

March 2019 Newsletter

Dear Investor,

The Global Volatility Summit (“GVS”) brings together volatility and tail hedge managers, institutional investors, thought-provoking speakers, and other industry experts to discuss the volatility markets and the roles volatility strategies can play in institutional investment portfolios. The GVS aims to keep investors updated on the volatility markets throughout the year, and educated on innovations within the space.

Eurex has provided the latest piece in the GVS newsletter series.

Cheers,
Global Volatility Summit

Event

The tenth annual Global Volatility Summit (“GVS”) is scheduled for Wednesday, March 13th, 2019 at Chelsea Piers in New York City. This year’s event will feature fresh panel topics, manager discussions, keynote speakers, and a new US Politics panel. Space is limited, so we encourage you to register as soon as possible.

2019 Manager Participants

36 South Capital Advisors
Argentièrre Capital
Artemis Capital Management
BTG Pactual
Capstone Investment Advisors
Capula Investment Management
Dominicé & Co
GCI Asset Management
Graticule Asset Management

III Capital Management
Ionic Capital Management
Lake Hill
Man
Parallax Investment Advisors
Penso Advisors
Pine River Capital Management
TPRV Capital
True Partner Capital

2018 Event Recap

The 9th Annual Global Volatility Summit was held on March 14, 2018 at Chelsea Piers in New York City. 14 hedge fund managers were joined by senior professionals from hedge fund consultants, the institutional investor community, and leaders in the industry to discuss volatility, tail hedging, macro and quant strategies within the investment context. Three keynote speakers, Lance Armstrong, David Gallo, and Ryan Holiday temporarily drove the conversation away from the central content to speak to volatility across other contexts including athletic competition and underwater astonishments. The event hosted the first-ever GVS Think Tank Panel, which featured three industry experts across East Asia policy studies, macro quantitative and derivatives strategies, and US politics. Among these panelists included Ryan Hass, Marko Kolanovic, and Demetri Sevastopulo.

MSCI exchange-traded derivatives in today's market structure

June 2018

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Executive summary

MSCI Exchange-Traded Derivatives in Today's Market Structure, commissioned by Eurex and produced by Aite Group, highlights various scenarios of trading MSCI exchange-traded derivatives (ETDs) and discusses how buy-side and sell-side firms can gain efficiencies and drive superior results.

Key takeaways from the study include the following:

- Regulatory changes have influenced the proliferation of new exchange-traded products as the market shifts away from over-the-counter (OTC) structures.
- The demand for plain-vanilla index products, given a preference for passive investment products and benchmarking, has grown.
- MSCI has responded to this demand by licensing ETDs to seven exchanges globally – the resulting fragmentation has led to differences in liquidity and transparency for instruments that are for all intents and purposes the same contract.
- Market participants must now consider several exchange attributes when choosing the best spot to trade MSCI ETDs.
- While liquidity, product offerings, and ease of execution are high on the checklist of vital qualities, regulations have forced capital efficiencies and margining practices to be as important to the vetting process.

Introduction

In recent years, regulatory challenges affecting the OTC derivatives market have shifted investment to ETDs. As a consequence, exchanges are quickly developing new products to address the changes to the derivatives market structure. The demand for plain-vanilla index products, driven by a strong preference for passive investing and benchmarking, has increased.

MSCI ETDs are presently licensed to seven exchanges globally. While this has addressed some customer demand, the fragmentation has also led to differences in liquidity and transparency for the same contract transacted on multiple venues. Market participants must now consider several exchange attributes when choosing the best spot to trade. While liquidity, product offerings, and ease of execution are high on the checklist of vital qualities, regulations have forced capital efficiencies and margining practices to be as important to the vetting process.

Methodology

In this white paper, Aite Group discusses the various considerations investors must undertake when deciding where to trade MSCI and other ETDs. To gain broader insight, 13 global buy-side and sell-side firms were interviewed between December 2017 and March 2018 to better understand the reasons their firms selected a particular exchange. Additionally, the benefit of exchange portfolio margining is explored using calculations provided by Eurex.

The broad derivatives market

The following section describes characteristics and trends of ETDs given the present regulatory environment.

Changes to derivatives market structure has shifted buy-side investors to ETDs.

Derivative securities allow users to cost-effectively protect against risks associated with movements in an underlying instrument's prices as well as profit from the ability to anticipate changes in market conditions. A wide range of financial assets, including equities or equity indices, fixed income instruments, foreign currencies, commodities, and credit events, underlie derivative securities.

In recent years, regulatory challenges affecting the OTC derivatives market have shifted investors to ETDs. Changes designed to increase uncleared swap margins and place stringent capital rules and additional segregation requirements on derivative instruments have adversely affected bespoke structures. The new rules have mostly limited market participants to a smaller set of investment opportunities for the time being.

“ We saw a significant switch from OTC swaps over to futures a few years ago in Asia, as the new OTC margining rules and extensive reporting requirements came into force. ”

Amaury Lacourte, Asia Delta One Index Trader,
Société Générale

Exchanges are responding to the transition toward ETDs by developing new offerings rather than transforming existing OTC products to the exchange environment. While some contracts are redeveloped OTC structures, such as total return futures and contracts with flexible maturities offered by Eurex, market participants continue to demand plain-vanilla index products, such as MSCI futures and options. As innovations come to market, hurdles such as volume and open interest (OI) thresholds present significant barriers to the early adoption of a product, often leading to its untimely death.

“ The buy-side's relationship to the exchange is important in relation to knowing about new products, indices, baskets, etc. Salespeople are discovering European clients and are calling asset managers to ask what their interest is. ”

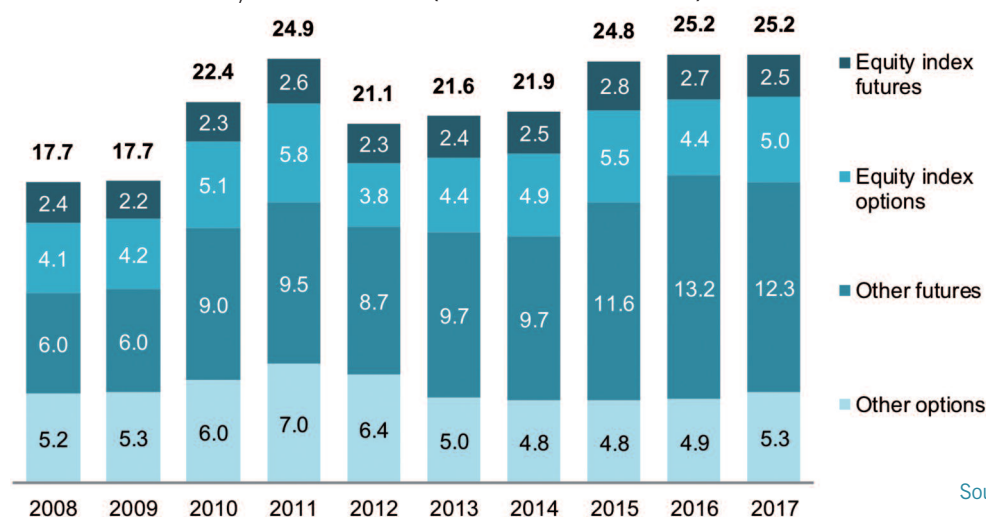
Stefan Thomsen, senior trader,
Union Investment Privatfonds GmbH

In light of these market structure and regulatory challenges, total ETD growth at the end of 2017 remained constant compared to the previous year. The number of transactions reached 25.2 billion contracts, as shown in Figure 1. During this time, more options were traded than futures. This trend is evident in both equity index and other types of contracts and was mostly driven by the generation of written options premiums in a rising stock market – particularly in the U.S.¹

¹ Three sell-side options dealers that Aite Group interviewed attributed rising options volume to the increased generation of written options premiums despite the low-volatility environment in 2017.

