

Millennial Investing Trends

Intergenerational Wealth Transfer and its Impact on Wealth Management

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SOCIETY**

Scope

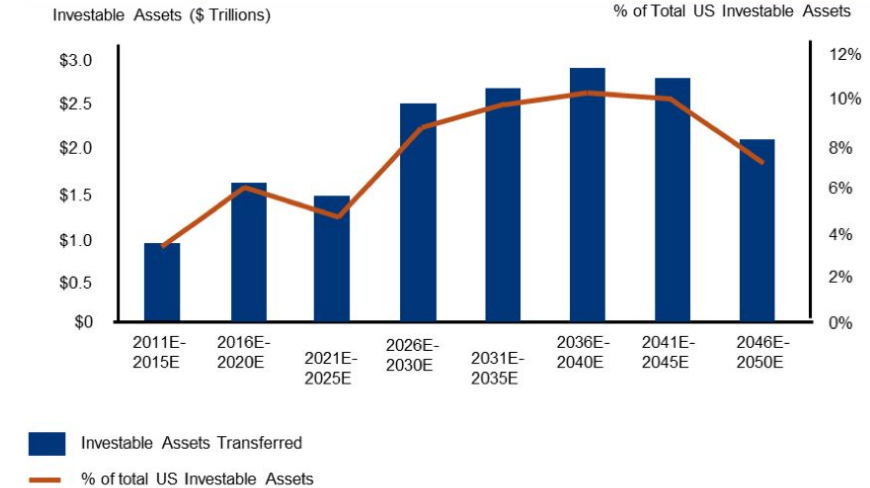
- Background
 - Intergenerational Wealth Transfer
 - Millennial Market vs Boomer Market
- Generational Differences and Trends
 - First Digital Native Generation
 - Preference for Sustainable Investing
 - Desire for Greater Control of Finances
 - Financial Goals
- Impact on Wealth Management Industry
- Key Takeaways

History's Largest Intergenerational Wealth Transfer

Transfer of wealth from Baby Boomers to Millennials

- Millennials will hold 5 times as much wealth as they have today and the group is anticipated to **inherit over \$68 trillion** from their Baby Boomer parents by the year 2030.
- Millennials will soon begin to replace Baby Boomers as the main economic engine of wealth creation and consumer spending
 - **35% of Asia's wealth** expected to be in the hands of millennials in the next five to seven years.

Chart 138: US Investable Assets Transferred by Year



Source: Accenture based on Cerulli Associates

Millennial vs Boomer Market

- Millennials have come of age during a time of technological change, globalization and economic disruption.
- Different set of behaviors and experiences across generations.
- Differences:

**First digital
native
generation**

**Ethically-
concerned
(Sustainable
investing)**

**Desire for
greater
control of
finances**

**Lack financial
knowledge
compared to
Boomers**

**Different
financial goals**

First Digital Native Generation

Millennials embrace technology

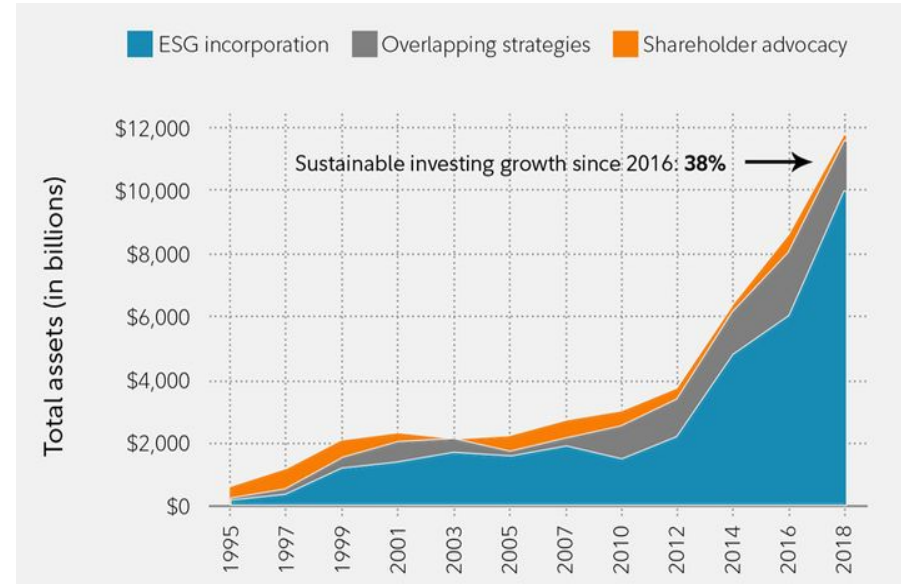
- Convenience is king
- Over 77% of Millennials say their mobile phone is always with them
- 49% prefer mobile banking to any other banking channel

Rise of Robo-Advisors

- Millennials are twice as likely as young baby boomers (aged 56-64) to consider using a robo-advisor for investments (51% vs. 24%).
- Millennials want access to a **diversified portfolio** that is suitable to an individual's financial background
 - Compared to traditional wealth management services that have a minimum investment threshold.
- Millennials prefer **goals-based investing** — pairing their asset allocation with specific material goals
 - *E.g Stashaway, Endowus, Syfe*

Preference for Sustainable Investing

- ESG and values-based investing
 - The process of incorporating environmental, social and governance (ESG) factors into investment decisions.
- Millennial shift towards sustainable investing
 - 86% of Millennials are interested in sustainable investing
 - Twice as likely as the overall investor population to invest in companies targeting social or environmental goals.



Desire for Greater Control of Finances

Preference for greater autonomy

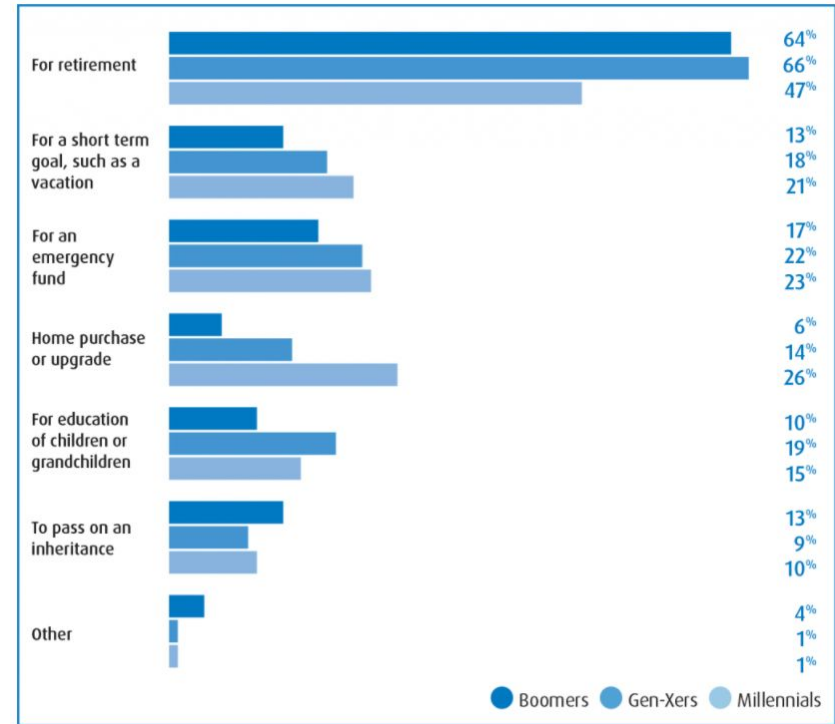
- They value control over their own financial decisions and want them to be as frictionless as possible
 - According to a study by Accenture, two-thirds of Millennials want access to tools like robo advisors and self-directed investment portals.
 - Half of Millennials want the ability to customize the look and feel of their apps, versus just 16 percent of Baby Boomers.

Lack of financial literacy and confidence in investing

- Main hurdle for many millennials is knowing **how** and **where** to start.
- Only 37% of affluent millennials feel knowledgeable about investing at all
 - In Singapore, 61% do not invest because they do not know how to.

