FINANCIAL SERVICES DEVELOPMENT COUNCIL
香港金融發展局

FSDC Paper No.54

Observations on Market Liquidity Enhancement

August 2022

Contents

Executive Summary

Hong Kong has been a successful world-leading IPO centre, having ranked first in IPO funds raised globally in seven out of the past 13 years.[1] Such a status has been, in part, supported by Hong Kong's proximity and connectivity to the Mainland market, benefiting from the continuous economic growth and innovation of the latter.

Despite the strong IPO market performance, secondary market activities in Hong Kong are arguably less vibrant, especially comparing to other leading global financial centres. Secondary market liquidity is an important indicator showing the level of development and sophistication of a market. Numerous studies have shown that stocks with higher liquidity tend to trade at a premium and, thus, at higher prices. Trading liquidity is not only important for secondary market investors, but also crucial to increasing a market's appeal to potential issuers, for whom the company's valuation is a key determining factor affecting the choice of a listing and trading venue.

With heightened uncertainties revolving around the global financial arena, as well as potential opportunities arising therein, Hong Kong should strive to continuously enhance its trading mechanism and market infrastructure to cater to the changing needs of issuers and investors.

With the above in mind, the FSDC initiated a study and prepared this paper with an aim of identifying potential mechanism enhancements that can boost market liquidity in Hong Kong. Recommendations set forth in this paper have a focus on facilitating activities of exchange traded funds (ETFs) and market makers who can, in turn, better discharge their market function as liquidity providers to create a virtuous circle benefitting the market as a whole. The recommendations are summarised as follows:

Enhancements of ETF trading activities:

1. Introducing a new spread table with tick sizes more suitable for Hong Kong-listed stocks;
2. Increasing the maximum spread range requirement to above 24 spreads;
3. Extending the market maker short sell permission for manual trades; and
4. Introducing adjustments to ETF settlement approaches.

Enhancements of general trading and clearing activities:

1. Introducing new rules that allow market makers to have multiple clearing participants;
2. Assessing portfolio risks of market participants across the central counterparties; and
3. Considering market maker programmes for illiquid stocks to improve liquidity.

Upgrade of infrastructure and systems:

1. Adopting an opt-in self-match prevention mechanism by the Hong Kong Exchanges and Clearing Limited (HKEX);
2. Providing more transparency on picked gateways connecting members and exchanges; and
3. Upgrading trading system with advanced technology accompanied with capacity building.

It is believed that the proposed enhancements will foster market liquidity, and, thereby, cement Hong Kong's status as a first-class international financial centre.

[1] HKSAR Government, "National plan hugely benefits HK" (26 May 2022), https://www.news.gov.hk/eng/2022/05/20220526/20220526_182018_303.html (accessed on 29 May 2022)

Background

Market liquidity and its importance

Market liquidity can be broadly defined as a market's ability to facilitate a large volume of transactions rapidly with little impact on price.[2] The concept of liquid has multiple dimensions, namely:[3]

- Breadth/tightness – refers to the difference between buy and sell prices. Breadth is usually identified and measured by the bid-ask spread. Tighter spreads encourage more active trading, and hence leads to better liquidity.

- Depth – refers to the number of pending orders on both sides of the bid-ask spread. The larger the number, the better, as this limits the influence of orders on price.

- Immediacy – refers to the speed at which orders can be executed at a given cost.

- Resilience – refers to the speed at which prices return to stability after a temporary shock.

Higher liquidity of a market makes it more appealing to different stakeholders of the financial market. For investors, a more liquid market would generally translate into lower trading cost, higher transaction efficiency, lower price volatility, and improved price formation. For issuers, a more liquid market would offer lower cost for raising capital and more accurate share price valuations. As for stock exchanges, higher liquidity increases the attractiveness of the market to investors, issuers and other market participants, and therefore brings about greater transaction volumes and profitability of the exchange.

As liquidity serves to deepen and strengthen a financial market and has a positive impact on overall financial market stability and development, it is a common objective among global regulators, stock exchanges and other stakeholders to ensure their markets exhibit a vibrant and healthy level of liquidity.

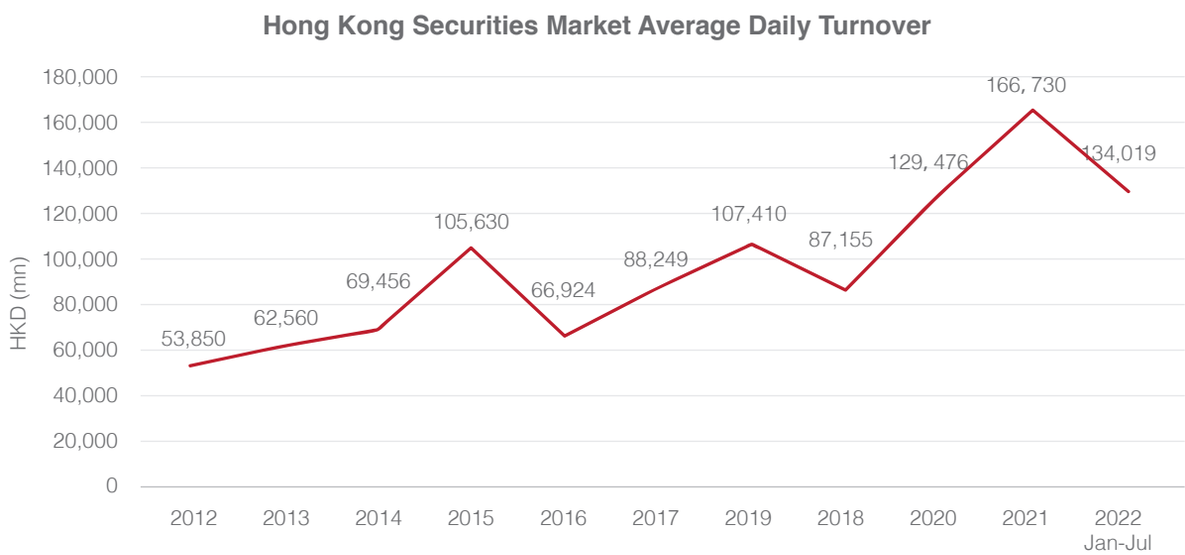
[2] Bank for International Settlements (BIS), "BIS quarterly review" (November 2000), https://www.bis.org/publ/r_qt0011e.pdf

[3] Oliver Wyman and World Federation of Exchanges, "Enhancing Liquidity in Emerging Market Exchanges" (October 2016), https://www.oliverwyman.com/content/dam/oliver-wyman/global/en/2016/oct/Liquidity-in-Emerging-Markets-Exchanges-.pdf

Global market liquidity

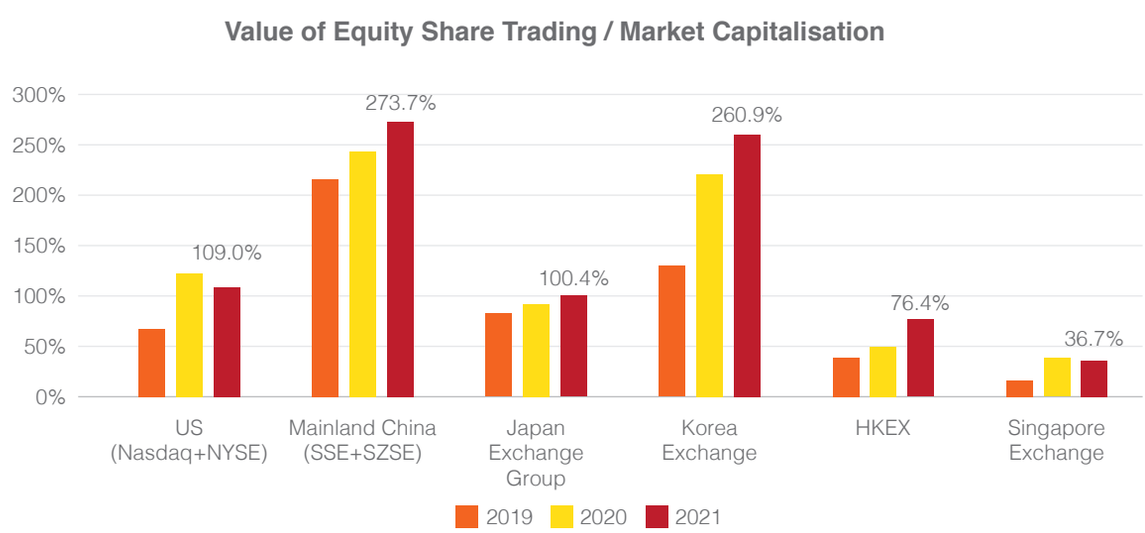
As mentioned above, enhancing market liquidity is an objective of stock exchanges, and there is no exception for HKEX. Despite collective efforts of HKEX and the financial market as a whole, the liquidity of Hong Kong's financial market still presents room for improvement. Although the average daily turnover of HKEX (figure 1) has generally shown an upward trend over the past years,[4] turnover velocity (value traded relative to the overall capitalisation), an indicator that reflects liquidity of a market, continues to be lagging other major exchanges globally. More specifically, the turnover velocity of HKEX was at 76.4% in 2021, while that of other major exchanges tends to be well above 100% (figure 2).[5]

Figure 1.



Source: HKEX

Figure 2.



Source: World Federation of Exchanges

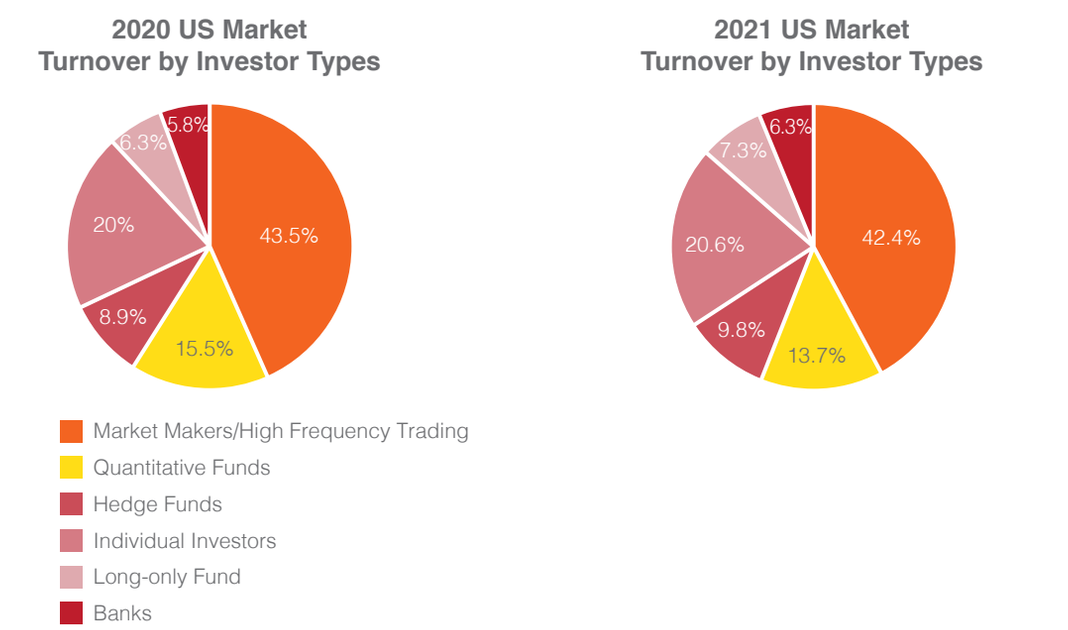
[4] HKEX, Annual Market Statistics, https://www.hkex.com.hk/Market-Data/Statistics/Consolidated-Reports/Annual-Market-Statistics?sc_lang=en; HKEX, HKEX Monthly Market Highlights, https://www.hkex.com.hk/Market-Data/Statistics/Consolidated-Reports/HKEX-Monthly-Market-Highlights?sc_lang=en (all accessed on 24 June 2022)

[5] World Federation of Exchanges, Annual Statistics Guides, https://www.world-exchanges.org/our-work/research/archive/statistics-focus (accessed on 24 June 2022)

Drawing references to the US market – one of the most liquid markets in the world — it is shown that market makers and ETFs, among others, have accounted for much liquidity of the US market.