Figure 1: Total listed volume has remained consistent in 2017.

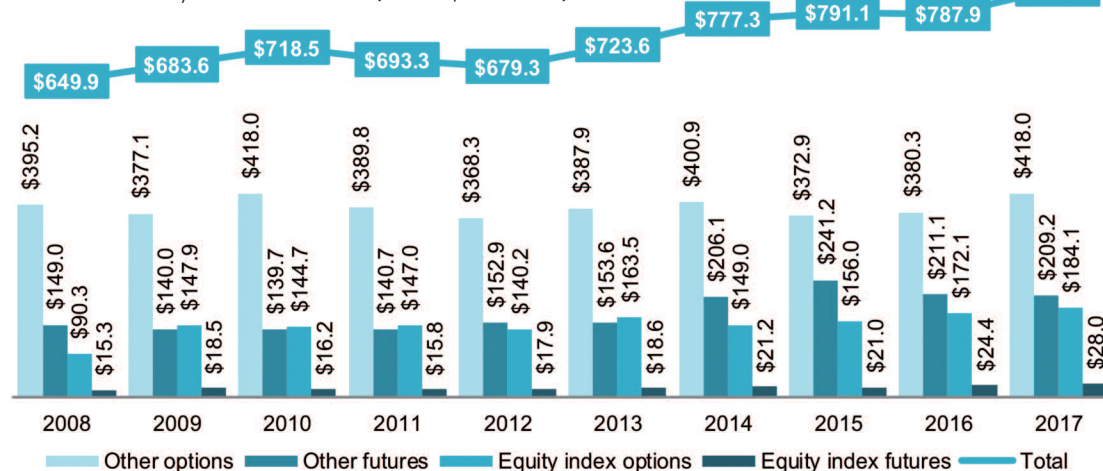
ETD annual volume, 2008 to 2017 (in billions of contracts)



Source: Futures Industry Association (FIA)

Figure 2: Listed OI has grown to record levels.

ETD annual OI, 2008 to 2017 (in US\$ millions)



Source: FIA

Volume in other futures contracts is mostly driven by rates futures (11% of the 2017 total). Futures based on currencies, energy, nonprecious metals, single stocks, agriculture, precious metals, and other underlying categories contributed less than 10% to the total on an individual basis. Alternatively, other options contracts were dominated by single stock options contracts, which account for 22% of the

2017 total. Options based on rates, currencies, and other previously mentioned classes on underlying instruments accounted for 5% or less of the total.

While total growth in transactions was mostly flat, the number of open listed futures and options positions has increased to record levels. Figure 2 describes trends in OI over the past 10 years. At the end of 2017, OI grew to US\$ 839.3 million, an increase of 6.5% over the previous year. Both equity index futures and

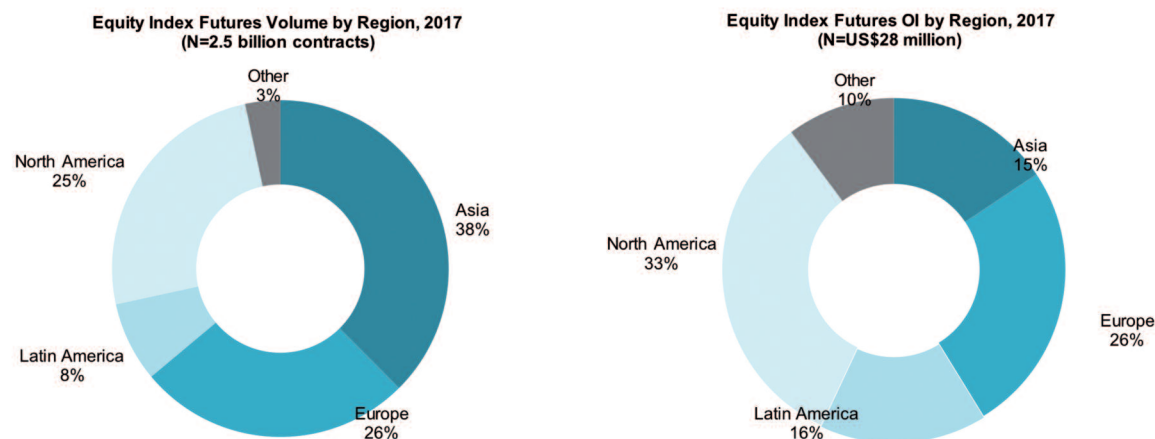
options OI increased during this period. Additionally, options positions linked to other types of assets increased substantially.

Futures OI was dominated by rates contracts (33% of the 2017 total), while contracts based on energy instruments and single shares also represented a significant portion – 20% and 16%, respectively – of the total. Single share equity options constituted over half (51%) of total 2017 OI. Besides equity index options OI (33% of the 2017 total), other types of contracts contributed little to the total.

Equity index futures and options have some important regional differences. Turning to 2017 data shown in Figure 3, futures volume totaled 2.5 billion contracts and was evenly spread across North America, Europe, and Asia (left pie chart). However, the majority of the US\$ 28 million of open interest was concentrated in Europe, with North American and Asian OI contributing notably lower percentages (right pie chart).

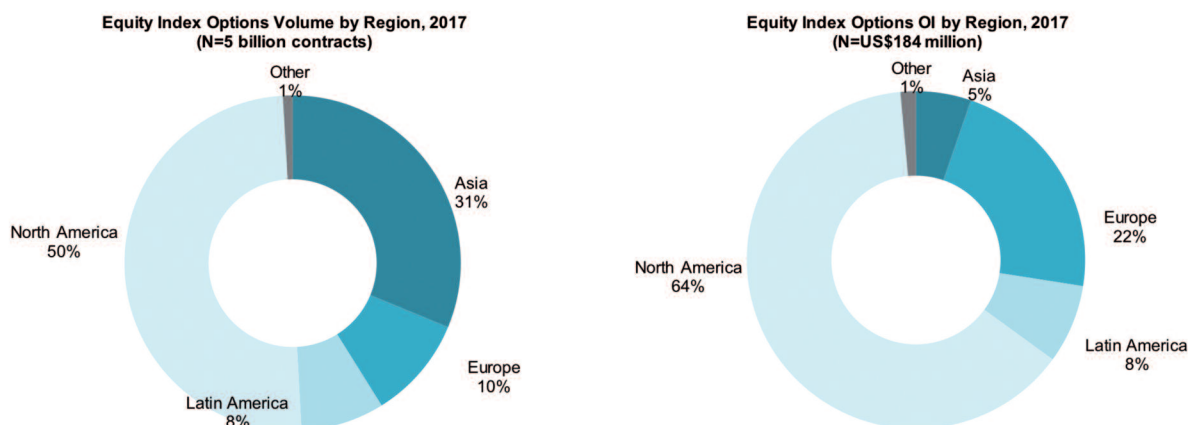
More extreme differences were observed in the percentage of equity index options volume and OI by region, which is described by Figure 4. Volume is mainly split between North America and Asia, which represent over 90% of the 5 billion transactions occurring in 2017

Figure 3: Equity index futures volume is more evenly distributed by region than is OI.



Source: FIA

Figure 4: Equity index options remain more concentrated in North America than are futures.



Source: FIA

(left pie chart). On the other hand, nearly 70% of OI is concentrated in North America (US\$ 127.7 million of US\$ 184.1 million) with far smaller percentages spread across Europe and Asia (right pie chart).

