Adyen: The "Navy SEAL" Team of Payments

Adyen means "start over again". In 2006, a group of entrepreneurs, including Pieter van der Does and Arnout Schuijff, founded Adyen. The name "Adyen" was chosen because the same group founded Bibit, a payment company, and after selling the company to Royal Bank of Scotland (RBS), they decided to start another payments company. Why? Pieter explains in this podcast,

"Our idea was to build in-house something that connects directly to the endpoint of payment and does not make a patchwork of systems. We believed that if you could make this product of the highest quality possible, then you'd be able to sell it to the best companies in the market. So we had a very unusual market entry strategy and a very ambitious plan - we know this market, we're going to build something that outperforms and we directly target the high-end."

After bootstrapping the company for almost five years, Adyen's founders raised their first VC round in 2011. Adyen also broke even in the same year, so it wasn't like they were under any pressure which is perhaps the perfect time to raise money. As internet companies were in the gold rush to expand globally in the last decade and half, Adyen was ready to provide them the shovels of payments which can be incredibly complex even though it may appear relatively simple for the end consumer. The complexity of payments helped Adyen's team as they had been involved with payments since the '90s and had very clear ideas and vision of what the internet scaled companies really need. One of their early backers labelled the founding team the "Navy Seal team of payments".

While Adyen does not receive nowhere close to the adulation Silicon Valley's darling Stripe gets from the press, this Netherlands based company processed €516 Bn of payments throughout the world last year, a whopping €212 Bn more than how much they processed in 2020.

Over the last month, I spoke with a couple of Adyen shareholders and interacted with several pseudonymous twitter accounts. I appreciate their help very much. Here's the outline for this month's deep dive:

Section 1 Adyen's place in the payments complex

Let me first start with some basics of the payment value chain. Even for many seasoned investors, the whole payment value chain can seem quite complicated. Therefore, while I may not be able to elucidate every little detail of the value chain in this deep dive, I want to provide a basic framework of how payments work.

As shown below, in any payment transaction, there are quite a few parties involved: merchants, card networks, merchant acquirers, card issuers, and issuer processors (read the description of these parties if you are not quite familiar).

Merchant	Network	Merchant Acquirer		Card Issuer	Issuer Processor
		Front-end processor	Back-end (acquirer processor)		
Accepts payments from consumers and pays the merchant discount rate (MDR) to the merchant acquirer	Acts as the hub for card payment transactions, relaying authorization and settlement messages between issuing and acquiring banks (earning fees from both in the process)	Signs up individual merchants, underwrites a merchant account for them at the underlying acquiring bank, and enables merchants to accept card payments; captures card/transaction data, routes the message to appropriate network for authorization (in real-time); earns the majority of the acquiring spread[1]	Handles settlement and clearing messages received from the card network, and deposits funds net of fees into the merchant's account; receives fixed fee per transaction, a minority portion of the acquiring spread[1]; chargebacks come to the merchant via the back-end processor	Provides consumers and businesses with bank accounts, credit extension, and cards; earns interchange on card transactions, the largest portion of the MDR. Interchange rates are set by V/MA	Sits in front of the issuing bank to receive authorization request messages from the card network, and relays decision back to the card network (in real time); then, clears and settles transaction for the issuing bank; earns account and transaction fees, outside of the MDR (indirectly funded by the issuers' portion)
Target, Home Depot, McDonald's, Lululemon, Reebok, Safeway, WaWa	Visa & Mastercard (open-loop); American Express & Discover (closed-loop); STAR, Accel, NYCE, Pulse, Interlink, Jeannie (PIN debit)	FIS (Worldpay), Global Payments & TSYS, Adyen, Chase Paymentech, Fiserv (First Data), Repay – all technically operate as ISOs in the US, sponsored by an acquiring bank		Chase, Barclaycard, Bank of America, Wells Fargo, US Bank, Capital One, Citi, Synchrony Financial	TSYS, FIS, Fiserv (First Data), Marqeta, Galileo, i2c, or in-house for larger banks (TSYS is the share leader among banks that outsource)
		Square, PayPal, Stripe	Acquiring banks (BIN sponsor): Wells Fargo, BMO Harris, BBVA USA, MetaBank, etc.		

Source: Credit Suisse Payments Primer (2020)

Let's start with how a $100 transaction at Target (i.e. the merchant) would work. While it may seem you just pull your credit/debit card out of your pocket at Point of Sale (PoS) and in a few seconds your payment is deemed successful, there is a dizzying amount of work being done in the background in the meantime.

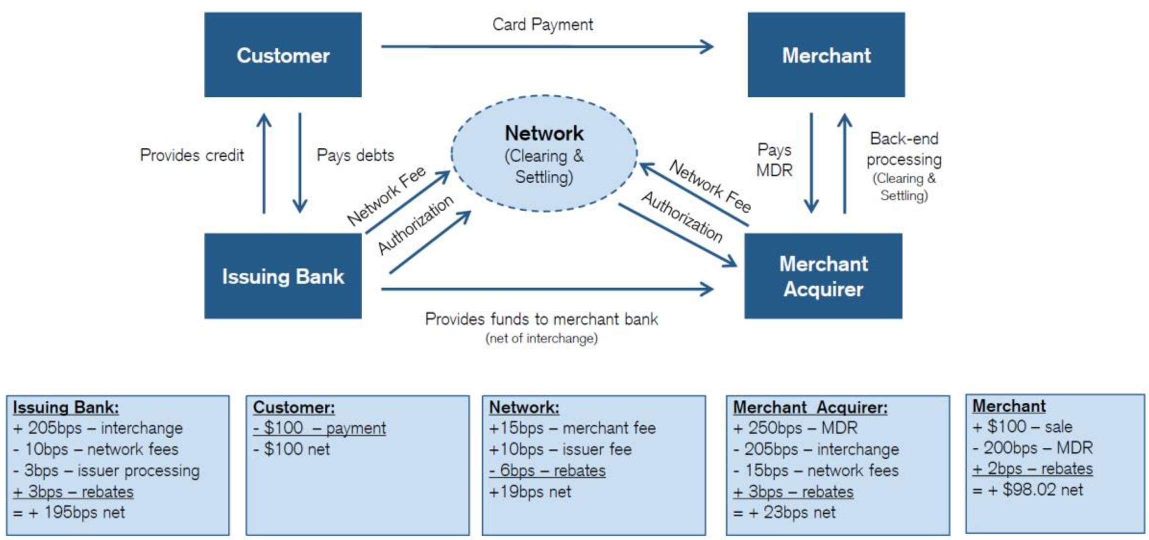
Once you insert the credit card into the Target's PoS, your card credentials and transaction data are captured, and then the merchant acquirer such as Adyen sends the data to the card networks (Visa/Mastercard) who subsequently queries the customer's issuing bank for authorization (fund availability, fraud checks, risk analysis etc. are also done here). Once green lighted by the issuing bank, the authorization flows through the card networks to the merchant acquirer (e.g. Adyen), and the merchant (the retailer) receives confirmation from its merchant acquirer that the transaction is authorized, and then the sale is completed. This is called the authorization phase. Then the settlement phase starts.

To start the payment process, the credit card issuing bank provides credit on behalf of the customer to settle the transaction which is routed through the card networks who then passes the transaction to merchant acquirer's back-end processor for settlement. The back-end merchant processor then settles the net outstanding balance between the card-issuing bank and the merchant acquiring bank (where the merchant has its merchant account). The merchant bank will then credit the merchant's account for the amount of the purchase, less *fees charged* (i.e. Merchant Discount Rate or MDR) for facilitating the transaction across multiple parties.

These fees can be segmented in three ways: a) interchange fees which can range from ~150-300 bps paid to the issuing bank, b) acquiring spread which can vary from 10-100 bps paid to the merchant acquirer such as Adyen. If front-end processor is separate from back-end, front-end processor gets the majority of this spread, and c) network fees of 15-20 bps goes to Visa/Mastercard (net of rebates and incentives).

When the customer receives the credit card statement, he/she either pays the bill in full amount or can choose to pay interest on unpaid balance. The issuing bank receives the interest in that case.

For the more visually inclined, you can see the following diagram to understand the flow of information in the payment value chain (the diagram shows a transaction in PoS terminal):



Source: Credit Suisse Payments Primer (2020)

Adyen's gross revenue is segmented in four categories: settlement fees, processing fees, sales of goods, and other services. Settlement fees is more than 90% of gross revenue (and ~56% net revenue); while processing fees is ~5% of gross revenue, it is ~29% net revenue.

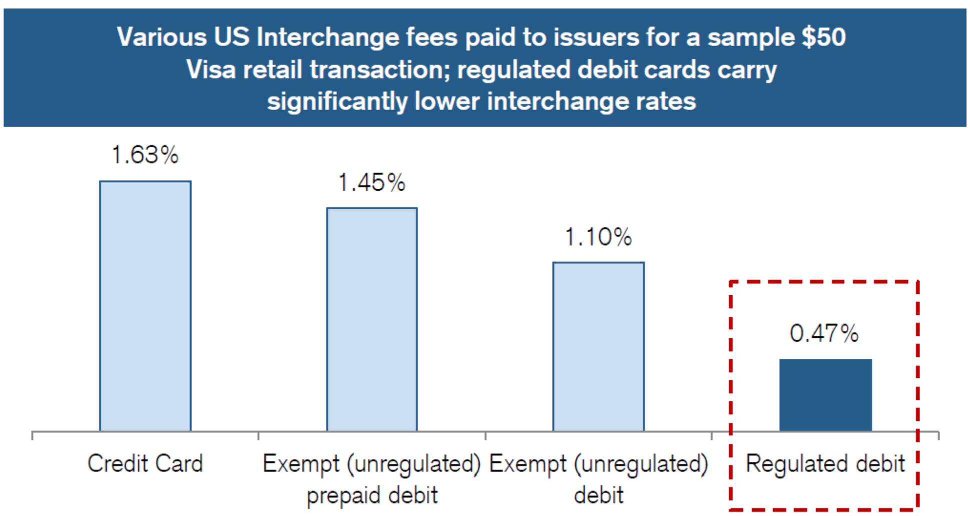
For the settlement fees, Adyen follows a "interchange plus" pricing. Adyen has a transparent pricing model and charges fees to merchants based on its own incurred costs plus a mark-up for its acquiring services, as agreed between each merchant and Adyen. On an average, Adyen's take rate is ~10% of the settlement fees. Acquiring spread or mark-up is inversely related to merchant size since higher volumes gives larger merchants greater negotiating leverage. As we will discuss later, Adyen primarily focuses on enterprise customers who are generally considered large merchants.

Since Adyen follows interchange plus pricing for its acquiring services, its net revenue margin (net revenue/gross revenue) may wildly differ in different geographies. For example, in North America, Adyen's net revenue margin has been ~8-10% in the last five years whereas in all other regions around the world, it hovered around ~25-30%. The difference can be almost entirely explained by different regulations around interchange fees in the US vs other regions in the world.

	2017A	2018A	2019A	2020A	2021A
As % of gross revenue					
EMEA	25.6%	24.6%	24.1%	26.1%	25.5%
North America	9.0%	10.5%	10.0%	8.8%	8.0%
Asia-Pacific	22.3%	25.5%	24.4%	24.6%	22.0%
Latin America	31.2%	30.9%	26.9%	26.0%	24.3%
RoW	20.9%	29.0%	36.2%		
Net revenue	**218**	**349**	**534**	**684**	**1,002**
As % of Payment Volume	*0.20%*	*0.22%*	*0.22%*	*0.23%*	*0.19%*
As % of Gross revenue	*21.6%*	*21.1%*	*20.1%*	*18.8%*	*16.7%*

Note: Adyen used to segment geographical breakdown in five regions, but changed to four regions in 2020

While in Europe interchange fees are capped at ~20 bps for debit and ~30 bps for credit, the range is much wider (~20-110 bps) in the US because of Durbin Amendment (Dodd-Frank Act of 2010). If the issuing bank has greater than $10 Bn assets, interchange is capped at 21 cents+5 bps of transaction value. However, there is no such cap for issuing banks with less than $10 Bn assets which is why we see the fintech and neobanks partner with such banks to launch debit cards. Since interchange fees are the cost Adyen pays to the issuing bank and keeps the spread, revenue after interchange fees or net revenues is essentially Adyen's "topline" and gross revenue is lot less meaningful number to look at.



	e-Commerce	Retail			
Visa US interchange (US Retail category)	**Credit Card**	**Credit card**	**Exempt (unregulated) prepaid debit**	**Exempt (unregulated) debit**	**Regulated debit**
Illustrative Transaction Size	$50	$50	$50	$50	$50
+ Cents per Transaction	0.10	0.10	0.15	0.15	0.21
x % of volume	1.95%	1.43%	1.15%	0.80%	0.05%
= Total Interchange ($)	$1.08	$0.82	$0.73	$0.55	$0.24
Total interchange (%)	**2.15%**	**1.63%**	**1.45%**	**1.10%**	**0.47%**

Source: Credit Suisse Payments Primer (2020)

Because of higher interchange rates in the US, North America has greater contribution to Adyen's gross revenue mix, but Adyen generated 60% net revenue from Europe and 23% from North America in 2021.

