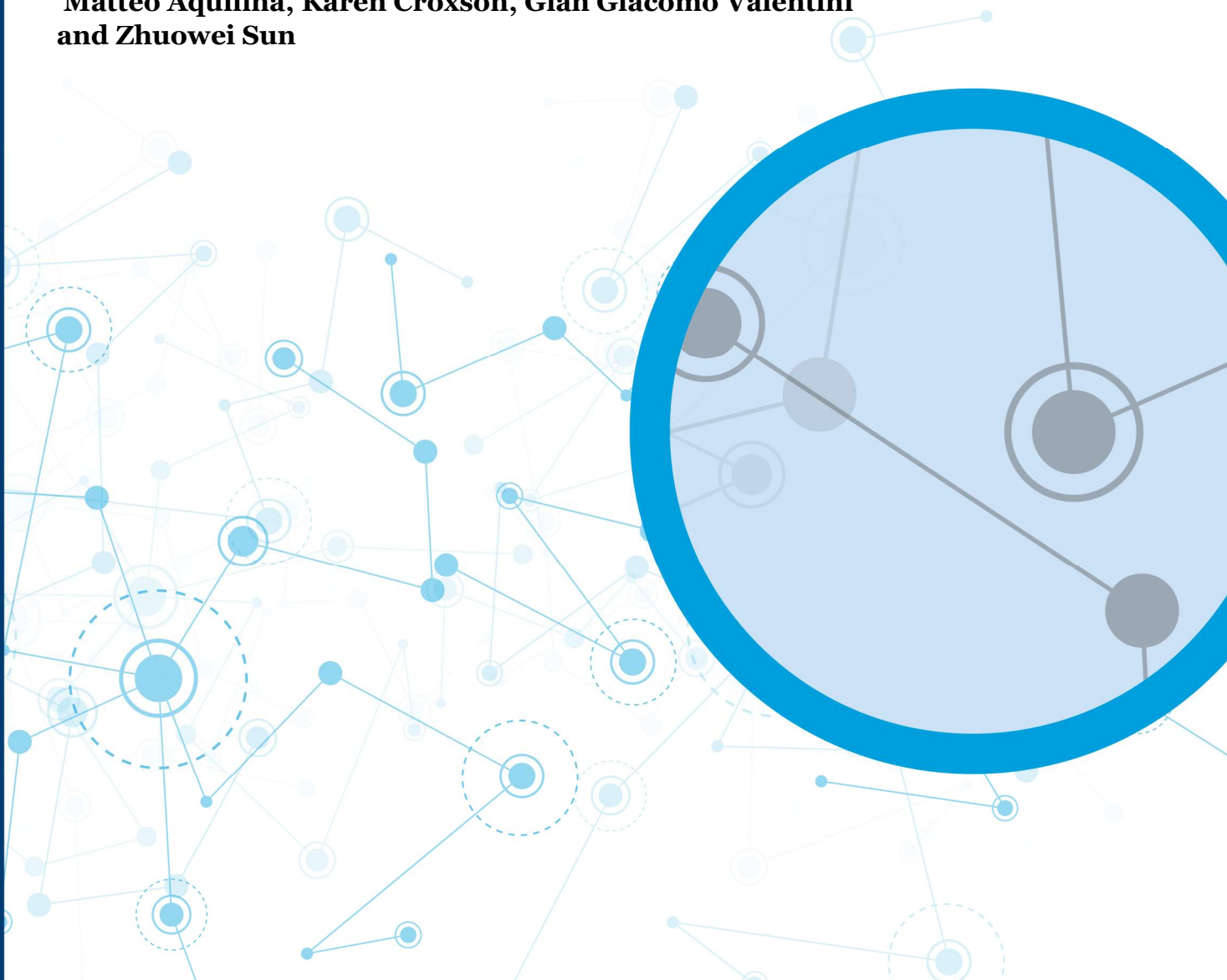


# Research Note

January 2021

## Fixed Income ETFs: secondary market participation and resilience during times of stress

**Matteo Aquilina, Karen Croxson, Gian Giacomo Valentini and Zhuowei Sun**



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# Abstract

The rapid growth in exchange-traded fund (ETF) markets creates potential risks to investor protection and financial stability. In Aquilina et al. (2020), using a unique transactions dataset, we showed that ETF primary markets are highly concentrated, particularly for fixed income ETFs, where concerns about 'liquidity mismatch' have been raised. However, we also found that alternative liquidity providers 'step in' during times of market disruption. In this paper, using previously unavailable data for the same ETF sample across an overlapping time window, we analyse ETF secondary markets from a financial stability perspective. We find that ETF secondary markets are somewhat concentrated, but that a subset of Authorised Participants (the only market participants who can create and redeem shares in the primary market) are active in both primary and secondary markets and act as a buffer between these. Only around a third of the net selling pressure in the secondary market manifests in redemptions in the primary market and this result holds across observed periods of mild market stress. Looking in more detail at the high yield fixed income segment, we do see some features that suggest this market may be more fragile during periods of stress. Finally, we also document some other stylised facts for ETF secondary markets, including that ETFs with less liquid underlying are more heavily traded. This finding underlines the role of ETFs in creating opportunities for trading exposure to illiquid securities.

# Contents

|   |   |    |
|---|---|----|
| 1 | Introduction  | 4  |
| 2 | Data  | 7  |
| 3 | Participation in ETF secondary market                               | 9  |
| 4 | The role of ETFs in liquidity creation                              | 13 |
| 5 | Resilience of liquidity in secondary markets during times of stress | 15 |
| 6 | A closer look at high yield ETFs                                    | 18 |
| 7 | Conclusion  | 21 |
|   | References  | 22 |

# 1 Introduction

The past decade has seen striking growth in the popularity of exchange-traded funds (ETFs) due to their relatively high liquidity and the opportunity they provide for cost-effective trading and low-cost diversification. In recent research (Aquilina et al 2020) we explored the potential systemic risk and financial stability implications of this trend, focusing on the European ETF primary market and analysing a unique data set gathered from 4 large ETF manufacturers. The resilience of the ETFs primary market is of interest since this is where ETF units are created and redeemed by Authorised Participants<sup>1</sup> (APs), hence effectively where demand and supply of ETFs is ultimately balanced. We found the primary market to be highly concentrated, especially for fixed income ETFs. However, we also provided some evidence that alternative liquidity providers 'step up' during times of stress. We did not observe other features of participation that raised financial stability concerns. In the current paper, we broaden our focus to look at the secondary markets and primary markets for ETFs in conjunction. During times of stress, shocks may be felt first in the ETF secondary markets, and potentially be transmitted via the ETF primary market into the market for the underlying assets.

