EFAMA

European Fund and Asset Management Association

MARKET INSIGHTS

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UCITS ETFS

A GROWING MARKET IN VOLATILE TIMES

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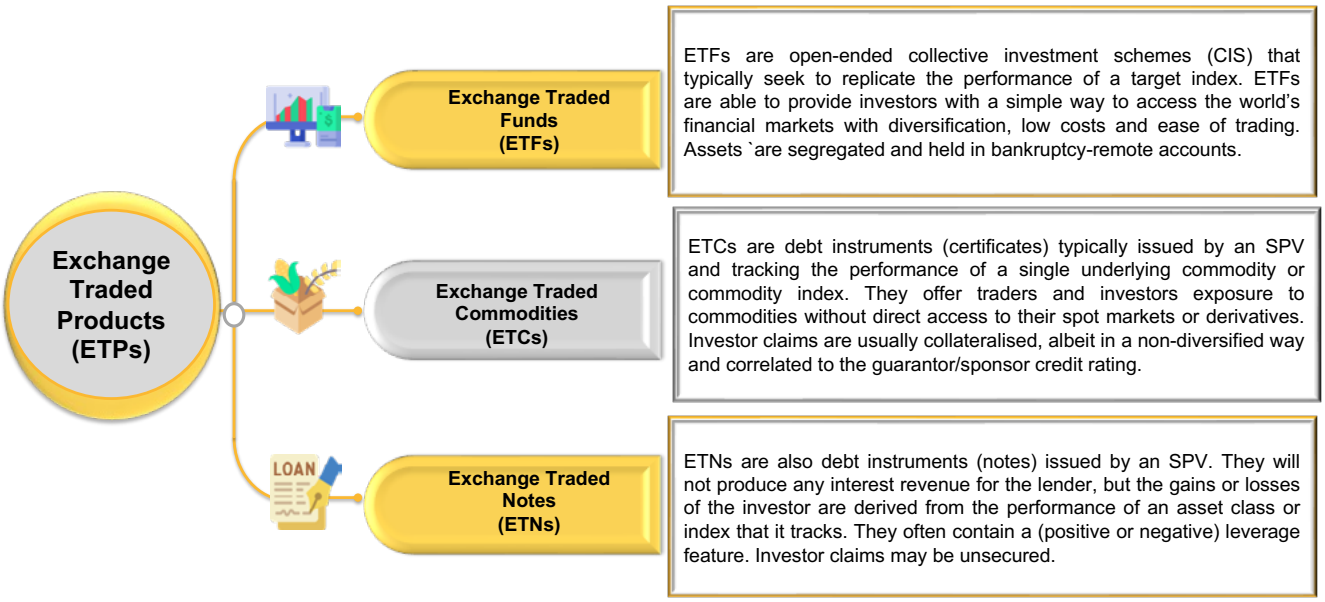
INTRODUCTION

In the course of the last decade, exchange-traded products (ETPs) have increasingly gained popularity among European investors, representing a rapid and cost-effective way to access a multitude of different asset classes, diversified indices and strategies. Coined as an umbrella term, ETPs in Europe can be further categorised into Exchange-Traded Funds (ETFs), Exchange-Traded Commodities (ETCs), and Exchange-Traded Notes (ETNs). Among these, ETFs have clearly attracted the overwhelming bulk of investors' interest and savings, due to the ease of buying a well-diversified portfolio through a single transaction, at a relatively lower cost compared to other investment options, and within a world-class regulatory framework embodied by the EU UCITS regime[1].

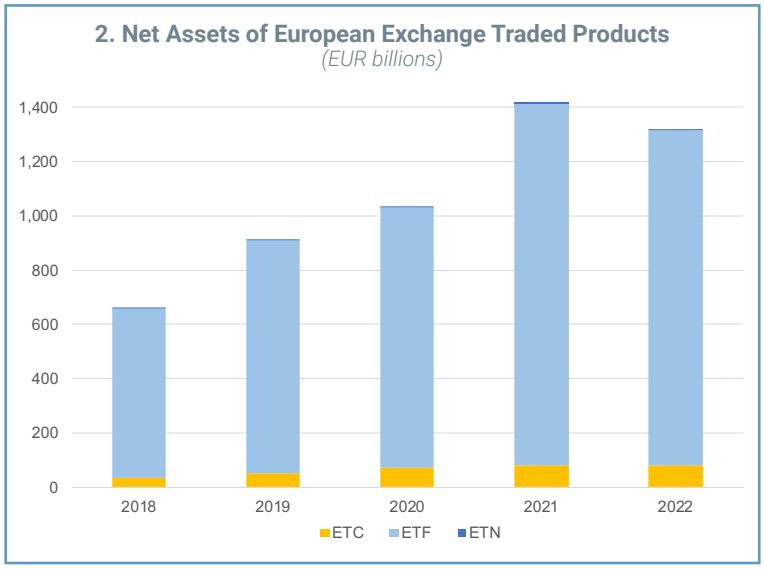
1. Classification of Exchange Traded Products (ETPs)



Source: EFAMA

Taken together, the net assets of European ETPs have grown consistently over the last five years, increasing roughly by 100%, from EUR 692 billion at the end of 2018 to EUR 1.4 trillion at the end of 2022. As mentioned above, ETFs represented the dominant category, corresponding to 93.8% of total net assets at the end of 2022, followed by ETCs (6.2%) and ETNs (0.2%).

Created in the 1990s to provide a cost-effective and flexible "plain-vanilla" product with clear diversification benefits, ETFs are open-ended investment funds whose shares are traded on one or more exchanges. They are typically structured to track the performance of a chosen market index, thereby offering the latter's same return and risk characteristics. With lower management fees relative to active investment funds on average, ETFs offer investors cost-effective access to a diversified investment, as well as to a wide range of asset classes. They can, moreover, be purely index-based or actively managed, and may pursue their investment objective either by directly holding the relevant index's underlying securities (i.e. "physical" replication), or by relying on derivative contracts such as total return swaps (i.e. "swap-based" replication)[2].



Source: EFAMA (ETFs) and Bloomberg Intelligence (ETNs and ETCs)

The significant development of the global ETF market over the last decade has inevitably also been accompanied by innovation in the ETF product structure, nowadays offering investors exposure to several non-equity asset classes, as well as to unique strategies (e.g. factor investing, life-cycling and active strategies, only to name a few). Institutional investors have moreover become accustomed to using ETFs as effective hedging tools, as well as for liquidity management purposes.

These innovations, and the growing size of the ETF industry, have nevertheless raised concerns by certain international standard-setters and regulatory bodies around the potential risks to the broader financial system[3].

Besides these concerns, the further development of a European ETF market is being stifled by the present fragmentation of liquidity and related transaction price information from listing venues across different jurisdictions, leading to shallower pools of secondary market liquidity for ETF shares compared to other global domiciles, notably the U.S. The European Commission's ongoing effort to establish a European real-time consolidated tape (for both pre- and post-trade data) should be supported further, moving beyond the limited progress achieved in the latest review of the MiFIR framework. Only a European pre- and post-trade consolidated tape will provide greater transparency on the effective liquidity of ETFs, as well as greater visibility on the reference prices at which these products are being traded across various European listing venues. Furthermore, it also promises to unlock several tangible benefits for product issuers and investors alike, all while growing the European ETF market and attracting more non-EU investors to the UCITS ETF label.

