AUTONOMOUS

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Equity – Payments

Sector: Payments

US Payments

Greener Pastures – Initiating on MA, V, & PYPL

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WHY READ?

We expand our US Payments coverage universe, re-initiating on Mastercard (OP), Visa (OP), and PayPal (N). We believe the pullback in share prices of the networks (Visa and Mastercard) is a great opportunity to buy high-quality franchises with upside to earnings as cross-border activity recovers. We are more cautious on PayPal, as we believe expectations in the name are still high and we see better relative upside in the networks.

- **Networks – quality on sale.** We view both networks as attractive investments near and long term mainly due to potential upside in earnings revisions. For V/MA, our above-consensus forecasts stem from: 1) a stronger recovery in cross border volumes, 2) an acceleration in the growth contribution from new flows, and 3) volumes in non-US countries improving after a rapid increase in vaccination rates. The spending of 'excess savings' in the US is not assumed in our forecasts and could be an additional driver of upside.
- **V/MA upside on cross border.** We believe consensus underappreciates the upside to the cross-border recovery. We split the cross-border businesses for V/MA into two, modeling 1) eComm/card-not-present (CNP) and 2) travel-related spend separately. Using monthly growth rates disclosed by the companies, we estimate eComm/CNP now accounts for 50%+ of the cross-border businesses for Visa and Mastercard. We're 9%/8% above consensus in 2023E on cross border revenue for MA/V, as we expect the travel cross border businesses to rebound off a larger eComm revenue base, which has grown throughout COVID.
- **PYPL – great company but potential headwinds.** While we expect PayPal to remain a dominant player in eComm and grow revenue at a 20% CAGR over the coming years, we believe the company could face a number of potential headwinds including 1) a slowdown in net active user growth as penetration in its core developed markets reaches elevated levels 2) take rate compression due to growth in marketplaces/bill pay, and 3) increased competition. We believe there is uncertainty around 3Q results as eComm growth has decelerated, potentially leading to net new actives (NNAs) coming in below management's guidance.
- **PYPL – diving into 'Super Apps'.** PayPal's strategic goals center around the creation of a 'Super App' akin to WeChat/Alipay in China. While we are skeptical that a 'Super App' will thrive in a similar fashion here in the US, as consumer habits are difficult to change, we expect the firm's strategic initiatives to result in higher average revenue per user moving forward (MSD per annum increase for PayPal and a three-fold increase for Venmo by 2025). While an acquisition of Pinterest could help PayPal round out the shopping experience of that 'Super App', we question whether management would be able to significantly turn around a firm that historically has struggled to improve monetization.
- **Valuation.** We apply target multiples of 30x and 33x to our 2023E EPS estimates for Visa and Mastercard (one turn discounts to NTM multiples), respectively, leading to price targets of $280 and $452 (both OP ratings). For PayPal, we apply a target multiple of 38x to our 2023E EPS estimate (120% of network multiples), leading to a $278 price target and a Neutral rating. While recent underperformance by PYPL due to a potential acquisition of Pinterest looks like a better entry point, we remain on the sidelines in-part due to uncertainty around 3Q results (risk of a miss on NNAs) and other headwinds highlighted above.

Rating summary

Ticker	Rating	PT	Upside
MA	OP	$452	26%
PYPL	N	$278	16%
V	OP	$280	21%

Source: Autonomous Research

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Estimates and Thesis Summary

Table 1: Autonomous Estimates vs. Consensus

$mn

	Revenues				EPS			
	CY3Q21E	FY2021E	FY2022E	FY2023E	CY3Q21E	FY2021E	FY2022E	FY2023E
Mastercard								
Autonomous	$4,949	$18,879	$23,254	$27,238	$2.18	$8.20	$10.94	$13.71
Consensus	$4,945	$18,853	$22,553	$26,024	$2.18	$8.14	$10.63	$13.06
% difference	*0%*	*0%*	*3%*	*5%*	*0%*	*1%*	*3%*	*5%*
PayPal								
Autonomous	$6,170	$25,666	$31,378	$37,980	$1.08	$4.71	$5.78	$7.32
Consensus	$6,235	$25,753	$31,593	$38,245	$1.07	$4.72	$5.87	$7.37
% difference	*-1%*	*0%*	*-1%*	*-1%*	*1%*	*0%*	*-2%*	*-1%*
Visa								
Autonomous	$6,617	$24,163	$29,538	$33,871	$1.59	$5.89	$7.45	$8.93
Consensus	$6,515	$24,047	$28,762	$32,796	$1.54	$5.81	$7.22	$8.61
% difference	*2%*	*0%*	*3%*	*3%*	*4%*	*1%*	*3%*	*4%*

Source: Bloomberg, Autonomous Research estimates

Table 2: Company Thesis Summary – Details on Autonomous views of Mastercard, Visa, and PayPal

Rating	Investment Thesis	Positives	Key Risks & Concerns
Mastercard – Outperform			
Target: **$452**	Mastercard's recent underperformance is not justified, in our opinion, and we believe investors underappreciate the upside to revenue and earnings estimates from a strong recovery in cross border activity. We expect the stock to outperform as earnings growth accelerates due to 1) a stronger recovery in XB volumes, 2) an acceleration in growth contribution from new flows, and 3) volumes in non-US countries improving after a rapid increase in vaccination rates. We prefer MA over V due to 1) potential market share gains, 2) exposure to areas with lower card penetration, and 3) superior value-added services.	• Upside to cross border • Taking share in C2B • International exposure	• Slowdown in US economic recovery • Near-term increase in rebates/incentives • Potential for elevated expense growth
ETR: **26%**			
PayPal – Neutral			
Target: **$278**	We expect PayPal to remain a dominant player in eComm and grow revenue at a 20% CAGR over the coming years. However, expectations are elevated, which prevents us from being more bullish. In terms of positives, we believe the Venmo monetization opportunity as significant and expect core PayPal to expand its ARPU over time. On the flip side, the company could face a number of potential headwinds including 1) a slowdown in net new active user growth as penetration in its core developed markets reaches elevated levels 2) take rate compression due to growth from marketplaces/bill pay, and 3) increased competition.	• Venmo ARPU expansion • Strong user engagement • BNPL positioning	• eComm deceleration • Risk of NNAs coming in below expectations • M&A headline risk (Pinterest)
ETR: **16%**			
Visa – Outperform			
Target: **$280**	Similar to MA, we see upside to Visa's cross border business. The company should also benefit from increased contribution from new flows as capabilities like Visa Direct begin to scale. Relative to MA, we believe Visa has some greater risks to it (e.g. pushback from merchants like Amazon on processing costs and regulatory concerns in the US debit market where Visa has greater share). These concerns plus worries around disintermediation (BNPL, SQ/Afterpay creating a closed loop, etc.) are overdone, in our opinion, and create an attractive buying opportunity. Our estimates are above consensus, and we believe the stock will outperform as earnings come in better than expectations.	• Upside to cross border • Acceleration in new flows • International exposure	• Slowdown in the US recovery where Visa has greater share than MA • US debit regulatory risk • Headline risk from Amazon surcharging
ETR: **21%**			

Source: Bloomberg, Autonomous Research estimates

Note: ETR equals estimated total return over the next twelve months

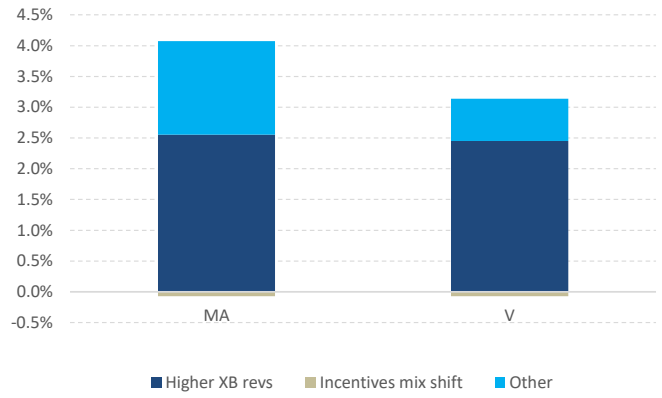
Networks Executive Summary

Over the past year, Mastercard and Visa have underperformed the S&P 500 and broader payments universe by -21% and -13% respectively. We think the stocks are being over-penalized for concerns around disintermediation (closed loop networks, BNPL, CBDCs, nationalism) and regulation (online debit routing in the US). Historically, concerns about regulation/disintermediation have proven to be excellent buying opportunities.

We view the networks as attractive investments in the near and long-term due to potential upside in earnings. We believe consensus underappreciates the upside to the cross-border recovery. We're 9%/8% above consensus in 2023E on cross border revenue for MA/V, as we expect the travel cross border businesses to rebound off a larger eComm revenue base, which has grown throughout COVID. We expect new flows to become a greater contributor of growth for the networks over time. We've dug into Visa Direct, a capability that allows Visa to push a payment to any card in the world, and while it makes up just 1-2% of revenue, we think it can become a bigger driver of growth over time. We expect V/MA to benefit as volumes from non-US countries improve after a rapid increase in vaccination rates. The spending of 'excess savings' in the US could also provide additional upside.

Chart 1: Cross border drives the majority of our top-line upside for the networks

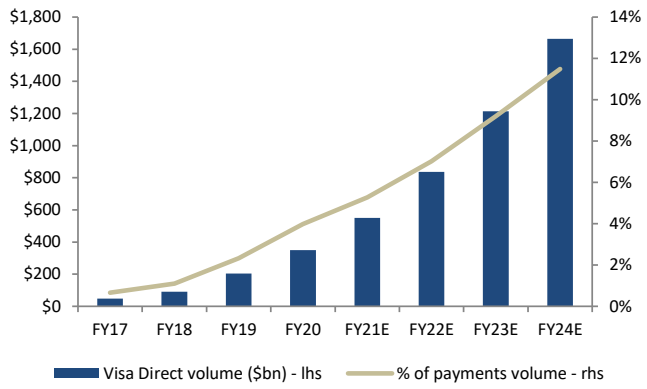
% difference versus consensus on 2023E net revenues



Source: Bloomberg, Autonomous Research estimates

Chart 2: We believe Visa Direct could account for >10% of volumes by FY24E

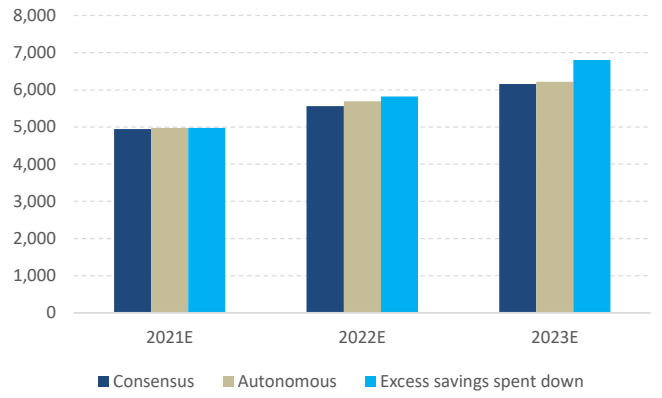
% of total payment volume (rhs)



Source: Company reports, Autonomous Research estimates

Chart 3: There is upside to our numbers if US consumers spend their 'excess savings'

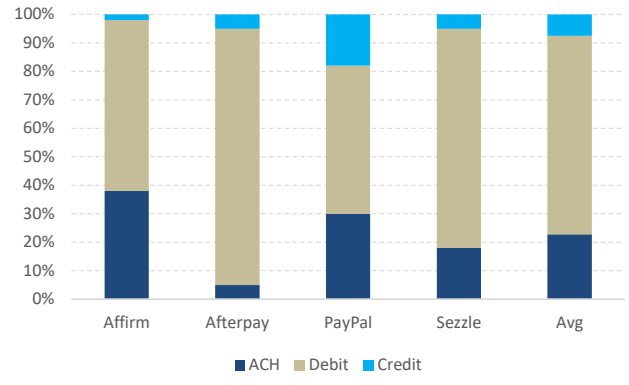
Visa US payment volume - $bn



Source: Bloomberg, FRED, Autonomous Research estimates

Chart 4: BNPL is not a headwind for the networks as the majority of payments are debit-funded

% funding mix



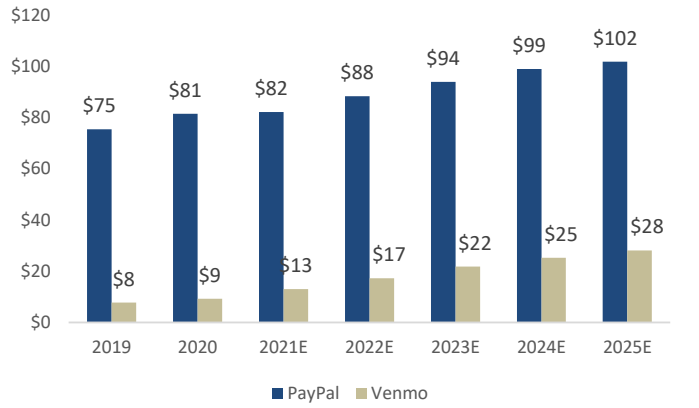
Source: Company reports, Autonomous Research

PayPal Executive Summary

Over the past 18 months, PayPal has benefited from a rapid shift in consumer spend to eCommerce, which has resulted in positive estimate revisions as well as a higher multiple. However, sitting here today, we believe the company faces a number of potential headwinds (slowdown in key growth metrics like net new actives (NNAs), increased competition, take rate compression) and view the stock as close to fully priced. The P/E multiple is elevated relative to history (FY3 P/E of 35x vs. a 3-year average of 26x) and consensus earnings forecasts assume an acceleration in NNAs and market share gains in eCommerce. While recent underperformance following a potential acquisition of Pinterest presents a better entry point, we initiate at a Neutral rating in part due to uncertainty around 3Q results (and the risk of a miss on NNAs).

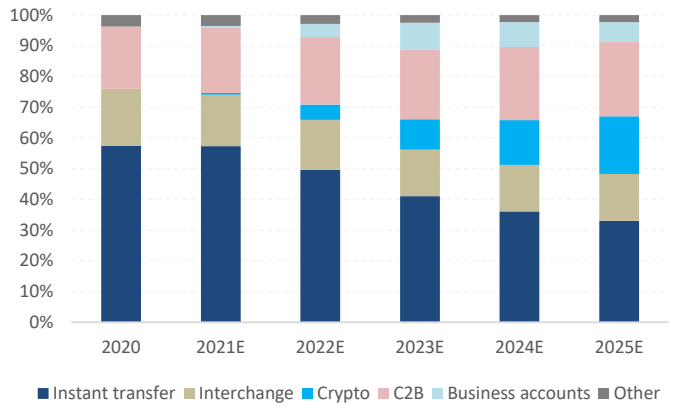
Chart 5: We expect a MSD per annum increase in PayPal's ARPU while Venmo's triples over-time

Average revenue per annually active user



Source: Company reports, Autonomous Research estimates

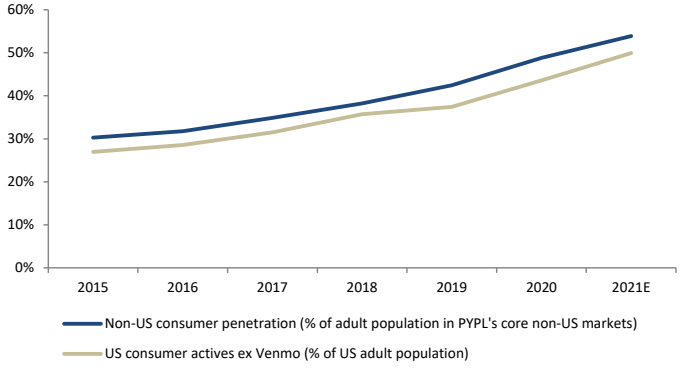
Chart 6: We expect crypto, Pay w/ Venmo, & business profiles to drive Venmo ARPU expansion



Source: Company reports, Autonomous Research estimates

Chart 7: We estimate core PayPal is already 50% penetrated in its core markets…

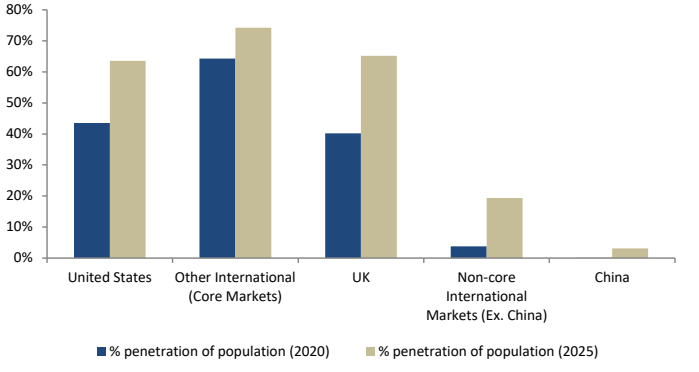
Active consumers % of adult population



Source: US Census data, ons.gov.uk, Instituto Nacional de Estadística, and other government websites. Company data, Autonomous Estimates; Chart shows consumer actives so it excludes any merchant count figures; Excludes Venmo and Honey accounts where applicable.

Chart 8: …and you might need to assume 70% penetration in 2025 to hit management's target

Active consumers % of adult population



Source: US Census data, ons.gov.uk, Instituto Nacional de Estadística, and other government websites. Company data, Autonomous Estimates; Chart shows consumer actives so it excludes any merchant count figures; Excludes Venmo and Honey accounts where applicable.

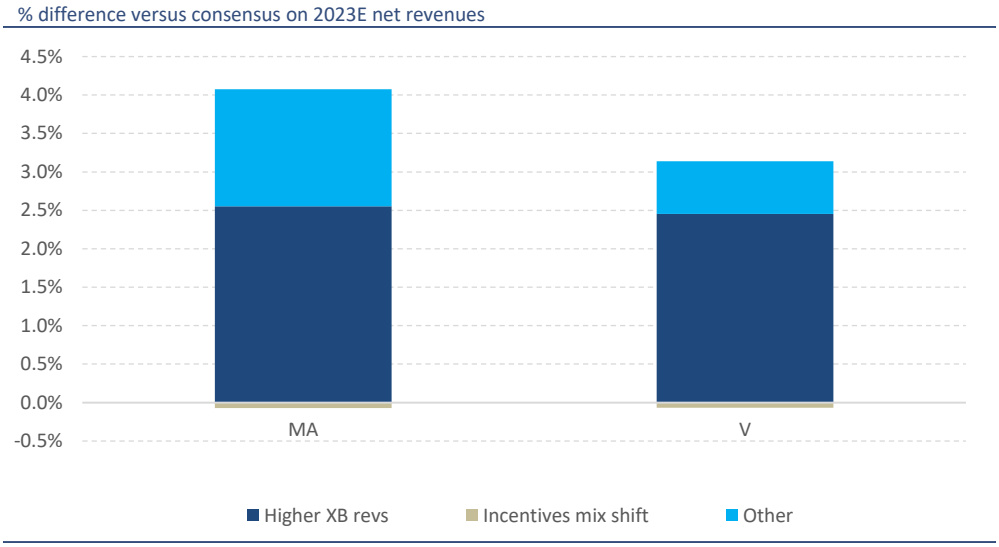
Networks: cross border upside

Investor Debate: How should investors forecast the recovery in cross border volumes?

We believe consensus underappreciates the upside to the cross-border recovery. We split the cross-border businesses for V/MA into two, modeling 1) eComm/card-not-present (CNP) and 2) travel-related spend separately. Using monthly growth rates disclosed by the companies, we estimate eComm/CNP now accounts for 50%+ of the cross-border businesses for Visa and Mastercard. We're 9%/8% above consensus in 2023E on cross border revenue for MA/V, as we expect the travel cross border businesses to rebound off a larger eComm revenue base, which has grown throughout COVID.

We believe beating on earnings will encourage investors to become more positive on the networks. The crux of our outperformance thesis is around higher earnings expectations, much of which comes from higher cross-border revenue expectations. As shown in the table below, more than 60% of the 2023E net revenue outperformance versus consensus comes from this factor alone. If Visa and Mastercard start outperforming on earnings expectations, we believe the stocks could benefit from a higher multiple, as the companies would have more positive momentum and be in "beat-and-raise" mode.

Chart 9: Cross border outperformance drives the majority of our above-consensus net revenue forecasts



Source: Bloomberg, Autonomous Research

While the vast majority of the networks' volumes stem from domestic transactions, cross border payments are higher yielding due to complexities of the transaction (currency translation, connecting a merchant in one country to an issuer in another, potentially elevated fraud risk, etc.) resulting in cross border fees being ~23% and ~28% of gross revenues for Visa and Mastercard, respectively, prior to the pandemic.

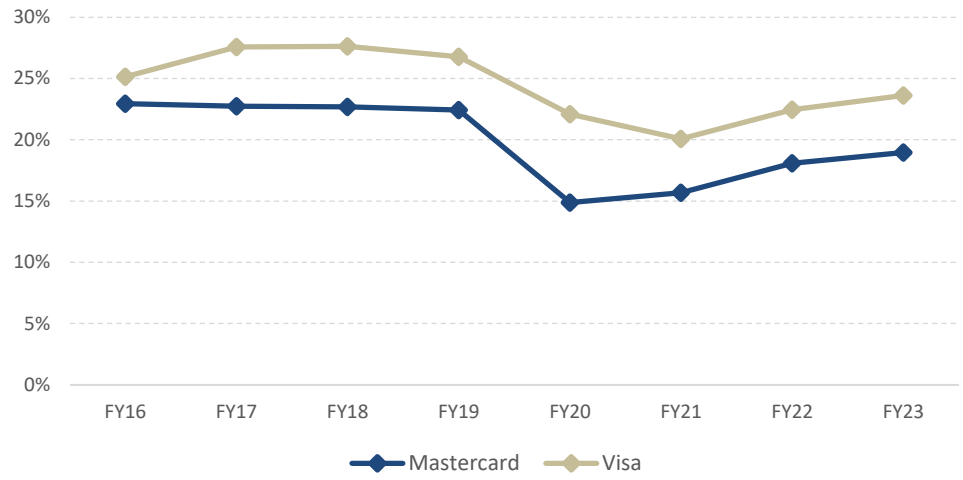
There are a number of secular trends benefitting the cross-border business, including: 1) globalization in eCommerce and 2) growing international travel. In fact, prior to the pandemic, cross-border revenues for Mastercard were growing 15%+ per year while Visa's revenue growth trend (adjusting for M&A) was in the low double-digits.

We believe that Mastercard and Visa's market shares in cross-border are well protected as competing networks have focused more on capturing domestic volumes (in places like

Canada, China, Australia). Often nationalist government movements (as we are seeing in Australia at the moment) result in share gains for the local player. These networks however lack the scale that Visa and Mastercard have on both sides of the payments network (merchants and issuers/consumers).

Chart 10: Cross-border fees accounted for ~25% of revenues pre-COVID

Cross border fees as a percentage of gross revenues



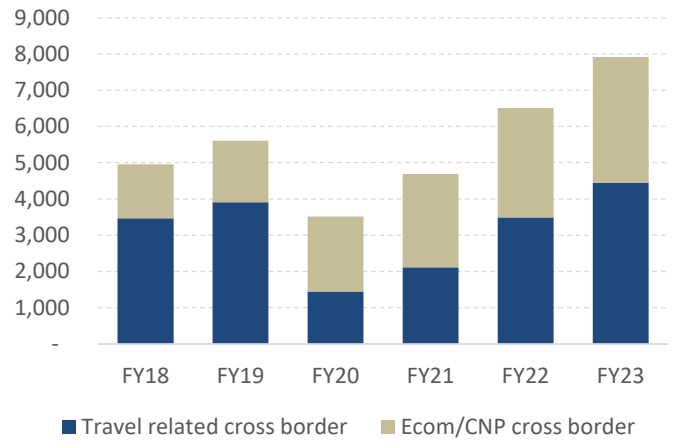
Source: Company reports, Autonomous Research

We believe consensus underappreciates the upside to the cross-border business over the next few years. The networks provide limited information around take rates and absolute dollars of volume coming from cross border, meaning many analysts model the cross-border business using a simple revenue growth figure (which leads to inaccuracies).

We believe a better way to forecast cross-border revenue is to split up the business into two buckets: 1) eCommerce or more broadly card not present transactions and 2) travel-related spend. Mastercard and Visa have stated that prior to the pandemic, travel drove ~2/3rds of cross border revenue, while card not present/eComm contributed the remaining 1/3rd. That mix flipped during 2020 as travel activity declined 75%+ and eComm surged.

Chart 11: Mastercard's travel cross border business should rebound off a larger eComm revenue base

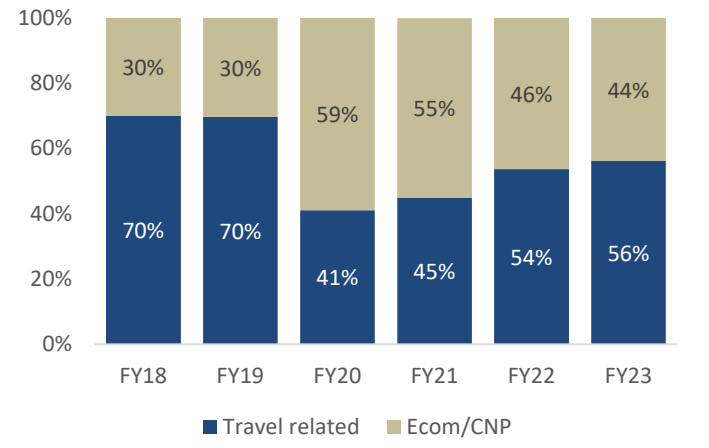
$mn



Source: Company reports, Autonomous Estimates

Chart 12: Mastercard's cross-border mix should shift more towards eComm post pandemic

% of Mastercard's cross border revenue

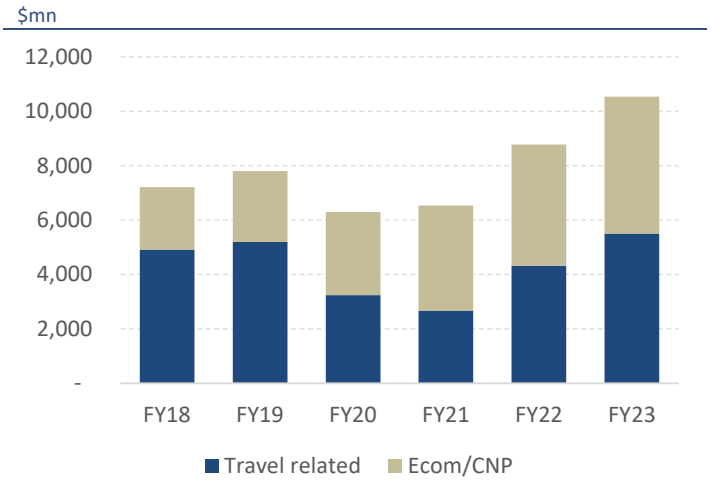


Source: Company reports, Autonomous Estimates

Using monthly growth rates disclosed by the companies, we estimate eComm/CNP now accounts for 50%+ of the cross-border businesses for Visa and Mastercard. We expect cross border eComm growth to persist, as consumer habits have changed following the pandemic. At the same time, travel-related cross-border should rebound in the coming years. We believe this is more of a question of when, rather than if.

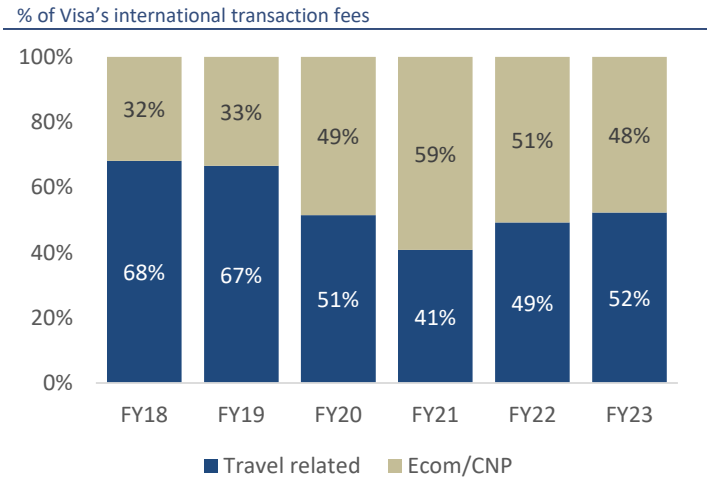
Similar to Mastercard, we believe Visa's cross-border revenue shifted more towards eComm over the past 18 months. As shown in the left chart below, we expect cross-border revenue in FY22E to be ~12% above FY19 levels, driven by strength in eComm (~170% of FY19 levels) and a recovery in travel (~83% of FY19 levels).

Chart 13: We expect Visa's cross-border business to benefit from similar trends



Source: Company reports, Autonomous Estimates

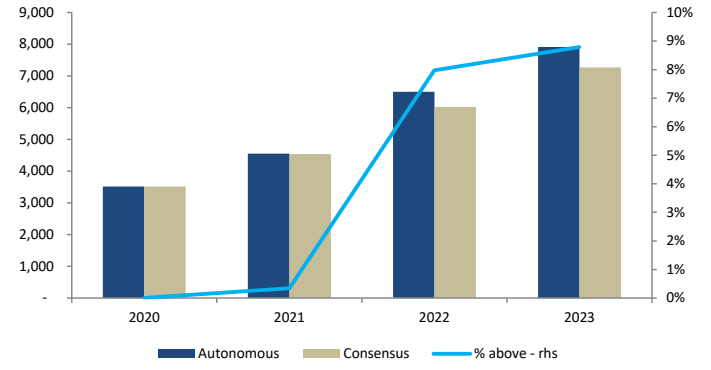
Chart 14: We expect eComm to drive 50% of Visa's cross-border revenue in FY22E (vs. ~33% in FY19)



Source: Company reports, Autonomous Estimates

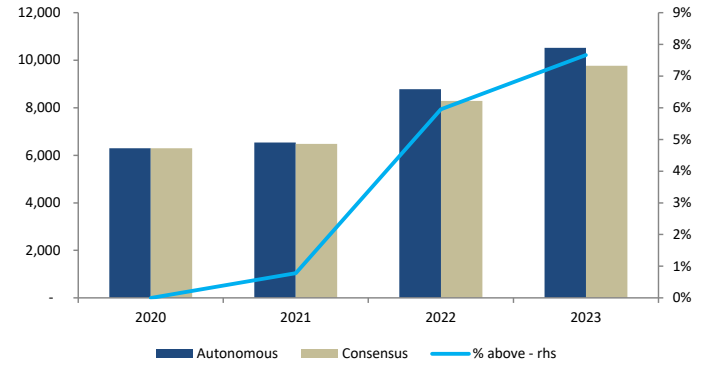
We're 9%/8% above consensus in 2023E on cross-border revenue for MA/V, as we expect the travel cross-border businesses to rebound off a larger eComm revenue base, which has grown throughout COVID.

Chart 15: We're 9% above consensus on Mastercard's cross-border volume fees in 2023E



Source: Bloomberg, Company reports, Autonomous Estimates

Chart 16: We're 8% above consensus on Visa's international transaction revenue in 2023E



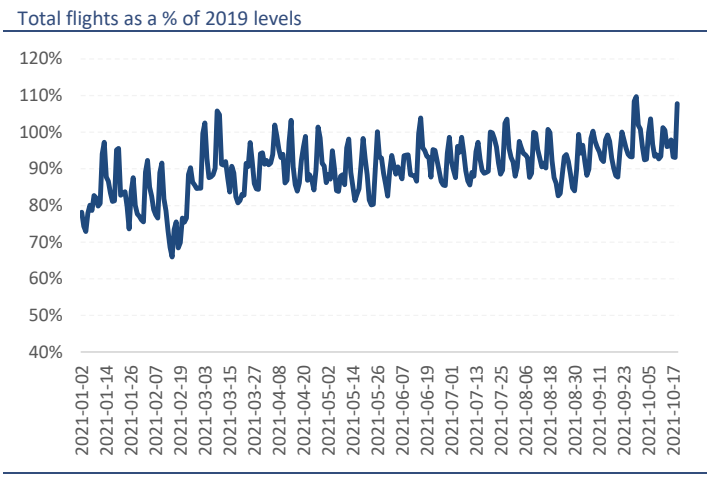
Source: Bloomberg, Company reports, Autonomous Estimates

We provide an update on the airline recovery below. Surprisingly, total flights are back to 2019 levels while commercial flights are close to 80-90% of 2019 levels. This does not necessarily mean the number of passengers has fully recovered though, as utilization rates are likely lower. In addition, we understand that domestic travel is likely recovering faster

than cross border. However, we like the way Mastercard's management team looks at cross border travel. They say that we must dissect both ***the ability*** and ***the intent*** to travel.

We believe the intent to travel is there, and now we're waiting on the ability to travel. The scientific community is making progress against COVID including rolling out preventative measures, vaccines, and therapeutics. We believe the ability to travel will return (we just need a crystal ball to know when). The first big datapoint here will be when US opens its borders to Canada, Europe, and Mexico next month. We believe the charts below provide a mark-to-market on the intent to travel, clearly indicating that demand is back. So, all-in-all, once the COVID situation improves, in our view, T&E should return to 2019 levels and grow from there.

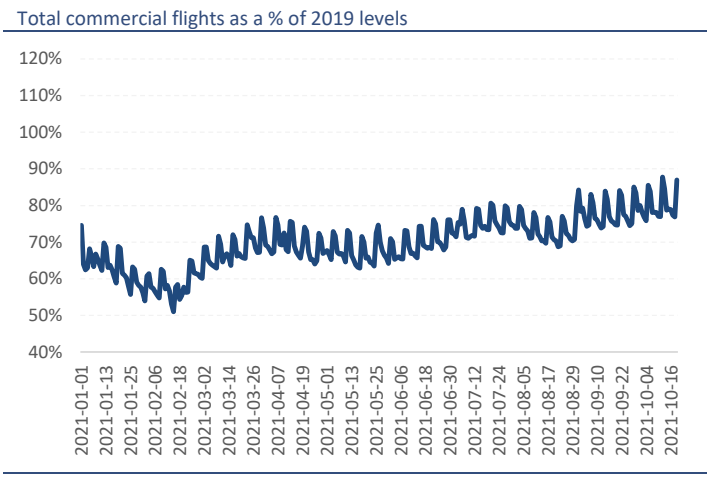
Chart 17: Total number of flights are already back near 2019 levels…



Source: Flightradar24

Note: total flights are defined as commercial flights + rest of business jet flights + private flights + gliders + helicopter flights + ambulance flights + government flights + some military flights + drones

Chart 18: … while commercial flights are not as far behind as one would expect



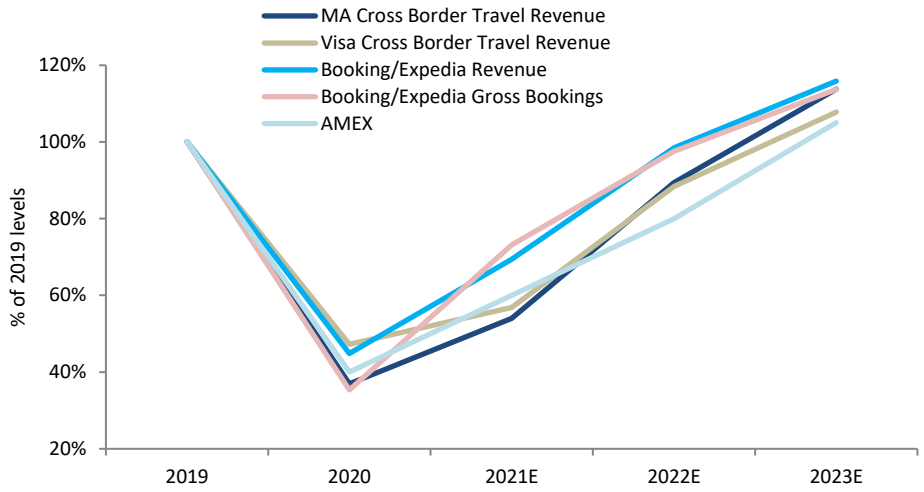
Source: Flightradar24

Note: commercial flights are defined as commercial passenger flights + cargo flights + some business jet flights

Cross-border eComm and travel recovery paths

To inform our assumptions in our cross-border revenue analysis, we leverage the expected growth rates of leaders in eCommerce (i.e. Amazon, PYPL) and travel (specifically online travel agencies Booking.com and Expedia). We expect the networks' cross-border travel revenue to lag the OTA's (online travel agency) revenue and gross bookings, as we believe Booking.com and Expedia are benefitting from a quicker return of domestic travel. That said, we expect Visa and Mastercard to close the gap between the OTAs in 2022 and 2023 (when looking at revenue relative to 2019 levels) as borders re-open.