While existing research on fixed income ETFs is available, there has been limited work to directly address the role of APs participation in the secondary markets and their potential impact on financial stability, due to the lack of granular data. Existing studies have focused on fixed income ETF ownership, secondary market liquidity and their underlying instruments. Several papers (Ye, 2019, Holden and Nam, 2019) argue that corporate bond ETFs improve the liquidity of the underlying and benefit retail bond investors and high yield bond investors in particular. Dannhauser (2017) state that ETFs have a long-term impact on the valuation of the underlying and improve overall market liquidity.

Despite the relatively developed literature on secondary market liquidity, few studies focus on the role of APs in the secondary market. Pan & Zeng (2017) is the only work we are aware of investigating the structural incentives faced by APs who are also market makers in the secondary market. Based on novel AP-level balance sheet data, they find that bond market illiquidity significantly limits APs' arbitrage capacity, leading to more persistent relative mispricing.

In order to add to the existing literature and extend our analysis to the ETF secondary market, we exploit information on trading obtained from transaction reports received by the FCA under MiFID II regulation. Combining information on the primary and secondary market allows us to have a novel vantage point compared to previous research, giving us a more complete view of the ETF market in Europe and an opportunity for additional insights into its functioning. We assess how market participants, and especially APs in their role as liquidity providers, behave in both markets and whether they behave differently in periods of stress compared to normal times. This enables us to contribute previously unavailable evidence to the ongoing international debate on the systemic relevance of ETFs. We have data on both primary and secondary markets for the entire calendar year 2018. In January 2018, new reporting provisions introduced by the MiFID II directive came into force, which required participants to report ETF trades to the FCA. Our data include – in addition to periods of normal activity – two periods of market stress: (i) February 2018, when fears of a sustained period of interest rate increases in the US put markets under

<sup>1</sup> We define Authorised Participants as all entities that have created or redeemed units on the primary market for the considered sample of ETFs during 2018.

significant pressure; and (ii) December 2018, when trade tensions between the US and China triggered large downward movements in asset prices. We can thus observe the behaviour of markets in stressed and unstressed conditions.

As in Aquilina et al (2020), when discussing resilience and stability issues we focus on the fixed income segment of the ETF market as it has been the main focus of potential concerns in international debate around ETFs and systemic risk. Fixed income ETFs have attracted particular interest because of the potential for significant liquidity mismatch between on the one hand, fixed income ETFs that offer intraday liquidity and, on the other hand, the underlying fixed income securities which are not easy to trade.

Our main findings are as follows:

- The secondary market appears quite concentrated. In fixed income ETFs, the top 5 participants are APs and are involved in nearly 60% of total volumes. In equity ETFs, the corresponding figure is approximately 50%. These figures suggest the secondary market is less concentrated than the primary market<sup>2</sup> for these ETFs, but still relatively high as there are thousands of participants in the secondary market as opposed to tens in the primary one.
- ETFs appear to create most liquidity in those asset classes where the underlying is least liquid. ETFs with less liquid underlying are more heavily traded in our sample, e.g., equity ETFs with a focus on developed economies are the least traded while high yield bond ETFs are the most heavily traded. This finding supports the idea (e.g., Bhattacharya and O'Hara, 2018, Dannhauser, 2017) that ETFs are an instrument of choice to trade illiquid securities.
- The same stress time periods can be observed in both primary and secondary markets and APs increase their activity in both markets during these times of stress.
- There is evidence that APs create a buffer between the primary and secondary market at all times: overall only about a third of the volume of ETFs sold by non-APs in the secondary market (and bought by APs) is passed through by APs into redemptions in the primary market.
- The high yield bond segment is more concentrated, more heavily traded, and APs active in this market seem less inclined to absorb shocks. In the February stress period, we observe APs pass onto the primary market almost 60% of the sales in the secondary market. This suggests that the high yield segment of fixed income ETFs may be more fragile than the fixed income ETFs market as a whole.

The Covid-19 pandemic will provide a further important case study for the behaviour of these markets during times of stress. Covid-19 created a large shock across asset classes, with a particularly pronounced impact on corporate bond markets. Issuance in primary markets came to a halt and mutual funds experienced net outflows. Aramonte and Avalos (2020) have reviewed some of the developments in relation to European and US ETF markets, noting that in mid-March 2020, as the pandemic took hold, the prices of many corporate-bond ETFs dropped significantly, trading at steep intra-day discounts to underlying asset values. The episode illustrates that ETF prices are more reactive to market

<sup>2</sup> Aquilina et al (2020) find for the same group of ETFs in the primary market that the top 5 APs account for 75% of volumes overall and 91% of fixed income only.

developments than the prices of underlying bonds, and the authors note their value as inputs for monitoring market developments and risk management models.

It will be important in future work to study the liquidity and overall market functioning of ETFs markets across the Covid-19 periods of stress. We aim to report research on this period in a future paper as data become available.

## 2 Data

The unique primary market dataset we exploited for Aquilina et al (2020) is based on a bespoke regulatory data request to ETF manufacturers and contained all primary market transactions for a sample of 257 EU-domiciled ETFs managed by 4 of the largest global issuers. It contains each transaction (both creations and redemptions) of ETF units that takes place between the AP and the manufacturer over our sample period 2016 to 2018.

In the current paper, we build on this primary market transaction dataset by extracting from MiFID II transaction reporting data<sup>3</sup> all secondary market transactions involving the same ETFs. MiFID II reporting began in January 2018, so we are able to rely on a full year overlap between the available primary and secondary market data.