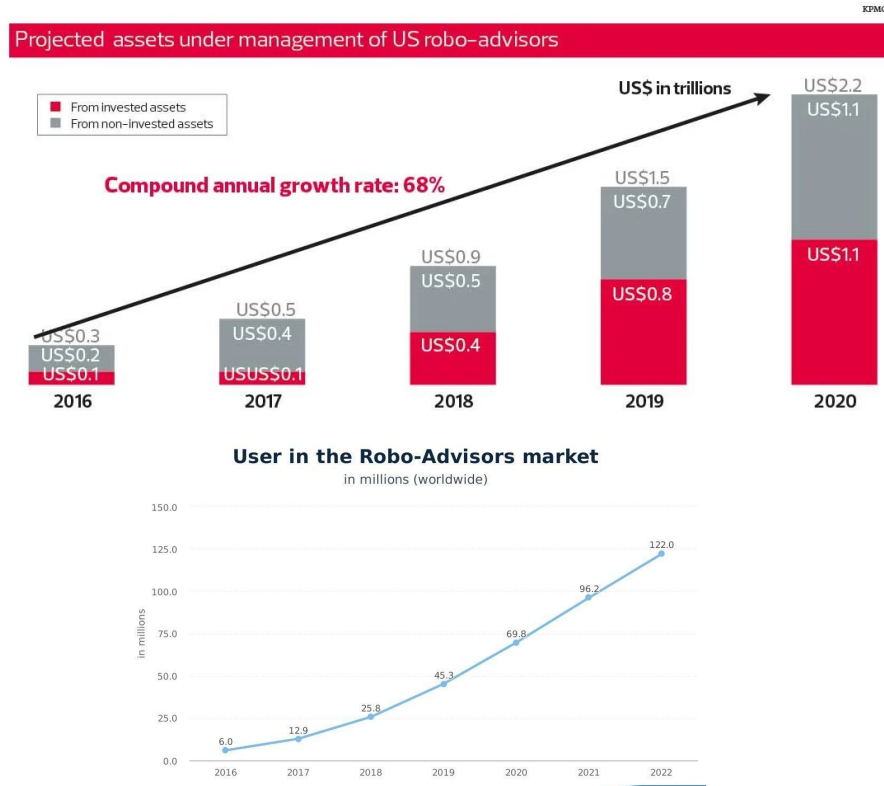
Financial Goals

- Millennials and Baby Boomers invest for different purposes
 - While saving and investing for retirement is important for millennials, it was highlighted by less than half.
 - For millennials, **shorter term goals**, such as saving for a vacation (21%) or to purchase a new home or upgrade an existing home (26%), were highly cited reasons to save and invest.



Impact on Wealth Management Industry

Rise of Robo-Advisory vs Decline of Traditional Financial Advisors



- Similar to human financial advisors, Robo-advisors offer a wide range of financial products and services that cater to the individual user's short and long term goals.
- In addition, Robo-advisors offer low barriers to entry for inexperienced users.

Robo-Advisory Boom

Impact on Wealth Management Industry

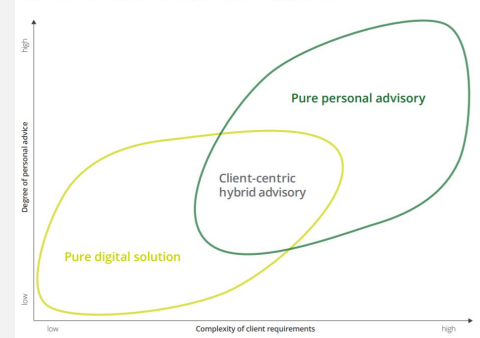
Digitization of services

- Digital Banking
 - Increasing number of private banks are adopting fintech solutions, including portfolio reporting and even integrated front-to-back digital capabilities.
 - Increasing number of Bank Robo Advisors Platforms.
 - *E.g DBS digiPortfolio*
- Importance of a quality digital platform
 - 54% of millennials stated that would move to a different firm if they were offered a better technology platform.
 - 49% prefer mobile banking to any other banking channel.

Hybrid-Advisory Approach

- Automation as key to save costs and to enable both an advisor-focus on core business and an interaction-based client satisfaction.

Fig. 3 - Automated and personal advisory as complementary approaches



Impact on Wealth Management Industry

Digitalisation and Automation of Financial Services

- Fintech Startups will need to evolve services ahead of millennial demands

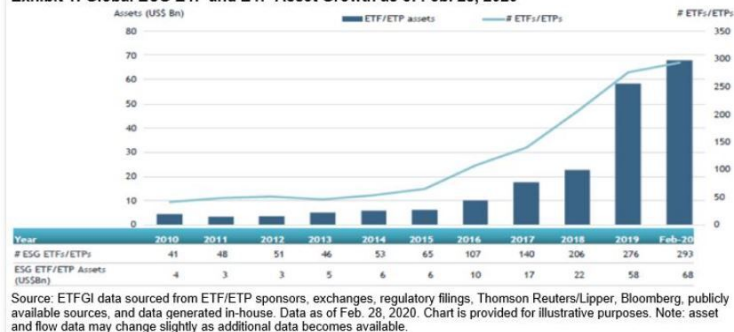


Impact on Wealth Management Industry

Provision and integration of ESG/value based investment options

- Significant influx of client funds flow into sustainable investments
 - For ETFs, there were \$8 billion inflows into ESG strategies, while for mainstream funds, the flows were \$12 billion.

Exhibit 1: Global ESG ETF and ETP Asset Growth as of Feb. 28, 2020



- ESG Investments are forming a significant portion in the wealth and asset management industry
 - ESG ETFs had accrued roughly \$52 billion in assets under management (AUM), a fraction of the \$6 trillion overall ETF market.

Impact on Wealth Management Industry

Provision and integration of ESG/value based investment options

- Wealth and asset managers are increasingly allocating resources to develop products and capture this emerging client segment.
- In recent years, major fund providers have focused on offering investments with a social or environmental conscience
 - *E.g S&P Dow Jones Indices launched its own ESG index based on the S&P 500 index.*
 - *E.g Vanguard and Fidelity have their own SRI or ESG lineups.*
 - *E.g Schwab offers socially conscious exchange-traded funds on its platform.*

Mainstreaming of ESG Management

- 78% of asset owners consider ESG management to be one of the key issues they now look at when choosing an asset manager.
- Adopting socially responsible practices is quickly becoming a requirement for doing business in the investment industry.

Impact on Wealth Management Industry

- “Customer intelligence” as the most important predictor of revenue growth and profitability
 - Client-centricity is the most important factor in a successful business digitalization.
 - Serve tech-savvy, autonomous, interactive clients by:
 - Providing a positive client experience along the complete value chain.
 - Creating a culture around the client based on analysis of their needs and investment preferences.

Big data analytics

70%

Cloud technology

69%

Mobile technology

68%

Internet of things

56%

Detailed customer segmentation

51%

Analysis of customer behaviors

68%

Social media

66%

Blockchain

64%

Identification software (biometrics)

38%

Virtual reality

36%

Artificial intelligence

49%

Real-time tracking systems

47%

Telepresence and web collaborations

39%

Customer “path to invest”

32%

Web analytics and sentiment analysis

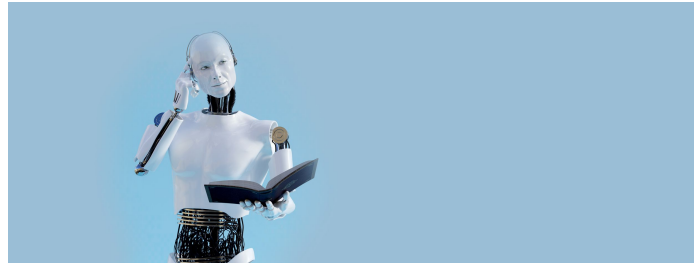
32%

Micro-targeting capabilities

26%

Key Takeaways

- Given the imminent intergenerational wealth transfer, there is an opportunity ahead for wealth and asset management firms to **redefine the standard for investment options** in an industry that will soon be dominated by millennial investors.
- The **increased digitalisation of financial services** and the **shifting preferences of the millennial generation** will become the new norm.
- In summary, against the backdrop of an increasingly competitive wealth management landscape, financial institutions should **leverage on technology** to drive operational efficiency and enhance client experiences to secure a major advantage.



Millennial Investing Trends

The Rise of Robo-Advisors

Lee Yu Qing

Kendrick Chng

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Robo-Advisors

Definition

Robo-advisors are a class of financial advisers that provide financial advice or investment management online with moderate to minimal human intervention based on mathematical rules or algorithms.

Purpose

They help rebalance assets within target-date funds as a way for investors to manage passive, buy-and-hold investments through a simple online interface.

Target

Appeals mostly to retail investors and affluent investors, in particular millennials and Gen Z.

Most Desired Features of Robo-Advisors

Auto-aggregation

Unified view from robo advisor of their banking, trust and brokerage accounts, giving them a seamless experience.

Auto-investing

Investment tool that automatically allocates available funds based on the parameters chosen by the investor to achieve a desired portfolio.

