THE FUTURE OF FINTECH

MARKET RESEARCH REPORT

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Introduction

From decades ago to the modern age, Finance has been associated with banking, leverage or debt, credit, capital markets, money, and investments. To pursue financial activities, traditional banks were used. However, technology's advancement is allowing information technology to transform finance in global markets, developing countries, and startups: a concept called financial technology. Financial technology (Fintech) refers to new technology that seeks to improve delivery and use of financial services. At its core, it is meant to help investors, managers, owners and consumers better manage their financial operations and processes by utilizing specialized software. Over the last decade, Silicon Valley has seen explosive growth in the sector, with investments increasing from 5% to almost 20% from private venture capital alone.

When originally coined, the term referred to technology employed to backend processes at highly regarded financial institutions. However, there has been a shift towards consumer oriented service and therefore the term has adopted more of a consumer oriented definition.

History

Fintech has been rapidly evolving from its base in the beginning as a simple mode of communication to its analytical driven computation today. Between the late 1880's and late 1960's, advancements such as the telegraph, steamships, and railroads were created to transmit financial information across the country. Alongside these marvels, Fedwire, the first electronic fund transfer system, was established. Around the 1950's, credit cards were introduced to eliminate the need to carry cash. This era of creation was taken over by the advancing era of fintech between the late 1960's and early 2000's, a period of digitization. In the late 1900's, traditional financial institutions created the first calculator and ATM. Right after, the formation of the first digital stock exchange changed the way business worked in 1970, also known as NASDAQ. A little bit later, mainframe computers from the banks were introduced along with online banking in financial institutions. The early 2000's sought complete digitization between providers and customers. The evolution of fintech to modern day mainly consists of startups who are replacing current financial services. New players started to enter the banking industry as distrust and changed mindsets started to appear with traditional banking systems. Bitcoin coming

into the industry in 2009 started the developments of new cryptocurrencies. Lastly, the ongoing expansion of the smartphones has allowed online financial services to be easily accessible within the click of one button. A complete detailed timeline is shown in Figure 1.1 below.

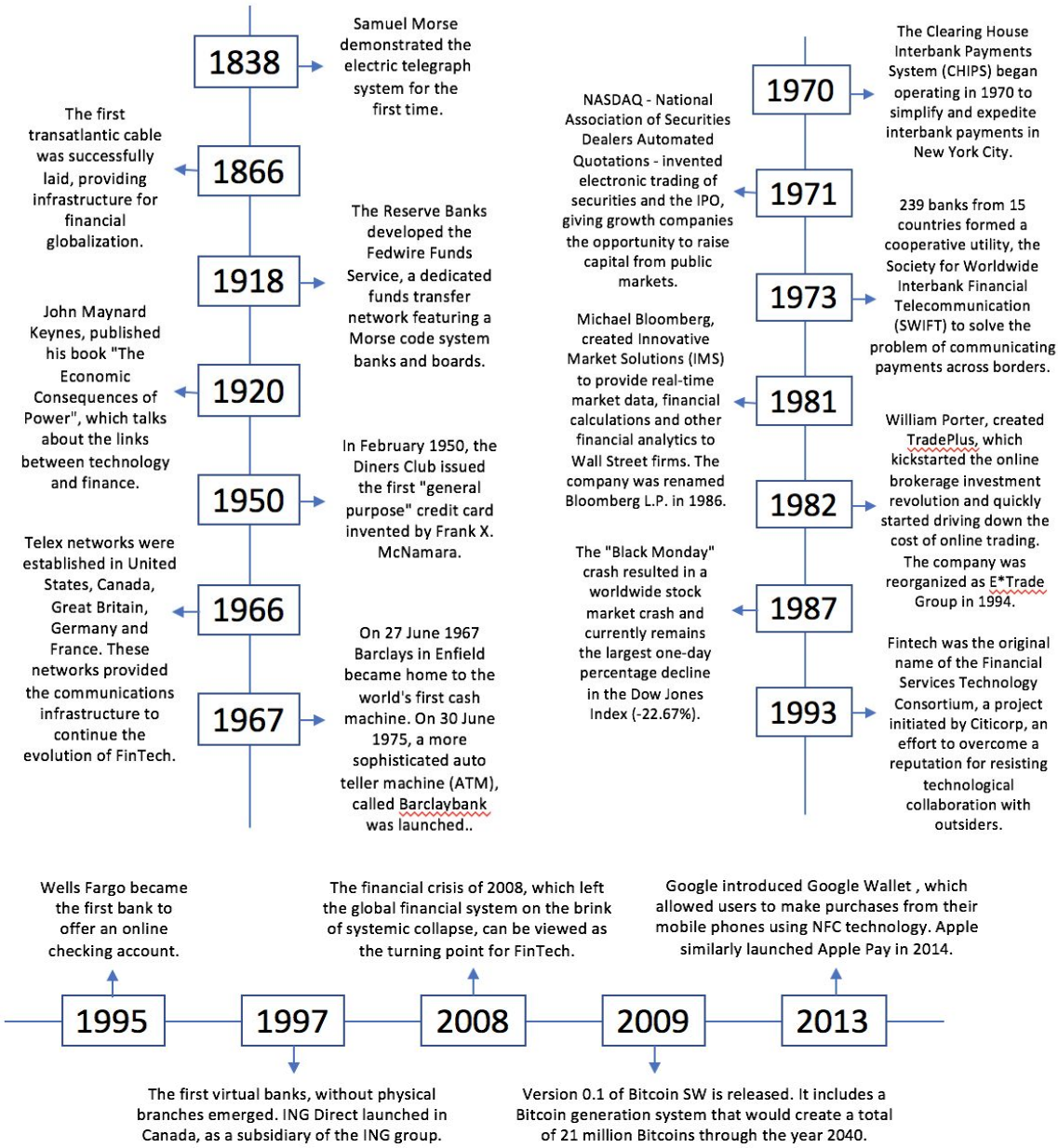


Figure 1.1 Detailed Timeline of Fintech

What is Fintech?

