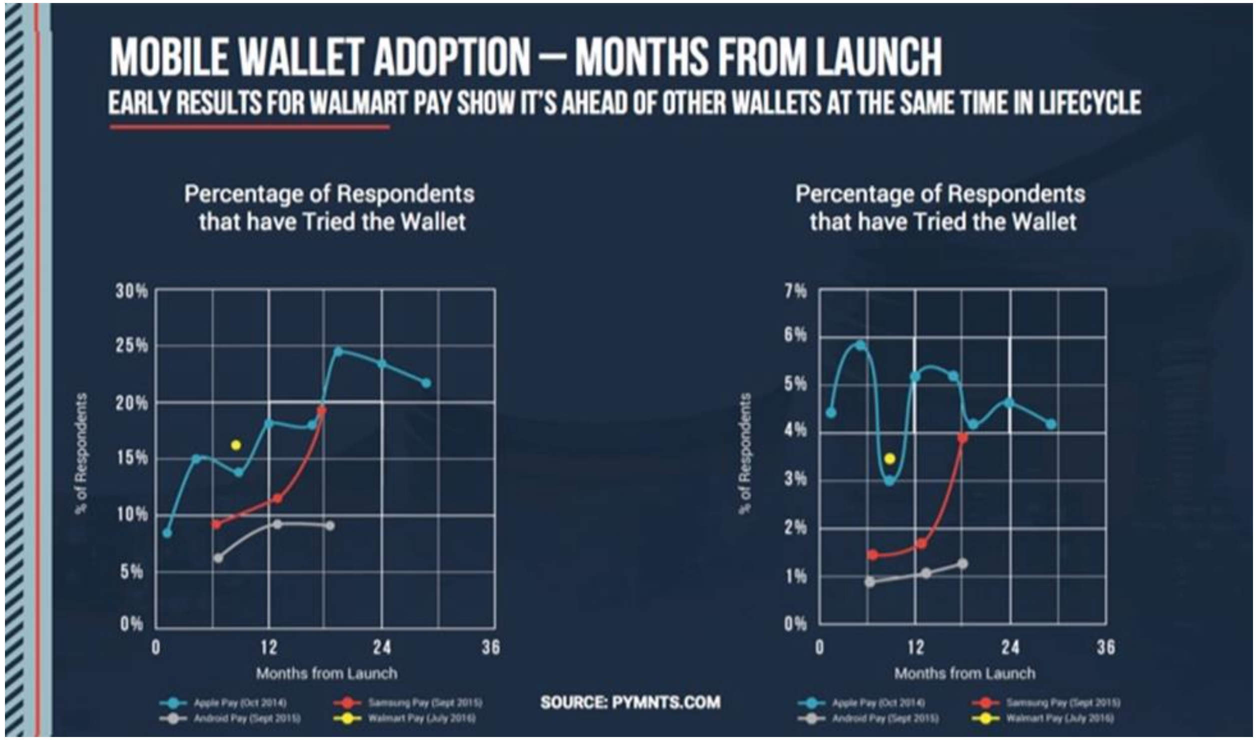
Mobile Wallet Disruption?

- ApplePay launched 2.5 years ago
- Surveys have shown that > 40% of consumers are happy with the way they are currently paying
- Less than 5% of consumers that have a mobile wallet actually use it when they can
- ApplePay has decent adoption, as ~22% of customers have actually tried the service…yet only 4% use if when they can. (see chart on right)
- 15% have tried Samsung Pay, the same percentage as Walmart Pay
- Mobile wallet usage is actually in *decline*
- ApplePay, which is the oldest, most well-known mobile wallet, only has 4-5% adoption, which is low
- Changing consumer habits can be difficult



Mobile Wallet Disruption?





As time continues since Apple Pay was launched, less and less people are "forgetting to use it", but more consumers are finding excuses for not using Apple Pay instead of traditional methods (card/ cash)

There has been minimal usage increases since launch in Apple Pay. Samsung has seen increases, but still very early innings, and only 4% have tried it, which is not meaningful yet.