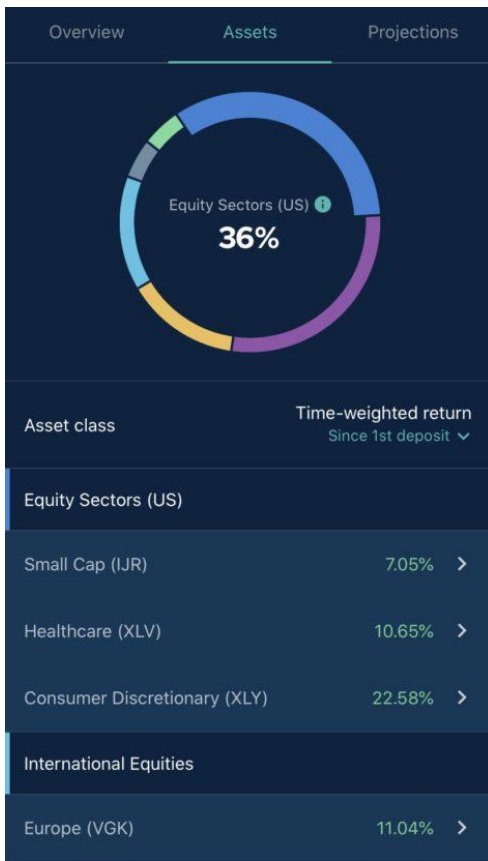
Ability to consult financial advisor

A model that gives investors high tech coupled with high human touch experience, such as the hybrid robo-advisor model, which is becoming the new norm.

Examples of Robo-Advisors in Singapore



Robo-Advisors: Stashaway



History

Started in 2016 by ex ZALORA Group CEO, Michele Ferrario, ex Nomura MD, Freddy Lim.

Methodology

A proprietary investment strategy called the Economic Regime-based Asset Allocation (ERAA) which continually monitors economic and market cycles to rebalance accordingly.

Interface

Adopting a modern interface similar to Betterment (USA) with simple goals charts, and visuals.

Fees

0.8% (S\$25000) to 0.2% (S\$1 Mil) of AUM p.a.

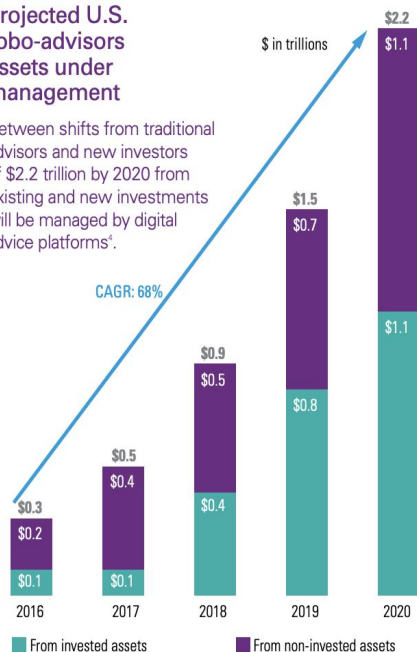
Minimum

No minimum to start

Rising Trend of Robo-Advisors

Projected U.S. robo-advisors assets under management

Between shifts from traditional advisors and new investors of \$2.2 trillion by 2020 from existing and new investments will be managed by digital advice platforms*.



- Robo-advisors AUM was forecasted to increase by a CAGR of 68% from 2015 to 2020 (Source: KPMG, 2015).
- Robo-advisory Services Market is expected to register a CAGR of approximately 50% from 2020 to 2025.
- Reasons behind this trend:
 - Rapid automation of processes and businesses across end-user industries.
 - Rapid adoption of Robo-advisory services across the globe.
 - Rise in digital investing activities due to Covid-19.

Rising Trend of Robo-Advisors

Robo-advisory Services Market - Growth Rate by Region (2020 - 2025)

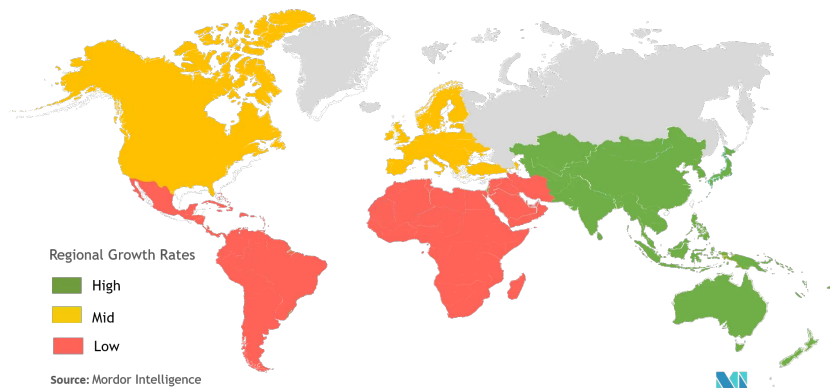
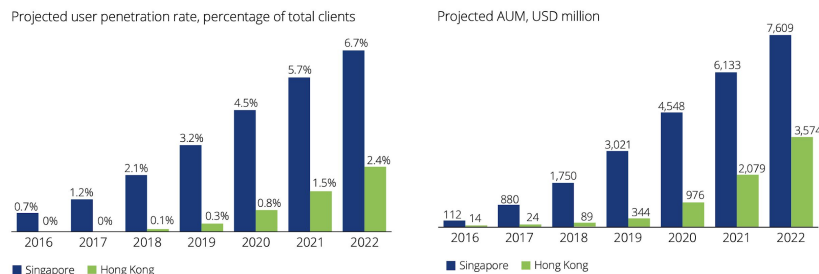


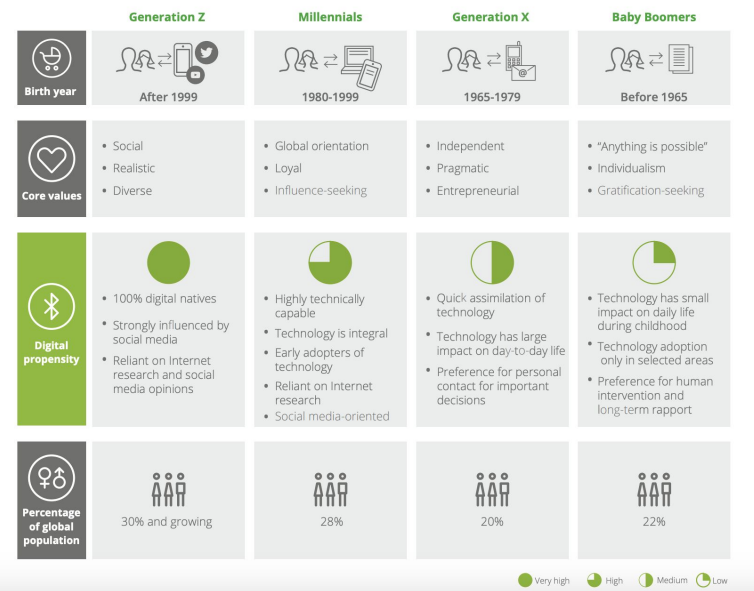
Figure 7: Projected robo-advisory user penetration rates and AUM for Singapore and Hong Kong¹⁷



- Global trend
 - Heavily used in United States & Western Europe, but its usage is limited in Asia.
 - Largest market is North America.
 - Fastest growing market is Asia Pacific
 - Singapore is one of the key robo-advisor markets for Asia Pacific due to its location, which allows for strategic access to China's large HNWI market.
- Major players
 - Betterment LLC, Wealthfront Corporation, The Vanguard Group, Charles Schwab & Co, BlackRock.

Rising trend of Robo-Advisors amongst Millennials

Figure 2: Characteristics of investors across different age groups^{1,2,3}



- Robo-Advisors are highly appealing to Millennials
 - Millennials (51%) are twice as likely to use robo-advisors as compared to baby boomers (24%) (Source: Vanguard).
 - 80 percent of millennials (age 18 to 34) said they would be “very likely or somewhat likely” to consider using a robo-advisor, making them the demographic group with the highest level of interest in robo-advisors amongst those surveyed (Source: KPMG, 2015).

Reasons behind the rising trend

Rise of digital world led to young investors being highly tech-savvy

Increase in demand for investment advice and interest in passive investing

Robo-advisors are easy to use and provide a convenient, enhanced customer experience

Robo-advisors increase transparency into investment options and decisions

Robo-advisors have low minimums and fees

Impact on mutual funds

For mutual funds, decisions are made by humans. For robo-advisors, decisions are made using algorithms. Consumers are shifting away from investing in mutual funds and investing in robo-advisors.

Robo-advisors are better than mutual funds

- Not subjected to human error & external factors like emotions.
- Lower commission fees as compared to mutual funds.