There is a symbiotic relationship between ETDs, exchange-traded funds (ETFs), and cash markets.² Although demand for ETDs has grown in the current regulatory environment, these instruments do not operate in a bubble. ETFs compliment as well as compete with futures contracts. At a higher level, there has been much debate about the cost efficiencies of one instrument versus another. While futures have generally been considered the go-to instrument type to gain exposure to equity index investments, ETFs have been on a roll, with volume and assets under management (AUM) steadily increasing year over year.

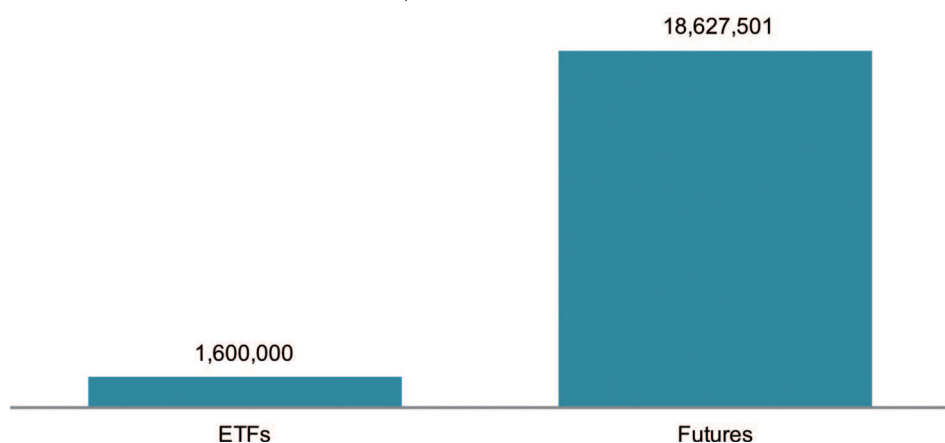
Comparing ETF average daily volume (ADV) to futures ADV yields some large differences. Typically, ETF liquidity is sourced through a deeper, more liquid

futures market, highlighted by Figure 5. During the first quarter of 2018, the ADV of U.S. ETF shares traded was roughly 1.6 million. The ETF industry had a strong start to the year in conjunction with renewed market volatility, finishing the first quarter of 2018 with 81 new ETF listings and more than US\$6 billion in AUM.³ U.S. futures ADV was 18.6 million contracts during that time – about 5% higher than the first quarter of 2017.

Increased passive investment has been a driver of ETF volume, as shown by Figure 5. Recent research suggests that passive AUM will exceed active AUM within 10 years (by 2027) – a shift in the market that is set to benefit ETFs and mutual funds as well as futures.⁴ Passive fund assets have expanded rapidly over recent years and now represent a significant portion of the global investment fund universe. Measuring industry size by AUM, passive funds managed about US\$8 trillion, or 20%, of aggregate investment fund assets as of June 2017, up from 8% a decade earlier. ETFs, however, grew even faster, as this instrument's

Figure 5: Futures ADV outpaces ETF ADV in U.S. markets.

ADV of U.S. ETFs vs. U.S. futures, Q1 2018



Source: Nasdaq, FIA

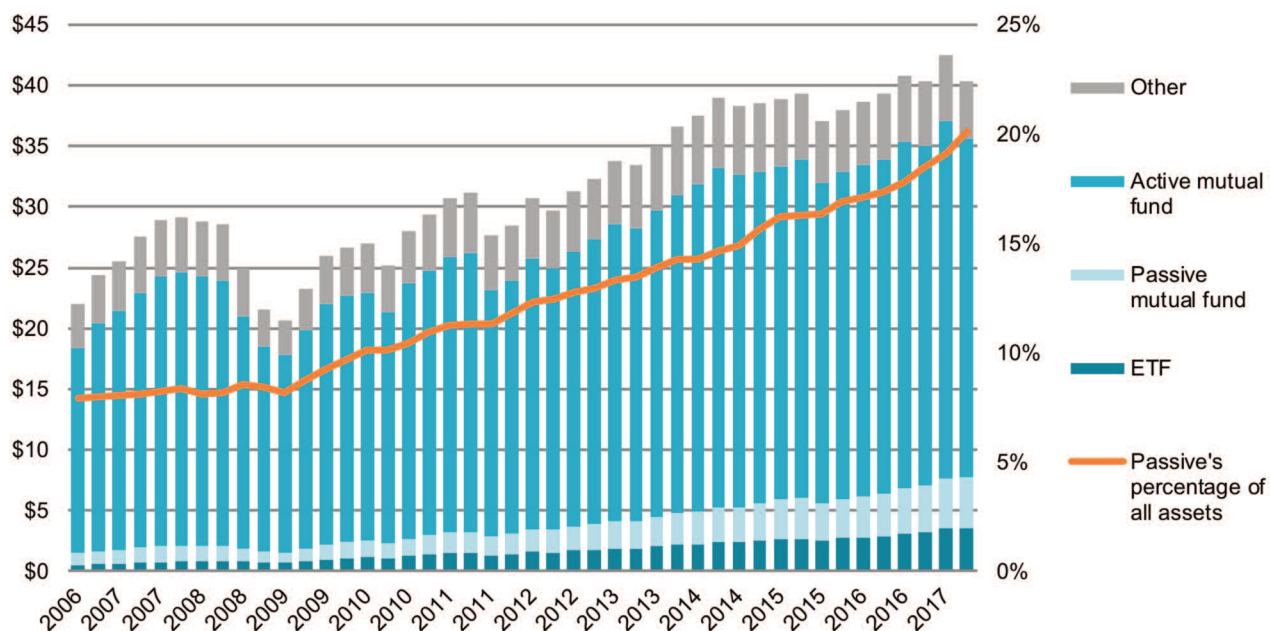
² "Conversations With the Buy-Side: Futures and ETFs," Aite Group, May 2017, accessed February 20, 2018, <http://www.cmegroup.com/education/files/conversations-with-the-buy-side-futures-and-etfs.pdf>.

³ "NYSE Arca ETF Report: A Strong First Quarter for ETFs," NYSE, accessed May 29, 2018, <https://www.nyse.com/etf/exchange-traded-funds-quarterly-report>.

⁴ "Reshaping Around the Investor: Global ETF Research 2017," EY, 2017, accessed May 31, 2018, [http://www.ey.com/Publication/vwLUAssets/ey-global-etf-survey-2017/\\$FILE/ey-global-etf-survey-2017.pdf](http://www.ey.com/Publication/vwLUAssets/ey-global-etf-survey-2017/$FILE/ey-global-etf-survey-2017.pdf).

Figure 6: The shift to passive is expected to continue.

Global AUM by fund type, Q3 2006 to Q2 2017 (in US\$ trillions)



Source: Bank for International Settlements

share of passive fund assets exceeded 40% in June 2017, compared with around 30% in 2007.⁵

The choice of ETFs versus futures contracts mainly comes down to investor preference along the lines of investment horizon, liquidity, leverage, and exposure. For example, proponents of futures contracts will argue that ETFs do not allow users to take advantage of leverage as futures do. For users of strategies that require leverage, ETFs are a nonstarter. Holders of an ETF pay a management fee to the ETF issuer –

a feature not present in futures contracts. Thus, the longer the ETF is held, the more relative fees are paid, resulting in a greater realized drag on the performance of a position.