Risk: ChaseNet’s True Intentions

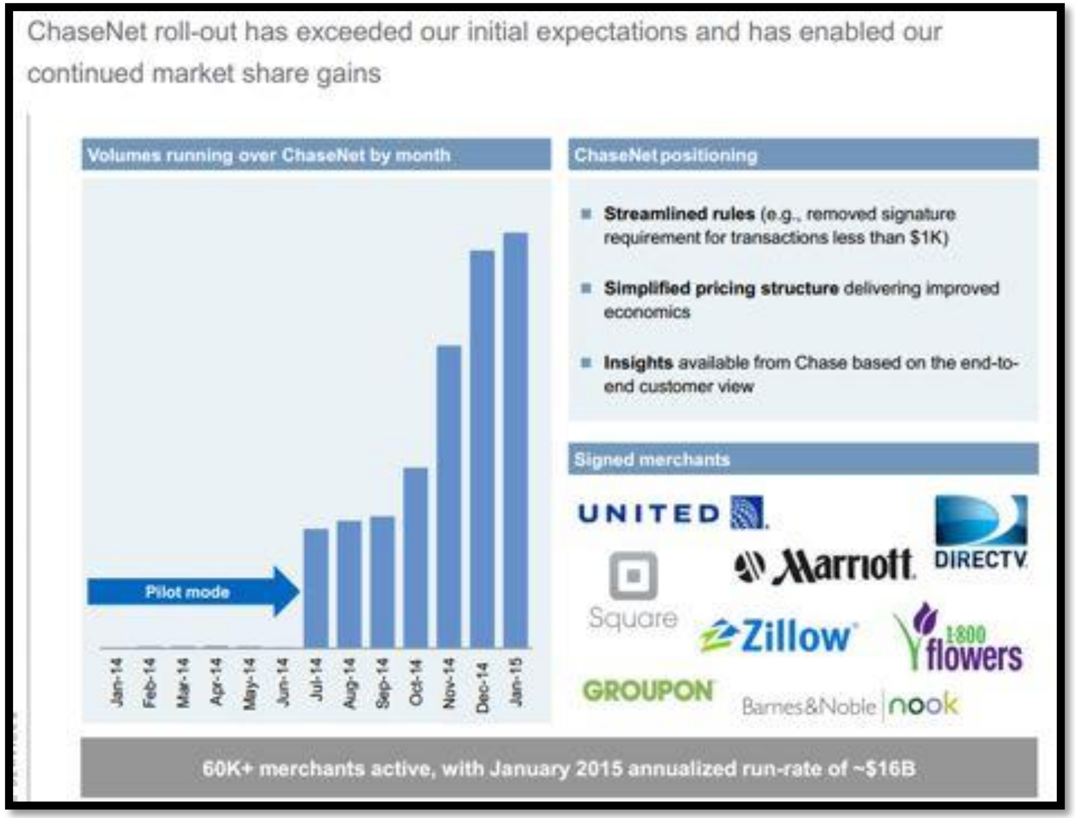
CHASENET

What is ChaseNet?

- Chase Net is Chase’s proprietary 3-party-scheme (closed loop)
  - Merchant acquirer and issuer
  - Go to merchant and re-negotiate the terms that Visa offered them
  - Chase net uses Visa as the rails for the network to operate as a 3-party-model
  - Merchant Acquirer: “Chase Commercial Solutions”
  - They state there are no processing or network fees, but this is because the network is ChaseNet, which is actually Visa’s network
- Based on a 10 year deal between V and JPM, which ends in 2023
- Good thing is that it partners with the largest issuer, and leverages their sales team, scale, and resources in attempts to get more traffic
- Uses Chase’s innovation and customer base, could push more volume over V rails
- Currently running about $30 billion in volume

ChaseNet and Visa: *Partnership*

- Visa and Chase partnered in 2013 for a 10 year agreement, where Visa would be the network in the closed-loop payment scheme called "ChaseNet"
- Primary benefit to Chase is the direct connection to merchants, offer merchants lower and more simplified pricing and rules (example: no signature required is under $1k)
- They won't use Visa's interchange pricing
- Contract is 20% the size of Visa's and pricing is simply
- Slide on right is from March 2015
- Interesting that JPM did not discuss ChaseNet at their 2017 investor presentation