Fintech in literal terms is a portmanteau of "financial technology", and represents the application of new technological advancements to products and services in the financial industry. Fintech refers to any business that uses technology to enhance or automate financial services and processes. Fintech is a broad and rapidly growing industry serving both consumers and businesses. Companies in the Fintech sector range in their products from mobile banking and cryptocurrency to investment applications [Appendix B.4].

Looking more at the funding rates for fintech companies, historically acquisition costs have been smaller, however, incumbent corporations are looking for bigger deals these days. For example, PayPal just completed its largest ever acquisition of Honey, at $4 billion. The pipeline of fintechs is growing too. Quarterly funding for fintech has been on the rise for the last few years. In 2019, there were over 59 megarounds, defined as over $100 million, globally [Appendix B.6,7].

As mentioned previously, there are several different types of application in the broad field of Fintech: Cryptocurrency, Personal Finance, RegTechs, Digital Banking Software Providers, and Payments and Remittances. In this section, we will explore some intricacies of each.

Cryptocurrency

By definition, cryptocurrency or colloquially known as "crypto", is a digital asset designed to work as a form of exchange that uses strong cryptographical techniques to secure financial transactions, controlling the creation of additional units of said currency and their verification. The reason that cryptocurrency has seen such an uptrend in the past few years is the use of a decentralized control as opposed to centralized digital currencies or central banking systems. The decentralized control of each cryptocurrency works through distributed ledger technology, typically a blockchain, that serves as a public financial transaction database.

Simply put, a blockchain is a growing list of records, called blocks, that are linked using various cryptographic methods. Each block contains transaction data of the previous block, a

timestamp, and transaction data. Companies are struggling with consumer-facing methods as many people have expressed their concerns regarding security - the underlying cause of which comes from a lack of clear understanding of what security blockchain offers.

The industry has seen an explosive growth over the last 5 years, especially in 2017-2018 and this led many people to follow the Bitcoin Boom by creating their own coin and thus making it a more competitive market for entry (shown in Figure 1.2). This growth has trickled over into other sectors such as mobile investing, software, and even payment and remittances.

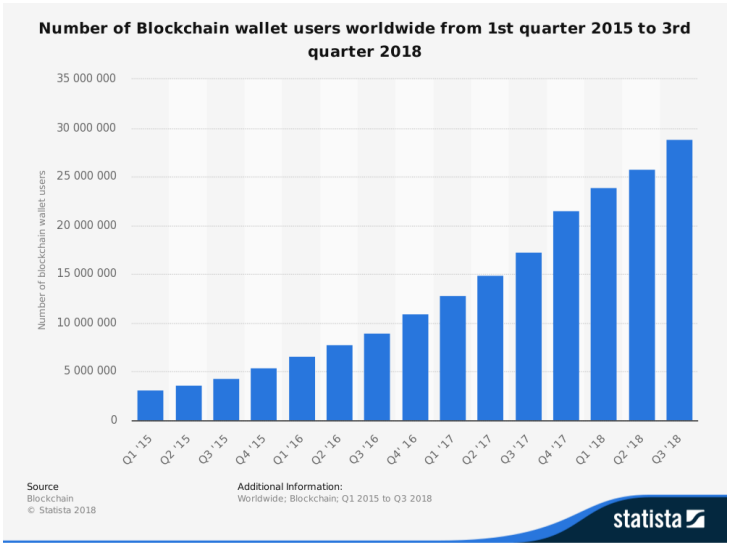
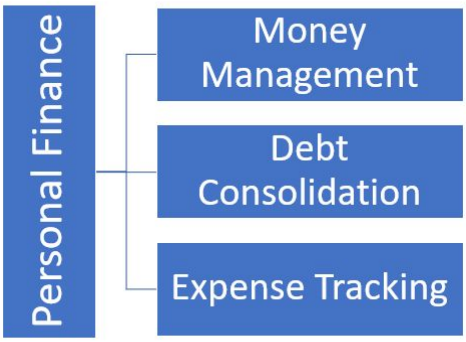


Figure 1.2 Number of Blockchain Wallet Users

Personal Finance

The purpose of personal finance applications in 2020 is to minimize the guesswork in digitizing finances. Applications and services in this space can be split into three different groups, each addressing a particular problem within the field.



Money Management applications like Mint act as an all-in-one resource creating a budget, tracking personal spending, and recommending prudent investment decisions. Such applications usually also track bill

payments and amounts owed while using artificial intelligence to learn about a user's spending habits and track budget limits.

