Fintech

A high level view and gaining intuition for what companies do

Examples of big winners:

Stripe

What exactly do they do

They are a payments gateway that connect merchants/startups with an online presence to existing legacy payments infrastructure like banks and card networks. They are an end-to-end solution which just involves creating an account with them (for non-devs) or hitting their API (for devs). They are cheap, simple to use which is a big selling point as a lot of other developers can cut payments-related code out of their codebase now (including things like building a dashboard to visualize revenue, compliance requirements for routing payments internationally)—essentially IaaS.

How did they come up with the idea or see the problem

Patrick was working on side projects, like the one that evolved into Auctomatic, and ran into the problem of accepting payments over the web first-hand, and questioned why it was so difficult to do so. They had some background with fintech via Auctomatic and so knew they had the background and connections to be able to go about solving it. They then prototyped and iterated for 6 months before finding a customer.

What will they do in the future and will it change the world

Outside of expanding the reach of their payments API, they want to do other things that allow for a lower barrier to entry to starting a company, like Atlas, which registers/incorporates a company for you, and start to lend to companies, potentially as a bank. They have over a billion in revenue, but whether they are profitable is unknown. From a leverage perspective, they really are changing the world—they are an important piece in increasing the "GDP of the internet" by removing an important barrier to entry, making way for thousands of tech startups that may never have existed otherwise.

Why did no-one do this before

No developer had a background in payments? IaaS was not really a business model back then?

Brex

What exactly do they do

A corporate credit card that is easy to get and use for startups. They give it less stringently to startups based on metrics of the business as opposed to personal credit history and using it 1)_ provides more insight into how employees expense money. You pay the charges off (it's a charge card, not quite a credit card) every 30 days and CANNOT move debt from one month to the next—you must pay every 30 days. It 2) has no personal guarantee 3) has above average rewards, importantly on things startups needs, like Google Ads and AWS as opposed to hotel

points and shit like other cards. Allegedly, they make more money off interest from big successful startups that spend a lot of money than they lose on startups that default on a loan one month and can't pay back what they spent.

How did they come up with the idea or see the problem

The founders sold "the Stripe of Brazil" when they were still in high school, having raised $30M and processed >$1.5B in transactions as young teens. They then started a couple more companies, which failed, before starting Brex. As with all fintech companies, they take one service (startup spending) and do it better than what big incumbents can afford to do. They have a business model innovation in that they can afford to not have a personal guarantee from founders and because of it being a charge card and big startups spending lots of money and being reliable bets they make more money than they lose in 1 month of spending if a startup spends that month then dies.

What will they do in the future and will it change the world

They are innovating new products, like trying to make bank accounts obsolete via Brex cash. They have given capital to lots of companies that genuinely would not get a card from a bank in the past, allowing them to grow and succeed and provide value to consumers where they otherwise can't. Trend in IaaS or enabling platforms that lower activation energy using some clever business model innovation implemented through technology.

Why did no-one do this before

Niche corporate credit cards, weird thing for a fintech to go after? I guess some ideas really hadn't been tapped beforehand, being seen as batshit crazy or childish.

Robinhood

What exactly do they do

An app that allows you to trade securities for no commission, thereby "democratizing" it. Many people who would never have traded before trade now because of this. That said, other competitors have sprung up with a similar model, making it lose its moat, and is just distinguished by the fact that it was the first and is currently the most robust. It offers the same services that brokerages (people who are licensed to enact trades) do, like Fidelity Investments and Charles Schwab.

They make most of their money from payments for order flow direction—they send the orders from their clients to particular "market makers" (Two Sigma, Citadel, etc.) that benefit from each transaction made through them as opposed to directly via an exchange, and give Robinhood a commission for doing so—but since each exchange takes different fees from the customer's trade order cash flow, this is potentially a conflict of interest, and the SEC mandates that the brokerage disclose this.

How did they come up with the idea or see the problem

After occupy wall street, they wanted to come up with a way that the 99% could trade just as easily and painlessly as the 1% who had insider access to the bureaucracy that was strangling

the majority. It's interesting that they had 75 failed investor pitches, much like other unicorn founders who had 50+ failed pitches under their belt.