Advocates of ETFs suggest that the regulation-driven increased cost of capital to banks, tied to certain business such as derivatives, has become quite expensive and has resulted in a higher cost to hold futures. Accounting complexity related to futures has also been voiced as a strength of holding ETFs.⁶

⁵ Vladyslav Sushko and Grant Turner, "The Implications of Passive Investing for Securities Markets," BIS, March 2018, accessed May 25, 2018, https://www.bis.org/publ/qtrpdf/r_qt1803j.pdf.

⁶ "FT-iShares Video Series: A Comparison of ETFs and Futures," BlackRock, accessed February 6, 2018, <https://www.blackrock.com/hk/en/etf-vs-future-video-series>.

MSCI exchange-traded derivatives

MSCI ETDs are an important subset of the broad ETD market described in the preceding section. Below, trends and challenges related to MSCI ETDs are detailed.

Growth of MSCI ETDs continues as investors employ passive trading strategies and benchmarking.

MSCI ETDs are tied to some intriguing statistics, as shown by Figure 7. Over 79.4 million MSCI contracts were traded in 2017. MSCI reports that US\$ 3.774

trillion of MSCI index-based futures and options were transacted in the year, a 45% increase over 2016.⁷ The impressive sustained period of growth has been linked to the general trend of passive investing, as funds tied to a benchmark must track their respective performances. Over US\$ 12.4 trillion is currently benchmarked to MSCI indices on a worldwide basis.⁸

Figure 7: MSCI ETDs 2017 snapshot



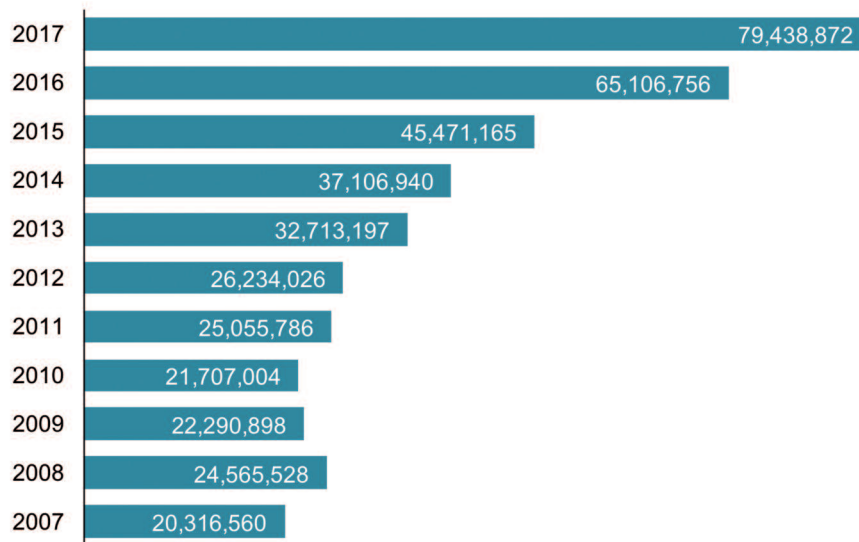
Source: MSCI

⁷ "Listed Futures and Options Based on MSCI Indices," MSCI Inc., Q1 2018, accessed March 1, 2018, <https://www.msci.com/documents/1296102/1360895/msci-LFO-cfs-en+-+Q4.pdf/cf8ea018-3d55-4a77-8951-113bc8ec919b>.

⁸ "Index Licensing," MSCI Inc., accessed March 1, 2018, <https://www.msci.com/index-licensing>.

Figure 8: MSCI ETD annual volume edges higher.

Total annual ETD volume, 2007 to 2017



*Figure does not include options on ETFs that track MSCI indices

Source: FIA

A broad range of financial products are based on or use MSCI indices, including ETFs, mutual funds, insurance products, structured products, OTC derivatives, and listed futures and options. MSCI ETDs have been growing in popularity and volume over the past 10 years, as shown by Figure 8.

When liquidity and fragmentation are the new normal, relationships matter.

Although a debated concept, liquidity is often described as the ability to transact an instrument at a reasonable cost across a wide variety of market conditions. Market participants will often make decisions about when and where to trade based on anticipated liquidity levels. When trading costs are low, participants can enter and exit positions without significant price impact. According to a recent Commodity Futures Trading

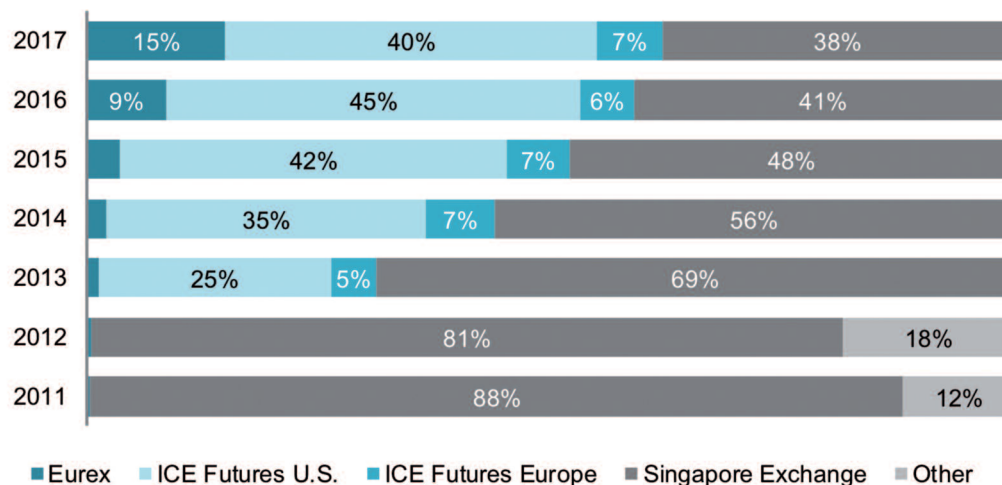
Commission white paper, changes in market structure, regulation, and participation in recent years, which may negatively influence liquidity levels in listed derivatives, have been stable in a low-volatility environment.⁹

MSCI ETDs have unusual characteristics and trade in a fragmented market, which limits liquidity to individual investor pools. Rather than being licensed on an exclusive basis, MSCI ETDs are currently spread across seven exchanges: Eurex, ICE Futures U.S., ICE Futures Europe, Singapore Exchange, and others (CBOE, JSE, and DGCX). As Figure 9 highlights, the 2017 market share picture has become more dispersed than it was at the beginning of the series. While the majority of trade count is presently linked to the Singapore Exchange (38%) and ICE Futures U.S. (40%), other venues have begun to occupy a larger slice of the pie. For example, Eurex accounts for 15% of market share and has been increasing its activity in MSCI ETDs since 2013.

⁹ Nicholas Fett and Richard Hayes, "Liquidity in Select Futures Markets," February 1, 2017, accessed January 9, 2018, http://www.cftc.gov/ido/groups/public/@economicsanalysis/documents/file/oce_liquidityfuturesmarkets.pdf.

Figure 9: MSCI ETD market share of volume is fragmented.