Chart 19: We expect the network's cross-border travel revenue to lag the OTAs (Booking/Expedia) but assume this gap closes in 2022/2023

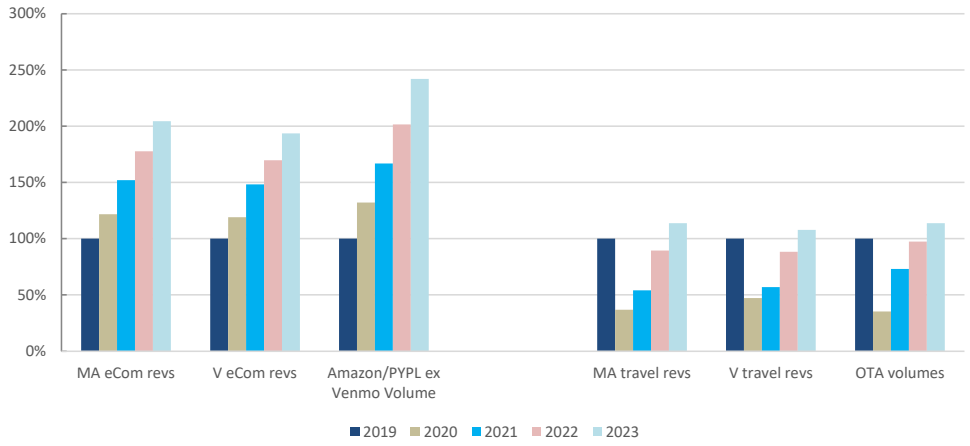


Source: Company data, FactSet, Bloomberg, Autonomous Estimates

Due to the pent-up demand for international travel (as illustrated by bookings growth across nations once borders open), we believe it is fair to forecast a revenue level in 2023 that is a bit north of 2019 for the networks. What is helpful here for the networks is the fact that the majority of the cross-border spend is consumer-based (we believe 90%+) unlike peer American Express (OP) who is more skewed to business-travel.

Chart 20: We use market expectations in other sectors to level set our cross-border expectations

Volumes and revenues as a % of 2019 levels; OTA's represents the aggregate volumes of Booking.com and Expedia

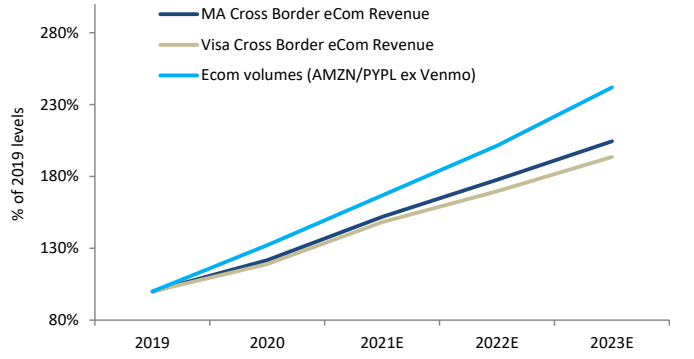


Source: Bloomberg, Bernstein, Company reports, Autonomous Research

Within eComm, our analysis suggests that Visa and Mastercard can grow in the mid-20% range in 2021E. While that might seem aggressive, we estimate their cross-border eComm businesses have already increased in the 25-30% range in 1H21 (calendar year). Our cross border eComm growth assumptions are generally below eComm peers such as Amazon and PayPal.

Chart 21: Visa and Mastercard cross-border eComm revenue relative to other eComm players

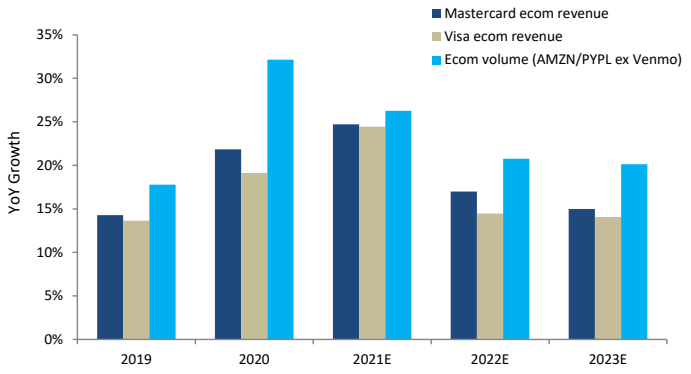
Volumes and revenues as a % of 2019 levels



Source: Company data, Autonomous Estimates

Chart 22: YoY growth rates for Visa and Mastercard cross-border eComm vs. peers

YoY growth rates



Source: Company data, Autonomous Estimates

In the chart above for eComm volume growth, we include Amazon and PayPal volume ex Venmo.

In the analysis highlighted above, we take a conservative approach and assume eComm volumes for the networks grew slower than Amazon and PayPal (ex. Venmo) in 2019. However, our conversations with Mastercard suggest that CNP ex travel cross-border revenue was growing ~20% pre pandemic (i.e. the pre-pandemic trend growth was similar for Amazon volumes and MA XB CNP revenues).

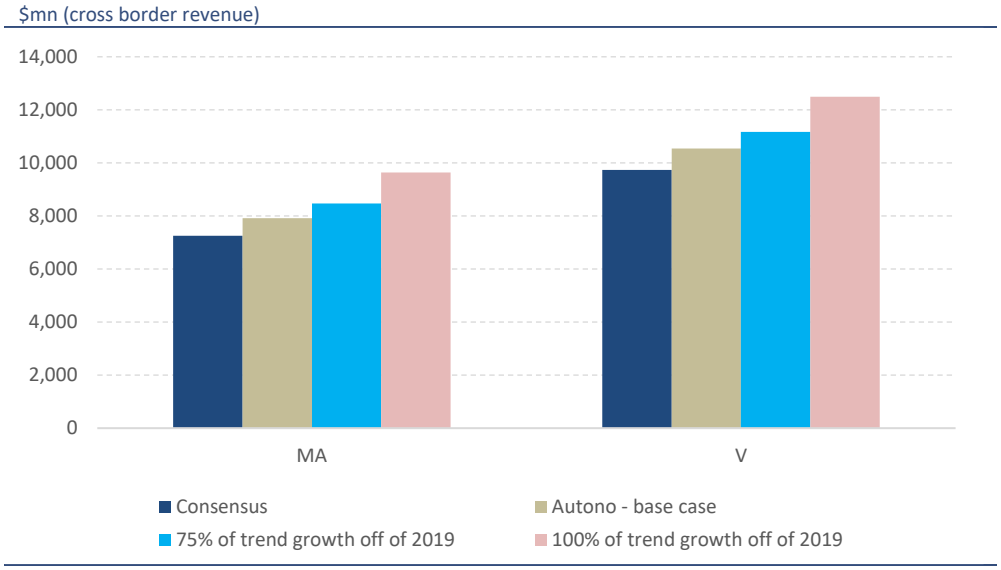
While Amazon fared much better in 2020 due to the surge in domestic spend, as the pandemic's impact fades and supply chain bottlenecks are resolved, we believe the growth rates could once again converge (with potentially a 'catch-up' trade for cross border).

A dream-the-dream scenario points to significantly more upside on cross-border revenue

While our estimates are centered around the aforementioned assumptions, we believe a more bullish scenario could occur, which would put Visa and Mastercard's cross-border revenues even further above consensus levels. The combination of 1) positive 2023 GDP revisions as economies re-open (GDP forecasts are in-line with pre-pandemic expectations for the US), 2) the secular trends for cross-border growth being in place, and 3) pent-up demand to travel means one could argue that cross-border revenues will return to their previous growth trend (i.e. assume Mastercard's revenues will compound at a 15% rate off 2019 levels). While the probability of this occurring might be low, it is certainly possible. If this proves to be the case, consensus estimates on cross-border revenues in 2023 are 33% and 28% too low for Mastercard and Visa respectively.

Separately, Visa and Mastercard's cross-border travel revenue could also benefit from an accelerated shift from cash to card caused by the pandemic. Many investors compare 2023 figures versus 2019 levels, but any change in consumer behavior (i.e. paying for goods with card instead of taking out cash at an ATM) could drive additional revenue versus pre-pandemic levels.

Chart 23: Scenario analysis points to potentially meaningful upside to cross-border revenue



Source: Company reports, Autonomous Research

In the scenario analysis highlighted above, we assume Mastercard's and Visa's cross border revenues (from 2019) compound through 2023 at their pre-COVID rates (~15% for Mastercard and ~13% for Visa).

The cross-border recovery should help lower rebates/incentives as a % of gross revenue

If Visa and Mastercard outperform on cross border revenue as we anticipate, it should help lower the rebate/incentives line as a percentage of gross revenue. The networks typically pay their partners (issuers, merchant acquirers, or other partiers) for meeting volume-based thresholds. Because many issuers/acquirers are domestically focused, incentives account for a relatively high portion of domestic volumes while international (i.e. cross border) fees have a low level of incentives associated with them. We think it is much more common to tie incentives to total volumes, not just cross border volumes.

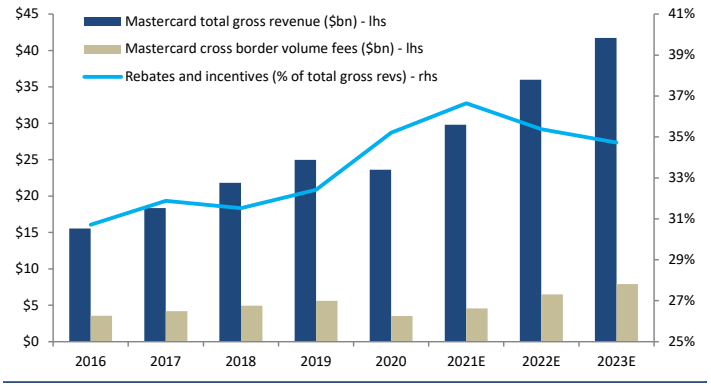
If Visa and Mastercard outperform on cross border revenue as we anticipate, it should help lower the rebate/incentives line as a percentage of gross revenue

In addition, we believe the networks do not necessarily need to provide incentives on cross border, as Visa/Mastercard provide lots of value for their partners (for example, cardholders can go anywhere in the world and use their credentials at a merchant they have never interacted with before). Recent commentary from both management teams helps support this argument:

- **Mastercard:** *"We're less indexed to rebates incentives on cross-border than we are on domestic."*
- **Visa:** *"The cross-border business, as you saw last quarter, was still down about 40%. Since our incentives are more linked to the domestic business, that shift in mix certainly is pushing up incentives as a percent of gross revenues. As the cross-border business recovers, which we hope will happen as we head into the second half and into next year, then that should help."*

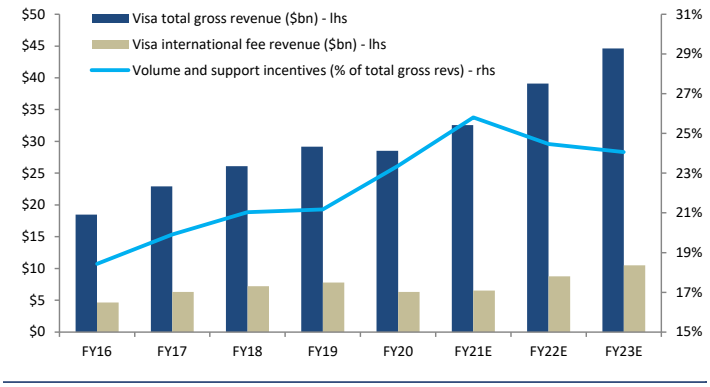
As shown in the charts below, as cross border volume and revenue declined, rebates and incentives as a percentage of gross revenue increased for both Visa and Mastercard. We forecast this percentage to decline from FY21 levels but remain above pre-COVID levels.

Chart 24: Mastercard's rebates and incentives as a % of gross revenue increased as cross border revenue declined…



Source: Company data, Autonomous Estimates

Chart 25: …Visa has similar trends; we expect the company's volume and support incentives as a % of gross revenue to remain above pre-COVID levels



Source: Company data, Autonomous Estimates

We've attempted to allocate rebates and incentives across the domestic and cross-border businesses, assuming a much lower rebate on cross-border activity. It is possible that our analysis proves overly conservative, meaning rebates and incentives come in lower than our forecast, which could provide additional upside.

As shown in the table below, in each of the last four quarters when Visa's international transaction fee line beat consensus expectations, volume and support incentives as a percentage of gross revenue also came in better than management's guidance. Lastly, as value added services continue to outpace payment processing revenue growth, incentives as a percentage of gross revenue should decline.

Table 3: When Visa beats on international transaction fees, its volume and support incentives (as a % of gross revenue) beat management's guidance as well

Visa volume and support incentive analysis	Sep '20	Dec '20	Mar '21	Jun '21	Sep '21E
Volume and support incentives % of gross revs (actual)	**25.0%**	**24.6%**	**25.8%**	**25.8%**	**26.8%**
Volume and support incentives % of gross revs (guide)	25.8% - 26.8%	25.5%	27.5%	26.8% - 27.3%	26.3% - 26.8%
International transaction fees (actual)	1,346	1,451	1,488	1,696	1,898
International transaction fees (cons.)	1,304	1,346	1,472	1,614	1,860
Above/(below) consensus	**3%**	**8%**	**1%**	**5%**	**2%**

Source: FactSet, Company data, Autonomous Estimates

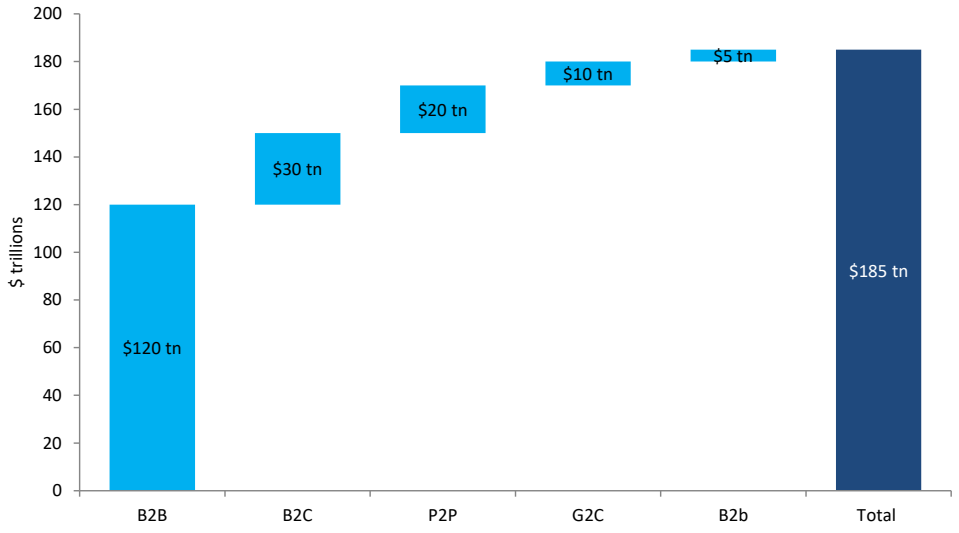
Networks: Expansion into new flows

Investor debate: How beneficial can increased penetration in new flows be to revenue growth?

Visa and Mastercard have benefited from the shift from cash to card in consumer to business (C2B) payments. While we expect this tailwind to persist for many years, the networks have started addressing payment flows beyond C2B (e.g. B2B, P2P, G2C, etc.). In the section below, we take a closer look at Visa Direct. Visa Direct is a push payment platform that reverses the traditional card payment flow by allowing payment originators to send funds directly to cards, and with the acquisition of Earthport, Visa Direct can also push funds directly into 1.5bn additional bank accounts. We estimate Visa Direct is generating ~$450mn in revenue in FY21E and contributing ~0.6ppts to Visa's overall top-line growth. Assuming Visa Direct continues to grow 30-50% over the coming years (a meaningful deceleration compared to recent results) we estimate Visa Direct volume could reach over $1.5tn in volume in FY24, or ~10% of Visa's overall payment volume. While our analysis focuses on Visa Direct rather than Mastercard Send due to lack of disclosure, we believe new flows could have a similar impact on Mastercard's volume and revenue growth.

While we believe the runway is still long on the consumer side, the meaningful infrastructure investments that Visa and Mastercard have made over decades to build their vast networks are allowing for an expansion into new payment use cases. As shown in the chart below, Visa estimates there are $185tn of new flows that it can target in the coming decades, with the largest bucket being B2B payments, followed by B2C and others.

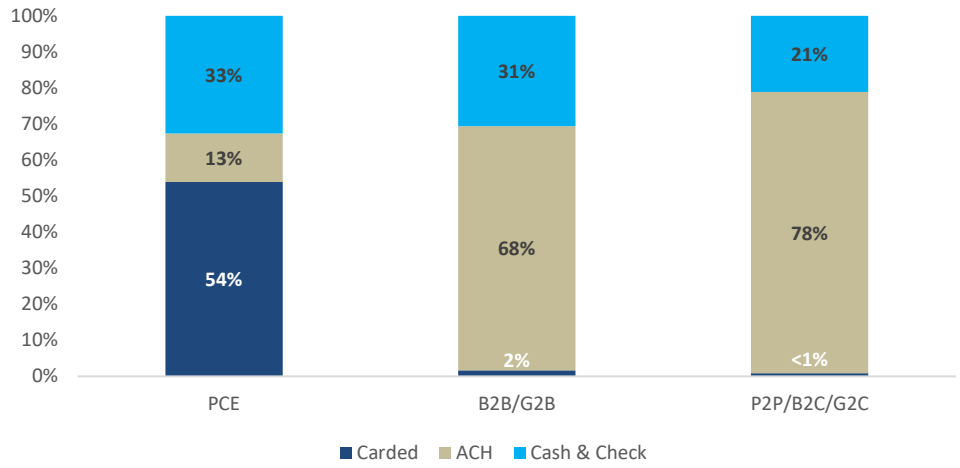
Chart 26: New flows represent a $185tn volume opportunity



Source: Visa Investor Day, Company data, Autonomous Research

Many of the new flows have low levels of card penetration (and often inefficient methods of payments), presenting the networks with an opportunity to address these new flows over-time.

Chart 27: Non-C2B payment flows are still dominated by ACH & Cash



Source: Mastercard 2019 Investor Day

Visa and Mastercard are addressing the $65tn of new flows across B2C, P2P, G2C and B2b with their "push payment" capabilities where the funding account pushes the payment to the payee rather than the payee needing to request or pull money. There are many use cases here including sending money to friends and family, businesses pushing money to consumers, or businesses using Visa Direct to obtain real-time access to working capital to buy inventory or make payroll.

These payments tend to be lower value, higher velocity flows. For example, the average migrant working abroad sends 13 transactions a year to his or her family, with the average transaction size averaging $300-400 per send. This is much smaller than a B2B payment, which could be tens of thousands of dollars.

A closer look at Visa Direct

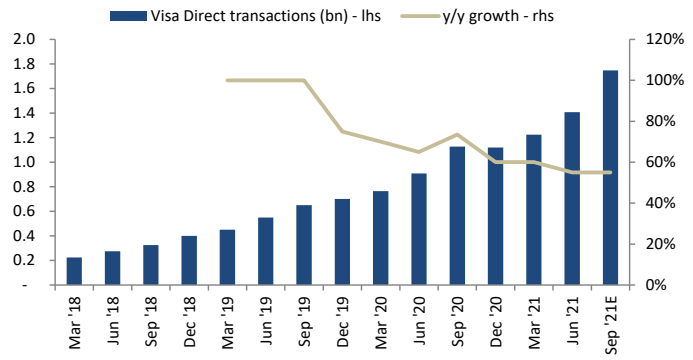
Visa has disclosed more statistics on Visa Direct than Mastercard has provided on Mastercard. Thus, we take a closer look at Visa Direct.

Visa Direct is a push payment platform that reverses the traditional card payment flow by allowing payment originators to send funds directly to cards, and with the acquisition of Earthport, Visa Direct can also push funds directly into 1.5bn additional bank accounts.

Our analysis suggests that Visa Direct makes up ~2-3% of Visa's payments transactions and ~5% of Visa payments volumes

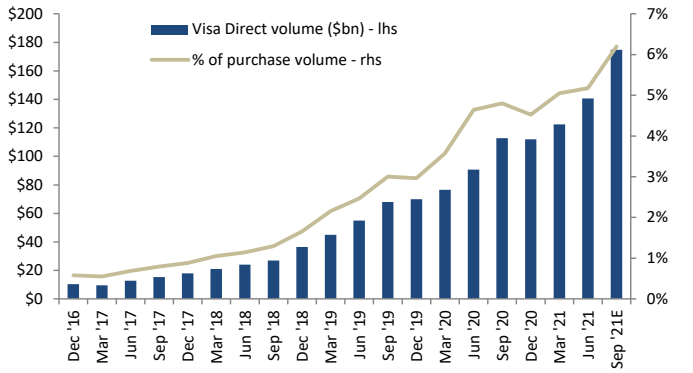
Our analysis suggests that Visa Direct makes up ~2-3% of Visa's payments transactions and ~5% of Visa payments volumes. This is based on Visa's restatement of historical payments volumes starting in F1Q19 to include Visa Direct volumes. We also leverage the transaction growth rates and absolute level of transactions that Visa has disclosed on its earnings calls and conferences (> 1bn txns in FY19, >0.7bn txns in F1Q20, 3.5bn txns in FY20).

Chart 28: Visa Direct transactions have increased to almost 2bn per quarter



Source: Company data, Autonomous Estimates

Chart 29: We estimate Visa Direct is approaching $200bn in quarterly volume (~5% of payments vol)



Source: Company data, Autonomous Estimates

In the table below, we show what Visa has disclosed when it comes to Visa Direct. Note that this table does not include the restatement of historical volumes starting in the F1Q19 earnings release, which provides us with even more data points historically.

Table 4: Visa has occasionally provided data points on Visa Direct, but you can still paint a picture

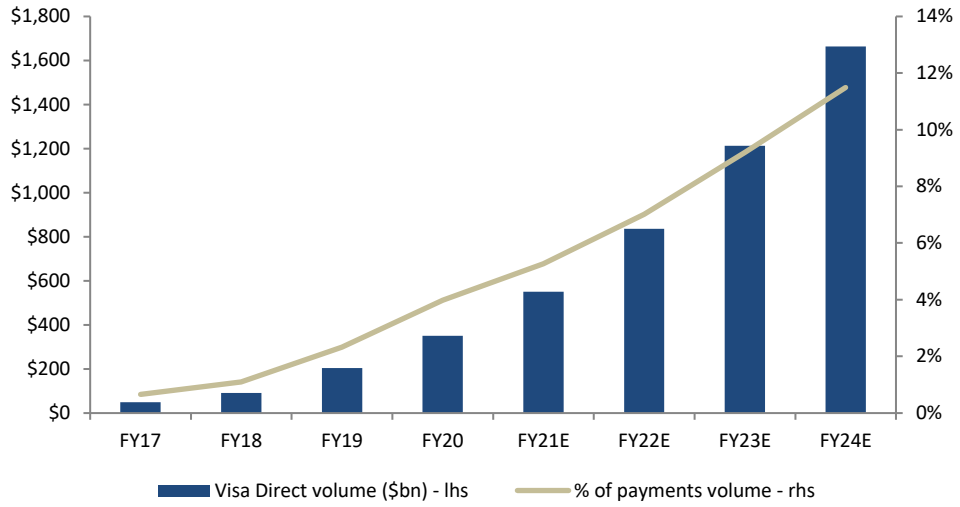
	Jun '19	Sep '19	FY19	Dec '19	Mar '20	Jun '20	Sep '20	FY20	Dec '20	Mar '21	Jun '21
Visa Direct volume ($bn)		$68									
Visa Direct txns (bn)			> 2	> 0.7				3.5			
Visa Direct y/y txn growth	100%		> 100%	Very high DD	70%	~65%			60%	60%	55%

Source: Company data, Autonomous Research

Visa Direct transactions were growing over 100% in FY19, and while transaction growth decelerated, it remained in the high double digit range throughout FY20. In the most recent quarter, growth has been 55-60% YoY. Growth has been robust as Visa Direct has been growing off a relatively small base, and Visa has been rolling out new use cases and pushing Visa Direct more aggressively in the market. Visa Direct's penetration of potential flows remains less than 1% by our estimates (~$0.5tn in volume out of a possible $65tn), which could allow growth to remain robust in the coming years.

Assuming Visa Direct continues to grow in the double-digit range over the coming years (~30-50%), we estimate Visa Direct volume could reach over $1.5tn in volume in FY24, or ~10% of overall purchase volume. Assuming greater traction in the market and a higher penetration of the $65tn of potential new flows, Visa Direct could be much larger than our estimates.

Chart 30: Assuming Visa Direct continues to grow in the 30-50% range in the coming years, we expect Visa Direct volumes to reach ~$1.5tn by FY24, or ~10% of Visa's overall payment volume



Source: Company data, Autonomous Estimates

We estimate Visa Direct's average transaction size is ~$100

Management has provided data on the number of Visa Direct transactions, and we assume an average ticket of ~$100 to derive our volume estimates. How do we come up with this estimate? We know that Visa Direct did 0.7bn transactions in F1Q20 and grew very high double digits YoY, likely putting F1Q19 transactions in the 0.35-0.40bn range. Visa disclosed separately that Visa Direct's quarterly volume run rate was ~$68bn in F4Q19. Transactions in the same quarter were likely in the 0.60-0.70bn range (using data points above and the fact that Visa generated >2bn in Visa Direct transactions in FY19, and there was likely some ramp in transactions throughout the year), leading to an estimated average transaction size of ~$100.

Based on data in the Nilson Report, Visa Direct's average transaction size was ~$100 in 2020

Additionally, based on data in the Nilson Report, Visa Direct's average transaction size was ~$100 in 2020. Nilson conducted an annual survey of 39 issuers using Visa Direct and Mastercard Send capabilities, and outflows from banks are comprised almost entirely of P2P fund transfers using third party apps (Square (NR) Cash, Venmo, Apple Pay Cash and Facebook). According to Nilson, Square Cash dominates those transactions, as it's 3x bigger than its nearest competitor in terms of share.

Table 5: Top US banks using Visa Direct (2020)

Table shows account funding transactions (outflows)

Account funding bank	Vol ($mn)	Txn (mn)	Avg. size
Wells Fargo	19,617	216	$91
Bank of America	15,567	137	$114
Navy FCU	9,021	91	$99
TD Bank	6,423	31	$206
The Bancorp Bank	5,902	80	$74
PNC Bank	5,389	59	$92
Regions Bank	3,158	38	$84
US Bank	3,118	31	$101
Citizens Bank	2,629	21	$125
Truist	2,399	17	$143
State Emply. CU (NC)	1,709	25	$68
USAA	1,386	12	$114
First Citizens	746	9	$85
M&T Bank	670	8	$88
Municipal CU	511	5	$100
Top 15	**78,243**	**779**	**$100**

Source: Nilson Report, Autonomous Research

Table 6: Top banks using Mastercard Send according to Nilson (2020)

Table shows accounting funding transactions (outflows)

Account funding bank	Vol ($mn)	Txn (mn)	Avg. size
Bank of America	7,243	72	$100
People's United Bank	339	4	$97
First Midwest Bank	90	1	$180
HSBC Bank USA	13	0	$129
4 banks reporting	**7,684**	**76**	**$101**

Source: Nilson Report, Autonomous Research

Visa Direct currently contributes just 1-2% of total revenues by our estimates, but it's growing a lot faster than the rest of Visa's business and will likely become a bigger portion of revenue in the coming years

Visa Direct's contribution to revenue depends on the yield assumption for the business, which can vary meaningfully depending on the mix of business. Our understanding is that cross-border remittances and insurance payout yields are a lot higher given the value Visa is creating for that customer/end user. Generally speaking, we believe Visa Direct transactions tend to be more of a flat fee rather than ad valorem pricing, and that cross border transactions have higher yields than domestic transactions.

Assuming a transaction yield of ~5-10bps on Visa Direct volume, we estimate Visa Direct could contribute ~$0.3-0.6bn in revenue in FY21, or ~1-2% of Visa's total revenue. We assume a yield of 5-10bps, as it's lower than what Visa earns on C2B transactions, and our channel checks with remittance provides suggest that they might be paying $1 per transaction to use the Visa Direct rails for a cross-border transaction, which could range from $700-$1,000 in average transaction size. The $1 fee on a $700-1,000 transaction equates to a 10-14bps yield. There are other transaction types outside of P2P that might have lower yields, so we conservatively assume 5-10bps.

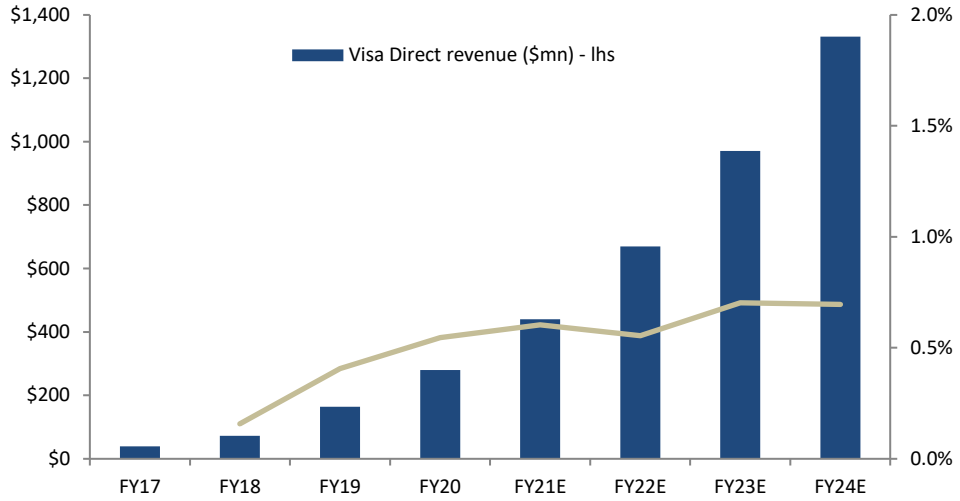
Table 7: We estimate Visa Direct could drive $0.3-0.6bn of revenue in FY21E

FY21E ($bn unless noted)	Low	High
Visa Direct volume (FY21E)	$550	$550
Visa Direct Yield	0.05%	0.10%
Visa Direct Revenue ($bn)	**$0.27**	**$0.55**
Visa Total company revenue	$24	$24
Visa Direct % of total company revenue	**1.1%**	**2.3%**

Source: Company data, Autonomous Estimates

As shown in the chart below, Visa Direct revenue (assuming an 8bps yield on volume) continues to increase and is estimated to reach ~$450mn in revenue in FY21. We estimate Visa Direct is becoming a bigger driver of revenue growth over time as well. In FY18, we think Visa Direct contributed just 0.2ppts to Visa's total company revenue growth. Our analysis suggests that this growth contribution accelerated to ~0.5ppts in FY19/FY20 and should continue to increase. We assume a flat yield of 8bps across all time periods, which could be conservative if more complex cross border transactions become a larger portion of the overall transaction mix.

Chart 31: We estimate Visa Direct is generating ~$450mn in revenue in FY21E and contributing ~0.6ppts to Visa's overall top-line growth



Source: Company data, Autonomous Estimates

While Visa hasn't provided specifics on Visa Direct pricing, they have made the following comments:

- *"Well I think that, as you can imagine, it's not quite as big a yield as a payment transaction. But we definitely get economics out of it. And as the volume grows, they'll become an increasing contributor to our revenue."*
- *"In general, I would say, you're never going to have yields of purchase swipe-type model. It's a different business, right? We're talking about deposits. So one, you always have to benchmark yourself against the local delivery models that are in place today. So, you got to go back to the ACH and wire models."*
- *"You've got domestic P2P, you got domestic disbursements and then you got cross border, right? The kind of the yields per se follow that. And so as the mix gets more into the cross border, mix gets more into the disbursements models, the yields are going to change."*
- *"If you look at Visa Direct, you've got the whole spectrum. You've got a lot of high-volume, low-ticket transactions, some of which are cross-border that come with very good yields, some of which are like P2P, which is not the same yield as you would expect on a traditional merchant transaction. So the yields in the traditional definition of the term vary a lot. Net-net, we like the yields. It's early days. The yields reflect the mix of business. The mix of business is improving as we go into a higher and higher value use cases, and especially cross-border use cases."*

We believe Visa Direct can gain traction as it offers a low cost way to move money and they can do it in real time

We believe pricing could be higher on cross border transactions because in certain cross border payments, there are multiple banks involved (correspondent banks), and they all might charge a fee to carry out that transaction, leading to higher cost. If cross-border payments become a larger mix of Visa Direct volumes, the yield would likely move higher. Note that in our analysis, we assume a constant yield of ~8bps, which may prove conservative.

Other reasons to use Visa Direct

We believe Visa Direct can gain traction as it offers a low cost way to move money and they can do it in real time. Visa can provide other services like vetting network membership,

providing tokenization, offering controls over transactions (like limits based on size) and monitoring activity. Entities can also leverage Visa settlement, reconciliation reporting, and exceptions handling (similar to how clients work with Visa today).

Visa also integrated Earthport into Visa Direct, which allows Visa to reach bank accounts in these countries (versus just cards previously)

The company leverages APIs to allow FinTechs and other players to integrate faster and be able to leverage Visa Direct sooner. These payments can often be more secure because the payment does not need to be made with cash or sensitive account information (email addresses and/or mobile numbers can be used instead). Visa also integrated Earthport into Visa Direct, which allows Visa to reach bank accounts in these countries (versus just cards previously). Earthport allows Visa to have a direct connection into ACH and RTP systems around the world and allows them to reach bank accounts that they could not previously.

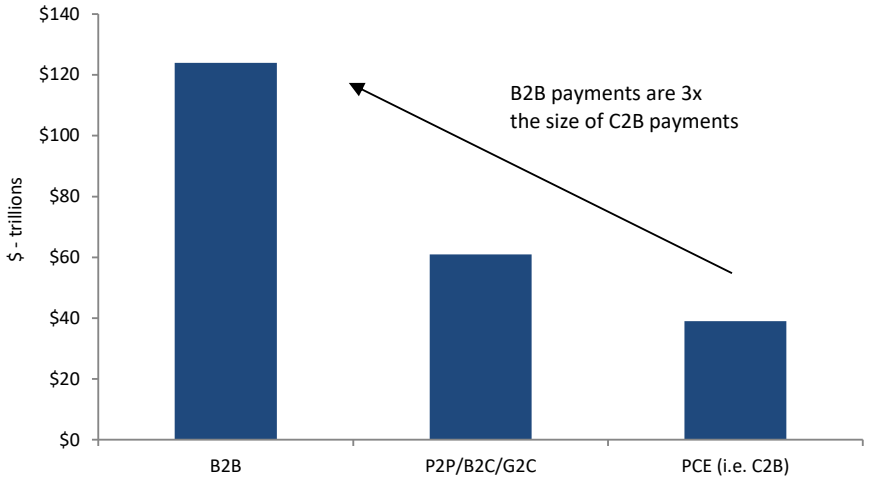
These are just a few additional reasons to use Visa Direct. For Visa, these new use cases are all incremental transactions that have a high incremental margin.

A closer look at the B2B addressable market

The B2B market is roughly 3x the size of consumer to business payments (~$120tn in B2B volume vs. C2B at ~$40tn). Visa and Mastercard are already addressing $20bn of this B2B market today with solutions like commercial cards, purchasing cards, and other T&E cards. We expect Visa and Mastercard to become bigger players in the remaining portion of B2B payments, including the $10tn of cross-border B2B volume and $90tn of domestic accounts payable (AP) and accounts receivable (AR) activity through initiatives such as Mastercard Track and Visa B2B Connect. We believe Visa and Mastercard are focusing on slightly different parts of the market when it comes to B2B. More specifically, Visa appears to be focusing on B2B Connect and helping business facilitate cross border payments. These are higher-yielding flows. On the other hand, we believe Mastercard Track started more on the domestic side, focusing on improving the inefficiencies/data quality of traditional AP/AR within B2B, although it's in the process of adding cross-border payment capabilities.