Market makers: Comparing the investor types of the US and Hong Kong markets, market turnover in the US is predominately contributed by market makers/high frequency traders, quantitative funds and hedge funds, who took up a total of 67.9% in 2020 and 65.9% in 2021.[6] These market participants (roughly categorised as Exchanges Participants)[7] only accounted for 28.1% of the market turnover in Hong Kong in 2020.[8]

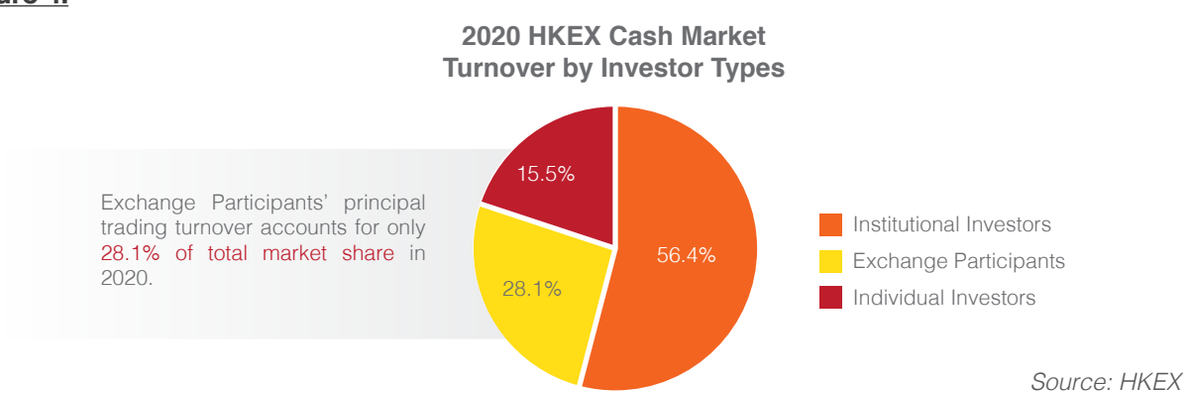
Figure 3.



Turnover from market makers/high frequency trading, quantitative funds and hedge funds accounts for 67.9% of total market share in 2020, and 65.9% in 2021.

Source: Bloomberg Intelligence

Figure 4.



Exchange Participants' principal trading turnover accounts for only 28.1% of total market share in 2020.

Source: HKEX

[6] Bloomberg Intelligence (accessed on 5 August 2022)

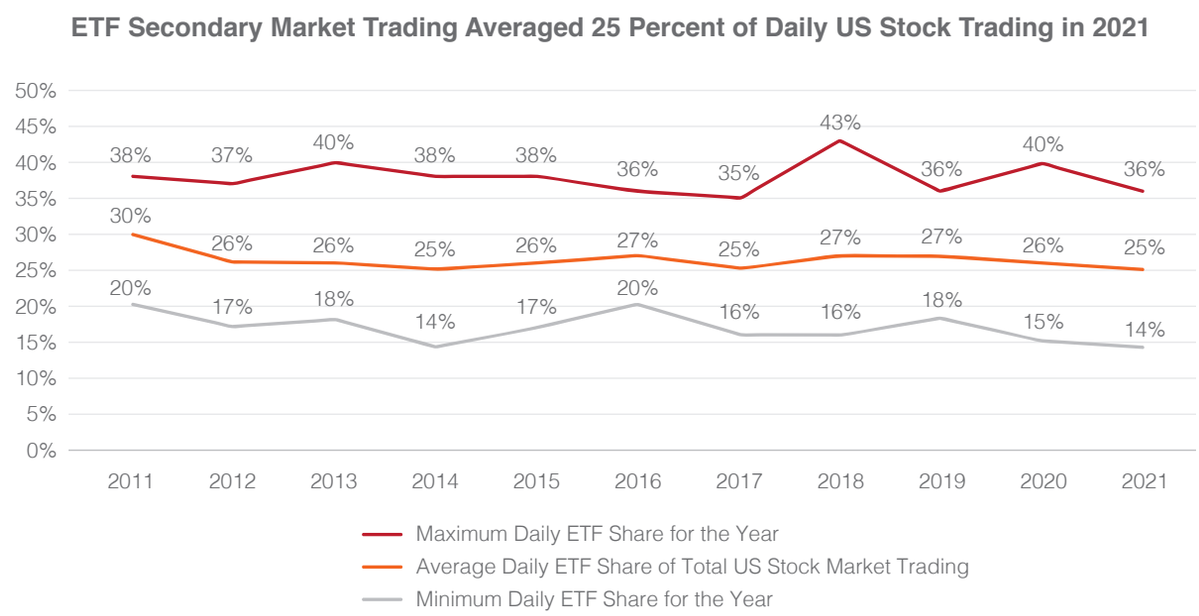
[7] An exchange participant is a corporation who may trade on or through the Exchange and is licensed under the Securities and Futures Ordinance to carry on securities/futures/options dealing activity. Please refer to HKEX, Exchange Participant Data, https://www.hkex.com.hk/Market-Data/Statistics/Participant/Exchange-Participant-Data?sc_lang=en (accessed on 31 May 2022)

[8] HKEX, "Cash Market Transaction Survey 2020" (April 2022), https://www.hkex.com.hk/-/media/HKEX-Market/News/Research-Reports/HKEX-Surveys/Cash-Market-Transaction-Survey-2020/CMTS2020_e.pdf

Zooming into the role of market makers in different major stock exchanges. In the New York Stock Exchange (NYSE), there are more than 140 liquidity providers for NYSE-listed securities as of July 2022.[9] In addition, according to the US Securities and Exchange Commission, there are more than 260 market-making firms providing liquidity for Nasdaq-listed stocks.[10] In contrast, there are merely over 30 market makers (known as Securities Market Makers and Designated Specialists collectively) providing market liquidity to Exchange Traded Products (ETPs) on HKEX as of June 2022.[11]

ETFs: In general, ETFs are considered an attractive investment vehicle among investors due in part to its high liquidity characteristics.[12] In 2021, ETFs accounted for about 25% of the total US stock trading by volume, playing an essential role in facilitating the overall liquidity of the market, directly and indirectly.[13] As of 27 May 2022, the average daily value of US ETF transactions stood at US$ 237.98 billion.[14]

Figure 5.

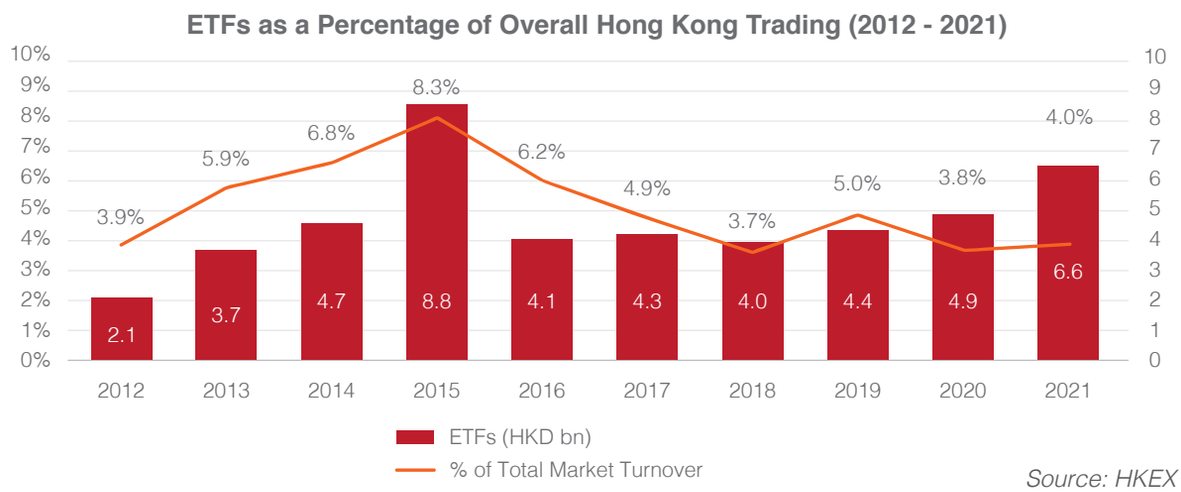


Source: Bloomberg, Cboe Exchange, Inc., Investment Company Institute

[9] NYSE, Membership, https://www.nyse.com/markets/nyse/membership (accessed on 14 July 2022)
[10] US Securities and Exchange Commission, Nasdaq Market Center Systems Description, https://www.sec.gov/rules/other/nasdaqllcf1a4_5/e_sysdesc.pdf (accessed on 26 June 2022)
[11] HKEX, Exchange Traded Product List of Securities Market Makers, https://www.hkex.com.hk/Products/Securities/Exchange-Traded-Products/Market-Makers/List-of-Market-Makers?sc_lang=en#:~:text=There%20are%20over%2030%20Securities,Products%20(ETPs)%20on%20HKEX. (accessed on 26 June 2022)
[12] JP Morgan, "ETF Liquidity: Trading during volatile markets", https://am.jpmorgan.com/us/en/asset-management/adv/investment-strategies/etf-investing/education/true-etf-liquidity/ (accessed on 29 June 2022)
[13] The Investment Company Institute, "2022 Investment Company Fact Book" (2022), https://www.icifactbook.org/pdf/2022_factbook.pdf
[14] New York Stock Exchange (NYSE), NYSE Arca ETF Quarterly Report, https://www.nyse.com/etf/exchange-traded-funds-quarterly-report (accessed on 27 May 2022)

In contrast, Hong Kong's ETFs average daily turnover represented less than 10% of total market trading volume over the last 10 years.[15] While a significant growth in turnover is observed in Hong Kong's ETF market in 2015, it was not sustained afterwards, with the average daily turnover staying at roughly 4% of the market total in 2021.[16] Compared to the US (~25%), there remains huge potential for growth in ETF's representation in Hong Kong's market.[17] We are, therefore, encouraged to see the inclusion of ETFs in the Stock Connect programme (known as "ETF Connect") commencing on 4 July 2022.[18] It is believed that the new inclusion will create additional business opportunities, thereby will help fostering the healthy development of the ETF market, therefore further enhancing the liquidity of the secondary market.

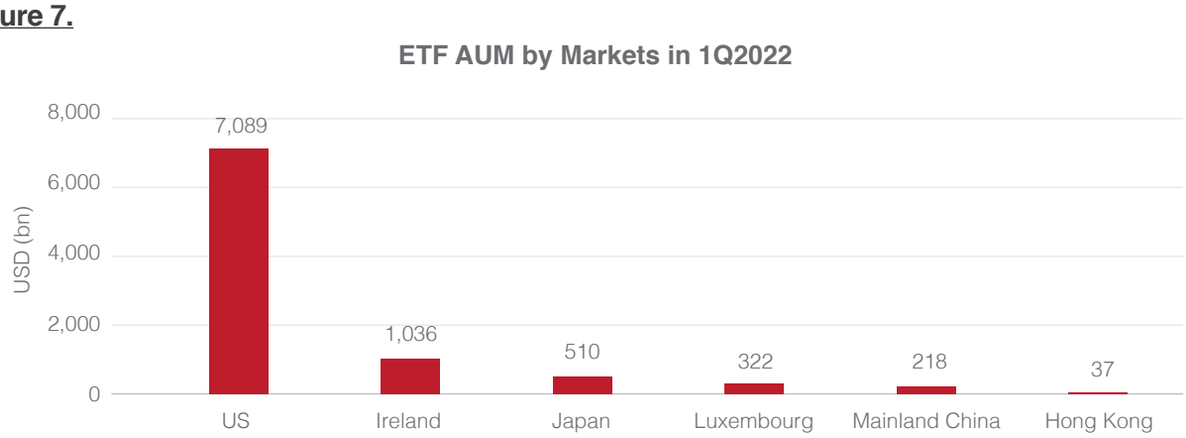
Figure 6.



Source: HKEX

Looking into the scale of ETF assets under management (AUM) by markets, Hong Kong's ETF market also exhibits significant room for improvement. As of 1Q2022, Hong Kong's ETF market scale was modest (US$37 billion) in comparison to US$7.1 trillion in the US,[19] whose size was more than seven times larger than any other major global markets. In this regard, with its advantages to investors and the importance to the market structure, Hong Kong should consider facilitating the further development of the ETF ecosystem.

Figure 7.