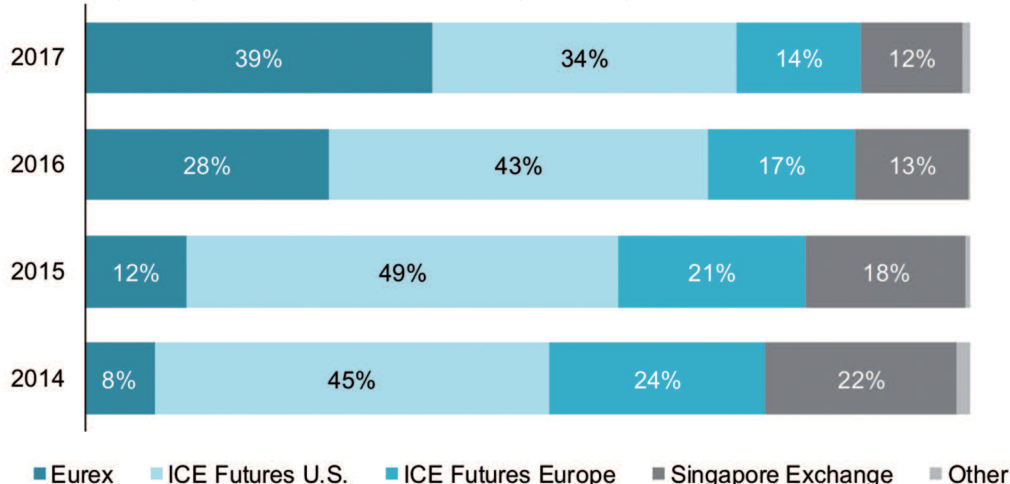
Percentage of trading of MSCI ETDs by exchange, 2011 to 2017



Source: FIA

Figure 10: MSCI ETD OI by exchange tells a different liquidity story.

Percentage of open interest of MSCI ETDs by exchange, 2007 to 2017



Source: FIA

Contracts traded and OI are both measures of liquidity; however, in the case of MSCI ETDs, these metrics differ significantly by exchange. The percentage of open contracts spanning the past four years is represented in Figure 10. At the end of 2017, the majority of OI resided at Eurex (39%). This result differs significantly from the volume metrics highlighted in Figure 9, in which the exchange held the third-highest percentage of volume at that time.

Venues have responded to the growing need to trade listed futures and options rather than OTC derivatives by offering carbon copies of the same product. For example, the MSCI World Net Total Return Index can be found in its U.S. dollar version on ICE Futures U.S. and Eurex. Likewise, variants of the same index are popping up – the euro-denominated version of this same index is also available on Eurex. As a result, managers have to consider not only which specific

index is best for their investment goals but also the advantages of transacting on a particular exchange given the full suite of products and margining practices – a topic that will be discussed in depth in the following section.

While the typical liquidity metrics used by market participants (OI, notional ADV, and trade count) are quite useful for identifying trends in the listed markets, investors rely on relationships with the broker community as one of the most important determinants when sourcing liquidity in a fragmented ETD market, according to a recent Aite Group survey. Intuitively, this makes sense given the sheer breadth of offerings: MSCI has licensed some 250 futures and options to seven exchanges.¹⁰

“(Liquidity is) not a point of OI or trades which print on the screen. It’s more about relationship – speaking to each broker and making sure they are aware of the interest or order coming through the pipe. Are they willing and able to quote?”

Stefan Thomsen, senior trader,
Union Investment Privatfonds GmbH

Low screen volume linked to certain contracts means “hidden” liquidity must be unearthed through market-makers and/or by using exchange tools that ease execution. For example, end-of-day auctions and block trading help investors trade large sizes without market

“The visible on-screen liquidity for most Asian contracts remains low at the moment. However, buy-side investors can rely on the liquidity provided by banks and market-makers (that) stand ready to quote blocs on these contracts.”

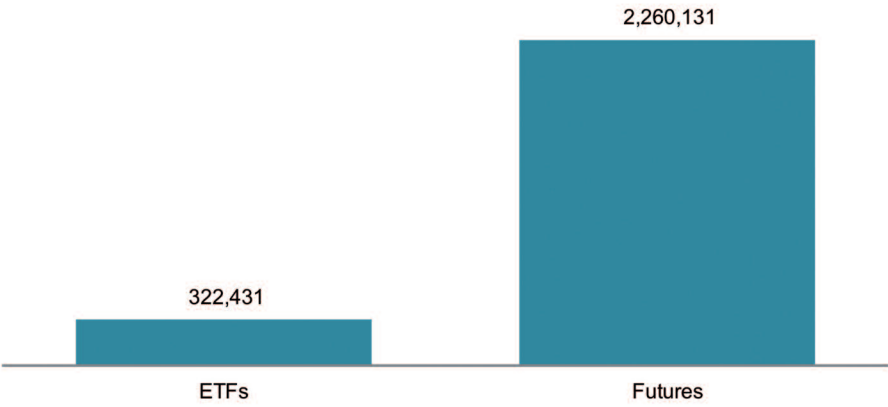
Amaury Lacourte, Asia Delta One Index trader,
Société Générale

impact. Access to a range of global futures and options through a single venue – particularly those approved for U.S. investors – also attracts flow. (This is evident in Figure 10, as Eurex has the broadest offering of global products while other exchanges are more regionally focused.) Thus, even though the OI or the number of contracts traded may be larger on one exchange than on another for a particular contract, these solutions can result in identical liquidity, and investors are able to trade the same size for the same cost.

As mentioned earlier, there is a relationship between ETF, futures, and cash markets. Often when screens are thin for one product, liquidity can be sourced from a related market. As Figure 11 shows, MSCI global futures ADV was about 2.3 million contracts during the first quarter of 2018, while 322,431 MSCI ETF shares are traded each day, on average, over the same period. While ADV is much larger for MSCI futures, trading activity is concentrated, as only 41% of futures were traded (88 out of 216 listings) compared to 92% of ETFs (843 of 920 listings) during this time.

¹⁰ Listed Futures and Options Based on MSCI Indices” MSCI Inc., Q4 2017, accessed March 1, 2018, <https://www.msci.com/documents/1296102/1360895/msci-LFO-cfs-en-+-+Q4.pdf/cf8ea018-3d55-4a77-8951-113bc8ec919b>.

Figure 11: 2018 MSCI ETF and futures ADV
ADV of global MSCI ETFs vs. futures, Q1 2018



Source: Thomson Reuters, MSCI

Margin cost: A driver of exchange choice

While liquidity and ease of execution are critical to exchange choice, capital efficiency is of key interest in the present environment. The following paragraphs provide insight to one exchange's portfolio margining system to highlight the importance of model impact.

Capital efficiency is a key concern for the buy-side.

Greater capital efficiency has been a key theme in the transition from OTC structures to listed contracts. According to a recent survey of market participants, in addition to liquidity, the type of margin agreement is one of the most important factors when choosing an exchange. Several market participants stress the importance of portfolio margining MSCI ETDs with other derivatives as a necessary component of trading. Several types of margining systems are employed

“Eurex is the only (exchange) that uses PRISMA so you can cross asset classes and net out margin requirements for our listed derivatives business. This arrangement is absolutely the best – (we) trade four different asset classes, and you can put it all together, net it out, and save costs. ... Unfortunately they do not accept the underlying stock for single stock call overwriting, so there are pros and cons.”

Stefan Thomsen, senior trader,
Union Investment Privatfonds GmbH

The Eurex Clearing PRISMA methodology is based on the concept of liquidation groups.

by exchanges, and margin requirements vary significantly depending upon the system used and the diversity of the portfolio of derivative products.

Eurex Clearing PRISMA

This section describes the merits of one type of portfolio-based risk management system: PRISMA.¹¹ The Eurex Clearing PRISMA methodology is based on the concept of liquidation groups. Since client portfolios usually consist of several heterogeneous instruments, it is typically impossible to liquidate every holding in a single day in the event of a default. A liquidation group combines instruments that have similar risk characteristics, and, consequently, similar liquidation timelines. Eurex Clearing PRISMA permits portfolio margining between products as well as across liquidation groups cleared

¹¹ “Margining Process”, Eurex Clearing AG, accessed December 13, 2017, <http://www.eurexclearing.com/clearing-en/risk-management/margining-process>.

by Eurex as long as offsets can be realized during the default management process. In doing so, the exchange has aligned its margining method with its default management process.