What will they do in the future and will it change the world

They are continuing to try and offer new ways to give customers free access to things and innovate the back end to make it financially viable. In aggregate, they've allowed a few hundreds thousands people in the middle class to make a few hundred, if not a couple thousand bucks (though I'm sure many have also lost money) that they would not otherwise had—it's not clear that this is net positive for society in itself, though I'm sure that the business model innovation will be useful in other, subtle, ways in the future.

Why did no-one do this before

Genuine business model innovation? I'm sure other people had the idea, but none could make it work—these guys wrote the tech that enabled it, had the right networks to get sufficient talent, know enough VCs, be just tenacious enough, and I'm sure a combination of other factors.

SoFi

What exactly do they do

They give student loans, undercutting existing lenders by taking into account the likelihood of customers to pay back their loans based on their education and background, and by converting operations into technology as opposed to in-person. They finance these loans by selling them to asset managers like pension and hedge funds that know they are likely to be paid back. If they cover a student loan for $100, the incumbents charge 7% APR and SoFi charges simple 5% over, say, 5 years, when the principle is due. At the end of the 5 years, they have been paid $125 by the borrower. They sell the loan to investors for $105, and the investors make $20 profit, leaving $5 for SoFi. They've used similar business model innovation to branch out into other types of loans—this is fundamentally creating a new financial instrument and implementing it using some technology, not really a technology startup. They are valued at over $4B. To be able to extend credit before loans having been paid back, they receive enormous amounts of funding from banks and investors—quite literally a form of VC2C.

How did they come up with the idea or see the problem

Four MBA students met at GSB, and since this was inherently a problem of coming up with a better financial instrument rather than any meaningful technology innovation, people with backgrounds in finance were well enough equipped to start the company, and knew the right people to ask for capital at the intersection of startups and finance. They had obviously experienced the problems themselves, and were in a position to solve it.

What will they do in the future and will it change the world

Branch out into other loans and generic financial products. I don't think this is productive—the good customers are subsidizing the bad ones, who need insurance most, and separately only treating them basically stops anyone who really needs a loan from getting one. This is just an efficiency optimization to make money.

Why did no-one do this before

Perhaps genuine business model innovation. I'm sure people have tried to use peoples' career prospects in underwriting before, so likely partnerships/networks they had to make it possible.

Plaid

What exactly do they do

Financial IaaS for bank integrations. If you have a startup idea, you don't need to partner/integrate with hundreds of banks to get information about the cash flow of your customers, you can just tap into Plaid who has done all of that for you, and move on with building your product.

How did they come up with the idea or see the problem

The co-founders were trying to build other braindead fintech apps and in the process of doing so repeatedly had to rebuild integrations and partner with banks to get off the ground, which came with a lot of overhead, and so they pivoted to build a unified payments API instead.

What will they do in the future and will it change the world

The key play here is getting user consent to use their data. Plaid powers all fintech companies under the hood, and so they need to explicitly ask permission for plaid to use and collect their data—all data about everyone's banks and transactions. This data is an immense treasure trove. An interesting take is that Visa bought Plaid to quietly kill it because it enables the kind of banking innovation that would put Visa's customers—issuing banks and credit unions—out of business.

Why did no-one do this before

Affirm

What exactly do they do

Its foundation is predicated on the fact that the credit card is very nuanced and powerful, much too so for the layperson, who will not understand the complexity of compounding interest, etc., and just wants to see things in plain dollar amounts, with no additional hidden fees. supposedly, taking individual loans on items brings clarity and simplicity—a blunter tool than the credit card, if you will—to the process of buying things. Essentially, they allow you to take a POS loan on an item and pay it back month-by-month—a fundamentally new way to pay for shopping.

How did they come up with the idea or see the problem

Levchin was the first mover in this space, with a deep background in consumer finance and payments. The problem he saw was that credit cards were too nuanced for a layperson to navigate successfully, and they needed a clearer way to borrow to buy stuff.

What will they do in the future and will it change the world

They are constrained by the number of partnerships they have—by the number of vendors that offer the opportunity for consumers to finance their products this way. If they scale to billions,

they can save consumers billions if not trillions of dollars that those consumers can spend elsewhere (but it's not clear that the act of saving these people this money is adding value to society).