This Market Insights focuses on European UCITS ETFs as part of a growing global market. The ETF product, together with actively managed investment funds, contributes towards the European Commission's goal for a Capital Markets Union (CMU) by enabling people to move their savings from bank deposits to investment in capital markets for better diversification.

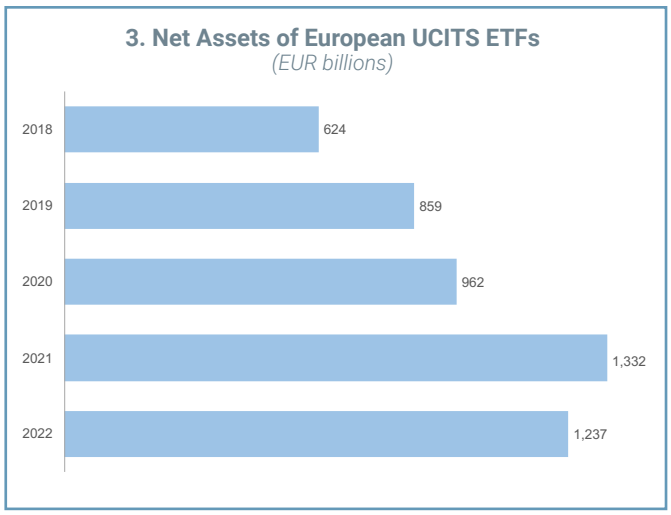
This report is organised as follows. In the first section, we report on the major trends observed in recent years in the European UCITS ETF market. The second section offers a summary description of the ETF product, highlighting some of its unique market mechanics, before focusing on its resilience at times of pronounced market stress. We conclude that the type of financial stability risks often feared by supervisors when it comes to ETFs did not materialise during past episodes of market volatility. A third and final section describes the current level of fragmentation of the European ETF market, while highlighting the evident benefits from a future real-time consolidated tape for equities/ETFs.

RECENT TRENDS IN EUROPEAN EXCHANGE-TRADED FUNDS

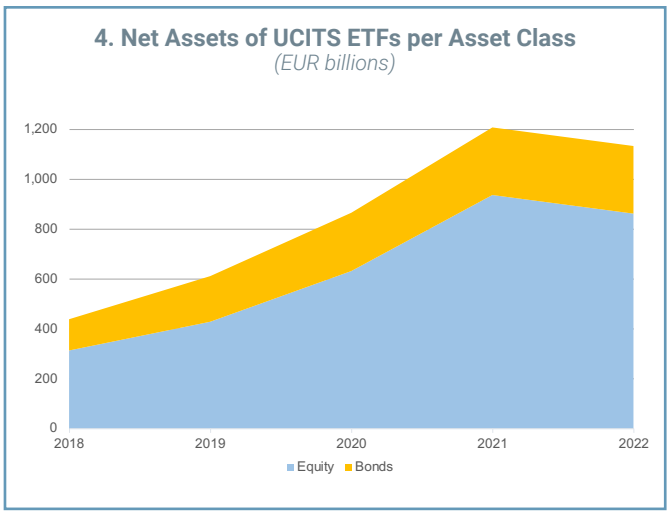
The net assets of UCITS ETFs have more than doubled during the period 2018-2022, from EUR 624 billion to EUR 1,237 billion. As a result of the market downturn in 2022, these fell by 7% in 2022, while consistently reporting positive annual growth during the preceding years. Overall, ETFs represent roughly 10% of total UCITS net assets.

UCITS ETFs in Europe are mostly allocated to equity and fixed income asset classes, where equity represents the most dominant asset class. The growth has been quite balanced among the two asset classes, where at the end of 2022 equity UCITS ETFs represented 70% of the total UCITS ETF universe, while fixed income amounted to 22% of the total net assets.

Yearly net flows of equity and bond UCITS ETFs have been consistently positive in the last five years, demonstrating resilience despite market turmoil. Year 2021 was a particularly good year with EUR 148 billion of inflows. When observing the monthly data in a particularly volatile 2022, only June and September reported slightly negative flows with the market reacting in the aftermath of the Russian invasion of Ukraine, as well as to the changing macroeconomic environment. In comparison, over the same 2-year period, non-exchange-traded open-ended equity and bond UCITS funds netted both positive and negative yearly flows, with 2021 recording the largest net inflows and 2022 the largest net outflows as a result of central banks significantly tightening monetary conditions.



Source: EFAMA



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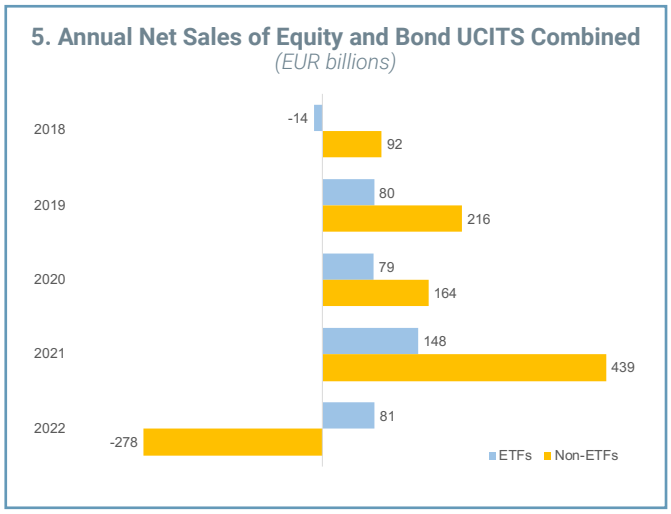

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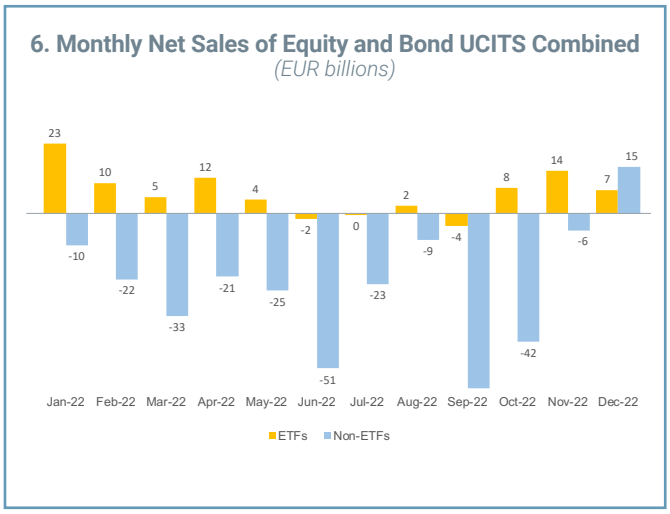