	2017A	2018A	2019A	2020A	2021A
Gross Revenue Mix					
EMEA	59%	56%	54%	45%	39%
North America	26%	29%	30%	42%	48%
Asia-Pacific	7%	8%	8%	7%	7%
Latin America	8%	7%	8%	6%	5%
RoW	1%	0%	0%	0%	0%
Net revenue Mix					
EMEA	70%	66%	65%	62%	60%
North America	11%	14%	15%	19%	23%
Asia-Pacific	7%	10%	9%	9%	10%
Latin America	11%	10%	10%	9%	7%
RoW	1%	0%	0%	0%	0%

Note: Adyen used to segment geographical breakdown in five regions, but changed to four regions in 2020

For processing fees, merchants pay a fixed fee per transaction (not based on transaction value). The higher the number of transactions, the more money Adyen makes in processing fees. Adyen processed 15.8 Bn transactions last year.

Adyen also has a POS terminal product which is recorded in the "Sales of Goods" segment. This is mostly sold at cost; therefore its contribution to net revenue is almost zero.

Finally, Adyen has "other services" such as foreign exchange service fees, third party commission, issuing services, risk, and fraud analytics etc. These value-added services to merchants allow Adyen to expand its take rates.

Amount in EUR Mn, except %	**2017A**	**2018A**	**2019A**	**2020A**	**2021A**
Gross Revenue	**1,012**	**1,653**	**2,657**	**3,641**	**5,995**
As % of payment volume	*0.93%*	*1.04%*	*1.11%*	*1.20%*	*1.16%*
Segments					
Settlement fees	872	1,444	2,373	3,294	5,525
As % of Payment Volume	*0.80%*	*0.91%*	*0.99%*	*1.08%*	*1.07%*
Processing fees	93	133	176	217	290
# of transactions (Bn)	3.7	5.5	8.3	11.1	15.8
Growth		*48.6%*	*50.9%*	*33.7%*	*42.3%*
Processing fees/transaction	0.025	0.024	0.021	0.020	0.018
Sales of goods	11	11	15	19	33
Growth		*1.9%*	*36.3%*	*32.1%*	*70.7%*
Other services	36	65	93	111	147
Growth		*81.0%*	*43.0%*	*19.2%*	*32.5%*
Total Payment Volume (TPV)	**108,400**	**159,000**	**239,600**	**303,600**	**516,000**
Growth		*46.7%*	*50.7%*	*26.7%*	*70.0%*
Costs incurred from financial institutions	**782**	**1,295**	**2,106**	**2,935**	**4,961**
As % of Settlement fees	*89.6%*	*89.7%*	*88.8%*	*89.1%*	*89.8%*
Costs of inventory	**13**	**9**	**17**	**22**	**33**
As % of Sales of Goods	*120.0%*	*84.0%*	*112.9%*	*113.7%*	*99.7%*
Net revenue	**218**	**349**	**534**	**684**	**1,002**
As % of Payment Volume	*0.20%*	*0.22%*	*0.22%*	*0.23%*	*0.19%*
As % of Gross revenue	*21.6%*	*21.1%*	*20.1%*	*18.8%*	*16.7%*
Growth		*59.8%*	*53.1%*	*28.1%*	*46.4%*
Net revenue mix					
Settlement fees	42%	43%	50%	52%	56%
Processing	43%	38%	33%	32%	29%
Sales of Goods	-1%	0%	0%	0%	0%
Other services	17%	19%	17%	16%	15%

Since we now have an idea on where Adyen sits in the broader payment value chain and how it makes money, let me explain Adyen's value proposition as well as its Total Addressable Market (TAM).

Section 2 Adyen's value proposition and TAM

After founding Adyen in 2006, Pieter and his co-founders had to deal with the chicken and egg problem in payments. In order to be relevant player for any Payments Service Provider (PSP) in the market, you need payment volume, but since a startup by definition doesn't get to process a high volume of payments, it is very difficult to be relevant in the early years. It took Adyen five years before they finally got their first sizable merchant: Groupon. Then many other US based companies started using Adyen to process their international payments. The US market, however, was difficult to crack even though Adyen tried to make a mark in this market from the very beginning; it took Adyen more than 10 years to become a major domestic player in the US.

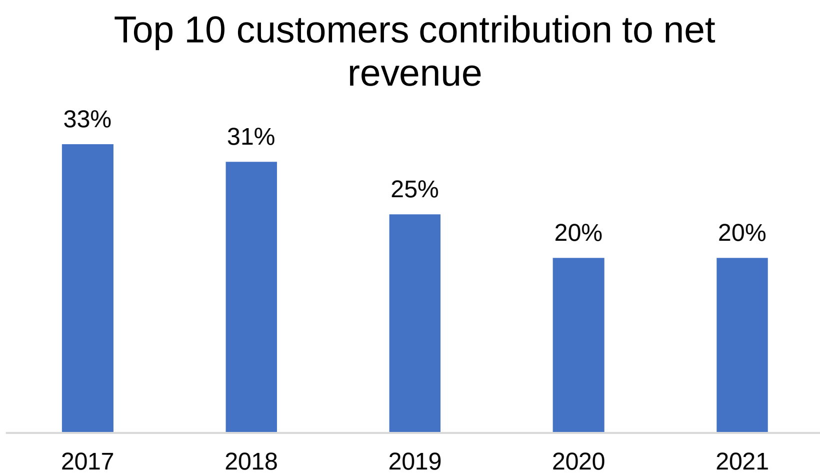
Why was Adyen able to cross the early chasm?

Adyen primarily targeted internet-scaled businesses with global ambitions. Generally speaking, most startups first target SMBs or some niche to build their reputation over time so that they can eventually move to up-market. Adyen took the opposite approach; the founding team had a very clear-eyed vision in terms of the problems any large merchants face in payments and how they can build one single platform to address such core and crucial need. In many cases, many of these internet-scaled businesses have country specific contracts with their PSPs, and hence when they would expand their operations to other countries, they could give their PSP mandate to a new company. For example, when Spotify or Uber expanded their operations in Australia, they could choose Adyen to process their payments in Australia. Over time, if Adyen outperforms in authorization rates or other performance metrics, Uber/Spotify would have a very compelling reasons to consider Adyen to process their payments in other regions as well.

Once they crossed the early chasm, Adyen was able to rapidly grow in three ways:

a) Adyen's customers themselves grew fast in the last decade or so. As Uber's and Spotify's of the world created new markets for their services, Adyen was there to process their payments. Adyen grew exponentially because its customers themselves were conquering the world.
b) Adyen followed "land and expand" model with many merchants. If a merchant started using Adyen to process e-commerce transactions, over time the same merchant may have ended up also using Adyen's POS services. Adyen's "unified commerce" blurred the need for different service providers for different channels as they became one-stop solution for all channels.
c) Finally, Adyen's share of transaction volume with its existing merchants itself increased over time. Most merchants have contracts with multiple PSPs, and over time, they can track relevant metrics such as authorization rates and objectively decide to give more volume to the PSP that has performed better.

Adyen mentioned more than 80% of their growth came from existing merchants last year. More importantly, volume churn has consistently remained at less than 1% in Adyen's history. Of course, Adyen also added new merchants to their platform to grow their payment volume and net revenues. Even though Adyen had significant customer concentration in initial years, the merchant base is getting increasingly more diversified over time.

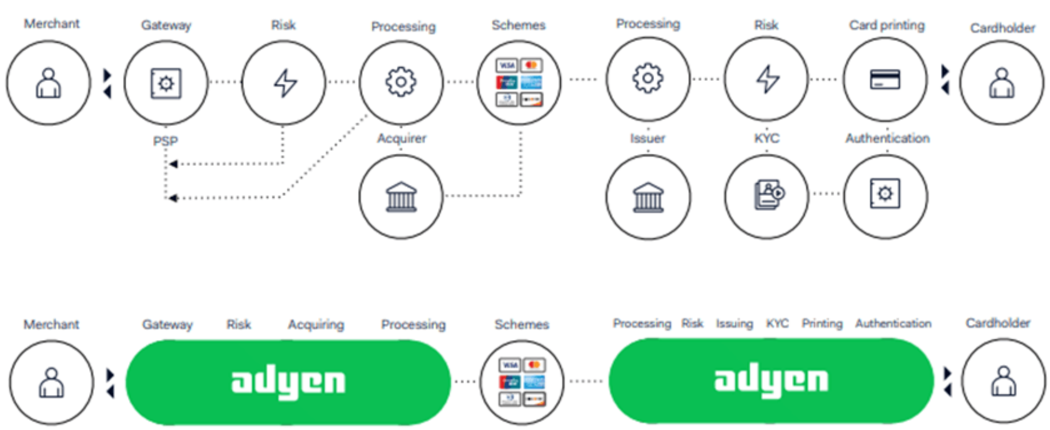


Source: Adyen's public filings

Why was Adyen able to outcompete the incumbent PSPs?

Unlike legacy incumbents, Adyen has a single integrated platform that operates across the entire value chain and offers simplicity for merchants by eliminating the need to work with a disparate group of gateways, risk management providers, processors, and acquirers. Adyen explained in its prospectus when it became a public company in 2018:

"The typical payments landscape has been characterized by a fragmented patchwork of providers and legacy systems, which Adyen believes leads to an inferior shopper experience, both explained and unexplained declined authorizations, low conversion rates and a high number of fraudulent transactions leading to administrative costs for merchants. In this context, the Adyen team set out to fundamentally change the payments industry by building a single, fully-integrated global platform which seeks to provide a high quality level of service to merchants."