Portfolio-based risk management provides several benefits to clients trading MSCI ETDs. For example, higher capital efficiencies, such as risk netting effects for listed positions and those between listed and OTC, can be realized. To illustrate this point, three portfolios are compared in Figure 12, Figure 13, and Figure 14. Details underlying each chart are provided in Table A, Table B, and Table C, respectively.

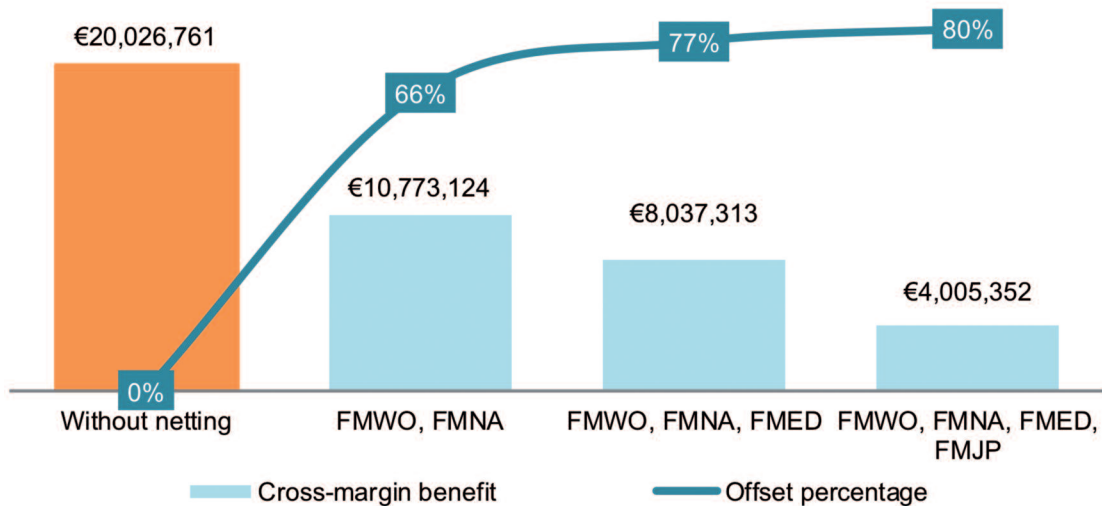
The first portfolio is a long-versus-short portfolio consisting of four MSCI developed market futures contracts: MSCI World (FMWO), MSCI N. America (FMNA), MSCI Europe (FMED), and MSCI Japan (FMJP). Without any netting benefit, the initial margin of these four positions, as shown by Figure 12, is 20,026,761 euros. By using PRISMA's portfolio risk-based margining methodology, a holder of this portfolio reduces his or her initial margin. To illustrate this point, if a portfolio consists of two positions – FMWO and FMNA – initial margin falls to 10,773,124 euros, as the portfolio margining

benefit creates an offset of 66%. Moving along the horizontal axis, the combination of three positions – FMWO, FMNA, and FMED – further benefits from netting effects, as initial margin is again reduced to 8,037,313 euros, an offset of 77%. Finally, when portfolio margining is applied to the initial portfolio of four positions – FMWO, FMNA, FMED, and FMJP, margin expense drops to 4,005,352 euros for a savings of 80%. The portfolio details underlying Figure 12 are summarized in Table A.

A second long-versus-short portfolio of five MSCI emerging market futures positions also benefits from portfolio margining effects, as described by Figure 13. Without the benefit of netting, the initial margin of this portfolio is 21,816,758 euros. As portfolio margining is applied iteratively, as shown previously in Figure 12, this figure falls to 8,453,359 euros – a reduction of 61%. Table B summarizes portfolio details described by Figure 13.

Finally, a third long-versus-short portfolio that consists of MSCI World futures as well as three commonly traded European index futures is described by Figure 14. A similar pattern emerges when comparing the initial

Figure 12: Portfolio margining benefits – MSCI developed market ETD portfolio (Eurex initial margin)



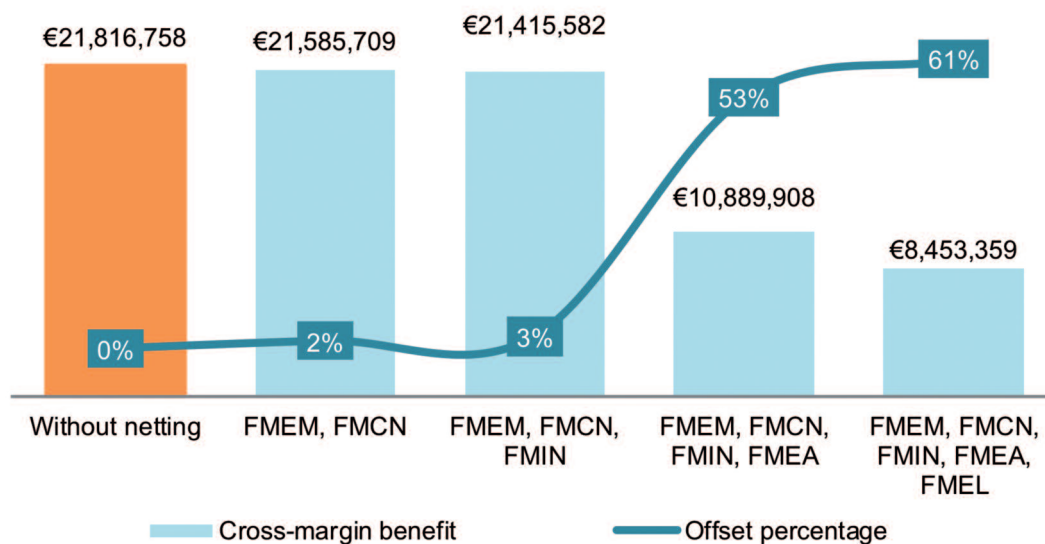
Source: Eurex

Table A: MSCI developed market portfolio – netting results in 80% savings

| Contract | Eurex Contract Code | Bloomberg Futures Code | Notional (US\$) | Long | Short | Initial margin |
|--|---------------------|------------------------|-----------------|-------------|-------|----------------|
| MSCI World | FMWO | ZWPA | \$100,000,000 | 2,090 | 0 | €9,175,640 |
| MSCI Europe | FMED | FJLA | \$15,000,000 | 0 | 271 | €1,485,183 |
| MSCI Japan | FMJP | FMIA | \$50,000,000 | 0 | 932 | €4,472,920 |
| MSCI North America | FMNA | KNRA | \$60,000,000 | 0 | 995 | €4,893,019 |
| Initial portfolio margin without netting benefit | | | | €20,026,762 | | |
| 80% margin savings using Prisma | | | | €4,005,352 | | |

Source: Eurex
Note: Calculation date April 11, 2018; near month expiration date June 18, 2018

Figure 13: Portfolio margining benefits – MSCI emerging markets ETD portfolio (Eurex initial margin)



Source: Eurex

margin of positions that do not benefit from any netting to a portfolio margined portfolio. Initial margin totals 14,833,374 euros with no netting offset. Again, applying the principles of PRISMA's portfolio risk-based