Debt Consolidation applications and services exist to combine multiple sources of debt: credit cards, high interest loans, and other bills into one monthly payment. The consumer benefits from a lower interest rate by bundling and can help save money on interest, lowering monthly payments or paying down debt faster. Discover has created a relatively new Debt Consolidation service that promises no fees aside from late fees, and this mantra has quickly propelled them to be one of the top loan distributors and consolidation services in the world.

Expense Tracking applications such as QuickBooks allows the user to save and budget their money with an in-depth financial analysis on their smartphone or computer that has direct access to your account information. Smartphone applications like Mint allow the user to categorize transactions, set transaction times, create spending limits and alerts, and allow free credit score monitoring.

RegTechs

Regtech is an emerging category of innovative solutions designed to address common regulatory challenges in financial service industries. Typically, service providers offer a combination of regulatory and technological solutions to help financial institutions effectively comply with regulations and do so in a cost effective manner. It is a relatively niche product, so the rate of growth and expansion is not similar to that of a product that is much more consumer facing, but the field is also still experiencing an uncontestable growth as shown in Figure 1.3. Agencies are also incorporating machine learning to solve a variety of regulatory and compliance related problems. Companies like Ayasdi include an intelligent platform for Anti-Money Laundering compliance, countering fraud by automatically creating rules based on evolving data. Also, a Model Accelerator uses unsupervised learning to assist in the creation of financial models to measure risk.

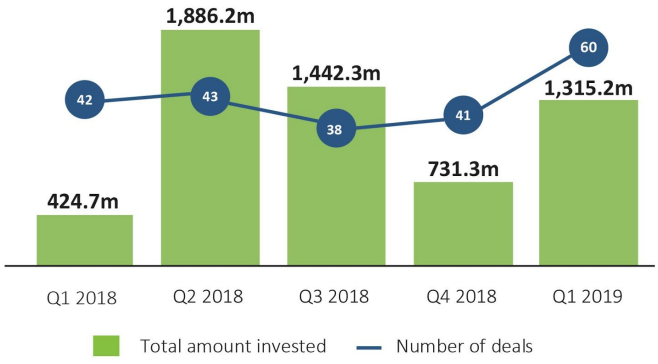


Figure 1.3 Global RegTech Investment

Digital Banking Software Providers

Digital Banking Software Providers are moving banking procedures virtually. Digitization has shaped the way traditional banking has turned into a concept that consists of top tier automation processes whether it ranges from cross-institutional services to online transactions and products. Financial information can be easily accessible through these providers on online platforms. Providers like Chase, Bank of America, and Wells Fargo claim enhanced methods of user experience and convenience through enabling purchasing decisions on digital platforms. The purpose of the digital banking software providers can be broken down into 6 parts: efficiency, cost savings, accuracy, competitive edge, agility, and security. Traditional banks are prone to slower processes with higher error rates that leads to a decrease in customer satisfaction; banking software providers are implementing IT solutions to speed up internal and external processes to enable maximum accuracy, efficiency, and productivity. A key factor about digital banking is its inclusivity of middleware solutions - software that "bridges operating systems or databases with other applications" including the ease of product development, marketing, and risk management.

Payments and Remittances

Before delving into the specifics of this section, it might be important to define what a remittance is - money or goods sent by migrants back to family or friends in their origin countries. Global Remittances are estimated to reach $689 billion in 2018 and the top five

remittance-receiving countries are as follows, India ($80 billion), China ($67 billion), the Philippines ($34 billion), Mexico ($34 billion) and Egypt ($26 billion) as shown in Figure 1.4.

Noting that the primary beneficiaries of remittances are usually developing low- and middle-income countries and that the remittance rate is increasing across the globe by approximately 10.8% annually. With the advent of instant remittance is the offer of much more competitive rates than offered through traditional banking systems. Unlike traditional providers, foreign exchange rates are considered a marginal cost and see tremendous decreases, thus the consumer only has to pay a minor processing fee, usually on the order of a few cents or dollars to cover the cost of processing transactions. Instead of waiting several days for banks to be able to process and deliver money overseas, technology has allowed transfers to occur in one to four business days using standard transfer methods and less than an hour using express transfers. The reason this industry is so appealing to consumers is the low rates on their end. Ultimately, that can be done only because companies like Venmo, CashApp, and PayPal can bypass the entire chain process of banks. Instead, users typically set up a bank account at their country of origin and can transfer their money directly into that account. Of course, there are minor fees to pay the bank to mitigate the hassle of payment on the consumer-side.