Adyen's platform runs on open-source technology and is independent of software commercially licensed from third parties. This is a conscious decision by Adyen and this philosophy almost permeates every decision it takes. The whole platform was built in-house and unlike other payment/fintech companies, Adyen seems to have strong aversion of acquiring companies as they believe patching disparate platforms can dilute their value proposition of being a single platform. Adyen grew their business entirely in an organic way. Adyen also thinks that *"managing all operations in-house helps to maintain a high level of security and performance. The end-to-end control further enables flexibility for Adyen to combine platform components in different configurations to meet the various needs of its merchants and allow for scalability."*

Because of the holistic view Adyen has thanks to its single integrated platform, it can provide insights into why a specific transaction is rejected by an issuer and find ways to improve authorization rates. Adyen's focus was not on building the most cost competitive product in the market, but to build a single platform that will improve authorization rate and hence can increase merchants' revenue. If Adyen's platform can increase authorization rate from 90% to 95%, the net revenue contribution is much larger than what a merchant might be able to save by picking the most cost competitive PSP out there. Even for MBI Deep Dives, I probably lose ~1% of my subscribers every month just due to payment failure (some of which do come back to re-subscribe/update payment information later). The prospect of higher authorization rate is much more compelling for larger merchants than choosing the lowest cost alternative. In the "Business Breakdown" episode, Michael Willar from Stenham Asset Management mentioned ~20% of all online transactions are declined (vs 5% in offline/card-present payments); therefore, there is certainly appetite for PSPs who can enhance authorization rate to boost merchants' revenue. To drive this point home, please see the below example to understand why higher authorization rate (and not lower take rates) is more compelling from the merchants' perspective:

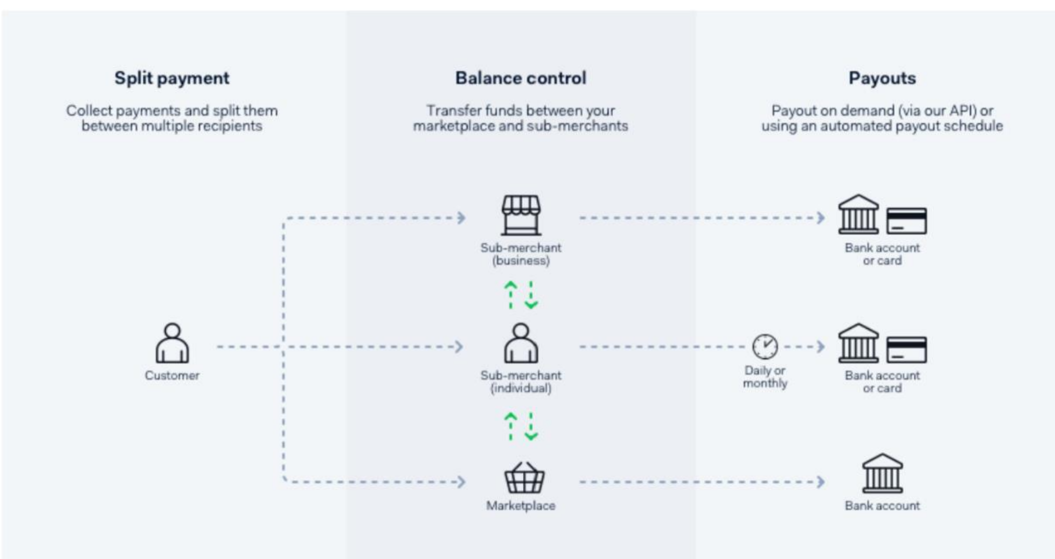
Company	A	B	C	D	E	Comment
Payment Volume	$100	$100	$100	$100	$100	
Authorization rate	98%	95%	90%	85%	80%	
Merchant Gross revenue	$98	$95	$90	$85	$80	Payment Volume*Authorization rate
Take rate by PSP	0.20%	0.01%	0.01%	0.01%	0.01%	Adyen's take rate is ~20 bps. In this hypothetical example in which I assume only 1 bps take rate for PSP, it shows that if you don't have high authorization rate, no matter how little a PSP charges the merchants, it may not compensate for the poor rate of authorization.
Interchange and other fees	2.5%	2.5%	2.5%	2.5%	2.5%	Assuming a fixed number regardless of PSP
Merchant Net revenue	$95	$93	$88	$83	$78	Net revenue generated by the merchant after payment related costs

Local acquiring licenses also helped Adyen in increasing authorization rates. Adyen explained, *"Acquiring licenses allow Adyen to process payments domestically in all key markets, generally leading to higher authorization performance and lower processing costs. Additionally, local acquiring licenses can lead to faster merchant payouts. Lastly, local acquiring generally results in* *lower interchange costs and card network fees, which directly benefits the merchant in Adyen's transparent "cost-plus" pricing model".*

Adyen used two types of acquiring: a) "full acquiring license" in which Adyen performs the full acquiring process and takes full financial responsibility for chargebacks where the merchant is unable to pay, and b) "Bin sponsor license" in which Adyen is unable to obtain a direct license from the card networks and instead 'rents' the license held by a local acquiring bank by paying a fee to the local acquiring bank. Adyen still controls the full technical stack for payment processing and takes full financial responsibility for chargebacks where the merchant is unable to pay. Because of this credit risk, Adyen is very careful in choosing industries/merchants they take the responsibility of acquiring, and merchants also demand strong balance sheet to feel comfortable. For example, Adyen doesn't do acquiring even in airlines industry. At the time of IPO, Adyen had full acquiring license in Europe, Australia, New Zealand, Singapore, and Hong Kong. Last year, Adyen also received US branch license which allows them to do full acquiring in the US. It is estimated that full acquiring may save 1-3 bps; given the size and volume of payments market, every bps matters for both merchants and Adyen.

Apart from settlement and processing services, Adyen has additional products and services. One of them is Adyen Checkout which can be used for online, mobile, and in-store payments. Adyen also has been focusing heavily on their "Adyen for Platforms" product (formerly known as Adyen MarketPay) which is an end-to-end payment solution for peer-to-peer marketplaces, on-demand services, crowdfunding platforms, and any other platform business models. McKinsey's "2021 Global Payments Report" project that marketplaces may enjoy 50-75% market share of digital commerce by 2025. Given the dominance of marketplace business model, it is very intuitive why payments services for marketplace businesses attracted a lot of attention from Adyen. Marketplaces have unique challenges in payments since they are responsible not only for integrating payments into their platform, but also the need to facilitate payouts of funds to their sub-merchants. Therefore, marketplaces have a much higher regulatory burden for things such as KYC and on-boarding requirements for a large number of sub-merchants.

"Adyen for Marketplace" is *"an extension of the same full payments stack as the Adyen platform and includes automated and secured on boarding of sub-merchants, the ability to automatically split payments between merchant funds and sub-merchant payouts, optimized payout facilitation, and managed compliance."*

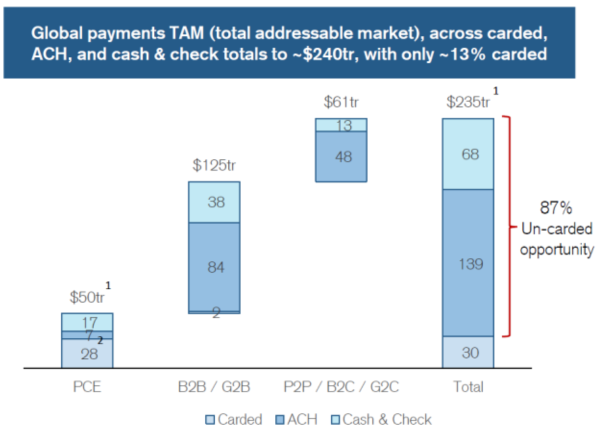


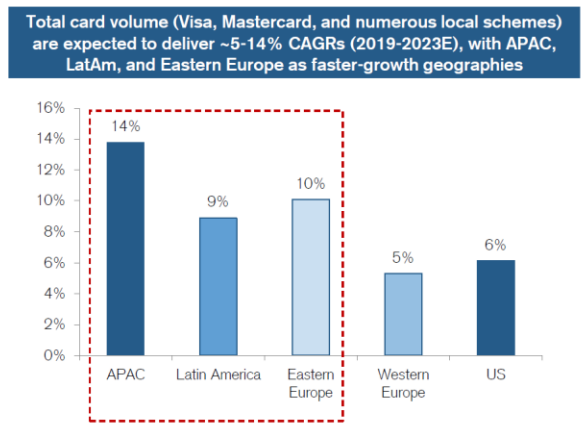
Products such as "Adyen for marketplace" also introduces opportunities for new products down the line. One such product that Adyen is currently working on is "Capital" by which they can help these marketplaces provide financing to the sellers. I am not sure about how the economics will be shared between Adyen, marketplace, and other relevant parties in this chain.

Apart from Capital, another product Adyen mentioned that may have "meaningful standalone net revenue contribution in the long term" is "Issuing" which allows its merchants to build their card programs. and create customizable virtual and physical cards from V/MA, among other things. Adyen's issuing products is still in the "tens of millions" vs acquiring volume of hundreds of billions.

Finally, Adyen also has several data-enabled products such as RevenueAccelerate, RevenueProtect, Shopper Insights etc. Revenues from these ancillary products are likely to be extremely high margin business.

Adyen's TAM: Payments is exceptionally large market. In fact, global payments volume was estimated to be $240 Tn which was higher than global GDP of $85 Tn in 2019 because multiple payments are made for the same level of output. However, since Adyen does not process payments in China, we need to consider payments volume ex-China.





Source: Credit Suisse Payments Primer (2020)

Although I am not aware of reliable estimates for global payment volume ex-China over the years (there might be some behind paywall), I decided to go for a reasonable alternative.

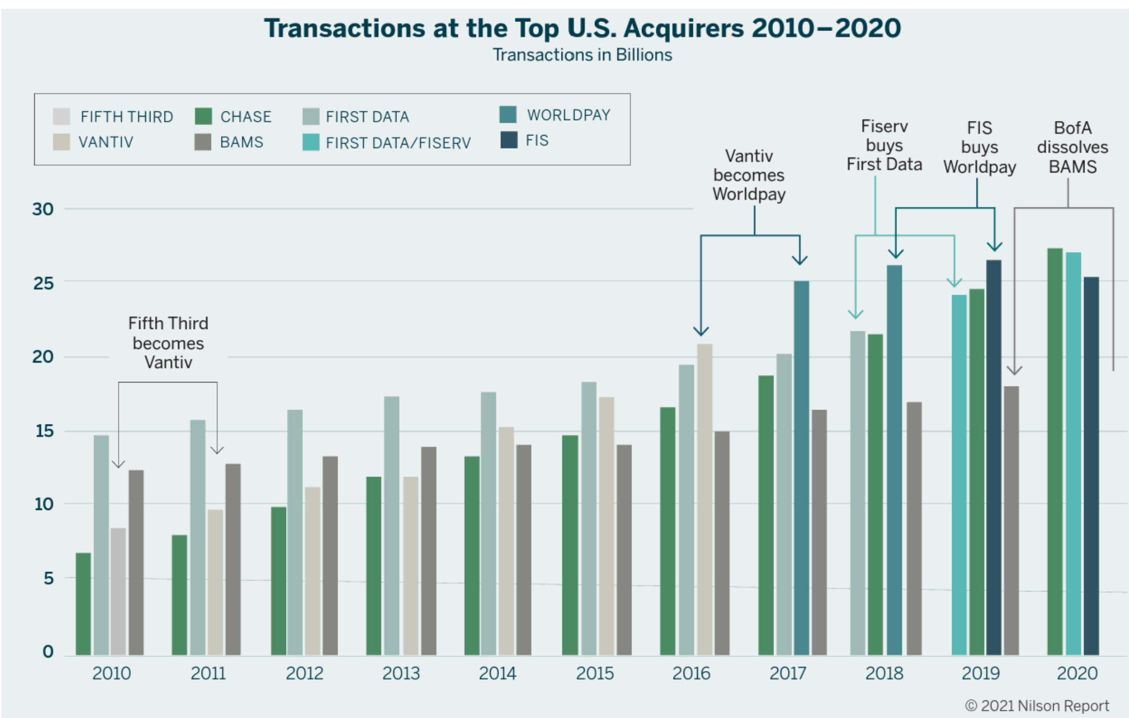
Both Visa and Mastercard publish their payments volume consistently and given they have ~75% market share of digital payments volume in the US, adding Visa and Mastercard's global payment volume and then divide it by 75% would give us a rough estimate of the TAM and how it's growing. Since their market share obviously varies from country to country and their combined market share is likely to be less than it is in the US, I decided to divide it by 70% to estimate Adyen relevant TAM. Of course, this is far from perfect since their Visa/Mastercard's combined market share may also be increasing and a more correct approach would be to divide their payment volume by their market share in each year instead of dividing it by a constant 70%. Since that's no easy task to figure out, I decided to do it in this simple framework which I believe to be not materially off the mark.

Once we have the TAM, we can also calculate Adyen's penetration in the TAM. Please note that since Visa and Mastercard report payment volume in USD whereas Adyen's numbers are in EUR, I have converted the USD numbers to EUR. As per my estimates, Adyen's penetration was ~70 bps in 2017. But they have continued to gain market share every year and currently had ~2.3% penetration. Please note this is a very broadly defined TAM and since Adyen does not focus in SMB space, its penetration of its actual addressable market is likely to be higher. Nonetheless, the broader inference does not quite change much even after considering such nuance and Adyen is likely to continue to grow its payment volume at a rapid pace.