MiFID II provides us with a unique transaction level regulatory database. Despite the comprehensiveness of this source, the coverage of transactions is subject to jurisdictional limitations. We are able to examine (i) all transactions where the ETF is listed or cross-listed in the UK; (ii) all transactions of the ETF traded on trading venues with reporting obligations to the FCA; (iii) all transactions of the ETF executed by firms with reporting obligations to the FCA.

The level of information reported under MiFID II for each transaction is extremely detailed. Among the numerous available fields, those most relevant to our work are the transaction date and time, the trading venue, International Identification Securities Number (ISIN), execution price, size of the transaction, buyer and seller identity, type of buyer and seller (i.e. Retail/Institution), and agency/principal trading capacity indicator of the transaction submitting entity. The raw data presents several issues to work with and we take multiple steps to clean it. First, we remove the clear reporting errors and single transactions showing as outliers by removing the top 0.5% of the volumes distribution. Second, we drop multiple reports of the same transaction submitted by different entities and venues. Last, we map the chain of transactions to avoid multiple counting. This leaves us with a final sample of 240 ETFs and 6.26 million secondary market transactions executed from the 1<sup>st</sup> January 2018 to the 31<sup>st</sup> December 2018. The 240 ETFs are split into 135 equity and 105 fixed income ETFs.

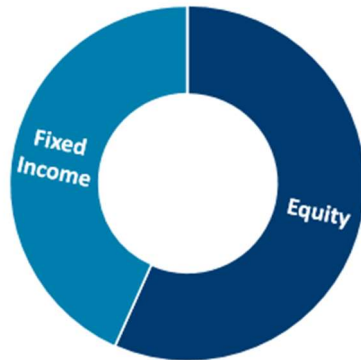
As shown in figure 1, equity ETFs account for slightly more than fixed income ETFs in terms of ETF secondary market volumes and, as shown in figure 2, this gap widens if the number of trades is considered. The total volume of secondary market transactions (\$638bn) is significantly larger than primary market activity (\$126bn creations and \$99bn redemptions). Table 1 summarises key statistics of ETF secondary market trading by underlying assets held. As anticipated by figure 1, the significantly larger number of transactions in equity ETFs results in an average transaction size (\$78k) which is less than half of the size observed for fixed income (\$168k). Fixed income ETFs only account for a third of total AUM in our sample, while in terms of trading volume the segment accounts for almost half overall, implying that the secondary market trading activity is more intense for fixed income ETFs.

<sup>3</sup> More details can be found at the following link: <https://www.fca.org.uk/markets/transaction-reporting>



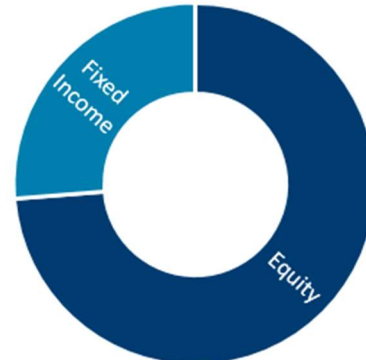
**Figure 1. Trading volumes in our ETF secondary market sample, by asset class**

Total volume = \$638bn



**Figure 2. Number of trades in our ETF secondary market, by asset class**

Total no. trades = 4.62m



Source: MiFID II transaction reporting data, FCA calculations

**Table 1. Summary statistics for our sample of European ETF secondary market trades, 2018**

| Segment      | Number of ETFs | Number of Trades (ml) | Traded Units (ml) | Average Traded Units (k) | Trading Volume (ml USD) | Average Trading Volume (k USD) |
|--------------|----------------|-----------------------|-------------------|--------------------------|-------------------------|--------------------------------|
| Equity       | 135            | 4.62                  | 8,933             | 1.94                     | 361,637                 | 78                             |
| Fixed Income | 105            | 1.65                  | 3,017             | 1.83                     | 276,616                 | 168                            |

Source: MiFID II transaction reporting data, FCA calculations

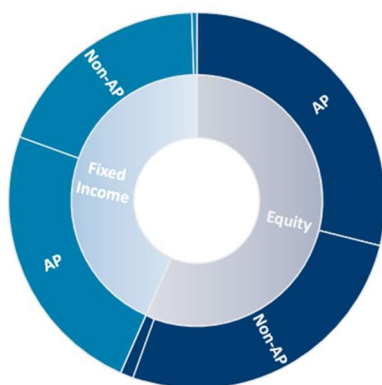
### 3 Participation in ETF secondary market

We categorize market participants into 3 broad groups<sup>4</sup> based on their high-level business model and type of engagement in the ETF market:

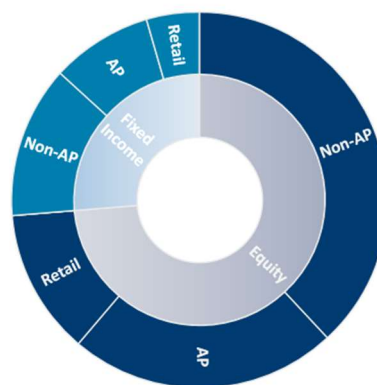
- Authorized Participants (APs)
- Other Institutions excluding Authorized Participants (non-APs)
- Retail Investors

Figure 3 and figure 4 show the breakdown of trades between APs, non-APs and retail investors.<sup>5</sup> Not surprisingly, with around 98% of the trading volume institutional investors dominate the ETF secondary market. Retail investors represent a small portion of transactions by number, and significantly less in monetary terms. Furthermore, equity ETFs account for more than half of the retail transactions.<sup>6</sup> APs account for most of secondary market volumes, while non-APs are the most active by number of trades.

**Figure 3. Trading volumes in our ETF secondary market sample, by counterparty type**



**Figure 4. Number of trades in our ETF secondary market sample, by counterparty type**



Source: MiFID II transaction reporting data, FCA calculations

Figure 5 looks more closely at AP volumes, breaking these down by AP type. Principal Trading Firms (PTFs) and Investment/Wholesale Banks (IWBs) account for a similar

<sup>4</sup> Investment/Wholesale Banks (IWBs) are traditional banks which have a branch of their business that acts as an AP. IWBs have been active in ETFs since the asset class was created and must usually meet strict capital requirements.