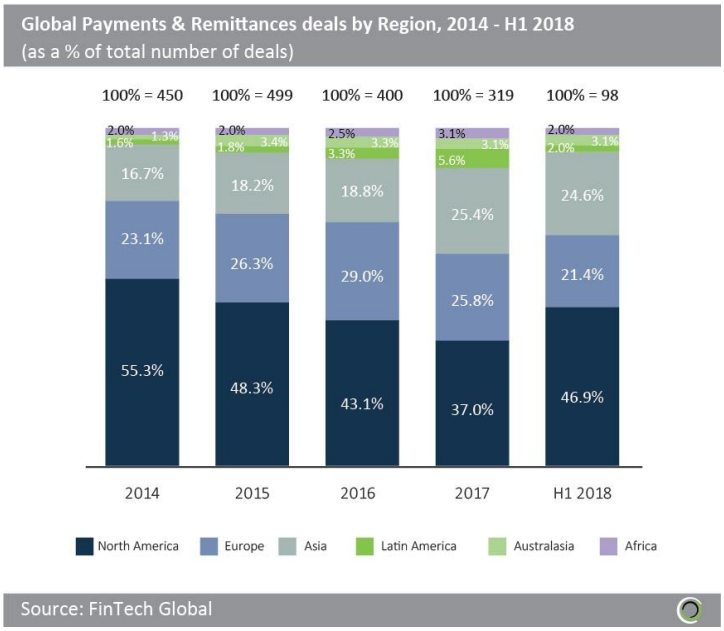


Figure 1.4 Global Payments & Remittances

SWOT Analysis

As an emerging industry, Fintech is naturally going to disrupt the current market force through its innovation of finance with technology. To assess the challenges and advantages of this new technology, a SWOT analysis has been completed below.

Strengths

- Interaction amongst financial services, consumers, and financial service providers has become easy and straightforward
- Reduction of traditional banking costs
- Enhanced efficiencies with data collecting methods
- Modernized financial infrastructure
- Expanded access to financial services
- Effective risk management
- Financial services has been expanded to lending, payments, personal finance, money transfer, and insurance

Weaknesses

- Privacy of consumer personal information is in danger
- Data breaches are more common
- Increased risks of financial frauds due to a lack of understanding with new financial products

Opportunities

- Offer solutions to the "de-risking" phenomenon
- Eliminate need for correspondent banking relationships
- Promotion of Fintech in developing or small countries
- Partnership with traditional banking sector to complement financial services

Threats

- Cybercrime could undermine entire financial system integrity
- Potential abuse to the industry such as excessive borrowing or increased personal debt accumulation
- Monopolistic power with few entrants in the market competition
- Difficulty of supervision amongst numerous financial services

Limitations

While the growing era of fintech strikes traditional methods of businesses to advance technology, there are mixed opinions regarding its movement. Researchers claim that financial technology has been creating cons in society that are hindering its improvement. First, the automation associated with fintech has led the percentage of human labor to decrease. With machine learning, the number of people needed to perform financial services has decreased. With speed, individuals tend to fall behind the robotic advances. Additionally, the industry is starting to contribute to global inequality. Countries such as the United States and China are economically ahead of countries such as Argentina and Nigeria , indicating the potential for more smartphones, data centers, and modern infrastructure. Without technological accessibilities in under-developed or developing countries, an economic disparity is created across the world. In terms of security, online financial services are utilizing behavioral analyses to determine interest rates or credit scores. Personal movements of expenditure can be tracked, allowing for development of mass go information. This relates to why individuals are reluctant to utilize fintech with major security problems. In Figure 1.5, the S&P annual reported the US Fintech market where 45.9% of 405 randomly polled individuals did not use apps such as Venmo due to security concerns. Lastly, fintech can end the informal economy - a detriment in the short term. With fintech removing cash with online payments and digitized money, the state will gain more insight into financial activities of different individuals, allowing them to augment taxes. Ultimately, economically disadvantaged individuals would be impoverished due to their inability to pay taxes matched to the market. Even with numerous benefits linked to advanced technological facilities in business, it's imperative to understand the disadvantages that occur simultaneously.

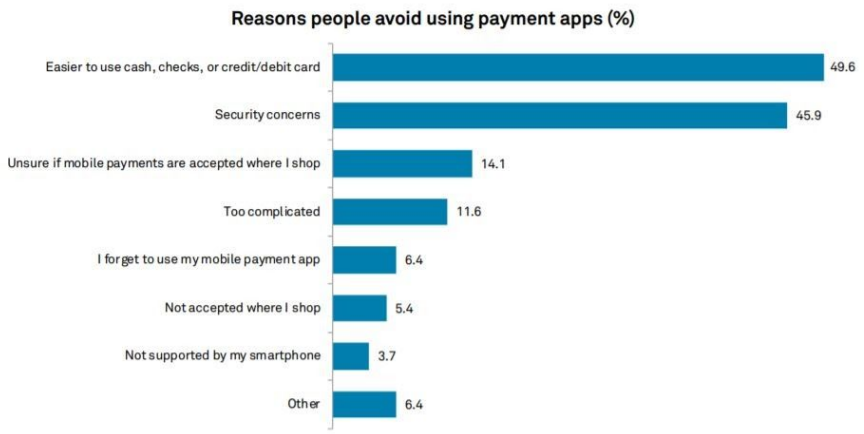


Figure 1.5 Reasons People Avoid Using Payment Apps

Future of Fintech

Future innovations in Fintech will most likely be seen within the startup community. This is not only a fantastic way for companies to get into a market with a relatively high barrier of entry but allows them to claim a niche. There are three key sectors that are being disrupted by a handful of startups: Lending, Investments, and Payment software.

Speaking to the work being done in Lending, one company Avant, is acting as a loan service for middle income consumers. They offer loans ranging from $2,000 - $35,000 across a multitude of uses: personal, home, auto, and credit card products through a simple application. Avant has managed to secure over $4 billion in institutional funding and has partnered with MasterCard to provide a line of credit for their lower income consumers.