Amount in EUR Mn, except %	2017A	2018A	2019A	2020A	2021A
Total Payment Volume (TPV)	108,400	159,000	239,600	303,600	516,000
Growth		*46.7%*	*50.7%*	*26.7%*	*70.0%*
Growth $		50,600	80,600	64,000	212,400
Visa transaction Volume $	7,196,000	8,139,000	8,619,000	8,714,000	9,968,000
Growth		13.1%	5.9%	1.1%	14.4%
Mastercard transaction volume $	5,241,000	5,901,000	6,461,000	6,337,000	7,719,000
Growth		*12.6%*	*9.5%*	*-1.9%*	*21.8%*
V+MA Transaction Volume $	12,437,000	14,040,000	15,080,000	15,051,000	17,687,000
Growth		*12.9%*	*7.4%*	*-0.2%*	*17.5%*
Total Addressable Market (TAM)	15,990,429	18,051,429	19,388,571	19,351,286	22,740,429
Adyen's market share	0.68%	0.88%	1.24%	1.57%	2.27%
Market share gain in bps		20.3	35.5	33.3	70.0

Section 3 Competitive dynamics against legacy and fellow disruptors

Broadly speaking, there are two sets of competitors for Adyen: legacy players, and fellow disruptors. I will discuss these two broad groups separately. But before I get into that discussion, please note there has been a dizzying number of M&A activities over the last decade in this industry.



Legacy players

The three largest legacy players in this space are Chase Paymentech (owned by JPMorgan), Worldpay (owned by FIS), and First Data (owned by Fiserv). Each of these players processed more than a trillion dollar of payment volume in 2020 and collectively did ~$4 Tn.

Top 10 Merchant Acquirers

Purchase Volume

RANK	ACQUIRER	BILLION	CHANGE
1	**Chase**	$1,460.82	4.7%
2	**FIS**	$1,269.25	1.0%
3	**Fiserv**[1]	$1,167.34	27.1%
4	**Wells Fargo**	$709.55	23.2%
5	**Global Payments**[2]	$580.14	–1.5%
6	**Bank of America**[3]	$339.22	–
7	**Elavon**	$277.94	–21.0%
8	**PNC**	$66.04	–6.7%
9	**Paysafe**	$58.96	–0.2%
10	**Priority Tech.**	$50.33	–0.9%

Purchase Transactions

RANK	ACQUIRER	BILLION	CHANGE
1	**Chase**	27.56	11.2%
2	**Fiserv**[1]	27.53	14.5%
3	**FIS**	25.12	–5.7%
4	**Global Payments**[2]	9.72	–2.0%
5	**Wells Fargo**	9.57	10.1%
6	**Bank of America**[3]	6.03	–
7	**Elavon**	2.60	–22.0%
8	**Paysafe**	0.89	1.2%
9	**No. Amer. Bancard**	0.53	2.0%
10	**Priority Tech.**	0.53	–9.9%

Purchase volume and purchase transactions include all Visa, Mastercard, American Express and Discover cards, all other credit cards such as Diners Club, JCB, UnionPay, etc. and PIN debit cards. **1** Includes Citi, Santander, SunTrust, BBVA and six months of its share of the BAMS joint venture after its dissolution. **2** Estimate. **3** Six months of business retained by Bank of America after dissolution of BAMS joint venture. ©2021 Nilson Report

One of the advantages for Chase Paymentech is its competitive pricing given JPM's scale as well as their ability to bundle with other payments and banking products/services. Moreover, Chase Paymentech tends to enjoy higher authorization rate for its own issued cards. This is likely to be true for other banks as well; Bank of America's (BofA) payment business is likely to deliver higher authorization rate for BofA issued cards. Card issuance is somewhat concentrated in the US as the top 5 players have ~60% market share, led by Chase. The more market share Chase has in card issuance, the more likely it is they will have a stronghold in payments service business given their higher authorization rate in their own cards. Therefore, while Chase may perform worse than Adyen when it comes to transactions in other banks' issued cards, it can remain a fiercely competitive player in this space for years in the future. However, apart from lower authorization rates in other bank issued cards, Chase seems to be more sluggish in responding to the ever evolving and increasing complexity of the payments world, partly because of the multiple platforms, companies, and integration that's required and the technical debt that results over the years. For example, RH switched from Chase to Adyen in 2018 since Chase wasn't able to handle split payments (e.g. charging customer half of the fees upfront and the rest upon delivery).

FIS and Fiserv, the second and third largest players respectively, likely have even more acute technical debt. Adyen's current management themselves sold their prior company Bibit to RBS and RBS' payment business, which included Bitbit, was spun out during global financial crisis to a private equity firm. Worldpay eventually became public in 2015, but then got acquired by Vantiv in 2017, and finally Vantiv itself was acquired by FIS in 2019.

Michael Willar elaborated on the point of technical debt of legacy players in the "Business Breakdown" episode:

"If I just pick on Worldpay, they are almost an amalgamation of 18 to 20 different platforms and even more systems that have been literally glued together. And the analogy that I can give you is actually from a startup called Silverflow, which I have recently been speaking to, and they were started by ex Adyen employees. Super switched on guys. Maybe there'll be a different podcast one day about them, but the analogy that they said, it's like gluing together different car parts from different manufacturers to make one car. You might get from point A to B, but you're bound to have a lot of issues and high maintenance costs. If it breaks down, you might not be able to find the spare parts. This is not great for a merchant for a number of reasons.

The first is that when these platforms were built, they were both in the eighties and nineties and technology was just completely different. Memory, processing power, even bandwidth was extremely expensive. And these legacy platforms were built on mainframes to be economical and use only the bare minimum of the data in a transaction given the high costs. If you fast forward today, everything that was expensive is not so expensive and the big D word in data is just mission critical to merchants. Because they want to improve the customer experience. They want to generate loyalty. They want to improve rates of fraud. They want to lower their costs. Just a plethora of reasons. A lot of the merchants that have switched to Adyen have said this to me, that having access to this data is just a total game changer. Then if you think about stitching up these multiple different old platforms, it creates a lot of headaches and costs.

If you are a global company and you are selling to 50 different markets, you don't want to be dealing with 30 different platforms. It's totally different companies, almost, with different operation teams you have to separately integrate for every single market in different channel. And this often leads to higher costs, low authorization rates, makes you slower to innovate and just complicates reconciliation. So this in essence is the key difference between Adyen and the legacy processes. Again, if you listen to what merchants say that have dealt with both Adyen and the legacy players, they will tell you how bad it is. So with Adyen, again, you deal with one platform, one contract for every merchant, every channel with transparent pricing, you get access to data, and again, higher chance of better authorization rates."

Overall, it appears to be extremely likely that legacy players will be share donors in this space over the next decade. But it is also important to note that the legacy players are unlikely to be extinct either. As mentioned earlier, authorization rate can be pretty high for some of the legacy players for their own issued cards. Moreover, merchants almost always (although there can be exceptions) want to have contract with multiple PSPs to have negotiating leverage. In most cases, merchants use one of the PSPs as their primary processor whereas the other players are their fallback options. In this industry, the larger the merchant is, the lower the take rate a PSP enjoys for a couple of reasons:

a) Larger merchants enjoy volume discounts. For example, in 2017 Adyen's top 10 customers contributed 33% of net revenue even though the same customers generated 39% of processed volumes. Similarly, the top 120 customers contributed 69% of net revenue but 83% of processed volume in 2017. While Adyen still discloses top 10 customers contribution to net revenue (20% in 2021), it does not report their contribution to processed volume. But it is easy to infer based on past disclosure that larger merchants are likely to enjoy volume discounts. Because of the significance of processing volume for PSPs for technological, branding, and frankly perhaps valuation implications, some PSPs may even agree to process payments volume at abnormally low pricing. I have heard speculations that Stripe processes Shopify's payments at very, very low take rates. Adyen is allegedly much stricter in pricing and generally known as "premium" PSP in the industry. Therefore, merchants using Adyen perhaps willingly choose them over other alternatives because of the potential of higher authorization rate. Because of the multiple PSPs that most merchants choose, there is not much of a switching cost. Given their "premium" nature and lack of much of a switching cost, it is absolutely essential for Adyen to maintain the supremacy of the quality of their product and services. Considering how mission critical payments is for any business and the failure rate of transactions especially online, despite the negotiating leverage large merchants are very much willing to focus on increasing authorization rates rather than saving a few bps.

b) The other reason PSPs enjoy lower take rates from larger merchants is many large merchants do a lot of data analytics and add-on services in-house rather than taking those services from Adyen or other PSPs. For example, although Uber uses Adyen (along with a few others) to process payments in many parts of the world, it does not use reporting, reconciliation, analytics and fraud tools from providers as they do this in-house. Some Adyen's shareholders I spoke with mentioned when a merchant is interested in the full range of analytics and services, their choice of primary PSP leans more towards Adyen.

Given the three largest legacy players in aggregate still process ~8x the volume Adyen did in 2021, legacy players remain the primary competition for Adyen today and perhaps in the near to medium term. Adyen was able to take quite a few marquee merchants from some of these legacy players over the last few years. For example, these are some of the companies on which Adyen became the primary PSP over the last 5-7 years (the parentheses show the earlier primary PSP for these merchants; in many cases they are kept as fallback to primary PSP): Canada Goose (Chase), Etsy (Worldpay), Uber (Worldpay), Farfetch (Worldpay), eBay (Braintree/PayPal). Even though legacy players remain the primary competition, there are some fellow disruptors who can also be a headache for Adyen over the long-term.

Fellow disruptors: The two companies that can be labelled as "fellow disruptors" who are also taking share from legacy players are Stripe and Checkout. Let's start with Stripe.

Stripe is perhaps Silicon Valley's most favorite private company! The Collison brothers so far raised $2.2 Bn from VCs and was "valued" $95 Bn in the latest funding round. In contrast, Adyen raised just $266 Mn in its history and when it came to public market, it didn't even raise money from the market. While there is not as much detailed disclosure available since Stripe is a private company, their recent "2021 Business Update" shared some important data points. Stripe disclosed they processed $640 Bn payments in 2021 which increased by 60% YoY. To make it more apple-to-apple comparison, I have converted the dollar amount to EUR (Adyen's reporting currency). I have also shown below Stripe and Adyen's valuation each time Stripe raised money from VCs over the last three years (Again, Stripe's numbers were converted to EUR). Since Adyen has been a publicly traded company, its numbers are derived from its stock price. As you can see below, while four years ago, Stripe and Adyen had similar valuation, Stripe's valuation was almost 50% higher than Adyen's in March 2021. Please note Adyen's market cap peaked at EUR 84 Bn in November 2021, it is currently valued EUR 45 Bn. I have read reports that indicate Fidelity recently marked down Stripe's valuation by 23% from March'21 numbers. If we assume such mark as current valuation, Stripe remains worth ~50% more than Adyen even though Stripe's reported TPV is only ~10% higher than Adyen's.

	Market Cap EUR Bn			TPV EUR Bn	
Month	**Stripe**	**Adyen**		**Stripe**	**Adyen**
Sep'18	18	18	2020	360	304
Jan'19	20	15	2021	576	516
Sep'19	32	19			
Mar'20	32	20			
Mar'21	86	58			

What could be potential reasons for such valuation discrepancy? One potential reason can be Stripe's take rate is likely to be higher since they have much more focus and exposure to SMB which may allow them to enjoy higher take rates. Moreover, Stripe has built incredible developer affinity over the years; Stripe talks about supporting startups from the first lines of code through IPO and beyond. Stripe mentioned in its 2021 Business Update that 60% of the tech companies that went public in 2021 was Stripe's customers. As explained earlier, it may be difficult to infer much from the statement; any merchant can choose "Stripe" or "Adyen" (and a few others) to process their payments but the much more important information that's missing here is whether Stripe is their primary PSP (Stripe probably is, but we don't know for sure). Moreover, even if Stripe's take rates is higher from SMB or startups, Shopify's payment volume itself was ~13% of Stripe's TPV (assuming 100% Shopify's payment processed by Stripe) from which Stripe's take rate is likely to be anemic.

Of course, even if take rates are higher for Stripe, we don't know whether margins are similar to Adyen's. Adyen posted ~63% EBITDA margin and ~73% incremental EBITDA margin in 2021 which is exceptionally high bar for Stripe to match. In fact, as part of Adyen's due diligence process, I spoke with an investor who has a good idea about Stripe's numbers. Since the information is not public, I cannot mention these in my deep dive; however, I can only mention that Stripe's margin numbers I heard are no where close to Adyen's numbers.

Perhaps Stripe just enjoys a massive narrative premium in its valuation compared to Adyen. I found it interesting that despite being a private company, there are perhaps more deep dives available on the internet on Stripe than there are on Adyen! Of course, it's very much possible price discovery is simply weak in private market these days.