Source: Morningstar, Wind Information, China International Capital Corporation (CICC)

[15] HKEX, Key Market Data, https://www.hkexgroup.com/Investor-Relations/Business-Analysis/Key-Market-Data?sc_lang=en (accessed on 31 May 2022)
[16] HKEX, HKEX Monthly Market Highlights, https://www.hkex.com.hk/Market-Data/Statistics/Consolidated-Reports/HKEX-Monthly-Market-Highlights?sc_lang=en&select={40F215EC-D057-4C61-9293-114240C470CD} (accessed on 27 May 2022)
[17] Investment Company Institute, "2022 Investment Company Fact Book" (2022), https://www.icifactbook.org/pdf/2022_factbook.pdf (accessed on 28 June 2022)
[18] HKEX, "HKEX to Include ETFs in Stock Connect on 4 July" (28 June 2022), https://www.hkex.com.hk/News/News-Release/2022/220628news?sc_lang=en (accessed on 28 June 2022)
[19] CICC, "全球ETF市场发展分析：被忽视的ETF"试验场"——加拿大篇" (17 May 2022) https://finance.sina.com.cn/stock/stockzmt/2022-05-17/doc-imcwipik0265590.shtml (accessed on 23 June 2022)

ETFs and Market Makers

As shown above, from the experience of the US market, ETFs and market makers are two important groups of market participants and major contributors to market liquidity. Given their respective roles as passive investment managers and liquidity providers, their ability to better discharge such market functions will play a significant part in facilitating transactions and thus enhancing liquidity in a market. This section dives deeper into the development trends and market functions of market makers and ETFs.

ETF liquidity spill-over effects

ETFs, according to the definition of HKEX,

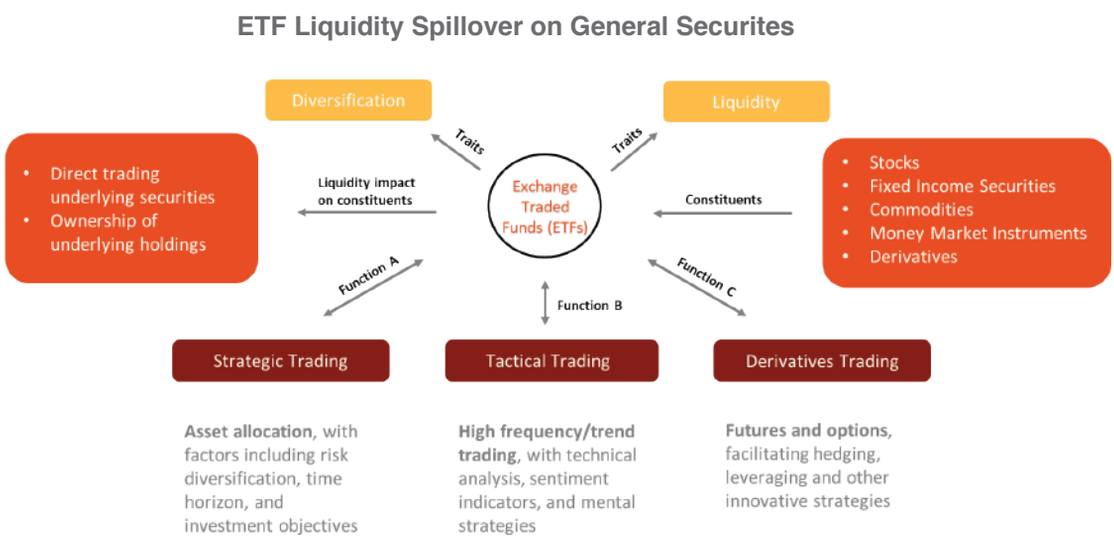
> are hybrid securities, combining features of both mutual funds and stocks. Like mutual funds, ETFs are open-end funds consisting of a portfolio of securities that is assembled according to an investment objective and strategy. Like listed shares of companies, ETF shares can be traded on an exchange, at any time of day while the markets are open, whereas mutual funds or unit trust investments often have restrictions on the frequency with which buy or sell orders are processed – typically once per day.[20]

With the intertwined relationships, the trading of ETFs may bring about liquidity on general securities, futures and options; that is, the spill-over effect of liquidity leading to changes from one market to another.[21] Such spill-over effects result in direct demand shocks, leading to volatility of its underlying securities and key constituents, resulting in changes in liquidity situations, vice versa.

Impact on general securities

Advantages of investing through ETFs, such as low-cost trading and easy access to a variety of asset classes, have encouraged investors to broaden the uses of ETFs. ETFs can be used for strategic trading – such as asset allocation, liquidity management, and portfolio completion – and tactical uses – such as tactical adjustments, cash equitization, and leveraged and inverse investing. Therefore, as the trading activities of ETFs increase, the liquidity of those general securities will also be enhanced.

Figure 8.



[20] HKEX, "ETF Handbook", https://www.hkex.com.hk/-/media/HKEX-Market/Products/Securities/Exchange-Traded-Products/Launch/HKEX_ETF-Handbook.pdf (accessed on 5 May 2022)
[21] Pham, Son D., Ben R. Marshall, Nhut H. Nguyen, and Nuttawat Visaltanachoti, Liquidity Spillover between ETFs and Their Constituents (2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3806140 (accessed on 5 May 2022)

Impact on underlying securities

The trading of ETF affects liquidity across other asset classes, including individual stocks, futures, options and derivatives. For example, in the US, substantial portions of individual stocks are held by ETFs (figure 9.). The underlying securities will be traded when creation/ redemption or rebalancing events happen. As the AUM and trading activities of ETFs continue to grow, the liquidity and price discovery of underlying securities will improve as well.

Figure 9.

Ownership % of Selected Individual Stocks Market Cap Held by ETFs in the US (as of March 2022)

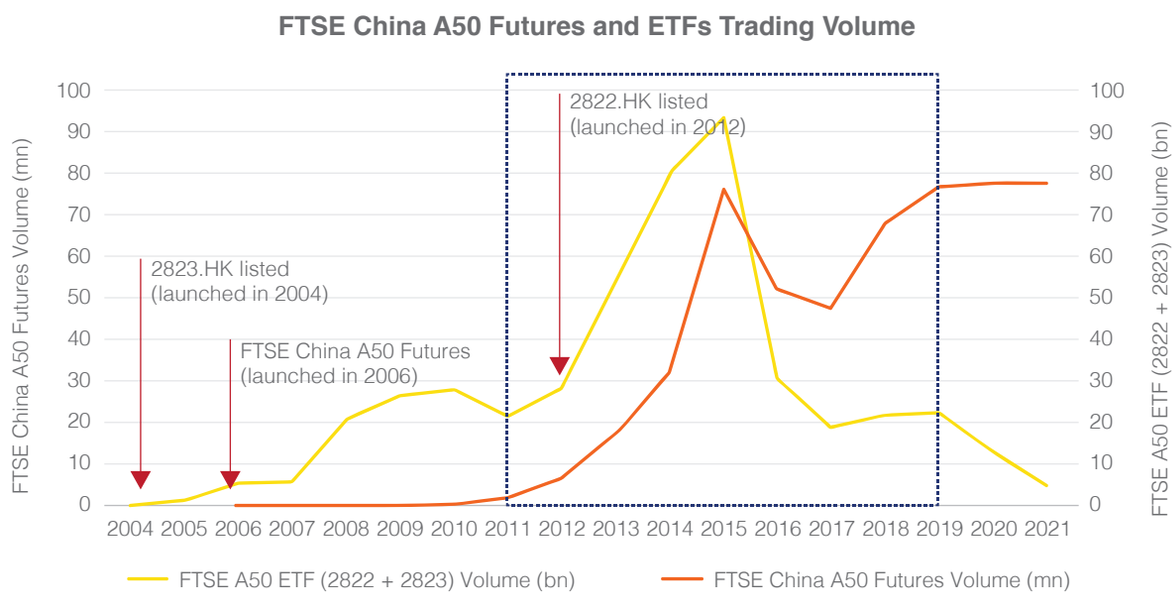
Name	Sector	Market Cap (mn of USD)	% of Weight held by all ETFs
American States Water Co.	Utilities	3,093	33.9
Universal Corp/VA	Food, beverage & tobacco	1,496	31.9
South Jersey Industries	Utilities	4,181	31.6
California Water Service Group	Utilities	3,065	31.1
Helix Energy Solutions Group	Energy	476	30.0
Coeur Mining Inc	Materials	862	29.9
Badger Meter Inc	Technology hardware & equipment	2,359	29.3
New Jersey Resources Corporation	Utilities	4,374	29.3
Armour Residential Reit Inc	Diversified financials	746	28.9
Brady Corporation Class A	Commercial & Professional Services	2,370	28.9
Avista Corporation	Utilities	3,245	28.0
LTC Properties, Inc.	Real estate	1,532	28.0
Petmed Express Inc	Retailing	1,417	27.8
Aerovironment Inc	Capital goods	2,143	27.5
Abm Industries Inc	Commercial & professional services	2,885	27.2
Itron Inc	Technology hardware & equipment	2,178	27.2
Industrial Logistics Properties Trust	Real estate	930	27.1
Global Net Lease Inc	Real estate	1,490	26.6
Carpenter Technology Corporation	Materials	1,323	26.5
Black Hills Corp	Utilities	4,901	26.2

Source: Bloomberg

Impact on the futures market

Historically, ETFs have also demonstrated positive liquidity spill-over effects on the futures market. Take the commonly traded FTSE China A50 Futures launched in 2006 as an example. Trading activities were rather limited in early-2000s when it was first introduced to the market, but the situation improved notably when the trading activities of iShares FTSE China A50 ETF (2823.HK) increased[22] and after the launch of CSOP FTSE China A50 ETF (2822.HK) in 2012. As shown in figure 10, the trading volume of the two FTSE China A50 ETFs has demonstrated a positive relationship with the growth in the trading of the underlying futures.

Figure 10.