Payment is an interesting line of Fintech as there is an increased demand to enter the field ever since the explosive success of Venmo and Cashapp. Braintree is an interesting foray into the world of payments, especially since it is technically a division of PayPal. Braintree provides payment services to businesses of all sizes. Accepted payment types are incredibly versatile, ranging from credit cards to Venmo, all included to meet their company mission to provide businesses a “frictionless” payment experience. Braintree boasts their ability to provide companies the expertise that PayPal brings to the table along with their innovative payment strategy and assures its consumers that their platform has had no trouble scaling – and quite

frankly, they've been hitting the mark so far. They currently play host as a payment platform for corporate giants like Uber, GitHub, Dropbox, StubHub, and Yelp among others.

Investments are last in terms of seeing significant strides in the startup game. An interesting take away from the consumer-facing software side is Morningstar's service; they provide a plethora of services that connect day-to-day investors to professional-grade financial research allowing them to make better investment decisions. Morningstar even provides services to new investors ranking specific stocks, futures, or mutual funds and allowing them to invest accordingly, thus taking some of the complexities out of the way while remaining independent in their evaluations and quote pages.

Speaking with regard to the startup sector, it's difficult to pinpoint a specific direction that Fintech might be taking. However, it is clear that the boundary between business and client side tools are being blurred. The trend today is to make the consumer more informed and more involved in the world of finance and bring companies the same ease of access that individuals have had for so long.

Conclusion

It is clear to see that the tools previously only afforded to professionals are now becoming commonplace - mirroring the trend of the software industry. Companies over the world are adapting to this trend, possessing cost effective and quicker methods of conducting financial services. This is allowing for more consumer-based innovation within the field, as can be demonstrated through the explosive growth in startups seen over the past decade. Companies are also seeing some movement in that they are beginning to move beyond just one core service sector. For example, PayPal, a money transfer service is now expanding by acquiring startups that perform novel functions in lending, payment services for different industries - ETF and Investments to name a few. Overall, fintech solutions have altered operations and relationships within the financial industry and will continue to enforce digital savvy consumers.

Appendix

Appendix A: Cryptocurrencies

A cryptocurrency, colloquially known as crypto, is a digital asset designed to work as a medium of exchange that uses strong cryptography to secure financial transactions, control the creation of additional units, and verify the transfer of assets. Cryptocurrencies use decentralized control as opposed to centralized digital currency and central banking systems.

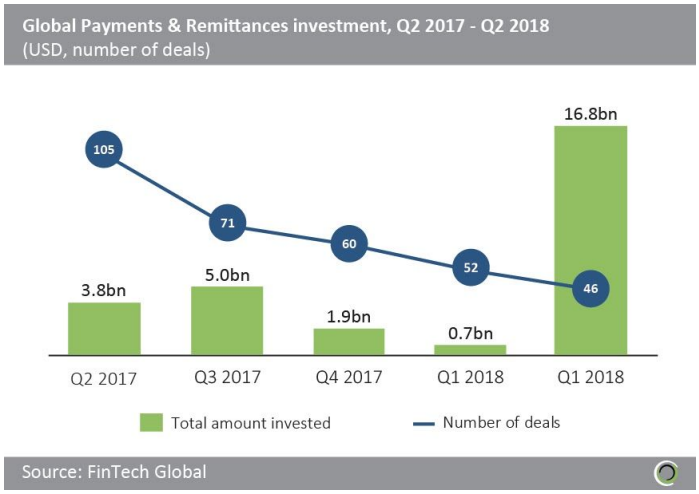
The decentralized control of each cryptocurrency works through distributed ledger technology, typically a blockchain, that serves as a public financial transaction database. Decentralized control prevents companies or governments from producing new units.

Specifically, blockchain is the verification factor that allows the decentralized network to avoid false or fraudulent transactions. A blockchain is quite literally a continuously growing list of records, called blocks, which are linked and secured using cryptography. Each block has a hash pointer to a previous block, a timestamp, and data. By design, these blocks are resistant to the modification of data and are managed by a peer-to-peer network collectively adhering to a protocol for validation of new blocks.

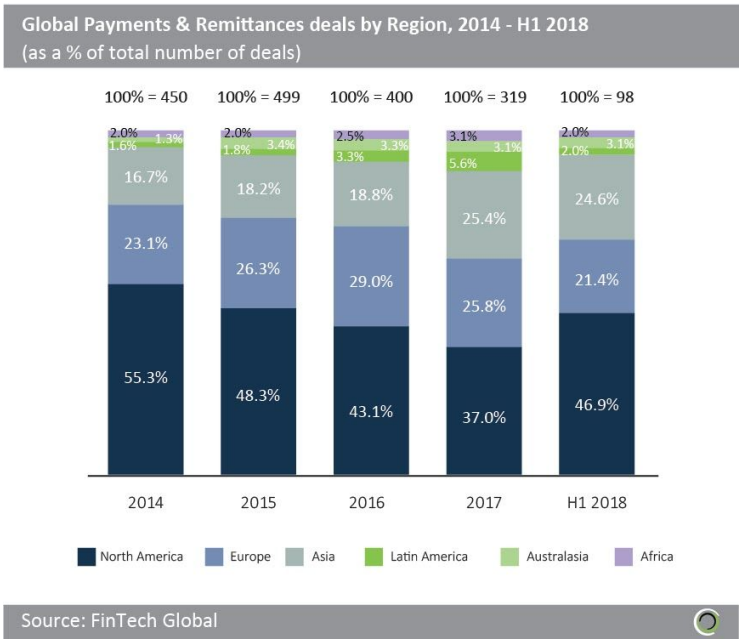
Timestamping is a method that the blocks used to prove legitimate transactions were added to the ledger. The most common methods that timestamping employs is based on SHA-256 and scrypt. The process behind SHA-256 is known as proof-of-stake and basically verifies across a network of computers if the transactions exist on the ledgers at the precise time and across accounts, thus requesting users to show ownership of a certain amount of currency.