As alluded earlier, payments markets are such a large market that it may not have to be either Stripe OR Adyen debate, especially given both companies can take share from legacy players over time and their combined payments volume is only ~25% of the largest three legacy players' volume today. Both companies can potentially be big winners (given their valuation, they are already somewhat priced as big winners, so this isn't a valuation comment rather a "business" comment); however, they are increasingly likely to be each other's major competitor in the long-term.

Although Stripe focuses on Startups, their "Business Update" makes it abundantly clear that they are also pretty serious about Enterprise and International merchants, both of which are Adyen's strongholds. Unfortunately, we don't have enough details/data points to make a fair assessment and comparison of these two companies unless Stripe becomes public.

Checkout: Checkout is another private PSP that has garnered a lot of attention in recent times. Guillaume Pousaz, the founder and CEO of Checkout, bootstrapped the business for the first seven years before raising $1.8 Bn in just last three years. The CEO on a podcast (April, 2021) mentioned that they never spent a single dollar on sales & marketing before raising $230 Mn in Series A; it was purely word-of-mouth and product led growth. He also mentioned the cash he raised from VCs weren't spent; it just sits on balance sheet as they maintained their capital discipline. While PSPs can be pretty capital efficient businesses, they all pale in comparison with Adyen's track record of utilizing just $266 Mn of external funding to create ~$50 Bn worth of market cap. Based on the latest round in January this year, Checkout is currently "valued" (perhaps a word very loosely used here) ~$40 Bn which is just ~20% below the current market cap of Adyen (but was ~45% below Adyen's market cap when the round was announced). In the funding press coverage at TechCrunch, the article mentioned that "*The company processed hundreds of billions of dollars in payments in 2021 alone*". Given the valuation, I assumed Checkout must have processed at least $200-300 Bn of payments volume in 2021. Since this is a private company, we cannot be sure, but my channel checks tell me the actual number is very close to $100 Bn which admittedly shocked me. While I cannot be certain of the veracity of the data, I am merely mentioning the datapoint I have heard from some investors during my due diligence. For what it's worth, the growth rate for payment volume is likely to be faster than Adyen and Stripe.

However, similar to Stripe, some caveats apply here as well. Checkout's take rate is likely to be materially higher than Adyen's. While Adyen does not exhibit much of an interest in crypto, Checkout is very much leaning to crypto. The same TechCrunch article mentioned Checkout *"powers some of the payments features of several cryptocurrency companies, such as Coinbase, Crypto.com, FTX, MoonPay and Novi from Meta."* Again, my channel checks tell me crypto contributes a material amount of processing volume to Checkout and hence the take rate is likely to be considerably higher than Adyen's. However, EBITDA margins were nowhere close to the same universe as Adyen's (my understanding based on conversations with investors). Given the current market environment, if Checkout were publicly traded, I think it's not unfair to say it would probably trade at a fraction of its last funding round valuation.

An article published in December, 2020 indicated that 50% of Checkout's transactions happened in Europe with much of the rest coming from Middle East (CEO's family lives in Dubai) and Asia. Unlike Adyen, Checkout doesn't have a POS product which make it difficult for them to get any retailer with physical locations. While they are yet to be a relevant player in the US, Checkout does have an ambition to grow its presence in North America.

Even though Adyen, Stripe, and Checkout can be bucketed as "fellow disruptors", they did take different approaches to get where they are today in terms of strategy and management philosophy which I'll elaborate in the next section.

Section 4: Management, and Capital allocation

As mentioned earlier, Adyen has not done any acquisition in its history. On the other hand, Stripe did 13 acquisitions since inception, and Checkout acquired four companies in the last two years. Adyen believes in organic growth and the core problem they have identified for legacy players is the maze of inevitable platform integrations related challenges that arise from acquisitions over the years. The root of this rigid philosophy of no M&A was eloquently explained by Pieter on a podcast:

"With the first company - you build something, see it run successfully, you sell it, you celebrate it. After selling Bibit, I stayed in the company for another two years, and as a result I had to run it under the umbrella of a larger company that made all sorts of decisions that I wouldn't personally make.

So when you start again with another company, you are very keen on not selling it. This implies that the decisions you take should be very different. Building something to keep, is like restoring a car. If you restore a car to sell it, the paint has to be great and the motor has to be running. But if you think you're going to do 200,000 miles yourself and you know you have a ton of problems hidden in the car, you will eventually encounter them yourself.

Similarly with Adyen, all the problems we have ever had in the business model, we encountered them ourselves at some point. So we really make sure we don't have any problems with the business model because in seven years from today, we will still be running this company."

Given how tempting it must be to just acquire a few companies here and there to increase take rates or expand geographical footprint, it is quite admirable how religiously committed Adyen has been with organic growth so far. There is no indication that they have any appetite for M&A going forward.

Interestingly, one of the complaints about Adyen that I came across is they don't do as many customization for merchants (which is a key value proposition for Checkout); the reason Adyen is unwilling to undertake customization efforts for merchant by merchant basis is it violates "The Adyen Formula", as shown below. Like Amazon's principles, these are not just feel good words rather a code of belief that gets embedded deep into Adyen's culture. The very first formula states that "We build to benefit all merchant (not just one)". Adyen organizes its projects around cross-functional teams, called 'streams', which are comprised of employees from the business side and the development side of the company and built in collaboration with merchants. Each stream follows four-weekly release schedule.

We build to **benefit all merchants** (not just one)	We **don't hide behind email,** instead we pick up the phone
We make **good choices** to build an ethical business and drive sustainable growth for our merchants	We **talk straight** without being rude
We **launch fast** and iterate	We include **different people** to sharpen our ideas
Winning is more important than ego; we work as a team — across cultures and time zones	We **create our own path** and won't be slowed down by "stewards"

Source: "The Adyen Formula" from 2021 Annual Report

Adyen guides to maintain ~5% of net revenue as capex. So, if Adyen doesn't do M&A, the business is not highly capex intensive, and generates mid-40s FCF margin, it must be buying back shares or/and paying dividends, right? No. Adyen has not paid any dividend or bought back shares. Management explained in one of the earnings calls why that is the case:

"…we have a dividend policy where we do not pay out any dividends, and we continue to have this policy given the high growth of the company.

And then the second question is like at what stage this dividend policy will be reevaluated.

We will continuously look at this. As long as we are in this high-growth trajectory, we will keep this dividend policy. So I can't give a precise timing on it right now. But as we're still in high-growth mode, it's not expected to change on the short term."

Management reiterated the no dividend policy in a recent call and elaborated why they prefer to have more cash on balance sheet:

"we still have a strategy to have -- to keep this cash on the balance sheet basically for 2 reasons. It makes our discussions with regulators way easier because they can see that we're a very financially stable company, which I think is important if you're applying for licenses throughout the world, so that's the first reason.

The second reason is that we're winning larger deals with larger companies as a customer. And also there, having this stable balance sheet without any debt is helping us. So at the moment, we don't have a strategy to change this, so we will continue the current no dividend policy for now."

So, if a payments company generates gobs of FCF, does not pay dividend "*for now*" but also doesn't repurchase shares or, the existing shareholders must be getting diluted via SBC at a pretty high rate, right? No.

In 2021, Adyen spent just ~$6 Mn in Share Based Compensation (SBC) which is only ~60 bps as % of their net revenue. Last year, Adyen only spent ~20% of their net revenue in wages and salaries of ALL employees which is typically just one of three division's (R&D, S&M, and G&A) salary in most of the tech companies at similar topline these days. Since Adyen had 2,180 Full-Time Employees (FTE), this implies an average Adyen employee made EUR 101,421 in 2021 which is perilously close to "Low Income Limits" in San Francisco. I am not joking; US Department of Housing and Urban Development (HUD) defined $82,200 for an individual and $117,400 for a family of four in San Francisco to be "Low Income Limits" in 2018.

Given the abundance of SBC that I'm used to seeing in many of the tech companies I have covered before, I had to triple check the numbers as I was quite incredulous looking at Adyen's SBC! It turns out lack of SBC (and dilution) and the resultant sky-high margin is one of the key reasons investors adore Adyen. But why has Adyen managed to keep SBC so low and how sustainable is it really?

After speaking with several investors and doing my own due diligence, there are three reasons I could identify to explain such low SBC at a time when engineers' compensation has skyrocketed:

a) A recurring and admittedly unsatisfying explanation that I have heard is since Adyen is a Dutch company and Dutch are relatively more frugal and conservative (I understand the broad-brush biases this may imply which is why I already mentioned it to be unsatisfying), Adyen hasn't indulged into the "bubble" of engineering compensation at Silicon Valley. Even if that's true, the question remains why (and if) Adyen was (and will be) able to attract good talent.

b) A far more cogent explanation is Dutch regulations. In Netherlands, the variable part of compensation i.e. your bonus cannot exceed 20% of fixed compensation. In the rest of

EU, the regulation allows variable compensation to be maximum 100%; I am not aware of any such regulation in the US. As a result, there is potentially a massive talent arbitrage that exists in the other side of the Atlantic. Adyen took full advantage of such arbitrage.

Since almost ~60% of Adyen's employees is from Netherlands, the regulatory talent arbitrage helps Adyen massively to keep its salary expenses low. Interestingly, even though North America contributed to 23% of Adyen's net revenue last year, only 12% of its employees are in the US.

FTE Per office	**2017**	**2018**	**2019**	**2020**	**2021**
Netherlands	396	503	660	1011	1262
Rest of Europe	107	148	262	378	451
US	80	126	167	232	271
Others	85	96	93	126	196
Total	668	873	1182	1747	2180
Mix					
Netherlands	59%	58%	56%	58%	58%
Rest of Europe	16%	17%	22%	22%	21%
US	12%	14%	14%	13%	12%
Others	13%	11%	8%	7%	9%
Total	100%	100%	100%	100%	100%

Having said that, even in the US, Adyen lags their peers considerably in terms of compensation. I have compared Stripe and Adyen's salaries in levels.fyi and found ~50% differential between Stripe's and Adyen's offer for an entry level Software Engineer (SWE). Please note I have looked at Adyen's offer SWEs in the US to make it more apple-to-apple with Stripe since the salaries in Netherlands are materially lower partly because of the aforementioned regulation. When I went through posts in "Blind", a forum where people anonymously share their thoughts on companies they work in, a recurring complaint from employees at Adyen is Adyen's below average compensation. Perhaps there is indeed some truth to "Dutch frugality and conservatism".

Entry-level SWE	**Adyen**	**Stripe**	**Difference**
Base	$105,000	$132,000	26%
Stock	$ 40,000	$ 76,000	90%
Bonus	$ 15,000	$ 28,000	87%
Total	**$160,000**	**$236,000**	**48%**

Source: levels.fyi

c) Finally, some Adyen shareholders think Adyen was able to keep the compensation in check because of its unique culture. Pieter spoke about Adyen's hiring process on this podcast in which he mentioned that during the hiring process, every single employee at Adyen is interviewed by one of the six management board members (recently Adyen spoke about extending this group to 12 people to help them scale) to ensure the quality of the human resource remains high. Please note Adyen has two-tier board structure consisting of management board (6 members) and supervisory board (5 members) who are independent of each other. The company speaks about great work-life balance and a no-nonsense work culture that they believe attract pretty competent talent.

Here's the concern I have. When I think about durability of Adyen's competitive advantage, a large part of it relies on their ability to maintain and grow their technical superiority of the platform. If they consistently lose out on hiring talents because they are paying ~50% lower than some of their peers, I wondered whether Adyen's platform will remain cutting edge 10 years from now. While some Adyen shareholders admitted that talent retention is indeed a concern they deeply think about, one investor thought the very premise of my question/concern is flawed. He believes that engineering talent is bit of a commodity and the relationship between compensation and quality is not quite linear. More importantly, a lot depends on a company's ability to extract value out of their talent regardless of the compensation. It is not obvious to him why Stripe's quality of talent is inherently better than Adyen's just because Stripe pays 50% higher. I see some merits on these push backs, and I think one might argue that given that Stripe's (or other peers) stock is a sizable part of total compensation which faced (or likely to face) a severe haircut, the actual compensation difference may not be 50% anymore. Moreover, the companies with heavy SBC component in comp may have to deal with employee discontent themselves as the employees grapple with a total compensation noticeable lower than what they presumed. The fact that Adyen was able to withstand not to indulge into the "hyperinflation" of engineering compensation in the last few years perhaps does speak volume to their commitment to build culture without relying too much on higher pay. It may not be easy to build a great company just by paying people more.