Source: EFAMA

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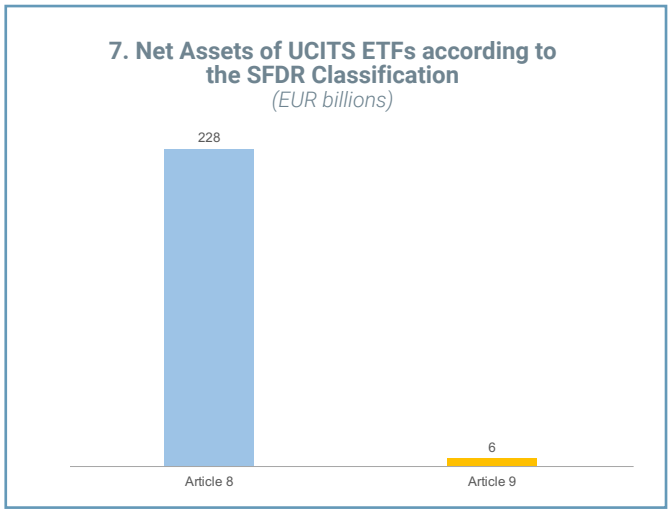
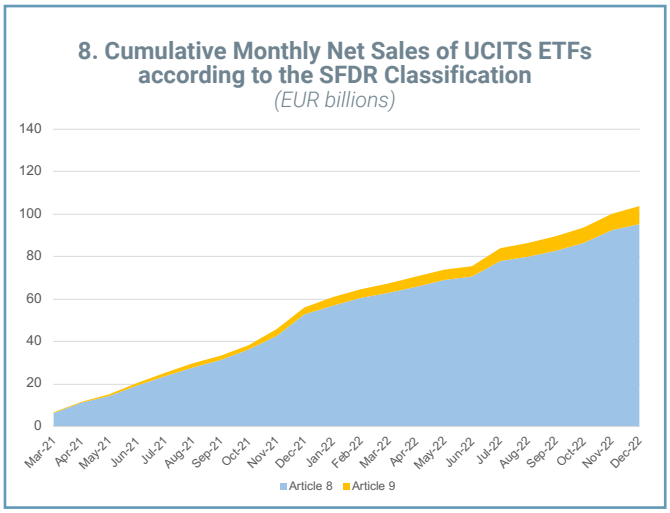


Source: EFAMA's calculation based on Morningstar Direct's data



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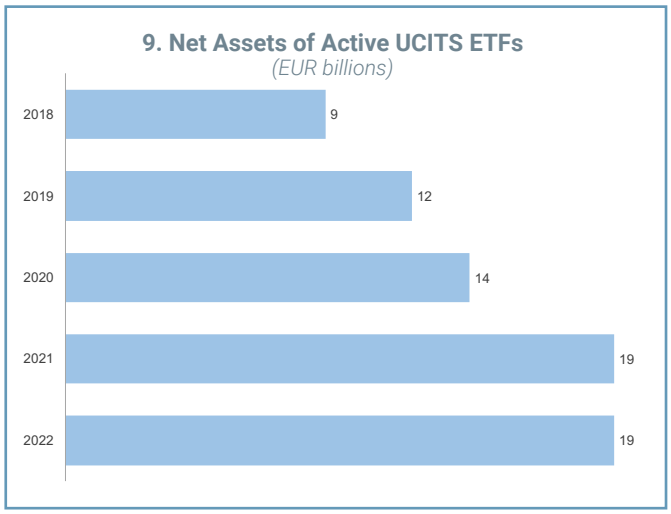
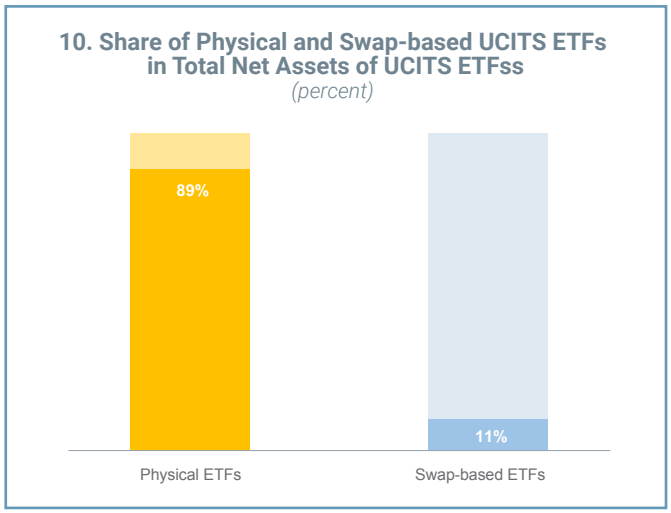


Source: EFAMA's calculation based on Morningstar Direct's data



Source: EFAMA's calculation based on ETFbook's data

ESG investing represents an important consideration in the UCITS ETF universe, as the sustainable investing agenda becomes ever more prevalent in investors' decisions across Europe. The chart below shows that Article 8 UCITS ETFs amounted to 228 billion and Article 9 only 6 billion at the end of 2022. This translated into 18.4% of UCITS ETFs classified as Article 8 funds, while 0.5% of them were classified as Article 9 funds[5].

Looking at the cumulative net flows, we notice persistent net inflows for Article 8 and Article 9 ETFs since the application of the SFDR (March 2021). Whereas the inflows are not high, they do show a progressive tilt towards sustainable investing, regardless of volatility in the markets. We also notice a considerably lower growth in flows for Article 9 ETFs. This could be explained by the general reclassification by issuers of Article 9 funds into Article 8 funds in the course of 2023, in order to avoid "greenwashing"[6] allegations in the absence of clear regulatory guidance around some core notions of the SFDR regime.

While most ETFs are passively managed, aiming to track a particular index, active ETFs have been gaining popularity globally. We observe an increase in active ETFs in Europe, however this trend remains limited. Passive ETFs accounted for 98.4% of UCITS ETFs at the end of 2022. With a 1.6% share in total, the active ETF market in Europe is smaller than the one observed in the U.S. (5.2%), which is mostly due to larger retail client participation in the U.S. and a more favourable regulatory regime since 2019[7].

Investors considering ETFs have a choice between those that use physical replication, and those that use swap-based replication to deliver the performance of a given benchmark. Physical ETFs aim to fully or partially hold the underlying constituents of an index, representing the dominant form of ETFs. Swap-based ETFs use derivatives, namely swaps[8], to offer exposure to a

benchmark[9]. At the end of 2022, 89% of European ETFs were physical and 11% swap-based, according to ETFbook data[10]. The share of swap-based ETFs is higher in Europe than in the U.S. (around 1% at the end of 2020), due to i) the importance of bank-affiliated asset managers in the development of the ETF market in Europe, versus independent asset managers in the U.S.; and ii) the fact that the EU's UCITS regulatory framework (including an ESMA-sanctioned "UCITS ETF" label) lends itself very well to accommodate both types of replication[11].