ChaseNet

- As respected payment expert Tom Noye noted in his blog, a top 3 bank issuer say what was happening with ChaseNet and said "F*** Chase, makes me want to work with the existing networks even more…"
- This may be some of the reason why Citi is working with Visa
- Current view is JPM is #1 card issuer, #3 merchant acquirer, and some of this was due to Chase Sapphire and enhanced rewards programs
- Noye currently believes, based on his March 2017 blog post, that the entire ChaseNet buildout was a waste of time for them, and they should've spent more time on building other parts of their business and enhancing partnerships

Risk: Blockchain

Blockchain

- What is blockchain?
  - A distributed database that maintains a list of records ("blocks")
  - Each record contains a timestamp and a link to a previous block
  - By design, they are resistant to modification of the data, so once recorded it cannot be altered retroactively
- Still in the early innings of usage
  - Insurance
  - Bank settlements
  - Medical records
  - Data storage
  - Payments?
- In my opinion – it is still too early to know whether blockchain will be a disruptor to V/MA's C2B payments business
- It is possible it could help V/MA in some ways, specifically in the larger commercial payments space
- Risk: *uncertain but not immediate yet*

Notes: Visa Inc.

PIN debit vs. Signature debit

- Visa CFO from 9/9/2008:
  - When comparing debit and credit transactions, debit transactions typically have a lower average ticket compared to credit. So, if I could use the following example. For every $100 of spend on a **debit card, we would make the same amount of service fee as we would on credit**, because service fee is a function of the amount spent on the card. And since $100 is the same between the two cards, the service fee income would be the same. However, it would take more transactions on a debit card to get to $100 a spend. **And we are paid a fixed -- typically a fixed amount per transaction**. Whether you spend $5 or $50, the per-transaction fee is the same for Visa. Therefore, **per $100 of spend on average, you would make more on debit versus credit**. However, we need to drill down into debit, because the truth of the matter is, they yield about the same because we have two different types of debit transactions. We have **signature debit and we have PIN debit. The signature debit has a higher margin than PIN debit**, and when you blend the mix of those together at current volume, it would yield about the same profitability per $100 of spend. All right? So, that was the first question.
  - So, in the use of a prepaid card cross-border, it would be processed over our debit processing system. So, we get the same kind of profitability that we would, say, with a signature debit card. And, remember of the two, we like signature better than PIN. We like them both, but **we like signature better than PIN.** So, for us, this is leveraging an existing network and an existing billing model.
- Visa CFO 2/26/09:
  - **Signature debit and credit are virtually the same in terms of profitability. Pin debit generates less revenue than signature debit**, but the blend of the two together, are approximately the same yield as credit, and all three products are solidly profitable and leveraged from economies of scale.
- Visa CEO 9/16/2009:
  - I think that there's less than 20% of the merchants in the United States are PIN-enabled

PIN debit vs. Signature debit

- Visa Americas President 3/11/2010:
  - So in the macro in the US, let's talk about the US debit market... So in general it's about 60% offline, non-PIN, 40% PIN-based transactions. We are seeing, in our business, PIN grow a little bit faster. But it's not because of -- it's not because the categories in signature are growing faster. We're picking up faster share in PIN for a number of reasons. So we've been more successful in portfolio conversions in PIN. So there are a number of things embedded in your question. One, the **tension that merchants have, the preference that they have, for PIN versus signature**. When you look at drug stores, convenience stores, supermarkets, discount retail, they do have a lower price point for PIN generally, although that gap has narrowed, in part because of the way that we've managed interchange. Ultimately, I think what you're going to find is the largest face-to-face retail **merchants, they've deployed PIN pads, they've deployed sophisticated prompting routines** and what we've done is we said, that's fine. The merchants ought to allow cardholders to authenticate themselves at the point of sale however they'd like. Consumers, some consumers prefer PIN. That's fine too. We shouldn't, to Elizabeth's point, we shouldn't fight on things like standards or authentication method. We ought to provide a broad suite of products and let the marketplace go where it needs to go. If we find ourselves fighting against those products, I think we're going to take our eye off the ball. I think over a time, our strategy has been try to create or minimize the interchange differential between PIN and signature and let consumers and merchants do what they want at the point of sale with the different options. **I think that as it relates to our economics, I think we told you we look at debit on a portfolio basis**. When we go into an issuer, the typical issuer that participates in PIN with us is also participating, by definition, in signature. The portfolio we have of services with an issuer on debit is equally attractive to us as it relates to credit. **So we are indifferent between the two, even though we make slightly higher margin on our top line and slightly lower margin on PIN**.
- CFO 4/28/2010
  - As you move outside the United States, we have very different mix profiles. So it actually does matter from which geographies the stronger growth rates are coming, because if yield is higher in the faster-growing, then we will have, everything else being equal, we'll have service fee revenues growing faster than payment volume. But if it is coming from areas that have lower yields on service fees, then we will have the opposite. And then, of course, there is a **difference between the mix between credit and debit. Credit carries on balance higher service fee yields than debit**. And then within debit, **signature carries a different service fee yield than pin signature debit than pin debit**. So in short, there are quite a few factors that go into the actual translation of payment volume into revenue, and what you see is the outcome of all of those in a given quarter.