Mutual funds are better than Robo-advisors

- Addresses specific concerns that robo-advisors cannot.
- Greater investment flexibility & diversification effects.
- Higher returns than robo-advisors.

Impact on Wealth Management

Disruptive Trends in Wealth Management

Boom in
robo-advisory
services

Automation of
processes

Need for customised
experience to meet
demand for superior
client experience

Disintermediation
of wholesale
channels

Streamline
financial services
into single,
integrated
ecosystem



Impact

- Asset managers will build their own D2C offerings.
- Technology companies are likely to become alternative distributors for asset managers.
- Hybrid Robo-Advisory Models as the new norm.

Robo-advisory Hybrid Models

Types

Digital Advisory Model

- Human advisor is only involved in initial stage
- Robo-advisor takes control
- For small investors

Scalable Advisory Model

- Robo-advisors used for gaining insights
- Final major investing decisions made by human advisors
- For tech-savvy investors

High-touch Advisory Model

- Human advisors have full control of platform
- Financial advisors dedicate time on client service and relationships while automating manual processes
- For high net worth clients who have complex financial needs and larger assets requiring tailored experience

Target

- Affluent investors, in particular those from Asia Pacific
 - Have great desire for control but are also open to advice.
 - 68% of affluent investors prefer hybrid advisors (Source: Accenture)
 - Demand for robo-advisors in Asia Pacific is 79% amongst HNWIs (Source: The Asian Banker).
- Millennials who need financial advice

Impact of Covid-19 on Robo-Advisory Services

During the pandemic, the robo-advisory industry has experienced a massive surge.

- Increase in number of millenials taking advantage of the buying opportunity in the market
 - Such investors have a **longer time horizon** and have a **higher tolerance for economic damage**.

Rising usage of Robo-advisors

1. Investors following goals-based planning philosophy base their investments primarily on the risk capacity aligned to their goals. This allows for lower-risk asset allocation, minimising the impact of short-term economic shocks.
2. Given the current market downturn, investors are moving to less risky asset allocations, like bond ETFs, to avoid downside risk.

Highlights the need for Robo-advisory Hybrid Models

The market has been particularly volatile and unpredictable during the pandemic. As a result, more investors are leaning towards hybrid robo-advisors by leveraging their human advisors to explain market volatility and investment strategies.



Millennial Investing Trends

Rise of Cryptocurrencies

John

Yan Ying

Ivan

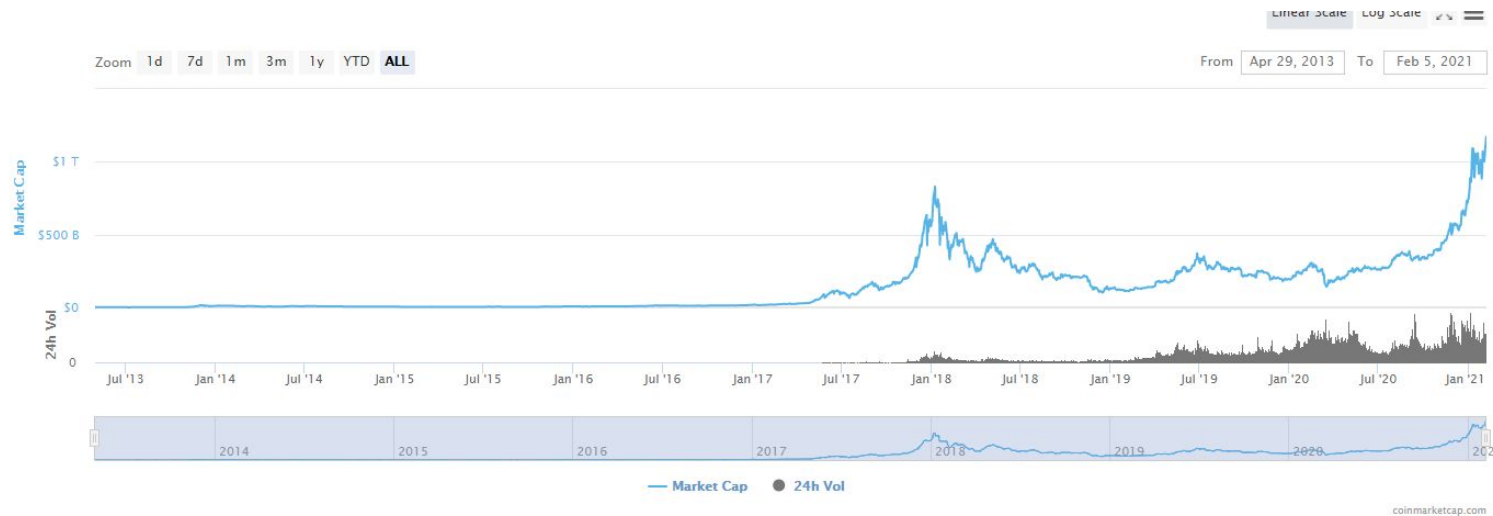
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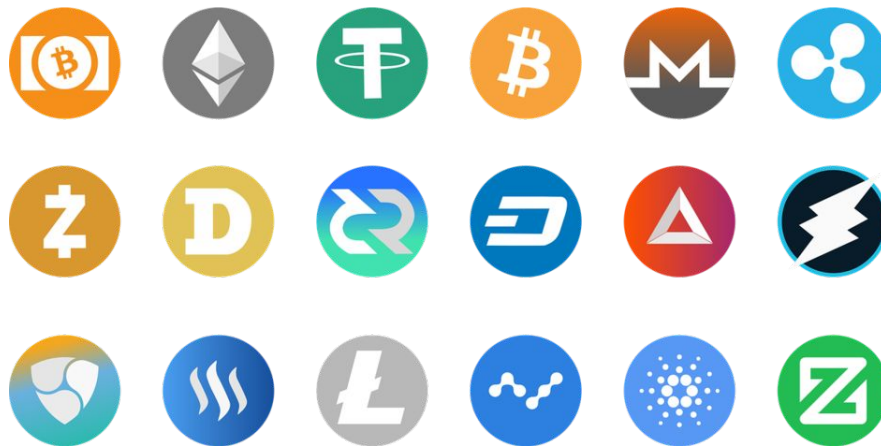
Market Capitalization

2016 - Present



What are Cryptocurrencies?

Cryptocurrency is a type of ***digital money in electronic payment systems*** that generally do not require government backing or the involvement of an intermediary, such as a bank. Many cryptocurrencies are decentralized networks based on blockchain technology — a distributed ledger enforced by a disparate network of computers.



Use cases of Cryptocurrency

Payments

Acts as a digital cash for both eCommerce and brick-and-mortar retailers.

Store of Value

Cryptocurrencies can be used as a store of value like gold, capable of retaining its value over time without depreciating.

Privacy

Allows more privacy by providing anonymity in digital transactions.

Decentralised Utilities

Crypto-enabled networks and services capable of exchanging between assets issued on the network (smart contracts).

Stablecoins

Crypto that are tied to the value of an external resource like US Dollars or gold for stability.

Alternative Finance

Crypto assets such as collectibles, commodities, and tokenization of commodities.

Cryptocurrency Trends

1. Decentralised Finance (DeFi)

Decentralized Finance (or simply DeFi) refers to a movement that aims to create an open-source, permissionless, and transparent financial service ecosystem that is available to everyone and operates without any central authority.

DeFi creates decentralized financial instruments separate from traditional centralized institutions and are usually built on Ethereum's blockchain.

In early 2020, there was only USD\$700M of crypto collateral locked in the DeFi economy. By 31st December 2020, that number had grown to an impressive USD\$14.24B.

Total Value Locked (USD) in DeFi

TVL (USD) | ETH | BTC

All | 1 Year | 90 Day | 30 Day



Cryptocurrency Trends

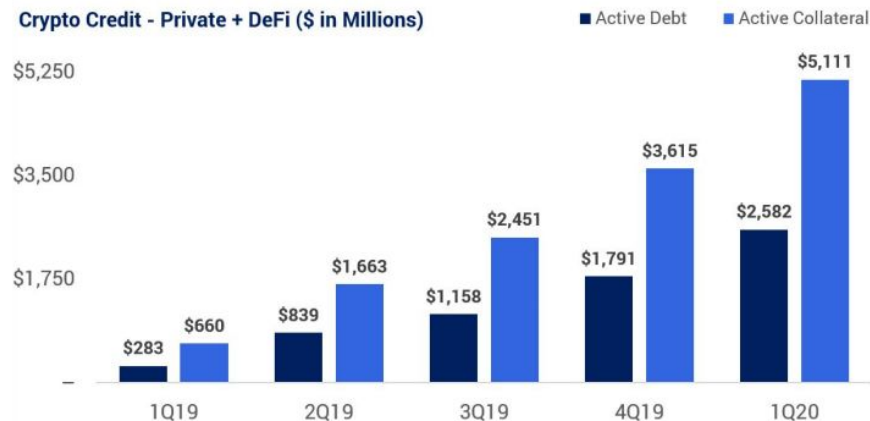
1. Decentralised Finance (DeFi)

Crypto Credit and Lending

- Platforms that provide borrowing and lending of crypto using smart contracts.
- No traditional financial players have entered the crypto credit market **yet**.