The B2B opportunity is estimated to be ~$120tn in annual volume and includes cash, checks, wires, ACH, and virtual card payments. Consumer to business payments are around ~$40tn annually, which makes the B2B market 3x as large as C2B payments.

Chart 32: The B2B opportunity is 3x the size of C2B payments

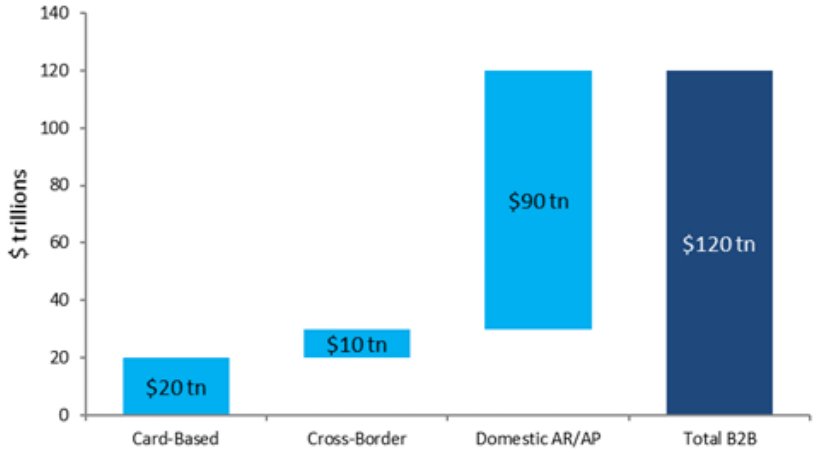


Source: Visa Investor Day Deck, Autonomous Research

Spending within the $120tn B2B opportunity can be segmented into three categories: 1) card-based solutions, 2) AR/AP solutions, and 3) cross-border payments. Domestic AR/AP

payments at $90tn is the largest of the three, followed by card-based payments at $20tn and cross-border payments at $10tn.

Chart 33: Addressable spending categories within the $120tn B2B opportunity

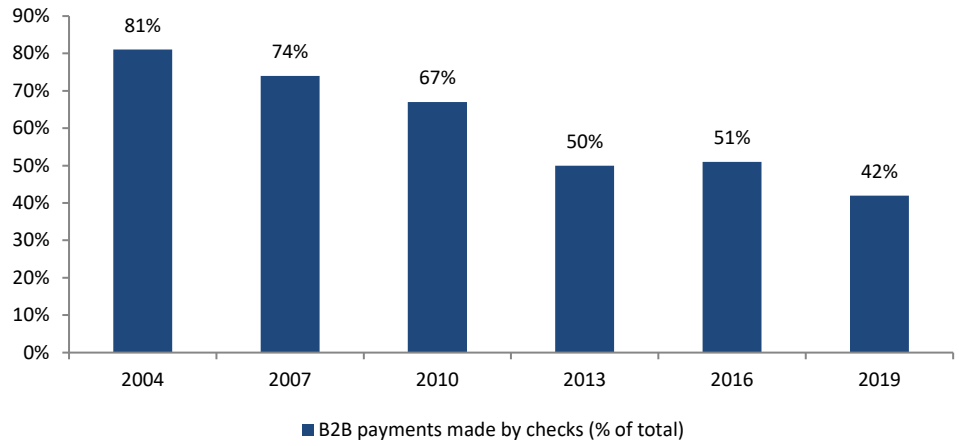


Source: Visa Investor Day Deck, Autonomous Research

Similar to trends in consumer payments, the usage of checks (as a percentage of B2B transactions) has declined over time. The Association for Financial Professionals (AFP) estimates that checks as a percentage of a company's payments have declined from ~80% in 2004 to ~40% in 2019. Bill.com (OP) and other AP automation companies have said that checks still make up over ~50% of some companies' total B2B payments.

Other payment types like ACH and virtual cards have become more popular with buyers and suppliers. In the case of ACH, this transaction type is electronic and more efficient than check, while virtual card carries rich remittance data that allows the transaction to be reconciled into the supplier's ERP system.

Chart 34: Checks have declined as a percentage of B2B transactions



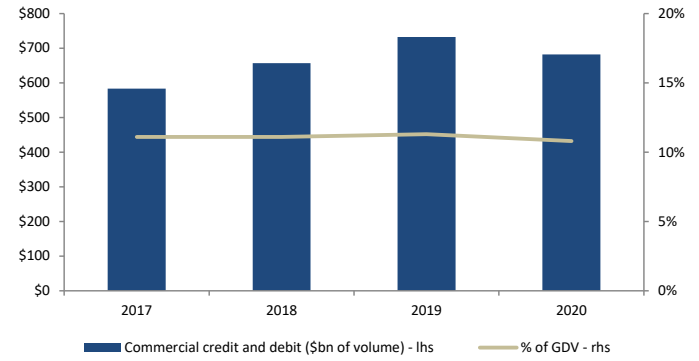
Source: 2019 AFP Electronic Payments Survey; Autonomous Research

Already addressing the $20bn in card-based spend

Visa and Mastercard are already addressing the $20bn in card-based B2B payments today with solutions like commercial cards, purchasing cards, and other T&E cards. As shown in

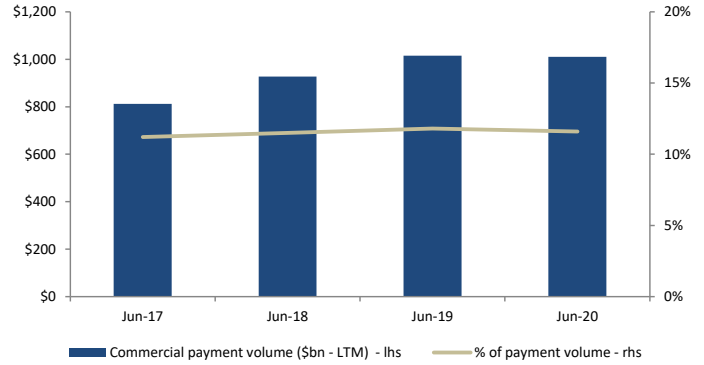
the charts below, commercial payments make up ~11% of Mastercard's GDV and ~12% of Visa's payment volume.

Chart 35: Mastercard commercial and debit volume makes up ~11% of total company GDV



Source: Company data, Autonomous Research

Chart 36: Visa's commercial payment volume makes up ~12% of total company payment volume



Source: Company data, Autonomous Research

We believe Mastercard's and Visa's commercial card business will continue to benefit as new FinTechs develop offerings that are attractive to businesses. For example, companies like Bill.com and AvidXchange (not covered) enable their AP automation customers to pay their suppliers with virtual cards. Visa and Mastercard generate volume and revenue when their cards are used.

Companies are at different stages of ramping their virtual card offerings. We estimate AvidXchange's virtual card penetration is at 15-20% of its payment volume whereas BILL is closer to 2% because it launched its virtual card program just a couple years ago. Our view is that it is difficult to issue a virtual card payment if the business is not plugged into an AP automation provider. That business is likely writing checks or paying with its bank account, as it cannot call a virtual card issuer like COMDATA to issue a virtual card because there is no connection.

The market for accounts payable and accounts receivable software providers is highly fragmented, and we believe there are several smaller software companies trying to build scale. We believe businesses are still in the very early inning of adopting AP automation solutions.

The market for accounts payable and accounts receivable software providers is highly fragmented, and we believe there are several smaller software companies trying to build scale

After aggregating the 12 largest AP automation providers, we estimate that combined they have penetrated ~2% of the US market on a customer count basis and ~6% of the US market on a TPV basis. The 98% of the market that is unpenetrated largely consists of companies manually collecting and processing invoices (i.e. pushing papers back and forth and using filing cabinets and sticky notes) and manually reconciling payments. ***As AP automation providers further penetrate this market opportunity, we believe Visa and Mastercard will be beneficiaries of increased virtual card volume being processed over their networks.***

Table 8: We estimate that the 12 largest AP automation providers combined have just 2% market share based on customer count and ~6% share based on volume

Company	# customers	TPV ($bn)	TPV per Customer ($mn)	TPV (% of Total Market)	# of customers (% of Total Market)	# of suppliers reached
Roger	4,000	$2	$1	0.0%	0.1%	N/A
Bill.com	121,200	$140	$1	0.6%	1.7%	3,200,000
AvidXchange	7,000	$38	$5	0.2%	0.1%	700,000
Stampli	2,000	$12	$6	0.0%	0.0%	N/A
MineralTree	2,200	$18	$8	0.1%	0.0%	500,000
CPS (aka Repay)	160	$2	$13	0.0%	0.0%	20,000
Tipalti	1,500	$23	$15	0.1%	0.0%	N/A
Beanworks	800	$14	$18	0.1%	0.0%	N/A
OnPay Solutions	500	$16	$32	0.1%	0.0%	400,000
NvoicePay (FleetCor)	400	$28	$69	0.1%	0.0%	1,000,000
Paymode-X (Bottomline)	2,000	$250	$125	1.0%	0.0%	425,000
Coupa	2,000	$852	$426	3.4%	0.0%	7,000,000
Total (of AP customers tracked)	**143,760**	**$1,395**	**$10**	**5.6%**	**2.1%**	
Total US B2B market	**7,000,000**	**25,000**				

Source: Company data, U.S. Census Bureau, Autonomous Estimates; Assumes US B2B market is 7mn establishments and ~$25 trillion in volume

Separately, we believe Visa and Mastercard will benefit as more companies adopt newer, more innovative expense management solutions like Divvy, Brex, and Ramp. These companies provide spend management solutions that allow businesses to track and control spending by employees. These companies often generate revenue from interchange fees, but Visa and Mastercard would benefit from increased adoption and spend on their cards. It is possible these new spend management providers are taking share from banks, so it might be less incremental volume for Visa and Mastercard (compared to AP automation, which is shifting check and ACH payments to virtual card). Regardless, we believe payment innovators help to accelerate card penetration in the business world.

Mastercard focusing on Mastercard Track

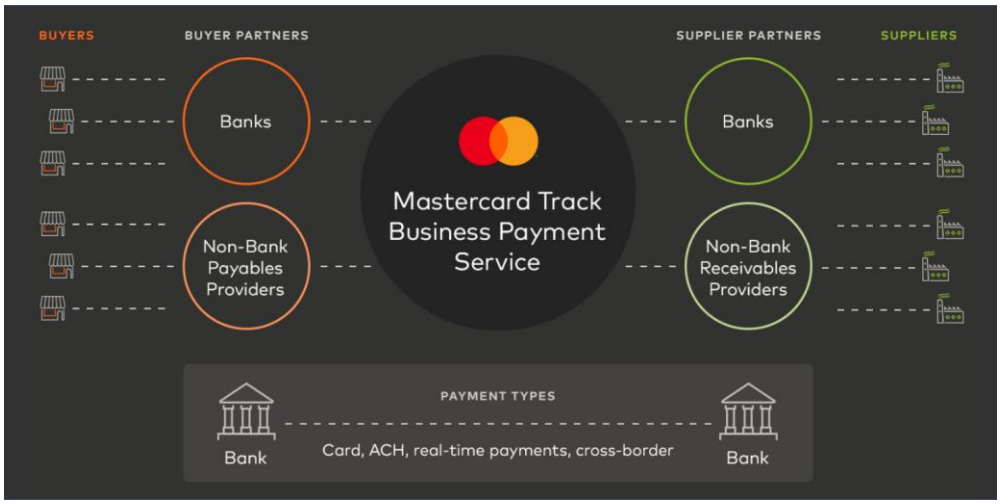
The networks have other initiatives to tackle the inefficiencies in B2B payments. Mastercard Track Business Payment Services, a suite of B2B products and services, reduces complexity and risk, cuts costs, and automates processes for businesses around the world.

In B2B payments, the data being passed along with a transaction is just as important as the payment itself, as it allows the supplier to reconcile that payment to the correct outstanding receivable. There are lots of pain points in the B2B industry around the data being passed along with the transaction, and often times suppliers need to go back and forth and manually reconcile payments.

Mastercard Track is focused on creating an open loop capability to manage B2B payments

Mastercard Track is focused on creating an open loop capability to manage B2B payments. There are many supplier networks being developed (e.g. COMDATA, AvidXchange, OnPay Solutions, etc.) but each one is limited in its reach. Our understanding is that Mastercard is building out its own supplier directory to allow for ubiquity of acceptance across all suppliers. Mastercard is developing common data standards so that data can be passed along to AR teams for seamless reconciliation.

Chart 37: Mastercard Track Business Payment Services is an open loop capability to manage B2B payments



Source: Company data, Autonomous Research

Mastercard is building out these capabilities across multiple rails, as the value prop to B2B buyers and suppliers would be limited if they did not capture their entire AP/AR files. Not having the entire file would lead to some transactions being manually reconciled and a team of AP/AR personnel to do that.

Suppliers can systemically manage how they get paid for different invoices for different buyers while buyers can optimize and automate efficiencies in paying suppliers with improved reconciliation to manage cash flow and capture early payment discounts. All of this is managed through a single platform that minimizes the need for manual and time-consuming back-and-forth between buyers and suppliers.

Mastercard Track had a commercial launch in May 2020, initially focused on optimizing virtual card payments. In November 2020, the company expanded its capability beyond cards, introducing account-to-account payments (including RTP and ACH in the US)

Mastercard Track had a commercial launch in May 2020, initially focused on optimizing virtual card payments. In November 2020, the company expanded its capability beyond cards, introducing account-to-account payments (including RTP and ACH in the US). Mastercard Track reduces the risk of bank account data being compromised, as suppliers no longer need to share their confidential bank account details with buyers, nor do buyers need to store those details. We believe Mastercard will begin to push a cross-border payments offering within Mastercard Track BPS later this year or next. Last week, Mastercard announced a new supply chain finance capability via a partnership with Demica, a supply chain finance tech company, that will be offered through Mastercard Track.

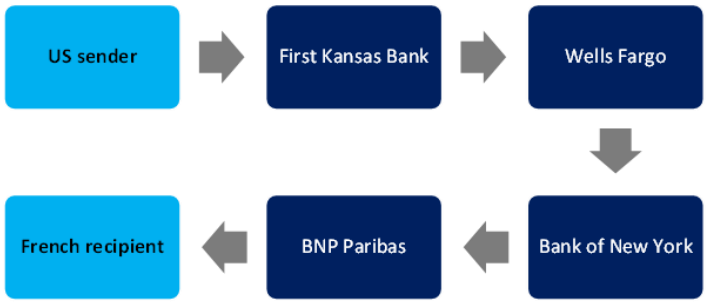
Visa building out B2B connect

Visa is focusing on building out Visa B2B Connect, a network that operates separately from VisaNet and helps facilitate cross-border B2B transactions. Visa B2B Connect is working to streamline cross border payments, which typically go through the correspondent banking system and tend to be more inefficient and costly.

Visa is focusing on building out Visa B2B Connect, a network that operates separately from VisaNet and helps facilitate cross-border B2B transactions

In order to facilitate cross-border money flows, the banking systems relies on the correspondent banking model. Since most banks globally do not have direct connections with one another, this model involves a series of banking intermediaries to move money internationally. The example below illustrates how a business in Kansas City might send money to another business in Paris using the correspondent banking model. The business initiates the transfer with its local bank, and the money then moves through various banks before reaching its intended recipient.

Chart 38: There are multiple banks involved in a transaction that goes through the correspondent banking network (an illustrative example)



Source: Autonomous Research

Chart 39: Visa B2B Connect is more of a point to point solution, eliminating the multiple hops that occur in the correspondent banking model

Source: Company data, Autonomous Research

This intermediary-heavy model leads to a handful of structural problems and inefficiencies:

- Because the correspondent banking model by definition involves multiple parties, costs are high as each party that handles the funds charges a fee.
- Because multiple parties are involved, transfers typically take days and it is difficult to predict with precision when the funds will arrive. It is also difficult to monitor funds while they are in transit as the originating bank and the beneficiary bank remain unaware where the funds of a transaction are at any given moment. If something goes wrong, it is also unclear which bank the business should call to resolve issue.
- Because multiple parties are involved, the potential for mistakes is elevated – this is all the more so given that the correspondent banking model relies largely on manual or only semi-automated processes.

Visa B2B Connect allows transactions to go directly from an originating bank to the recipient bank, eliminating a lot of friction

Visa B2B Connect allows transactions to go directly from an originating bank to the recipient bank, eliminating a lot of the friction described above. This allows these cross-border B2B payments to be delivered cheaper, faster, and with more data and transparency. For example, Visa can tell the parties when the transaction will settle, the amount, the impact from FX, the fees for the transaction and the settlement amount. Much of the data related to cross-border payments does not make it through to the beneficiary, making it difficult for the recipients to reconcile those transactions.

It also eliminates the need for other parties to build out and manage their own correspondent banking network, allowing banks to invest less to manage their intermediary bank relationships. Visa will likely be able to execute these cross border transactions more securely as well (i.e. using tokenization services to reduce fraud), helping banks and other entities comply with KYC and AML regulations.

Our understanding is that Visa will build out the scale of this network (partnering with players like ACI Worldwide, Fiserv, and Bottomline) and then price based on the value it is creating in the market. Our channel checks suggest that cross border transactions tend to be larger than domestic B2B payments. There could be transactions sizes in the tens of millions of dollars, and the pricing will likely be on a dollar per transaction basis (note that Visa and Mastercard earn attractive yields on cross-border C2B payments). Visa B2B Connect is available in nearly 100 markets globally, with additional markets likely opening in the coming years.

Cross border transactions tend to be higher yielding, meaning Visa's emphasis on the cross border side could lead to a greater revenue contribution from these initiatives in the near term

Differences in approaches

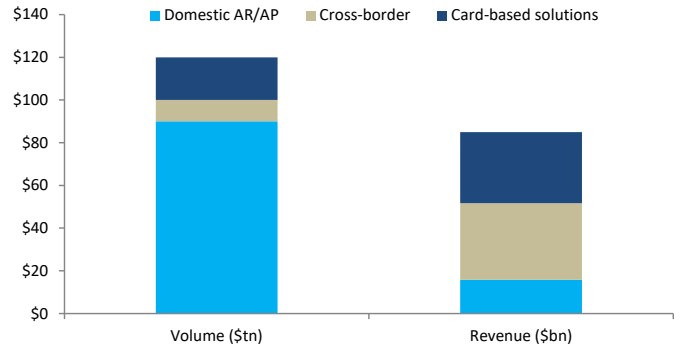
We believe Visa and Mastercard are focusing on slightly different parts of the market when it comes to B2B. More specifically, Visa appears to be focusing on B2B Connect and helping business facilitate cross border payments. On the other hand, we believe Mastercard Track started more on the domestic side, focusing on traditional AP/AR within B2B. Mastercard is working on building out its supplier directory and other capabilities to be able to pass along rich remittance data with those transactions.

Cross border transactions tend to be higher yielding, meaning Visa's emphasis on the cross border side could lead to a greater revenue contribution from these initiatives in the near term. Mastercard, on the other hand, appears to be tackling a potentially harder task of getting suppliers and buyers connected to a single platform, which is something no firm has been able to achieve at great scale likely due to the different systems all these businesses have, the different processes they have in place, and the different types of payments they're making.

We believe both approaches can work over the long term, and Mastercard is already in the process of adding cross-border payment capabilities to Mastercard Track. This is an important move for Mastercard because, as we have seen with other B2B companies like BILL or FleetCor, businesses want to execute all their payments (both domestic and international) in one location.

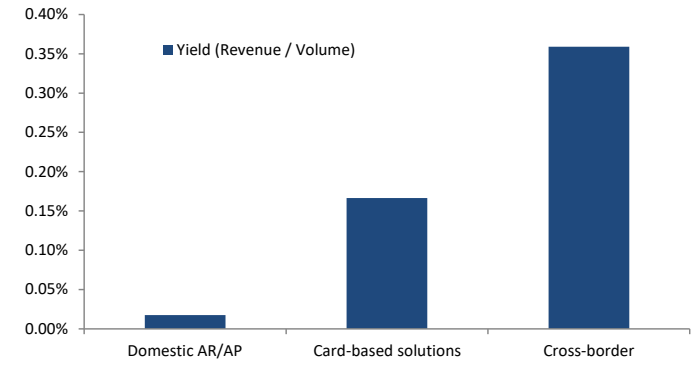
As shown in the left chart below, Visa estimated the revenue opportunity across the different subcategories within B2B. Card-based and cross-border flows represent ~25% of the volumes but ~80% of the revenue opportunity. As shown in the right chart below, we believe Visa is assuming a yield of 30-40bps on cross border B2B payments, well-above the implied yield of 1-2bps of domestic AP/AR payments.

Chart 40: Card-based and cross-border B2B flows represent ~25% of B2B volumes but 80% of the revenue opportunity



Source: Visa Investor Day presentation, Autonomous Estimates; Volume is in the trillions of dollars while revenue is in the billions; Chart shows B2B market volumes.

Chart 41: Visa assumes a yield of 30-40bps on cross border B2B payments, well above the yield of 1-2bps on domestic AP/AR payments



Source: Visa Investor Day presentation, Autonomous Estimates; Yield calculated as revenue divided by volume.

Networks: Attractive long-term growth algorithm

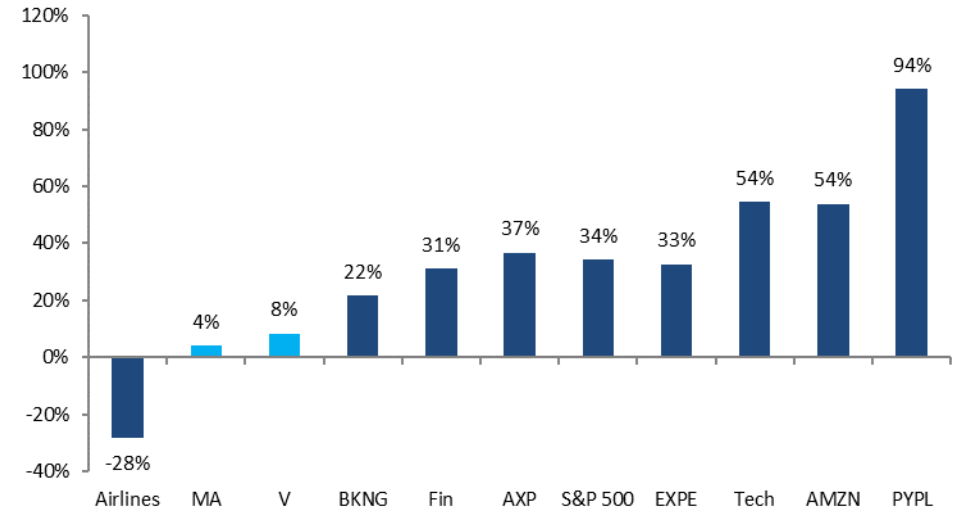
Investor Debate: Has the long-term earnings growth algorithm changed as a result of the pandemic or higher consumer card penetration?

We view the networks as high margin, high ROIC companies operating in a duopolistic industry and believe their long-term growth algorithms are still attractive. We think Visa and Mastercard should continue to benefit from the shift from cash to card, even in countries like the US that have relatively high card penetration (cash to card tailwind in the US averaged ~4ppts the last five years by our estimates). Customer habits formed during the pandemic combined with new initiatives like contactless payments should only help the shift from cash to card. We believe the networks could also benefit from more cyclical forces at play. Volumes in non-US countries should improve after a rapid increase in vaccination rates, and Visa and Mastercard have more international exposure than other payment companies. Lastly, since the beginning of 2020, checkable deposits for US consumers and non-profits have increased $2.3tn according the Fed. The spending of 'excess savings' in the US is not assumed in our forecasts and could be an additional driver of upside to payment volumes.

The underperformance of the networks (versus both peers and broader indices) over the past year and a half is striking. We believe the networks can be viewed as a combination of two cohorts of firms: 1) cyclical, consumer-driven firms with a skew towards travel (financials, airlines, online travel agencies, American Express) and 2) capital-light technology/eCommerce-focused firms (technology/software indices, Amazon, PayPal).

Chart 42: The networks have broadly underperformed both peers and indices since the start of the pandemic

Performance since 2/19/2020



Source: Bloomberg

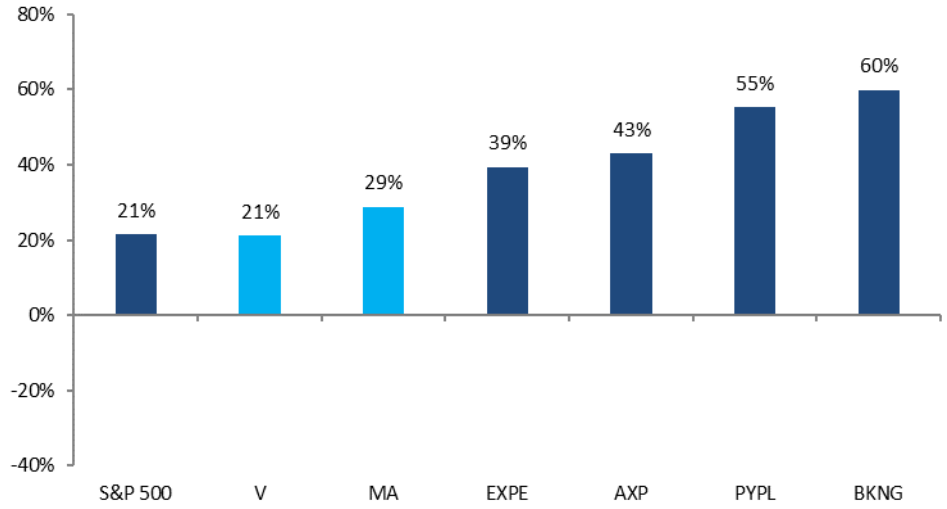
Understandably, given the stickiness of eCommerce gains, Amazon and PayPal have both meaningfully outperformed since the start of the pandemic. However, we would argue that other financial services firms (such as American Express) and the online travel agencies (Booking.com, Expedia) have seen their businesses hindered by the pandemic in a greater

fashion than the networks. Despite this, the stocks of Visa and Mastercard have underperformed these companies by 20-30ppts since February 2020.

Most recently, the networks have traded in a similar fashion to capital-intensive, hyper-cyclical firms like the airlines and cruise lines. The networks may indeed be a "re-opening play", but we believe investors should focus more on secular factors that drive earnings power rather than the cyclical forces at play. Interestingly, multiples have expanded for American Express, Booking, and Expedia (as the market is adjusting for cyclically lower earnings streams) to a greater extent than the networks during the pandemic.

Chart 43: The networks have seen their P/E multiples increase to a lesser extent than peers

Change in FY3 P/E today versus 2/19/2020

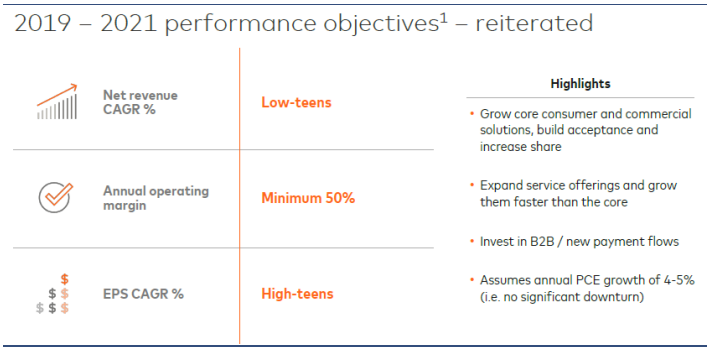


Source: Bloomberg; FY3 P/E defined as a P/E multiple using EPS from three fiscal years in the future

Long-term growth algorithm still in place

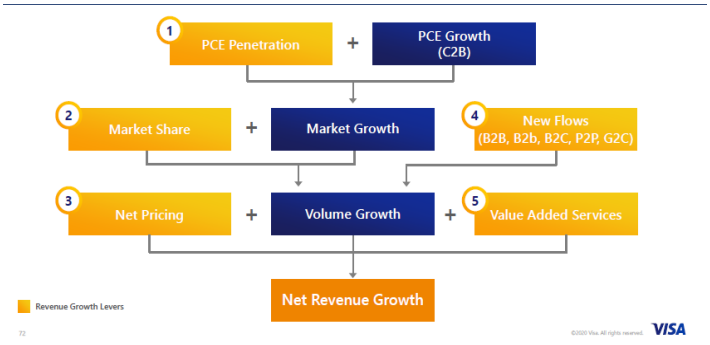
Within the past several years, both networks have held investor days (Mastercard in August 2019 and Visa in February 2020), providing detail on how to think about revenue and earnings growth. We agree with the approach from both companies and expect an elongated re-opening benefit to result in above-trend growth in each of the next three years. Mastercard is actually holding its next Investor Day on November 10, and we expect the CFO's section to drive this point home.

Chart 44: Mastercard historically has pointed to high-teens earnings growth



Source: Mastercard 2019 Investor Day

Chart 45: The networks' revenue growth formula points to low double digit revenue growth



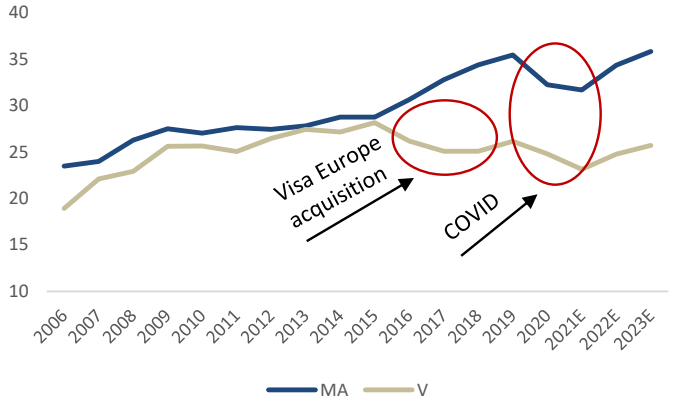
Source: Visa 2020 Investor Day

The attractiveness of the networks stems from four key characteristics: 1) secular trends boosting volume growth (cash to card, new flows), 2) pricing power (in-part because they operate in an oligopoly), 3) high incremental operating margins, and 4) limited capex needs (resulting in shareholder friendly capital return).

Below we focus on the pricing power, which some have called into question as the networks have delayed increasing assessment fees during the pandemic. We assess pricing in three ways: 1) changes in revenue yield, 2) pricing announcements for assessment fees, and 3) comparing volume and revenue growth over-time. Any way the data are sliced, aside from periods impacted by COVID and Visa's acquisition of Visa Europe, the networks have exhibited +2-3% pricing power per annum. One aspect which helps the networks here is the fact that their fees account for a rather small portion of the total merchant discount rate (~15% estimated).

Chart 46: Aside from idiosyncratic events MA & V's revenue yields have consistently trended higher

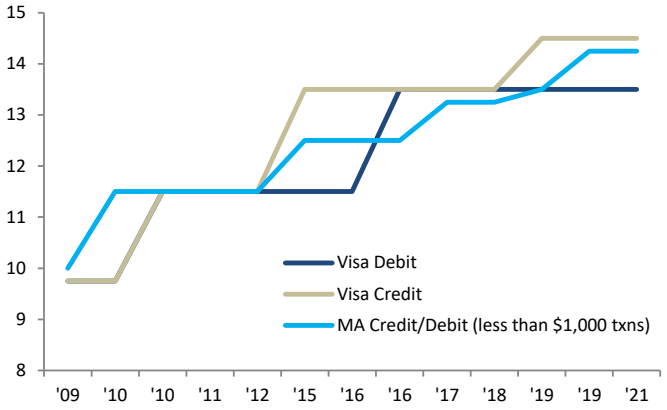
Net revenues as a % of purchase volumes (in bps)



Source: Company reports, Autonomous Research estimates

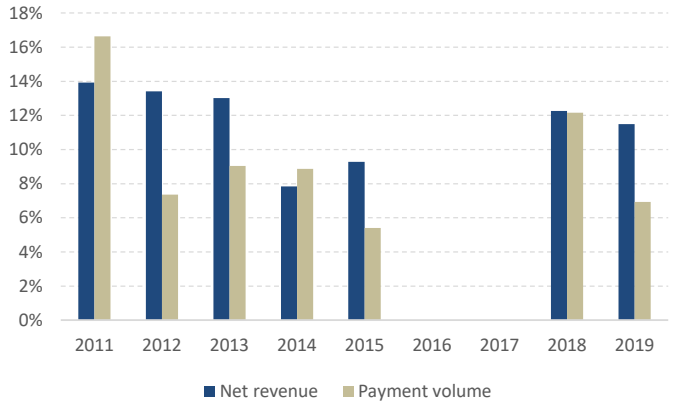
Chart 47: Networks have a history of increasing acquirer assessment fees

Assessment fees in bps



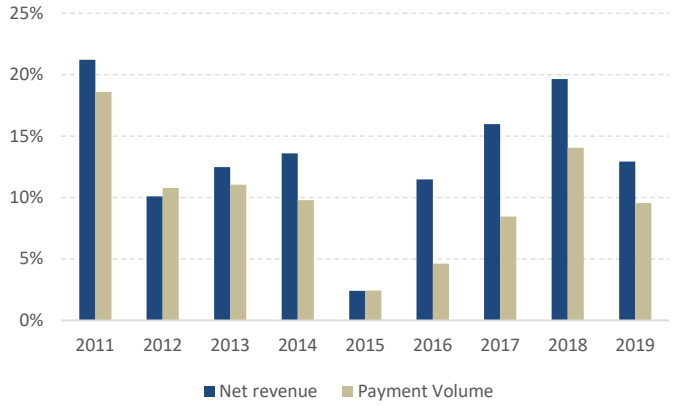
Source: Automated Merchant Systems, Company reports, Autonomous Research; Chart shows history of Visa U.S. Acquirer Service Fee (assessments) and MA Acquirer Brand Volume fees

Chart 48: Visa's implied 'pricing & services' boost has been +3% on average



Source: Company reports, Autonomous Research

Chart 49: Mastercard's implied 'pricing & services' boost has been +2% on average



Source: Company reports, Autonomous Research

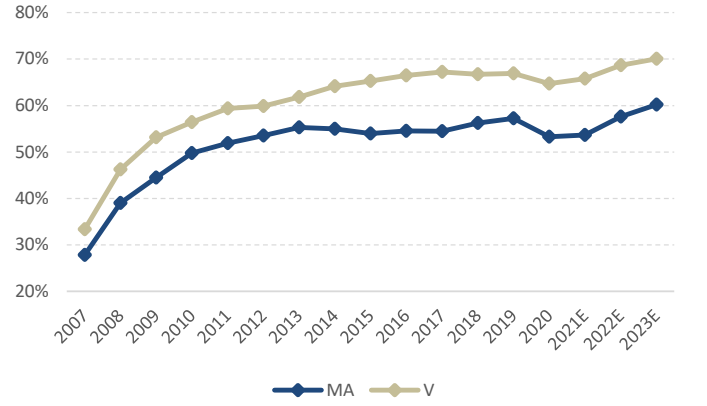
We removed the 2016 and 2017 years above for Visa as the Visa Europe acquisition impacted the revenue yield.

The networks benefit from having a mainly fixed cost base and volume that is fairly resilient even if they pull back on marketing spend. This results in the firms having a higher incremental margin (ranging from 70-80% in most periods). Margins have expanded in nearly every year outside of the periods impacted by COVID and the Visa Europe acquisition.

In addition, capital expenditure needs are fairly limited and ROICs are high for the networks in-part because other members in the payments industry are constantly investing in technological infrastructure to make the payments ecosystem more efficient. These players are also investing to distribute the Visa and Mastercard networks (think banks or acquirers investing to grow their businesses and V/MA benefit from increased volume). This low capex need allows the networks to return capital to shareholders or be acquisitive in an effort to boost growth and/or fend off disintermediation risks while also maintaining high payout ratios.

