

Investor Activity in EFSF/ESM secondary bond markets

This paper discusses investor and dealer behaviour in the secondary markets of EFSF and ESM bonds between 2014 and 2020.



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This study discusses investor and dealer behaviour in the secondary market bond trade data of the EFSF and ESM, two of the largest supranational bond issuers in the euro area in the last decade. The underlying data are reported trades from the ESM primary dealers between 2014 and 2020 and comprise most of the global trading in EFSF and ESM bonds.

We discuss stylised facts and trends related to investor and dealer behaviour. We illustrate the trends of increasing fund manager activity and digitalisation, and how turnover increased in the market segment of long maturities as yields decreased. We further explain the impact of small banks in the dealer network with respect to liquidity, and we illustrate the resilience of the bond markets during the COVID-19 pandemic. We use directed network graphs to visualise the net flows between the anonymised primary dealers and types and regions of investors based on aggregations of the granular data.

Keywords: Bond secondary market, investor behaviour, dealer behaviour, bond trading, bond turnover, bond liquidity, investor diversification, primary dealer, digitalisation, electronic trading platform, COVID-19 pandemic, bond market resilience

JEL codes: G12, G15, G23, G40

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July 2024

Abstract

This study discusses investor and dealer behaviour in the secondary market bond trade data of the EFSF and ESM, two of the largest supranational bond issuers in the euro area in the last decade. The underlying data are reported trades from the ESM primary dealers between 2014 and 2020 and comprise most of the global trading in EFSF and ESM bonds.

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1. INTRODUCTION

Well-functioning secondary bond markets are of significant importance, particularly to large issuers and investors. For the latter, secondary markets enable them to adjust their bond holdings independently of issuances and maturities. For issuers, they make it possible to reach investors that limit their investment scope only to bonds with liquid secondary markets, and also, because the secondary market provides them with important information about investor behaviour, information that is also relevant for the primary market (Hillebrand et al., 2021, Krebbers et al., 2023). This includes not only price levels, but also information about turnover, which may deliver granular insights into the trading activity of different investor groups.

The purpose of this study is to deliver deep insights into secondary market dynamics and investor behaviour that help issuers in their investor relations strategy and issuance planning. The proprietary granular trade dataset of EFSF and ESM bonds contains information about investor type, region, trading platform, and dealer. It also allows for a detailed analysis of investor behaviour in secondary bond markets which is unprecedented in literature. EFSF/ESM bonds are also especially interesting due to their role of providing funds for countries temporarily under funding stress.

Particularly, we investigate liquidity trends with respect to investor type, trading platform, market segment, and dealer. Therein we assess the impacts of digitalisation, the low-yield environment, and the pandemic on investor behaviour.

Our trade-by-trade study for a specific issuer complements existing literature on secondary markets:

Power (1996) reviews the important role of secondary markets for sovereign debt from a legal perspective and concludes that bondholders are more likely to enforce redemption of their bonds than banks in the case of sovereign loans, as bondholders do not depend on recurring transactions the way loan creditors do. From this perspective, secondary markets can be expected to lower risk and credit spreads. Friedman (2004) describes the development and regulation of the US fixed income securities market. Arvai and Heenan (2008) review influencing factors and requirements to successfully develop “deep and liquid” secondary sovereign markets and their benefits for public funding costs and risks.

In a seminal article, Broner et al. (2010) show the importance of secondary markets to mitigate the negative consequences of sovereign debt on credit and welfare that were suspected to arise from reputational risk and a lack of default penalties in the earlier literature. Broner et al. (2013) empirically analyse gross capital flows and conclude that investors are more likely to liquidate foreign sovereign bonds than domestic sovereign bonds, as sovereigns have a higher incentive to default on foreign claims. Broner et al. (2014) even warn of incentives for domestic investors to buy domestic sovereign rather than private debt to create a crowding-out effect. The “secondary market theory” of Broner et al. (2010) is confirmed by Brutti and Saure (2016) who highlight the market segmentation during the euro sovereign debt crisis but assume a mitigation once investors rationally reassess the improving solvency of sovereign issuers.