PIN debit vs. Signature debit

- Visa CEO 5/18/2010:
  - In the United States the **revenue that we earn on any particular credit card transaction is significantly more than what we earn on any particular debit card transaction**. But because there are **more debit card transactions** in the end it equals, it pretty much equals out. Remember in the debit environment you have PIN debit and signature debit so there is a trade off between the two. But when you add them up it all comes out in the wash to be about the **same yield with three times as many transactions**. So there is obviously -- when I say it's the same yield then there is obviously an assumption that we are carrying a lot of the additional transactions at low or no cost because of our infrastructure.
- CFO 6/8/2010
  - Yes, so their base -- there are two types of debit. One is signature and then one is pin debit. So the pin debit is one -- you mentioned supermarkets. Pin debit is particularly suitable for retailers with high throughput that do not have a process bottleneck at the Positive because it takes extra transaction time to punch in your pin. If you can accommodate that and you have high throughput, then pin debit is less expensive than signature debit. And so, we are, honestly, we're indifferent because we are focused on having debit disintermediate cash and check. So victory for us is either pin or signature. **But if you use signature debit…has a higher margin or a higher revenue base than pin debit**.
- CFO 9/14/2010
  - So the Durbin amendment focuses on debit virtually exclusively, and to help bound it, roughly 20%, just a **tad over 20% of total Visa net revenue is debit**. Of that let's say 20%, a little over 80% is represented by US debit. So 80x20 is 16, so somewhere **around 16% of our total revenue is debit, US debit**. Then if you were to push that down a little further, **roughly two-thirds of our debit transactions are what we refer to as "signature debit; one-third would be PIN debit.** Our view is on the legislation that this is much more aimed at PIN debit than signature. So that gives you a sense of what we might have at play in terms of revenue exposure.

PIN debit vs. Signature debit

- Visa CEO 7/6/2011
  - I believe something in the neighborhood of **70% of the merchant outlets don't have PIN pads** -- do not have PIN pads. So it is dramatic. If you issued PIN only card, it would be good at **supermarkets, gas stations and some large discount stores**, but it wouldn't be in most merchant outlets. Having said that, you have to **have two unaffiliated networks on a card.** So that means that you have to have two signature marks on a card or two PIN marks on a card and no signature mark, or you need to have one signature mark and two PIN marks, if one of them is unaffiliated, or you could have three PIN marks and three signature marks. This is an extraordinarily complicated situation.
- President of Americas 9/20/2011
  - So no question what we have seen over the last 15 years as roughly two million merchants in the United States have become PIN pad enabled. It has been a bit of an arbitrage on interchange. Right? **Merchants have had this strong financial incentive to deploy PIN pads, one, because of the interchange gap**. But secondly, you know some consumers who have said very clearly they like to authenticate him or herself that way. So what might happen over the next 12 to 18 months to dramatically change that? It would have to be merchant or consumer facing. I **don't see a material increase in the deployment of PIN pads**. I think that the financial incentive for those investments are likely a lot less -- well they are a lot less than they used to be. And secondly, when you look at those merchants segments who have ingrained PIN at the point of sale to how they do business, most of them are doing that for reasons unrelated to interchange or Durbin. They are doing it because it is right for their business. So beyond 12 to 18 months, I think there is a whole host of things that might change the trajectory. But in the relative short-term, I think for the **roughly 60/40 mix that we have got in the US is something we are going to see for a while in our view**.