Expected trends

1. Crypto being accepted as a collateral in traditional institutional transactions.
2. An unsecured and non-overcollateralized credit market will emerge, along with the concept of crypto credit scoring.
3. More customers will opt for interest-bearing crypto accounts.



Cryptocurrency Trends

1. Decentralised Finance (DeFi)

Other use cases of DEFI

- Stablecoins
- Decentralised Exchanges

How will DEFI reshape Finance

- No need for arbitrators or intermediaries→ Frictionless financial system
- Better access to financial systems

Financial Verticals disrupted by DEFI

- Financial Data→ provide financial institutions with an immutable and verified single source of financial market data for any market and asset type.
- Lending
- Asset Management (non-custodial ownership of assets, composability to seamlessly plug in DeFi products with other products, automation, global access and financial inclusion and pseudo-anonymity).
- Insurance

Cryptocurrency Trends

2. Acceptance of Cryptocurrency as a Form of Payment

PayPal

Background:

Adoption of cryptocurrency has been increasing rapidly due to several reasons such as:

- Weakening of fiat currency due to the pandemic as countries are printing more money to keep their economy afloat.
- Increased interest in digital currencies from central banks and consumers.
- Transparency and speed of cryptocurrency transactions.

Paypal released its official notice in October 2020 that it is teaming up with cryptocurrency firm, Paxos Trust, to allow its customers to use their cryptocurrency holdings as a funding source to pay at PayPal's 26 million merchants around the globe. This is done with the aim "to increase consumer understanding and adoption of cryptocurrency".



Cryptocurrency Trends

2. Acceptance of Cryptocurrency as a Form of Payment

How does this work?

1. Beginning in early 2021, PayPal customers will be able to buy, hold and sell cryptocurrency directly with their PayPal wallet. These cryptocurrencies include Bitcoin, Ethereum, Bitcoin Cash and Litecoin.
2. Consumers will be able to instantly convert their selected cryptocurrency balance to fiat currency, with certainty of value and no incremental fees.
3. PayPal merchants will have no additional integrations or fees, as all transactions will be settled with fiat currency at their current PayPal rates.

Moving forward, Paypal is also exploring the potential of digital currencies through partnerships with licensed and regulated cryptocurrency platforms and with central banks around the world.

Cryptocurrency Trends

2. Acceptance of Cryptocurrency as a Form of Payment

What does this mean for end users like us?

PayPal's new service eliminates two hurdles regarding the use of cryptocurrencies for retail purchases:

1. Getting cryptocurrency into a form that's usable for retail purchases
2. Merchant acceptance of cryptocurrency as a form of payment

Cryptocurrency is essentially **becoming another funding source inside Paypal's digital wallet** that provides users the following benefits:

1. Adds enhanced utility to cryptocurrency holders
2. Address concerns surrounding volatility, cost and speed of cryptocurrency-based transactions

Cryptocurrency Trends

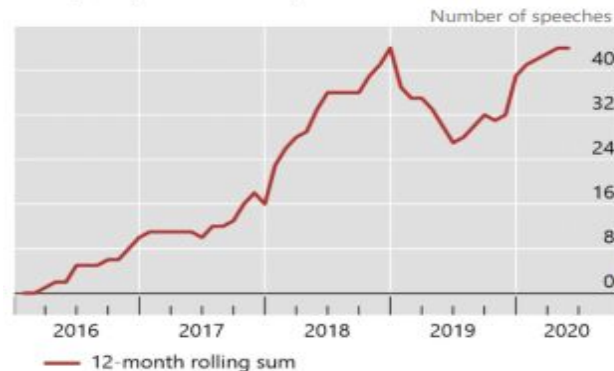
3. Rise of Central Bank Digital Currencies (CBDCs)

A CBDC is a digital payment token which is issued and fully backed by a central bank and is legal tender.

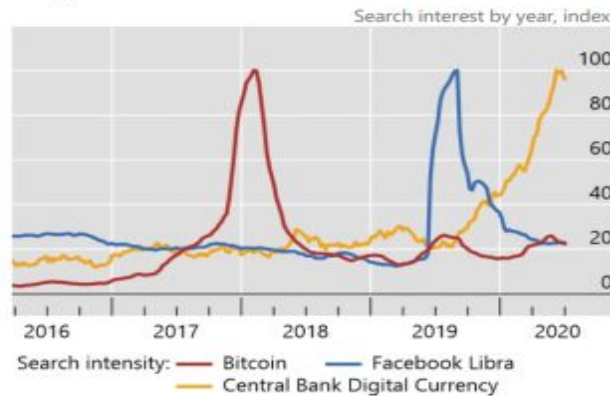
Over the centuries, different payment technologies have emerged to meet societal demands. Coins, banknotes, cheques and credit cards were each innovations in their own day. In the recent years, there is growing discussion of a new payment technology: central bank digital currencies (CBDCs) in response to the declining use of cash in some countries.

The pandemic, together with the social distancing resulted in public concerns that cash may transmit the Covid-19 virus and new government-to-person payment schemes have further sped up the shift toward digital payments.

Timing of speeches and reports on CBDC¹



Google search interest over time²



Cryptocurrency Trends

3. Rise of Central Bank Digital Currencies (CBDCs)

Benefits of CBDCs:

- Enhanced monetary policy
- Convenient & Secure
- Real-time access to the overview of the economic activity
- Financial Inclusion

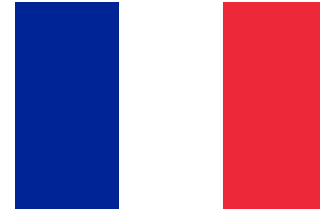
Examples of CBDCs:



- Digital Yuan in **China**



- E-Krona in **Sweden**



- CBDC in **France**

Cryptocurrency Trends

3. Rise of Central Bank Digital Currencies (CBDCs)

In Singapore's context: Project Ubin: SGD on Distributed Ledger

Background:

In Singapore, 'Project Ubin' is a multi-phase collaborative project with the banking sector that first started in 2016. It explores the use of DLT for clearing and settlement of payments and securities, as well as new methods of conducting cross-border payments using CBDCs.

Each phase aimed at solving the pressing challenges faced by the financial industry and the blockchain ecosystem.

Purpose:

To evaluate the implications of having a tokenized form of the SGD on a DL, and its potential benefits to Singapore's financial ecosystem.

This project represents a significant opportunity for Singapore's ecosystem to establish leadership in the area of DLT research and development, in line with Singapore's broader goal of becoming a Smart Financial Centre.



Cryptocurrency Trends

3. Rise of Central Bank Digital Currencies (CBDCs)

What does this mean for end users like us?

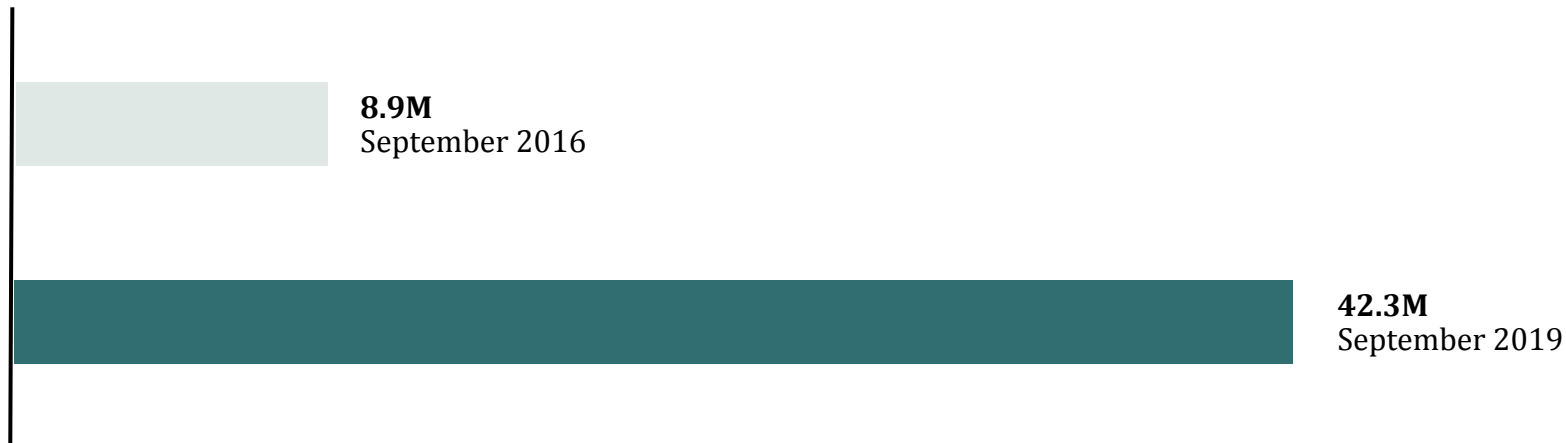
In July 2020, MAS reported that it has completed the 5th and final phase of Project Ubin. This phase saw a successful development of a domestic multi-currency payments network prototype, which addressed immediate business needs for cross currency exchange and foreign currency transactions.