Principal Trading Firms (PTFs) are relatively newer firms who tend to be more focused on certain sub-sectors of the ETF market, such as fixed income. As they are not involved in the traditional banking business, they tend to have less rigid capital constraints. This, combined with the use of sophisticated technology for high-frequency trading, allows PTFs to run a larger balance sheet and manage risk more effectively.

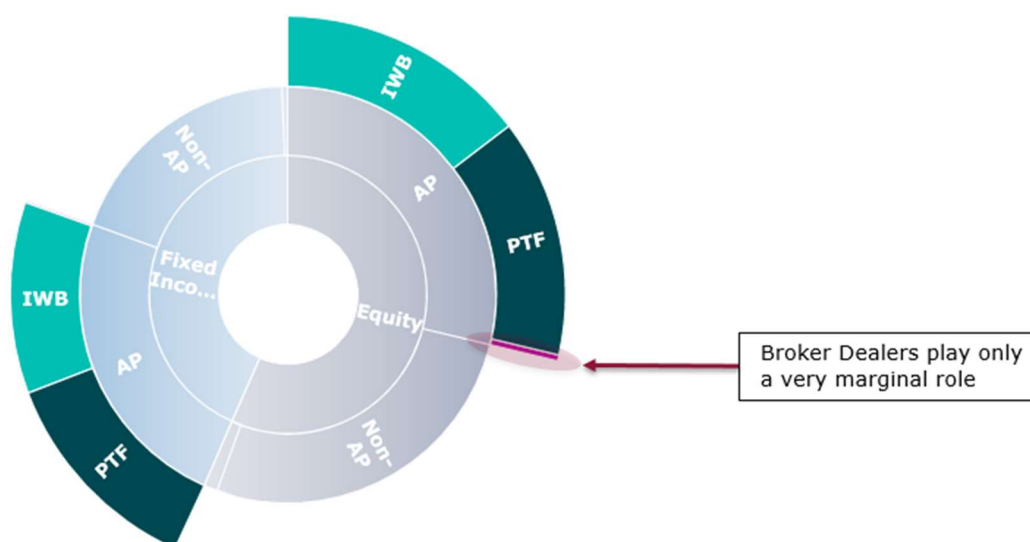
Broker Dealers (BDs) combine brokerage business with proprietary trading. They rarely act as an AP.

<sup>5</sup> As each trade involves two parties, in order to cover both sides, we double-count each transaction. Providing the breakdown in relative terms preserves the integrity of the results. In order to calculate the portion of volumes APs and other market participants take part to we need to decompose each transaction in two parts as follows. Assume for example AP1 buys 10 units from a retail investor RET1. This single transaction is decomposed in (i) 10 units bought by AP1 and (ii) 10 units sold by RET1. If we had to consider the total number of units we would be looking at a total of 20, which would be misleading – we refer to this as ‘double counting’. However, when we look at relative terms this allows us to get a more accurate picture. From this perspective, we see that AP1 and RET1 split volumes 50-50, which is exactly what we aim to show on a larger scale in Figure 3 and Figure 4.

<sup>6</sup> Morning Star (2017), “A guided tour of European ETF marketplace”, February. Central Bank of Ireland (2017), “Exchange Traded Funds”, discussion paper, May.

share of trading volume in both fixed income ETFs and equity ETFs. As we also observed in the primary market, Broker Dealers (BDs) play a very marginal role.

**Figure 5. Trading volumes in our ETF secondary market sample, by type of Authorised Participant**



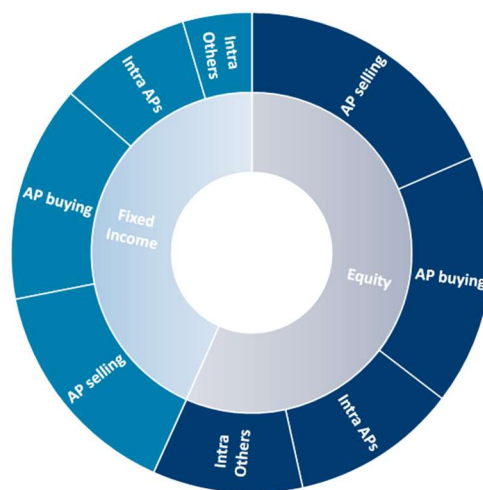
Source: MiFID II transaction reporting data, FCA calculations.

Figure 6 breaks down the AP volumes into 4 categories based on the role played by the AP in each trade:

- AP buying: AP buys from Other Institution or Retail Investor
- AP selling: AP sells to Other Institution or Retail Investor
- Intra APs: AP trades with another AP
- Intra Others: Other Institution or Retail Investor trades with another non-AP

We see from figure 6 that APs have a role in most trading (80% of volumes), and one third of the time the AP involved is buying. The role of APs is strongest in fixed income ETFs; only 11% of trades in fixed income ETFs do not involve APs (vs. 18% in equity ETFs).

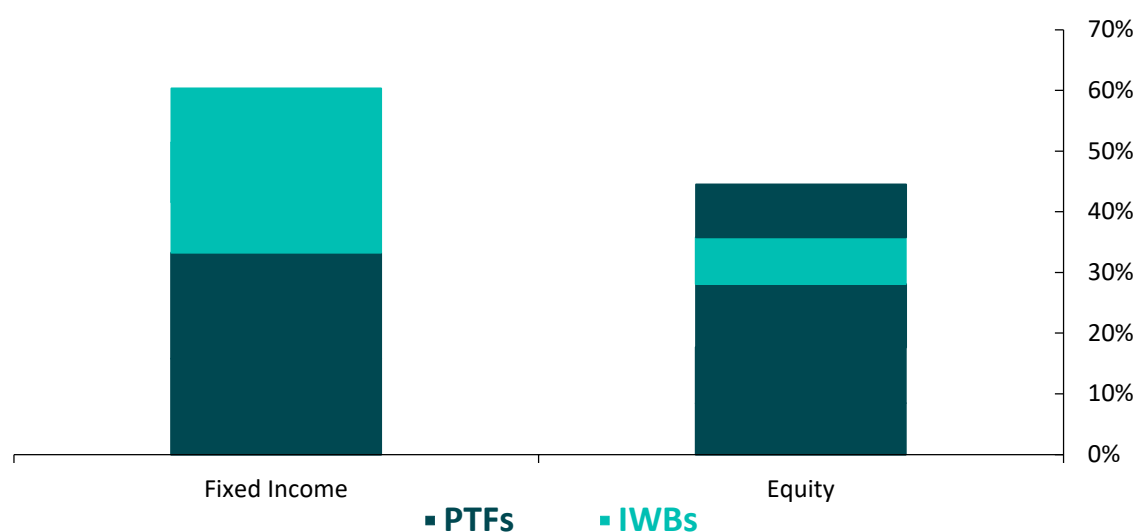
**Figure 6. Trading volumes in our ETF secondary market sample, by the role of the AP in each trade**