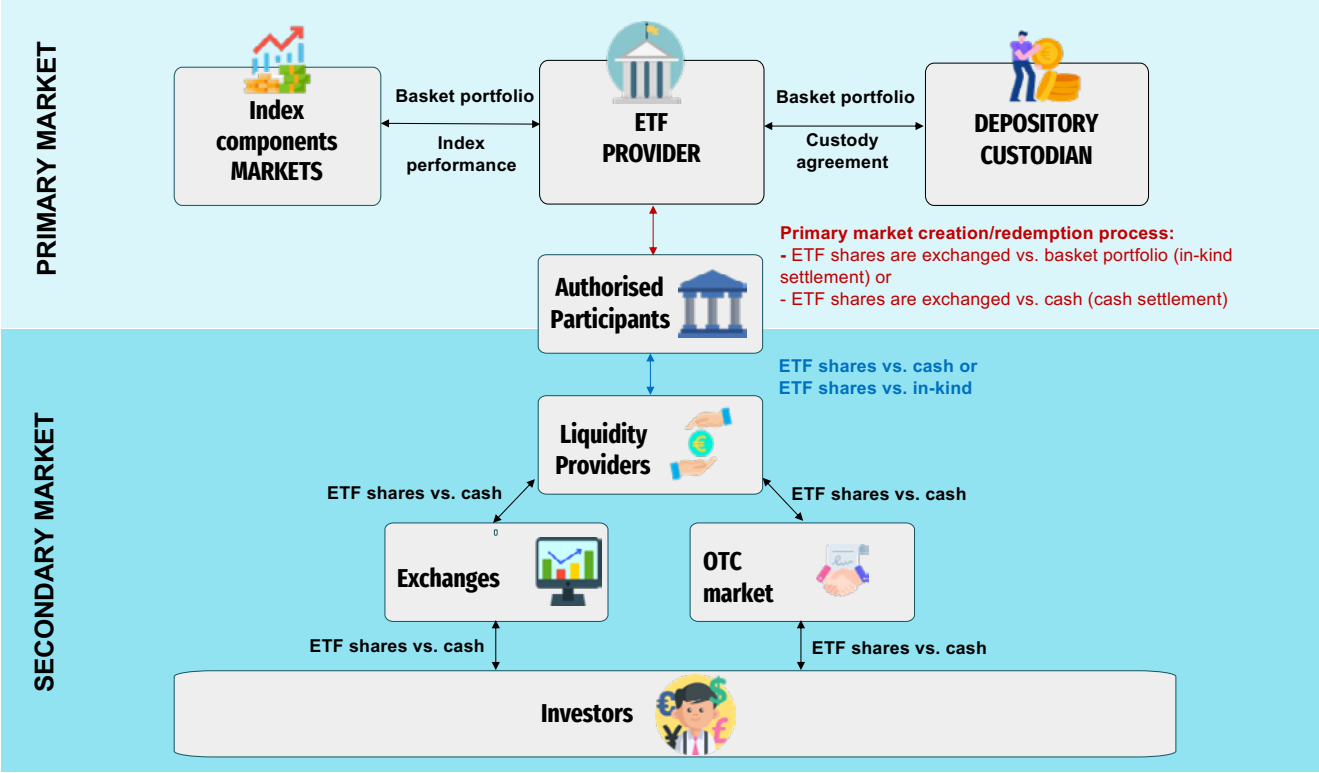
THE LIQUIDITY OF THE EUROPEAN ETF STRUCTURE IN VOLATILE TIMES

A simple way to understand ETF product design is to compare it with ordinary (non-exchange traded) open-ended funds. A first key difference with the latter is that structuring an ETF involves an additional set of market players from the outset, namely one or more large dealers – commonly known as "authorised participants" (APs) – along with a host of market-makers/trading firms known as "liquidity providers" (LPs).

The creation and redemption of ETF shares involve a series of operations performed exclusively between the ETF issuer and a designated AP. As a first step, the latter assembles the securities included in the chosen index into a securities basket, reflecting their respective weights in the index. This basket is then delivered to the ETF issuer in exchange for the ETF shares (in-kind settlement), or alternatively exchanged for cash (cash settlement), depending *inter alia* on the APs preferences[12]. Thirdly, the AP will either place them directly into the secondary market itself, or do so indirectly by first allocating them to chosen LPs. Once on the secondary market, the ETF shares can then be traded among investors just like other securities listed on one or more European listing venues (being both traditional exchanges and electronic platforms), or alternatively over-the-counter (OTC).

LPs act as market-makers, thereby playing a critical role in enhancing an ETF's liquidity by quoting bid/ask prices for its shares throughout daily trading hours. Important to note is that the average daily trading volume of an ETF's shares on the secondary market is commonly a multiple of their trading volume on the primary market. This effectively "cushions" the primary market from sudden bouts of volatility and offers ETF investors an additional "layer" of liquidity.

11. Stylised representation of an ETF's structural set-up with key players and flows



Source: EFAMA

A second salient feature of ETFs compared to ordinary funds relates to the fact that ETF shares can be traded throughout the trading day on the secondary market and are therefore priced far more frequently than units of ordinary funds which are normally valued at end of day and traded at the fund's official Net Asset Value (NAV) price. The resulting advantages for investors are therefore the increased convenience of intraday liquidity and price transparency in terms of having bid/ask spreads and volumes reflected almost in real time. In light of an ETF's core structural features illustrated above, we are now able to better address some of the recurring supervisory concerns pertaining to an ETF's resilience during episodes of market volatility. These can be broadly grouped into three: i) the risk of a "liquidity mismatch"; ii) the product's resilience and continued presence of APs in times of market stress; and iii) the possibility in such circumstances of large and persistent price deviations from an ETF's net asset value (NAV).

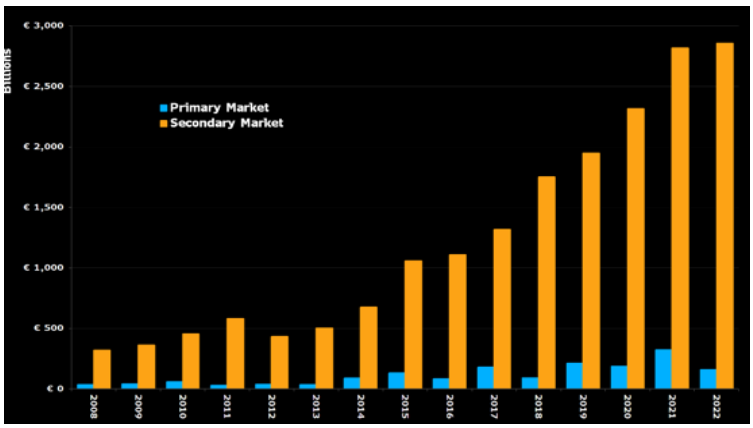
Considerations on ETF liquidity

Perceived liquidity risks of open-ended funds – in the form of a hypothetical "liquidity mismatch" – have long been the main preoccupation of several regulatory bodies, including national supervisors, central banks and international standard-setters (e.g. IOSCO, FSB and IMF). Such preoccupations, however, have too often overlooked a simple fact, i.e. that unlike for units of ordinary open-ended funds, ETF shares additionally derive their liquidity from a deep secondary market. Therefore, when considering ETFs, we must understand the two distinct "layers" of liquidity, as well as their interplay[13]. Secondly, the long-held assumption that APs/LPs could withdraw from their market-making roles at times of heightened volatility has also not been proven true.

As clearly demonstrated in chart 12 below, secondary markets for European-domiciled UCITS ETFs have recorded increased investor activity over recent years, as evidenced by the steady growth of secondary market turnover. The latter can be explained by the confluence of two reenforcing trends: the growing take-up of ETFs in investor portfolios, alongside traditionally active investment allocations, and the fact that recent episodes of market volatility have *de facto* encouraged more investors to trade their exposures on the secondary market. Flows, on the other hand – expressed as the absolute value of ETF share creations and redemptions through designated APs (i.e. primary market activity) – have remained stable and considerably subdued.