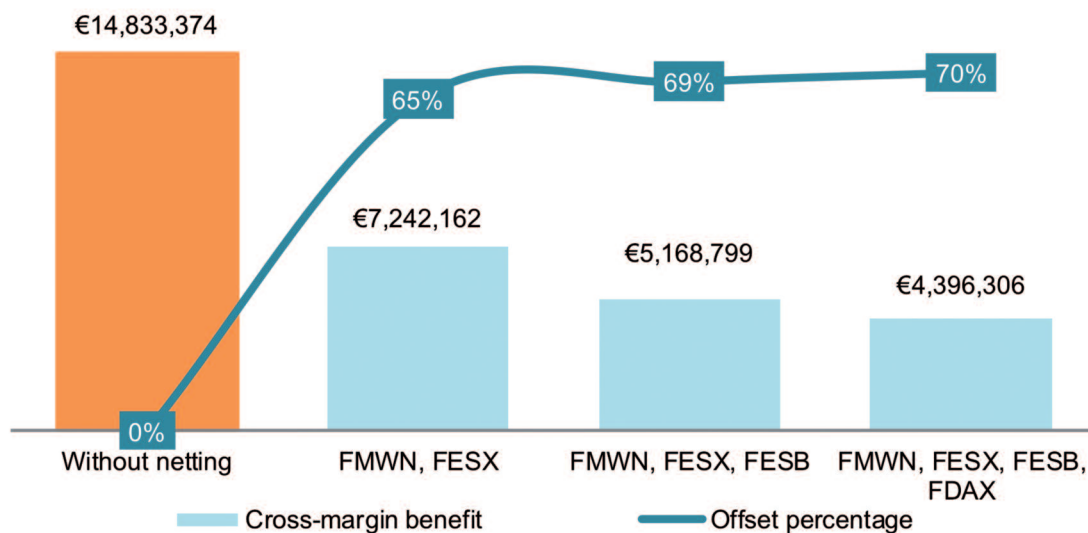
margin methodology results in a reduction in margin cost. The original portfolio of four positions now carries an initial margin fee of 4,396,306 euros, a savings of 70%. Portfolio details are described by Table C.

Table B: MSCI emerging markets portfolio – netting results in 61% savings

| Contract | Eurex Contract Code | Bloomberg Futures Code | Notional (US\$) | Long | Short | Initial margin |
|--|---------------------|------------------------|-----------------|-------------|-------|----------------|
| MSCI EM | FMEM | ZTSA | \$100,000,000 | 2,316 | 0 | €10,929,176 |
| MSCI China | FMCN | ZUYA | \$25,000,000 | 647 | 0 | €3,450,628 |
| MSCI India | FMIN | ZVLA | \$10,000,000 | 185 | 0 | €1,201,503 |
| MSCI EM Asia | FMEA | ZTWA | \$50,000,000 | 0 | 1,032 | €4,969,846 |
| MSCI EM Latin America | FMEL | ZULA | \$10,000,000 | 0 | 223 | €3,450,628 |
| Initial portfolio margin without netting benefit | | | | €21,816,758 | | |
| 61% margin savings using Prisma | | | | €8,453,359 | | |

Source: Eurex
Note: Calculation date April 11, 2018; near month expiration date June 18, 2018

Figure 14: Portfolio margining benefits – Eurex equity index portfolio (Eurex initial margin)



Source: Eurex

Table C: Eurex equity index portfolio – netting results in 70% savings

| Contract | Eurex Contract Code | Bloomberg Futures Code | Notional (US\$) | Long | Short | Initial margin |
|---|---------------------|------------------------|-----------------|--------------------|-------|----------------|
| MSCI World Futures | FMWN | RSWA | \$100,000,000 | 4,102 | 0 | €8,089,603 |
| DAX Futures | FDAX | GXA Index | \$10,000,000 | 33 | 0 | €732,111 |
| EURO STOXX 50 Index Futures | FESX | VGA Index | \$50,000,000 | 0 | 1,497 | €3,570,720 |
| EURO STOXX Banks Futures | FESB | CAA Index | \$20,000,000 | 0 | 3,255 | €2,440,941 |
| Initial portfolio margin without netting benefit | | | | €14,833,374 | | |
| 70% margin savings using Prisma | | | | €4,396,306 | | |

Source: Eurex

Note: Calculation date April 11, 2018; near month expiration date June 18, 2018

Looking forward

Several key themes will continue to influence the trading of ETDs. The paragraphs below highlight important factors market participants must bear in mind in 2018.

Volatility is back, driving ETD volume higher.

While the ongoing shift away from OTC swaps into futures continues, the return of volatility in the market will influence trading and managers' strategy decisions. The first three months of 2018 experienced strong growth in volume on a year-to-date basis: Between January and March, 7.4 billion contracts traded, an increase of 23.4% from the first three months of 2017. On an annualized basis, volume increased to 29.5 billion contracts, which represents a near 17% gain compared to 2017 data; this is shown by Figure 15. Given the dramatic change to a new volatility regime this year, market participants are more optimistic about liquidity and trading in ETDs.

Technology and the availability of new products also play key roles and will continue to shape the liquidity picture as well as influence investors' exchange choice. Aite Group believes the best consumers of new tech-

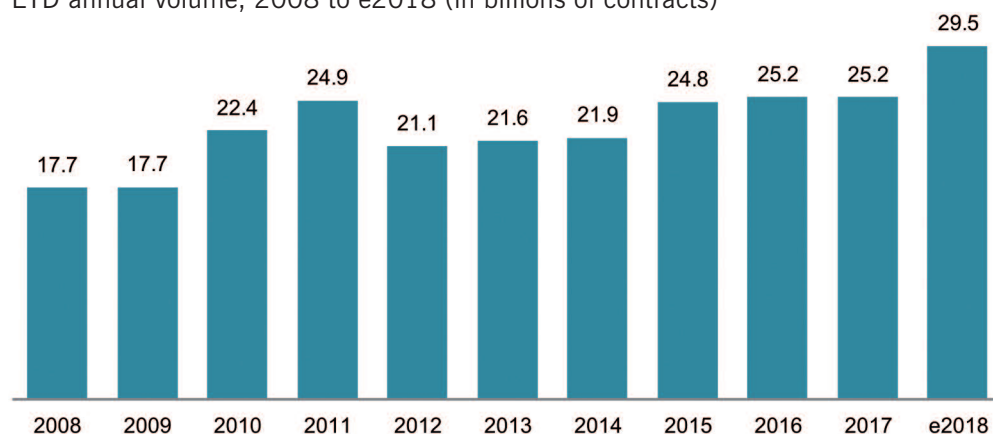
“ (When considering an exchange,) the first factor is the product offering – whether there are many products on the exchange to choose from to get the exposure needed. ”

Manfred Wong, portfolio manager,
Northern Trust Asset Management

nology will be able to offer the most optimal experience for both the buy-side and the sell-side participating in the ETD market. Investors, particularly those with multiple portfolios, require technology that streamlines workflows from pre-trade to execution and to post-trade resources across a global suite of products. The arms race for better technology and an enhanced product suite will continue to inspire fierce competition across venues as ETD trading expands.

Figure 15: The return of volatility will influence ETD volume.

ETD annual volume, 2008 to e2018 (in billions of contracts)



Source: FIA, Aite Group

Concentration of trading and clearing to continue

While the appetite for ETDs continues to grow and the number of exchanges hoping to capitalize on this trend increases, longer term, trading and clearing volume is likely to concentrate around a handful of global exchanges. The trend toward a smaller number of U.S. futures commission merchants (FCMs), for example, is the byproduct of tougher regulations, stricter capital guidelines, and consolidation in the financial services industry. This progression is described by Figure 16.