Mining is another process by which transactions are verified and added to the blockchain ledger. Essentially, each time a transaction is made, a crypto miner has to authenticate the new information and update the blockchain within the transaction itself. The mining process itself is based around solving complex mathematical problems with cryptographic hash functions that are associated with a block containing transaction data. The first miner to crack the code is rewarded by being able to authenticate the transaction and in return, they are awarded a small amount of cryptocurrency on their own. Miners require their own hardware, usually consisting of a GPU (Graphical Processing Unit) or ASIC (Application-Specific Integrated Circuit), sufficient cooling methods, a robust internet connection, a legitimate cryptocurrency mining software package, and membership in both a cryptocurrency exchange as well as an online mining pool.

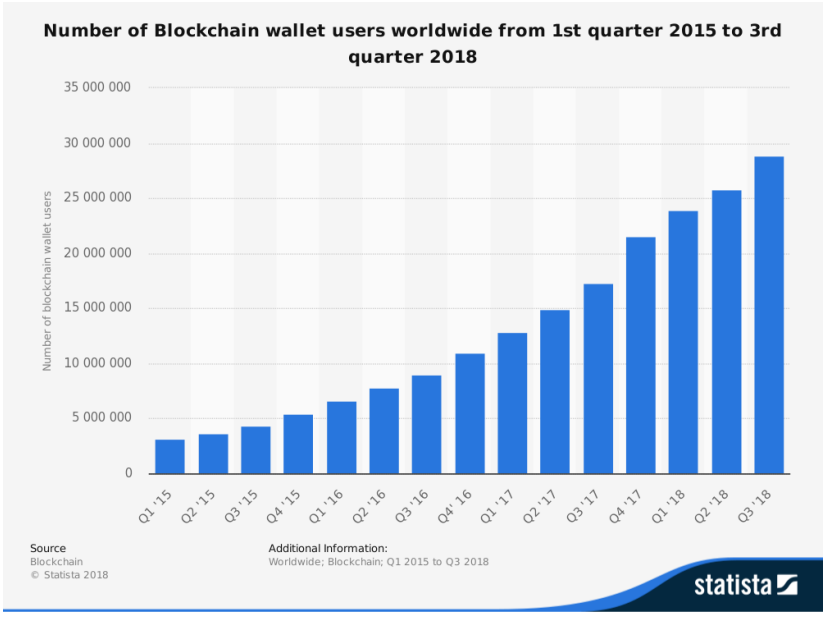
Appendix B: Data and Charts



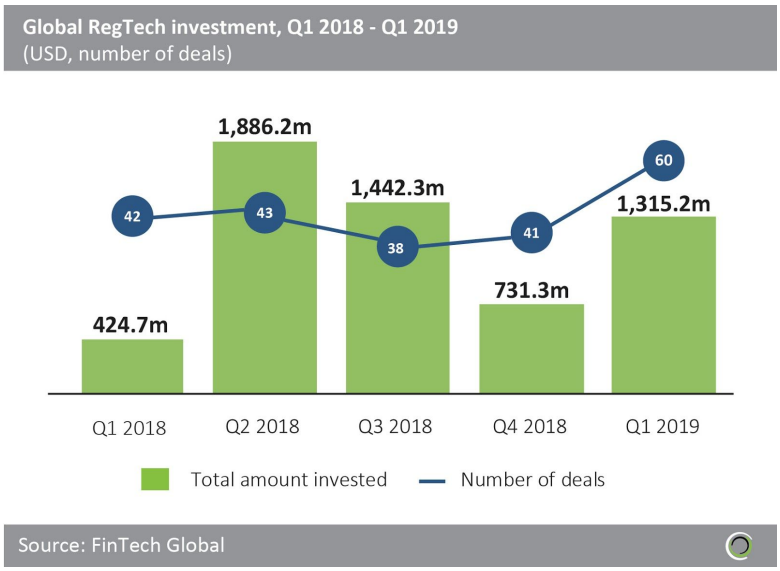
B.1 - This chart represents the growth of the payment and remittance sector and plots the comparison of that growth versus the number of "deals", which in this instance is reminiscent of the number of companies in the sector within the United States.