These observations are confirmed by the performance of a given ETF during recent market turbulence, such as the March 2020 Covid-induced sell-off, or the geopolitical tensions of early 2022 in eastern Europe. Chart 13 confirms the stark differences between secondary-to-primary monthly traded volumes for the iShares IHYG UCITS ETF, tracking a broad basket of Euro-denominated high-yield corporate bonds. Particularly noteworthy is the fact that considerable "spikes" in the ETF's secondary market volumes are visible at the same time as some of the abovementioned market corrections, reaffirming the significantly larger buying and selling activity of the ETF's shares at and around these given moments. By comparison, primary market activity remains subdued by quite a considerable magnitude, suggesting that even for less-liquid asset classes (such as high-yield corporate bonds) investors do not "force" new share creations or redemptions onto the AP and the issuer[14]. This finding marks a critical difference in the redemption dynamics of ETFs compared to ordinary (non-exchange traded) open-ended funds, further dispelling another popular "myth" around ETF redemption activities affecting the underlying securities' markets directly.

12. Europe ETF Aggregate Flows and Turnover
(EUR billions)

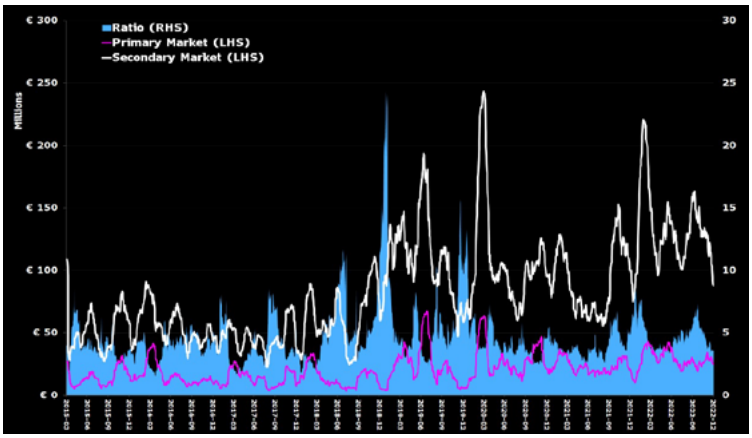


Source: Bloomberg Intelligence

What emerges from chart 13 is that ETF shares can be traded in the secondary market with little to no trading of the index's underlying securities, along with a relatively subdued or absent creation/redemption activity performed by the APs. This reduced primary market activity is therefore a by-product of a significantly more active secondary market at times of increased volatility. Investors looking to sell their shares will meet more buyers, which in turn are looking to take on the same exposure by paying a lower price. An initial oversupply of an ETF's shares is nothing but a first-round effect of a volatility spike, inevitably accompanied, as a second-round effect, by rising demand from buyers for the same shares as

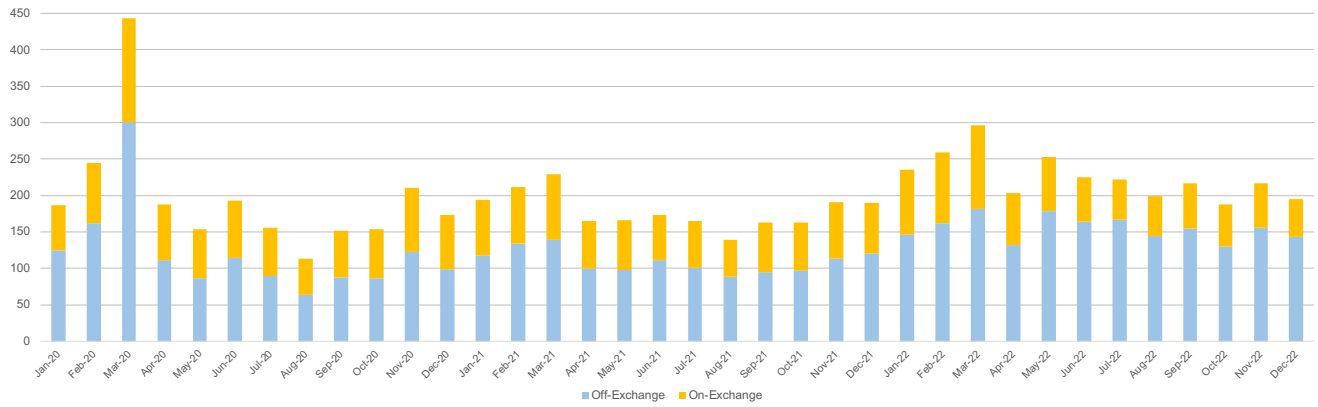
these enter the secondary market. In other terms, the perceived inactivity of APs results from there not being a strong enough arbitrage opportunity for them to make a redemption worthwhile, rather than them withdrawing altogether[15]. In this manner, the secondary market aptly "cushions" the impact of the volatility spike, serving as a buffer and lessening the likelihood for APs to have to intervene in the primary market, if at all. Chart 14 below offers a breakdown of secondary market liquidity between on-exchange and off-exchange (OTC) traded volumes. The considerable volumes of off-exchange ETF liquidity - including multilateral trading facilities (MTFs) - are a characteristic of the European market and are only likely to tilt more in favour of on-exchange liquidity once the prospect of a pre- and post-trade consolidated tape for ETF shares becomes a reality.

13. Primary and Secondary Market Activity for the iShares IHYG UCITS ETF
(EUR millions)



Source: Bloomberg Intelligence

14. Total Monthly Secondary ETF Trading in Europe
(EUR billions)



Source: Bloomberg Intelligence

An interesting corollary stemming from the visible rise in secondary market trading activity relates to the role of ETFs as valuable "price-discovery" vehicles, particularly for those tracking indices comprising traditionally less liquid asset classes, like fixed income. In view of this asset class' natural characteristics, investors – and the market more broadly – have realised that a fixed income ETF may often serve as a better "proxy" of the true fair value of a given basket of bonds relative to the basket's individual components. The reason as to why fixed income ETFs are an efficient source of price information for the index's underlying components lies in the fact that APs and other LPs need to price all such components in their arbitrage activity, resulting in their prices converging towards the price of the ETF shares. Also, one must recall that bonds are typically traded OTC with no real reference price (unlike equities). This can be exacerbated by a liquidity crisis when bond prices may be scarce, stale or unknown. As witnessed across several bouts of short-term market volatility resulting from exogenous shocks, investors have increasingly turned to ETFs as an expedient means to determine the price of an individual bond at a moment when, under prevailing liquidity conditions, the security is not trading, or its last available price is no longer reliable. As fixed income ETFs are better able to efficiently approximate the price of an individual fixed income index component, more investors – even large institutional fixed income traders – will use such ETFs for price discovery.

The continued presence of Authorised Participants

The above findings should also not be interpreted as the effect of APs retrenching from their dealing activity by simply opting to "step away" when market volatility increases. According to these concerns, an AP's agreement with the ETF issuer to continue dealing primary market orders becomes imperiled at times of severe market volatility, where the AP would find it increasingly expensive to hedge its market exposure. Consequently, an AP may opt to no longer service the agreement for the creation/redemption of ETF shares as it seeks to reduce its own risk, at the expense of the ETF issuer and its investors.