Why did no-one do this before

Point-of-sale loans are hardly new — banks have been offering them indirectly at the likes of furniture stores and orthodontists' offices for decades. The biggest players historically have been Wells Fargo, Citigroup and Synchrony Financial. But this type of lending has become increasingly popular in recent years as technology has improved to the point where merchants and contractors that previously may have only accepted cash, check or credit cards are now offering the option of a loan at the moment of purchase, whether online, in stores, or in person. They have also been a boon for online lenders — San Francisco-based Affirm originated more than $1 billion in point-of-sale loans last year — and, increasingly, for regional banks that are funding the loans, either directly or behind the scenes.

At a high level, the purpose of the financial industry is to allow for efficient access to capital by both consumers and businesses. That is to say, make borrowing and lending easier. When done correctly, people can deploy capital that is not theres, strengthening the economy (more goods and services, in absolute terms, produced) as well as promoting social mobility. Fintech refers to use of software and algorithms to improve the efficiency of this process, previously thought of only in bank-end of large financial institutions but now also in the hands of individual consumers.

Thematically, Fintech startups try to offer the same services that large institutions do, but using technology to reduce operational costs, and offering a simpler interface. In other words, making personal and business finance cheaper and easier. This could be everything from personal money transfers to personal investing. In the industry, partnerships are king. How many banks/lenders does your API interface with? If you can't partner with the big players, you have no value prop for your consumers and the network effect won't kick in.

Important avenues for Fintech work include banking (mobile banking), personal finance (robo-advisors and investment tracks), insurance (rethinking incentive structures and automation), and crypto/blockchain. Part of the reason that big tech companies are getting into finance is because big tech itself is starting to become more regulated, and so they aren't moving as fast as they used to and hence lose less by setting roots in the finance space (where all the biggest non-tech companies are).

Interesting to note the hype around new technologies affecting stock price—an iced tea company (Long Island Iced Tea) changed their name to Long Blockchain corporation, and share prices went up 430%. This name-hype phenomenon has been observed in the past with .com and .ai too.

Geographically speaking, London and New York are financial hubs, and so people tout these cities, as well as others like Singapore and Hong Kong, as Fintech capitals. This is not the case. The San Francisco Bay Area is, and will continue to be, the world capital for anything to do with technology, Fintech included. All the biggest Fintech companies come out of the valley, because they are fundamentally technology companies, and the valley is ripe with both talent and funding. It should be noted, however, that rising commercial rent prices and increasing taxes (to

pay for homelessness shelters, etc.) are stacking the odds slowly against the city in the long-term.

Fintech IaaS future

One opinion/bet is that every company will become a fintech company. Just as AWS took away all the overhead from starting a software company, new startups will soon enter the space and provide IaaS products reducing the complexity and overhead that comes with starting a fintech company. Currently, there are several barriers/hurdles when one wants to start a fintech business, since it's heavily regulated. Before you even start building out your actual product, you have to get certain licenses, find ways to ensure lots of compliance with regulation (and, indeed, know what that regulations even is)

The premise here is that current banking experiences are shitty (from surveys) and large investments into technology are just being used for maintenance of shitty, legacy systems rather than genuine innovation on behalf of the big banks. But there is a big moat a la complex regulations and infrastructure—if only someone could abstract those away people would love to compete with the big banks.

The current way to offer any banking services involves 1) applying for a license (which takes years, so many startups looking to offer banking services borrow a license from an existing player) 2) core systems that actually store/move money from place to place 3) payment systems that allow customers to get money out of their accounts 4) giving loans means you need to know customers' backgrounds which come through credit bureaus (private, for-profit companies that collect information on you, like Equifax or TransUnion) 5) comply with regulation from government agencies 6) prevent fraud. And to do all of these, you need partnerships and integrations with loads of companies, from payment systems to credit bureaus and more, which takes lots of time and money. This is analogous to how 15 years ago if you wanted to start a software company, you'd have to buy servers, set up racks, and build out all the *very same* infrastructure again and again until AWS came in and abstracted it away at scale, which is exactly what can happen with each one of these obstacles—it can be abstracted away.