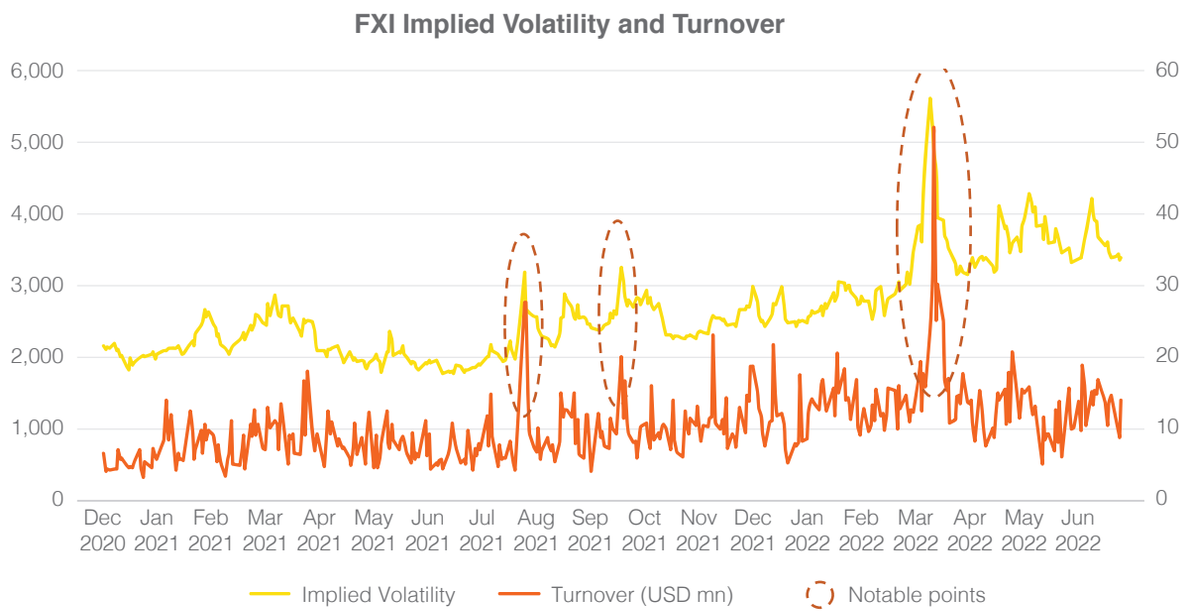
Source: Bloomberg

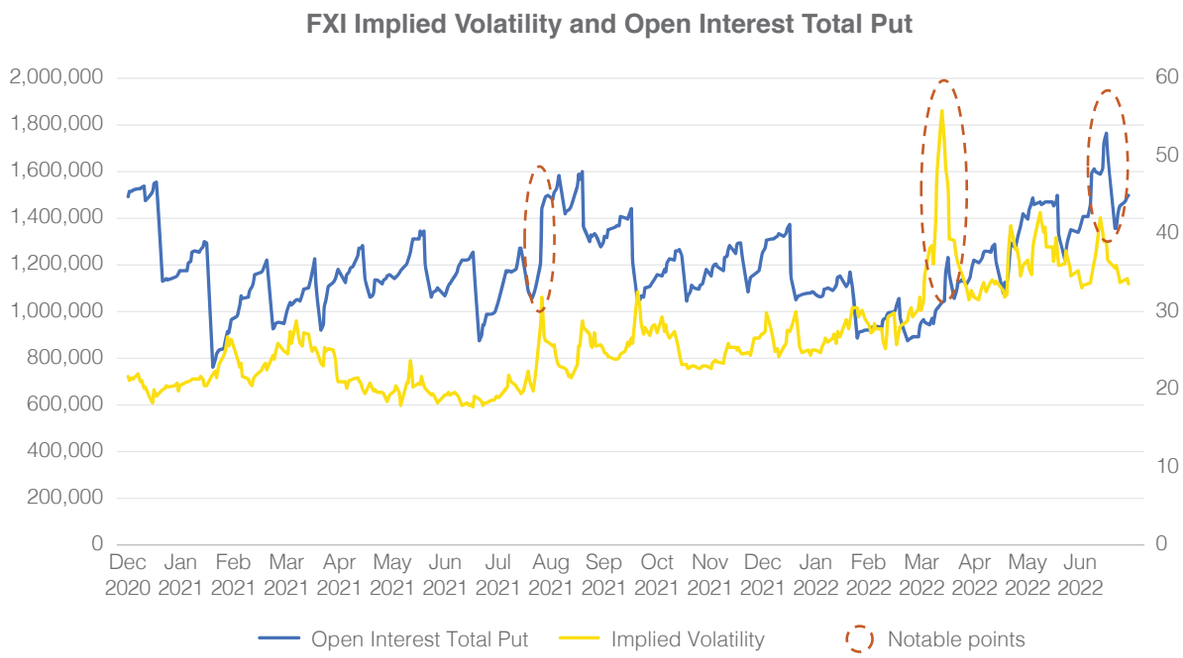
ETF liquidity spill-over on options

When market volatility increases, the turnover of ETFs and related options tend to increase at the same time, as they are considered important tactical trading tools. As shown in figure 11, when the implied volatility of FXI (China Large-cap ETF) and KWEB (China Internet ETF) went up, the turnover of ETFs and open interest of options (figure 12) also spiked, indicating a higher level of hedging activities.

[22] iShares FTSE China A50 ETF was launched in 2004.

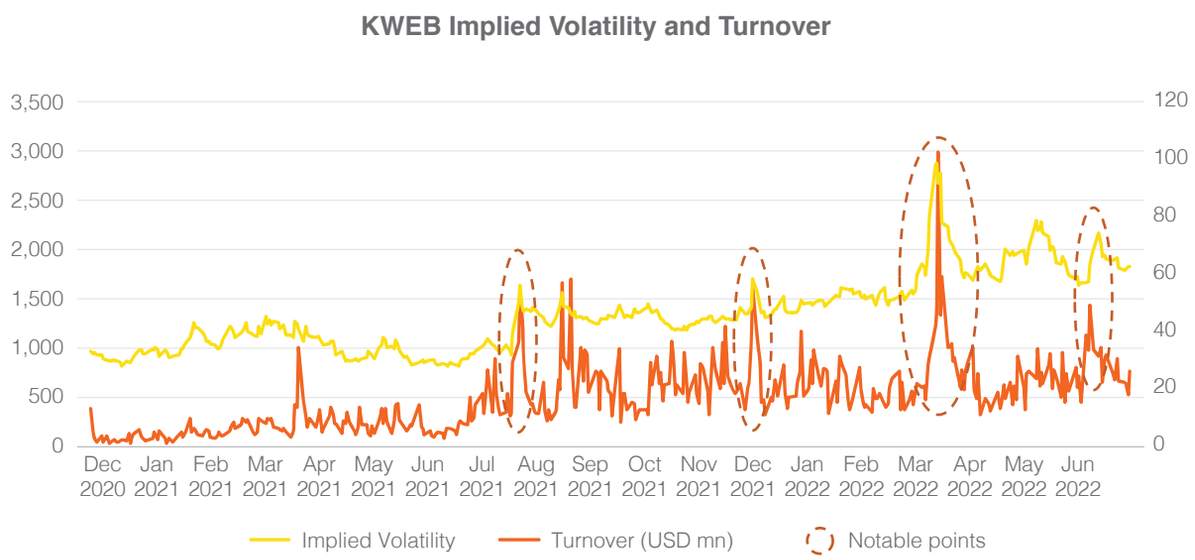
Figure 11.

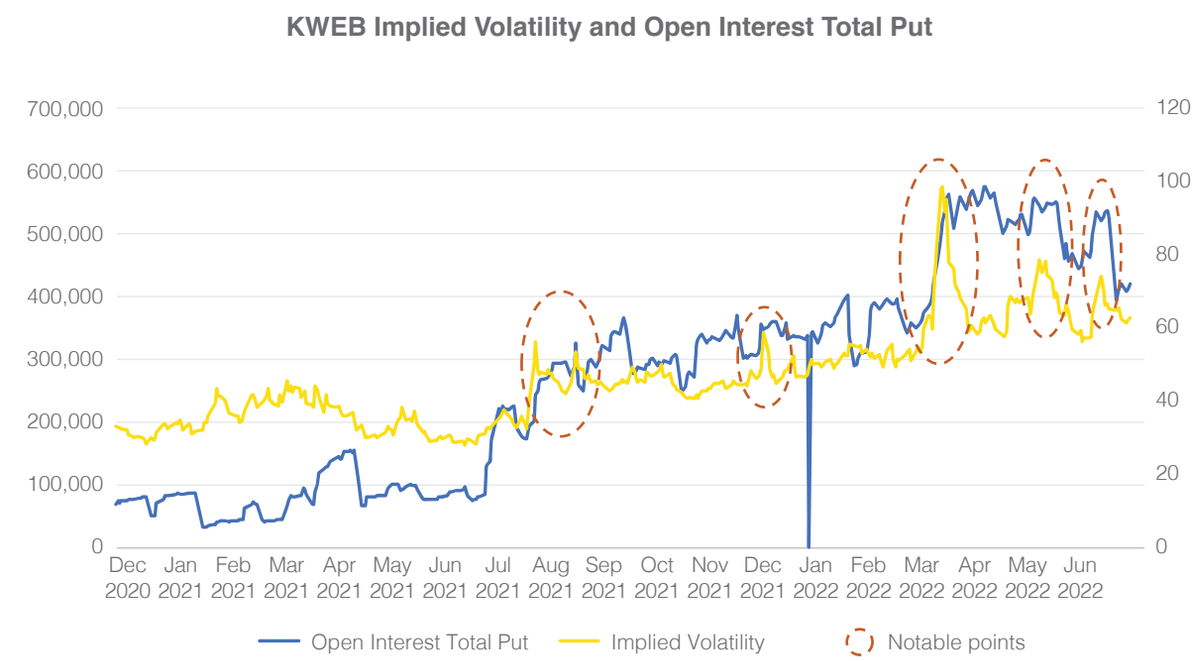




Source: Bloomberg

Figure 12.





Source: Bloomberg

ETF liquidity and market depth

Trading of ETFs improves market depth and liquidity. Generally, an ETF is categorised as an open-end fund as it consists of multiple underlying assets, with no limits on the number of shares that can be created and redeemed. Given this nature, unlike individual stocks, drawing implications from the average daily volume of an ETF alone might not be able to reveal the complete picture of its liquidity. In this regard, it is worth noting that when the liquidity of ETFs is discussed, multiple dimensions need to be taken into consideration[23,24]:

1) On-screen liquidity – the most visible source of liquidity that refers to typical trading orders in the secondary market conducted by typical investors. This can be assessed by looking into the average trading volume and the bid-ask spread of the ETF. The information available "on-screen", however, only reflects a fraction of the ETF's liquidity.

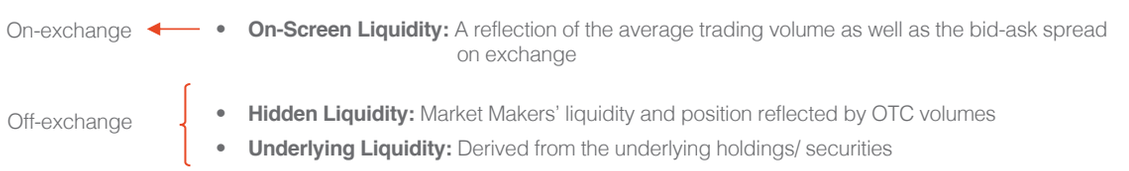
2) Hidden liquidity – refers to off-exchange transactions, which are generally, other than the highest bid and lowest ask that are publicly available, additional quotes that can be accessed with the assistance of brokers/ market makers. Hidden liquidity is a reflection of "market makers' inventory that has not been committed to the market and inventory that is available through over-the-counter (OTC) platforms and securities borrowing".[25]

3) Underlying liquidity – among market participants, this is considered as the fundamental and deepest source of an ETF's liquidity, which can be accessed through the process of creation and redemption of shares in the primary market. The underlying liquidity is derived from its underlying holdings/ securities and, thus, there is an established positive relationship between such.

With the above in mind, an ETF can be more liquid than it appears on-screen, which explains why the average daily volume on exchange platforms may neither necessarily equal to nor be indicative of an ETF's actual liquidity. As an extreme but not uncommon example, an ETF with low trading volume can be considered liquid if its underlying holdings are liquid. As mentioned, the underlying liquidity has a positive relationship with the liquidity of the underlying holdings/ securities. Therefore, as long as the underlying holdings are liquid – for instance, they provide tight bid-ask spreads, and that the orders on both buy and sell sides are significant enough – the liquidity profile of that ETF may mirror liquidity of the underlying securities/ holdings.[26]

Figure 13.

Deepen the Market through Multiple Layers for Trading Liquidity



Source: HKEX

[23] HKEX, "ETF Handbook", https://www.hkex.com.hk/-/media/HKEX-Market/Products/Securities/Exchange-Traded-Products/Launch/HKEX_ETF-Handbook.pdf (accessed on 5 May 2022)
[24] American Century Investments, "ETFs: Three Levels of Liquidity for Greater Access to the Market" (24 March 2021), https://www.americancentury.com/insights/understanding-etf-liquidity/ (accessed on 29 June 2022)
[25] HKEX, "Assessing the Impact of HKEX's ETF Liquidity Enhancements" (December 2022), https://www.hkex.com.hk/-/media/HKEX-Market/Products/Securities/Exchange-Traded-Products/Attachment/HKEX--Assessing-the-impact-of-HKEX_s-ETF-liquidity-enhancements_whitepaper_en.pdf (accessed on 23 June 2022)
[26] Central Bank of Ireland, "Response to the Central Bank of Ireland's Discussion Paper on Exchange Traded Funds ("ETFs")" (11 August 2017), https://www.centralbank.ie/docs/default-source/publications/discussion-papers/discussion-paper-6/vanguard-group-response-etf-discussion-paper.pdf?sfvrsn=0 (accessed on 27 June 2022)

Market makers and the trading ecosystem

The primary role of a "market maker" is to create liquidity by being ready to buy and sell securities within the market at publicly quoted prices,[27] and therefore they are indispensable to a highly liquid market. According to HKEX, market makers "contribute to Hong Kong's market quality by providing improved liquidity and price efficiency, enabling investors to trade in a timely manner and at a lower transaction cost".[28] They are recognised as a key source of liquidity for various financial products, such as ETFs, stocks, options and futures. Using ETFs as an example, based on our exchanges with ETF operators and managers, market makers actively offer bid-ask quotes to market participants and are, thus, instrumental in enhancing the efficiency of the market. In certain markets such as the US, maker makers contributed around 16% of the liquidity created in the US market.[29]

Market makers are commonly present in most developed markets, and they have seen increasing popularity in other emerging market exchanges.[30] Under these schemes, market makers usually need to fulfil certain obligations set out by their respective exchanges and are, in return, compensated via certain incentives such as fee rebates. The obligations of market makers, as set out by the stock exchanges, usually involve trading actively in a wide range of securities, which would lead to:

- **Narrower bid-ask spreads,** and hence accelerating fair price discovery;
- **Higher quoted quantities,** thus enhancing robustness of market liquidity; and
- **Higher liquidity in the market,** both on-screen and off-screen.

Functions of market makers throughout the product lifecycle:

Figure 14 below shows how market makers function as liquidity providers for a product throughout the product lifecycle.

As there is a cluster of market participants involved at different stages in the full cycle of a new product, from initiation to maturity, market makers play a crucial role in connecting different participants, and they are involved at each and every step throughout the process to facilitate the launch and implementation of the product.