Chart 50: The networks benefit from high incremental margins…

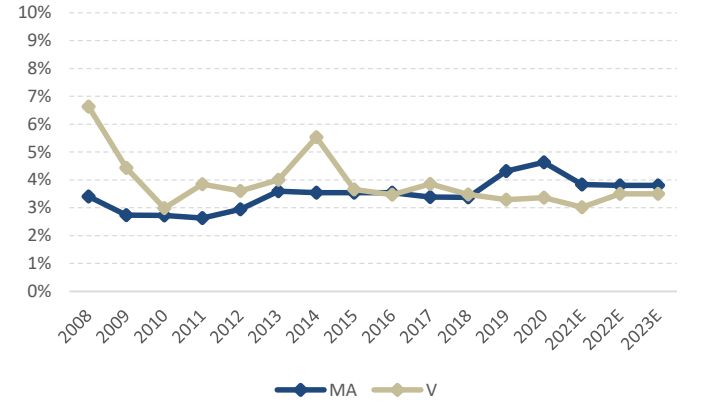
Adjusted operating margin (%), fiscal year



Source: Company reports, Autonomous Estimates; Chart shows adjusted EBIT margins

Chart 51: … and capex requirements are low, allowing for attractive shareholder return policies

Capex as a % of net revenues



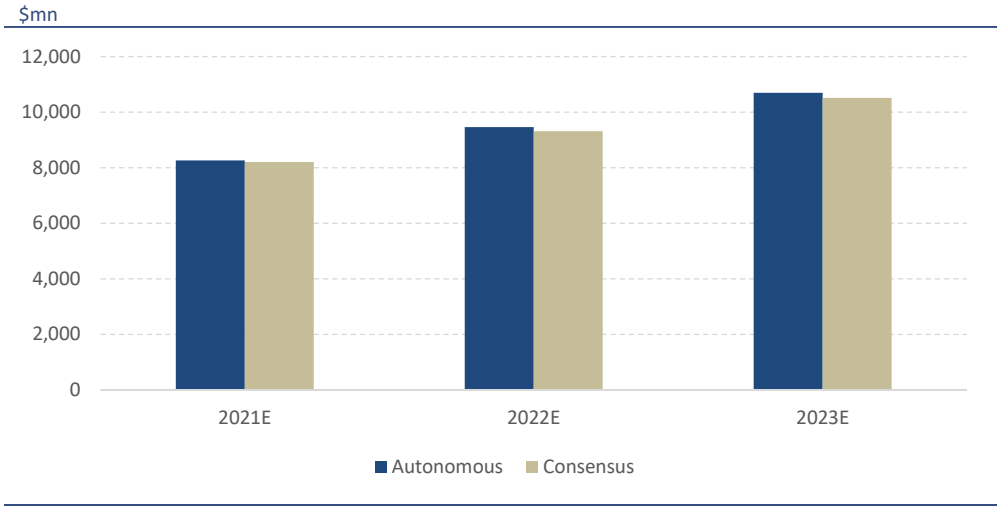
Source: Company reports, Autonomous Estimates

Consumer volumes

Over the past several decades, the networks have benefitted from the electronification of payments. While this secular tailwind is on-going, particularly in emerging markets with lower card penetration rates, we believe some investors are beginning to question if the tailwind is beginning to dwindle.

In our view, there is still plenty of white space left for the networks, and we see upside to consensus forecasts on domestic assessments. We believe our estimates may even prove conservative and see upside to expectations driven by a combination of: 1) the spend down of 'excess savings' in the US, 2) payments infrastructure investments in emerging markets resulting in an acceleration of card penetration and eCommerce adoption, and 3) consensus under-estimating the cyclical benefit of international economies beginning to recover post the pandemic as vaccination rates are improving at a rapid pace in some countries.

Chart 52: We're above the Street on domestic assessments for Mastercard



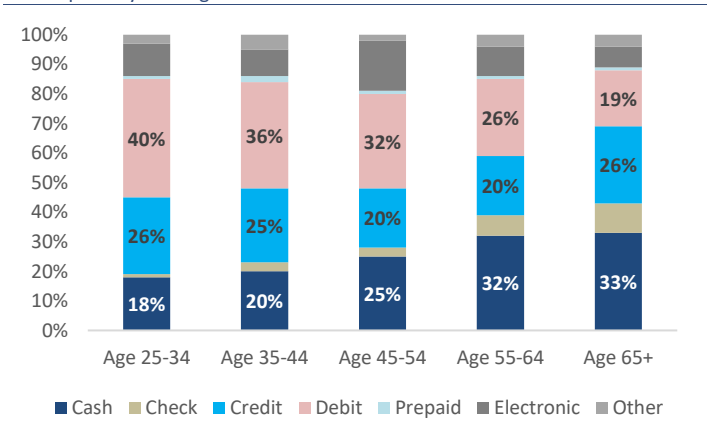
Source: Bloomberg, Autonomous Estimates

US volume expectations

We believe the first key benefit in consumer payments, which may be overlooked, is the fact that younger generations tend to use cards rather than cash. In the left chart below, we show findings from the Fed regarding payment type by age cohort, while on the right, we show the decline in cash usage across Generation X. As Millennials and Generation X in the US account for a greater proportion of disposable income and personal expenditures over-time, card penetration should naturally trend higher.

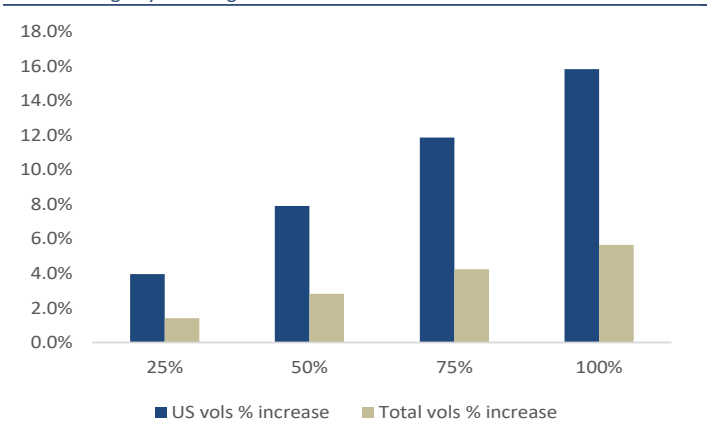
Deloitte estimates that Millennials and Gen X will account for 47% of total wealth in the US in 2030 versus 18% in 2015. While the wealth and spend mix obviously will not be exactly the same, as younger generations tend to spend more than they save, we believe this metric shows the scale of the shift in buying power towards consumers which have a higher propensity to use cards. It is worth noting that we believe the networks are agnostic to whether volumes are debit or credit, meaning they should benefit regardless of which type of card Millennials inevitably migrate to.

Chart 53: As younger consumers become more of total spend, card penetration will increase…



Source: Findings from the Diary of Consumer Payment Choice

Chart 54: … while education and industry dynamics are resulting in more card spend for Gen X

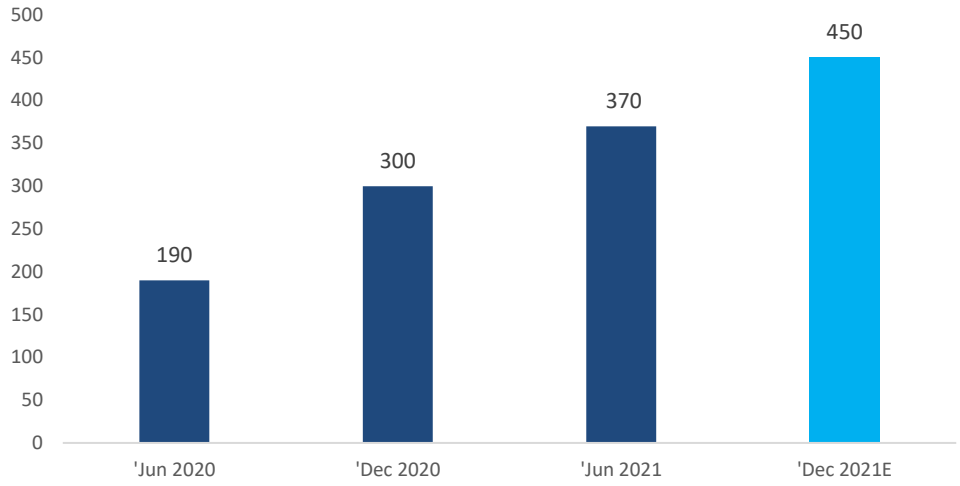


Source: Findings from the Diary of Consumer Payment Choice

We believe contactless will become a more popular form of face-to-face transactions, further driving this shift from cash to card. Contactless payments are popular in other regions around the world, particularly Europe, but participants are laying the groundwork for contactless to be successful in the US. Firstly, the number of contactless-enabled cards continues to increase; Visa recently stated that it expects contactless cards in the US with its brand to increase from 190mn in June 2020 to 450mn by the end of 2021.

Chart 55: The number of contactless enabled cards in the US has doubled

Visa branded contactless enabled cards

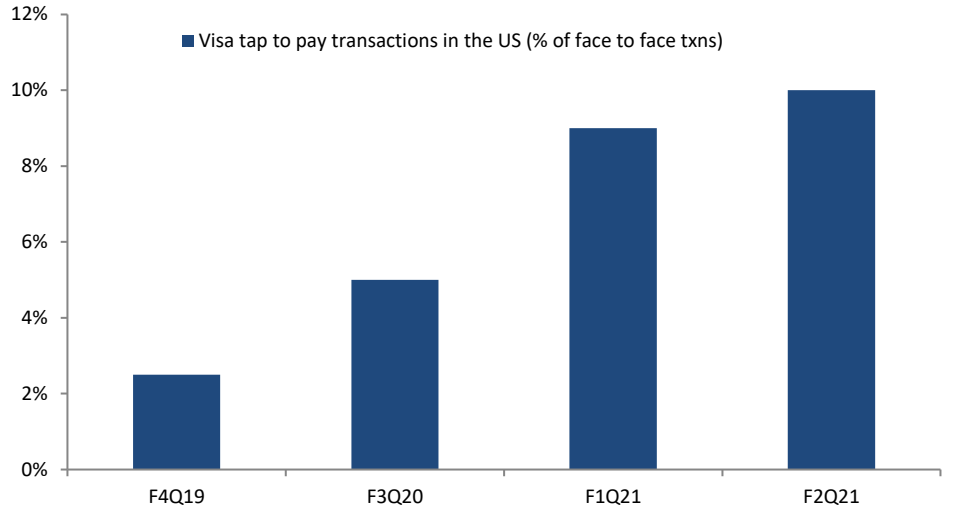


Source: Company data, Autonomous Research and Estimates

The percentage of face-to-face transactions that are contactless continues to increase as merchant adoption has accelerated over the past 18 months (in-part due to the aftermath of the pandemic). Visa stated that contactless increased from 2-3% of face-to-face transactions in the US in 2019 to ~10% of face-to-face transactions in F2Q21.

Chart 56: The percentage of face to face transactions that are contactless has increased

Visa US tap to pay txns - % of US face-to-face transactions



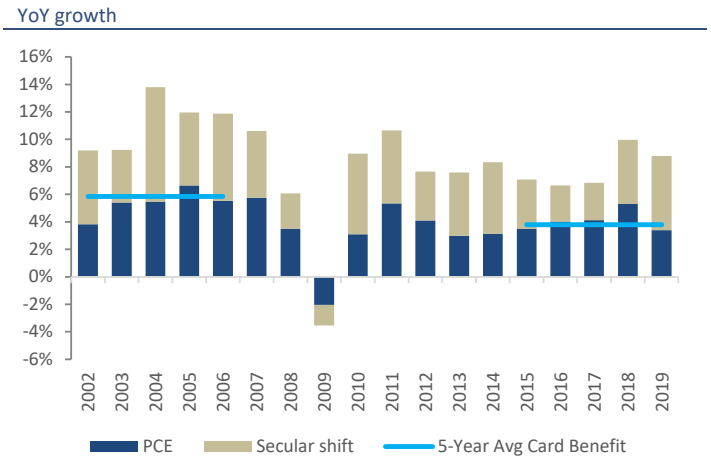
Source: Company data, Autonomous Research

To summarize, we believe the cash to card tailwind is still intact, even in a country like the US with relatively high card penetration. Looking forward, we believe this ongoing shift will

continue and will be driven by three main factors: 1) higher eCommerce penetration, 2) spend mix shifting to younger consumers, and 3) contactless adoption.

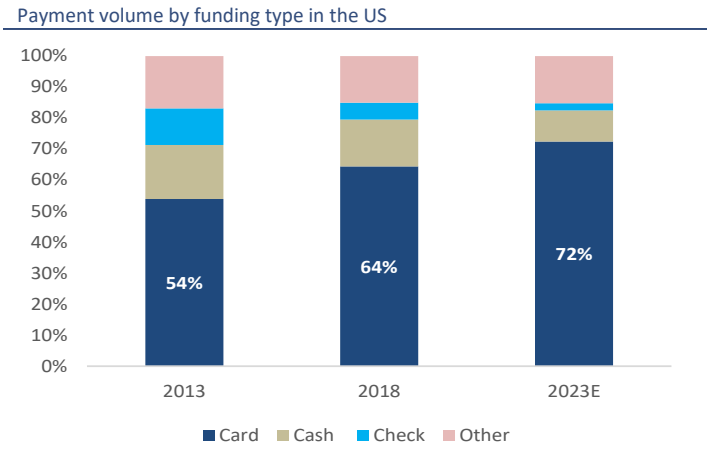
Nilson touched on similar factors in its report forecasting card penetration in the US. While they expect the improvement in the card penetration rate to slow (2013-2018: +10ppts, 2018-2023E: +8ppts), on a per annum basis the difference is fairly small (2013-2018: +2.0ppts, 2018-2023E: +1.6ppts). We would also note that PCE growth in the US has averaged 4-5% over the past decade and ultimately, we believe the volume growth formula (prior to taking any cyclical factors into account) should be 2-4% PCE growth plus 3-4ppts of secular benefit.

Chart 57: The secular benefit of cash to card has averaged 4-6ppts per year in the US



Source: Nilson, Autonomous Research

Chart 58: The cash to card tailwind should continue at a somewhat similar pace in the US



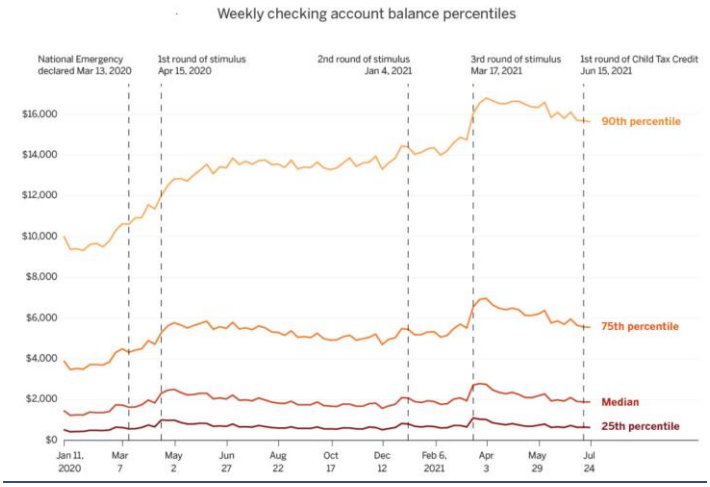
Source: Nilson, Autonomous Research

Moving from the secular to cyclical benefit, there has been a continuous discussion on the level of excess savings in the US following the combination of outsized stimulus payments and the run up in the stock market. While it seems like each news outlet has its own way of calculating 'excess savings', in an effort to determine the additional savings which could be used to purchase of goods & services once the economy reopens, we prefer to look at changes in checking account balances held in the US.

Since the beginning of 2020, checkable deposits for US consumers and non-profits have increased $2.3tn according the Fed. If we assume the level of PCE which is spent on the networks stays flat versus 2019 levels (a conservative assumption), a complete spend down of these 'excess savings' would result in a 16% and 7% increase in US and total volume respectively. What may hold back a 100% spend down of the savings however is the fact that much of the savings sits with consumers with high balances (see left chart below); as such, we provided a sensitivity analysis to gauge other possible outcomes.

Chart 59: Most US consumers have yet to spend down their excess savings

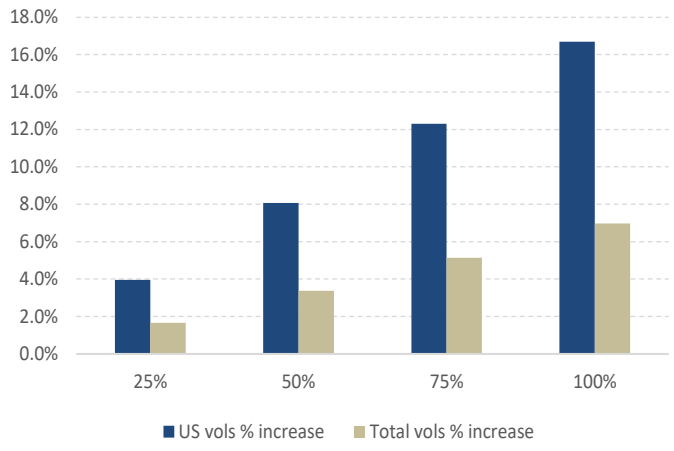
Checking account average balance by percentile



Source: JPMorgan

Chart 60: We believe the spend down of excess savings could be a 4-16% tailwind to US volumes

Est. excess savings as a % of 2019 volumes, x-axis: % of excess which is spent

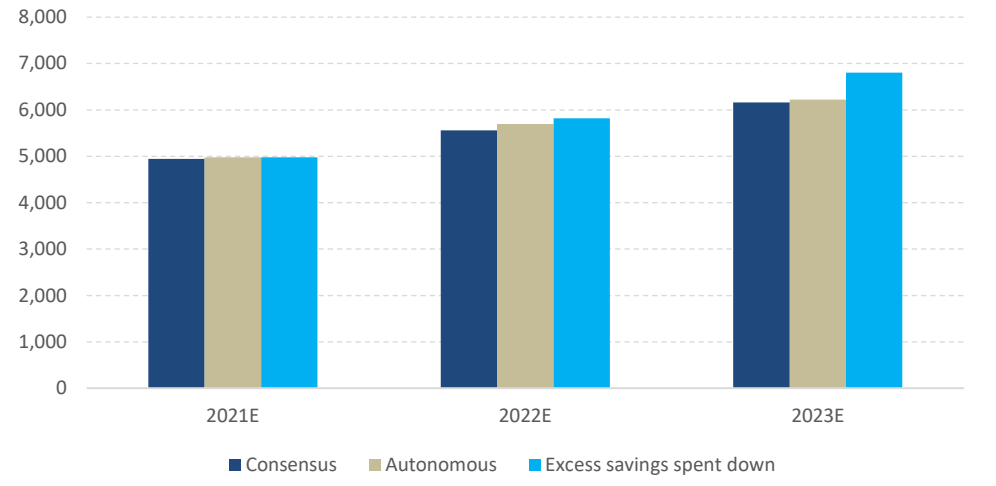


Source: FRED, Autonomous Research & Estimates

Lastly, to put absolute numbers behind our analysis, assuming the natural volume growth rate is +9% (+4% PCE, +4% secular benefit in C2B, +1% from new flows) and assume that 100% of the excess savings are spent over the next two years (+8ppt per annum benefit), that leads to $6.8trn of purchase volume for Visa in 2023, which is +11% above consensus. This simple analysis does not consider that Visa is growing over easy comps in early FY22, meaning the upside is potentially even higher.

Chart 61: There is 10%+ upside to US volume expectations if excess savings are spent

Visa US purchase volume - $bn



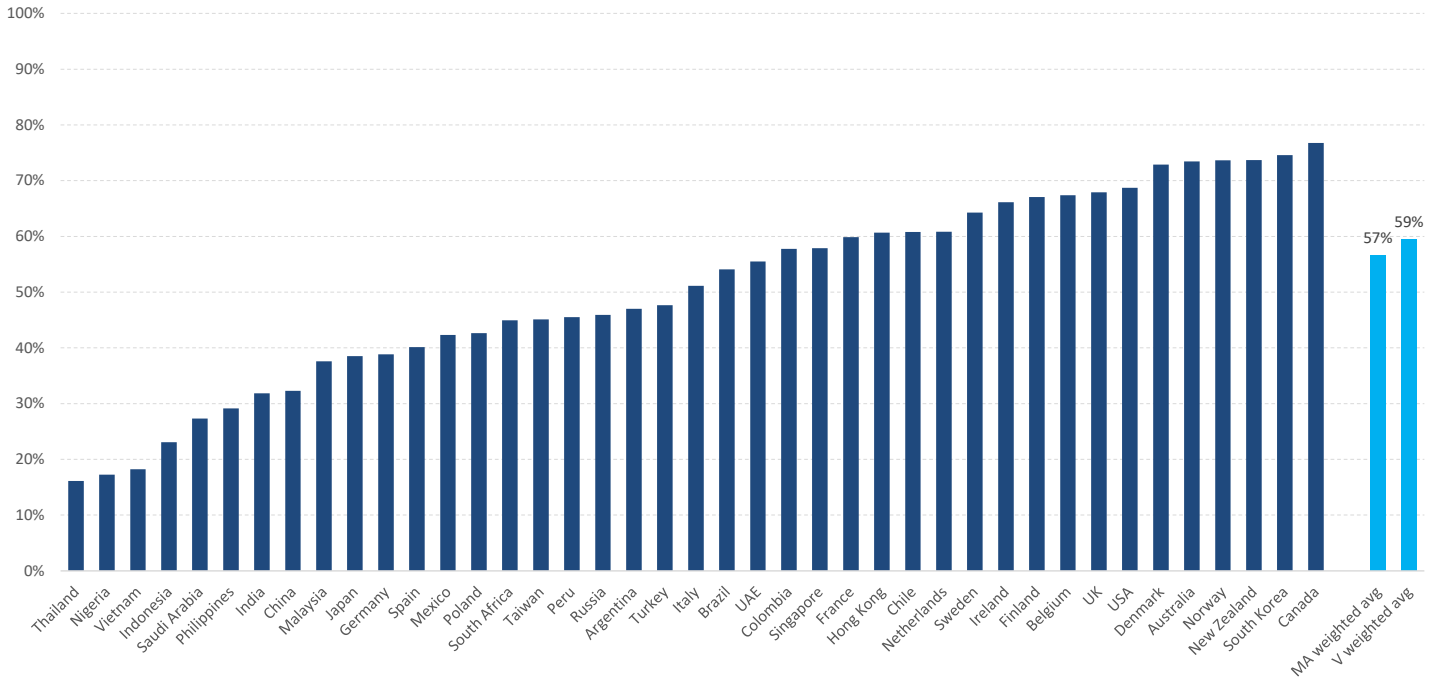
Source: Bloomberg, FRED, Autonomous Research estimates

International markets are catching up to the US

There are several factors to consider regarding international volume expectations. Firstly, PCE growth is typically higher than the US due to a combination of better demographics and faster through-the-cycle GDP and PCE growth for developing economies. Secondly, the boost to volumes from the aforementioned 'secular shift' is larger because many developing countries are still primarily cash-based.

To level-set volumes expectations for Mastercard and Visa as a result of this dynamic, we used Worldpay's 2021 Global Payments Report, which provides expectations for payments across funding mechanisms (cash, debit/prepaid, credit, and other) for 40 of the largest economies. We then cross-refenced the Worldpay-reported card penetration rates versus Mastercard and Visa's geographic exposure. As shown below, we believe the weighted average card penetration rate in the markets Mastercard and Visa operate in is 57% and 59%, respectively, (compared to 69% in the US).

Chart 62: Mastercard is skewed more toward markets with a lower card penetration rate

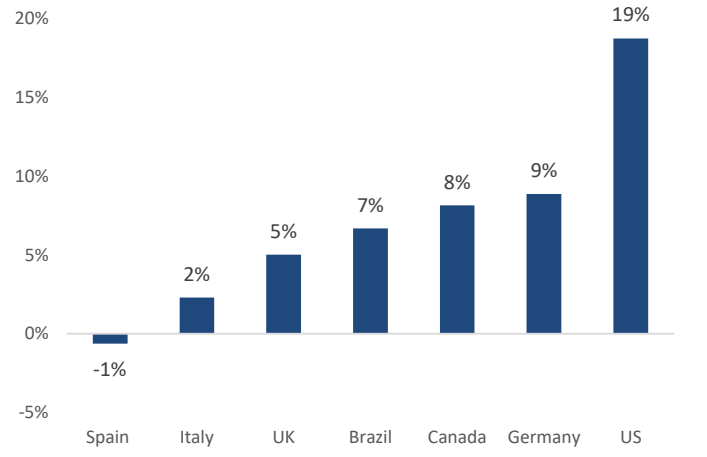


Source: WorldPay 2021 Payments Report, Autonomous Estimates

While we believe the US recovery is ongoing, there are signs that the rest of the world is catching up. This can be seen in the retail data we highlight below. While the US consumer is still the strongest (US retail sales are +19% above 2019 levels versus other developed countries in the mid-to-high single-digits), that improvement may be stalling in the US while other countries have plenty of runway for improvement. Looking at the change in retail sales versus 2019 levels for this quarter versus last, the US is lagging other developed countries slightly (outside of the UK).

Chart 63: The US consumer continues to lead the global economic recovery…

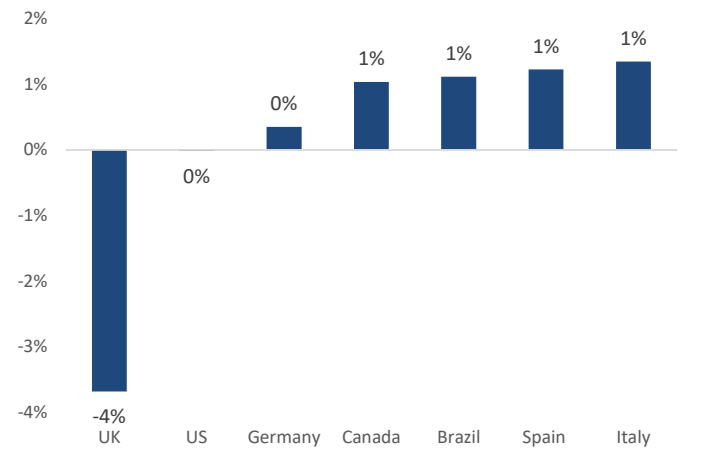
July/August nominal retail sales versus 2019 levels (real retail sales for Brazil)



Source: Bloomberg

Chart 64: … however, that outperformance has already slowed

QoQ change in retail sales versus 2019 levels (July/August vs. 2Q)

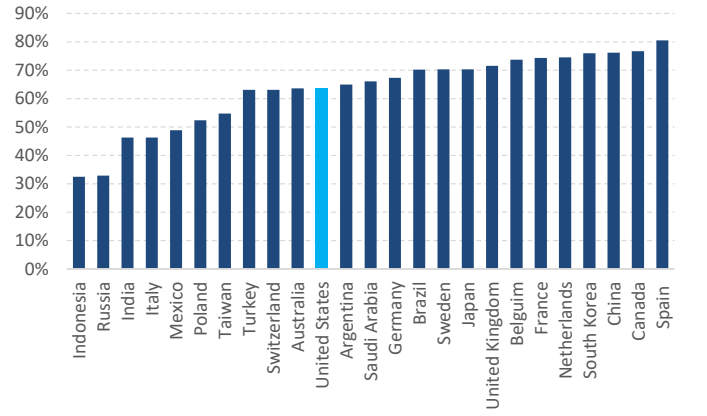


Source: Bloomberg

We have seen over the past ten months that improvements in vaccination rates can be viewed as a leading indicator for higher consumer spend. As such, we can look at vaccination rates by country/market to assess where the largest pick-up in spend may occur in 2022. Interestingly, the United States currently sits near the middle of the pack in terms of vaccination rates, but what we find more interesting is that the improvement in the vaccination rate has stalled in the US. On the contrary, vaccination rates are improving at a rapid pace across Asia and some emerging markets.

Chart 65: The US is middle of the pack on vaccination rate…

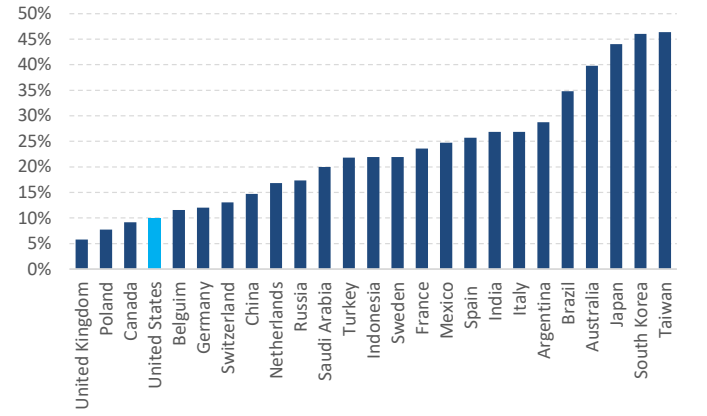
% of population with at least one shot as of September 30th



Source: Our World in Data

Chart 66: … but its pace of improvement has slowed compared to other markets

Chg in % of population with one shot September 30th vs. June 30th

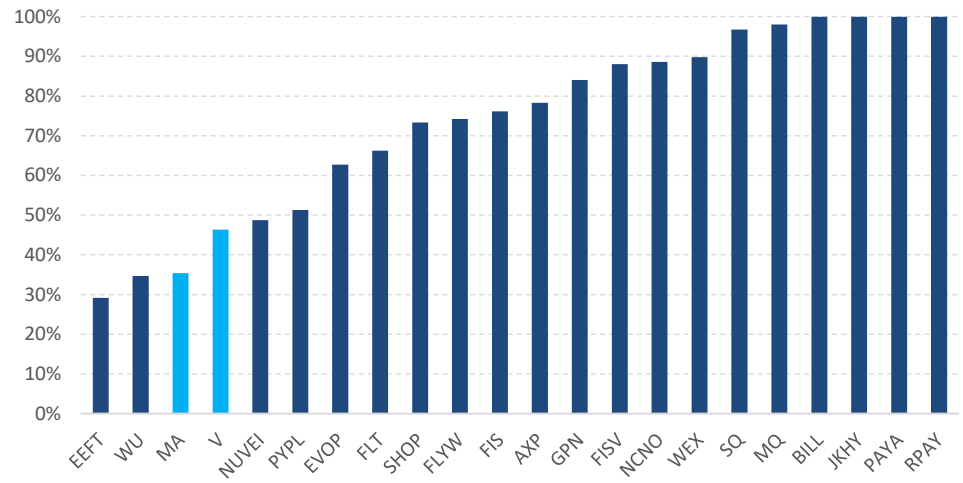


Source: Our World in Data

As vaccination rates continues to improve, we would expect management teams with greater international exposure (such as the networks) to become more upbeat on their outlooks. As such, the recent moves in vaccination rates is making the likelihood of 2022 being a beat and raise year more likely.

Chart 67: The networks have less exposure to North America than other US-listed payments companies

% of revenues from North America in 2020



Source: Bloomberg, company reports

Networks: Disintermediation

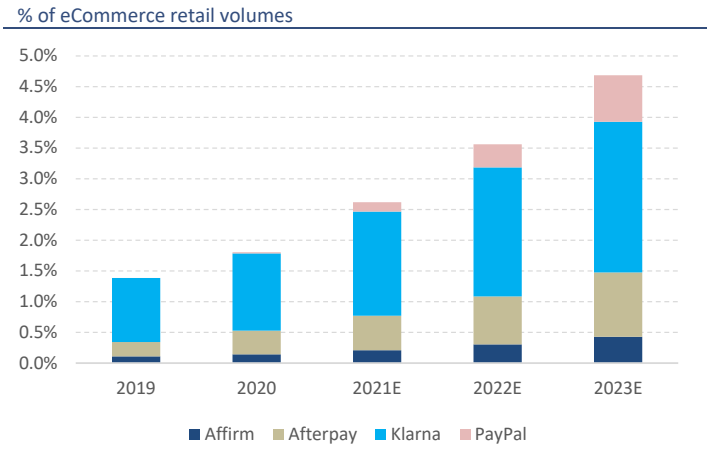
Investor Debate: How concerned should we be about disintermediation risks?

We think V/MA stocks are being over-penalized from concerns around disintermediation (closed loop networks, BNPL, CBDCs, nationalism) and regulation (online debit routing in the US). Historically, concerns about regulation/disintermediation have proven to be excellent buying opportunities for the networks, and we think the same applies today. Our unit economics analysis of a BNPL transaction suggests that V/MA actually make more money when a credit transaction is split into four separate transactions (assuming the repayment is done via a debit card). Regarding Amazon's decision to surcharge, we expect the issue to be cleared up in the coming quarters like in previous disputes (Kroger in 2018/2019 and Walmart Canada in 2016/2017). We believe Amazon selected two markets to surcharge (Singapore/Australia) that have low ecom penetration and that are relatively new for the company, making any impact to Visa's volume insignificant. For cryptocurrencies, we believe the networks have a significant advantage in terms of merchant acceptance and processing speeds. Lastly, the networks will likely work closely with central banks and governments in the coming years when it comes to creating central bank digital currencies (CBDCs), putting them in a position to remain an important middleman if any of these new digital currencies gain traction. In the section below, we walk through in greater detail a few of these potential risks.

Buy Now, Pay Later

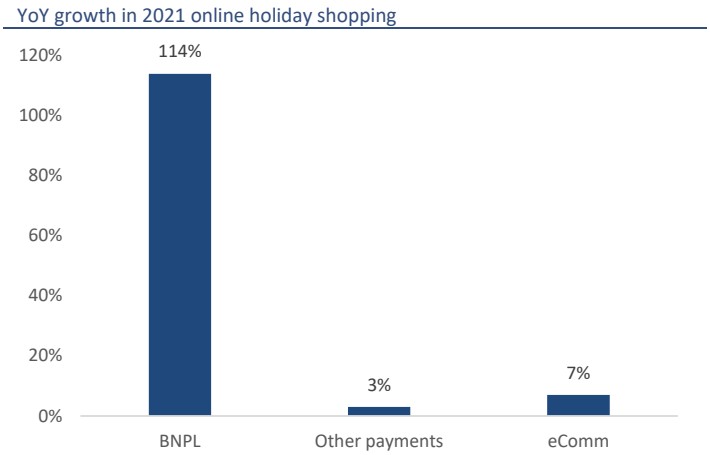
Recent growth has been robust across the space given the benefits the solution provides to each side of the transaction (consumers: access to free credit, merchants: higher average order volume and cart conversion). As we show below, the key BNPL players are expected to continue taking market share (a topic Autonomous Analyst Rob Wildhack touched on in his recent initiation on the space – click here). In addition, some industry experts believe the BNPL share gains in eComm will accelerate meaningfully in the near-term. A recent report from Salesforce stated: *"As consumers contend with these higher prices, global "buy now, pay later" usage will likely account for 8% ($96B globally and $20B in the U.S.) of online orders this holiday season, up from 4% of orders during the 2020 holiday season."*

Chart 68: BNPL players are expected to continue taking share…



Source: Company reports, eMarketer, Autonomous Research

Chart 69: …and some experts expect BNPL to hog most of the near term eComm growth



Source: Salesforce

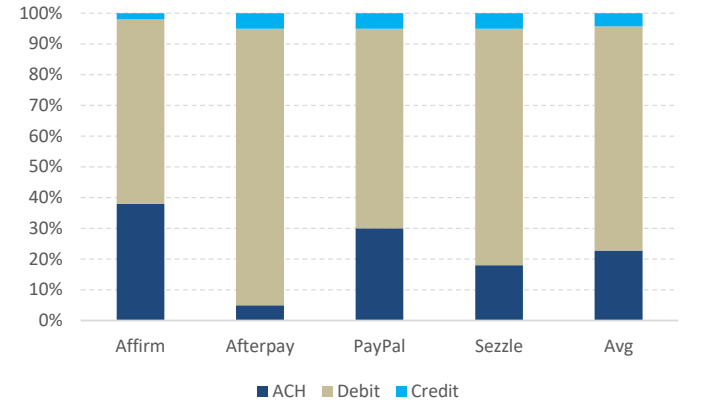
If the market share gains play out as such, BNPL volume would grow +114% YoY while other payment methods would increase just +3% in comparison. This forecast may be viewed as optimistic, but holiday time is when consumers stretch the most to buy a product, and BNPL allows for purchases to be extended and covered by January/February paychecks (i.e. such share gains could be feasible).