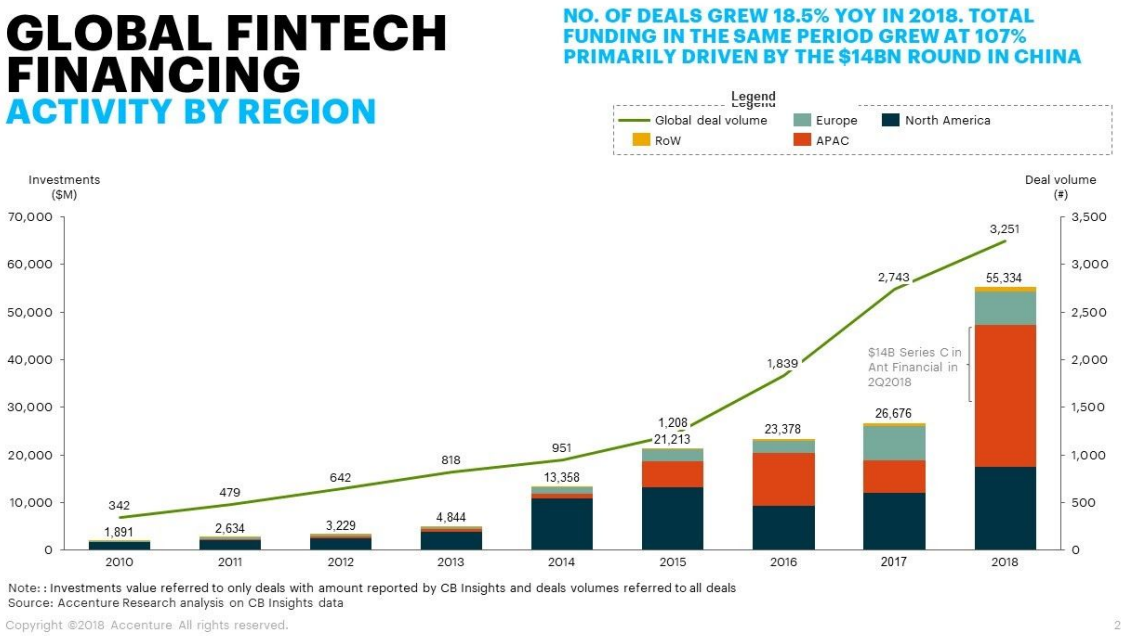
B.2 - This chart indicates the global payments and remittance deals of continents across the world in comparison to previous years. North America and Europe continue to dominate the total number of deals worldwide.



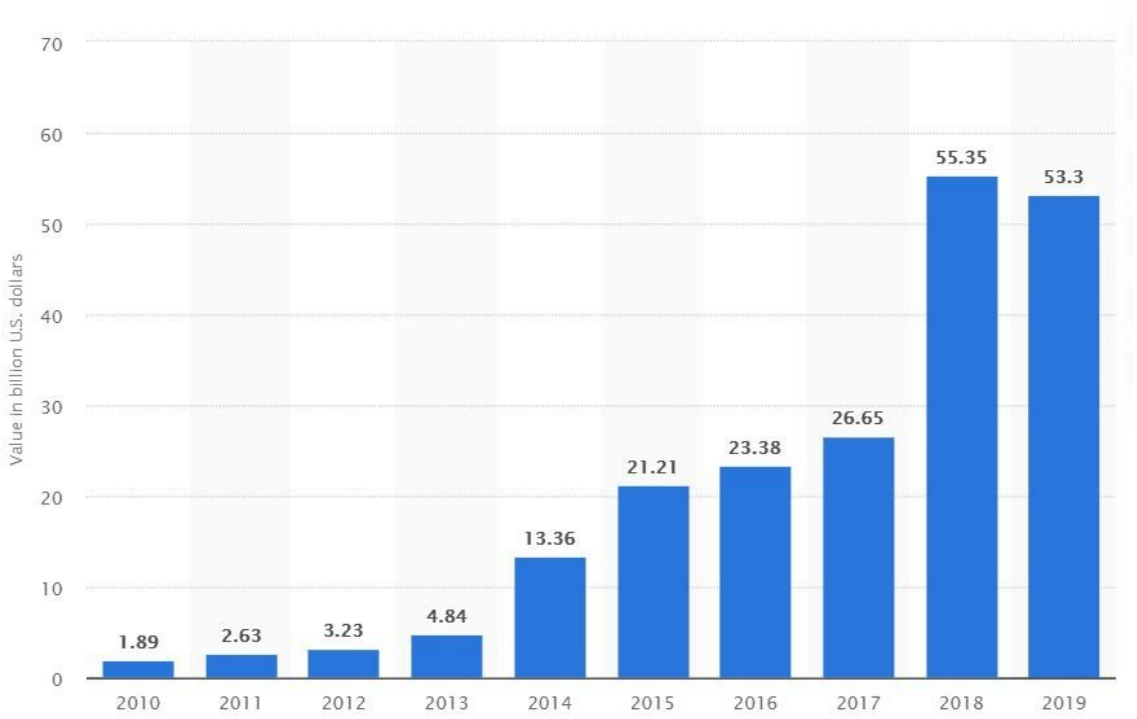
B.3 - This chart represents the number of blockchain wallet users in the entire world in quarterly comparisons from the year 2015 to year 2018. The number has been steadily increasing in terms of millions to emphasize the growth of blockchain.