Galliani et al. (2014) find duration and issue sizes to be important drivers for liquidity in European fixed income markets. Bouveret et al. (2015) highlight increased risks for market liquidity due to reduced risk warehousing of market makers because of regulation and due to the trend towards electronic trading. Vanguard (2016) delivers a positive outlook on technical innovation in fixed income markets. Eisl et al. (2017) model the linkage between primary and secondary bond markets for the euro area. They find dealers to liquidate more risky and more liquid inventory positions to have risk capacity for primary market auction participation. Oprica and Weistroffer (2019) discuss

the impact of institutional investors beyond banks on market liquidity. They find money market funds, investment funds, insurance companies and pension funds to significantly contribute to liquidity, but at the cost of increased market volatility. Goldstein et al. (2019) find a close link between the primary market issue spread and secondary market liquidity. Duyvesteyn et al. (2016) find only slow adjustment of bond prices to changes in political risk.

Schwendner et al. (2019) discuss secondary market flows of EFSF and ESM bond investors around the 2016 Brexit referendum, the 2017 French presidential elections and the 2018 budget negotiations between the new Italian government and the European Commission. In a literature survey, Bessembinder et al. (2020) compare fixed income to equity market microstructure and regulation and highlight the role of dealer networks. Andries et al. (2021) find the COVID-19 crisis and lockdown measures in Q1-2020 to have a negative impact on sovereign risk as measured by increased CDS spreads. Hordahl and Shim (2020) and Gubareva (2020) observe decreased liquidity of emerging fixed income markets in the same period. Guo and Zhang (2020) discuss liquidity of Australian sovereign bonds.

Based on the literature, we identify a research gap concerning the role of specific investor types, the role of dealers, and product as well as trade specific factors for secondary market liquidity. Thanks to our access to all reported trades in the EFSF and ESM secondary market trade database (Chapter 2), we are in a unique position to fill this gap and describe stylised facts in a large and representative market of a supranational issuer.

Understanding secondary bond markets relies to a large extent on the analysis of market activities from specific types of investors. This, and particularly the increasing role of fund managers is discussed in Chapter 3, which describes some of the overall trends we see in the market. We find statistical evidence that fund managers have become the most important market participants in large risk-bearing trades, i.e. large trades or trades with a long time to maturity. A global trend that is not restricted only to capital markets is digital transformation. We show evidence that this trend is also transforming the secondary bond market due to emerging electronic trading platforms, and we identify investor types with dissimilar paces of transformation.

The dominating overall trend in global bond markets until around 2020 had been the declining interest rates that even crossed into negative territory for the first time in history. A natural reaction of many investors was the “flight” to longer maturities, where yields still remained at moderate levels. In Chapter 4 we investigate to what extent this trend transformed the market segment of long maturities, not only looking at trading volumes but also diversification aspects. Another relevant factor of secondary market liquidity is the primary dealer network providing the distribution channels for bonds. Aside from global banks that are involved in most of the secondary market trading, the role of local banks is less obvious. We show the significant contribution of these banks to a liquid secondary market.

Finally, we focus on resilience in distressed times. We evaluate the functioning of the secondary market during the first impact wave of the COVID-19 pandemic in Europe in Q1 2020 in Chapter 5, particularly looking at investor type specific and regional dynamics and also distinguishing between different maturities.

2. DATASET

The dataset used in this study consists of more than 300,000 individual secondary market trades involving EFSF and ESM bonds, which have been reported by the EFSF/ESM group of banks (Market Group) from 2014 to 2020 on a monthly basis. The Market Group consisted in this period of approximately 40 banks that acted as primary dealers and represented a large majority of the turnover volume traded by investors globally in the secondary market.

Monthly reporting of trades is a mandatory requirement to obtain the right to participate in the primary dealership for EFSF and ESM bonds. Banks willing to take part in the Market Group and qualify as candidates for primary dealership in syndicated bond transactions are therefore required to report individual trades as specified by the European harmonised reporting standard. Each reported trade includes a date of the trade, security traded, type of transaction, nominal value, counterparty type, counterparty's country and trading system. Furthermore, additional complementary information is attached to individual trades, such as time until maturity of the traded security.