PIN debit vs. Signature debit

- Visa CEO 10/26/2011
  - A key part of our strategy positions Visa to compete for every transaction on a Visa branded debit card. To that end, earlier this year, we reminded clients that Visa check cards are enabled for PIN authentication. While merchant acquirers have historically used signature authentication for check cards, in the overwhelming majority of circumstances**, Visa is fully capable of facilitating both signature and PIN debit transactions over one network, VisaNet. This is an important competitive advantage** and differentiator in the new environment.
- CEO 2/8/2012
  - The **deceleration of our US debit volume growth during the first quarter was an early sign of this impact, driven by slower growth in PIN transactions and an expected de-emphasis by issuers of debit card, marketing, and debit rewards programs**. A key driver of this slower growth was one major **financial institution's decision to remove Interlink from the back of their cards**, which began in the fall as part of their own plan to comply with the regulation. They and Visa will be able to compete for PIN transactions with the PIN authentication available on Visa check cards. We are aggressively pursuing a back-of-card strategy that adds Interlink to many existing cards that currently carry competitive brands. In fact, we're poised to sign new agreements with major financial institutions to secure back-of-card placement. **Signature transactions generate a far larger share of our US debit revenue and offer greater revenue yields**. This is particularly important as we see no sign of a wholesale shift to PIN debit by the merchant community, and **our signature debit volumes were resilient during the first quarter.** On a parallel track, we are moving forward with strategies to compete for merchant routing decisions. One key aspect of that plan is Visa's previously announced program to modify acceptance economics in the United States, which we believe will offer merchants greater incentive to route transactions over our network in an opportunity to lower their per-unit transactions costs.
- President 2/16/12
  - The economics between EMV transaction and PIN debit are the **same**.

PIN debit vs. Signature debit

- JPM Analyst 5/17/12
  - About half of the debit cards were exclusive prior to Durbin, but Durbin made it to where two unaffiliated networks had to be on the back of the debit card, so Visa lost exclusivity for debit on Interlink (PIN network by Visa)
- Durbin's impact on Visa's debit business
  - Requirement that merchants were given a choice in routing debit transactions by Durbin
  - Just prior to Durbin, Visa signed a large number of exclusivity clauses, meaning a large portion of US debit card had only the Visa debit (Signature, VisaNet) and Interlink (PIN routing) options. Following Durbin, US debit cards carry an average of 3 PIN debit networks on the cards.
  - In the 6 months following Durbin, Visa lost about 55-60% of their debit volume from Interlink as merchants "smart routed" to cheaper networks
  - Within 6 months of Durbin, Visa developed a plan to regain a great majority of the lost market share
  - Visa introduced **FANF** (Fixed Acquirer Network Fee), a $1.3 billion per annum fixed fee. It was able to subsidize Interlink switch fee reductions, which came into effect April 2012, making it the cheapest routing option for many transactions.
  - Visa also introduced Pin Authenticated Visa Debit (**PAVD**), a routing system, which meant it could gain PIN debit market share while simultaneously keeping interchange and network fees at the higher signature level. It would take the PIN transaction and process it over VisaNet (Signature)