Consumers can expect to see the following:

1. **Real-time Gross Settlement:** Inter-bank transactions, cross-border remittances, and tokenized securities can be settled with distributed ledger technology that has full settlement finality and transaction privacy.
2. **Convenience:** As Singapore is planning to work with Bank of Canada to link up the two Blockchain platforms, Project Jasper and Project Ubin, Singaporean investors can potentially start purchasing corporate bonds in Canada in a single transaction across the Singapore, Canada and bonds settlement blockchains.
3. More collaborations with central banks and other financial institution to build better cross-border payments networks.

Growth of Crypto Economy

Number of Cryptocurrency Users



Source: Statista

Perception of Cryptocurrency

Recent studies have shown that mainstream adoption of cryptocurrency may be imminent with the younger generation leading the adoption of it.

63%

Sees crypto as an easy payment method

82%

Willing to use tokens for loyalty reward programmes

78%

Willing to use crypto from companies they already know

Percentage of positive views on crypto, by generation

81%



Generation Z

71%



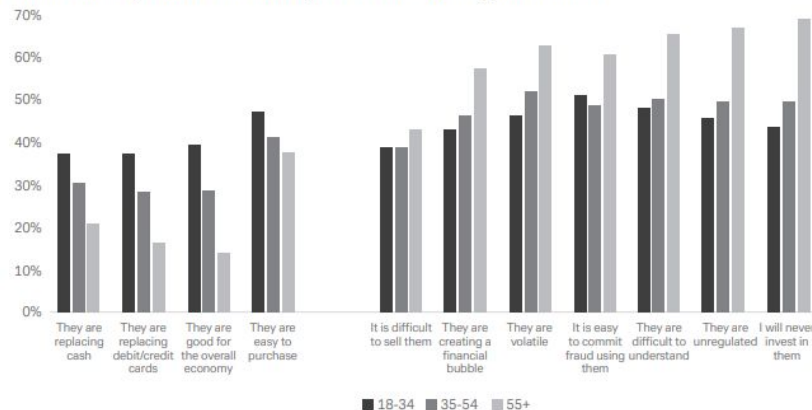
Millennials

50%



Baby Boomers

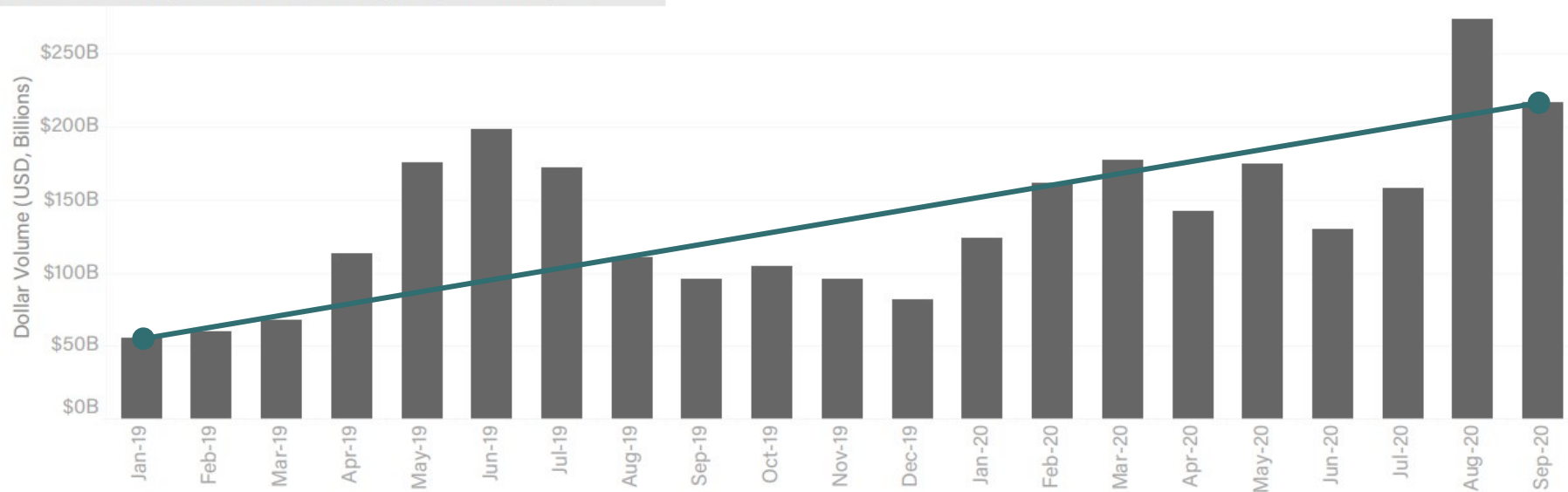
Citizens who agree with the following statements about cryptocurrencies



Source: dbDIG Deutsche Bank Research. Note: include China, France, Germany, Italy, the UK and the US.

Volume

Verifiable Monthly Dollar Volume on Crypto Spot Exchanges

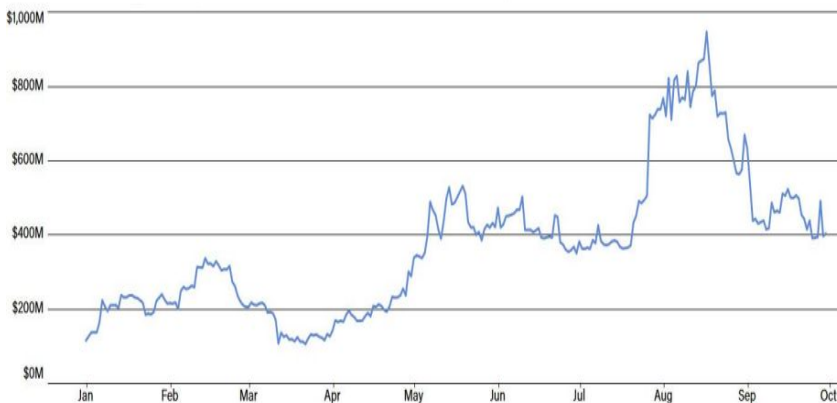


Source: [Nomics](#) 'transparent' volume.

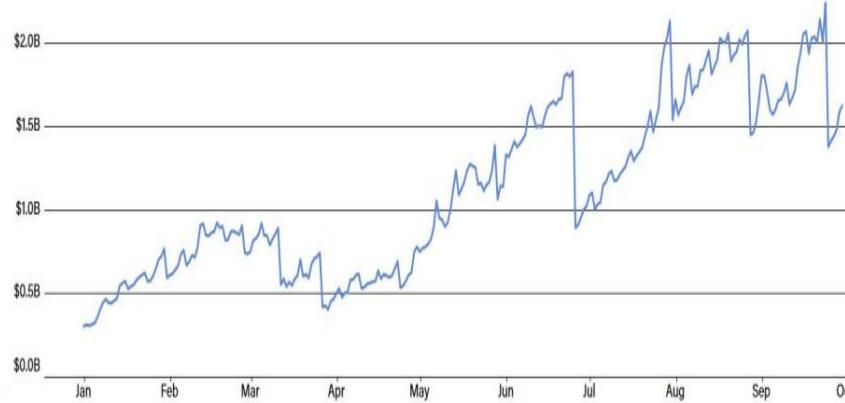
Crypto Derivatives

CBOE futures exchange launched the first ever cryptocurrency derivatives, bitcoin futures in December 2017, followed by CME, the largest futures exchange provider in the world. This has provided more ways and liquidity for institutions and individuals alike to participate in bitcoin/cryptocurrency speculation.