As mentioned earlier, I have read through common complaints about Adyen's compensation on Blind. When I spoke with an Adyen shareholder, I also came to know that the shareholder spoke with a recruiter who's been recruiting for Adyen for quite some time and has noticed material spike in attrition recently. When asked for the reason for attrition, the shareholder mentioned he spoke with former employees and they sometimes mentioned about the joy of working for a startup that understandably gets diluted over time as the company gets bigger and bigger. These are, of course, anecdotal data points and the whole tech industry itself experienced retention issues in the last couple of years, so it can be difficult to infer much from such anecdotes. Adyen was asked about talent management in a recent earnings call (February 09, 2022) and the management basically said attrition rates are similar to prior years:

"If you look at our attrition rates over the 2 pandemic years, they are similar to the years before. So you also see that we have a very loyal group of employees that like working here. So it's something that we are very protective of.

In the same -- at the same time, we also expanded where we are with our engineering team. So we added Madrid and Chicago there to be closer to where the merchants are but also not to be just dependent on Amsterdam. So that's how we look at the strategy there."

Despite the above discussion, I am reluctant to assume Adyen can keep paying a noticeably below market level salary forever; at the very least the growth rate of wages & salaries per headcount is likely to be faster than their peers. I understand the investors' current angst between the lopsided value shared between employees and shareholders in many tech companies today, but generating 60% EBITDA margin and 70% incremental EBITDA margin while paying noticeably below average market salary doesn't appear to be good equilibrium between "labor" and "capital" either.

Section 5: Valuation and model assumptions

If you are reading my deep dive for the first time, I strongly encourage you to read my piece on "approach to valuation". Please read it at least once so that you understand what I am trying to do here. I follow an "expectations investing" or reverse DCF approach as I try to figure out what I need to assume to generate a decent IRR from an investment which in this case is ~9%. Then I glance through the model and ask myself how comfortable I am with these assumptions. As always, I encourage you to download the model and build your own narrative and forecast as you see fit to come to your own conclusion. None of us have the crystal ball to forecast 5-10 years down the line, but it's always helpful to figure out what we need to assume to generate a decent return.

Revenue Model: As explained in section 1, Adyen's revenue can be segregated in four categories: settlement fees, processing fees, sales of goods, and other services.

Settlement fees are driven by Total Payment Volume (TPV); gross settlement fees are ~110 bps of TPV and after paying 90% of gross settlement fees to financial institutions mostly for interchange fees, Adyen keeps the rest 10%. As explained in section 3, TAM for TPV is calculated based on sum of Visa and Mastercard's transaction volume, dividing it by 70%, and finally converting into EUR (Adyen's reporting currency) by multiplying it by 0.9. Since Visa and Mastercard report these numbers regularly, it will be easier to track and maintain this model going forward. For projections, I have assumed Visa and Mastercard will grow its transaction volume by high single digit in the next 5 years, and then gradually reach at mid-single digit growth by the end of this decade. I assumed Adyen's market share in this TAM will increase by 60 bps each year going forward. Historically, they gained 30-35 bps market share in 2019-2020, but really accelerated in 2021. It remains to be seen whether this acceleration is likely to sustain. Legacy players have stronger presence in physical world, so as the world is opening up in the post-Covid world, it may be difficult to keep last year's incredible growth momentum in TPV. Based on my assumptions, Adyen is expected to process EUR 3.2 Tn payments volume in 2030 which implies ~8% market share for Adyen. This doesn't seem quite implausible given I expect Adyen to continue to take market share from legacy players due to its superior platform and/or legacy players' growing challenges in staying relevant in the increasingly complex payments environment. Can Adyen get to 10% share? Those are the vexing questions that can be hard to answer. However, if you see TPV growth in absolute EUR, Adyen will have to grow EUR 400 Bn YoY in 2030. These are some lofty assumptions which although not quite improbable considering the size of the payments market. I want to follow and observe Adyen more before being comfortable with such assumptions.

Processing fees are based on number of transactions; the higher the number of transaction, the higher Adyen's processing fees. Overall, Adyen's take rate or net revenue as % of TPV is ~20 bps. I have wondered how sustainable this take rate is. There are two competing point of views at play here. On the one hand, the 20 bps take rate does not incorporate any future revenue streams such as issuing, capital, or any other products Adyen may launch going forward. On the other hand, I wondered whether the competitive dynamic that lets Stripe process Shopify's payments at a very low take rate will be more common in the future. Of course, the merchants know how exorbitantly profitable these PSPs are, and merchants also know they have good enough alternatives. Unlike Visa and Mastercard, consumers have no real connection with Adyen or Stripe; a retailer not accepting Visa or Mastercard is a real hassle for the consumers but Adyen or Stripe is largely abstracted from the consumers. A compelling counterargument is, of course, payments is deeply mission critical and as explained earlier, saving a few bps is not worth it at the expense of higher authorization rates. The more I thought about it, I came to the conclusion that if we ever reach a point where two or three PSPs reach a statistically similar authorization rates, there can be a tremendous pricing pressure on the PSPs. Looking through that lens, it made me appreciate Adyen's religious commitment to one platform and focus on scalability and higher authorization rates rather than customization. Unfortunately, none of the companies in this space reports their global authorization rates that would allow us to compare and contrast how things are progressing in this industry. It appears to be a critical data point that investors don't have access to.

Overall, my model implies net revenue CAGR of 31.0%, 27.5%, and 22.7% respectively for the next 3, 5, and 9 years. Adyen guides net revenue CAGR between the mid-20s and low-30s in the "medium" term (Adyen doesn't define "medium" term).

Amount in EUR Mn, except %	**2017A**	**2018A**	**2019A**	**2020A**	**2021A**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**2029E**	**2030E**
Gross Revenue	**1,012**	**1,653**	**2,657**	**3,641**	**5,995**	**8,313**	**10,931**	**13,899**	**17,203**	**20,942**	**24,942**	**29,405**	**34,049**	**39,128**
As % of payment volume	*0.93%*	*1.04%*	*1.11%*	*1.20%*	*1.16%*	*1.16%*	*1.17%*	*1.17%*	*1.18%*	*1.18%*	*1.19%*	*1.19%*	*1.20%*	*1.20%*
Growth $		641	1,004	985	2,354	2,318	2,617	2,968	3,304	3,739	4,001	4,463	4,644	5,079
Growth %		*63.3%*	*60.7%*	*37.1%*	*64.6%*	*38.7%*	*31.5%*	*27.2%*	*23.8%*	*21.7%*	*19.1%*	*17.9%*	*15.8%*	*14.9%*
Segments														
Settlement fees	872	1,444	2,373	3,294	5,525	7,681	10,118	12,876	15,948	19,425	23,137	27,270	31,565	36,274
As % of Payment Volume	*0.80%*	*0.91%*	*0.99%*	*1.08%*	*1.07%*	*1.08%*	*1.08%*	*1.09%*	*1.09%*	*1.10%*	*1.10%*	*1.11%*	*1.11%*	*1.12%*
Processing fees	93	133	176	217	290	401	526	666	821	996	1,181	1,385	1,596	1,826
# of transactions (Bn)	3.7	5.5	8.3	11.1	15.8	21.9	28.7	36.3	44.8	54.3	64.4	75.5	87.0	99.5
Growth		*48.6%*	*50.9%*	*33.7%*	*42.3%*	*38.4%*	*31.1%*	*26.7%*	*23.3%*	*21.3%*	*18.6%*	*17.3%*	*15.2%*	*14.4%*
Avg. value per transaction	*29*	*29*	*29*	*27*	*33*	*33*	*33*	*33*	*33*	*33*	*33*	*33*	*33*	*33*
Processing fees/transaction	0.025	0.024	0.021	0.020	0.018	*0.018*	*0.018*	*0.018*	*0.018*	*0.018*	*0.018*	*0.018*	*0.018*	*0.018*
Sales of goods	11	11	15	19	33	40	48	57	69	82	99	118	142	170
Growth		*1.9%*	*36.3%*	*32.1%*	*70.7%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*	*20.0%*
Other services	36	65	93	111	147	192	240	300	365	439	526	632	745	857
Growth		*81.0%*	*43.0%*	*19.2%*	*32.5%*	*30.0%*	*25.0%*	*25.0%*	*22.0%*	*20.0%*	*20.0%*	*20.0%*	*18.0%*	*15.0%*
Total Payment Volume (TPV)	**108,400**	**159,000**	**239,600**	**303,600**	**516,000**	**714,010**	**936,181**	**1,185,947**	**1,462,077**	**1,772,771**	**2,101,916**	**2,466,179**	**2,841,792**	**3,251,095**
Growth		*46.7%*	*50.7%*	*26.7%*	*70.0%*	*38.4%*	*31.1%*	*26.7%*	*23.3%*	*21.3%*	*18.6%*	*17.3%*	*15.2%*	*14.4%*
Growth (EUR)		50,600	80,600	64,000	212,400	198,010	222,171	249,766	276,130	310,694	329,145	364,264	375,613	409,303
1000														
Visa transaction Volume $ Bn	7,196	8,139	8,619	8,714	9,968	10,865	11,734	12,673	13,560	14,509	15,380	16,303	17,118	17,974
Growth		13.1%	5.9%	1.1%	14.4%	*9.0%*	*8.0%*	*8.0%*	*7.0%*	*7.0%*	*6.0%*	*6.0%*	*5.0%*	*5.0%*
Mastercard transaction volume $Bn	5,241	5,901	6,461	6,337	7,719	8,491	9,255	9,995	10,795	11,659	12,475	13,348	14,149	14,998
Growth		*12.6%*	*9.5%*	*-1.9%*	*21.8%*	*10.0%*	*9.0%*	*8.0%*	*8.0%*	*8.0%*	*7.0%*	*7.0%*	*6.0%*	*6.0%*
V+MA Transaction Volume $	12,437	14,040	15,080	15,051	17,687	19,356	20,989	22,669	24,355	26,168	27,855	29,651	31,267	32,972
Growth		*12.9%*	*7.4%*	*-0.2%*	*17.5%*	*9.4%*	*8.4%*	*8.0%*	*7.4%*	*7.4%*	*6.4%*	*6.4%*	*5.5%*	*5.5%*
Total Addressable Market (TAM)	15,990	18,051	19,389	19,351	22,740	24,886	26,986	29,145	31,314	33,645	35,813	38,123	40,200	42,392
Adyen's market share	0.7%	0.9%	1.2%	1.6%	2.3%	2.9%	3.5%	4.1%	4.7%	5.3%	5.9%	6.5%	7.1%	7.7%
Market share gain in bps		20.3	35.5	33.3	70.0	60	60	60	60	60	60	60	60	60
Costs incurred from financial institutions	**782**	**1,295**	**2,106**	**2,935**	**4,961**	**6,913**	**9,106**	**11,589**	**14,353**	**17,483**	**20,823**	**24,543**	**28,409**	**32,647**
As % of Settlement fees	*89.6%*	*89.7%*	*88.8%*	*89.1%*	*89.8%*	*90.0%*	*90.0%*	*90.0%*	*90.0%*	*90.0%*	*90.0%*	*90.0%*	*90.0%*	*90.0%*
Costs of inventory	**13**	**9**	**17**	**22**	**33**	40	48	57	69	82	99	118	142	170
As % of Sales of Goods	*120.0%*	*84.0%*	*112.9%*	*113.7%*	*99.7%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*
Net revenue	**218**	**349**	**534**	**684**	**1,002**	**1,361**	**1,777**	**2,253**	**2,781**	**3,377**	**4,021**	**4,744**	**5,498**	**6,310**
As % of Payment Volume	*0.20%*	*0.22%*	*0.22%*	*0.23%*	*0.19%*	*0.19%*	*0.19%*	*0.19%*	*0.19%*	*0.19%*	*0.19%*	*0.19%*	*0.19%*	*0.19%*
As % of Gross revenue	*21.6%*	*21.1%*	*20.1%*	*18.8%*	*16.7%*	*16.4%*	*16.3%*	*16.2%*	*16.2%*	*16.1%*	*16.1%*	*16.1%*	*16.1%*	*16.1%*
Growth		*59.8%*	*53.1%*	*28.1%*	*46.4%*	*35.9%*	*30.6%*	*26.8%*	*23.4%*	*21.4%*	*19.1%*	*18.0%*	*15.9%*	*14.8%*

Cost structure: Below the net revenue line, the major component of Adyen's cost structure is wages and salaries which was ~20% of Adyen's net revenue last year. While Adyen had only 2,180 full-time employees in 2021, Stripe reported more than 7,000 employees in its "2021 Business Update (LinkedIn shows 7,574 Stripe employees and 1,802 Checkout employees as of this writing). I assume Adyen's hiring spree will continue going forward and projected a 5% increase in salary expense per FTE in 2023-2030. Based on these assumptions, Adyen will have ~9k FTE in 2030, a number Stripe will probably hit in less than couple of years. Salary per FTE can prove to be a bit lower since Adyen is expanding in the US and even though they pay lower compared to their peers in the US, it costs 30-50% more even for Adyen to hire engineers in the US compared to engineers in Amsterdam. Overall, my model does not imply much of an operating leverage even though Adyen mentions *"We aim to improve EBITDA margin, and expect this* *margin to benefit from our operational leverage going forward and increase to levels above 65% in the long-term."*

As per my model, EBITDA margin remains around ~65% going forward.