PIN debit vs. Signature debit

- Group President 5/17/12
  - And as much as people talk about the fixed acquirer network fee, FANF, people lose sight -- the industry has lost sight of the fact that **we reduced the variable fees, the authorization fees at the same time**. So merchants and acquirers with whom we've now been having discussions look at that and say, all right, so now I have an **incentive to drive more transaction volume onto the network because I've got a lower unit price**. And the thing that I think **you all ought to feel good about is that the unit pricing that we've got with that lower variable fee, which is roughly about 25% discount, is still well, well north of our marginal costs of processing that next transaction, which are close to zero**. So, through a rebalancing of the economics, we've given the larger merchants, in particular, more of an incentive to drive more volume over the network, which is positive to the operating margin of the Company. And I think -- and it de-risks what would happen on the low end is someone decides to go another way.
  - There's no question that what happened with Durbin, while the regulations on the interchange flowed through, impacted the bank economics and the consumer value proposition around debit, you're right. The bigger impact to us from a routing -- from a network participation standpoint was impacting the **roughly 40% of transactions in the U.S. that happen on PIN**. It was about a **quarter of our business**, but as we've said time and time again, **our lowest-yielding transactions** and a **relatively small impact on the P&L**.
- President 6/12/12
  - PIN debit is a 1/3 of the transaction volume, but represents about **2% of Visa's revenue**.
  - Visa card that has PIN capability and then there is another network. So to the bank their revenue, **regardless of how the merchant decides to authenticate that transaction, the revenue to the bank is the same**. It's the merchant's decision as to how they want to route that. So today they can route that through a PIN authenticated Visa transaction or they can route it through the alternative network that sits on that card. But Visa -- today we have 14 out of the 15 largest debit issuers still issue Visa debit cards. Those trends, those contracts now run through 2015 and it will be the merchant's decision as to how they want to authenticate the transaction.

PIN debit vs. Signature debit

- CFO 9/11/2012: How Visa will regain some lost PIN debit market share
  - We lost 60% of our volume in April which is the first month the Durbin rules on PIN debit became active. Now, as of September, the market share loss is, its sitting a little under 50% of volume lost. We do not expect to regain all of that market share. The Signature debit side of the business has been healthy, growing at mid single-digit rates, and this has continued to this day.
  - A very important element of the Durbin legislation was **that the merchant would be able to direct routing of a debit transaction at the time of transaction**. And so, once that took place, it became very important for everyone to **be competitive at the marginal price of a transaction at the point the merchant made its decision**.
  - And so, up to that point, **our pricing structure for debit was completely variable**. But, if it's the variable cost that you're competing on, **it didn't make sense to maintain that structure going forward**.
  - So, what we did was the following. **We restructured our pricing in a way that would make us more competitive at the time that the merchant would decide on the routing** and, at the same time for comparable volumes, would represent a price reduction, and we designed our pricing structure that way.
  - The components were, for the first time, we introduced what we refer to as a fixed acquiring network fee. So, that's a fixed fee. To give you an idea of what that fee represents, **roughly 80% of retailers impacted by this fee will pay $5.00 or less per location per month. 60% of the retailers will pay $2.00 or less per location per month**. So, it's not a huge fee, but that kind of gives you a flavor.
  - So, we introduced a fixed fee. We then lowered our variable transaction fee. And **then, to incent volume, we created a new set of incentives payable to merchants and, in some cases, to acquirers to incent volume**.
  - And when you put all of those together, for the comparable volume we would have delivered in the prior year, it represented a little bit better than **a $100 million price reduction**.
  - The implementation of those fees were timed with the implementation of the Durbin legislation. The fixed acquirer fee is now in place. The lower variable cost is in place. We have a significant number of incentive agreements signed up with a multitude of merchants.
  - And I would say at this point it's gone very smoothly. And, in a sense, it's in place so we are now operating under those revised conditions.