Examples of how you'd start some fintech companies

Financial planning/budgeting help application—this doesn't need to reinvent the stack, it just needs some information on your spending habits to get information *out* of the stack. To serve people, you need to know everything about all their bank accounts; i.e., exactly what they are doing with their money. You need to be able to hit the APIs of hundreds of different banks (these are integrations), and structure code to be able to stomach different core systems you're interacting with (UBS loans vs M&A may have non-uniform data formats, etc.) and compliance methods for each bank. You also need to integrate with brokerage firms like Fidelity that have information about your customer's investments/trades. Similar with information about their payroll—when they're getting paid, how much, by whom, means you have to integrate with firms like Gusto and Zenefits, and then other miscellaneous things like student loans, which begets an entirely different set of integrations. *Here's the kicker—Plaid builds and maintains all of these hundreds of integrations, and translates data into the format that you need, meaning that you don't spend months setting up the infrastructure for your financial planning web application, you can just hit the Plaid API and get up and running in a day. Isn't that crazy?!*

Another example is Synapse, which actually implements these integrations, and integrations with ATM providers and more, so you can actually start a banking service on top of it, like Mercury—the ads for which you've seen all the time when walking around the city.

Another example is ComplyAdvantage, which makes it easier for banks to find fraudulent accounts. Normally, banks have to integrate with hundreds of government lists of suspects, and then iterate to make sure none of them have access to accounts. Not only does this lead to frustrating UX in a false positive case, but also means banks have thousands of employees just so they can manually comply with these regulatory mandates, and still are pretty terrible at this. CA reduces integrations to one, and automates much of the searches for fraud, saving banks tons of money.

This is important because a platform like AWS essentially launched us into the tech-centric world we know today, where startups are ubiquitous and omnipresent in their influence. Many of them wouldn't have come to exist wit it wasn't easy to start a software company. The same will happen in finance, where tons of new fintech products will enter the market, adding to consumer choice, lowering prices and making finance generally less bureaucratic and much easier to navigate just by virtue of competition.

There are lots of opportunities for companies building IaaS, but even more for companies that *use those products* to get financial services as one of their offerings, just like Rappi is offering financial services to the unbanked that are using their food delivery platform (and Uber is introducing Uber Money). Moreover, bigger institutions can move faster as a result of this, and have more startups to partner with.

The future of Fintech (and general entrepreneurship advice)

A general advantage of the Silicon Valley paradigm is that smart people have access to lots of problems they would otherwise never be exposed to, because all those problems have a common thread—they can be solved using technology. In this way, an atomic physicist turned software engineer could improve the efficiency of the taxi industry, then how people get loans, then how people order clothes, all in one career. That would never have happened 50, or even 20, years ago. There's a fundamental paradigm shift that the valley has brought about in how problems are solved, and it's more than "just another industrial fad" in that sense.

Another key insight is that most tech companies don't use advanced tech. They use tech as a medium to make one unified end-to-end experience that is clean, simple, fast, and easy. And there is no industry more wrought with customer dissatisfaction and unnecessary bureaucracy and complexity than finance.

An aside—when a16z finance branch head met 19 year old Patrick Collison in a Palo Alto cafe, when asked about how he'd take over from incumbents, Patrick responded with "my customers don't exist yet". How incredibly *chilling* in its visionary accuracy and self-awareness. He saw a wave of tech companies coming into the world, and Stripe would capitalize on that market.

An important thing to recognise when founding a company is that your idea is not novel. The difference is successful founders recognize that, and think about how they can best position the idea to succeed by planting it at the right place and time.

Battles between startups and big incumbents often come down to whether the startup can get to market sooner, or whether the incumbent can innovate sooner, and very often it's the latter.

A huge operational point to be mindful of is the importance of distribution channels—who controls access to the consumer. After Square and Stripe build out their customer base and have many people using their platform, their CaC becomes near 0 going forwards since so many people are using their products. This is specific to platforms, since they can build products on top of their own platforms, unlike others' products, who are dependent on Square and Stripe's infrastructure. This is why it can be beneficial to think of a first product as a boring product that establishes a platform/distribution channel upon which you can build other products. It's enormously powerful to have both distribution AND engineering talent.

On the Chinese fintech market—many believe china to be ahead of the US in fintech due to 1) quick user adoption due to cultural reasons 2) leapfrogging over existing infrastructure. It's interesting how different cultures can evolve in separate directions due to small variations in initial conditions—Chinese weChat has the ability to buy movie tickets, serve as your asset manager and a chat application all in the same app—that would never be culturally normal in the US!