CME Bitcoin Futures Daily Open Interest vs. Time (USD Million)

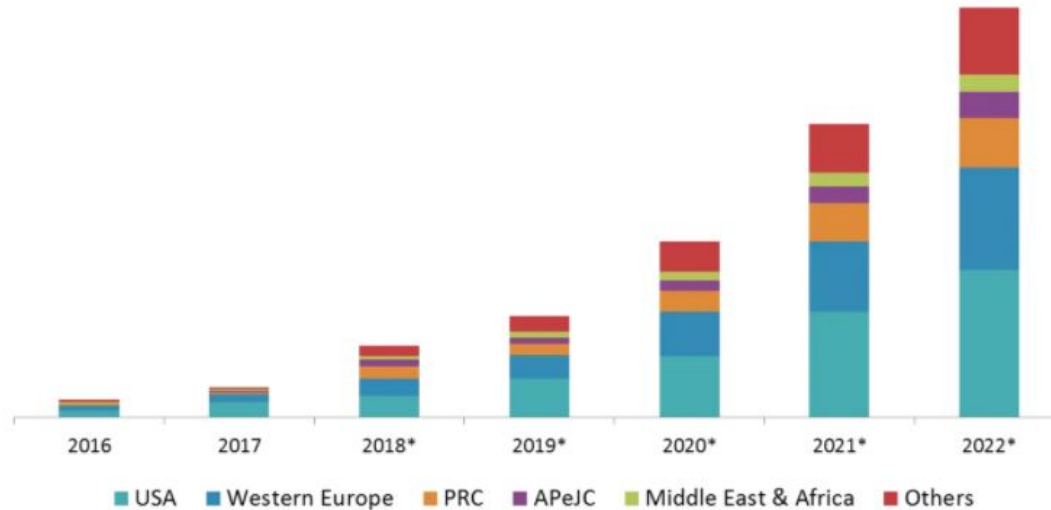


Bitcoin Options Aggregated Open Interest vs. Time (USD Million)



Worldwide Spending on Blockchain Solutions

Worldwide Spending on Blockchain Solutions, 2016 to 2022, by region (in billion USD)



Source: Mordor Intelligence



Limitations of Cryptocurrency and its growth

Industry-wide non-adherence to Cryptocurrency Security Standard (CCSS) for transactions

- Organisations using cryptocurrency (wallets especially) as part of its business logic are prone to cybersecurity breaches.

Uncertain Environmental Impacts

- Cryptocurrency mining requires increasing levels of electricity to power hardware and software required for mining as computing problems get more complex. Contradictory results from studies have been found regarding CO2 emissions from mining of Bitcoin, a leading cryptocurrency.

Irrecoverable losses

- Asymmetric cryptography (public-private keys) allows for secure and untraceable access to wallets, but if data loss occurs and private keys are lost, all associated cryptocurrencies are lost.

Global Impacts of Cryptocurrency

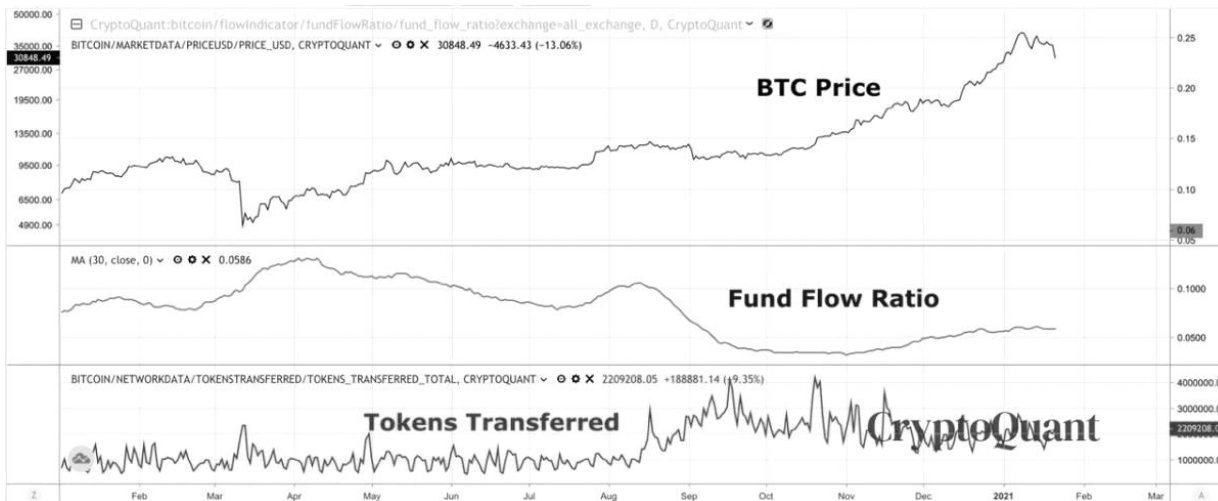
1. **More efficient international transactions:** cheaper and faster settlements across ledgers and financial institutions (that would otherwise go through various expensive routes to send money across borders).
2. A shift towards **digital versions of national currency and transactions:** better security but potentially lower privacy than cold hard cash (Chinese CBDC is centrally controlled by the authorities instead of a decentralized network).
3. **Changing portfolios and rise of cryptocurrency ETFs:** similar to precious metals like gold, the non-correlated nature of the cryptocurrency market can be seen as a hedge against risk and inflation (since the number of cryptocurrency coins in circulation is mathematically limited over time).

Conclusion

CHARACTERISTIC	BITCOIN	GOLD	S&P 500®	U.S. BONDS	WTI CRUDE
Correlation to Bitcoin	1	0.18	0.21	0.21	0.06
1-Year Volatility (%)	81.7	14.9	25.9	3.7	98.9
3-Year Volatility (%)	83.9	12.2	18.8	3.2	61.6
5-Year Volatility (%)	85.4	13.2	15.3	2.9	50.2

Source: S&P Dow Jones Indices LLC, Lukka. Data as of Dec. 31, 2020. Correlation based on past five year monthly returns. Volatility annualized based on monthly total returns in USD. Gold represented by the S&P GSCI TR, U.S. Bonds represented by the S&P U.S. Aggregate Bond Index. WTI Crude represented by the S&P GSCI Crude Oil TR. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Low correlation of other assets to Bitcoin



Institutional buying of Bitcoin's dip

Source: CryptoQuant



Millennial Investing Trends

The Rise of Algorithmic Trading

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Shawn Neo

Marketing & Communications



**NUS
INVESTMENT
SOCIETY**



Algorithmic Trading



Can you defeat a computer?

Algorithmic trading is the process of executing trade orders that utilises an automated and pre-programmed set of criteria which often involves complex formulas and mathematical models.

Algorithm Input

Vast array of market information inputted to assess the state of the market

Algorithm Output

Market state which tells users when, where and how to trade

Trade Execution



Algorithmic Trading



Can you defeat a computer?

Some forms of algorithmic trading include order execution, arbitrage, and trend trading.

High-frequency trading (HFT) is frequently used by algorithmic traders. Using such a trading method allows tens of thousands of trades to be made every second. Trading at such high speeds is unachievable by humans manually.

Since larger financial institutions invest heavily in trading infrastructure, retail traders who are less capable to do so, lose out in the aspect of speed.

Benefits

Why employ algorithmic trading strategies?

Reduced risks



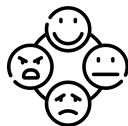
As trades are computerised based on the pre-set algorithms, **risks associated with real-time monitoring** are reduced. Accurate predictions can be easily made and traders need not constantly monitor the charts and find potential trade set-ups.

Backtesting of strategy



Testing against historical data allows traders to know which parts of their trading system work and do not, allowing traders to **eliminate flaws** and **fine-tune their algorithms** before running them in the live markets.

Taking emotion out of the equation



Computerised trades within a set of predefined criteria reduces one's susceptibility to emotions a manual trader might experience. This helps to **reduce the amount of irrational trading decisions** made due to fear or greed.

Trade at the best possible price



Trade order is placed instantaneously and accurately when the pre-defined criteria are met, creating an edge by allowing orders to be placed at the **best possible price with the fastest execution speed**.

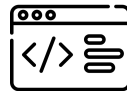
Limitations

Dependence on technology



Being immensely dependent on technology means that it is **vulnerable against any technological failure**. For example, disrupted internet connection would lead to the inability to execute the trading strategies.

Programming knowledge



As traders require technical programming skills to develop the algorithms for trading, it is often perceived as **overly complicated and confusing** for the general public.