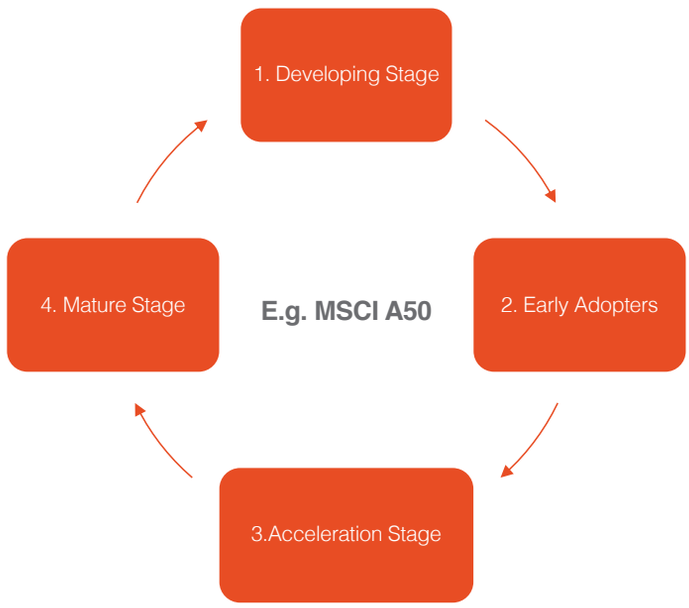
[27] NYSE, "Market Makers in Financial Markets: Their Role, How They Function, Why They are Important, and the NYSE DMM Difference" (September 2021), https://www.nyse.com/publicdocs/nyse/NYSE_Paper_on_Market_Making_Sept_2021.pdf (accessed on 26 June 2022)

[28] HKEX, Exchange Traded Product Overview https://www.hkex.com.hk/Products/Securities/Exchange-Traded-Products/Market-Makers/Overview?sc_lang=en (accessed on 24 May 2022)

[29] Nasdaq, "Who is Trading on U.S. Markets?" (28 January 2021), https://www.nasdaq.com/articles/who-is-trading-on-u.s.-markets-2021-01-28 (accessed on 20 July 2020)

[30] Oliver Wyman and World Federation of Exchanges, "Enhancing Liquidity in Emerging Market Exchanges" (October 2016), https://www.oliverwyman.com/-content/dam/oliver-wyman/global/en/2016/oct/Liquidity-in-Emerging-Markets-Exchanges-.pdf (accessed on 5 May 2022)

Figure 14.



1. Developing stage – prior to the launch, substantial support is required, especially from market makers. Market makers provide initial liquidity to a product from day one, when investors are still observing market makers' pricing of a new product before investing.

2. Early adopters – market makers actively facilitate market demand from early adopters such as retail and professional investors with sizable amounts through the creation and redemption of shares.[31] Their sizes increase as more investors are involved, which may help provide tighter bid-ask spreads.

3. Acceleration stage – market makers formulate trading strategies and favourable offerings to encourage more players to participate in the market. "Speculators" are more likely to enter the market after seeing sufficient product turnover, and thereby further contribute to boosting liquidity.

4. Mature stage – as the market becomes more efficient and vibrant through facilitation adjustments, attracting more long-term "real-money" investors who can fund investments at their full value. More types of trading are expected to happen at this stage, including arbitrage between derivatives/ ETFs, quantitative trading strategies, long/ short strategies, etc.

As demonstrated above, market makers serve as the connector among stakeholders in the product lifecycle. They cater to demands from various dimensions through (i) providing liquidity while improving market depth, (ii) facilitating tighter bid-ask spread to lower trading costs, and (iii) allowing direct trades to reduce market impact. Considering the above, the FSDC believes that the some 30 Securities Market Makers and Designated Specialists with presence in Hong Kong, including the global leading ones, fuel the development of Hong Kong's capital market by improving liquidity and pricing efficiency.

[31] HKEX, "ETF Handbook", https://www.hkex.com.hk/-/media/HKEX-Market/Products/Securities/Exchange-Traded-Products/Launch/HKEX_ETF-Handbook.pdf (accessed on 5 May 2022)

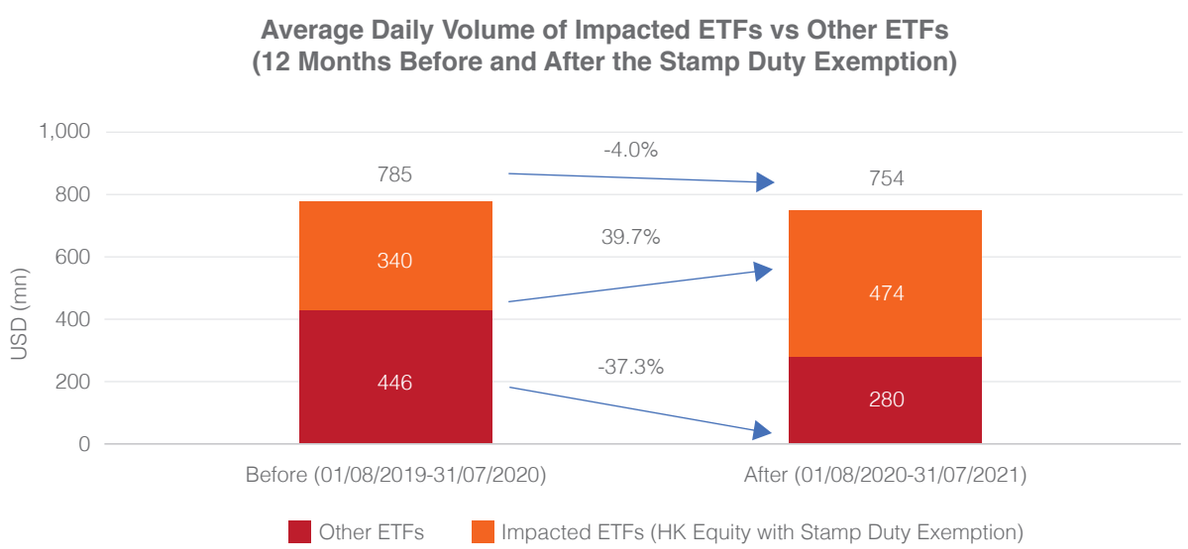
Case Studies: Infrastructure Enhancements and Their Impact on Liquidity

While ETFs and market makers contribute positively to enhanced market liquidity, appropriate market mechanism and supporting infrastructure will need to be in place for them to better discharge their functions. Over the years, Hong Kong and other markets across the world have launched a range of effective infrastructure enhancements with an aim of growing market liquidity, including some that were targeting to facilitate ETF trading and/ or market making activities. Prior to discussing potential mechanism enhancements for Hong Kong, it would be useful to draw experiences from enhancements previously rolled out in Hong Kong and other global markets.

Example 1: HKEX – Improved liquidity from stamp duty exemption for ETFs

On 1 August 2020, the Stamp Office rolled out stamp duty exemption on "sale and purchase of Hong Kong stock involving the activities of ETF market makers in the course of allotting and redeeming ETF shares or units listed in Hong Kong".[32] The initiative, together with other enhancement measures on market microstructure, reduced the transaction cost of trading ETFs listed in Hong Kong. This favourable factor has led to more active participation in trading of relevant EFTs.[33] As a result, average daily volume of the impacted ETFs increased by 39.7% in the subsequent year, while the total average daily volume of the Hong Kong market saw a decline of 4.0% during the same period.

Figure 15.



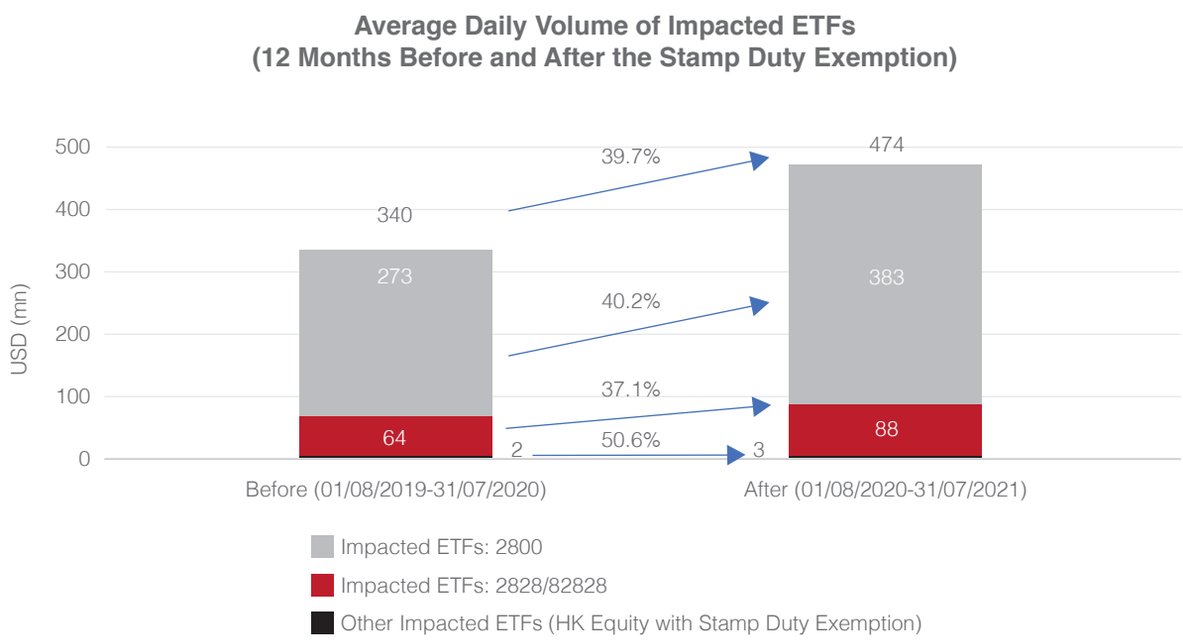
Source: Bloomberg

[32] Inland Revenue Department Stamp Office, Stamping Circular No. 03/2020, (August 2020), https://www.ird.gov.hk/eng/pdf/sdo/ext_cir/so_ext_-cir_03_2020_e.pdf (accessed on 27 May 2022)

[33] Financial Services and the Treasury Bureau (FSTB), Legislative Council Brief, Stamp Duty Ordinance (Chapter 117), Stamp Duty Ordinance (Amendment of Schedule 8) Regulation 2020 (13 May 2020), https://www.fstb.gov.hk/fsb/en/legco/docs/b200513_e.pdf (accessed on 25 June 2022)

Zooming in on the performance of specific ETFs, the liquidity of the Tracker Fund of Hong Kong (2800.HK) increased by 40.2%, the liquidity of Hang Seng China Enterprises Index ETF (2828.HK) increased by 37.1%, and the liquidity of other Hong Kong equity ETFs covered by stamp duty exemption increased by 50.6% over the period between August 2020 and July 2021, compared to the preceding twelve months (i.e. August 2019 to July 2020).

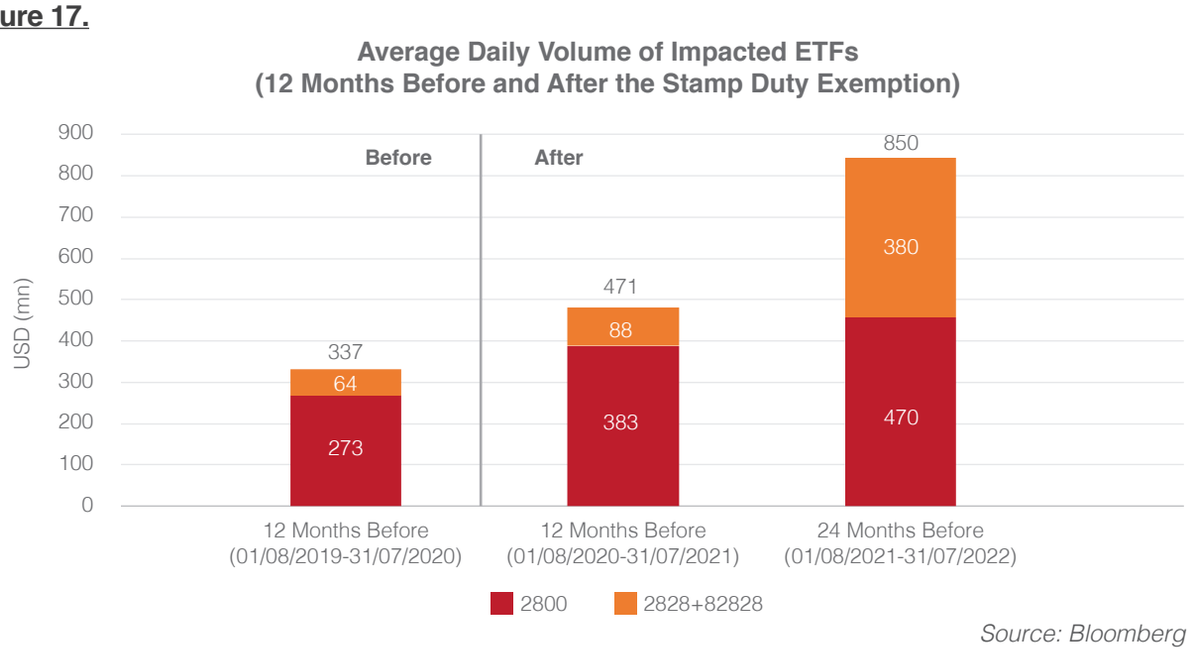
Figure 16.