It's also important to recognize that you can embed and couple fintech innovations in any other industry—Zola Electric and M-Kopa are energy innovators in developing countries that finance their products by giving them to customers and getting customers to pay back their loans with the savings from using their product (via mobile banking), thereby making something that was previously uneconomical, economical and giving clean, 24/7 power to millions who wouldn't otherwise have it. In the future, insurtech for cars will be part of buying the car, and similarly other verticals will integrate technology into them in the same way.

Interview of Max Levchin of Affirm

He sees a future where you can walk out of a store having bought something with a mobile wallet, and at POS the wallet had AI embedded that chose a particular method of financing that particular thing (groceries vs car, etc.) based on both your background and the market more broadly (taking a POS loan vs up-front payment vs using other financial products, etc.) to optimise your money saved.

He believes that the credit card loan system, as a product, is very nuanced and complicated, and far too subtle for the average layperson for whom it was intended to be useful. And then when the average person doesn't fully understand its complexities, they seek refinancing and birth the current trillion dollar debt.

Understanding Visa as a Case Study

Understanding Visa is a good way to understand the payments landscape and the complexity behind much of the world's financial infrastructure that happens behind the scenes. Almost no member of the public actually understands how this company works, despite it being the very backbone of modern payment technology. Visa doesn't give loans (that's a bank) or issue credit cards (also a bank), merely connects the banks that need to transfer money.

A customer goes to a shoe shop to buy a shoe. They flash/insert their card, and when this is done a message goes from the card reader at the merchant (shoe shop) to the acquirer bank (the merchant's bank) which then routes the card request through Visa's network, which then hits the issuer bank (the customer's bank) that does identity verification, credit checks and fraud prevention before sending a request back to the acquirer bank (through VisaNet) saying the transaction is good-to-go, in which case, the POS terminal shows the card has been approved, and the customer leaves. Later, overnight, the acquirer bank deposits the money from the days sales into the merchant's account, and the issuer's bank pays them back (through VisaNet) and is paid by the customer when they pay off their credit at the end of the month. There are transaction small fees littered throughout the process, which mean that for every $100 a customer pays, the merchant gets about $98, with the rest being split by Visa and the banks in processing fees. The real value prop in this complex system isn't just the authentication and fraud checks, but the systems in place in case something goes wrong. In this case, there's complete and instant transparency into where money went and how it got there, so that funds can be traced and secured in case of any fraud. In payments, security is at the heart of everything that is done (take class on cryptography and cybersecurity if interested in solving fintech problems). There are also additional layers of complexity like other parties intervening and exchanging small sums of money to send to airlines and hotels to fuel rewards/loyalty programs, etc. Visa also has other Fintech products, like the entire ATM network.

But because all of this communication infrastructure is so complicated, it's all based on legacy infrastructure (AmEx hires devs who write in a 1970s language, so that's what their backend must be based on—billions is spent on maintaining this infrastructure). This means it's almost impossible to move fast and keep up with current best practices. So when we started using electronic payments, instead of the acquirer bank implementing the infrastructure for this, payments gateway companies like Stripe came in, and basically said we'll be the intermediate between online card details and the whole credit-card-5-parties loop we just discussed since the acquirer back didn't have the bandwidth to accommodate loads of different browsers and data formats. This is important because then by working with the gateway, the merchant is agnostic to the backend infrastructure—they can swap banks/from Visa to MasterCard based on what's pricing optimal, and the merchant potentially will not be able to tell as they're just using Stripe.