While there is no arguing that BNPL is clearly changing the industry, particularly here in the US, the economic impact on the networks can be debated and is ultimately dependent on the consumer's choice of payment method. The bear argument for the networks is that BNPL is cannibalizing card payments (either debit or credit), so to the extent users are willing to provide their bank information, allowing for repayments to flow over lower-cost ACH rails, that would result in market share losses for the networks.

In practice however, the vast majority of BNPL transactions are ultimately repaid with debit cards (60-90% of repayments). The BNPL providers would indeed benefit from repayment volume shifting to ACH however, as it would lead to lower costs and a higher net take rate.

Chart 70: Most BNPL transactions are repaid with debit cards…

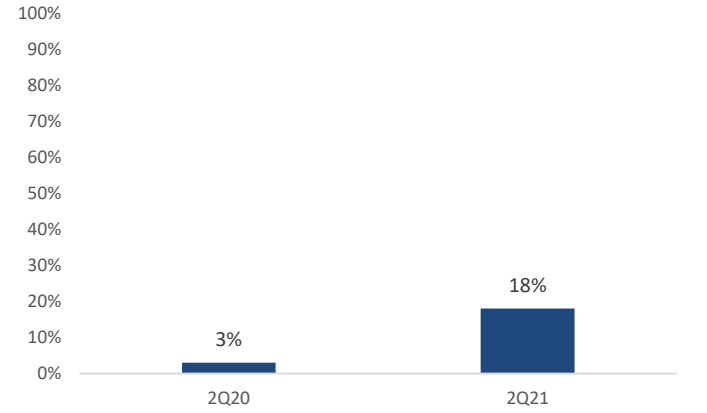
Current BNPL transaction funding mix



Source: Company reports, Autonomous Research

Chart 71: … but Sezzle, for example, has been incentivizing repayments to happen over ACH

% of BNPL transactions funded with ACH



Source: Company reports

Companies such as Sezzle have been incentivizing consumers/merchants to shift the volume to ACH (likely passing on some of the take rate benefit through rebates or rewards). In our opinion however, which lines up with comments from Affirm's CEO, BNPL providers and merchants ultimately want to drive user and volume growth rather than being overly focused on unit economics. 'Forcing' consumers to shift funding mechanisms could negatively impact growth (would you want to provide your bank information to each BNPL provider?). There are also more protections on debit and credit cards. As such, we are skeptical that a meaningful amount of volume will shift away from card repayment to ACH repayment in the near or medium-term.

- **Affirm:** *"So to answer the question, we're roughly 40% ACH and 60% debit today. We have a small, deminimis amount of credit card acceptance that we use in a very specific use case, but it's not material. We, of course want more ACH. That's a little bit economic and a little bit strategic. Frankly, the more link to the bank account, the stickier the relationship with the consumer is. Obviously it's also a lot less expensive. But we would never steer consumer to a one repayment mode or another."* – Mike Linford, Affirm CEO
- **Sezzle:** *"So, I think, we haven't had much change over the first half in terms of ACH processing. And I don't know if we really expect significant change in the next few months. And it's really -- it really comes down to creating incentive structures. And I think we talked about this in the past, as we needed -- we've done some incentive structures*

towards ACH, we plan to create more because we really like that payment method." – Charlie Youakim, Sezzle CEO

In the tables that follow, we lay out the economic impact on the networks of shifting one credit card payment to a typical pay-in-four BNPL transaction. In the first table below, we assume the repayment is done with a debit card. Given the fact that Visa earns revenues on both a fixed and variable basis, we estimate a transaction shifting from credit to BNPL debit-funded is actually +67% accretive as the variable revenue is little changed while the per transaction revenue increases four-fold.

Table 9: If transactions are funded w/ debit or credit cards, we believe BNPL is up to 70% accretive to the network's economics

Credit transaction					
Txn	$100				
Fixed fee	$0.04				
Variable rate fee	0.11%				
Revenue	**$0.15**				
BNPL Approach	**1st**	**2nd**	**3rd**	**4th**	**Total**
Installment payment	$25	$25	$25	$25	$100
Fixed fee	$0.04	$0.04	$0.04	$0.04	$0.16
Variable rate fee	0.09%	0.09%	0.09%	0.09%	0.09%
Revenue	**$0.06**	**$0.06**	**$0.06**	**$0.06**	**$0.25**
Increase in revenue from BNPL ($)					**$0.10**
Increase in revenue from BNPL (%)					**67%**

Source: Autonomous Research

The ultimate revenue impact on the networks however will be dependent on the percentage of BNPL volume that remains on their rails rather than shifting to ACH. At current industry funding-mix levels (70-80% card), growth in BNPL would be quite a tailwind to the networks. The risk however is that BNPL providers and merchants will be able to shift consumer habits, moving volume to lower-cost ACH. If the BNPL volume mix were to move to 60% carded we believe the BNPL growth impact on the networks would be neutral, while a shift to 50% would result in a headwind to network revenues.

Table 10: The revenue impact is ultimately dependent on the funding mix; we estimate the breakeven point is 60% debit repayment/40% ACH

	80% debit (20% ACH)	**70% debit (30% ACH)**	**60% debit (40% ACH)**	**50% debit (50% ACH)**
Txns on BNPL	10	10	10	10
Rev per credit txns	$0.15	$0.15	$0.15	$0.15
Lost rev from credit txns	**($1.50)**	**($1.50)**	**($1.50)**	**($1.50)**
Revenue per BNPL txn (debit repay)	$0.25	$0.25	$0.25	$0.25
% of BNPL repaid with debit card	**80%**	**70%**	**60%**	**50%**
# of BNPL repaid with debit card	8	7	6	5
Revenue gained from BNPL txns	**$2.00**	**$1.75**	**$1.50**	**$1.25**
Net gain from BNPL (10 txns)	**$0.50**	**$0.25**	**$0.00**	**($0.25)**
% increase in revenue (%)	**33%**	**17%**	**0%**	**-17%**

Source: Autonomous Research

Visa and Mastercard both say that their yields on credit are fairly similar to debit. We believe the transaction size impacts the yield as fixed fees on a smaller ticket lead to a higher yield. Credit transactions for the networks are ~$70 per transaction while debit transactions are closer to ~$50. In the analysis above, we assume a fixed fee per transaction of $0.04 and a variable rate yield of 0.11% for credit transactions and 0.09% for debit transactions. As shown in the table below, while the revenue per transaction is lower for

debit vs. credit, the yield works out to be equivalent at ~0.17% because of the lower transaction size for debit.

Table 11: We estimate the yield on credit and debit transactions are similar, but credit has a higher revenue per txn due to a higher avg. ticket

Credit vs. debit yield analysis	Credit	Debit
Txn size	$70	$50
Fixed fee per txn	$0.04	$0.04
Fixed fee per txn % (yield)	0.06%	0.08%
Variable rate fee	$0.08	$0.05
Variable rate fee % (yield)	0.11%	0.09%
Total fee	**$0.12**	**$0.09**
Total fee % (yield)	*0.17%*	*0.17%*

Source: Company data, Autonomous Estimates

While Visa generates a revenue per processed transaction of ~$0.08 (using the data processing fees line), we believe this needs to be adjusted lower for 1) value added services revenue, and 2) higher yield cross border transactions, both which flow through the data processing fee line. As shown in the table below, excluding the $2-3bn in value added services revenue in Visa's data processing line, we estimate a revenue per transaction closer to ~$0.06. This $0.06 revenue per transaction includes cross border revenue, so we adjust this lower in our BNPL analysis to $0.04 to be conservative, since we believe the majority of BNPL transactions are domestic transactions.

Table 12: Visa's revenue per processed transaction is close to $0.06 excluding value-added services in the data processing fee line; this $0.06 is likely being skewed upward by higher rev per txn cross-border fees

Visa rev per transaction analysis (mn unless noted)	FY18	FY19	FY20	FY21E
Visa Service Fees ($mn)	8,918	9,700	9,804	11,544
Visa payment volume ($bn)	8,212	8,782	8,804	10,436
Yield	**0.11%**	**0.11%**	**0.11%**	**0.11%**
Revenue per txn (reported):				
Visa Data Processing Fees ($mn)	9,027	10,333	10,975	12,892
Processed transactions (mn)	124,320	138,328	140,840	165,479
Visa revenue per processed txn	**$0.07**	**$0.07**	**$0.08**	**$0.08**
Revenue per txn (adjusted):				
Visa Data Processing Fees	**9,027**	**10,333**	**10,975**	**12,892**
Value added services in data processing	1,611	1,933	2,300	2,714
Visa Data Processing Fees ex VAS	**7,416**	**8,400**	**8,675**	**10,178**
Processed transactions (mn)	124,320	138,328	140,840	165,479
Rev per processed txn (includes cross-border txns)	**$0.06**	**$0.06**	**$0.06**	**$0.06**
Value-added services - % of Data Processing Fees	*18%*	*19%*	*21%*	*21%*

Source: Company data, Autonomous Estimates

Visa and Mastercard introducing their own solutions

As volume has shifted to BNPL, Visa and Mastercard have introduced their own solution sets to help industry participants more seamlessly facilitate these transactions. Like most situations, Visa and Mastercard are partnering with industry participants on both sides of their networks (issuers and merchants) and ultimately both firms' installment offerings add another payment option to the already long list consumers can choose from. They serve to increase use cases for the banks' BNPL offerings by bringing them into the shopping experience (occurring at checkout rather than after the transaction occurs).

As volume has shifted to BNPL, Visa and Mastercard have introduced their own solution sets to help industry participants more seamlessly facilitate these transactions

Visa Installments, which is currently in the market, helps solve pain points in the industry by reducing friction for consumers when they sign up, providing a global ubiquitous solution for merchants, and pre-qualifying consumers with issuers ahead of time. This product solution only works for consumers already with an existing credit card. Mastercard recently announced its installment plan offering, which is similar to Visa's, but it appears to offer more customization and involves the issuance of a virtual card rather than relying on existing credentials like Visa.

We believe the networks' solutions help them remain in the middle of a key, growing part of the payments industry. However, we do not expect either product to have a meaningful impact on volume of the BNPL providers, as their solutions do not provide the same product page placement, which drives the higher AOV and conversion.

Pressure from large merchants on fees

Amazon introduces surcharge due to high payment acceptance fees

Amazon has announced a 0.5% surcharge on purchases made with Visa credit cards in Singapore (effective September 15th) and Australia (effective November 1st). Amazon believes that the cost of accepting card payments remains too high and even rewarded customers with an AUD 20 gift card if they add an alternative to Visa to their default payment method. We believe this is a broader theme of retailers pushing back on the cost of payment acceptance.

We expect Amazon's surcharging practices to have a limited impact on Visa's results. As shown in the chart below, assuming Amazon has ~10% of the eComm sales in both Australia and Singapore, it would translate to ~$4bn in annual payment volume, which represents less than 1% of Visa's Asia Pacific payment volume. Amazon went live in Australia at the end of 2017 and in Singapore in October 2019, so these are relatively new markets for the company and likely still a small percentage of GMV, making them good markets to test Visa's willingness to negotiate on fees.

Table 13: We estimate Amazon's eComm sales in Australia and Singapore are less than 1% of Visa's Asia Pacific payment volumes

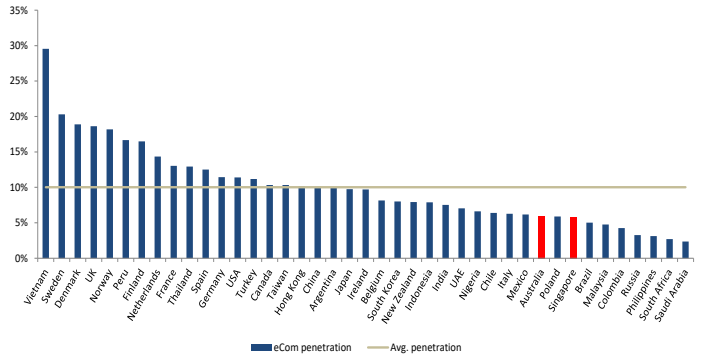
$bn unless noted	2020	AMZN share (%)	AMZN sales	% of Visa Asia Pac payments volume	% of Visa payments volume
Australia ecom sales	$37	10%	3.7	0.2%	0.0%
Singapore ecom sales	$7	10%	0.7	0.0%	0.0%
Total Australia & Singapore	**$44**		**4.4**	**0.2%**	**0.0%**
Visa Asia Pacific payment vol	$1,788				
Visa total payment volume	**$8,918**				

Source: The Global Payments Report by Worldpay; Company data, Autonomous Estimates

We believe Amazon is using this as a negotiating tactic with Visa, and it's likely that Amazon picked two markets that were relatively new for the company, have low eComm penetration, and where Visa has average or below-average share of card volume.

Chart 72: eComm penetration in Australia and Singapore is below the average in the top 40 global markets

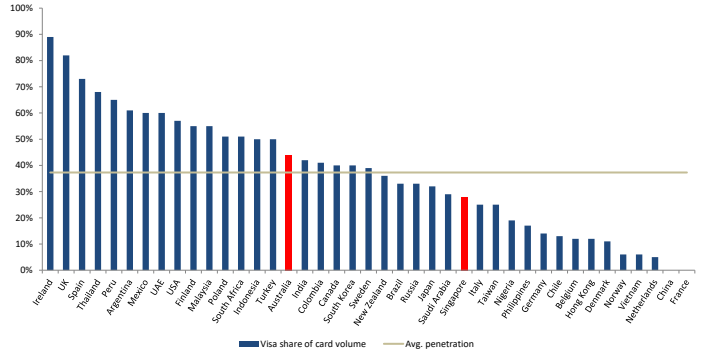
Ecom penetration by country (%)



Source: The Global Payments Report by Worldpay; Company data, Autonomous Estimates

Chart 73: Visa's share of Australia card volume is average while its share in Singapore is below average

Visa share of card volume (%)



Source: The Global Payments Report by Worldpay; Company data, Autonomous Estimates

If Amazon surcharges in other markets, the impact to Visa is still manageable

The greater risk here is if Amazon decides to introduce surcharging to other markets that are much larger. We believe this is a low probability event, but even if it does, the headwind should be manageable for Visa. As shown in the table below, we estimate that Visa credits cards drive ~$170bn of eComm GMV for Amazon (1-2% of Visa's total payment volume).

Table 14: If Amazon decided to surcharge in all markets, we believe it would impact 1-2% of Visa's payments volume

$bn unless noted	Visa FY21	% of Visa Payments volume
Amazon ecom GMV	576	5.5%
% of sales on card	*85%*	
Amazon ecom GMV paid via card	490	4.7%
Visa share of AMZN GMV	*70%*	
Amazon ecom GMV paid via Visa card	343	3.3%
Share on credit cards	*50%*	
Amazon ecom GMV paid via Visa credit card	**172**	**1.6%**
Visa payments volume	10,436	

Source: Company data, Autonomous Estimates

It should be noted that Amazon is not turning off Visa cards, but instead is adding a 0.5% fee. Instead of a consumer paying $50 for a basket of goods at checkout, he or she would pay $50.25 (0.5% surcharge). It is possible many Amazon customers are not that price sensitive to change behavior and use another card.

Additionally, Amazon might face roadblocks in the US. Surcharging is currently illegal in 10 states (California, Colorado, Connecticut, Florida, Kansas, Maine, Massachusetts, New York, Oklahoma, and Texas) and these 10 states make up 40% of the US population and likely a similar percentage of retail sales. Additionally, surcharging might alienate customers, which could make merchants hesitant to tack on the incremental fee.

We are not surprised to see large merchants push back on payment acceptance fees, but the reality is that merchant market share is so fragmented that they have limited bargaining power over the networks. And these disagreements usually get resolved, although it is unclear if/how much the networks reduce payment costs following these disagreements.

Kroger and Walmart as examples

There are two examples that illustrate events like these have limited impact on results of the networks. Kroger stopped accepting Visa credit cards at its Foods Co stores in California in August 2018 because of a price dispute over high payment acceptance costs. Kroger also stopped accepting Visa credit cards at all of its Smith's Food and Drug stores (100+ locations) in April 2019. Kroger later reversed its ban on Visa's credit cards in October 2019.

In June 2016, Walmart Canada said it would stop accepting Visa cards across all of the country's stores because of high payment acceptance fees

In June 2016, Walmart Canada said it would stop accepting Visa cards across all of the country's stores because of high payment acceptance fees. The ban went into effect at three stores in Thunder Bay, Ontario and later expanded to Walmart's 16 stores in the province of Manitoba in October 2016. Just a few months later in January 2017, Walmart struck a new fee agreement with Visa. Neither event had a noticeable impact on Visa's results, and both retailers limited the ban to certain geographies.

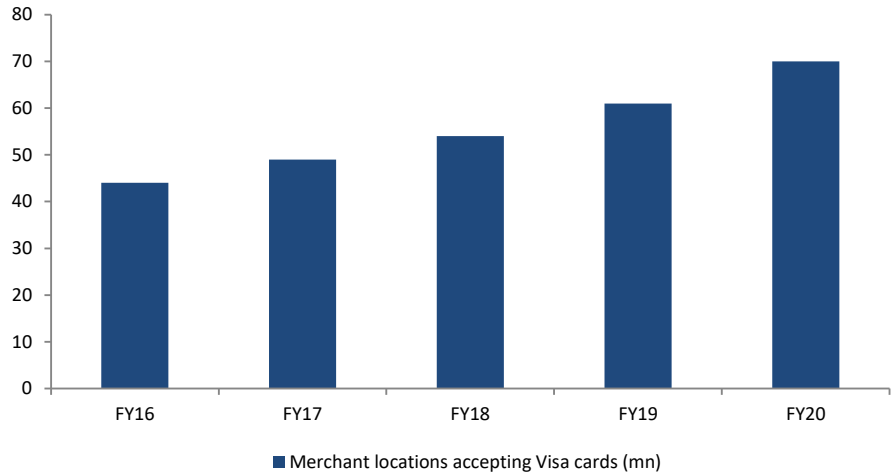
We expect the Amazon dispute to be resolved in the coming quarters. We believe Visa could resolve the issue multiple ways including lowering price, offering more rebates and incentives, or by adding other value added services to the relationship. Visa might be more willing to compromise considering it has the co-brand relationship with Amazon (i.e. the Amazon Prime Rewards Visa Signature Card).

Cryptocurrencies & central bank digital coins (CBDCs)

A few advantages for the networks

We believe the networks offer several advantages over cryptocurrencies. The first is broad acceptance. Visa cards are accepted at ~70mn locations globally. Visa and Mastercard have expanded their acceptance locations over several decades under the protection of banks. Cryptocurrencies face the chicken and the egg problem where if merchants do not accept crypto as a form of payment, then consumer will not use it, and if consumers do not use it, what is the incentive for merchants to add it as a payment method?

Chart 74: There are 70mn merchant locations that accept Visa cards, up from ~44mn in FY16



Source: Company data, Autonomous Research

The Strawhecker Group conducted a survey in 2021 of nearly 600 small business owners in the US and found that less than one in ten accepted cryptocurrencies in exchange for goods and services. A January 2020 survey by Hartford Steam Boiler (HSB), part of Munich Re,

suggested that 36% of the small and mid-size businesses accepted cryptocurrency. While that 36% figure seems a little high to us, we are still a long way from acceptance ubiquity.

Other factors such as processing times and costs could play a role. Visa and Mastercard process thousands of transactions per second by our estimates versus bitcoin at an estimated 5-10 transactions per second

Other factors such as processing times and costs could play a role. Visa and Mastercard process thousands of transactions per second by our estimates versus bitcoin at an estimated 5-10 transactions per second. Processing transactions quickly is important in consumer to business payments. Speed might be less important in certain transactions like high value B2B payments where the buyer and supplier have an established relationship. Visa said earlier in 2021 that its network is capable of handling more than 65,000 transaction messages a second. According to Blockchain Council, Ripple (XRP) is one of the fastest and secure blockchains as XRP can process 1,500 transactions per second.

Another difference between the networks and a cryptocurrency like bitcoin is the cost to process transactions. Visa and Mastercard has net revenue yields in the 25-35bps range. To the extent there are elevated costs when it comes to processing cryptocurrency transactions, it could make the networks more attractive.

Strategies around crypto/CBDCs

Visa has highlighted several priorities when it comes to crypto/CBDCs including 1) enabling consumers to make purchase of these currencies/bitcoin (working with wallets and exchanges), 2) cashing out to fiat (i.e. converting to fiat on a Visa credential and then allowing a consumer to buy goods at the 70mn merchants), 3) enabling FinTechs/banks to have crypto for their customers (using APIs for customers), 4) settlement (settle with these digital currencies and stable coins (similar to settling in USD), and 5) working with central banks around the world

Crypto is also an opportunity for the networks as a majority of the crypto purchases are cross-border transactions where consumers use cards. Thus, it is no surprise that again the networks have formed partnerships with many of the major crypto exchanges (many located outside the US), as the crypto platforms benefit from joining the network and gaining access to billions of cardholders. Given the Visa and Mastercard brands, the networks also increase credibility for these platforms.

Crypto is also an opportunity for the networks as a majority of the crypto purchases are cross-border transactions where consumers use cards

Mastercard launched a card with the crypto exchange Gemini and partnered with players like Paxos and Circle; meanwhile, Visa has formed partnerships with players like FTX, Circle, BlockFI and Coinbase.

CBDCs

Not only is the global economy looking to embrace digital payments, but central banks are also are looking to the future and investigating how to support innovation while maintaining monetary policy and financial stability as they issue and distribute currency. So once again, it is no surprise the networks are trying to position themselves in the middle.

Mastercard announced a proprietary virtual testing environment for central banks to evaluate CBDC use cases, which is certainly a crucial step for them as they look to forge partnerships with the public and private sectors. For its part, Visa has outlined how CBDCs can replace physical cash even in the absence of an internet connection. This is key to consider as most central banks appear to be contemplating a model in which they partner with private sector institutions as the existing payments model works quite well in many countries. While many of the early supports of crypto want a decentralized system, many central banks and governments want to maintain control over the system and create stability.

Visa and Mastercard are trusted partners, and this might lead regulators to utilize the existing network rails rather than create new rails in order to drive adoption. Furthermore, as we highlighted in a report earlier this year (click here), the existing model is highly scalable (Visa has the capacity to process 65,000 transactions per second) and has proven its resilience over time and outages have historically been rare at both Visa and Mastercard.

PayPal: Super Apps & ARPUs

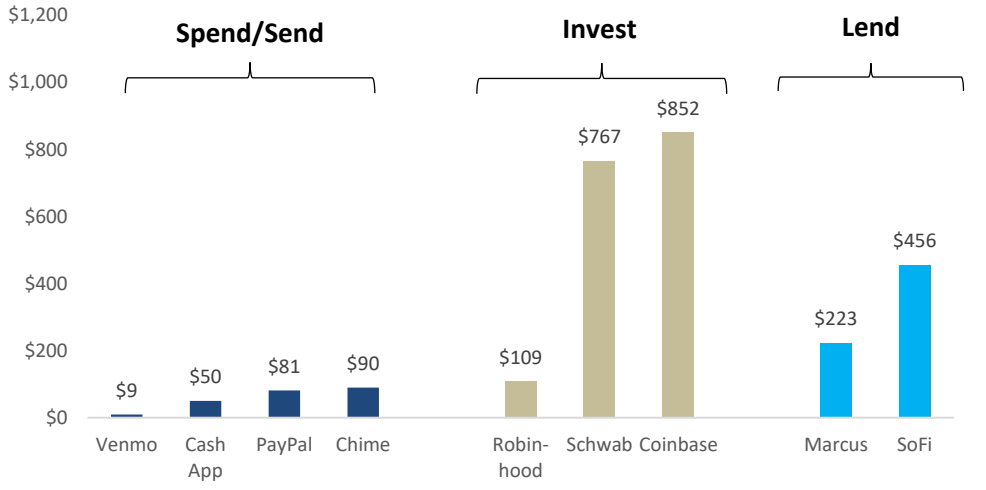
Investor Debate: Can PayPal become a 'Super App' and how should we model Venmo's ARPU expansion?

PayPal's strategic goals center around the creation of a 'Super App' akin to WeChat/Alipay in China. While we are skeptical that a 'Super App' will thrive in a similar fashion here in the US, as consumer habits are difficult to change, we expect the firm's strategic initiatives to result in higher average revenue per user moving forward (MSD per annum increase for PayPal and a three-fold increase for Venmo by 2025). We expect Pay with Venmo and Venmo business profiles to become a larger share of Venmo's revenue mix over time. Please reach out if you are interested in receiving our detailed model breaking down revenue forecasts for each of Venmo's business lines.

Aside from Buy Now, Pay Later, which we touched on earlier, the ability for direct to consumer platforms in the US to turn into 'Super Apps' akin to WeChat/Alipay in China may be the most popular talking point within the world of payments. Indeed, this was a key topic at PayPal's Investor Day last year when CEO Dan Schulman laid out PayPal's 'multi-year journey' to create a 'Super App'. The firm envisions a financial services supermarket with services including payments (P2P, C2B, bill payment), banking (savings/checking accounts, direct deposit), investing (stocks/crypto), shopping (BNPL, rewards, price monitoring, universal checkout) and other ancillary features such as subscription management. The roll-out is ongoing for both PayPal and Venmo, with the ability for customers to purchase cryptocurrencies (Bitcoin, Ethereum, and Litecoin) getting the most attention.

Chart 75: FinTech ARPUs vary meaningfully by vertical

2020 average revenue per user (2Q21 annualized for Marcus)



Source: Company reports, Autonomous Research estimates

Note for the denominator: PYPL/Venmo annual active users, Cash App / Coinbase monthly active users, Chime/Marcus/Robinhood/Schwab total funded accounts, SoFi total members

When assessing 'Super Apps', investors typically look at two things: 1) total users and 2) average revenue per user, the latter being a function of engagement, services offered, and consumer behavior. PayPal has a massive lead on the user front, with active users (defined as a user which has transacted over the past twelve months) of 278mn and 70mn for PayPal and Venmo, respectively, as of the end of last year. This compares to competitors that average ~12mn active users. As such, the key question is how PayPal can better monetize

its user base as ARPUs vary meaningfully based on a firm's core competencies and the services rendered.

Through partnerships with firms like The Bancorp Bank (NR) and Synchrony Financial (OP), PayPal is able to offer a wide range of financial services products while remaining asset light. As we show below, PayPal's offerings are now very similar to neobanks and neobrokers, meaning the firm is well on its way to becoming that aforementioned financial services supermarket.

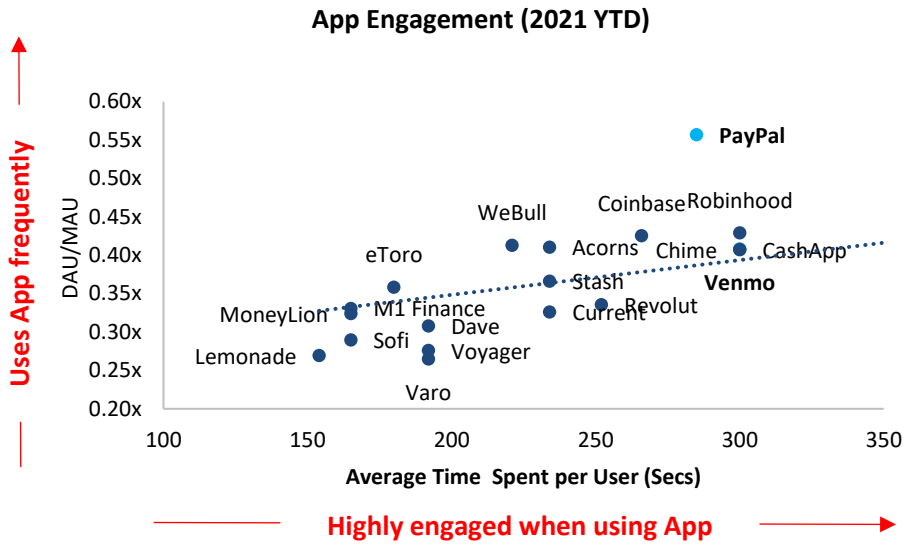
Chart 76: US mobile wallets' / neobanks' competitive offerings

	PayPal	Venmo	Cash App	Chime	Dave	SoFi	Coinbase	Robinhood
Invest								
Stock trading	☑	☑	☑	☒	☒	☑	☒	☑
Options trading	☒	☒	☒	☒	☒	☒	☒	☑
Crypto - BTC	☑	☑	☑	☒	☒	☑	☑	☑
Crypto - alt coins	☑	☑	☒	☒	☒	☑	☑	☑
Banking								
Savings account	☑	☒	☒	☑	☒	☑	☒	☑
Checking account	☑	☒	☒	☑	☑	☑	☒	☒
Direct deposit	☑	☑	☑	☑	☑	☑	☑	☑
Paycheck advance	☒	☒	☑	☑	☑	☑	☒	☒
Buy Now, Pay Later	☑	☒	☑	☒	☒	☒	☒	☒
Personal loans	☒	☒	☒	☒	☒	☑	☒	☒
Home loans	☒	☒	☒	☒	☒	☑	☒	☒
Student loans	☒	☒	☒	☒	☒	☑	☒	☒
Overdraft protection	☒	☒	☒	☑	☑	☑	☒	☒
Payments								
P2P payments	☑	☑	☑	☑	☒	☒	☒	☒
Debit card	☑	☑	☑	☑	☑	☑	☑	☑
Credit card	☑	☑	☒	☑	☒	☑	☒	☒
Instant transfer	☑	☑	☑	☒	☒	☒	☒	☒
C2B payments through QR code	☑	☑	☑	☒	☒	☒	☒	☒
Misc.								
Tax services	☒	☒	☑	☒	☒	☒	☒	☒

Source: Company reports, Autonomous Research; A green checkmark means the company has that capability/feature while a red box with an "X" means it does not.

A key leading indicator for changes in a company's ARPU is the level of engagement, as consumers are more likely to utilize a greater number of offerings if they either use the app daily or spend a longer amount of time on the app once it is opened. As we show below, both PayPal and Venmo screen very well on these engagement metrics.

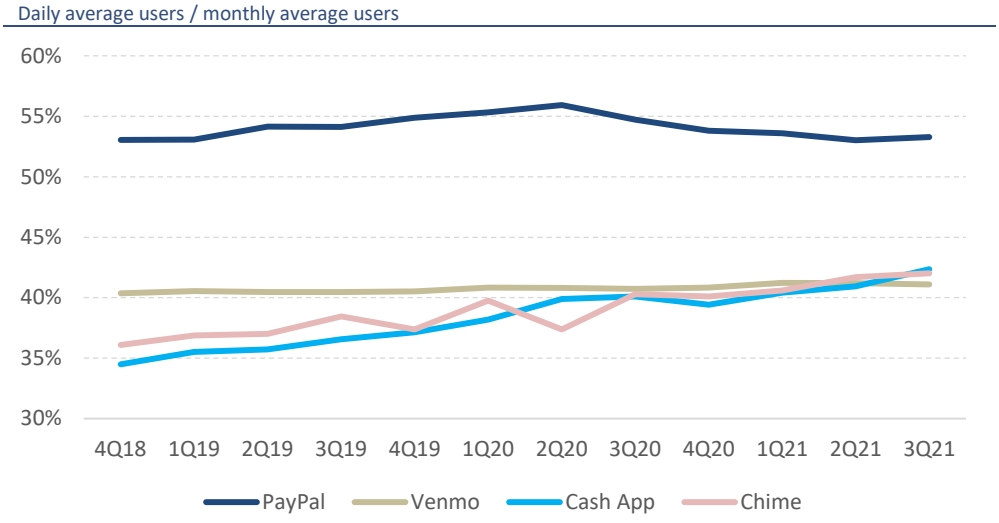
Chart 77: PayPal/Venmo screen relatively well in terms of engagement



Source: Apptopia, Autonomous Research

All that said, in our view, the relative change in engagement over-time is a better indicator for shifts in ARPU than the absolute engagement level (i.e. we view the relative changes as a potential shift in consumer behavior). PayPal's engagement, defined as daily average users as a percentage of monthly average users, has remained in the low 50s aside from a temporary pop during the beginning of the pandemic. Venmo's engagement levels have also been steady, in the 40-41% range, while peers such as Cash App and Chime have seen continuous improvement over the past several years.

Chart 78: Engagement levels for PayPal and Venmo have remained steady while it has improved for peers



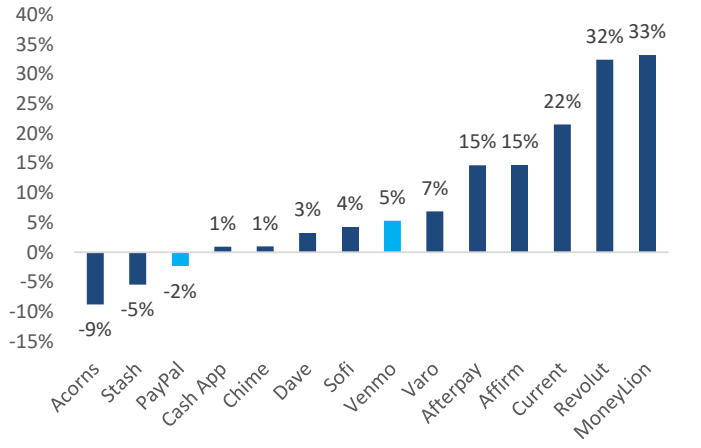
Source: Apptopia

Narrowing our focus to the most recent quarter, PayPal and Venmo do not screen relatively well. We believe the re-opening of economies, as the pain from the COVID crisis eases, is resulting in a slight decline in both DAUs and MAUs for PayPal as tertiary customers are no

longer using the app. Venmo, on the other hand, saw some re-acceleration in MAUs in 3Q, although the acceleration is lower than some peers.

Chart 79: PayPal's core user growth may have slowed…

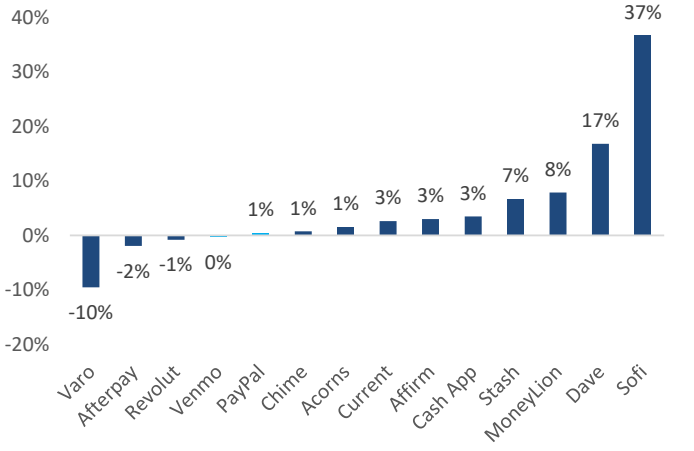
3Q QoQ change in monthly average users – period average



Source: Apptopia, Autonomous Research

Chart 80: … both PayPal and Venmo are not seeing the same engagement improvement as peers

3Q QoQ change in engagement (DAUs / MAUs) – period average

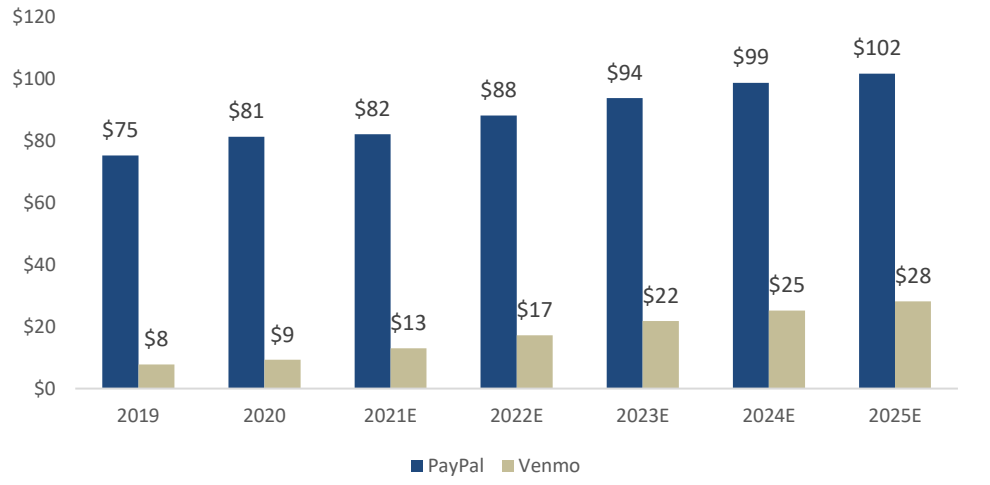


Source: Apptopia, Autonomous Research

While we go into a detailed breakdown of the Venmo ARPU below, we believe the PayPal ARPU benefit from becoming a 'Super App' is a bit more straight forward. All-in-all, we believe the PayPal app rollout will result in a higher level of growth in transactions per customer in the coming years (we forecast a 9% CAGR over the next four years versus a 7% CAGR over the past four years), while we do not expect meaningful revenue contributions from the investing or banking services (given PayPal's already large revenue base). As such, we believe PayPal's ARPU will increase in the mid-single-digit range moving forward.