Amount in EUR Mn, except %	2017A	2018A	2019A	2020A	2021A	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Wages and salaries	56	73	100	151	199	**274**	**351**	**442**	**552**	**684**	**836**	**1,010**	**1,202**	**1,414**
As % of net revenue	*25.5%*	*20.8%*	*18.8%*	*22.1%*	*19.9%*	*20.1%*	*19.8%*	*19.6%*	*19.9%*	*20.3%*	*20.8%*	*21.3%*	*21.9%*	*22.4%*
Total FTE	668	873	1,182	1,747	2,180	2,725	3,270	3,924	4,630	5,464	6,283	7,226	8,093	9,064
Growth		*30.7%*	*35.4%*	*47.8%*	*24.8%*	*25.0%*	*20.0%*	*20.0%*	*18.0%*	*18.0%*	*15.0%*	*15.0%*	*12.0%*	*12.0%*
Salary per FTE		94,375	97,762	103,407	101,421	111,564	117,142	122,999	129,149	135,606	142,387	149,506	156,981	164,830
Growth			*3.6%*	*5.8%*	*-1.9%*	*10.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Social securities and pension costs	9	14	22	29	41	**56**	**73**	**93**	**115**	**140**	**166**	**196**	**227**	**261**
As % of net revenue	*4.2%*	*4.1%*	*4.1%*	*4.2%*	*4.1%*	*4.1%*	*4.1%*	*4.1%*	*4.1%*	*4.1%*	*4.1%*	*4.1%*	*4.1%*	*4.1%*
D&A of tangible and intangible fixed assets	6	9	22	29	35	**46**	**59**	**72**	**86**	**101**	**116**	**133**	**148**	**164**
As % of net revenue	*2.7%*	*2.5%*	*4.2%*	*4.2%*	*3.5%*	*3.4%*	*3.3%*	*3.2%*	*3.1%*	*3.0%*	*2.9%*	*2.8%*	*2.7%*	*2.6%*
Other operating expenses	54	80	95	102	131	**172**	**215**	**261**	**309**	**358**	**406**	**456**	**501**	**543**
As % of net revenue	*24.8%*	*22.9%*	*17.8%*	*14.9%*	*13.1%*	*12.6%*	*12.1%*	*11.6%*	*11.1%*	*10.6%*	*10.1%*	*9.6%*	*9.1%*	*8.6%*
Other income	0	0	0	0	0									
As % of net revenue														
Operating Income	93	173	295	374	595	813	1,079	1,384	1,719	2,094	2,495	2,950	3,420	3,929
Operating margin	*42.8%*	*49.6%*	*55.1%*	*54.6%*	*59.4%*	*59.8%*	*60.7%*	*61.4%*	*61.8%*	*62.0%*	*62.1%*	*62.2%*	*62.2%*	*62.3%*
EBITDA Margin	*45.5%*	*52.1%*	*59.3%*	*58.8%*	*62.9%*	*63.2%*	*64.0%*	*64.6%*	*64.9%*	*65.0%*	*65.0%*	*65.0%*	*64.9%*	*64.9%*
Incremental EBITDA Margin		*63.2%*	*72.8%*	*57.1%*	*71.7%*	*63.9%*	*66.8%*	*67.0%*	*66.1%*	*65.4%*	*64.8%*	*65.0%*	*64.4%*	*64.6%*

Valuation: To generate ~9% IRR, I had to use 30x FCF multiple in 2030. Please note I have ignored working capital dynamics in FCF calculation because cash receivable from merchants and payables to merchants drive working capital which need to be ignored as cash coming from those dynamics are not unencumbered. Moreover, even though Adyen does not appear to be willing to pay dividend or buyback shares "for now", I have assumed 50% of FCF each year will be deployed to buyback shares. Since Adyen intends to beef up its cash position to provide ample comfort to regulators and merchants, I don't know how they quantify ample reserve so that Adyen can think about paying dividends or buying back shares. If Adyen does not use FCF to pay dividend or buyback shares for a long time from now (assuming incredibly low probability for M&A), the IRR assumptions may turn out to be a bit aggressive.

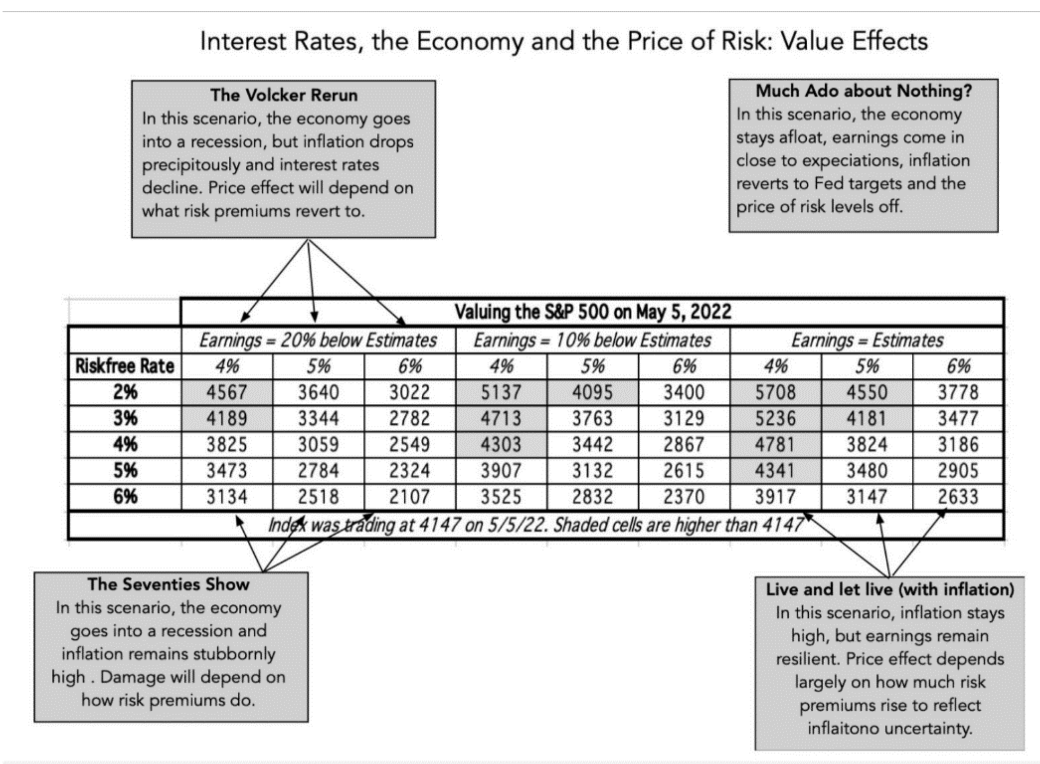
Items			**2022E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**2029E**	**2030E**
FCF											
EBITDA			859	1,138	1,456	1,805	2,195	2,612	3,082	3,568	4,093
Interest			-	-	-	-	-	-	-	-	-
SBC			8	11	14	17	20	24	28	33	38
Taxes			(163)	(216)	(277)	(344)	(419)	(499)	(590)	(684)	(786)
Lease payment			(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Capex			(67)	(89)	(112)	(139)	(168)	(195)	(234)	(281)	(247)
FCF			**628**	**834**	**1,071**	**1,329**	**1,618**	**1,932**	**2,276**	**2,626**	**3,087**
FCF/share			20.5	27.3	35.2	43.9	53.9	64.9	77.2	90.0	107.0
Terminal FCF multiple											**30.0x**
Terminal Stock price											**3,211**
Current price*	**1449.8**										
Dividend/share		-	-	-	-	-	-	-	-	-	-
Cash flow		(1,450)	-	-	-	-	-	-	-	-	3,211
IRR	**9.2%**										
#diluted shares outstanding		31	31	31	30	30	30	30	29	29	29
**Closing price of May 19, 2022*											

Section 6: Final words

While Adyen stock is down ~45% from its peak, I still think the current valuation may prove to be a bit rich. Of course, stock and business can be very much different things. As per the model, Adyen's revenue and EBITDA are assumed to be ~6-7x in 2030 from its 2021 level, and yet during the same time the stock may do a ~2x from current price even if these numbers prove to be true unless you assume a pretty elevated terminal value multiple. Having said that, there are certainly ways Adyen can prove my model to be "conservative" if its market share gain in global, ex-China payment volume accelerates and its new products such as issuing, capital etc. ends up contributing material amount to top and bottom line. I will keep a close eye on market share gain and take rates to re-asses my opinion going forward.

__Portfolio Discussion__: Please note that these are **NOT** my recommendation to buy/sell these securities, but just disclosure from my end so that you can assess potential biases that I may have because of my own personal portfolio holdings. Always consider my write-up as my personal investing journal and never forget my objectives, risk tolerance, and constraints may have no resemblance to yours.

As you are probably aware, the market has been quite challenging for long-only investors, especially investors who are overweight on tech and underweight on energy. My portfolio has also experienced pronounced drawdown (YTD: -31.4%) compared to the market; admittedly I have experienced bit of an ebb and flow in my emotions while going through this volatility. At times, I felt quite excited that as a 31-year-old managing growing pool of savings for my personal portfolio, this is likely to be an opportunity-rich environment in which valuation has come back to earth and I don't have to rely on multiple expansion to generate double digit CAGR return. If I'm right on the business, I can perhaps get double digit IRR without any multiple expansion at all. On the other hand, while I have not experienced a deep and prolonged bear market in my career (neither in Bangladesh nor in the US), looking at market's history I got a chilling reminder that some (or most?) of my stocks may remain in the gutter far longer than I may have imagined. Even worse, it can go down even further from here. Professor Damodaran recently showed potential market scenarios based on different variables, and as you can see below, there are certainly potential scenarios where we can still go down a lot more from here.



Valuing the S&P 500 on May 5, 2022

	Earnings = 20% below Estimates			Earnings = 10% below Estimates			Earnings = Estimates		
Riskfree Rate	4%	5%	6%	4%	5%	6%	4%	5%	6%
2%	4567	3640	3022	5137	4095	3400	5708	4550	3778
3%	4189	3344	2782	4713	3763	3129	5236	4181	3477
4%	3825	3059	2549	4303	3442	2867	4781	3824	3186
5%	3473	2784	2324	3907	3132	2615	4341	3480	2905
6%	3134	2518	2107	3525	2832	2370	3917	3147	2633

Index was trading at 4147 on 5/5/22. Shaded cells are higher than 4147

I understand, and acknowledge the risks on macro level, but while rates can go lot higher to combat potentially persistent high inflation in the near-term, I continue to think long-term inflation and interest rates are likely to come back to low single digits. The secular forces of anemic population/labor growth and deflationary nature of technology are unlikely to reverse course. Then again, macro can be insanely complicated to analyze; while sometimes we can fool ourselves into thinking we understand the range of scenarios, it can still surprise us in unexpected (both positive and negative) ways. Just think about the last two years and what has transpired and it should be intuitive what I'm talking about.