Constant changes to algorithms are required



As market conditions are ever-changing, algorithms have to be fine-tuned frequently so that it would still work as intended. This requires **regular monitoring of market conditions** even though traders do not need to spend long hours constantly looking for trade set-ups.

Exacerbation of market volatility



With the use of high-frequency trading during periods of market stress, market volatility may be exacerbated through the automatic execution of large orders. An example is the **May 2010 Flash Crash**.

Limitations

Inability to achieve a perfect model



Past performance is not indicative of future results. Therefore, while algorithmic trading might be profitable on paper, **live trading results might differ significantly**. Hence, traders ought to use logical thinking and their understanding of current market conditions to continuously optimise the model and keep it up-to-date as there is no such thing as a perfect trading system.

Increased market abuse



Spoofing, where orders are placed only to be cancelled right before execution, creates false market sentiments and **misleads other computers and traders**.

Trends

In the next few years, these are trends we expect to observe with respect to algorithmic trading.

Rapidly rising market share



Algorithmic trading is responsible for around **60-73% of all U.S. equity trading** (Business Wire, 2019).

The percentage of market volume generated through algorithmic trading has been rising since 2014 and is forecasted to grow at a **YoY CAGR of 11.23%** till 2025.



Source: MarketsandMarkets Analysis



Trends

In the next few years, these are trends we expect to observe with respect to algorithmic trading.

Institutional investors to hold majority share



Buy-side firms need to execute large trade orders to fulfil the firms' and clients' portfolio needs and strategies. However, stock prices fluctuate upon the execution of large-volume trades. To combat this and reduce transaction costs, buy-side firms use algorithms to execute these large orders discreetly by breaking them into smaller order quantities.

Moreover, algorithmic trading is also used to automate the process of investing in products with the objective of keeping to the index it is benchmarked against.

Trends

What fuels these trends?

Covid-19 pandemic



Due to the Covid-19 pandemic, traditional over-the-counter trades and less electronic markets have been disrupted as evidenced by **trading floor closures**. This has resulted in investors searching for **alternative ways to trade**, such as electronically, thereby leading to a spillover effect where more investors are looking at algorithmic trading.



Increase in accessibility to associated resources



In recent years, with the advent of technology, accessibility to resources that are essential to algorithmic trading have been increasing. They include **data feeds, processing tools, cloud-based solutions, services, and cloud computing**.

This enables more firms and individuals to adopt these resources to develop their own algorithms and leverage on the benefits algorithmic trading offers.

Trends

What fuels these trends?

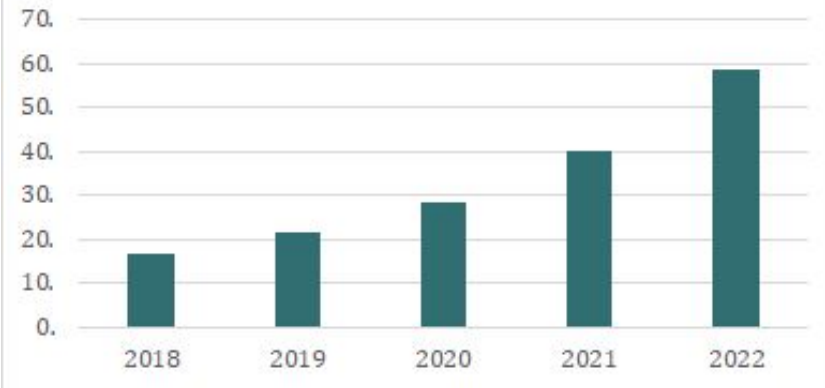
Growing adoption of AI in the finance industry



With the **rise in demand for artificial intelligence (AI) in the finance industry**, it is increasingly being incorporated into algorithmic trading. As developers input more market information, the machines learn from these experiences, thereby enhancing their ability to make better trade decisions.

From the bar chart, we can see that the investments made by Chinese financial institutions into AI has been rising over the years (Statista, 2020). As one of the largest economies in the world is investing more into AI, it is expected to lead to greater adoption by smaller countries.

Investment value of China's traditional financial institutions in artificial intelligence from 2018 to 2022 (in billion yuan)



Impacts on traditional retail investors

Inability to 'beat' the market.

High-frequency trading

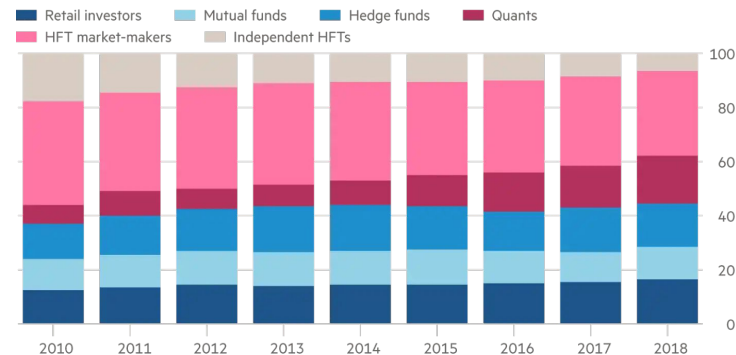


High-frequency trading (**HFT**), a subset of algorithmic trading, accounts for more than half of all US equity trading activity. Since these traders and institutions that are deploying algorithmic HFT have a **speed advantage** and given that trading is **zero-sum game**, they are **taking significant profits away from traditional retail traders**. This has been reported in a study by a top government economist according to The New York Times.

This resulted in individuals losing confidence in the market and giving up on trading. Consequently, there is an overall sentiment that small retail traders cannot 'beat' the market, resulting in **low consumer confidence** in the stock market.

Quants and high-frequency traders account for over half of all US equity trading

Market share (%)



Source: Tabb Group
© FT

Impacts of algorithmic trading

Increase in regulations of algorithmic trading stabilises the market and prevents flash crash incidents.

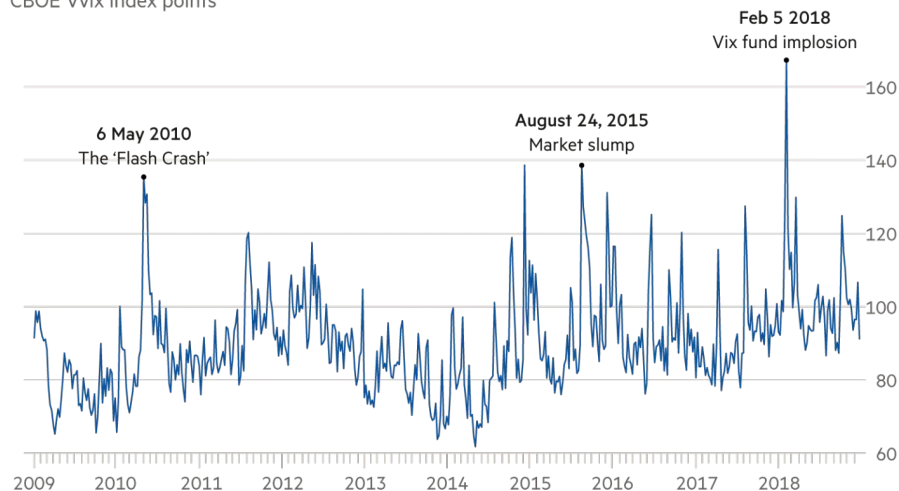
'Flash crash'



As computerised HFT systems sell securities rapidly, such a system can set off a **cascading effect** amongst other HFT systems. This triggers more sell-orders, driving down the overall market in a **snowball effect known as a “flash crash”**.

As prices are driven down by algorithmic trading systems that constantly place sell orders at very high speeds, retail traders holding long positions risk having their positions getting wiped out or receiving margin calls due to the large drawdown.

CBOE Vvix index points



Source: Bloomberg
© FT

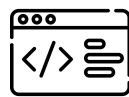
Key takeaways

Learn to conduct algorithmic trading



According to FinanceFeeds, as algo trading is a good opportunity for traditional retail traders to tap on, it is wise for individuals to learn how to employ algo trading strategies.

Strong programming knowledge required



However, the learning process may take a very long time as only those equipped with strong programming knowledge are capable of employing such strategies.

Be cautious and impose safeguard mechanisms



Despite the benefits algo trading brings, it is potentially dangerous. One's capital may be wiped out by market errors as in the 2010 "Flash crash", or by algorithmic errors. Hence, it is imperative for mechanisms like kill switches to be implemented so that all trading activity can be halted under certain circumstances and so as to protect one from the downsides.

Mitigation of downside with stricter regulations



According to Investopedia, stiffer regulations have been imposed by authorities in response to the higher frequency transactions and to prevent another flash crash resulting from high-frequency trading. This stabilises the wider market in this new era of algorithmic trading.

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