Chart 81: Core PayPal's ARPU should continue to trend higher while Venmo could see meaningful upside

Average revenue per annual active user



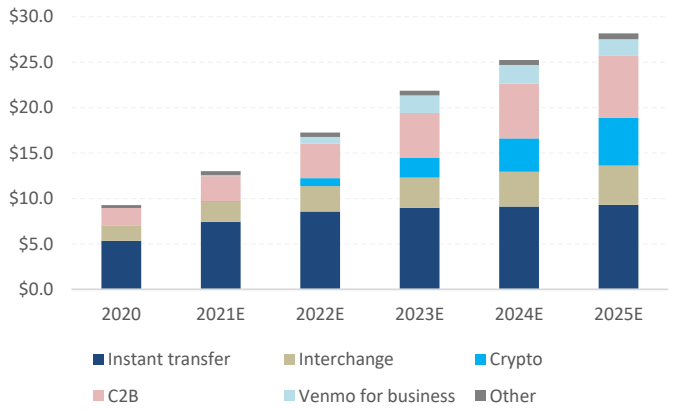
Source: Company reports, Autonomous Estimates

It is fair to say that we are more optimistic on the potential for Venmo's ARPU expansion than we are PayPal's due to the combination of: 1) Venmo's core competency being P2P rather than eCommerce (i.e. it is more similar to Cash App or Chime than PayPal) and 2) the fact that Venmo is currently under-monetized relative to peers.

Since Venmo's inception in 2009 and PayPal's acquisition of Venmo through Braintree in 2013, management has been successful in building out the network and meaningfully broadening its US user base. However, attempts to improve monetization outside of instant transfer have fallen short.

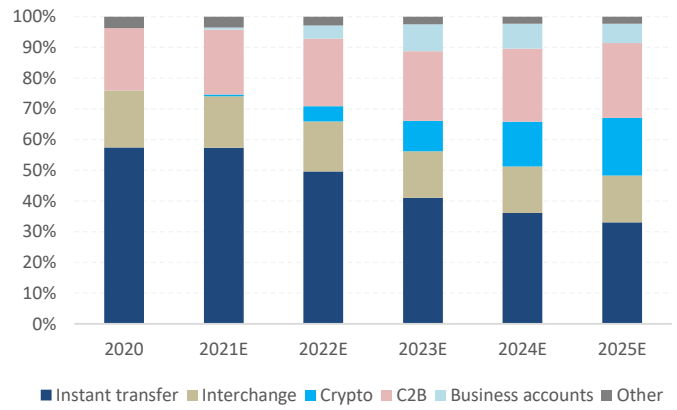
While we do not expect Venmo to reach ARPU levels of 'mobile wallet' peers such as Cash App or Chime due to a variety of factors (demographics, direct deposit penetration, etc.), we do believe the company will be more successful in improving monetization going forward. This is due to a combination of card growth, increased crypto activity, increased usage of paying with QR codes, and the upside potential from Venmo business profiles.

Chart 82: We expect Venmo's ARPU to triple by 2025…



Source: Company reports, Autonomous Research estimates

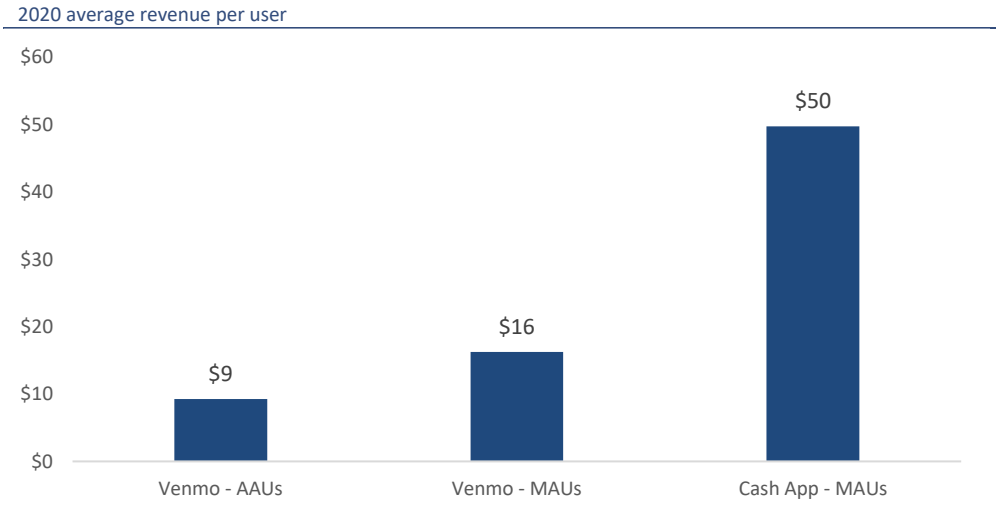
Chart 83: …driven mainly by crypto & C2B initiatives



Source: Company reports, Autonomous Research estimates

Before going further into the individual drivers of Venmo's revenues, we believe it is important to note that some of the ARPU differential between Venmo and Cash App is due to reporting discrepancies. Square reports monthly average users while Venmo reports annual active users. Luckily, Square recently provided both datapoints for Cash App (2Q21 MAUs: >40mn, AAUs: 70mn). If we hold that ratio constant for Venmo, its ARPU nearly doubles and is roughly 1/3rd of Cash App's.

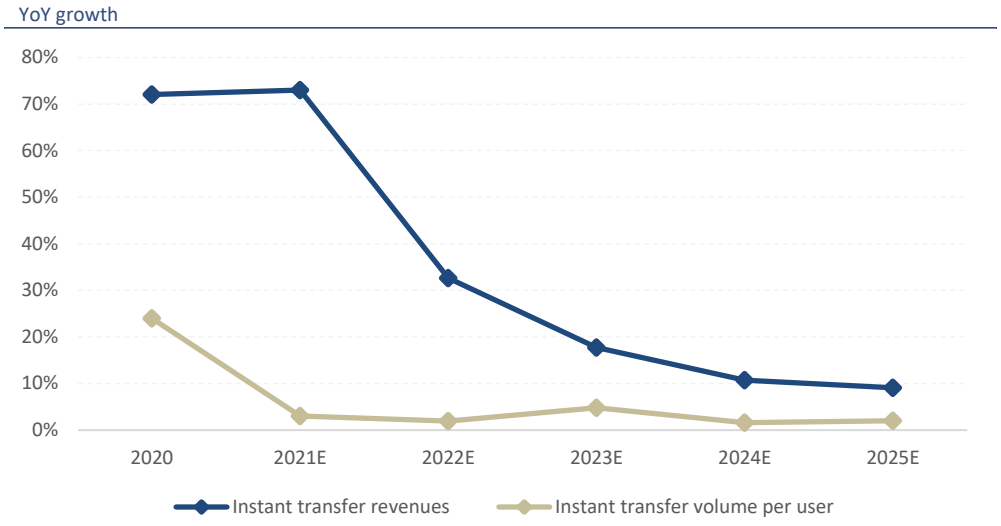
Chart 84: Reporting differences help bridge part of the ARPU gap for Venmo



Source: Company reports, Autonomous Research estimates

- **Instant Transfer:** The ability for consumers to instantly transfer their Venmo balances into their connected bank accounts (rather than waiting 1-3 days) drives the majority of the economics today. Effective on August 2nd, PayPal increased the price of instant transfer (to 1.5% with a $15 max from 1.0% with a $10 max), bringing pricing in line with Cash App. We believe this increased pricing power will be sticky and do not expect price changes moving forward. However, we do question the growth profile and sustainability of this revenue line as improvements in payment technology (i.e. real-time payments) will allow for faster flow of money over time at a cheaper price. Indeed, the large US banks provide the same P2P service through Zelle for free in most cases. In addition, growth in other revenue streams (pay w/ Venmo, interchange/rebates) in part depends on users increasing their account balances, which could cannibalize instant transfer revenues. Lastly, relative to Cash App we believe demographics could be an issue for Venmo, as its more-affluent customer base likely has less dire cash flow needs. Nevertheless, instant transfer growth has been impressive, and the firm recently increased pricing an impressive 50%. We believe same store sales growth (i.e. volume per user) can grow at an inflation-type pace moving forward.

Chart 85: We expect instant transfer revenue growth to slow over time as volume per user grows at an inflation-type pace



Source: Autonomous Research estimates

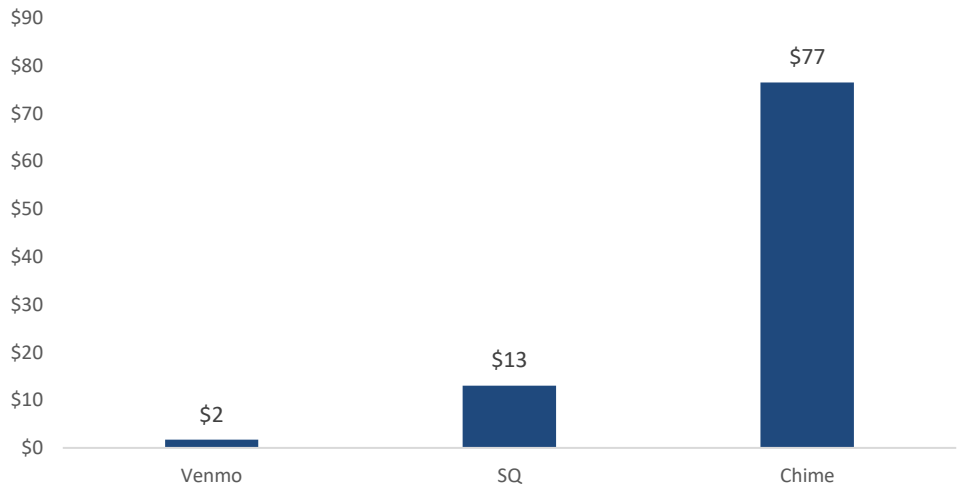
- **Interchange / rebates:** Venmo now has both a debit card (launch: 2Q18, issuer: the Bancorp Bank, brand: Mastercard) and a credit card (launch: 3Q21, issuer: Synchrony, brand: Visa) where it earns economics by receiving rebates from their issuer partners (i.e. they earn a portion of interchange). We believe the Venmo credit card offering is attractive given the combination of cash back (3% on certain items), cash back conversion to crypto, and unique branding (who doesn't love the cotton candy colored card? https://venmo.com/about/creditcard/). On the contrary, they are attempting to introduce a new product in the midst of what is beginning to feel like a rewards war.

  Expansion of Square's Cash Card (Cash App's debit card offering) has garnered a lot of investor attention given the rapid growth (cards outstanding have increased >300% over the past 18 months). Investors likely wonder if Venmo can generate a similar level of traction. While we expect meaningful growth for Venmo from this vertical (we forecast a 32% CAGR in total card revenues over the next four years), we do not expect Venmo to bridge the gap between Square or Chime. In our view, driving better interchange economics is all about establishing some sort of direct deposit relationship. Below we

estimate the ARPU contribution in 2020 from interchange, and it shows quite a large gap. The main driver of which being that 66% of Chime accounts have some sort of direct deposit relationship. We believe Cash App is making the right investments (it has been stating that improving direct deposit capabilities in Cash App is Square's top priority) and has the proper product placement in place to increase its direct deposit penetration moving forward. Venmo on the other hand, is not prioritizing direct deposit as shown through the snippets below, in-part likely due to a lack of demand from the Venmo user base for the app to turn into a neobank.

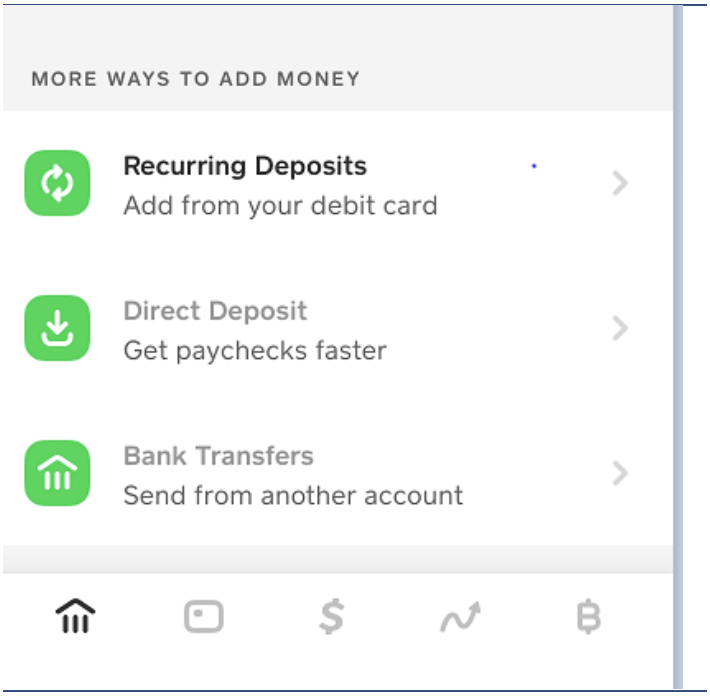
Chart 86: We believe driving better interchange economics per user is dependent on deposits

Interchange/rebates revenue per active user in 2020



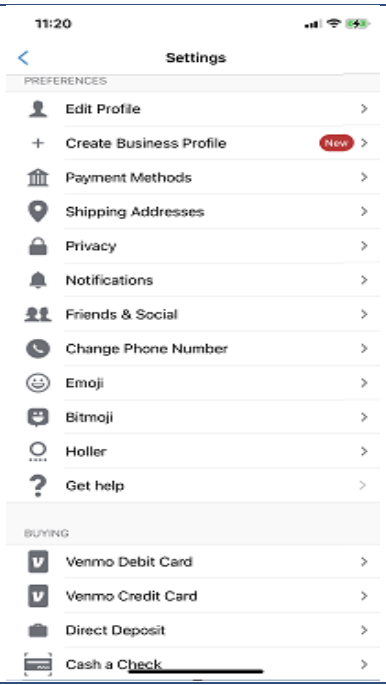
Source: Autonomous Research estimates

Chart 87: Cash App advertises the ability to set up recurring deposits right when you open the app



Source: Cash App

Chart 88: While Venmo users have to search for the direct deposit option deep within settings



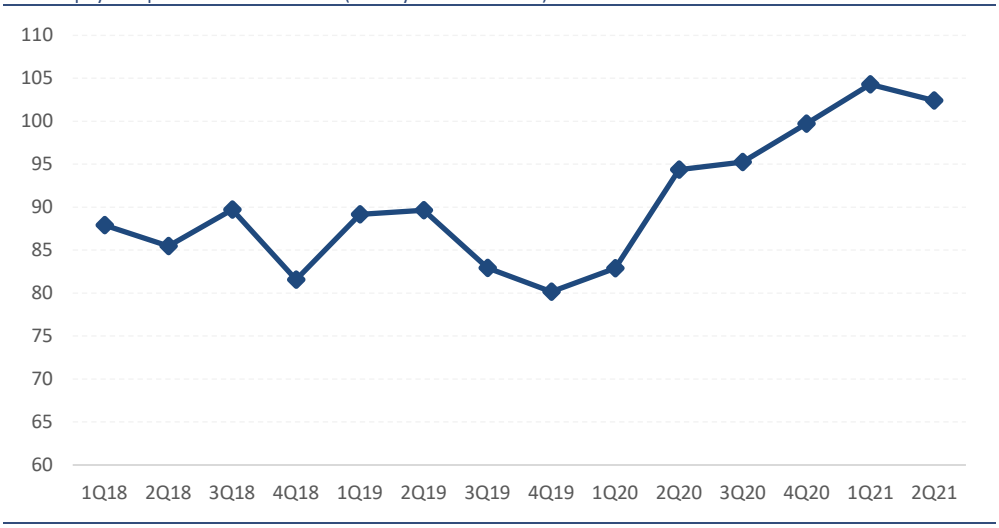
Source: Venmo

- **Crypto:** The cryptocurrency boom over the past 18 months has resulted in significant user adoption and many financial services firms offering the ability for users to purchase these securities. Venmo introduced 'Crypto on Venmo' in April but did not prominently feature the product until an app update a month or so ago. Broadly, we expect decent user adoption, in part due to making more crypto currencies available (BTC/ETH/LTC versus just BTC on Cash App), and select promotions (in August/September, PayPal offered 10,000 rewards of $25 of crypto eligible with any $25-100 crypto purchase). We use Cash App's adoption curve to help us model Venmo's revenue base for this vertical and expect management to provide an update on the upcoming earnings call.

Pay with Venmo is a payment option facilitating both eCommerce (through a checkout button) and in person (through QR codes) transactions

- **Pay with Venmo (C2B):** Pay with Venmo is a payment option facilitating both eCommerce (through a checkout button) and in person (through QR codes) transactions. Transactions can be funded either with a consumer's Venmo balance or an underlying bank account or card. PayPal recently adjusted the rack rates here, effective August 2nd, increasing the merchant discount rate for online sales (3.49% + $0.49 from 2.90% +$0.30) while decreasing the cost of in-person sales (1.90% + $0.10 from 2.90% + $0.30). We expect the pricing changes to have a de-minimis impact on the take rate. Looking forward we likely have a more cautious outlook for this revenue stream than the management team does (management has stated that they expect Pay w/ Venmo to drive the majority of Venmo's growth). In our opinion, given the growth in contactless cards, which removes some of the benefit of paying via a QR code, growth here will be mostly dependent on Venmo users maintaining higher balances. As we show below, the average account balance expanded during the pandemic but declined in the most recent quarter and was range-bound prior to the pandemic. Lastly, on its website Venmo highlights that it is accepted by "more than 2mn merchants" versus 2mn merchants in 2Q19, so it appears that merchant adoption here has been difficult to come by.

Chart 89: Absent stimulus benefits, the Venmo/PayPal average balance has not moved higher



Source: Company reports, Autonomous Research estimates

- **Venmo business profiles:** Venmo recently revamped 'Venmo for business' in an effort to improve monetization efforts on C2B payments. Users now have an option at payment to tag a payment as 'Family & Friends' or 'Goods & Services', helping Venmo recognize when funds are being used for business purposes. Venmo in-turn provides protections for the consumer when 'Goods & Services' is selected. Essentially, the yoga instructors and babysitters who used Venmo to receive payments now have the option to create a business profile rather than being paid through their personal account. They will be charged 1.9% +$0.10 per transaction. The level of adoption here is a big wildcard as we

believe it will be difficult to track users receiving business payments into their personal accounts (i.e. side stepping the fees) and adjust consumer adoption. Nevertheless, 500k business profiles were created in the first half of 2021 (indicating some nice early momentum) and we expect management will provide an update on the upcoming earnings call.

Please reach out if you are interested in receiving our detailed model breaking down revenue forecasts for each of Venmo's business lines.

PayPal: Users Outlook

Investor Day: Can management meet their 2025 goal? Can NNA growth re-accelerate next year?

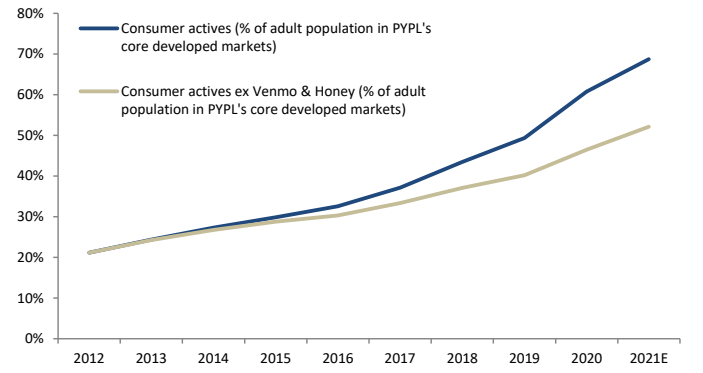
Our analysis shows that PayPal has successfully grown its customer base in its core developed markets, although penetration is now reaching higher levels (estimated at ~50%, up from ~20% in 2012). To reach its 750mn net actives target in 2025, we believe PayPal has to continue further penetrating these core developed markets and scale in other international markets like Mexico, Brazil, and Japan. There are other digital wallets in emerging markets, which could make it more challenging for PayPal. Separately, Apptopia data suggest that PayPal's net new actives might come in weaker than expected in 3Q.

Investors are asking whether PayPal can hit its 750mn guide on net actives in 2025. As shown in the left table below, taking PayPal's consumer actives and dividing by the adult population, we estimate that PYPL is penetrated ~70% of its core developed markets, which we define as the US, UK, Germany, France, Italy, Spain, Australia, and Canada. This analysis looks at PYPL's consumer actives (i.e. excluding merchant actives) relative to the adult population in these countries.

This analysis needs to be taken a step further, however, as some people might have a PayPal, Venmo and Honey account and appear as three users in PayPal's reporting. After excluding Venmo and Honey net actives, we estimate that core PayPal is ~50% penetrated across these core markets, up from ~20% in 2012. We believe PYPL is slightly more penetrated internationally (54% penetration) versus the US (50% penetration).

Chart 90: We estimate PYPL is 50% penetrated across its core developed markets (US and non-US)

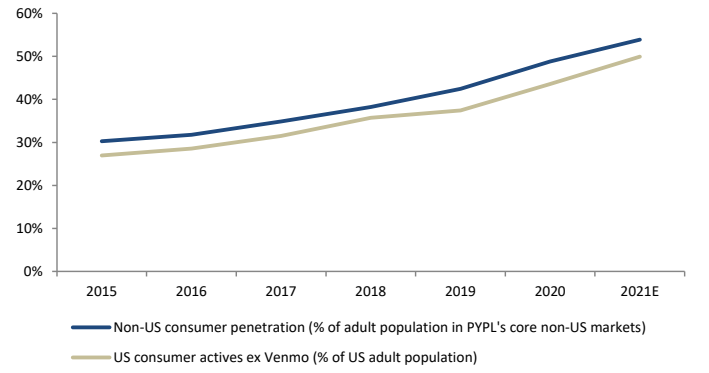
Consumer actives divided by adult population (%)



Source: US Census data, ons.gov.uk, Instituto Nacional de Estadística, and other government websites. Company data, Autonomous Estimates; Chart shows consumer actives, so it excludes any merchant count figures; Excludes Venmo and Honey accounts where applicable.

Chart 91: We believe PYPL is slightly more penetrated internationally versus the US

Consumer actives divided by adult population in US and non-US (%)



Source: US Census data, ons.gov.uk, Instituto Nacional de Estadística, and other government websites. Company data, Autonomous Estimates; Chart shows consumer actives, so it excludes any merchant count figures; Excludes Venmo and Honey accounts where applicable.

We highlight a couple observations from the charts above. Firstly, PayPal is 50% penetrated in its core markets today (ex. Venmo and Honey) versus 20% eight years ago. That has been a nice source of growth for the company. Secondly, PayPal saw its net adds accelerate in 2020 and 2021, so its penetration of the adult population accelerated. On one hand that is a positive since the company attracted more users to its platform and now PYPL can increase their engagement. On the other hand, PayPal has already acquired these users, making it more difficult to grow in these core developed markets in the coming years and forcing PayPal to move into other markets.

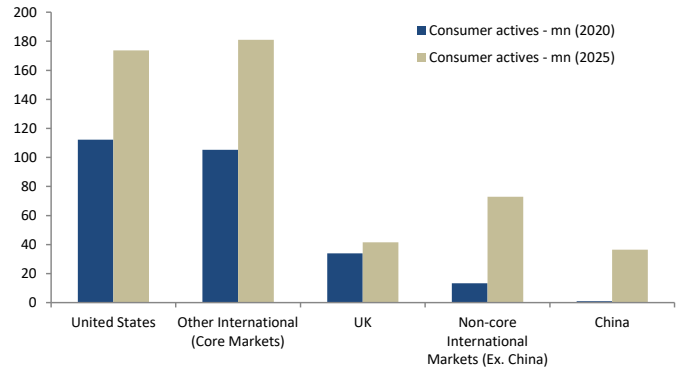
What is the math to get to 750mn users by 2025?

We conducted an analysis of PYPL's active users by geography to determine what type of penetration levels the company has to hit to achieve its 750mn user guide. There are multiple ways to hit 750mn actives, but we outline one scenario below and test whether the assumptions are realistic.

As shown in the chart below, we believe PayPal has to capture additional consumer actives in its core markets (US and international) as well as expand into other non-core markets like Mexico, Brazil, and Japan (non-core international markets). The analysis below includes only consumer actives, as we model merchants, Venmo users, and Honey actives separately.

Chart 92: Hypothetical scenario of where PYPL's consumer actives might come from to hit the 750mn net active user guide in 2025

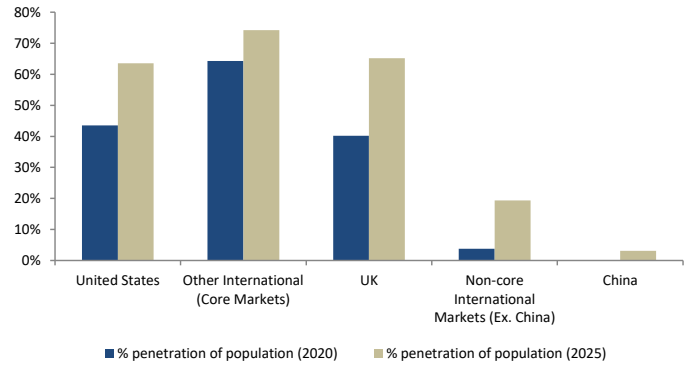
# of consumer actives (mn)



Source: Government population data, company data, Autonomous Estimates; Chart shows consumer actives, so it excludes any merchant count figures, Venmo users, and Honey actives, which we add in separately to our analysis

Chart 93: Our analysis assumes PYPL achieves higher level of penetration (% of the adult population) in these various markets

% penetration of adult population (includes only consumer actives)



Source: Government population data, company data, Autonomous Estimates; Chart shows consumer actives, so it excludes any merchant count figures, Venmo users, and Honey actives, which we add in separately to our analysis

As shown in the table below, penetration in PayPal's core developed markets stood at 44% at the end of 2020. The first column shows active users by geography, the second includes adjustments to exclude merchants/Venmo users/Honey actives, and the third column shows PayPal consumer actives. We use this third column (PYPL consumer actives) to estimate penetration across geographies. We assume small levels of penetration in Mexico, Brazil, Japan, and China, although it's likely that there's a long list of countries where PayPal has a small presence.

Table 15: PYPL penetration across various countries/geographies (2020)

Country/Region	PayPal Active Users (mn)	Adjustments (Merchants, Venmo, Honey)*	PayPal Consumer actives (mn)	Population Age +18 (mn)	Penetration (%)
United States	**207**	**95**	**112**	**258**	**44%**
UK	**37**	**3**	**34**	**53**	**64%**
Other International (Core Markets)	**113**	**8**	**105**	**262**	**40%**
Canada				31	
Germany	29	2	27	69	39%
France				53	
Italy				50	
Spain				39	
Australia				20	
Total Core Markets (US & International)	**358**	**106**	**252**	**573**	**44%**
Mexico	5	0	5	88	5%
Brazil	5	0	5	158	3%
Japan	4	0	4	107	4%
Non-core international Markets (Ex. China)	**14**	**1.0**	**13**	**353**	**4%**
Total (Exc. China)	**372**	**107**	**265**	**926**	**29%**
China	5	4	1	1,106	0%
Total Including China	**377**	**111**	**266**	**2,032**	**13%**

*Source: US Census data, ons.gov.uk, Instituto Nacional de Estadística, and other government websites. Company data, Autonomous Estimates. *Adjustments exclude any Venmo, Honey or merchant actives to get a better understanding of penetration of consumers.*

The table below (similar to the one above) shows the assumptions needed to reach 750mn net actives by 2025. We assume PayPal increases its penetration in the UK by 10ppts over the five years, 20ppts in the US, and 25ppts in other core developed markets (Canada, Germany, France, Italy, Spain, Australia). We also assume PayPal reaches ~20% penetration in non-core international markets (Mexico, Brazil, and Japan) and adds ~37mn consumer actives from China. We also assume Venmo users increase by ~50mn in the US and PayPal adds another 50mn outside the US. We also assume US merchants, non-US merchants, and Honey actives grow at a 13% CAGR over the 5-year period.

Table 16: PayPal needs to further penetrate its core developed markets while also tapping into emerging market countries like Mexico, Brazil, Japan, and China to hit its guide for 750mn net actives in 2025

Country/Region	Population Age +18 (mn)	Increase in penetration '20-'25 (ppt)	Penetration (%) 2025	Incremental Consumer Active Accounts (mn)	PayPal Consumer actives (mn) - 2025	Adjustments (Merchants, Venmo, Honey)	Active Accounts 2025 (PYPL def)
United States	**273**	**20%**	**64%**	**61**	**174**	**164**	**338**
UK	**56**	**10%**	**74%**	**8**	**42**	**16**	**57**
Other International (Core Markets)	**278**	**25%**	**65%**	**76**	**181**	**51**	**232**
Canada	33						
Germany	74						
France	56						
Italy	53						
Spain	41						
Australia	21						
Total Core Markets (US & International)	**607**	**21%**	**65%**	**145**	**396**	**231**	**627**
Mexico	94	15%	20%	14	19	2	21
Brazil	169	15%	18%	26	30	2	32
Japan	114	17%	21%	20	24	1	25
Non-core international Markets (Ex. China)	**377**	**16%**	**19%**	**60**	**73**	**5**	**78**
Total (Excluding China)	**984**	**19%**	**48%**	**205**	**469**	**236**	**705**
China	1,183	3%	3%	36	37	8	45
Total Including China	**2,167**	**10%**	**23%**	**240**	**506**	**244**	**750**

*Source: US Census data, ons.gov.uk, Instituto Nacional de Estadística, and other government websites. Company data, Autonomous Estimates. *Adjustments exclude any Venmo, Honey or merchant actives to get a better understanding of penetration of consumers.*

The analysis above does not include India. It is possible that if PayPal gains traction in India, it could be another driver of net adds as the population is significant at 1.4bn people. Just a few percentage points of penetration could add tens of millions of users. This would provide an alternate path to 750mn users.

Please reach out if you are interested in our detailed model of PayPal's active users by country/geography.

Emerging Markets Digital wallets and ecosystems

There are other digital wallets in emerging markets, which could make it more challenging for PayPal to expand into these markets

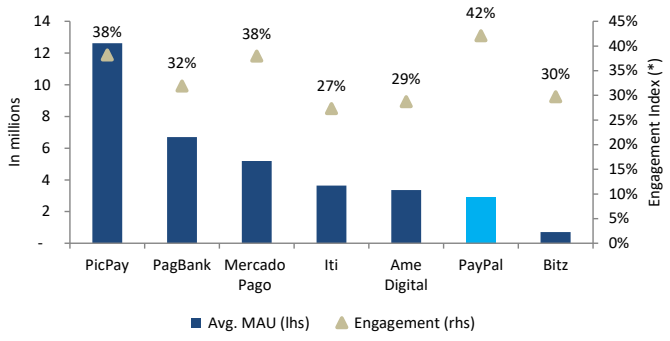
We believe PayPal had success in its core developed markets because it faced less competition, and PayPal's conversion rates for online checkout were higher than others. There are other digital wallets in emerging markets, which could make it more challenging for PayPal to expand into these markets.

For example, in Brazil, there are lots of digital wallets including MercadoPago, PicPay, and Ame Digital from Americanas. PicPay is the most prominent digital wallet in Brazil having surpassed the 50 million user mark earlier this year, with the goal of hitting 80mn users by year end. It has managed to reach such scale by combining a solid user experience, promotional campaigns, and an ever-growing merchant base.

It is unclear if Brazil needs another wallet though. Our channel checks suggest that PayPal was more popular in Brazil in the 2000s when there were few options to make P2P transactions. The brand is still well-known across 25+ years olds in Brazil, but there are also new offerings occupying space. That said, we believe PayPal is still a go-to solution for cross border payments.

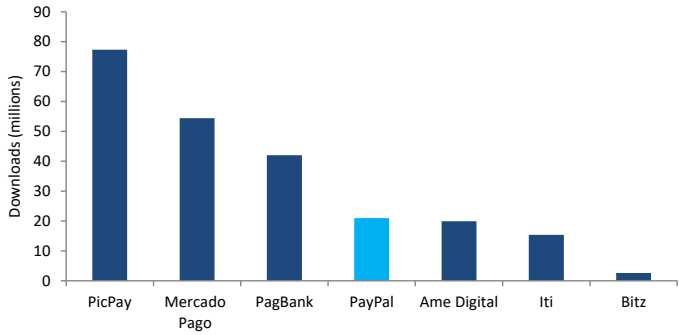
Our analysis of app usage in Brazil confirms our overall view. Several players including PicPay, PagBank, Mercado Pago, Iti, and Ame Digital rank higher than PayPal in terms of monthly active users (MAUs), although PayPal's engagement (daily active users divided by monthly active users) tops the list. Additionally, PayPal's app downloads since 2015 are just a fraction of the other players.

Chart 94: Monthly active users and engagement scores for Brazilian digital wallets (2021 YTD)



Source: Apptopia, Autonomous Research

Chart 95: Top digital wallet downloads in Brazil (2015-2021)



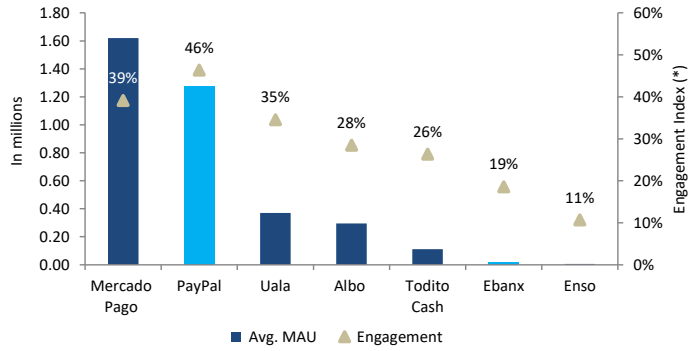
Source: Apptopia, Autonomous Research

A greater chance of success in Mexico

We believe PayPal has a greater probability of success in a country like Mexico. PayPal is second in MAUs only behind MercadoPago, and PayPal's engagement stats are quite high. Additionally, the company has maintained a high share of downloads since 2015. Mexico also has low eComm penetration (< 10%), and eComm sales are expected to grow at a 16% CAGR for the next four years according to the Global Payments Report by FIS.

Chart 96: PayPal's MAU and engagement scores in Mexico are impressive (2021 YTD)

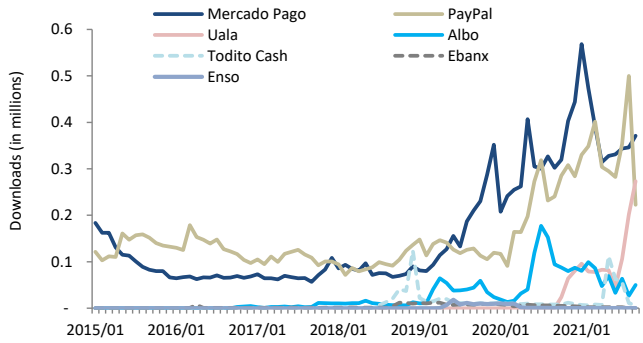
MAUs (millions) and engagement (DAU/MAU)



Source: Apptopia, Autonomous Research

Chart 97: PayPal ranks high on the list of digital wallet app downloads in Mexico

Downloads (millions)



Source: Apptopia, Autonomous Research

Emerging markets digital ecosystems

In the chart below, we show services and products provided by select emerging market digital ecosystems. If these players are already leading in their respective markets and offering a wide range of services, we believe PayPal could face challenges scaling in these markets.