PIN debit vs. Signature debit

- CFO 9/11/2012: How Visa will regain some lost PIN debit market share
  - the acronym is **PAVD, Pin Authenticated Visa Debit**. So, when we think of how you authenticate a transaction, it has always been a part of our **Visa debit signature platform that you could authenticate it with PIN** -- with a PIN. So, it's always been something we've deployed. It was modestly used up to this point, but -- so when the Durbin rules went into place, **we decided to activate that** more fully. And so, we had a bit of work to do to make sure that, as volume built, that we would be able to scale that as a form of authentication of our transactions. And so, that capability we've phased in. So, in terms of deploying it against the eligible universe, I would say **we're just under 100% deployed**. There are a few banks, smaller banks, mid tier banks, that have yet to come on. So, we are substantially adopted in that regard. And then, we're simply scaling the amount of volume we are accepting, because this is -- we're obviously in a very scale business. And with this PAVD capability, we wanted to make sure that we could process seamlessly an increasing number of transactions as that picks up. So, that's where we stand. And so far, so good.
  - There is some impact on the yields on Signature due to Durbin, but it is modest.
  - Signature and Fraud Prevention: “So, the answer is **it's not**. So, in signature, what **we use to validate that it is the correct cardholder using the card is an instantaneous matching of that particular spend against your spending profile**. And when that -- when the location or the type of retailer doesn't match your spending profile, that's what triggers the red flag that might cause a denial of the transaction or a call from your friendly issuing bank. And that's why -- well, so signature, in a sense, is a bit of a red herring in that regard. **It's the spending profile algorithms**. And I got to tell you, folks, they're really good. They are really good.”
- CFO 10/31/2012
  - Because with regards to PIN, thanks to a **regulatory change, a substantial part of our PIN market share was gifted to our competition**. And so it's a little hard for us, on the margin, to comment on the PIN. However, on the **signature debit**, or what we refer to as Visa debit, I can tell you that our business has -- since the implementation of the rules -- I think, in prior quarters, we have experienced a **solid mid-single-digit growth**. And that growth rate is, on balance, drifting a little north, in the most recent quarter.

PIN debit vs. Signature debit

- CFO 9/11/2012: How Visa will regain some lost PIN debit market share
  - As you know pre regulation Visa have enjoyed a very strong position in US debit. We were roughly 60% of the category when you look at signature and PIN-base debit. And that **volume, our share of that category** has absolutely declined. It's come down about 15% from 60% of the **category to just about 50%.**
  - And that share position decline is going to be something that will stay with us. The regulation, the ways in which Interlink competes with other products on those cards, this is the reality. The good news is from an investor standpoint, the volume ran away that will likely to stay away as we've talked about is lower yielding and frankly a portion of the business that was more competitive.
  - So when you look at the aggregate revenue associated with the US business which is our largest business globally when you look at it from a geography or product perspective, it's still about 20% of our global revenues. (US Debit)
- CFO 1/30/2014
  - On the debit side, I would say hard to read that. There is pretty tepid growth in **personal disposable income which is the primary indicator we look at** now that we pretty much lapped the more immediate Durbin effects. Remember **debit is disproportionately nondiscretionary.** So **one of the important drivers of debit spend is the growth in jobs which adds to the overall growth in nondiscretionary and debit spend** and we are just not seeing much in the way of growth rates there. What we are seeing is declining growth rates there for the US in that regard.
  - If we were to take a look at kind of Visa signature versus interlink, I would say the **growth rates on the PIN side have been running higher than on the signature side**.

Cross Border

- Visa CFO 2/26/09:
  - Cross border, without a doubt, is our most profitable revenue-generating transaction. In a cross-border transaction, you earn fees from payment volume, you have a data processing charge from the transaction, and then you have a cross-border charge. So when all those three are put together, it is our most profitable form of transaction.
- Visa Global Executive, Corporate Strategy 6/6/2013
  - The **highest yielding transaction** we have globally is our cross-border transaction. Roughly speaking, you have **10 times the yield** both in the multicurrency fees and other fees that we charge in those transactions, as well as the fact that all of our transactions globally when they happen cross-border run over our network. So those yields are very attractive. We like that business very much.

Prepaid

- Visa CFO 2/25/10:
  - Whether it's prepaid, whether it's debit, whether it's credit, the variable costs associated with processing **an incremental transaction are pretty low**. So the margins, given that **we're a high-fixed-cost, low-variable-cost business, the margins are always going to be attractive for us**. And we focus much less on the margins and much more on what it is to penetrate and what kind of yields do you get. The yields and margins for prepaid are very attractive for us. And the nice thing about prepaid cards is that the markets that we're targeting are reloadable cards. So once the programs are established, they become a form of annuity, over time.
- CFO 6/8/2010:
  - We would equate the prepaid economics much more closely to signature debit
- 6/6/2013
  - View prepaid volume opportunity globally as $3.8 trillion, in the United States alone, see it as $2.2 trillion opportunity.
  - Prepaid is our fastest growing consumer product globally in the US, we have been sustaining 20% to 30% growth rates in prepaid.

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