Source: Bloomberg

Taking a closer look at the longer impact of the stamp duty exemption on the Tracker Fund of Hong Kong (2800.HK) and Hang Seng China Enterprises Index ETF (2828.HK and 82828.HK), both funds have experienced an overall sustained growth in terms of trading volume since the introduction of the stamp duty exemption in August 2020.

Figure 17.

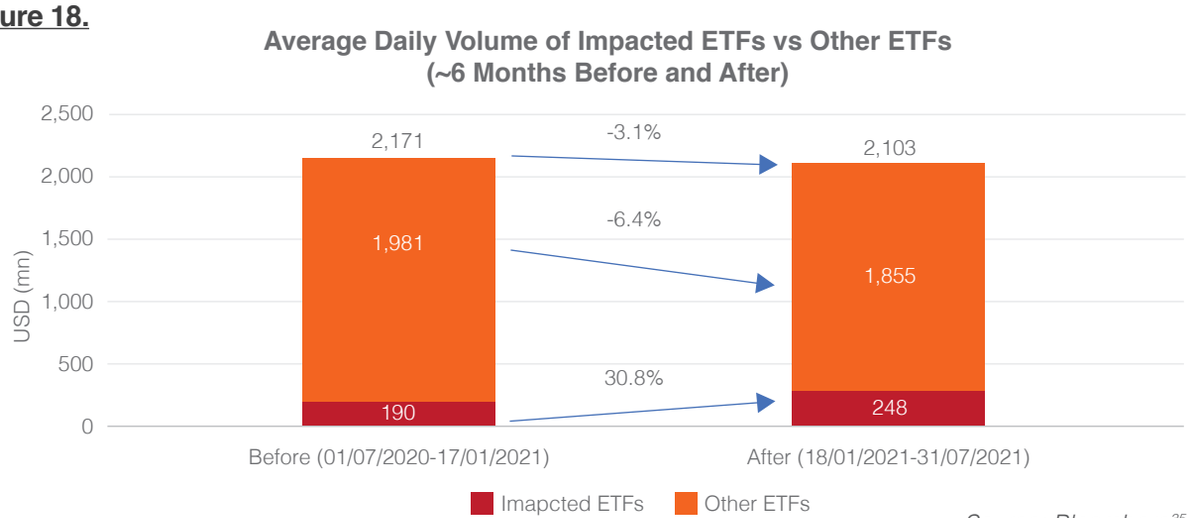


Source: Bloomberg

Example 2: Tokyo Stock Exchange – Improved liquidity from streamlined ETF settlement process

The implementation of a more efficient settlement process can lead to favourable market response. Take the experience in Japan as an example. The Tokyo Stock Exchange streamlined the ETF settlement process in 2021, by smoothening creation/redemption settlement procedures and allowing designated securities companies to use net settlement clearing mechanism for transactions related to ETF creation/redemption. By responding to market suggestions, this adjustment has enabled settling a number of transfers between or among counterparties on a net basis.[34] As a result of the enhancement, average daily volume of the impacted ETFs increased by 30.8%, while the total average daily volume of the ETF market saw a decline of 3.1% over the same period.

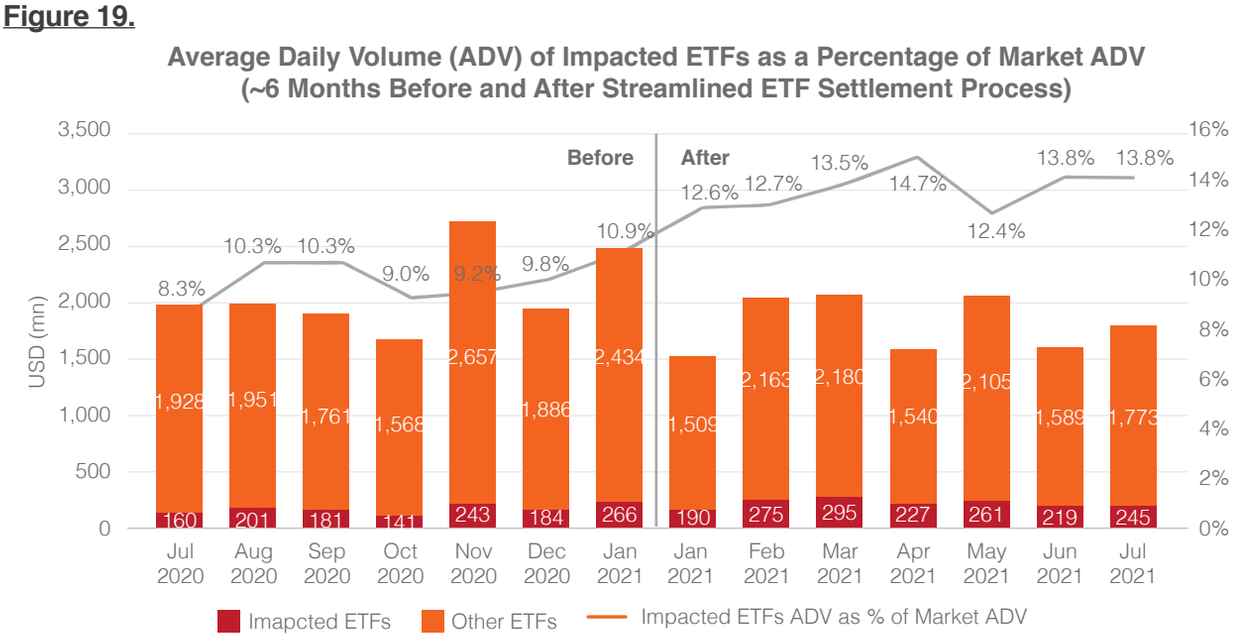
Figure 18.



Source: Bloomberg[35]

The average daily volume of impacted ETFs as a percentage of market average daily volume increased from 9.7% to 13.4% on average in the ~six months since the implementation of such enhanced mechanism.

Figure 19.



Source: Bloomberg[36]

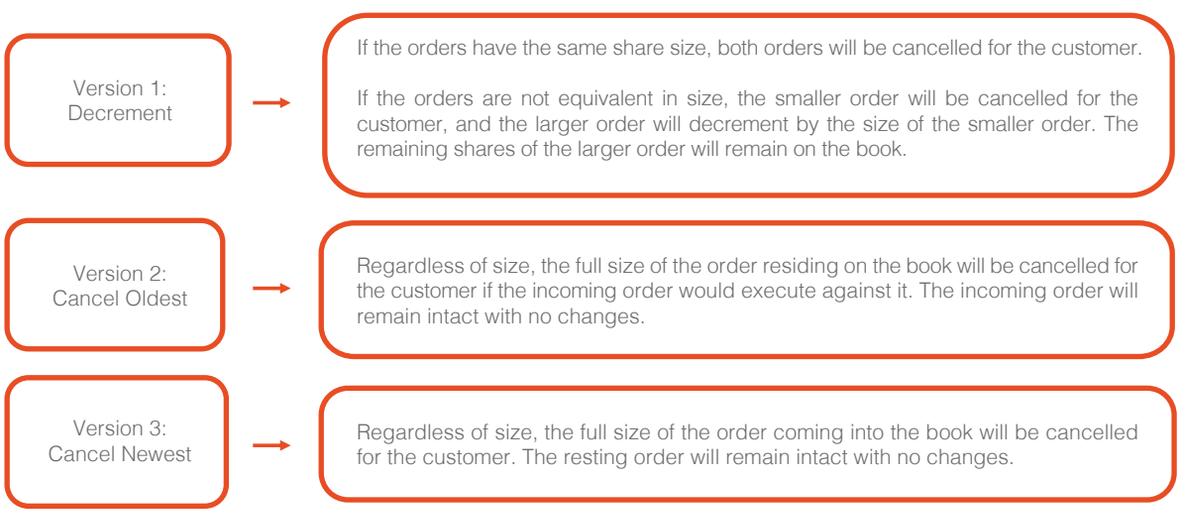
[34] BIS, Committee on Payment and Settlement Systems, "A glossary of terms used in payments and settlement systems" (2003), https://www.bis.org/cpmi/-glossary_030301.pdf (accessed on 22 June 2022)
[35] Only included Japan-listed ETFs with JT tickers on Bloomberg (accessed on 8 August 2022)
[36] Only included Japan-listed ETFs with JT tickers on Bloomberg (accessed on 8 August 2022)

Example 3: Enhanced trading environment via self-match prevention mechanisms

It is common among market participants to run numerous trading instructions simultaneously. Hence, there is possibility that the market's matching platform could match the buy and sell orders made by the same firm.[37] With no change in beneficial ownership, such self-matching scenario is unintentional and should be avoided.

Implementation of the self-match prevention mechanism is important to enhancing market resilience, facilitating risk management, and upholding market integrity.[38] In order to safeguard exchange participants from engaging in unintended self-trading, many exchanges around the world have adopted an optional functionality – self-match prevention mechanism, which prevents two orders with the same market participant identifier (MPID) from executing against each other.[39] For instance, the Nasdaq Stock Market (Nasdaq), Nasdaq BX (BX) and Nasdaq PSX (PSX) offer this optional feature free of charge to their market participants.[40] Nasdaq offers three versions of the functionality to allow participants to choose how orders are handled in the event of a self-match situation.[41]

Figure 20.



Source: Nasdaq

Advanced self-match prevention mechanism promotes more efficient trading, higher quality volume of trades, lower operational costs, and more diverse trading strategies that will contribute to a more resilient ecosystem. With this in mind, many exchanges across the world have adopted self-match prevention mechanisms. Please refer to the Annex 1 for additional information.

[37] The Futures Industry Association (FIA), "What is a self-trade, anyway?" (October 2015), https://www.fia.org/ptg/resources/what-self-trade-anyway (accessed on 22 June 2022)

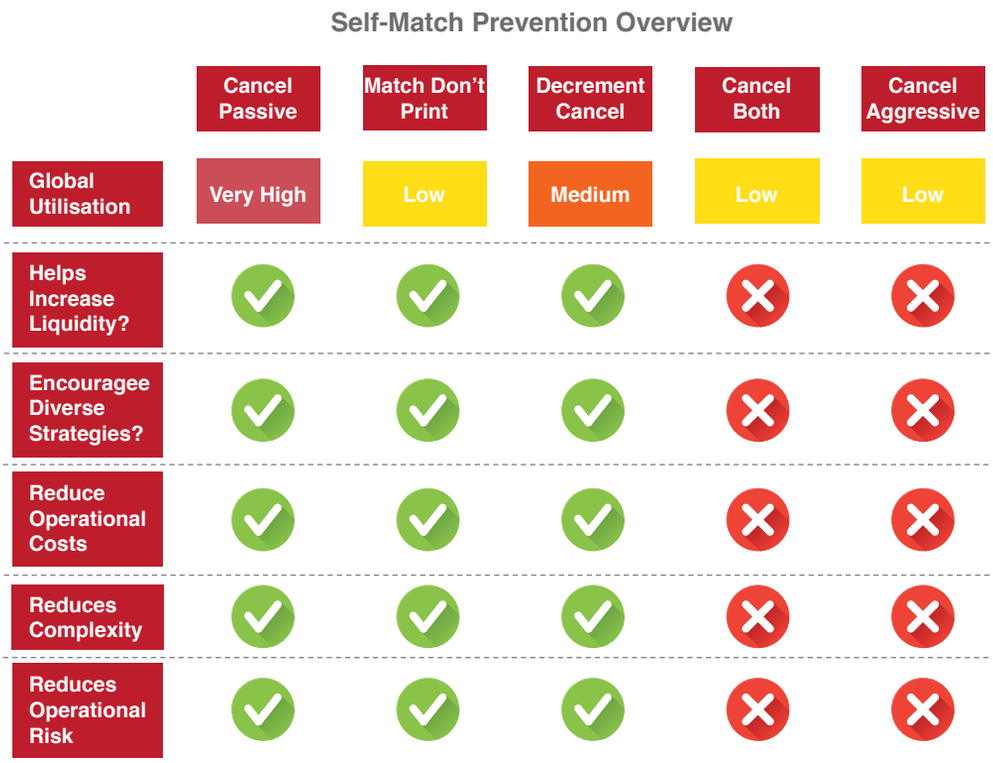
[38] HKEX, "HKEX Investor Presentation" (May 2022), https://www.hkexgroup.com/-/media/HKEX-Group-Site/Ir/IR-Pack/2022-May_HKEX-IR-Pack_vF.pdf (accessed on 20 June 2022); HKEX, "Building a Vibrant Trading Market", https://sc.hkex.com.hk/TuniS/www.hkexgroup.com/-/media/DD3938B66C45456AACC25C49CF6BCF54.ashx (accessed on 20 June 2022)