Chart 98: Many digitals ecosystems in emerging markets offer lots of services and products

Services and products provided by selected companies	Services provided by the bank itself or a joint venture						functions offered through external partners					funtions not offered				
Services	**Sber**	**Tinkoff**	**Yandex**	**Mail.ru**	**Kaspi**	**Bajaj Finance**	**Sea Group**	**Capitec**	**Banco Inter**	**Mercado Libre**	**Ame Digital**	**Ant Financial**	**WeBank (Tencent)**	**Ping An**	**Kakao Bank (Kakao)**	**OTP**
Main markets	Russia	Russia	Russia	Russia	Kazakhstan	India	SE Asia	South Africa	LatAm	LatAm	LatAm	China	China	China	S. Korea	Hungary
Finance/Fintech																
Lending																
Payments/ e-wallet																
Insurance																
Retail brokerage																
AM /WM																
Loyalty/ Bonus programs																
Crowdfunding																
Marketplace/E-commerce																
Buy-now-pay-later option?																
Goods marketplace																
Car marketplace																
Property marketplace																
Travel marketplace																
Lifestyle/Entertainment																
Food delivery, restaurants																
Streaming services																
Ticket sales																
Mobile services																
Health & Wellness																
Technology																
AI, ML, cybersecurity																
Cloud																
App platform																
Speech/voice/face assistance																
Analytics																
Transport/Logistics																
Logistics services																
Taxi/Car sharing services																
Other services																
Business admin.																
Advertising																
Other*																

*Source: *Other includes property maintenance, content creation, devices; Company disclosures and company websites. Autonomous Research. Covered stocks include Sber, Tinkoff, Bajaj Finance, Banco Inter; Only services and products sold to external parties are considered. A dark green coloring assumes the service is provided by the company itself or through a controlling ownership of a subsidiary. Light green colouring includes partnerships with third parties and does not assume a controlling stake of a subsidiary. Red coloring means the service is not provided to external customers by the company.*

In certain markets, PayPal is partnering to build out its presence. It is partnered with players like MercadoLibre, China UnionPay, Itaú, and HDFC Bank just to name a few

Partnerships will help

In certain markets, PayPal is partnering to build out its presence. It is partnered with players like MercadoLibre, China UnionPay, Itaú, and HDFC Bank just to name a few. It is unclear how many net adds these partnerships are contributing as disclosure has been limited.

We did find one article from August 2018 that said the partnership with Itaú is expected to add 1 million users to its current 3.8 million client-base in Brazil in two years (click here). The 1 million net adds is unlikely to move the needle for PayPal, and larger partnerships are likely needed for PayPal to grow in non-core markets. PayPal highlighted in 2019 that it was gaining a lot of traction in India after it put a full product suite into market.

On December 2019, MercadoLibre and PayPal entered into a commercial agreement, after PayPal had purchased 1.7mn shares ($750mn) in MercadoLibre's secondary offering earlier that year on March.

3Q21 NNA expectations

Investors have focused on the outlook and growth prospects for net new actives (NNAs), as there is a fair amount of uncertainty surrounding PayPal's go forward user growth profile as economies re-open and consumers becoming less dependent on eCommerce. The firm experienced a fairly large decline in NNAs last quarter (11.4mn vs. 15.0mn in 1Q21) in-part due to the roll-off of users that downloaded their apps at the beginning of the pandemic but have not used them since (i.e. higher churn).

We believe a similar dynamic may have occurred this quarter; Apptopia is showing a -7% QoQ decline in MAUs for PayPal. On the contrary, Venmo's DAUs and MAUs both increased +5% QoQ according to Apptopia. While our analysis involves some apples-to-oranges comparisons, as we are using MAU data to help determine change in annual active users, we believe there is a risk that NNAs in 3Q is just in-line or even a bit worse with 2Q. This compares to management commentary on last quarter's earnings call that they expect a sequential improvement in both 3Q and 4Q.

Table 17: 3Q NNA forecast for PayPal using Apptopia data; another potential slowdown this quarter

In mn

						QoQ growth			
	PYPL MAUs	Venmo MAUs	Other (Plug)	Total	NNAs	PYPL MAUs	Venmo MAUs	Other	Total
3Q19	18.7	29.2	238.1	286.0					
4Q19	19.8	30.7	254.5	305.0	**19.0**	5.9%	5.0%	6.9%	6.6%
1Q20	20.6	31.9	272.5	325.0	**20.0**	3.9%	4.2%	7.1%	6.6%
2Q20	25.5	34.3	286.2	346.0	**21.0**	23.8%	7.6%	5.0%	6.5%
3Q20	29.1	36.2	295.7	361.0	**15.0**	14.2%	5.5%	3.3%	4.3%
4Q20	32.0	38.0	306.9	377.0	**16.0**	10.1%	5.0%	3.8%	4.4%
1Q21	35.4	39.6	317.0	392.0	**15.0**	10.6%	4.1%	3.3%	4.0%
2Q21	35.4	41.6	326.4	403.4	**11.4**	-0.1%	5.1%	3.0%	2.9%
3Q21	32.8	43.7	337.8	414.4	**11.0**	-7.2%	5.1%	3.5%	2.7%

Source: Apptopia, Company reports

PayPal: Other Key Debates

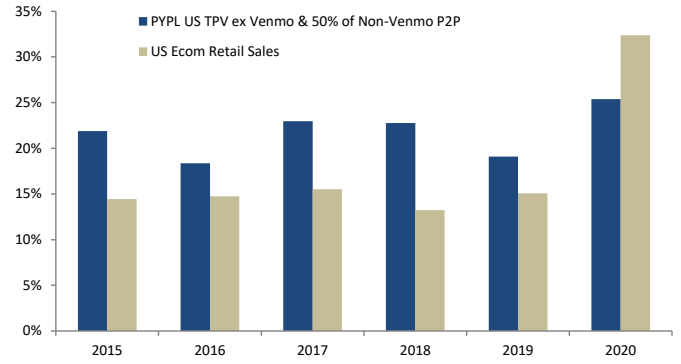
Investor Debate: Is PayPal gaining or losing market share in eComm?

Our analysis suggests that PayPal continues to gain share of US eCommerce sales. It's unclear how much of the share gains are coming from PayPal branded transactions vs. unbranded transactions though. One area we are watching closely is increased competition from other digital wallets like Apple Pay, which surpassed PayPal in quarterly transactions in 4Q19. While Apple stopped disclosing transactions after its December 2019 quarter, it did state in October 2020 that "Apple Pay is doing exceptionally well". There are also newer players emerging like Shopify Pay (known as Shop Pay), which is growing triple digits and expanding its presence online.

Our analysis suggests that PayPal continues to gain share in the US markets. As shown in the table below, PayPal's US TPV (ex. Venmo & 50% of non-Venmo P2P volume) continues to grow faster than US retail sales. It is likely PayPal is growing on marketplaces, which are growing faster than overall eComm retail sales. It is unclear how quickly Braintree and the core PayPal button are growing though. PayPal's underperformance in 2020 is likely driven by increased purchases on Amazon, which has a large share of US eComm retail sales (and PayPal is not a payment option on Amazon, although PayPal/Venmo cards are).

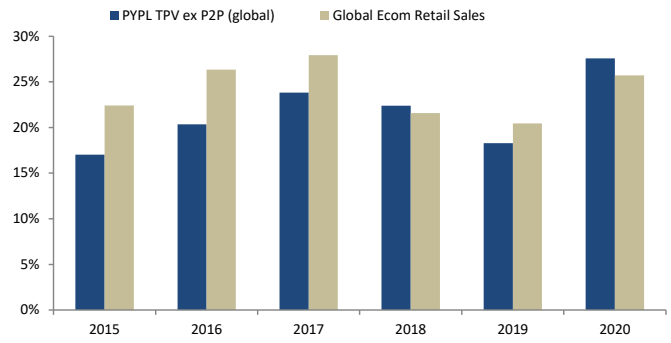
PYPL appears to be growing slower than global eComm retail sales, although that trend reversed in 2020, possibly due to merchants needing to establish an online presence quickly and signing up for PYPL during the year.

Chart 99: Core PayPal's US TPV has grown at a faster rate than US eComm retail sales



Source: eMarketer, Company data, Autonomous Research

Chart 100: PayPal's total TPV (ex P2P) has grown at a slower rate than global eComm retail sales

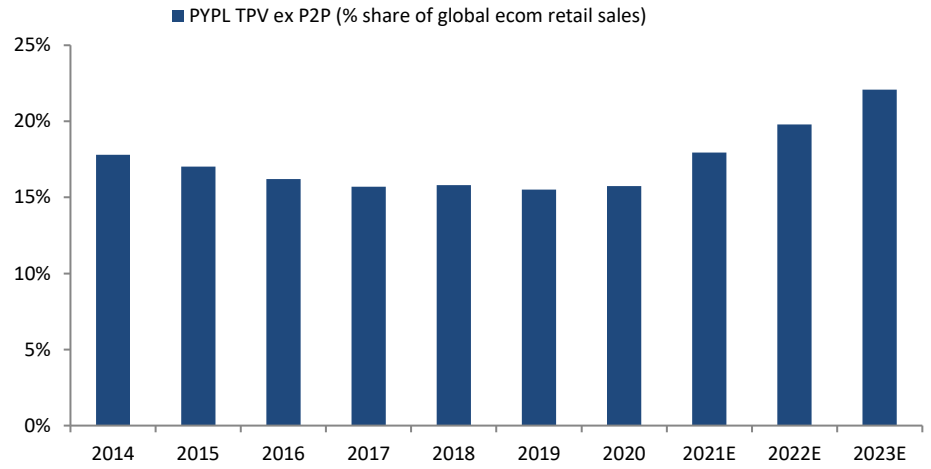


Source: eMarketer, Company data, Autonomous Research

We would note that there are some comparability issues across data as eMarketer does not include travel and events in its retail sales figures (~10% of PYPL's TPV pre COVID). In addition, PayPal's TPV includes bill pay, which has been driving volume growth more recently but is not included in the eMarketer data.

Using consensus TPV estimates for PayPal and our estimates for P2P volume, we believe consensus is modeling PayPal to gain share of global eComm sales. Note that PayPal has lost share on this basis from 2014 to 2019, although it is scaling its bill pay business and its T&E spend is rebounding (two factors that are bit included in the eMarketer eComm retail sales data), which could justify the share gains in the chart below.

Chart 101: Consensus is implying PayPal's share of global eComm sales grows in the coming years

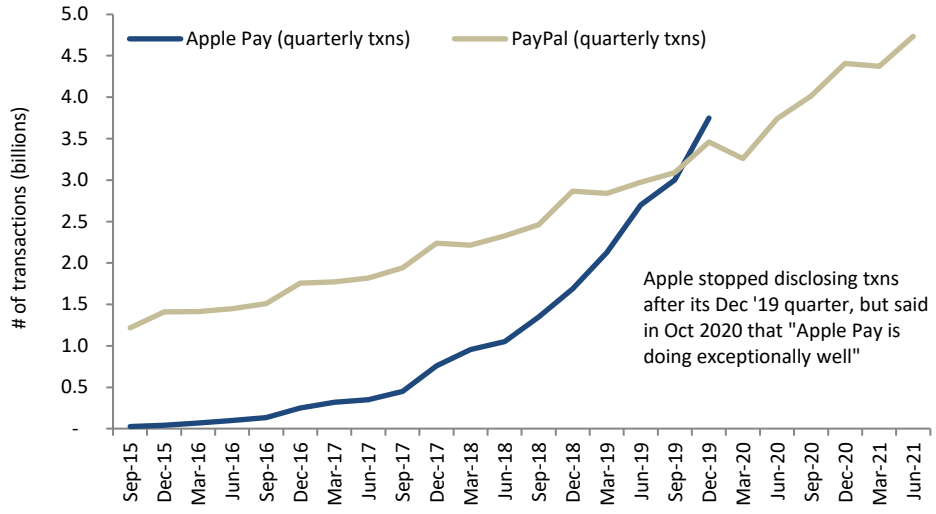


Source: eMarketer, Company data, Autonomous Estimates; Chart shows PYPL TPV ex P2P as a percentage of global ecom retail sales; note that PYPL's TPV includes bill pay and travel/events spending, which are not included in eMarketer's definition of ecom sales.

Increased competition

One area we are watching closely is increased competition from other digital wallets like Apple Pay, which launched in September 2014. Apple has made more of a push into payments and financial services with the launch of Apple Cash and Apple Cash Card in 2017 and the Apple Card in 2019 (partnered with Goldman Sachs). As shown in the chart below, Apple Pay surpassed PayPal in quarterly transactions in 4Q19.

Chart 102: Apple Pay transactions surpassed PayPal transactions in 2019



Source: Company data, Autonomous Estimates; Apple Pay transactions are estimated when not disclosed by the company.

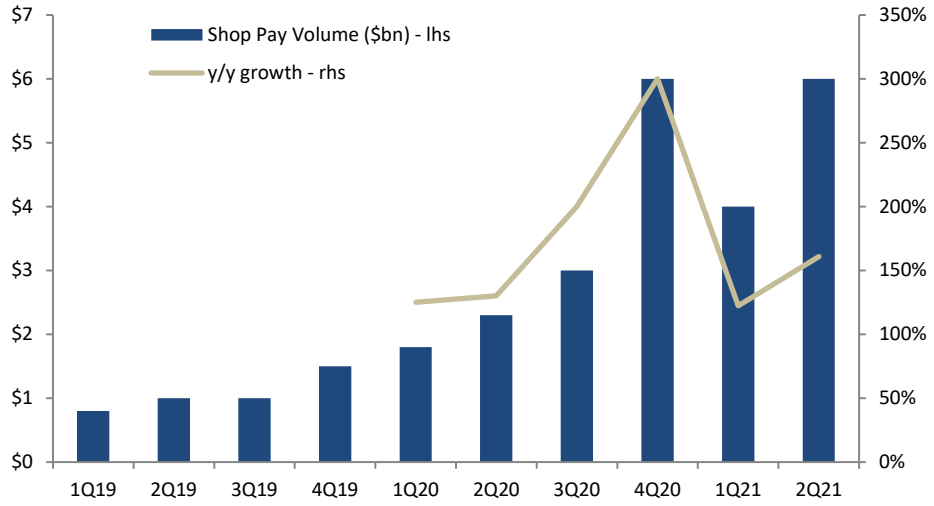
While Apple stopped disclosing transactions after its December 2019 quarter, it did state in October 2020 that "Apple Pay is doing exceptionally well". We believe Apple can be a formidable competitor to PayPal, as the Apple Pay experience is one of the best payment

experiences in the market, in our opinion. Apple also has an advantage in that it has an installed base of more than one billion iPhones as of 2021 (vs. PayPal's 370mn consumer actives).

Other potential competitors include Amazon Pay, Google Pay, and "Click to Pay". While "Click to Pay" seemed to take a back seat during COVID as merchants focused on shifting their sales capabilities from offline to online, we think the networks could make another push here in the coming years.

There are also newer buttons emerging like Shopify Pay (known as Shop Pay), which is a convenient payment button that Shopify merchants can add to their checkout process. The solution is powered by Stripe and allows customers a convenient way to check out at Shopify stores. The tool allows customers to save credit card information and other data like shipping address and billing information for a faster checkout next time they buy.

Chart 103: Shop Pay has grown at triple-digit rates, increasing its volume to ~$6bn in the most recent quarter



Source: Company data, Autonomous Research

While Shop Pay initially focused on Shopify merchants, we believe the solution is expanding beyond the Shopify ecosystem. Earlier this year, Shopify announced that it was taking steps to become the "preferred checkout for all merchants". Starting with Facebook and Instagram and then Google, Shop Pay will be available to more than one million merchants across both platforms, even if they do not use Shopify's online store. Checkout on Shop Pay within the Shopify platform is 70% faster than a typical checkout, with a 1.7x higher conversion rate. This is the first time that a Shopify product will be available to merchants who don't use Shopify to manage their stores.

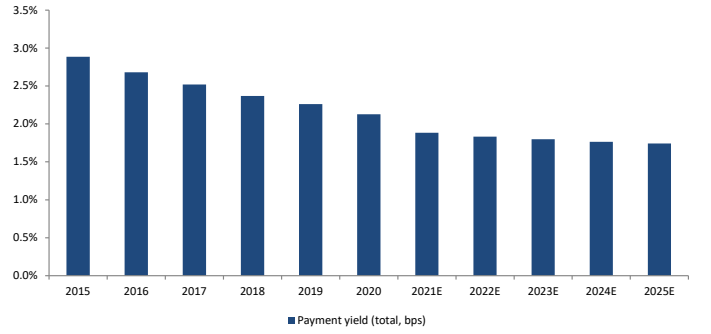
Investor Debate: How will take rate trend in the coming years?

We expect take rate compression to moderate versus prior years mainly due increased Venmo monetization and a smaller headwind from the completion of eBay's transition to managed payments. Our TPV estimates are 1-2ppts above consensus over the next few years while our take rate is below. We believe growth in large merchants/marketplaces and increased bill pay volume could put pressure on the take rate. We also take a closer look at eBay and estimate a take rate on eBay volume in the 2.3-2.5% range in 3Q21E and 4Q21E.

While we expect take rate declines to continue, we expect the YoY declines to be smaller than prior years. This is primarily due to increased Venmo monetization and a declining headwind from eBay's transition to managed payments. As shown in the right hand chart below, PayPal's take rate has been more stable after removing revenue and volume from both Venmo and eBay.

Chart 104: PayPal's reported take rate has declined over the years, but we expect the decline to moderate

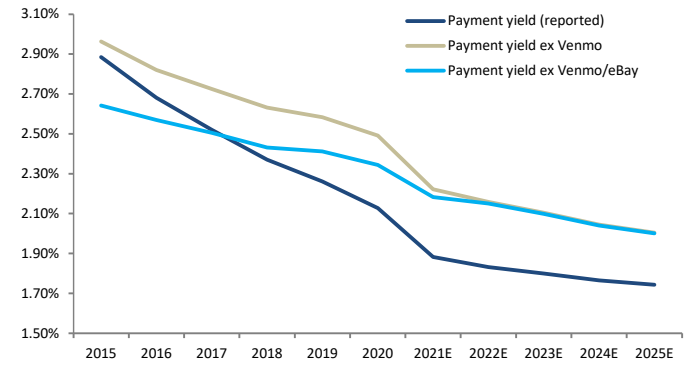
Take rate % (transaction revenue divided by total volume)



Source: Company data, Autonomous Estimates

Chart 105: PayPal's take rate has held up better excluding revenue and volume from Venmo and eBay

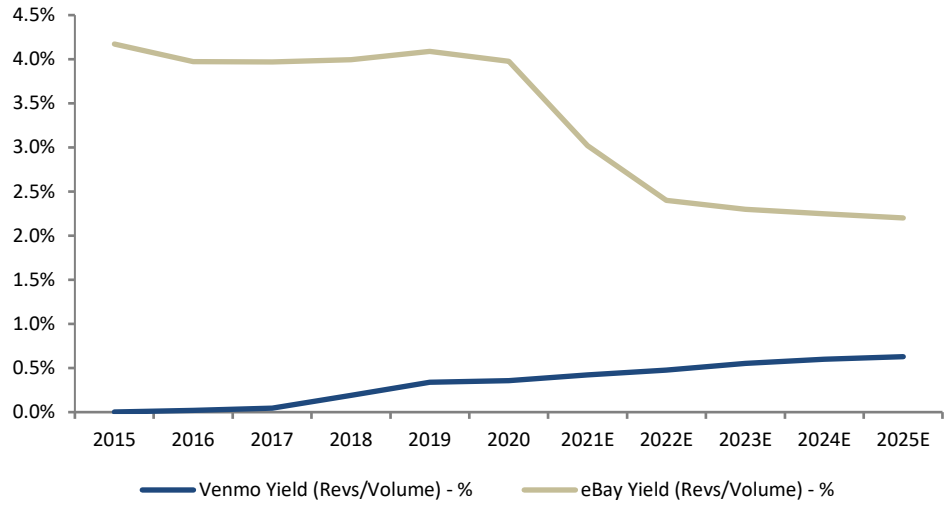
Take rate % (transaction revenue divided by total volume)



Source: Company data, Autonomous Estimates; Chart excludes both revenue and volume for Venmo and eBay where appropriate

PayPal is still in the early stages of monetizing the Venmo asset, and we estimate Venmo's take rate (revenue divided by volume) is in the 0.4-0.5% range (compared to total PYPL at ~1.9% and total PYPL excluding Venmo at an estimated 2.2%). Additionally, eBay had a take rate of ~4%, but this has been declining as eBay transitions to managed payments. We estimate the eBay take rate that PYPL generates could be as low as ~2.1% going forward (starting in 4Q21). As we highlighted in the section on Super Apps, Venmo's revenue yield should increase over time and dampen PayPal's overall take rate declines. In addition, eBay should be less of an issue next year, as most of its transition to managed payments occurred in 2021.

Chart 106: There are lots of moving parts to PayPal's take rate including increasing monetization at Venmo and lower yields at eBay



Source: Company data, Autonomous Estimates

Best way to model the take rate

We believe the best way to model PayPal is by breaking apart the business and forecasting volumes for Venmo and non-Venmo separately. We model a take rate on the non-Venmo TPV excluding our estimated revenue impact from Venmo and the impact from FX hedging. We believe this results in a cleaner picture of how the core business is performing. We then add in the FX hedging impact to our revenue estimate. On top of that, we add in our estimates for Venmo revenue and volume (see the PayPal/Venmo ARPU section in this note for more detail on our Venmo revenue estimates). Management has provided enough disclosure historically that we feel comfortable with our Venmo revenue estimates.

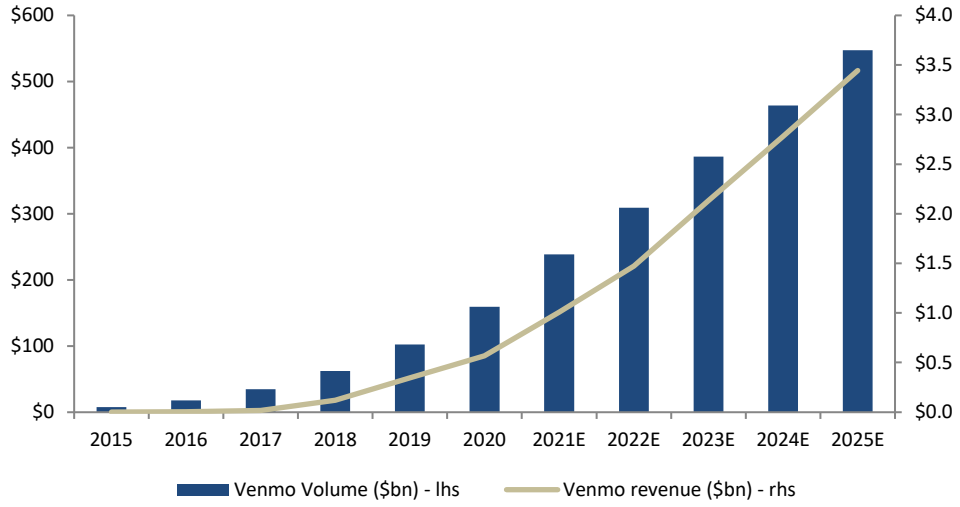
While we model a take rate with eBay in the numbers, we have a good sense of eBay's historical revenue and volumes, and our take rate ex Venmo considers the moving parts of eBay's transition to managed payments.

Table 18: Autonomous bottom-up build of PayPal's transaction revenue

Txn Revenue Build (mn unless noted)	2018	2019	2020	2021E	2022E	2023E	2024E	2025E
Payment yield ex Venmo and hedging (%)	2.64%	2.54%	2.49%	2.24%	2.15%	2.10%	2.04%	2.00%
TPV ex Venmo ($bn)	**516**	**610**	**777**	**1,026**	**1,283**	**1,584**	**1,940**	**2,332**
Transaction revenue ex Venmo & hedging	**13,613**	**15,517**	**19,331**	**23,002**	**27,627**	**33,322**	**39,660**	**46,733**
Hedging impact	(23)	238	20	(198)	53	-	-	-
Transaction revenue ex Venmo	**13,590**	**15,755**	**19,351**	**22,803**	**27,681**	**33,322**	**39,660**	**46,733**
Venmo revenue	119	344	567	1,007	1,473	2,132	2,782	3,443
Total transaction revenue	**13,709**	**16,099**	**19,918**	**23,810**	**29,153**	**35,453**	**42,442**	**50,176**

Source: Company data, Autonomous Estimates

Chart 107: By 2025 we expect Venmo volume to increase to over $500bn and Venmo revenue to reach $3.5bn

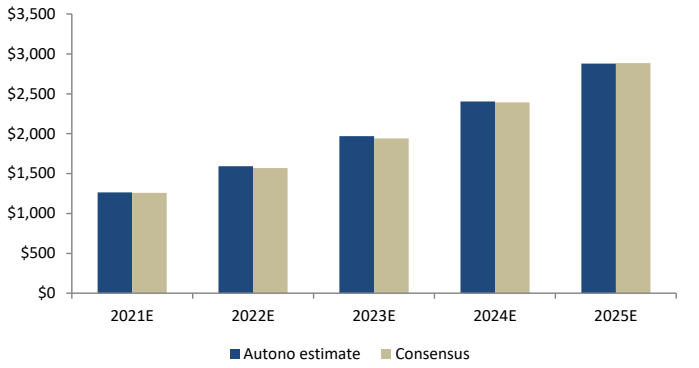


Source: Company data, Autonomous Estimates

Our TPV estimates are 1-2ppts above consensus over the next few years while our bottom-up build of transaction revenue and payment volumes results in a take rate that is below consensus during the next two years, but above in the out years (although there are limited estimates in 2024/2025).

Chart 108: We're 1-2% above consensus on TPV during the next few years

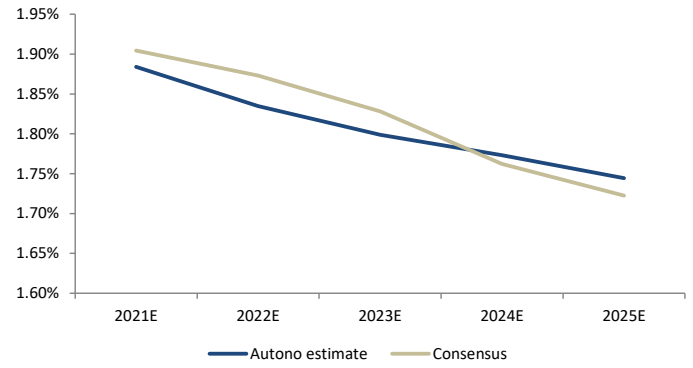
TPV ($bn)



Source: Bloomberg, Company data, Autonomous Estimates

Chart 109: Our take rate estimate is below consensus for the next two years

Take rate % (revenue divided by volume)



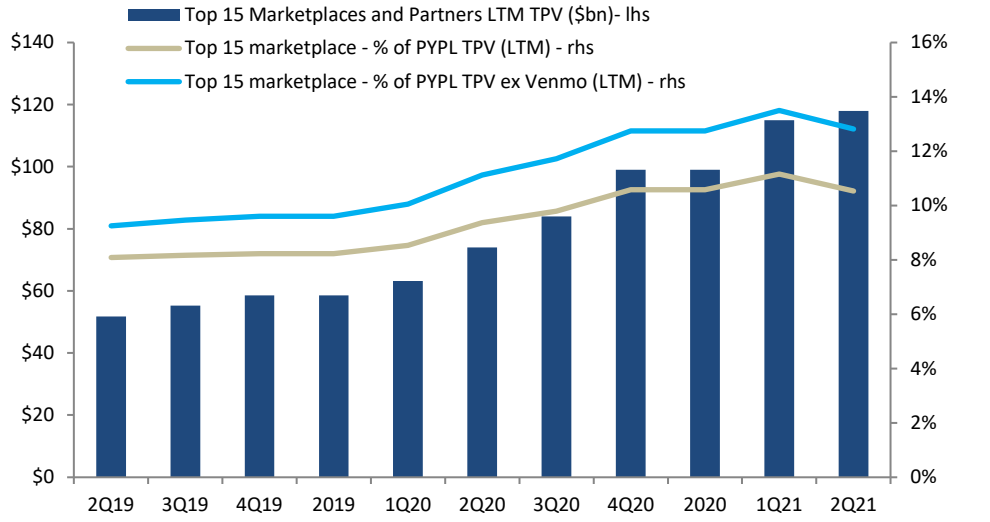
Source: Bloomberg, Company data, Autonomous Estimates

Volume shifting to marketplaces hurts take rate

As shown in the chart below, PayPal's volume coming from the top-15 marketplaces has increased to ~$120bn LTM as of 2Q21, up from ~$70bn in 2Q20. While the extra volume from large merchants is not a bad thing, it puts additional pressure on PayPal's take rate. Large merchants pay a lower take rate to accept PayPal relative to small merchants.

PayPal is also ramping its bill pay offering, and it earns a lower take rate on those transactions as well. That said, some of the lower take rate bill pay volume is offset by lower transaction expense, so PayPal still earns attractive gross profit on those transactions.

Chart 110: More of PayPal's TPV is shifting to large marketplaces, which have lower yields than small merchants

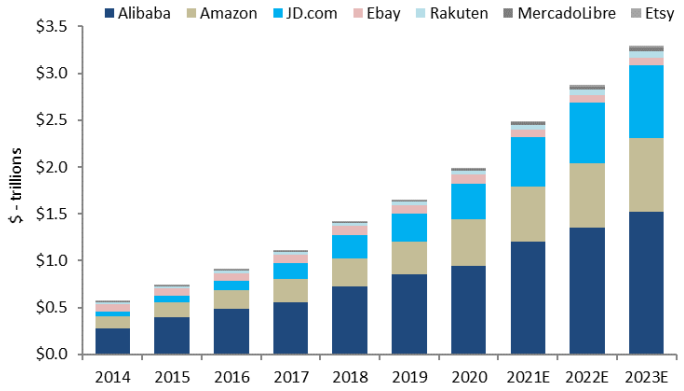


Source: Bloomberg, Company data, Autonomous Estimates; Note that different marketplaces can enter the top 15 over time.

Our analysis suggests that marketplaces will continue to gain share of eCommerce sales. This could be a headwind to PayPal's take rate as larger merchants are able to negotiate better rates with PayPal, or some marketplaces like Amazon don't even accept PayPal as a payment option.

As shown in the table below, the gross merchandise volume for major eCommerce marketplaces (Amazon, eBay, Alibaba, JD.com, MercadoLibre (OP), Rakuten and Etsy) is expected to reach ~$3.2bn or ~51% of global eCommerce sales in 2023, up from ~$600bn (or ~49% of global eCommerce sales) in 2014.

Chart 111: Major eCommerce marketplaces have increased their volume to $2tn in 2020…



Source: Company data, Bernstein Estimates, Autonomous Research

Chart 112: … and their share of Global eComm is expected to increase in 2022 and 2023

Source: Statista, Company data, Autonomous Estimates, Bernstein Estimates

Large marketplaces have been the main beneficiaries of the significant growth of eCommerce sales in recent years, due to their convenience for online shoppers, being a one-stop shop for many shopping occasions, given their large and growing range of products available, improving inventory management and rapid deliveries with several platforms now offering same-day delivery, and very competitive pricing.

Clearly, there are significant network effects in place, as the growth of new customers allows the marketplaces to invest further behind category expansion, efficient inventory

management and deliveries and competitive pricing, leading to further customer growth, and so on. So, the most successful marketplaces such as Amazon and Alibaba's Taobao and Tmall should continue expanding and growing their market share further.

Our take rate forecast in 2025 is slightly below management's targets

As shown in the table below, our take rate in 2025 is slightly below management's implied target from its Investor Day (1.87% vs. 1.90%). That said, we're above on management's implied revenue target in 2025 (~$53bn), driven by engagement and ARPU outperformance.

We believe the revenue contribution from Venmo is a key wildcard to these targets. Each $500mn in additional Venmo revenue adds ~2bps to the overall take rate.

Table 19: We're slightly below PayPal's implied total take rate target for 2025

PYPL Targets	PYPL 2020A	Mgmt. targets (2025E)	CAGR	Autonomous Est. (2025E)	CAGR	Consensus Est. (2025E)	CAGR
Revenue ($bn)	$21.5	$53.4	20%	$53.7	20%	$53.0	20%
Customers (mn)	377	750	15%	684	13%	725	14%
Rev per customer (EOP)	$57	$71	5%	$79	7%	$73	5%
TPV ($bn)	$936	$2,811	25%	$2,879	25%	$2,884	25%
TPV per customer	$2,483	$3,748	9%	$4,212	11%	$3,977	10%
Total Take rate	**2.29%**	**1.90%**	**-4%**	**1.87%**	**-4%**	**1.84%**	**-4%**

Source: Bloomberg, Company data, Autonomous Estimates

eBay creating short term noise

Volumes transitioning off PayPal to eBay's managed payments offering is impacting PayPal's revenue. Management quantified the headwind to total company revenue growth in 3Q21 at ~8.5ppts, or ~$465mn, with less of a headwind expected in 4Q21 (~6ppts to total company revenue growth).

As shown in the math below, we expect eBay's revenue to decline in the 60-70% YoY range in each of the next two quarters. Management also said that it expects eBay volume to approach 2.5% of PayPal's TPV by year end. We assume eBay might make up ~2.7% of PayPal TPV in 4Q21, as "approach by year end" seems like eBay volume might be ~2.5% of PYPL TPV on December 31st. Our analysis suggests that the eBay business might generate a pro-forma take rate of ~2.3-2.5% for PayPal.

Table 20: We estimate the eBay business will have a take rate of 2.3-2.5% in 3Q21 and 4Q21

eBay analysis ($mn unless noted)	1Q21	2Q21	3Q21E	4Q21E	2021E
Base year revenue for PYPL (total company)	4,618	5,261	5,459	6,116	21,454
eBay headwind to revenue growth (ppts)			8.5%	6.0%	
Decline in eBay revenue YoY	**(75)**	**(425)**	**(464)**	**(367)**	**(1,331)**
eBay base year revenue	645	840	694	606	2,785
eBay current year revenue	**570**	**416**	**230**	**239**	**1,455**
% decline	*-12%*	*-51%*	*-67%*	*-61%*	*-48%*
eBay (% of TPV)	5.5%	4.2%	3.2%	2.7%	3.8%
eBay (TPV)	**15,700**	**12,913**	**10,012**	**9,668**	**48,293**
Implied Take Rate	**3.63%**	**3.22%**	**2.30%**	**2.48%**	**3.01%**

Source: Company data, Autonomous estimates

It should be noted that we estimate eBay's revenue to decline $1.33bn for full year 2021, which is below the $1.4bn impact that management put in its 2Q21 earnings presentation.

The implied take rate on eBay volume is sensitive to two assumptions: 1) eBay revenue in the base year, which is driven by the take rate assumed on eBay volume in 4Q20 (we assume a 3.7% eBay take rate in 4Q20) and 2) eBay's % of PYPL TPV in 4Q21 (we assume ~2.7%). As shown in the table below, we believe the pro-forma take rate for eBay could range from 2.1-2.8% range depending on the assumptions made.

We assume a take rate range of 3.2-4.1% on eBay volume in 4Q20, as management disclosed that eBay had a blended take rate of 3.22% in 2Q21 and 4.1% in 2Q20. In our model, we forecast a 2.4% take rate on eBay volume for 2022E.