Source: MiFID II transaction reporting data, FCA calculations

Figure 7 shows the market share of the 5 most active participants in the secondary market. In both equity and fixed income segments, APs are the most active traders; the top 5 APs account for approximately 60% of volumes in fixed income ETFs and 45% in equity ETFs. We reported previously that in the primary markets for these ETFs, the top 5 APs accounted for 91% and 63% for equity ETFs and fixed income ETFs respectively, which means the secondary markets are slightly less concentrated. However, considering the significantly larger number of participants overall in the ETF secondary markets<sup>7</sup>, the degree of concentration is still striking.

**Figure 7. Market share of the five most active participants in our ETF secondary market sample**



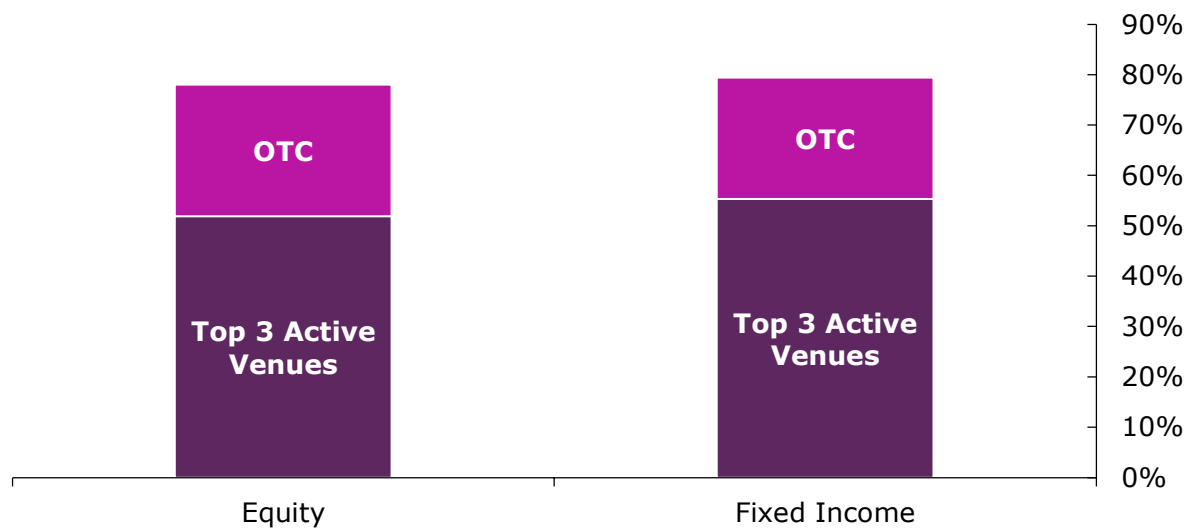
Source: MiFID II transaction reporting data, FCA calculations

<sup>7</sup> 34 APs are the only active entities in the primary market. Conversely there are thousands of participants in the secondary market.

PTFs are the most active APs both in equity and fixed income ETFs. Nevertheless, unlike the primary market, the chart shows several IWBs among the 5 most active APs and this might suggest that their business model is less reliant on the creation/redemption mechanism.

As reported in figure 8, ETF secondary market volumes are also concentrated when we look at trading venues. In equity ETFs, the three most active trading venues capture 52% of volumes, while 26% are reported as Over-The-Counter (OTC) transactions. In fixed income ETFs, the three most active trading venues capture 55% of volumes, with 24% traded OTC. Blackrock (2016) and AMF (2017) estimated around 70% of ETF trading in Europe took place in OTC markets before the end of 2016 (i.e. before the implementation of MiFID II).

**Figure 8. Market share of trading venues in our ETF secondary market sample**



Source: MiFID II transaction reporting data, FCA calculations

## 4 The role of ETFs in liquidity creation

Low liquidity can make direct exposure to an asset class quite expensive, especially when instruments trade with large notional values. In this section, we aim to shed some light on the ability of ETFs to facilitate exposure to such asset classes while controlling costs.

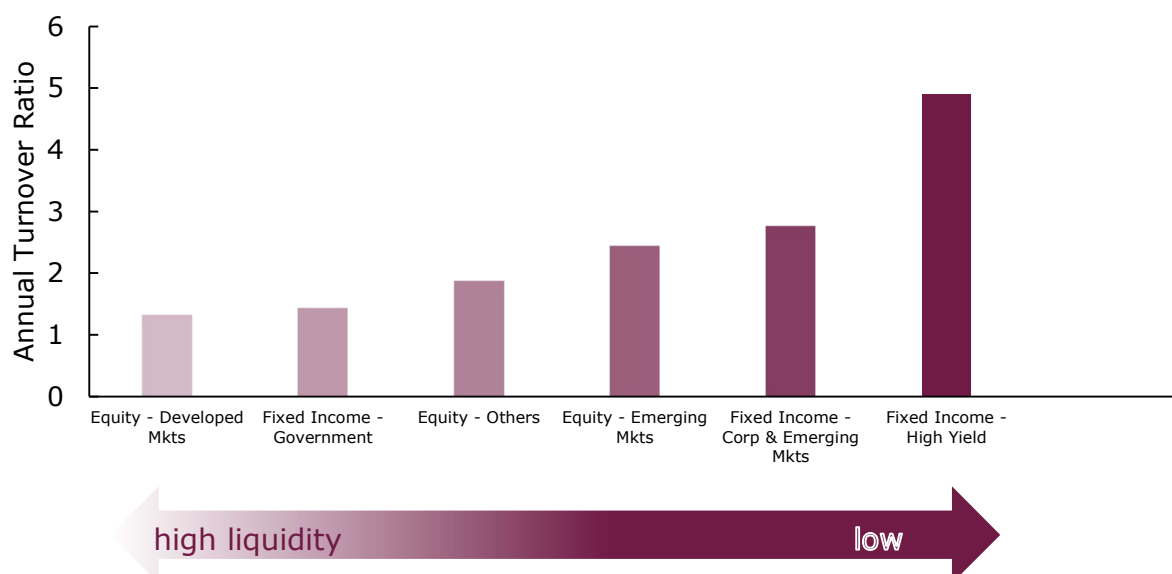
We group the ETFs in our sample into 6 categories and rank them based on liquidity in the underlying asset classes:

- Equity - Developed Markets: tracking the performance of an index composed of large, mid and small-cap developed market equities
- FI - Government: tracking the performance of an index composed of local currency bonds issued by governments of developed economies
- Equity - Others: tracking the performance of an index composed of equities excluding developed and emerging market
- Equity - EM Markets: tracking the performance of an index composed of large and mid-cap emerging market equities
- FI - Corp & EM Markets: tracking the performance of an index composed of emerging market and investment grade corporate bonds
- FI - High Yield: tracking the performance of an index composed of high yield corporate bonds (junk bonds)

The second component of the analysis is the Annual Turnover Ratio (ATR), which expresses the intensity of trading of the ETF. We define this as the ratio between the annual trading volume of the ETF and the assets under management (AUM). The higher the ratio, the more actively traded the ETF will be.

$$\text{Annual Turnover Ratio} = \frac{\text{Annual Trading Volume}}{\text{AUM}}$$

**Figure 9. Annual Turnover Ratio of ETFs in the secondary market**



Source: MiFID II transaction reporting data, FCA calculations

As shown in figure 9, ETFs with less liquid underlying are also those with a higher ATR, and hence traded the most relative to their AUM. With an annual volume of about 5 times the AUM, high yield ETFs are proportionally the most traded segment in the secondary market.

At the other end of the spectrum, the relatively least intensely traded ETFs are those with most liquid underlying, such as developed market equities and government bonds. This seems to suggest that ETFs create an alternative source of liquidity for those assets that are difficult to trade directly.

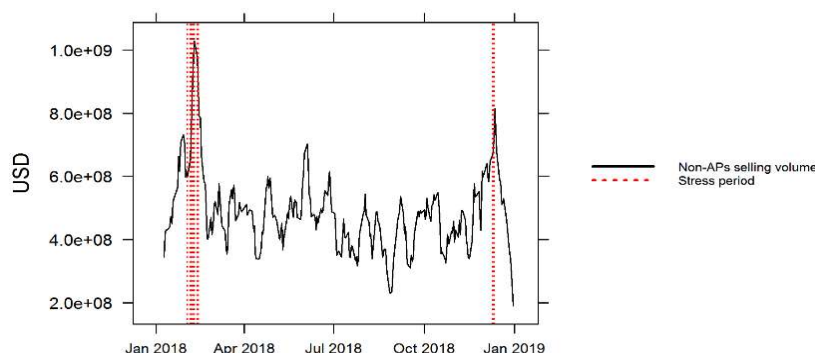
Consequently, if ETFs are the instrument of choice of market participants seeking exposure to less liquid instruments, it is crucial to ensure the ability of these markets to withstand periods of stress.

## 5 Resilience of liquidity in secondary markets during times of stress

We turn now to consider the resilience of ETFs secondary markets during times of stress. We think of resilience as the ability of the ETF secondary market to absorb shocks without these triggering redemptions in the ETF primary market, which would put further pressure on the price of the underlying securities.

As in Aquilina et al. (2020), we narrow our secondary markets focus to fixed income ETFs, as a larger liquidity mismatch and relatively higher trading volume make this the most relevant segment for considerations of resilience during times of stress. In order to define periods of stress, we look at secondary market selling volumes but exclude APs. We focus on selling volumes by non-APs because these volumes represent the actual demand for liquidity in the secondary market, generated by those investors who are unable to access the primary market.

**Figure 10. Periods of stress: non-APs selling**



Source: MiFID II transaction reporting data, FCA calculations

Periods of stress are identified by looking for the 10 5-day windows with the greatest selling volumes by non-APs. As shown in figure 10, 8 of these intervals fall in February 2018 and 2 in December 2018. These two stress periods roughly coincide with the two stress events observed in the primary market and discussed in Aquilina et al. (2020). The fact that these stress periods essentially coincide despite being generated using two independent methodologies and datasets further confirms that these are the periods we should focus on.

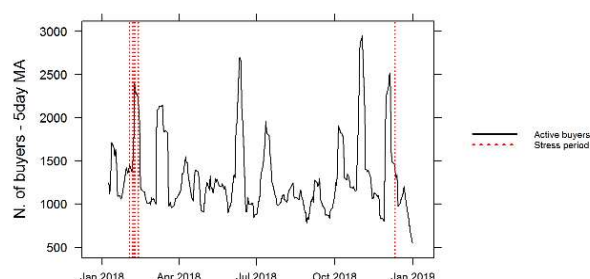
As a first step, we assess liquidity resilience in the secondary market by looking at the overall number of active buyers and at the market share of APs during the identified periods of stress. With the aim of understanding how much of a secondary market sell-off could put pressure on the price of underlying securities, we also draw a comparison between buying volumes by APs in the secondary market and the volume of primary market redemptions on each day.

Figure 11 highlights that the number of active buyers significantly increases during periods of stress. However, this is in the context of a very volatile time series and it might well be accidental. Similarly, figure 12 shows that the market share of the top-10 APs acting as a

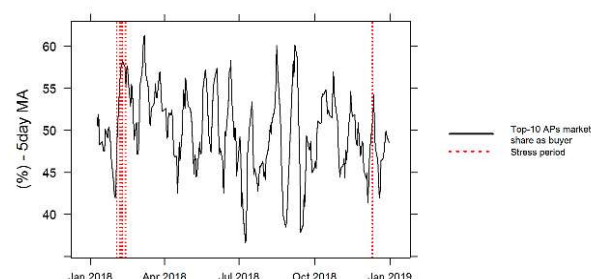


buyer significantly increases during the same stress periods. In this case, we also observe several comparable patterns throughout the timeseries.