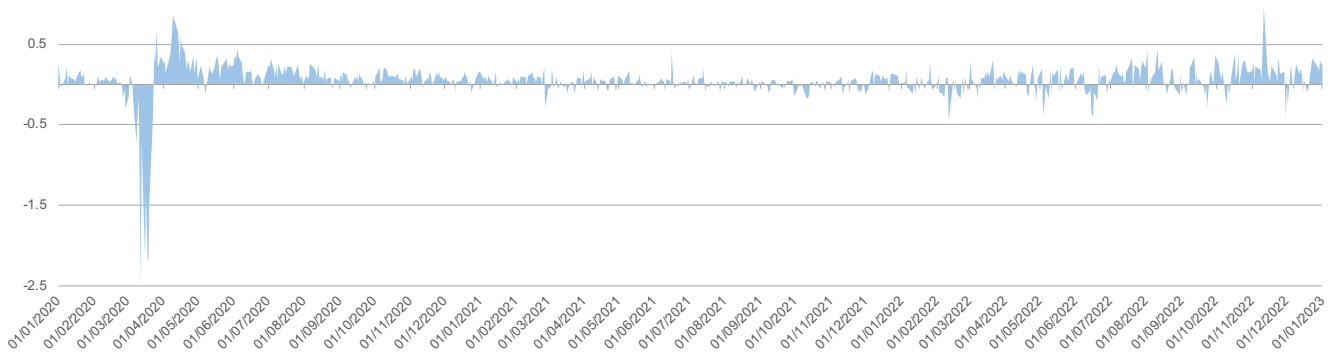
Worth noting in the context of the March/April 2020 volatility is that – contrary to some beliefs – APs and market-makers remained engaged to support ETF liquidity. As a reminder, there are very clear economic incentives for APs to honor their arrangement with the ETF issuer, offered by the arbitrage opportunities inherent in the creation/redemption mechanism, especially during bouts of market volatility such as those observed in March 2020. Moreover, given the surges in ETF average daily secondary market volumes relative to those of the underlying "cash" market precisely around the time of significant market events, there is a clear decorrelation to be observed between secondary-to-primary market orders. This proves that APs do not usually deal primary market orders at the same time as large demand or supply imbalances observed in the secondary markets (which result respectively in ETF inflows or outflows). Where they do, the resulting primary orders also typically occur with a notable lag relative to the date of a volatility spike, suggesting that APs maintain discretion as to when they choose to deal creations/redemptions, based on the size of their respective stock inventories, available market prices for the underlying securities, as well as on their hedging capabilities. Lastly, as a good practice and one dating well before the March/April 2020 events, the large majority of European ETF issuers can rely on a network of multiple active APs. To the best of our knowledge, there have been no cases of APs, nor of market-makers, withdrawing from serving any European ETF issue.

Temporary deviations from NAV

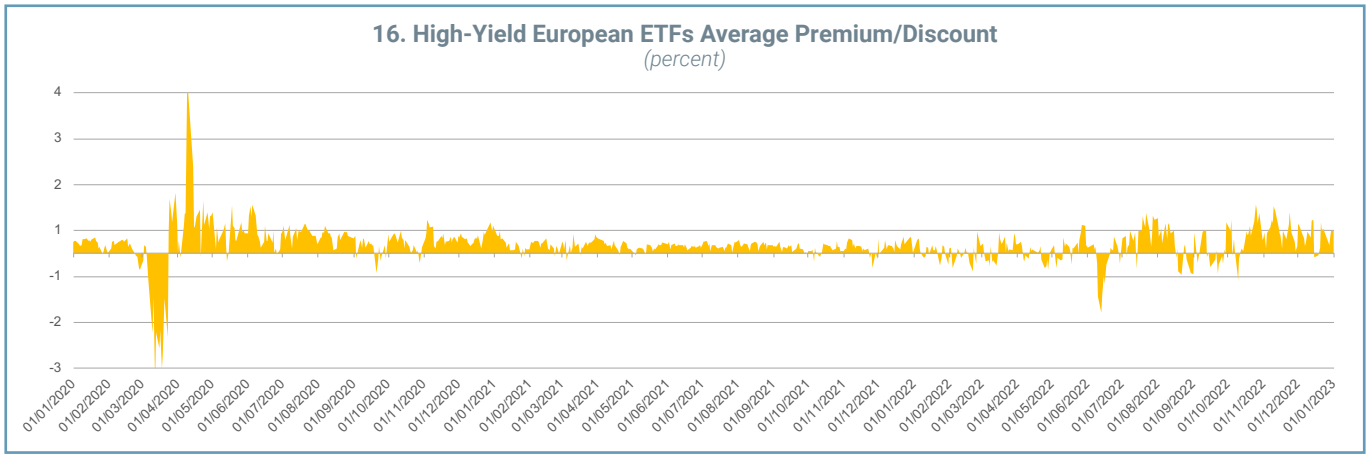
Another commonly-held concern among supervisors is that at times of volatility an ETF's share price can diverge quite significantly from the portfolio's NAV. Where this occurs, if the price of the ETF is trading above its NAV, the ETF is said to be trading at a "premium". Conversely, if the price of the ETF is trading below its NAV, the ETF is said to be trading at a "discount". In relatively calm market conditions, ETF prices and their respective NAVs are generally aligned (as the product requires). However, when financial markets become more volatile, ETFs are more quickly able to reflect changes in market sentiment, while their NAVs may take longer to adjust, thereby resulting in the observed premiums and discounts. This is noticeable for ETFs tracking indices made-up of traditionally less-liquid asset classes, such as certain categories of bonds for instance (e.g. corporate debt and high-yield). Regulators have consequently expressed concerns that volatility in the markets could cause such divergences to become entrenched, leading to investor harm over the longer-term.

We test this hypothesis by analysing the divergence between the ETF share price in the secondary market and the NAV of European investment grade and high-yield ETF bond funds[16] and how quickly such divergence is closed by studying average premiums/discounts during episodes of market stress (charts 15 and 16)[17]. For each of the two types of bond asset categories, the following charts show the recorded deviations for all European investment grade and high-yield bond ETFs over a 3-year period.

15. Investment Grade European ETFs Average Premium/Discount
(percent)



Source: Bloomberg Intelligence



Source: Bloomberg Intelligence

The charts demonstrate that despite the severity of certain deviations (especially those in March 2020), these were only short-lived, as the price of ETFs soon realigned with their underlying NAV. An inflationary macroeconomic forecast and the Russian invasion of Ukraine at the start of 2022 caused such deviations to reappear again, albeit at levels far lower than March 2020.

Prolonged discounts between certain ETF shares' value and their NAV - particularly acute for corporate investment and high-yield debt ETFs – should not be understood as a product-specific anomaly. Instead, these discounts were the by-product of a very volatile and contingent trading environment, compounded by the general market uncertainty and possible central bank policy actions, as well as a severe deterioration of market liquidity. As with other types of securities, these conditions were largely responsible for the widening of bid-offer spreads investors faced when looking to trade their exposure using ETFs in their respective secondary market. Moreover, such discounts should be studied by considering the functioning of the ETF ecosystem as a whole, including the incentives and constraints of other significant market actors. Among these are the APs, in their essential role as arbitrageurs between a secondary market for an ETF's shares and a primary one that involves direct transactions with the ETF issuer (either settled in-kind or in cash).