Biography of Levchin
Grew up in Ukraine to a family of physicists, escaped after the Chernobyl accident. Introduced to programming in assembly when 11, became deeply passionate about computing and studied CS at Urbana-Champagne. Moved to Palo Alto at peak of dot-com explosion and met Thiel at a Stanford lecture, and talked lots with him then co-founded PayPal. His deep experience was not a huge advantage when building it though as it's not as if it was cutting-edge software, just a new way of thinking about payments and a bet that people will want to send money over palm pilots in the future. Similarly, the Collison brothers, when asked who their customer was in a Palo Alto cafe, replied that "my customers don't exist yet" when thinking about how millions of merchants were about to come online. *Both of these were big bets on a particular future coming to life in the next 5 years based on extensive research, firsthand experience in the industry, and general independent/intelligent thinking.*

The physical cost and overhead of infrastructure like branches, tellers, ATMs means that small transactions are money-losing, which isn't the case with digital banking, where you can afford to take small margins off small transactions at scale. There are challenger banks popping up everywhere in the developing world, like mPesa in Kenya, bKash in Bangladesh, easyPesa in

Pakistan, and virtually an analogous one in every major developing country. There are still difficulties in getting these types of companies off the ground—you have to apply for a banking license, partner/be supported by a bigger bank, all of which takes a lot of time and capital, and a lot of failures on the way. There's also strict and often nebulous regulation around the industry which only big banks can stomach.

mPesa works by allowing people without access to a bank account to use it through a SIM card and their phone number as their unique ID. You take cash to an mPesa desk and they credit your phone number with money, which you can then transfer easily however you wish.

Despite all this, a little under 2 billion people remain unbanked, without access to basic financial services. Only a third of Africans are banked, and around half of south Asians. How might we align incentives to solve this, using mobile or otherwise?

3 Ways Startups Are Coming for Established Fintech Companies -- And What To Do About It

When competing with an incumbent, it's less about taking *all* their customers than taking *their most profitable* ones. For a startup vying with an insurance company or bank that has to underwrite insurance or loans, you can do so by offering the very best customers better rates, because they are less likely to default, and still be profitable. The big players need these customers to subsidize paying for bad customers, but you don't *have* bad customers and thus can thus undercut them (only accepting healthy people or safe drivers, as measured by a variety of metrics used in underwriting). This is what SoFi is doing with student loans, offering lower rates by 1) having less overhead via being a tech company and 2) predicting future career prospects and offering better rates by only loaning to high-potential people. So the first way a startup can take on an incumbent is by using psychology in marketing and their business model to select for a particular type of customer that is especially profitable.

The second approach is to collect and leverage new sources of data that incumbents would never think to collect—literally anything—and check for correlation with credit worthiness (signal building like at RenTec). There is lots of regulation surrounding who you discriminate against—if any signal you match (like number of cats you own) corresponds to a gender, race, religion, or something of the sort—you can't use it as a basis to not give someone a loan. Instead, by collecting new and unusual data sources like phone metadata you can map signals to determine how creditworthy someone is without any discrimination.

The final way that startups can take on incumbents is by changing the behavior of customers to benefit them. This could be by employing a business model that taps their peers and gets co-commitments as a social pressure for the borrower to pay back their loan, or using their phone to re-underwrite their insurance prices every day, forcing them, say—if it's car insurance we're talking about—to make sure they aren't trying to game the system by changing their behavior in the short term to simply get a good deal.

Would I like to look further into this industry in college? Why?

There seems to be a big difference in terms of philosophy, mission and impact between finance (banking, hedge funds) and fintech. There is little bureaucracy, nepotism and corruption in

fintech because fintech companies are ultimately technology companies employing engineers, but they are offering many of the same services as banks, at scale (other financial institutions, like hedge funds, really don't offer any services/value to society). I hadn't realized this until now because I had little to nor exposure toor understanding of finial products/services, but offering people access to financial products genuinely means they get access to capital (and hence opportunities) they would otherwise, in less efficient and innovative markets, have access to. This can be life-changing—the difference between owning a house and a car and sending your kids to good schools and being able to afford healthcare for your family, all done even though you don't quite have the money to do so straight up. Banks offer many of these products, but are culturally prone to corruption and misaligned incentives and bureaucracy. Tech companies offer these services, and more, and suffer none of those problems, and can also automate software to solve and deploy these solutions at scale. A company like Plaid without which potentially hundreds of *other* innovative fintech companies could not have entered the market, is literally adding billions of dollars of value and hundreds of new, creative, potentially world changing ideas to humanity, giving people access to trillions in capital they wouldn't otherwise have had access to. Financial services can be confusing at times, sure, but when done right, they add tons of value, and I couldn't see that before because the canonical intuitions of finance (banks, hedge funds, etc.) are not optimizing for impact.