The concentration of clearinghouses exacerbates changes in the liquidity provision of listed markets. The prevalence of high-frequency trading firms and banks' internalization of flows have further fragmented trading, limited transparency, and price discovery of the central limit order book. Additionally, historically low volatility in 2017 has driven some market-makers out of the business. Aite Group believes that challenges to the clearing model combined with limited liquidity

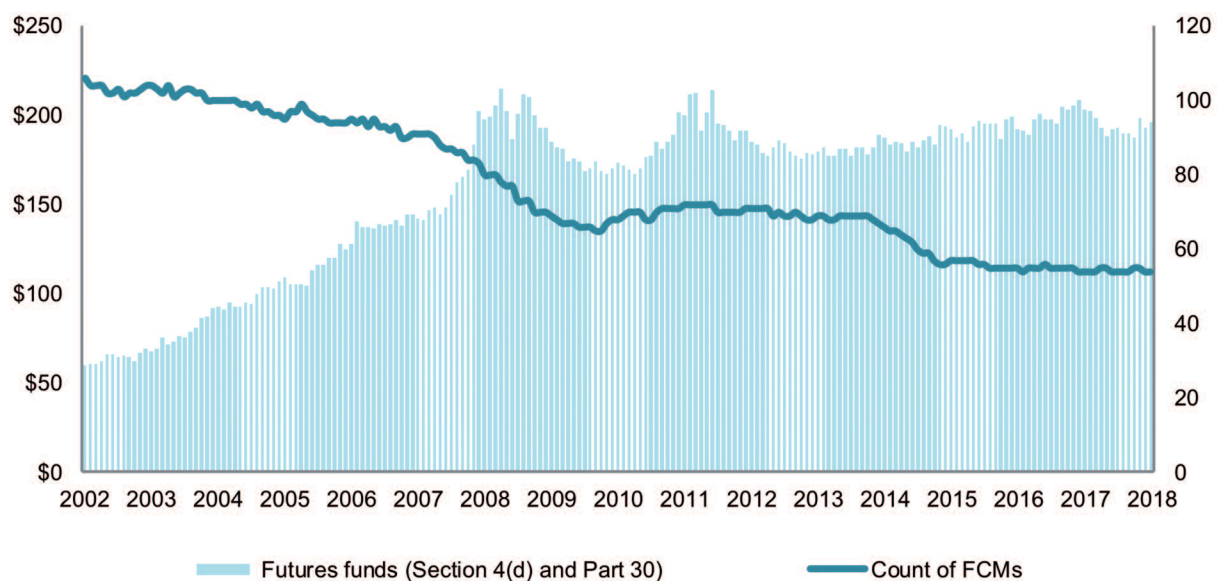
and depth on the screens for some contracts will continue to encourage investors to rely on strong dealer relationships (i.e., take trades upstairs) and utilize exchange tools such as auctions.

Passive trading and factor investing trends to continue.

As mentioned earlier, MSCI reports US\$ 3.774 trillion of MSCI index-based futures and options were transacted during 2017, marking a 45% increase compared to 2016. According to a recent study, the percentage of passive AUM could exceed active AUM during the next decade, as described by Figure 17.¹² While the shift to passive investing has been in effect over the past 10 years, headwinds, such as pushback from active managers, could potentially slow the progression. Additionally, future volatility shocks and other events also cast a positive light on active versus passive management.

Figure 16: Customer funds in futures accounts trend higher with fewer active FCMs.

Monthly futures funds in US\$ billions and the count of FCMs, March 2002 to March 2018

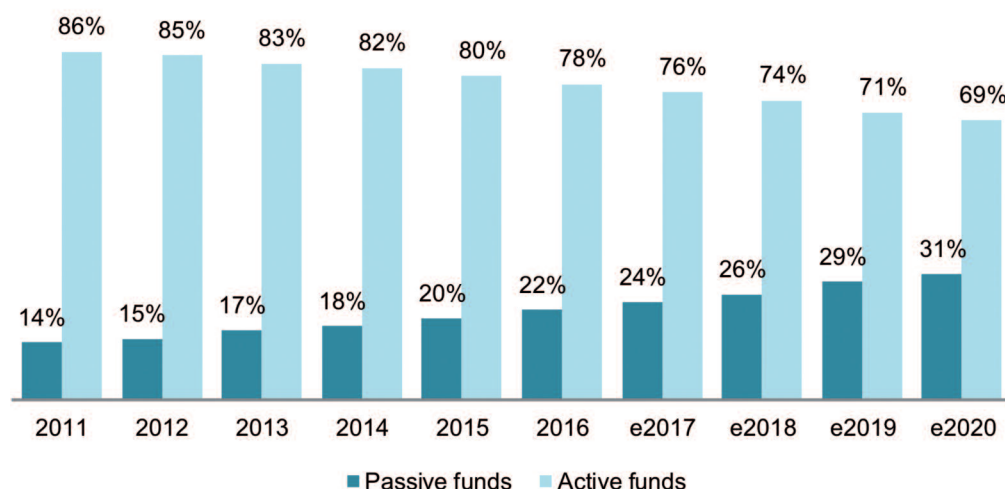


Source: Commodity Futures Trading Commission, FIA

¹² "Reshaping Around the Investor: Global ETF Research 2017," accessed May 31, 2018.

Figure 17: Passive AUM is expected to increase.

Market share of total assets of globally regulated open-end funds, 2011 to e2020



Source: EY

Liquidity and margin efficiency are the difference-makers of exchange choice.

Buy-side clients will be checking several boxes in order to tap the best liquidity pools while maintaining the most efficient use of capital – a delicate balance only a small number of exchanges will be able to satisfy. Aite Group believes that exchanges, such as Eurex, that offer superior portfolio margining of portfolio positions across a global suite of futures and options contracts are well-positioned to continue to grow their client base. Additionally, the exchange's ability to trade many products with U.S. clients will also be a key growth factor.

“The exchange community needs to think specifically and get liquidity going around newer products, such as basis trading, which is still mostly done bilaterally and is interdealer market-driven.”

Raj Purandare, trader

Conclusion

Buy-side participants:

- Because screen liquidity is often fairly light, buy-side survey participants suggest their relationship with a market-maker is vital to trading ETDs. These participants are most concerned that off-screen liquidity will be there when they need it.
- In addition to market-makers, **tools to enhance liquidity, such as block trading and end-of-day auctions, are key to choosing a venue in which to trade MSCI ETDs.** One buy-side participant mentions that some technologies are too restrictive and that more flexibility is needed when using trading platforms.
- Finally, in addition to liquidity, one of the most important factors in choosing an exchange is the margining agreement. Market participants who trade client portfolios across multiple ETDs, for example, note that a portfolio-based margin system, such as PRISMA, is the optimal choice given its netting benefits.

Sell-side participants:

- Sell-side participants, such as banks, are keen to address the importance of off-screen liquidity. They suggest that while open interest may be an indication of market depth, MSCI ETDs that trade on multiple exchanges may be traded in the same size and at the same price, even if liquidity metrics vary.
- **One sell-side firm emphasizes exchange risk as a strong focal point for banks over the last few years. Segregation rules and the waterfall structure of developed exchanges (in the event of a counter-party default) are carefully scrutinized since unused cash must be left at the exchanges.**
- Finally, the type of margining program is again mentioned by sell-side firms. Simply stated, the more portfolio margining possibilities, the better. Cost considerations are paramount to the margin discussion.

About Aite Group

Aite Group is a global research and advisory firm delivering comprehensive, actionable advice on business, technology, and regulatory issues and their impact on the financial services industry. With expertise in banking, payments, insurance, wealth management, and the capital markets, we guide financial institutions, technology providers, and consulting firms worldwide. We partner with our clients, revealing their blind spots and delivering insights to make their businesses smarter and stronger. Visit us on the [web](#) and connect with us on [Twitter](#) and [LinkedIn](#).

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