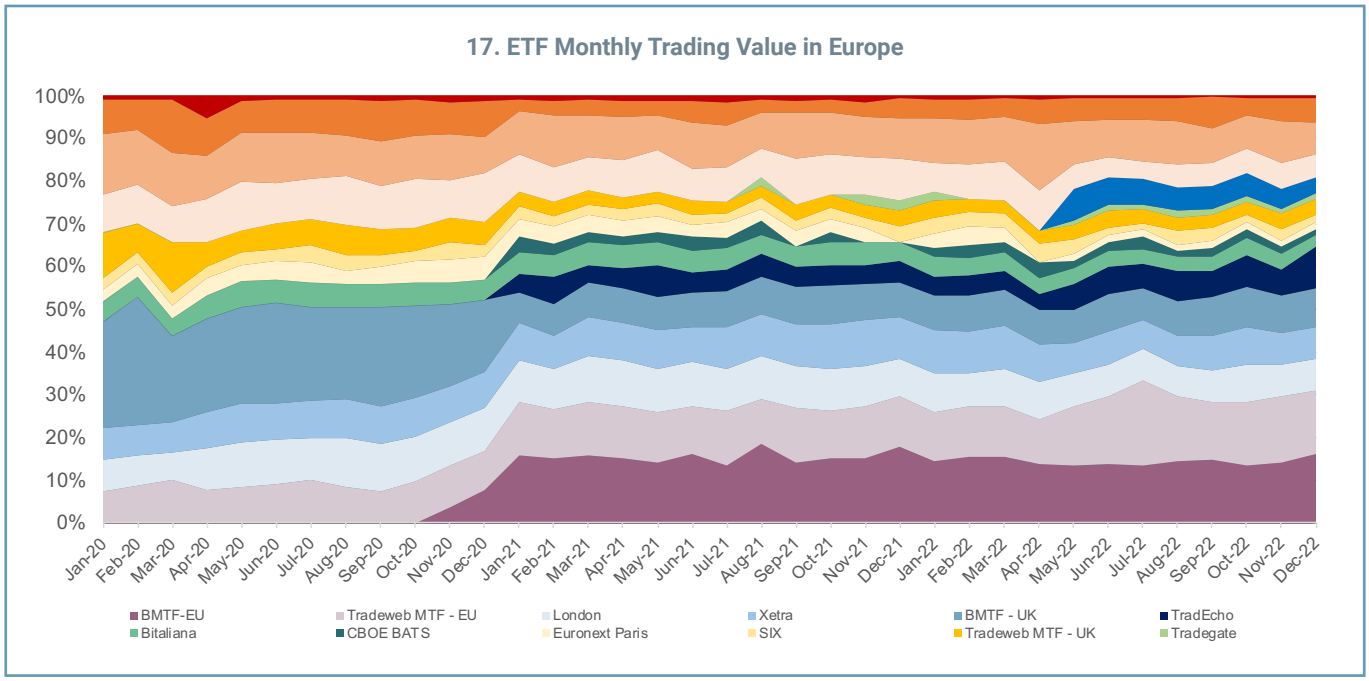
More specifically, the conditions of March 2020 made it more complicated for APs to efficiently hedge their exposure to the underlying basket for specific fixed income ETFs when access to the basket's single components and their tradability became difficult. This had potential negative repercussions from a cost impact on APs' own balance sheets. When setting the price for an ETF's shares, an AP will, among other factors, consider the estimated transaction costs related to the bid-offer spread for the underlying securities, often adding a "liquidity risk premium" to offset the risk that the actual transaction cost is greater than anticipated. Specialist market-makers – in their role of rapidly matching ETF investors by offering two-way quotes in the secondary market – were also compelled to widen their bid-offers in light of the challenging market conditions. During the volatile weeks of March 2020, both estimated that transaction costs and liquidity risk premiums were elevated for virtually all types of fixed income securities. By comparison, NAV calculations varied far less as they are usually calculated once a day based on third-party valuation models that seek to extrapolate the value of the individual securities comprising the ETF's basket.

Another important driver behind the large temporary discounts observed in fixed income ETFs was the nature of fixed income securities, compounded by a very fragmented trading environment in Europe. For instance, it is well recognised that bonds are less-standardised, do not trade frequently and vast swathes of European market transactions are OTC by nature. The volatile market conditions observed in March 2020 only made bond trading more difficult, and with fewer observable trades, deriving the value of a bond ETF's NAV – compounded by the greater probability for valuation errors/discrepancies in AP/market-maker pricing models – only became more challenging. This resulted in an ETF's NAV becoming "stale" and the inevitable gap between the live, real-time secondary market price of the ETF versus the derived and indicative value of its underlying bond basket soon widened to become increasingly apparent[18].

EUROPEAN MARKET FRAGMENTATION IN THE PROSPECT OF A CONSOLIDATED TAPE

European trading remains fragmented across listing venues (both traditional exchanges and MTFs) with liquidity spread out across a wide range of products and where electronic trading platforms do not publish their trading data outside of their approved publication arrangements (APAs)[19]. For ETFs, such fragmentation also comes as a by-product of the UCITS "passport", allowing ETFs to be listed and distributed cross-border. Furthermore, it is worth reiterating that the European ETF market is mostly in the hands of institutional investors (unlike in the U.S.), with large volumes being executed OTC or through MTFs (as per Chart 14 above) and for which price information is either not available (in the first case) or only partial and costly to obtain (in the second case).

The absence of a real-time consolidated tape and the consequent lack of transparency on transaction price information contributes to investors being diverted away from European capital markets, slowing their growth prospects. Moreover, smaller and less liquid securities are either excluded from indices' security selection process, or traded to a far lesser extent compared to those listed on Europe's main exchanges. Chart 17 below depicts the fragmentation of the European ETF market in terms of monthly trading values across Europe.



Source: Bloomberg Intelligence

It is true that European ETFs, combined with their UCITS wrapper, are extremely popular in other jurisdictions, particularly in Asia and Latin America (and partially also due to their withholding tax benefits). Yet, issuers of European ETFs are unable to capitalise more on this interest due to the lack of a real-time consolidated tape in the EU. Unable to access real-time volume data efficiently, foreign investors are overlooking EU ETFs in favour of those listed in jurisdictions where this data is available, notably in the U.S. A real-time consolidated tape for equities and ETFs would gradually place the EU on par with the U.S. for ease of data access. We estimate that around 10-20% of AUM (assets under management) held today by non-US clients (APAC, Latin America and some EMEA) are in U.S.-domiciled ETFs. Representing approximately USD 1 trillion, a good portion of these assets could potentially migrate to EU-listed ETF products.

A related consideration stemming from the lack of data on liquidity in Europe is the dampening effect this has on what could otherwise be attractive investment niches. During the post-Covid period, we noticed that there was a sharp increase in interest in small and mid-cap stocks. Yet, ETF issuers were unable to include these stocks in their baskets given the lack of consolidated liquidity data. An EU consolidated tape which includes listings in smaller markets promises to reverse the current dynamics (where institutional investors have to opt into separate and costly data feeds to extract price information). Increased visibility and the ease of accessing complete liquidity and price data in a single place will provide a critical boost for smaller markets as well.