[39] Nasdaq, "Self Match Prevention" (2018), https://www.nasdaqtrader.com/content/productsservices/trading/selfmatchprevention.pdf

[40] Nasdaq Stock Market (Nasdaq), Nasdaq BX (BX) and Nasdaq PSX (PSX) are the three exchanges owned by Nasdaq. Nasdaq is the largest U.S. equities exchange venue by volume and it accepts various order types from clients to execute various trading strategies. Nasdaq BX has an inverted pricing model and provides rebates to liquidity removers in order to execute trades. Nasdaq PSX has a pro rata pricing allocation that encourages market participants to aggressively compete on price. Please refer to Nasdaq, "U.S. Equities", https://www.nasdaq.com/solutions/u.s.-equities; Nasdaq Trader, "The Nasdaq Stock Market (Nasdaq)", https://nasdaqtrader.com/Trader.aspx?id=TradingUSEquities; Nasdaq, "TradeTalks Nasdaq PSX is the Most Unique Equity Exchange" (19 April 2017), https://www.nasdaq.com/articles/tradetalks-nasdaq-psx-is-the-most-unique-equity-exchange-2017-04-19 (all accessed on 29 June 2022)

[41] Nasdaq, "Self Match Prevention" (2018), https://www.nasdaqtrader.com/content/productsservices/trading/selfmatchprevention.pdf (accessed on 24 June 2022)

Figure 21.



Source: Citadel

Cost benefit analysis of infrastructure enhancements

Despite the costs of putting in place new mechanisms, long term benefits of the enhancements should be recognised. This paper has structured an analysis with a view of assessing the costs and benefits of implementing such changes.

As with other investments, potential monetary involvement would be mostly related to the new or upgrading of the infrastructure, such as systems and networks. Furthermore, some costs may be incurred at different stages of the process, ranging from costs relating to piloting, troubleshooting, and maintenance. In addition, in view of the new processes and rules needed alongside the development, training support offered to staff will be crucial. However, monetary involvement in these investments can be gradually amortised over the years while bringing significant favourable impact.

The enhancements will improve trading efficiency for investors and reduce risk exposures arising from the settlement process. We envisage that developing our market into a more advanced trading venue will bring various benefits. For instance, the enhancement will induce more and a wider variety of market players to utilise our platforms, which will in turn lead to a more robust and dynamic investment environment, and thereby creating more job opportunities and stronger growth of the economy. In the long term, the enhancements will promote the overall market vitality and trading quality, resulting in better liquidity and will further improve Hong Kong market competitiveness among other global markets.

Potential Measures to Enhance Market Liquidity

A market's liquidity is a crucial deciding factor as investors, issuers and other participants consider where to take part in financial market activities. Through our exploratory exercise, increasing popularity of ETF investment is observed in developed markets, due in part to its cost-effective characteristics and diversification benefits. With increased investor interests, the liquidity of ETF underlying assets is enhanced, and such positive impacts can be further boosted with the facilitation and support of market makers. With the aim of enhancing liquidity of the Hong Kong market, this paper sets out a set of recommendations - adopting a multi-pronged approach to facilitate ETF trading activities, to enhance current rules and incentive programmes in relation to trading and clearing, as well as to upgrade the trading infrastructure.

With the enhancements of ETF trading activities and introduction of market makers as key points of reference, recommendations set forth in this paper are put together to tackle specific issues faced by ETF operators or market makers. Such enhancements will also be timely for the development of the newly launched ETF Connect. We believe that these proposals will enable ETFs and market makers to better discharge their market function as liquidity providers; these suggestions will, together, create a virtuous cycle that can enhance market liquidity, and cement Hong Kong's competitiveness as an international financial centre.

Enhancements of ETF trading activities

Over the last few years, HKEX has introduced various mechanisms to foster market development through facilitating market participants, market makers and ETFs to better perform their roles. FSDC recommends HKEX to consider building on these successful initiatives and rolling out further enhancement measures that can bring immediate positive impacts to the trading of ETFs and, hence, the market. These suggestions, among which, are with lower barrier to accomplish. These suggestions include:

1. Introducing a new spread table with tick sizes more suitable for Hong Kong-listed stocks

Introducing a spread table that sets out the minimum price movements (i.e. tick intervals) for securities to trade at different price ranges.[42] Smaller tick size leads to greater flexibility, better price efficiency, and potentially lower trading cost.[43] In February 2020, HKEX introduced a new spread table with reduced tick sizes for ETFs and Leveraged and Inverse Products to create greater trading flexibility for investors.[44] While the adjustment was well received by the market, it is worth noting that single stocks are still traded in accordance with the old spread table, which not only leads to investors paying higher spreads for single stocks trading, but also results in ETF market makers having to mark-up ETF quotations to cover for the higher stock spreads.

In this context, HKEX should explore introducing a new spread table with tick sizes more suitable for Hong Kong-listed stocks at different prices to align with the latest market development. This can reduce price spreads when market makers offer ETF pricing to investors, lower trading costs for market participants, enhance flexibility and price efficiency for investors when faced with various unexpected market conditions, and, ultimately, increase ETF market liquidity. Adjustments should be made based on price range to ensure the new spreads are suitable for stocks within different price ranges.

[42] HKEX, Exchange Traded Product Investors, https://www.hkex.com.hk/Products/Securities/Exchange-Traded-Products/Investors?sc_lang=en (accessed on 20 June 2022)

[43] HKEX, "Introducing smaller tick size to Hong Kong ETFs", https://www.hkex.com.hk/-/media/HKEX-Market/Products/Securities/Exchange-Traded-Products/Launch/HKEX-Exchange-Traded-Product-Introducing-Smaller-Tick-Size-to-Hong-Kong-ETFs-infosheet.pdf (accessed on 21 June 2022)

[44] HKEX, "Circular: Introduction of new spread table and continuous quoting market making obligations for Exchange Traded Funds and Leveraged and Inverse Products - Update" (27 February 2020), https://www.hkex.com.hk/-/media/HKEX-Market/Services/Circulars-and-Notices/Participant-and-Members-Circulars/SEHK/2020/ETP_00220_e.pdf (accessed on 5 May 2022)

2. Increasing maximum spread range requirement to above 24 spreads

An ETF has two prices, namely the one measured by its net asset value (NAV), which represents the estimated "fair value" of its underlying securities, and the market price on the exchange where the ETF can be bought or sold by investors within trading hours.[45] These two prices might be different from each other depending on market conditions (e.g. price discrepancy tends to be larger when markets and sentiments are more volatile). Market makers play a major role in restoring the ETF back to its fair value when the ETF is trading at a premium (i.e. when demand is higher than supply) or discount (i.e. when supply is higher than demand) by setting a bid price and an ask price in and around the ETFs intra-day NAV.

According to the current the HKEX trading rules, the maximum spread range allowed for equities and ETFs is 24 spreads when trading on-screen.[46] However, this spread might not be significant enough for market markets to trade under certain market conditions, especially when the market becomes overly volatile. For example, if an aggressive investor wants to sell a large lot of ETFs, the investor will then have the ability to drive down the price. That said, under the current rules, a market maker can only price the sale of the ETF within 24 spreads, which may not be sufficient for the market maker to hedge all potential risks and provide a buffer for holding the inventory. More specifically, if the average daily volume of one ETF is 100,000 units and one seller wants to sell 10,000,000 units, market makers may need months to unwind their positions on-screen, which requires more buffer on pricing to hedge the risk.

HKEX may consider increasing the maximum premium/discount requirement to above 24 spreads under certain circumstances as appropriate, while other measures can be put in place to prohibit certain behaviour intended to disrupt market orders. For instance, when the market is volatile or facing considerable uncertainties, a wider pricing difference for official market makers of ETFs can facilitate the execution of large volume trades in volatile markets. This will, in turn, facilitate trading efficiency in the secondary market and enhance liquidity for the larger financial market.

3. Extending the market maker short-sell permission for manual trades

In Hong Kong, market makers are unable to provide liquidity outside the continuous trading sessions with exemptions such as short selling, tick rule, stamp duty, etc.; this arrangement hinders their market making functions. For instance, if a client reaches out to a market maker to buy a specific ETF at 5pm when the HKEX market is closed, the market maker will not be able to match the trade unless the market maker has sufficient inventory. In other markets, such as the US, short sell exemption is allowed round the clock (i.e. 24/7).

The permission to short sell will incentivise a market participant to become a market maker. Short selling, apart from being a fundamental function of market makers, also allows further flexibility to the participant and provide it an alternative channel to generate profit. HKEX may consider extending the short sell permission for market makers to manual trades (OTC trades after-market hours), which will unlock an important market making function of market makers, allowing them to provide more ETF liquidity during non-continuous hours and improve ETF liquidity on the following days.

[45] HKEX, "ETF Handbook", https://www.hkex.com.hk/-/media/HKEX-Market/Products/Securities/Exchange-Traded-Products/Launch/HKEX_ETF-Handbook.pdf (accessed on 5 May 2022)

[46] HKEX, Securities Market Operations, https://www.hkex.com.hk/Global/Exchange/FAQ/Securities-Market/Trading/Securities-Market-Operations?sc_lang=en#collapse-8 (accessed on 27 May 2022)

4. Introducing adjustments to ETF settlement approaches

Settlement approaches can affect market makers' effectiveness to create liquidity. On the ETF primary market, where market makers create or redeem ETF units for securities and/or cash, market makers are required to a) perform Free of Payment (FOP) settlement[47] on T or T+1 for the creation orders, and b) obtain ETF units at T+2 through one of the four settlement batches (i.e. 10:30 a.m., 12:00 noon, 2:00 p.m. and 3:45 p.m.).

In practice, as it may not be clear or even unknown as to which batch the ETF unit may be settled through, GCPs and counterparties usually require market makers to prefund and transfer funds on T+1. This practice, though not a requirement, would adversely impact the utilisation and deployment of capital among market makers, resulting in higher costs (e.g. funding cost, opportunity cost) and risks (e.g. liquidity risks, market risks). The ripple effect would lead to pass-on costs to investors and discourage investors from trading in Hong Kong.

It is believed that if ETFs can settle through Delivery Versus Payment (DVP), it can lead to better market liquidity than using FOP. DVP refers to "a securities settlement mechanism that links a securities transfer and a funds transfer in such a way as to ensure that delivery occurs if and only if the corresponding payment occurs".[48] Settlement made through DVP will mitigate the risk that securities are transferred but payment are not received, or vice versa, as payment and securities are settled simultaneously.[49]

Considering the above, HKEX is recommended to set clearer guidance and allow ETFs to settle through DVP on T+2, or through one batch of settlement at T+2 afternoon.

[47] Free of Payment refers to "a transfer of securities without a corresponding transfer of funds". Please refer to BIS, https://www.bis.org/cpmi/publ/d00b.htm?&selection=128&scope=CPMI&c=a&base=term (accessed on 29 May 2022)

[48] BIS, https://www.bis.org/cpmi/publ/d00b.htm?&selection=26&scope=CPMI&c=a&base=term (accessed on 29 May 2022)

[49] BIS, Committee on Payment and Settlement Systems, Technical Committee of the International Organization of Securities Commissions, "Recommendations for securities settlement systems" (November 2001), https://www.bis.org/cpmi/publ/d46.pdf (accessed on 21 June 2022)

Enhancements of general trading and clearing activities

It is recommended that HKEX should assess the suitability of current rules and incentive programmes in relation to trading and clearing, and introduce adjustment where necessary, with a view to addressing challenges caused by legacy issues. By referring to global best practices, it will ensure that the Hong Kong market can provide a competitive level of ease and convenience to participants, which will maximise growth potentials of the overall market. Some recommendations are as follows:

1. Introducing new rules that allow market makers to engage multiple clearing participants

Having flexible and effective clearing arrangement in place would ensure market makers that they could conduct trading in a safe and efficient manner. Based on rules set out by HKEX, each market maker in Hong Kong can only settle trades with one clearing participant, also known as General Clearing Participant (GCP),[50] which could result in high concentration risks. Such a practice is different from the treatment for hedge funds, who also trade frequently but are allowed to have multiple prime brokers to diversify risk exposures. Such a practice also allows hedge funds to move their asset holdings among prime brokers to manage risks based on prevailing market conditions.