Peter Lynch once said, *"If you spend 13 minutes a year on economics, you've wasted 10 minutes"*. After wasting my "10 minutes", I have inferred that instead of worrying about these things, let me just focus on buying good businesses at reasonable price. In fact, I ended up taking leverage for the first time while investing in the US. I do, however, remember the Buffett quote, *"If you're smart you don't need leverage; if you're dumb, it will ruin you."* In order to save me from myself, I have set a strict 20% max leverage (I'm currently at ~11%). Given my high savings rate and considering I'm still at early stage of wealth accumulation, I can save my way to close my leverage perhaps in a year if I maintain max 20% leverage. I'm more confident about that than believing that I'll continue to get the prices I'm seeing for some of the companies I own. Let me spend more time than usual why I think that for some of my major holdings and discuss some of my portfolio activity since last month. But before I do so, please note I am not here to convince anyone; just treat this as my journal which I decided to share. These are my condensed thoughts on these companies and not deep dives, so I cannot possibly delve into much details here. I understand that reasonable people can disagree with my opinions and that's fine.

FB (~17% weight): I believe FB's underlying earnings and FCF power is noticeably underestimated by the market and sell-side. As I have recently explained here on this twitter thread, FB's maintenance capex is likely to be overestimated by ~$10 Bn by analysts which itself can potentially undervalue FB by ~20-30% assuming just 10-15x FCF multiple. I also think this year's opex may come $2-4 Bn lighter than analysts are expecting (see this tweet). Next year's analyst estimates for opex may also be overestimated by $5-10 Bn. If FB's opex turns out to be ~$85 Bn this year, I think it is very unlikely that FB will spend $102 Bn next year (current estimates) given the current environment; I won't be surprised if it's ~$90-95 Bn opex next year. My 95 percent confidence interval for aggregate FCF range for FB in 2022-2024 is $80 Bn-120 Bn (the variance is largely explained by different macro scenarios; of course there are scenarios where it can do worse than $80 Bn aggregate FCF); all of these FCF are likely to be deployed to buyback shares. For this business, I'm paying ~$520 Bn EV today which I am quite comfortable with. I increased my weight on FB from ~8% in February to ~18% now. You can read my Q1 earnings summary here.

GOOG (~17% weight): What does Google's ~$1.5 Tn market cap imply today? If you assume 15x LTM operating income for Google Services, multiply Google Cloud's current revenue run-rate by 5x (which is growing at ~45% CAGR in the last 2-3 years), deduct LTM corporate costs*20x, and then add net cash, you get to today's market cap. I assign zero value to "Other bets" in this exercise. Again, this seems like a bet worth taking and most "risks" are perhaps in the upside. Sure, in a recession, advertising revenues may prove to be somewhat cyclical, but I have ample time to wait for the economy to normalize. For all big tech companies, there are a lot of discretionary expenses which can be used as a lever to cut down on costs and grow earnings even in a difficult macro environment. While some investors worry about Apple's potential attempt at search, I consider it very unlikely that Apple will try to tackle AR/VR, Apple Car, and search simultaneously especially when Google's TAC has been such a reliable and comfortable source of income for Apple. I increased weight on GOOG from ~12% in April to ~18% now. You can read my Q1 earnings summary here.

ADSK (~14% weight): ADSK generates ~90-92% gross margin half of which is expected to convert to FCF. It trades at ~20x NTM FCF. If we do not assume multiple expansion, topline grows at ~12-15% in the next 5 years, and ADSK does buyback offsetting slightly more than its dilution, I expect to generate mid-teens IRR. I am aware there has been a lot of discussion on SBC and working capital dynamics for ADSK. We are at the point of cycle when investors want to deduct SBC from FCF and then also model dilution. I don't think it's correct approach, and I model only dilution. While working capital dynamics should be ignored for many companies (see Adyen, for example), we may overly penalize some companies by ignoring working capital. Most of ADSK's working capital benefit comes from deferred revenue; many of the operating expenses related to this deferred revenue are largely expensed in income statement even though revenue is deferred. Given the economic reality of ADSK's business, I don't think we should deduct working capital benefits while calculating FCF in the near-term. Of course, in the long-term, working capital benefit should be minimal, so we may need to adjust long-term FCF numbers a little to make sure we aren't assuming persistent and material working capital benefits forever. I increased weight on ADSK from~7% in April to ~14% now.

AMZN (~13% weight): In March this year, I explained why I halved my weight in AMZN: *"I am slightly worried about AMZN's ability to navigate a higher inflation environment, especially in light of the recent geopolitical developments. Given the high capex intensity of both retail and cloud, I wonder to what extent AMZN can insulate itself in a persistent higher inflation scenario. Of course, if AMZN can fully pass the higher cost to customers, it may all work out fine. While AMZN may have pricing power in AWS given the oligopolistic structure in hyperscale cloud, I wonder whether pricing power in retail can be fully exercised in a political environment in which grocery chains' margins are scrutinized and vilified. AMZN may also be quite affected by supply chain issues that may continue to persist longer than anticipated. Moreover, we have lot less clarity on AMZN's "other bets" compared to META and GOOG. I wish AMZN started disclosing EBIT by segment (1P, 3P, Subscription, AWS, Ads, and Others). In a volatile and bearish market sentiment, investors may decide to forget the economics of those segments and focus on the aggregate number which presumably consists of the masked losses from "other bets". I don't have high confidence on the validity of these concerns which is why I still own ~6% in AMZN.*"

While some of my concerns remain relevant, two things changed since then: a) AMZN stock went down by ~33% in two months since I wrote it; and b) I wasn't quite expecting AWS to post ~35% GAAP EBIT margin which not only has valuation implications (see here) but also shows their ability to grow at compelling profitability even when AWS' two competitors are growing at tandem with them. Looking at Walmart and Target's recent results, it is clear that current operating environment is quite difficult for any retailer (both e-commerce and physical retailers). However, as alluded earlier, I think AMZN has a lot of discretionary expenses which are likely to be under the scanner of its management, especially since some prominent investors started questioning it. As AMZN's revenues and operating income shift more and more to services (3P, Prime, AWS, ads) and a lot of capex has already taken place to the point they have now excess capacity, I have started to feel a little more comfortable about their chances to successfully navigate during inflationary period. I am likely to continue to add if stock prices stay here or go lower. I increased weight on AMZN from ~6% in April to ~13% now (bought at various prices between $2,200 and $2,500 range). You can read my Q1 earnings summary here.

IAC (~12% weight): I have shared the following SOTP a few days ago to figure out what's implied in current stock price. IAC, in my opinion, is mostly a publicly traded security to access the "access game" i.e. VC investing or investing in private companies at fees that are materially lower than VC fees. Thoma Bravo led $60 Mn funding round for Vivian last month. How much do you think IAC's public shareholders effectively paid for Vivian?

I increased weight on IAC from ~10% in April to ~12% now.

Segment	# shares owned by IAC	Current Price	Value	Per share value of IAC	Comment
ANGI	425	4.5	1,911	22	
MGM	64	36.5	2,318	26	
Turo			600	7	IAC owns ~30% of Turo (including warrants). Assumed valuation $2 Bn
Dotdash+Meredith			3,150	36	~300 Mn adjusted EBITDA this year, and $450 Mn adjusted EBITDA next year. Assuming 7x 2023 EBITDA
Search			402	5	4x annualized operating income
Emerging (Care+Vivia+Bluecrew etc)			67	1	0.1x annualized revenue; Note that just Vivian stake itself was "worth" $300 Mn in the recent funding round led by Thoma Bravo
Net Cash			(200)	-2	
Corporate overhead			(1,000)		~$90-100 mn costs/year, valued ~10x
Total estimated value			7,247	82	
# of shares of IAC			88.0		

BRK (~10% weight): Before the pandemic, BRK was ~10% of my portfolio. After the pandemic, I noticed a massive valuation dislocation in July, 2020. Even though S&P 500 almost recovered to its pre-pandemic high by July 2020, BRK was still trading near its Covid lows. I increased BRK's weight to ~20% and kept around that level for last two years before selling half of my shares in $320-330 range in the last week of April. Since July 2020, BRK was up +73% vs S&P 500 +30% and NASDAQ 100 +18%. I believe similar alpha is perhaps more likely to exist in big tech today than in BRK over the next 2-3 years; therefore, I decreased BRK's weight back to ~10%.

The two stocks that I sold completely are LULU (various prices between $380 and $390) and ANSS (at $296). While LULU's long-term future is likely to be bright, I thought IRR in some of my other portfolio holdings are potentially much higher. Moreover, the macro environment can prove to be challenging for LULU. The decision to sell ANSS also had similar rationale; in order to generate mid-teens IRR, I would probably need to rely on sustained elevated multiples. Besides, after owning and following the company for more than a year, I thought I had initially overestimated their topline growth potential. While Ansys is a strong business with little terminal value risk, valuations did not appear to be compelling, especially with more muted topline growth than I assumed. Both LULU and ANSS stock went down by 20-30% since then and IRR are likely to be reasonable from here, but still likely to be lower than my current holdings.

I have also added to SQ, SHOP, and TRUP. But these are much smaller adds compared to the stocks discussed above. While I do think valuations are getting more reasonable for these stocks, operating environment may remain challenging for SQ and SHOP. SQ's exposure to low-income demography, BNPL, and potentially higher dilution to retain employees makes the situation a little murky. However, given my time horizon, I can afford to look through the short-term headwinds and I do think SQ can be a compelling long-term opportunity from here.

For SHOP, there has been a lot of talk about "Buy with Prime" and the potential devastating impact on Shopify's merchant solutions revenue. While these potential concerns are not quite unfounded, I also noticed how SHOP's GMV $ growth was higher than AMZN's GMV $ growth in 1Q'22. When you look at this data in the context of ATT headwinds and historical trends, it seems even more remarkable. AMZN's excess capacity is unlikely to last too long once they get closer to the holiday season this year; I'm not sure AMZN will be able to do a great job at meeting customers' expectation by delivering both its own marketplace customers as well as Shopify's merchants' customers. Ultimately, it is not beyond doubt that AMZN may just choose to prioritize its own marketplace customers once excess capacity issues get resolved over time. I do admit that among the companies I own, the range of outcomes is the widest for SHOP. SHOP's valuation can be ~$30 Bn to ~$300 Bn in 2030. Given such a wide range, I will keep my weight low (max ~5%) in SHOP.

I don't quite expect current market to snap back materially; if this turns out to be a prolonged bear market, it can potentially shape who I am as an investor. I am committed to investing for the long-term, studying one new business every month, and trying my best to allocate my savings prudently. While it's not fun to see my portfolio dwindle, I am enjoying studying business just as I did at any point of my investing career!

My current portfolio is disclosed below:

Ticker	Avg. Cost	Current Weight*	Unrealized Gain (loss) %	First Bought	First Buy Price	Last Bought	Last Buy Price
FB	215.5	17.3%	-11.2%	Aug'18	172.8	Apr'22	172.3
GOOG	2,422.7	17.0%	-8.6%	May'19	1,150.2	Apr'22	2,284.1
ADSK	241.3	14.5%	-19.7%	Feb'21	301.3	May'22	190.8
AMZN	2,622.2	12.7%	-18.1%	Feb'20	1,820.0	May'22	2,203.3
IAC	104.3	12.5%	-22.0%	Jul'20	83.0	May'22	80.1
BRK.B	202.7	10.2%	50.1%	Aug'19	199.7	Nov'21	285.2
SPOT	180.0	6.1%	-41.2%	Dec'21	239.6	Mar'22	120.0
SQ	163.1	5.7%	-46.6%	Sep'21	271.3	May'22	76.4
CNSWF	1,733.8	5.4%	-11.6%	Mar'22	1,733.8	Mar'22	1,733.8
TRUP	76.0	5.3%	-17.3%	Oct'21	80.0	May'22	61.0
SHOP	605.6	3.5%	-35.4%	Jan'22	826.3	Apr'22	461.8
ANGI	11.7	0.9%	-56.0%	Nov'20	11.7	Nov'20	11.7
Cash		-11.1%					
Total		100%					

**Based on prices as of May 19, 2022 (time-weighted YTD: -31.4%); Since inception (August 24, 2018) time-weighted annualized return +8.6%*

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