Despite the obvious benefits stressed by EFAMA, the conclusion of the MiFID/R review in June 2023 fell undoubtedly short in terms of the depth and coverage of data that the consolidated tape will deliver. In an ideal world, a pre-trade equities/ETFs tape would have delivered five layers of best bids and offers to market participants, providing a much needed view on overall liquidity and pricing for European-domiciled UCITS ETFs. The consolidated tape resulting from the EU legislative process has only taken some timid steps towards greater transparency and consolidation of data. Nevertheless, with a possibility to review the core data that the tape delivers by June 2026, we hope that a more ambitious consolidated tape can still emerge in time to support the trading and attractiveness of the UCITS ETF product for European and international investors alike. This will furthermore encourage greater retail demand for UCITS ETFs by improving visibility and lowering trading costs, at a moment where the UCITS ETF market in Europe – unlike the U.S. – remains fundamentally an institutional one.

CONCLUSION

The European market for ETFs has undeniably grown in the course of the last decade. The ETF product's transparency, its relative low cost, the large range of products available, the ease for investors to trade it, along with a world-class regulatory framework (i.e. the EU UCITS regime), have all supported growing demand for the product from both European and global investors. Moreover, the product's versatility has enabled it to flexibly accommodate growing demand for exposures to niche asset classes and specific investment strategies (e.g. active or sustainability-related ones).

Continuous growth and the commercial success of several ETF launches have inevitably attracted the interest of the regulatory community, followed by closer scrutiny into the product's design, ecosystem and usage. Despite hypothetical concerns around liquidity stresses and the resilience of an ETF's broader market ecosystem (including APs/LPs as critical actors), we stress that ETFs have successfully weathered sharp market corrections – including recent ones – while acting as a valuable tool to derive an aggregate price for underlying securities during temporary market dislocations. Far from contributing to systemic risks, our analysis concludes that ETFs can act as an important pressure valve at times of stress, allowing investors to continue trading their respective exposures for a given asset class.

Lastly, we believe there would be considerable benefits for the further development of the UCITS ETF market following the review of the EU MiFIR regime in view of delivering a real-time consolidated tape for equities and ETFs. We consider this to be a critical step in enhancing the liquidity and transparency of European ETF markets in view of delivering the longer-term and ambitious goals of the European Commission's Capital Markets Union project.

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ENDNOTES

1. *Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS); available at the following link.*
2. *In a swap-based structure, the ETF uses investors cash to buy a basket of securities and simultaneously enters into one or more total return swap agreements with agreed counterparties. The latter commit to deliver the underlying index's performance to the ETF in exchange for the performance of the securities purchased and subsequently held by the fund.*
3. *See for instance, the 2011 study of the Financial Stability Board (2011), entitled Potential Financial Stability Issues Arising From Recent Trends in Exchange-Traded Funds (ETFs), or the 2018 paper of the ECB on Counterparty and liquidity risks in exchange-traded funds.*
4. *References to the UCITS ETFs market in this report do not include index-tracking funds.*
5. *The EU SFDR's disclosure regime has led providers to classify their funds as either an "Article 6", an "Article 8" or an "Article 9" fund, depending on their characteristics and degree level of sustainability. "Article 6" are funds without a sustainability objective; "Article 8" funds are those that promote environmental or social characteristics; and "Article 9" funds are those that have one or more sustainable investments as their specific objective.*

6. *Morningstar (2023). SFDR Article 8 and Article 9 Funds: Q4 2022 in Review Article 9 fund assets shrink by EUR 175 billion, or 40%, following a wave of downgrades.*

7. *Of relevance is the facilitation via the SEC's 2019 "ETF Rule" reform for issuers to launch "non-transparent active" ETFs, whereby the ETF does not need disclose the contents of its portfolio to the public on a daily basis, thereby avoiding the risk of potential "front-running" by other sophisticated market players.*

8. *Instead of replicating the index physically, swap-based ETFs enter a total return asset swap , such as an OTC derivative, with a counterparty that promises to pay the return on the benchmark to the ETF. The swap is collateralised with a portfolio of securities to which the ETF has access in case the swap counterparty defaulted on its obligations. In greater detail, there are two types of swap: (i) an "unfunded" version, where the ETF directly holds the counterparty's collateral whose returns are "swapped" against the performance of the chosen index on a segregated account in its own name; and (ii) a funded "swap" version, where the counterparty's collateral is also held on a segregated account, albeit with a third-party custodian and in the name of the counterparty (although technically held on behalf of the ETF). Both models are used, with a clear preference for the "unfunded" version due to easier access to collateral in the event of the counterparty's default.*

9. *For further information, please refer to the 2020 study by Vanguard, An overview of physical and synthetic ETF structures.*

10. *Source: ETFbook.*

11. *Differently, the U.S. displays a significantly larger share of physical replication. Besides the decisive development of a large domestic market populated by independent asset managers, one notes that, in addition, the 1940 Investment Company Act requires ETFs to invest at least 80% of their portfolio assets in the securities of the chosen target index. As a result, swap or derivative-based replication is more rare and mostly confined to multiple-leverage and inverse-products. For further information, please refer to the relevant SEC's 2010 release.*

12. *Chief among these considerations is the ease with which the AP hedges its exposure to the underlying basket, considering the accessibility and tradability of its components, as well as their cost impact on its balance sheet. Both settlement methods have distinct advantages that will be considered by APs on a case-by-case basis. Noteworthy is that, unlike in the U.S. where creations/redemptions are predominantly settled in-kind and accrue a tax advantage, in Europe cash settlement is more common. In-kind settlement is more advantageous for European APs when doing creations/redemptions of fixed income ETFs, allowing the former to access baskets of bonds on more convenient terms than otherwise having to source them in a more fragmented open market and with possibilities for settlement fails.*

13. *Please refer to EFAMA's 2019 Comment Paper to the ECB.*

14. *For further evidence, please refer to BlackRock (2020) Lessons from COVID-19:ETFs as a Source of Stability.*

15. *In simple terms, an arbitrage opportunity exists every time the price of the ETF trades above (at a premium) or below (at a discount) relative to its underlying net asset value (NAV). Where these mis-pricings occur as a result of demand/supply dynamics and are sizeable enough, an AP will seek to realise the arbitrage opportunity by buying more of the cheaper securities – be they the ETF's shares or its underlying basket components – while selling the more expensive of the two thus capturing the spread. In doing so, APs draw the price of the ETF back to be relatively in line with its NAV, thereby ensuring that the ETF effectively tracks its chosen index and thus reducing tracking error.*

16. *We choose bond funds due to the higher probability of diminished activity and lack of liquidity in the markets of the underlying securities (bonds).*

17. *The discount/premium percentage for each group is calculated according to the formula: (ETF share price - NAV)/NAV. We calculate the average discount/premium for each trading day for all funds representative of each group. The market coverage for the high-yield group is 70% of the total market AuM and for investment grade group 33%. We then calculate the average premium/discount for each group for each date by averaging the data points of the representative funds belonging to a group, obtaining the European 'average' discount/premium for the two groups separately - high-yield and investment-grade.*

18. *For a succinct analysis of the Covid-induced market stresses on ETFs and further evidence to debunk commonly held "myths", please refer to the DWS Investment Insights of April 2020, ETF Trading in Volatile Times.*

19. *See for instance the article from Bloomberg Intelligence (2022), European ETP Trading Stays Elevated in 2021.*