With only a few eligible GCPs in the market, market makers' choice of GCP is limited and, as a result, embedded risks are highly concentrated. In the event of extreme market events such as those happened during the global financial crisis, market makers could be significantly impacted. This creates an unfavourable impact on market makers' ability to provide liquidity in Hong Kong, as internal risk management procedures usually limit the number of trades that can be dealt with by one GCP – despite this may not be required by rules or regulations.

HKEX may consider allowing market makers to clear with multiple clearing participants (i.e. allowing a multiple-GCP system on the exchange level), with each clearing participant making required reporting. Allowing multiple GCPs will help market makers reduce concentration risks, and it will also provide market makers the flexibility to choose suitable clearing participants. This arrangement will liberalise the market through introducing further competition among GCPs, which will in turn lead to further enhancement of the overall market competitiveness.

2. Assessing portfolio risks of market participants across the central counterparties

There are three central counterparties (CCPs) supporting activities at HKEX's two exchanges (i.e. The Stock Exchange of Hong Kong and Hong Kong Futures Exchange Limited). These three CCPs are, namely, Hong Kong Securities Clearing Company Limited (HKSCC), HKFE Clearing Corporation Limited (HKCC), and the SEHK Options Clearing House Limited (SEOCH). While many investors hold portfolios across all three CCPs, margins are calculated based on each of the portfolios held under the three CCPs separately, without any regard to the overall position held by an investor.

From the market makers' perspective, this practice creates inefficiency in terms of capital usage, resulting in higher costs that limits the market makers' ability to provide liquidity in the market and poses higher inventory risk, especially at times when market are volatile. To address these issues and provide further incentives to attract market participants, HKEX may consider assessing portfolio risks of participants across CCPs to optimise capital efficiency for clearing and trading participants.

[50] A General Clearing Participant is "a participant who registers and clears trades for its own and clients accounts and on behalf of non-clearing participants". Please refer to HKEX, Becoming a HKCC Participant, https://www.hkex.com.hk/Services/Clearing/Listed-Derivatives/Getting-Started/Becoming-a-HKCC-Participant?sc_lang=en#:~:text=General%20Clearing%20Participant%20(%22GCP%22,behalf%20of%20Non%2DClearing%20Participants (accessed on 29 May 2022)

3. Considering market maker programmes for illiquid stocks to improve liquidity

As previously mentioned, market maker is a key liquidity provider and one of their obligations is to conduct high-volume trading that covers a wide range of securities, including ETFs, to provide liquidity and will, in return, be compensated via incentives such as fee rebates. Such a practice is widely adopted in developed markets and the HKEX also uses market makers. In spite of existing incentive schemes offered to market makers by HKEX,[51] such as discounted trading fee or 100% trading fee waiver or rebate, a significant number of securities remain relatively illiquid in the market.

Through using the trading of ETF as a point of reference, HKEX may take Hong Kong's market characteristics into account and introduce market making incentives targeted at low-liquidity securities with practical standards. For example, in the Japanese market, one of the incentives provided by the stock exchange is that, if the market makers are to trade one of the lowest liquidity securities as reflected on a certain list, they will be able to enjoy more attractive incentives (e.g. cash rebate) compared to trading the highest liquidity securities.[52]

[51] HKEX, Market Making/Liquidity Providing Obligations and Incentives, https://www.hkex.com.hk/Products/Listed-Derivatives/Market-Maker-Program/Market-Maker-Obligations-and-Incentives?sc_lang=en (accessed on 27 May 2022)

[52] Tokyo Stock Exchange, "Handling of ETF Market Making Incentive Scheme" (June 2022), https://www.jpx.co.jp/english/equities/products/etfs/market-making/b5b4pj000001zbcx-att/b5b4pj0000020mqm.pdf (accessed on 20 July 2022)

Upgrade of infrastructure and systems

To cement Hong Kong's competitiveness and comprehensiveness as not only a world-class listing market, but also a premier trading market, HKEX should continue to embrace technological advancement as part of its long-term strategy and strive to enhance its trading system and increase market transparency. A vibrant secondary market with ample liquidity will, in turn, play into providing stronger support for Hong Kong's primary market to reach greater heights. It is recommended that the HKEX to consider allocating more investment in upgrading infrastructure.

1. Adopting an opt-in self-match prevention mechanism by the HKEX

As discussed in the previous section of this paper, many exchanges in both developed and emerging markets have adopted self-match prevention mechanisms to reduce unintentional, frictional and other transaction costs. Self-match prevention mechanisms are vital to making an exchange more robust, by boosting higher quality volume and encouraging diverse trading strategies which contribute to a more resilient ecosystem. Currently, there are no self-match prevention mechanisms for equities on HKEX.

Considering international practices and Hong Kong's fundamental market structure, HKEX should consider adopting an opt-in self-match prevention mechanism with reference to self-match prevention rules of other exchanges, such as those in the US and other markets. Some self-match prevention rules may reflect such practices adopted by Nasdaq as detailed on P.18.

2. Providing higher transparency on picked gateways connecting members and exchanges

Currently, information on which gateway(s) is(are) allocated during the time of trading through the matching engine[53] is not transparent enough in Hong Kong. In other markets (e.g. US), information such as the general number of gateways, which gateway connections for each market are chosen during each trade, and the rule of how gateways transmit data, is disclosed and can easily be retrieved by market participants.

Among others, HKEX may consider changes in three main areas:

a) disclose more details on how the technical infrastructure is designed, including information on network/ gateways/ matching engine/ information servers, etc;

b) maintaining a single first-in-first-out gateway with advanced time-stamping technology to minimise gaming of timing; and

c) making available a single session per symbol-gateway switch for each client to reduce variability and prevent a race of infrastructure expenditure by sophisticated participants.

[53] A technology that matches bids and offers to execute trades, according to Nasdaq, Trade Matching System, https://www.nasdaq.com/solutions/trading-and-matching-technology (accessed on 31 May 2022)

3. Upgrading trading system with advanced technology accompanied with capacity building

In the face of the constantly evolving technology landscape, it is widely recognised that regular system upgrades are necessary to keep up with changing client needs and stay relevant in the global competition. In this regard, when compared with other major global exchanges, more proactive actions would be appreciated.

To strengthen the competitiveness of its service offerings, HKEX should continue to develop and upgrade its trading systems, preferably with the most advanced technology that supports optimal electronic mechanisms and infrastructure. As such upgrades are incorporated, HKEX should structure comprehensive and detailed capacity building plans for market participants and stakeholders, as they will support them in making informed decisions and seizing opportunities that they are less familiar with.

Conclusion

Hong Kong is no doubt the leading international financial centre in the Asian time zone, with its fundraising capabilities being often cited as the obvious strength of its financial market. This study is conducted with a view of further strengthening our ecosystem, looking into ways to further enhance our market liquidity and boost the secondary market trading activities. Liquidity, together with other market factors, determines whether trades can be executed efficiently and in a cost-effective manner, and it is a key factor for investors as they consider where to operate. Therefore, Hong Kong's ability to constantly improve market liquidity is crucial to the sustainable development of the market.

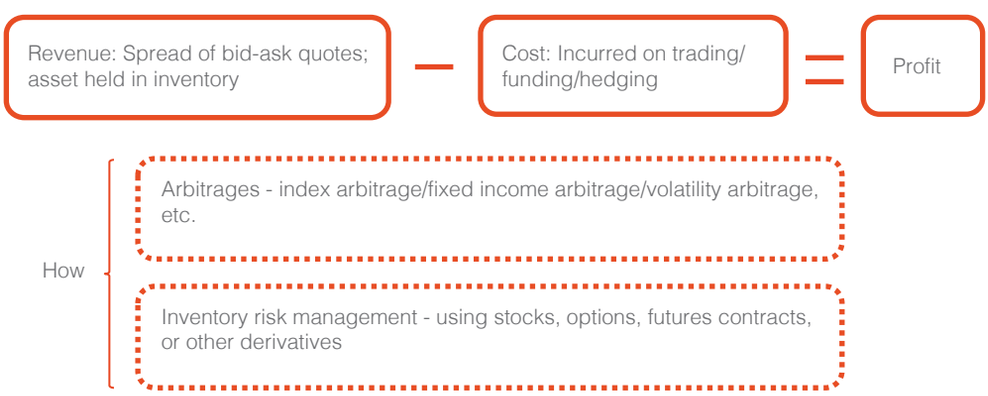
To this end, the FSDC, through engagement with subject matter experts, proposes recommendations that are considered useful in enhancing the overall market liquidity. Through these enhancements, we believe ETFs and market makers, who are key market participants and liquidity providers in developed market, can better play their role in boosting liquidity and nurturing a more favourable trading ecosystem.

Appendices

Appendix 1. Maker makers' sources of profit

In general, market makers generate revenue from two sources: (i) trading (selling and buying) and (ii) holding particular assets. While market makers infuse liquidity into a market by buying and selling securities, they generate revenue at the same time from taking the arbitrage of such differences between the bid and ask price on their trades. Another source of revenue comes from net changes in the value of assets held in inventory, in addition to accrued interests.[54] Profits of market makers can then be derived by adding these revenues together with a deduction of costs incurred on trading, funding, hedging, etc. Additionally, market makers should take note of the inventory risk in view of the possible price fluctuations on holding assets.

Figure 22.



Source: BIS

[54] BIS, BIS Quarterly Review, "Shifting tides - market liquidity and market-making in fixed income instruments" (March 2015), https://www.bis.org/publ/qtrpdf/r_qt1503i.pdf (accessed on 23 June 2022)

Appendix 2. Markets that have implemented self-match prevention mechanisms on multiple exchanges since 2008 (by region)

America	
Exchange	**SMP Implementation Date**
Cboe BZX Equities	2008
Nasdaq Options	2009
Nasdaq BX	2009
NYSE Arca (CA,CP, CD, CB)	2009
Cboe BZX Options	2010
Cboe BYX Equities	2010
EDGA Equities	2010
EDGX Equities	2010
Cboe Options	2011
Cboe C2 Options	2011
MIAX Options	2012
NYSE (CA, CP)	2013
NYSE American (CA,CP)	2013
CME (CA)	2013
ICE	2013
Cboe Futures (CFE)	2014
CME (CA, CP)	2014
Nasdaq PHLX	2014
Cboe EDGX Options	2015
MIAX Pearl	2017
NYSE American (CA, CP, CD, CB)	2017
NYSE Chicago	2017
NYSE National	2018
Nasdaq ISE	2018
Nasdaq MRX	2018
Nasdaq GEMX	2018
MIAX Emerald	2019
NYSE (CD)	2021

APAC	
Exchange	**SMP Implementation Date**
Cboe Australia (CA, CP, DC, CB)	2011
ASX	2013
JNX	2013
Cboe Japan	2014
NSE	2015
BSE	2015
SGX-DT	2016
OSE	2019
HKFE	2019
TSE	2021
NZX	2021
SGX-ST (to be launched)	To be launched in late 2022
SET (to be launched)	Platform upgrade planned for 2023
KRX (to be launched)	Platform upgrade planned for 2023

Europe	
Exchange	**SMP Implementation Date**
Cboe Europe	2009
Turquoise	2013
LSE	2013
Borsa Italiana	2013
Euronext Cash	2014
Nasdaq OMX Cash	2014
SIX	2015
Xetra	2015
Eurex	2015
Nasdaq OMX Derivatives	2015
IDEM	2016
BME	2020

*CA = Cancel Aggressive (Incoming), CP = Cancel Passive (Resting), CB = Cancel Both, CD = Cancel & Decrement

Source: Respective Exchanges

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About the FSDC

The FSDC was established in 2013 by the Hong Kong Special Administrative Region Government as a high-level, cross-sectoral advisory body to engage the industry in formulating proposals to promote the further development of the financial services industry of Hong Kong and to map out the strategic direction for the development.

The FSDC has been incorporated as a company limited by guarantee with effect from September 2018 to allow it to better discharge its functions through research, market promotion and human capital development with more flexibility.

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