**Figure 11. Number of active buyers on each day**



**Figure 12. Market share of the top-10 APs as buyers (% of total vols.)**

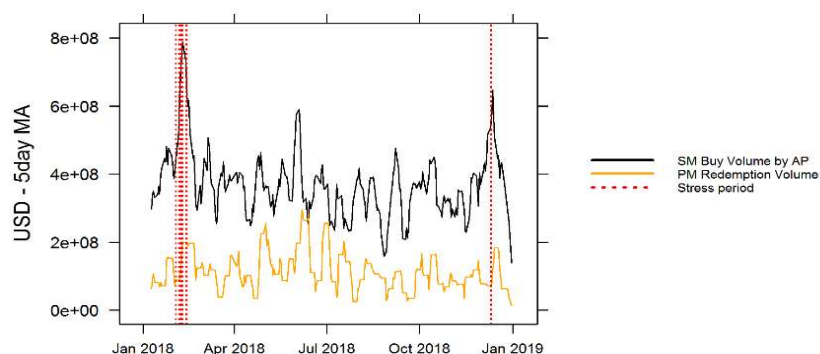


Note: values calculated as a 5-day moving average

Source: MiFID II transaction reporting data, FCA calculations

In addition to providing liquidity, the analysis shows that APs also act as a buffer between the secondary and primary market. A quick turnaround of ETF units purchased by APs on the secondary market into the primary market could put pressure on the price of the underlying securities.

**Figure 13. Buy volume by APs in secondary market and redemptions in primary market**



Note: values calculated as a 5-day moving average

Source: MiFID II transaction reporting data, firm data, FCA calculations

As figure 13 clearly shows, the overall levels of primary market redemption volumes are well below the levels of buy volumes by APs recorded in the secondary market. This holds true also during the identified periods of stress, suggesting that APs act as a buffer between the two markets. We define this as the APs' shock absorbing capacity and recognize it as critical to prevent secondary market selling pressure from driving down the price in the underlying securities through primary market redemptions during times of stress. These findings are in line with our understanding of APs' business models, where APs not only act as market maker but also manage a risk portfolio.

Conclusions arising from figure 13 are overall reassuring, even if only at high level and based on aggregate data. These findings are in line with our understanding of APs' business models, where APs not only act as market maker but also manage a risk portfolio.

We are mindful of the fact that fixed income ETFs constitutes a broad category and acknowledge that these findings do not rule out worse scenarios. Bid-ask spreads for all securities tend to widen in times of market uncertainty as market makers seek to price in risk. This looks to have been the case during the stress periods relating to the Covid-19 crisis, where wider spreads and lower liquidity may have undermined APs' ability to prevent shock transmission from secondary to primary market. Blackrock (2020) highlights that credit markets in Europe were especially stressed during this period with spreads widening by a factor of 2-3 times and trading costs of corporate bonds rising to an average of 55bps. The corresponding ETF bid-ask spreads also widened during this period and the obligations placed on market makers by trading venues may have been relaxed. However, the Blackrock report also highlights that bid-ask spreads in the five largest corporate bond ETFs by AUM averaged 24.4 basis points during this period, which indicates that APs continued to act as a buffer between primary and secondary markets and that it remained more cost-effective for investors to utilise fixed income ETFs than trade in the individual bonds.

While our available data has not allowed us to include the Covid-19 period in our study, the next section will focus on high yield ETFs, which is the asset class with the most pronounced liquidity mismatch in our sample and will allow us to further test these results.

## 6 A closer look at high yield ETFs

The first thing to emerge from our analysis is that the secondary market is more concentrated for the high yield segment. As illustrated in figure 14, the 5 most active entities account for more than 60% of trading volumes, and we also note (not shown on the chart due to confidentiality) that this market share is more evenly distributed across them compared to non-high yield (non-HY) fixed income.

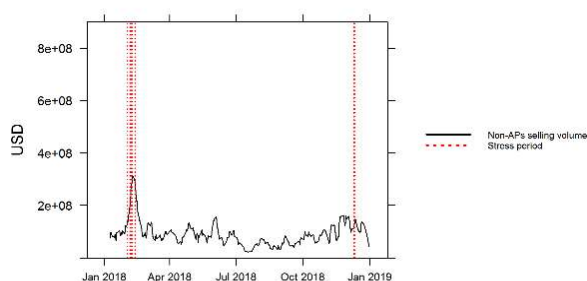
**Figure 14. Market share of the five most active entities in our ETF secondary market sample (all APs unless indicated)**



Source: MiFID II transaction reporting data, FCA calculations

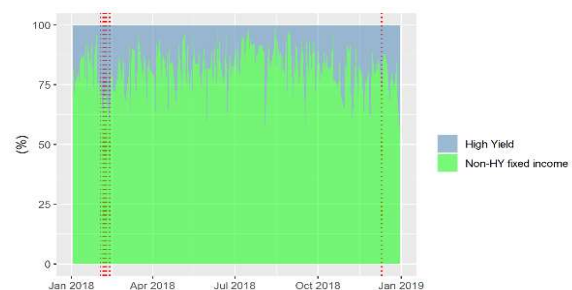
Furthermore, for the first time in the analysis a non-AP appears as one of the most active market participants. Note that this entity, whilst not an AP for any of the ETFs considered in our sample, may serve as an AP for other ETFs. This is not observable from our sample.