Table 21: The take rate on the eBay business could be in the 2.1-2.8% range in 4Q21 (assumes various takes rates on 4Q20 eBay volume and different levels of eBay volume in 4Q21)

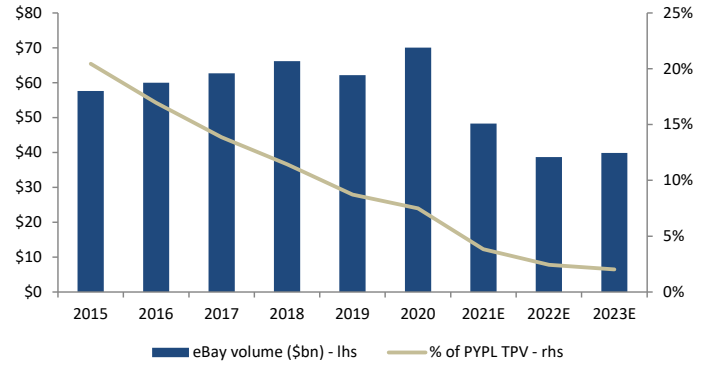
Table shows implied eBay take rate (eBay revenue divided by eBay volume)

		eBay (% of TPV in 4Q21) & eBay TPV ($bn)					
		$8.7	$9.1	$9.4	$9.8	$10.1	$10.5
		2.5%	2.6%	2.7%	2.8%	2.9%	3.0%
4Q20 Take Rate for eBay	3.20%	1.81%	1.74%	1.67%	1.61%	1.56%	1.51%
	3.35%	2.09%	2.01%	1.93%	1.87%	1.80%	1.74%
	3.50%	2.37%	**2.28%**	**2.20%**	**2.12%**	2.04%	1.98%
	3.65%	2.65%	**2.55%**	**2.46%**	**2.37%**	2.29%	2.21%
	3.80%	2.94%	**2.82%**	**2.72%**	**2.62%**	2.53%	2.45%
	3.95%	3.22%	3.09%	2.98%	2.87%	2.77%	2.68%
	4.10%	3.50%	3.37%	3.24%	3.12%	3.02%	2.92%

Source: Company data, Autonomous estimates

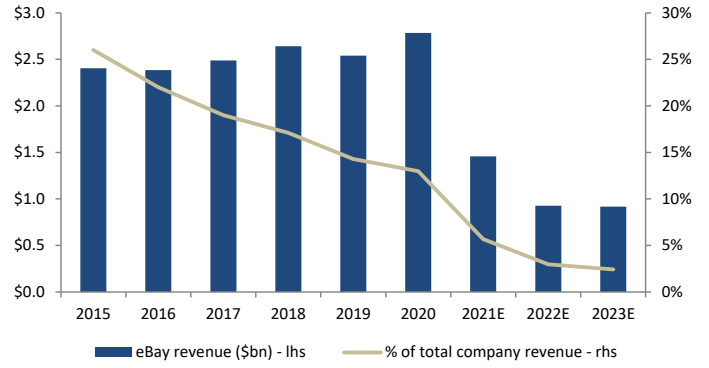
As shown in the chart below, we expect eBay volume to decline to ~2% in 2022, down from 20% in 2015. We forecast eBay revenue to decline to ~$930mn in 2022E, or ~3% of PYPL's total revenue, down from ~26% in 2015.

Chart 113: eBay volume forecast to decline from ~20% of PayPal TPV in 2015 to ~2% in 2022E



Source: Company data, Autonomous estimates; Chart shows PYPL's eBay volume

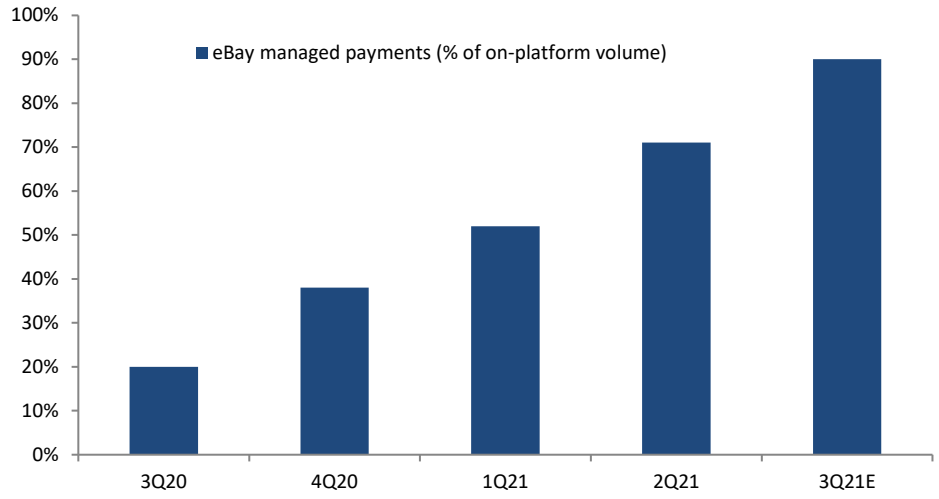
Chart 114: eBay revenue forecast to decline to ~3% of PayPal revenue (vs. ~26% of revenue in 2015)



Source: Company data, Autonomous estimates; Chart shows PYPL's eBay revenue

eBay's transition to managed payments has happened quickly over the last several quarters. PayPal has described the quicker transition as ripping off the band-aid, leading to more of an impact to its 2021 financials, but less of a headwind in 2022. As shown in the table below, eBay is expected to manage payments for ~90% of its on-platform volume in 3Q21, up from just 20% in 3Q20.

Chart 115: eBay is expected to manage payments for ~90% of its on-platform volume in 3Q21, up from just 20% in 3Q20



Source: Company data, Autonomous Research

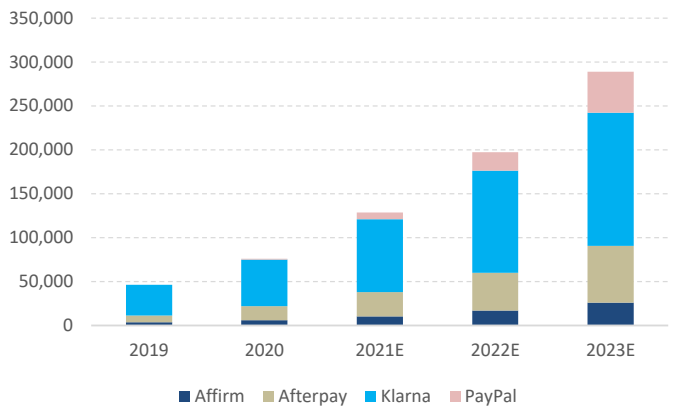
Investor Debate: How big can BNPL be for PayPal? Can it move the needle?

Since launching on the BNPL names earlier this year, our colleague Rob Wildhack has put together a number of great reports on the industry (initiation here, quantifying value proposition here, PayPal price increase here). To summarize, we expect Buy Now, Pay Later will continue to take market share given the benefits the solution provides to each side of the transaction (consumers: access to free credit, merchants: higher average order volume and cart conversion).

While there are a number of smaller players emerging in the space, we believe the Buy Now, Pay Later marketplace is turning into a 'Big 4' (Affirm, Afterpay, Klarna, PayPal) and everyone else dichotomy. The solutions being put together by the networks and incumbent banks may slow the growth of the pure plays, but regardless, we believe the runway here is robust and expect each of the BNPL 'Big 4' to continue to take share of eCommerce volume over the coming years.

Chart 116: We expect robust growth of the BNPL providers…

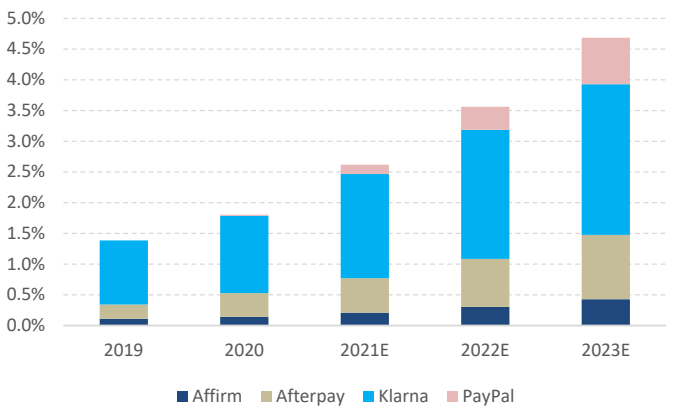
BNPL TPV in $mn



Source: Company reports, Autonomous Research estimates

Chart 117: … as they continue to take share within eCommerce goods & services volume

BNPL volume as a % of eMarketer G&S volume forecasts



Source: Company reports, eMarketer, Autonomous Research estimates

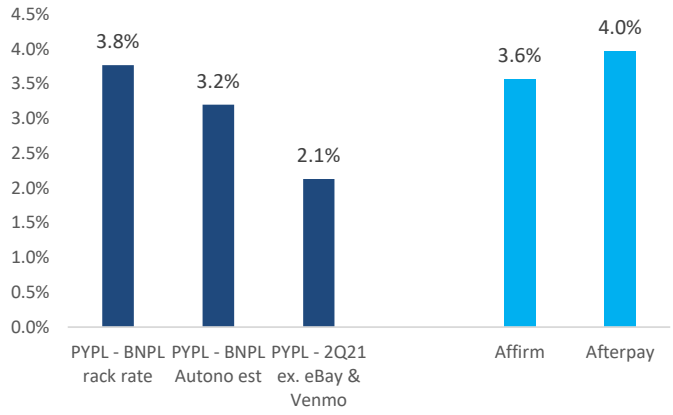
We expect PayPal will continue to build on its robust momentum and take market share moving forward at a faster pace than peers. PayPal's strong competitive positioning revolves around a combination of a lower price point for merchants (although this discount to peers has narrowed following the price change on August 2nd), a more customer friendly product (no interest payments), its massive scale (both merchants and consumers) which dwarfs competitors, and its well-established position in the marketplace as a leader in eCommerce.

Importantly, merchants that already utilize PayPal as a checkout option are able to seamlessly add their Buy Now, Pay Later offering (meaning PayPal might be able to take market share quickly). Additionally, for PayPal and the BNPL peers, it is important to be positioned on the product page rather than checkout, as the product page placement helps drive higher average order size. As Rob Wildhack highlighted in his recent report on PayPal, the firm is increasing its product page presence based on our channel checks.

When comparing the merchant discount yield or take rate for PayPal's BNPL product versus the pure play BNPL firms, we believe it is important to consider the likelihood that larger merchants will pay discounted pricing rather than the full rack rate. While PayPal's rack rate appears to be in-line with the take rates reported by Affirm and Afterpay, we believe the true take rate on the product is lower. We provide the firm-wide take rate as a way to level set the potential discounting, but all-in-all, our best guess is that the merchant discount rate PayPal charges for its 'Pay in 4' product is between 2.50-3.50%.

Chart 118: We believe PayPal's take rate is still below peers after the price increase

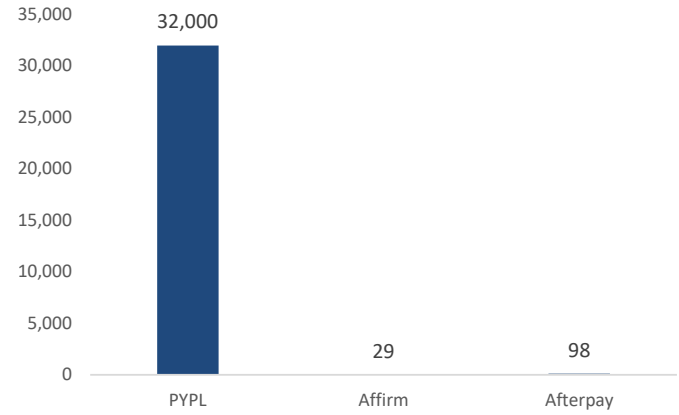
PYPL BNPL rack rates based on a $175 transaction



Source: Company reports, Autonomous Research estimates

Chart 119: PayPal could take advantage of its existing merchant base to take share in BNPL

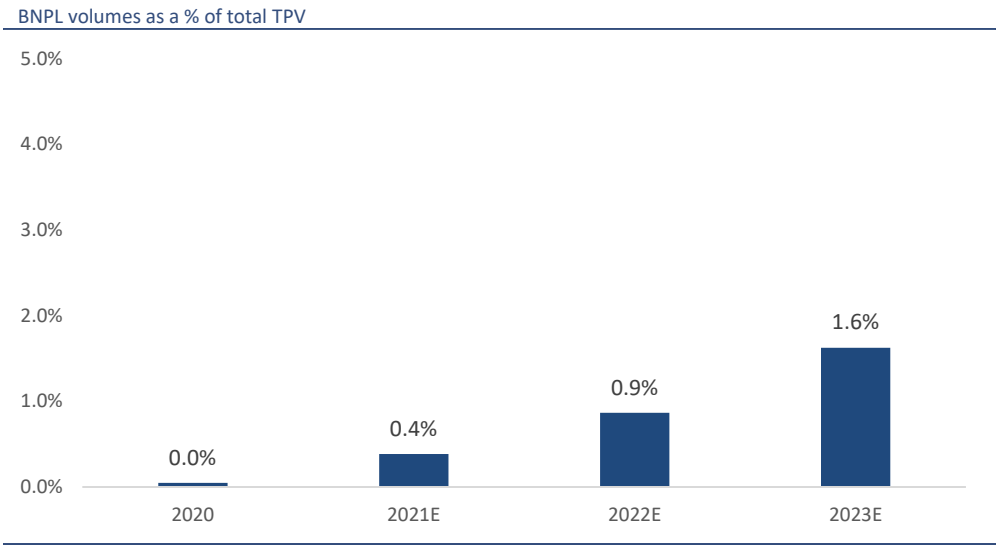
Total active merchants in thousands



Source: Company reports

Despite the robust BNPL growth we expect for the reasons provided above, it doesn't really move the needle for PayPal, as the firm is already well established in eComm and generating a significant amount of payment volume. We estimate that in 2023E BNPL can account for 1-2% of PayPal's firm wide volumes and ~3% of revenues given the higher take rate. In summary, we view PayPal's BNPL offering as a nice to have that can help the firm maintain its market share in eCommerce rather than a factor helping the firm deliver outsized volume growth versus peers.

Chart 120: We expect BNPL will make up a small portion of PayPal's total TPV even after assuming rapid growth



Source: Company reports, Autonomous Research estimates

Investor Debate: How should we think about a potential Pinterest deal?

According to a Bloomberg release, PYPL is considering acquiring Pinterest (PINS), the social media company, for a potential price of $70 per share ($45bn), which translates to 10x 2023E sales. PayPal has been making a push towards commerce (Honey acquisition in 2020) and we believe assets, such as Pinterest, would help PayPal improve the shopping experience on its 'Super App'. With the acquisition of Pinterest, PayPal could be a big part of both the top of the shopping funnel (lead generation through Pinterest) and bottom of the funnel (PayPal checkout button).

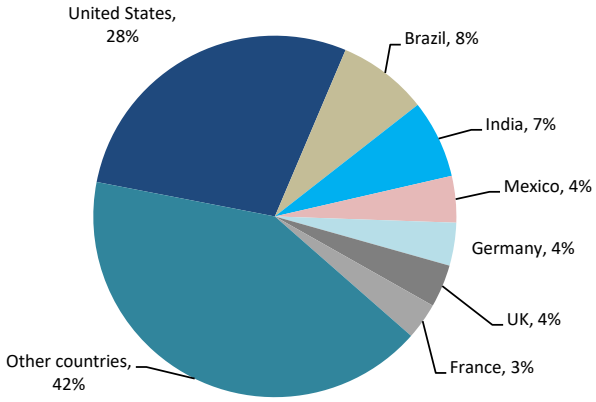
There could also be a nice monetization opportunity for PayPal as Pinterest's ARPU which is just $4 vs. PayPal's >$100 (on MAUs). Improving the ARPU would likely require increasing engagement within the app and creating new avenues of monetization (i.e. in-app purchases)

There could also be a nice monetization opportunity for PayPal as Pinterest's ARPU which is just $4 vs. PayPal's >$100 (on MAUs). Improving the ARPU would likely require increasing engagement within the app and creating new avenues of monetization (i.e. in-app purchases). The fact that the ARPU is low suggests that PayPal might face challenges converting Pinterest users into engaged users (i.e. why has Pinterest management failed to monetize its user base so far?). PayPal could also cross-sell the PIN model into its 33mn merchant customers (Pinterest makes revenue primarily from advertising) or bring advertisers on Pinterest into the PayPal ecosystem.

This deal could also be described as a user grab, giving PayPal a foot in the door in many international markets where the firm has less of a presence (i.e. India, Brazil, and Mexico). Pinterest reported ~450mn monthly active users (MAUs) in 2Q21, 80% of which are outside of the US. It should be noted that there is likely overlap between PayPal's and Pinterest's user bases, which could limit the cross sell opportunity.

MAU data from Apptopia suggest that Pinterest's primary non-US countries for active users include Brazil, India, Mexico, Germany, United Kingdom and France. The remaining active users are split across many countries, with each country accounting for less than 3% of the total active user base.

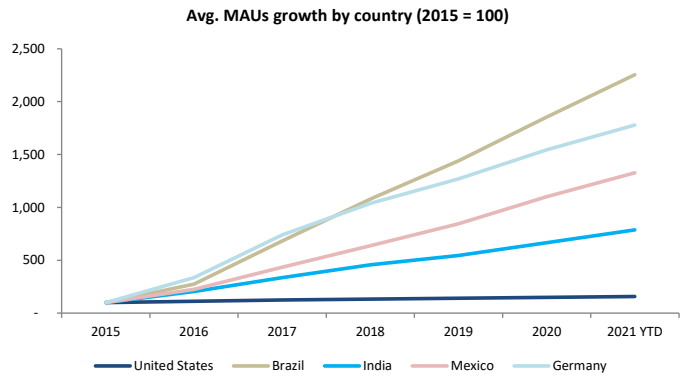
Chart 121: Based on Apptopia data, Pinterest has a sizeable user base in Brazil, India, and Mexico



Source: Apptopia, Autonomous Research

Chart 122: Average Pinterest MAU growth by country

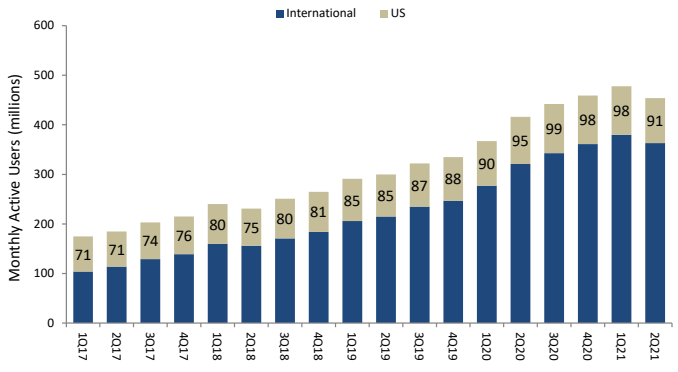
(2015 = 100)



Source: Apptopia, Autonomous Research

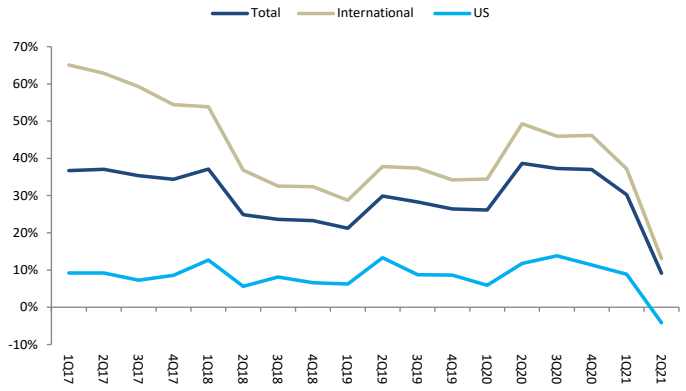
Both the company's reported MAUs and Apptopia data show that active user growth is decelerating. In fact, in 2Q21 MAUs declined -5% QoQ, which Pinterest management attributed to economies re-opening and users spending more time *doing* activates rather than looking up cooking recipes or DIY home repairs. To be fair however, over time, Pinterest has been able to rapidly increase its non-US active user base in countries such as Brazil, India, and Mexico, which could be a big benefit for PayPal as it has talked about scaling in these markets.

Chart 123: Pinterest's MAUs have increase from ~200mn in 2017 to ~450mn today…



Source: Company data, Autonomous Research

Chart 124: …but YoY user growth has slowed in recent quarters



Source: Company data, Autonomous Research

The $40bn+ transaction would equate to ~15% of PayPal's market cap, making it the largest deal in PayPal's history (and would likely require funding beyond cash on hand). PayPal has had a mixed M&A track record, and there are plenty of initiatives on PayPal's plate including Venmo monetization, international expansion, increasing engagement, and in-store usage for the management team to focus on.

A potential deal also raises into question how much PayPal might lean on acquisitions to hit its net actives target of 750mn by 2025. Our understanding was that the 750mn net actives target was mostly an organic number. We have already seen signs of net adds slowing (last quarter's reported results, Apptopia data on 3Q), so investors might view acquiring users as a way to offset negatives in the core business.

The FT ran a story earlier this year (click here) about Microsoft approaching Pinterest to acquire the social media company for $50bn+ ($80 per share).

Pinterest accretion

We've put together an accretion model for PayPal's potential acquisition of Pinterest (please reach out if you would like the excel). This is a simple illustration of what accretion could be and not a formal model.

As shown in the table below, we estimate +4% accretion to 2023E adjusted EPS. There is slight dilution on a GAAP basis (-0.3%) because a larger portion of Pinterest's adjusted net income comes from stock-based compensation, which PayPal would presumably keep add back in its adjustments to calculate adjusted EPS. For perspective, PayPal's stock-based compensation is expected to be ~12% of gross profit in 2023E versus Pinterest at ~20%.

The accretion model is sensitive to assumptions around PayPal's ability to increase Pinterest's ARPU. We believe management would not be interested in the deal if they did not have a sound plan in place to improve monetization. We think that enabling an increase in in-app purchases (using a checkout button powered by PayPal) could be low-hanging fruit. As such, in the analysis below, we assume Pinterest's ARPU increases by ~50% in 2023 (it's tough for us to model a higher level given the slow ramp historically in Venmo's ARPU). We also assume the incremental margin on revenue growth would be above Pinterest's current margin.

Table 22: Our preliminary estimates suggest mild accretion in 2023 assuming revenue synergies

On 2023E

In millions except per share data	PayPal	Pinterest	Adjustments/ Synergies	Combined
Transaction Revenues	35,439			35,439
Other value-added services	2,542	4,813		7,355
Total net revenues	**37,980**	**4,813**	**2,407**	**45,200**
Cost of sales	18,519	1,011	457	19,988
Gross Profit	**19,461**	**3,802**	**1,949**	**25,213**
Gross Margin %	***51%***	***79%***	***81%***	***56%***
Operating Expenses	12,020	3,239	1,547	16,807
As % of revs	***62%***	***67%***	***64%***	***37%***
GAAP EBIT	7,441	563	402	8,406
EBIT %	***20%***	***12%***	***17%***	***19%***
D&A	1,544	52	0	1,596
GAAP EBITDA	8,985	615	402	**10,002**
Other Income/(Interest expense)	-	44	-221	(177)
Pre-tax Income	**7,441**	**607**	**181**	**8,229**
Pre-tax Margin %	20%	13%		18%
Income Tax Expense	1,190	121		1,342
Tax rate (%)	16%	20%		16%
Net Income	**6,250**	**486**		**6,888**
Adjustments	2,390	747		3,017
Non-GAAP Net Income	**8,640**	**1,233**		**9,905**
Non-GAAP Net Income Margin %	23%	26%		22%
Diluted Shares out	1,181	711	124	1,305
Diluted Non-GAAP EPS	**$7.32**	**$1.73**		**$7.59**
Accretion				***3.7%***
GAAP EPS	$5.29	$0.68		$5.28
Accretion				-0.3%

Source: Company data, Autonomous Estimates, Bernstein Estimates; Accretion model assumes a $45bn total transaction value, 65% (or $29bn) funded with stock, $6bn funded with cash on hand, and $9bn in additional debt at an interest rate of 2.3%; Assumes synergies equal to 50% of Pinterest's revenue.

Valuation

Price targets and ratings – Outperform on Visa and Mastercard, Neutral on PayPal

As shown in Chart 128 below, we believe the current multiples for the network are justified on a growth adjusted basis. The stocks trade at 31x and 34x NTM EPS, respectively. While we believe their multiples could expand if they beat earnings expectations (likely due to outperformance in cross border), we take a slightly more conservative stance and assign target multiples of 30x and 33x to our 2023 EPS estimates for Visa and Mastercard (one turn discounts to NTM multiples), respectively, leading to price targets of $280 and $452. We'd note that the network multiples have already derated in recent months, making additional derating less likely, in our opinion. We rate Visa and Mastercard as Outperform.

For PayPal, we apply a target multiple of 38x to our 2023 EPS estimate, leading to a $278 price target. PYPL's target multiple is ~120% of the networks' target multiple average, in line with the premium over the last three years. We see less upside in PayPal and assign a Neutral rating.

Table 23: Summary of Price Targets and Ratings

	V	MA	PYPL	PYPL vs. Networks Avg.
EPS (CY23)	$9.32	$13.71	$7.32	
Target Multiple	30x	33x	38x	121%
Target Price	**$280**	**$452**	**$278**	
Current Price	$231	$359	$240	
Upside/Downside %	21%	26%	16%	
Rating	Outperform	Outperform	Neutral	

Source: Bloomberg, Company Filings, Autonomous Research Estimates

The following table summarizes our estimates for V, MA and PYPL versus consensus. Our revenue and EPS estimates for V and MA are above consensus. In the next few years, we expect V and MA to benefit from a rebound in cross-border revenue, driven by a rebound in cross-border travel and continued strength in cross border ecom. For Visa, we estimate revenue will grow at a ~18% CAGR between FY21 to FY23 (vs. consensus at ~17% CAGR), while for Mastercard, we estimate revenues will grow at a ~20% CAGR in the same period (vs. consensus at ~18% CAGR). For Visa, our adjusted EPS estimates stand at $5.89 in FY21E, $7.45 in FY22E and $8.93 in FY23E. For Mastercard, we forecast adjusted EPS of $8.20 in FY21E, $10.94 in FY22E and $13.71 in FY23E.

Our estimates for PYPL are slightly below consensus, as we think there is more priced into expectations. Our analysis suggests that PayPal's has penetrated a lot of its core markets from a net actives perspective, and it'll need to gain traction in more developing economies. We see slightly faster take rate compression compared to consensus over the next two years, with less compression relative to consensus in 2024/2025. We estimate PYPL's revenues to grow at 21.6% CAGR between FY21 and FY23 (vs. consensus at ~21.8% CAGR), and our adjusted EPS estimates stand at $4.71 in FY21E, $5.78 in FY22E and $7.32 in FY23E.

Table 24: Estimates vs. Consensus for V, MA and PYPL

		FY21E	FY22E	FY23E	CAGR
	Revenues				
V	**Autono Est.**	**24,163**	**29,538**	**33,871**	**18.4%**
	Consensus	24,049	28,830	32,839	16.9%
	Above/below %	0.5%	2.5%	3.1%	
MA	**Autono Est.**	**18,879**	**23,254**	**27,238**	**20.1%**
	Consensus	18,851	22,644	26,208	17.9%
	Above/below %	0.1%	2.7%	4.0%	
PYPL	**Autono Est.**	**25,666**	**31,378**	**37,980**	**21.6%**
	Consensus	25,762	31,689	38,205	21.8%
	Above/below %	-0.4%	-0.9%	-0.4%	
	Adjusted EPS				
V	**Autono Est.**	**5.89**	**7.45**	**8.93**	**23.2%**
	Consensus	5.82	7.24	8.62	21.8%
	Above/below %	1.2%	3.1%	3.6%	
MA	**Autono Est.**	**8.20**	**10.94**	**13.71**	**29.3%**
	Consensus	8.13	10.62	13.05	26.7%
	Above/below %	0.9%	3.0%	5.1%	
PYPL	**Autono Est.**	**4.71**	**5.78**	**7.32**	**24.6%**
	Consensus	4.71	5.91	7.40	25.3%
	Above/below %	0.0%	-2.2%	-1.1%	

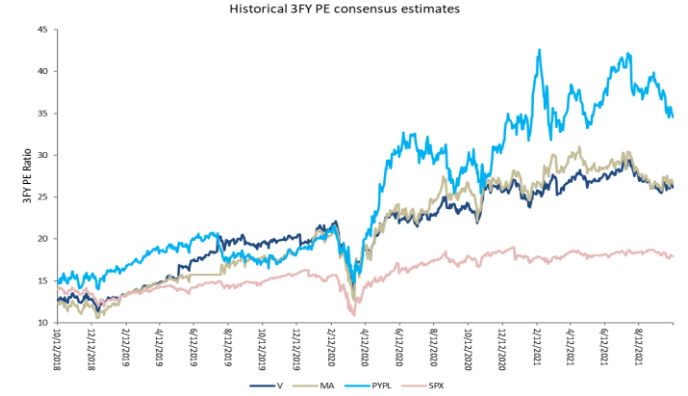
Source: Bloomberg, Company filings, Autonomous Research Estimates

Historical valuations

Over the last three years, V, MA and PYPL have traded above the S&P 500 on a P/E basis. As shown in the following chart, since March 2020, the P/E multiple gap on a 3FY basis (uses rolling EPS estimates 3 fiscal years forward) between V, MA and PYPL and the S&P 500 has widened. Relative to the S&P 500, V and MA have traded at an average ~130% for the last 3 years, while PYPL has traded at an average ~157% during the same period.

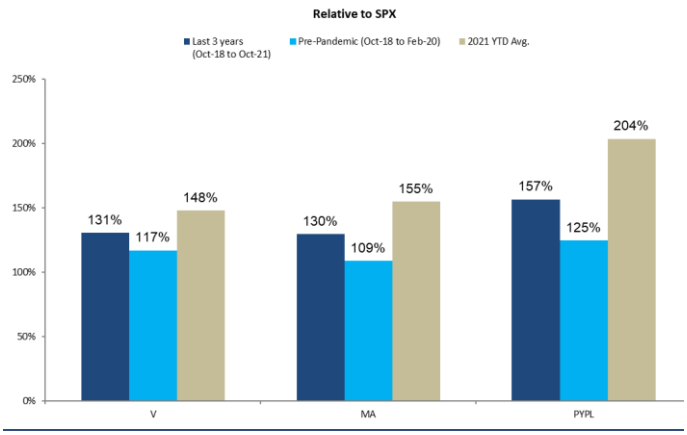
Breaking down the time series by pre-pandemic (October 2018 to February 2020) vs. 2021 to date, suggests that the 3FY P/E gap relative to the S&P 500 has widened significantly, and that V and MA are trading at an average of 148% and 155% YTD, respectively, versus 117% and 109% pre-pandemic. Considering the high-quality nature of these business (including high growth while being capital light) and the fact that they should hold up better in an inflationary environment warrants a premium multiple versus the S&P 500, in our view.

Chart 125: Over the last 3 years, V, MA and PYPL have traded above the S&P 500



Source: Bloomberg, Autonomous Research

Chart 126: 3FY P/E ratios relative to S&P500



Source: Bloomberg, Autonomous Estimates

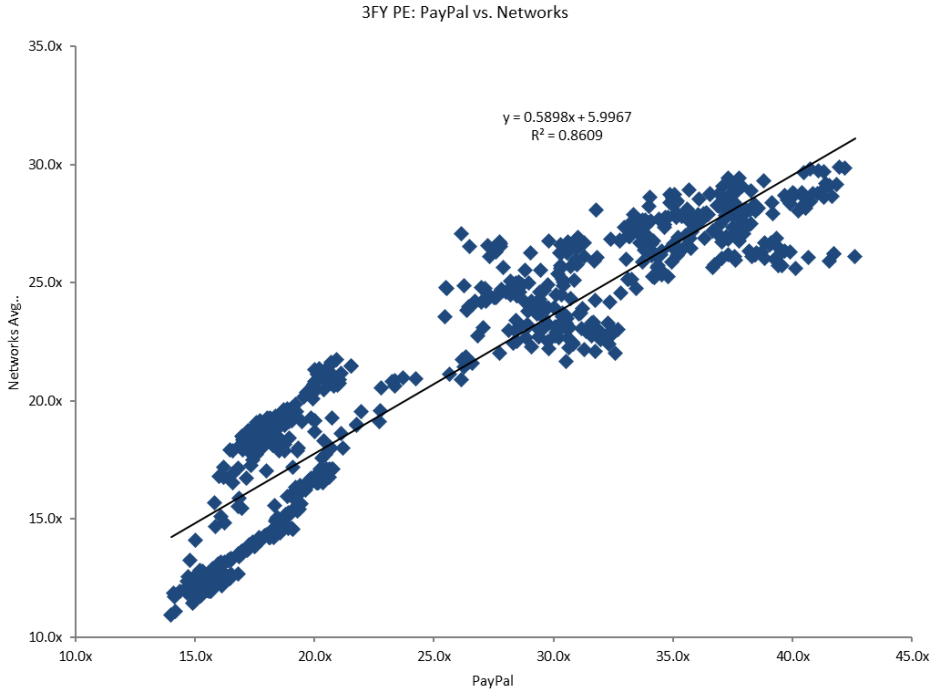
The following table summarizes consensus estimates of 3FY PE ratios for V, MA and PYPL on an absolute basis and relative to the S&P 500, as well as PYPL relative to the networks (average between V and MA). YTD 2021, PYPL traded ~135% above the networks.

Table 25: Consensus estimates of 3FY P/E ratios for V, MA and PYPL relative to the S&P 500

3FY PE Average	Last 3 years (Oct-18 to Oct-21)	Pre-Pandemic (Oct-18 to Feb-20)	Mar-20 to Dec-20	2021 YTD Avg.	3FY PE (Latest Date)
Absolute P/E:					
V	21.1x	17.0x	22.5x	26.8x	26.7
MA	21.0x	15.7x	23.2x	28.1x	27.3
PYPL	25.5x	17.9x	27.4x	36.9x	33.0
SPX	15.9x	14.4x	16.5x	18.1x	18.7
Relative to SPX:					
V	131%	117%	142%	148%	143%
MA	130%	109%	147%	155%	146%
PYPL	157%	125%	184%	204%	177%
PYPL vs. Networks	120%	112%	127%	135%	122%

Source: Bloomberg, Autonomous Research

Chart 127: Consensus estimates of 3FY P/E ratios for PayPal relative to Networks (average of V and MA)



Source: Bloomberg, Autonomous Research

Adjusting for Stock-based compensation, PYPL's gap relative to the networks is even higher

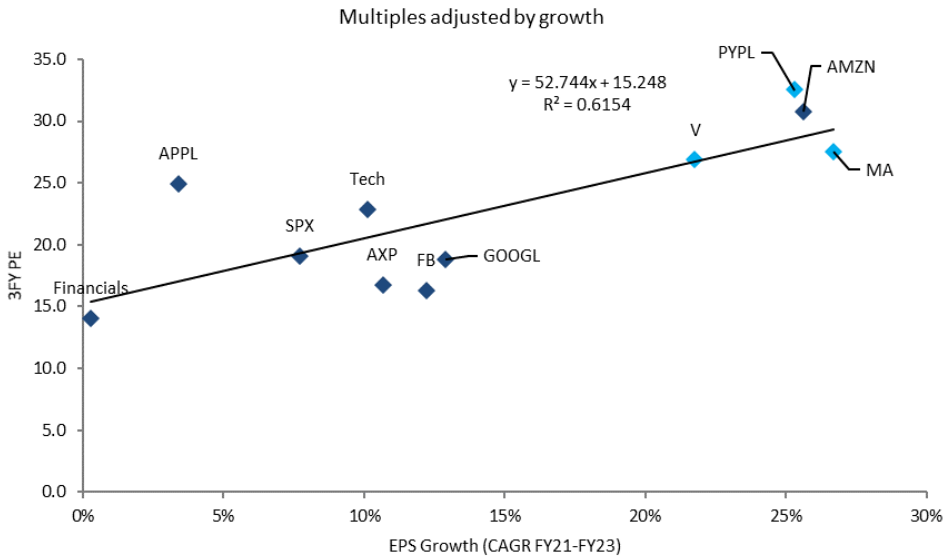
As shown in the following table, treating Stock-based compensation (SBC) as a real expense for PYPL, results in a larger gap relative to the networks average.

Table 26: Treating SBC as a real expense for PYPL results in a larger PE gap relative to the networks average

P/E (forward 3-year estimate)	Visa	Mastercard	PayPal	PayPal vs. Networks
Adjusted EPS (BBRG)	26.1	26.6	34.5	131%
Adjusted EPS w/ SBC as an expense	26.1	26.6	45.0	171%

Source: Company filings, Bloomberg, Autonomous Research

Chart 128: Mastercard screens attractive adjusted for growth, while PYPL screens more expensive



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