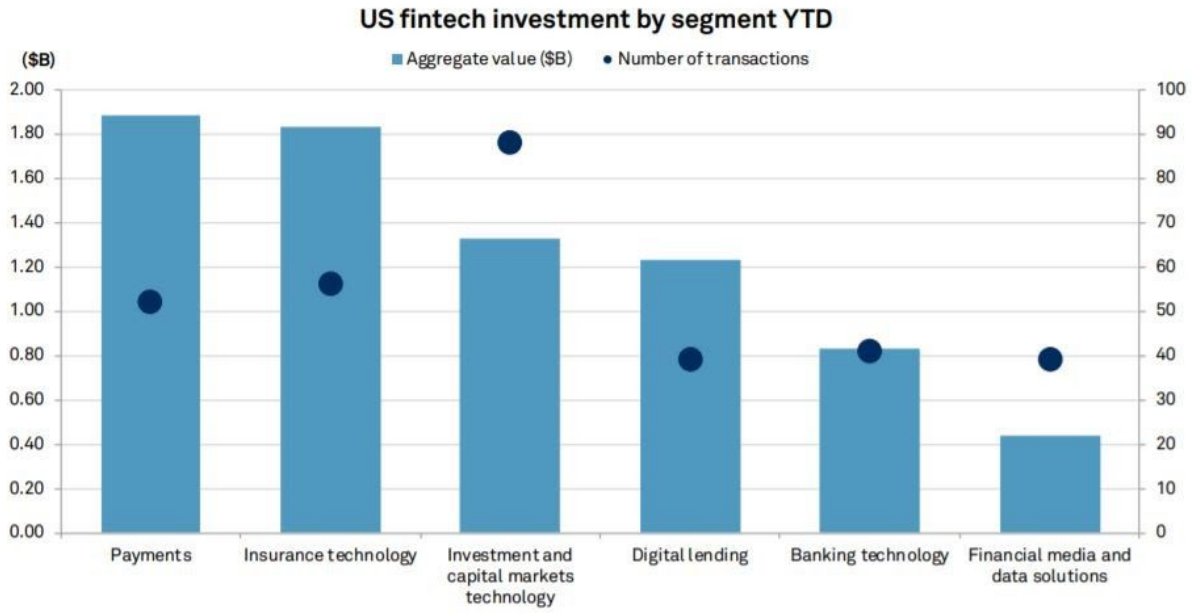
B.4 - This chart indicates the fluctuating trend of RehTech investments across the 2018-2019 year. The number of deals per quarter is plotted in comparison to the total amount invested within RegTech to identify the pattern between the two variables.



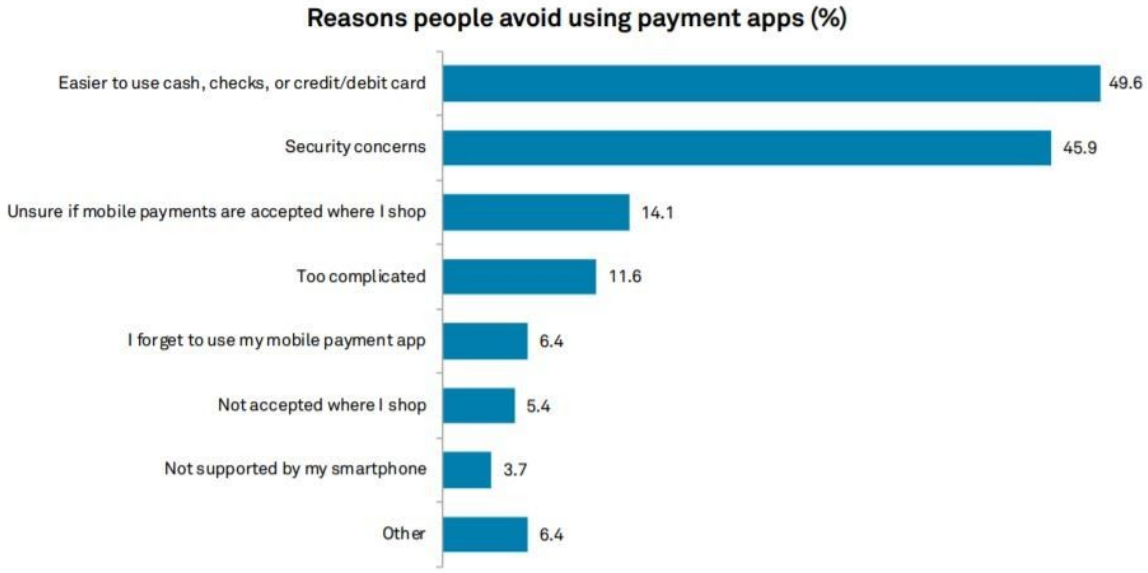
B.5 - The graph is clearly indicative of the growth of Fintech investment across continents and regions, with the areas showing the most growth being North America and the Asia Pacific regions. The line also indicates the undisputed increase in deal volume, meaning the number of investments has only been growing since 2010.



B.6 - Here is the trend of venture capital investment in fintech over the past decade.



B.7 - A detailed outlook on the distribution of US Venture Capital Investment in 2018, divided by segment. As predicted, the sector with the most investment and growth is Payments and Remittances.



B.8- This is a graph collected by the S&P annual report on the US Fintech market. These statistics were derived from a survey of 405 randomly polled individuals at a 95% confidence level. These figures support the fact that many people see securitization as a valid concern for their lack of use of applications like Venmo.