**Figure 15. Non-APs selling high yield ETFs**



Source: MiFID II transaction reporting data, firm data, FCA calculations

**Figure 16. Non-APs selling HY and non-HY fixed income ETFs**

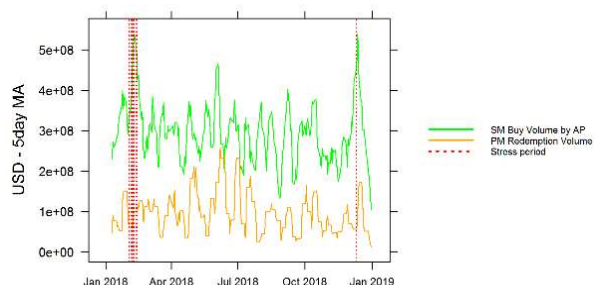


Broadly in line with what we would expect, figure 15 shows a significant spike in volumes for high yield ETFs during the February 2018 stress period. High yield ETFs account for approximately 3% of assets in our overall ETF sample and approximately 8% of the fixed

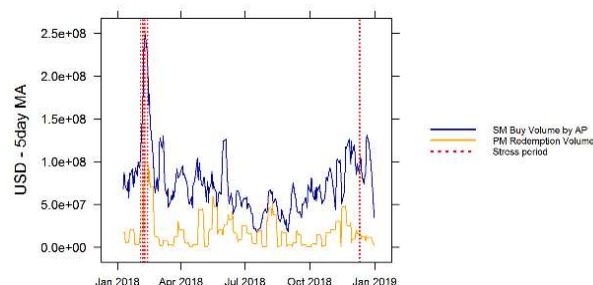
income segment. The respective figures for high yield ETF volumes are 8% and 19%. However, as illustrated in figure 16, the high yield proportion of the total fixed income ETFs sold by non-APs reaches 28% during the February 2018 stress window. This represents an important case to further assess the impact of secondary market selling pressure on primary market redemptions and downward pressure on the price of the underlying securities.

As we did for the overall population of fixed income ETFs, we plot daily volumes for ETFs purchased by APs on the secondary market against the volume of redemptions we observe in the primary market. We compare the two subgroups: high yield ETFs and non-HY fixed income ETFs.

**Figure 17. Total SM purchases and PM redemptions – Non-HY fixed income**



**Figure 18. Total SM purchases and PM redemptions –High yield**

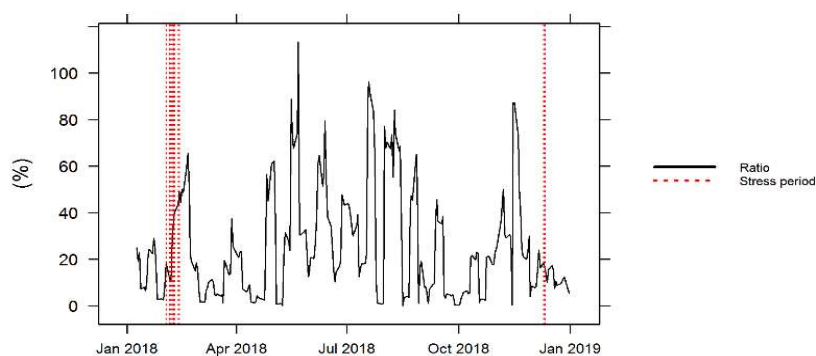


Note: values calculated as a 5-day moving average.

Source: MiFID II transaction reporting data, firm data, FCA calculations

As shown in figure 17 and figure 18, for both subgroups, APs act as a buffer between secondary and primary markets. Nevertheless, APs' shock absorbing capacity is put under greater pressure by high yield ETFs around the February stress event. This becomes clearer looking at figure 19, which shows the proportion of the units bought by APs on the secondary market that are redeemed on the same day in the primary market.

**Figure 19. Proportion of high yield ETF units bought by APs that are redeemed**



Source: MiFID II transaction reporting data, firm data, FCA calculations

Figure 19 shows a series of spikes in the primary-to-secondary market volume ratio for high yield ETFs. The first spike builds up through the February stress period to reach a peak of approximately 65%. This tells us that APs have been able to absorb at least 35% of the secondary market selling pressure in high yield ETFs, partially preventing price pressure on the underlying assets. It is worth noting that we observe other spikes<sup>8</sup> in the ratio which are not justified by periods of stress, nor apparently by anything else. Nevertheless, we consider these less insightful from the viewpoint of financial stability as these do not occur during periods characterised by exceptionally high volumes.

Overall, our results indicate that high yield ETFs become more relevant during periods of stress. Furthermore, APs shock absorbing capacity is put under greater pressure in this segment than in the rest of fixed income ETFs. While the current size of the high yield segment of the ETF sector is probably still too small<sup>9</sup> to be considered systemic, the analysis suggests that it is worth monitoring future growth and developments.

<sup>8</sup> Some of the observed spikes could be due to the one-day window over which the ratio is calculated, which would not capture primary market redemptions carried out on the following day. In such circumstances, if secondary market volumes fall to low levels these could impact the calculated ratio significantly. A relatively small number of units redeemed on a day with very low secondary market volumes could still translate into a spike in the primary-to-secondary market volumes ratio, while not causing any price pressure on the underlying securities as the nominal size is not significant. Accordingly, spikes in this ratio around the identified periods of stress (characterised by high volumes) are quite meaningful.

<sup>9</sup> High yield ETFs account for 2.8% of AUM (8.4% of fixed income ETF AUM), and 8.1% of secondary market trading volume in our sample (18.6% of fixed income secondary market volume).

## 7 Conclusion

This paper builds on previous work on ETF primary markets in which we analysed a unique dataset on creations and redemptions for a large set of European ETFs obtained through a supervisory request. Here we complement our analysis by looking at secondary markets for the same ETFs using transaction reports that market participants submit to the FCA in compliance with MiFID II regulation. By looking at the behaviour of APs in the secondary market, and how this links back to the primary market, we provide a near complete picture of ETF markets in Europe and use this to contribute a previously unavailable perspective on overall ETF market functioning during times of stress.

We find a concentrated secondary market, with few APs accounting for most of the volumes. We also document that ETFs with illiquid underlying securities trade relatively more than ETFs with liquid ones. We interpret this fact as ETFs creating an opportunity to trade exposure in otherwise illiquid markets. In addition, we find evidence that APs absorb shocks: they buy ETF units in periods of stress and redeem only approximately a third of these units in the primary market. They therefore help to buffer the transmission of shocks to the underlying securities.

However, when looking at the high yield ETF segment a less benign picture emerges: the segment is more concentrated, and APs seem to be less active in absorbing shocks.

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