There are no comparable alternate sources of information available on the secondary market trading to verify the reported trades. The data collection team is therefore carefully considering the reported information and validating any potentially incorrectly reported trades during a subsequent reconciliation process with the reporting banks to ensure high quality of the dataset. One such example are transactions executed within the framework of central banks' monetary policy, which should not be reported as specified in European Commission (2021). Trades from the relevant ECB's quantitative easing programmes (PSPP, PEPP) are therefore excluded from the reported trades. A database comprising all the reported trades is maintained, where additional analysis techniques are developed and applied retroactively to continuously improve the quality of the data.

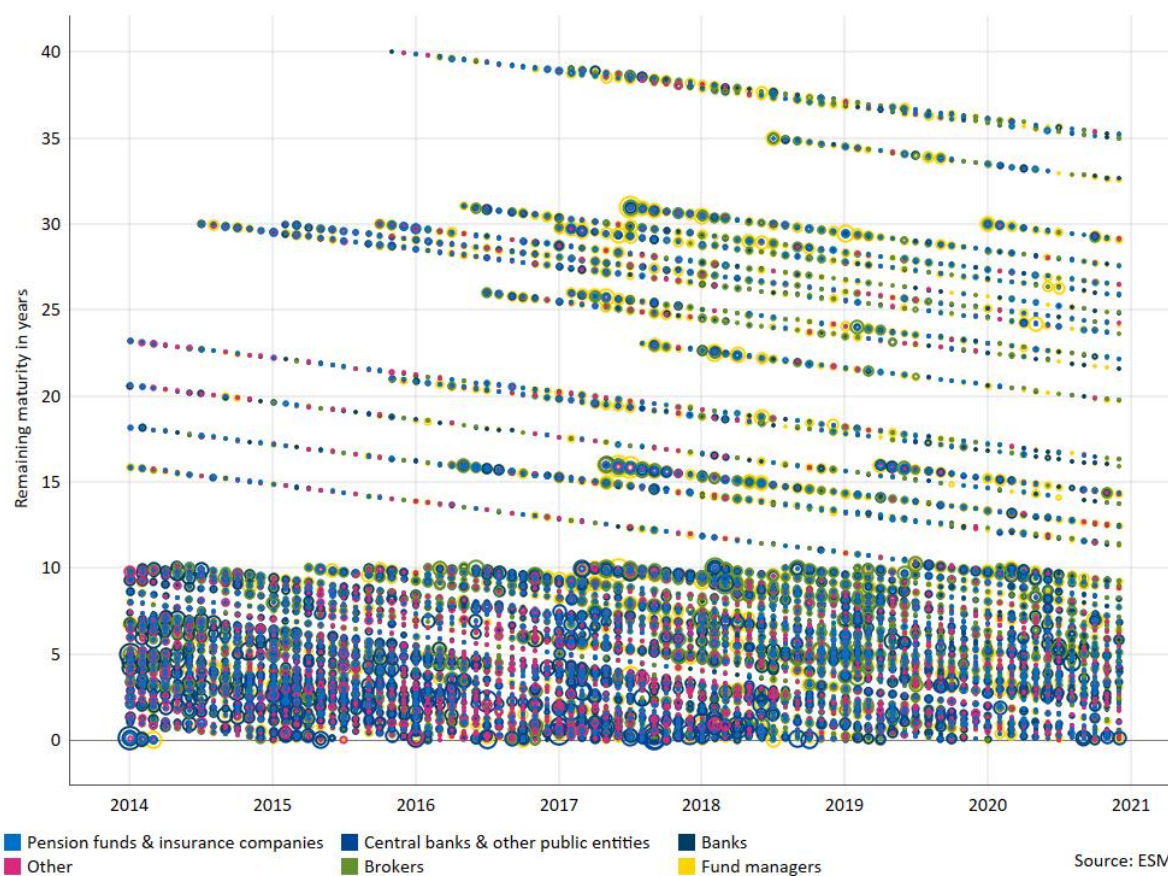
We obtained the market price data in this study from Bloomberg.

3. MAJOR TRENDS AND INVESTOR PREFERENCES

In this chapter we look at the long-term trends in secondary market trading from 2014 to 2020. Specifically, we look at the trading dynamics of the different investor types and assess their product preferences.

3.1. PREFERENCES FOR MATURITIES

Figure 1: Monthly turnover per bond maturity and investor type from 2014 to 2020.

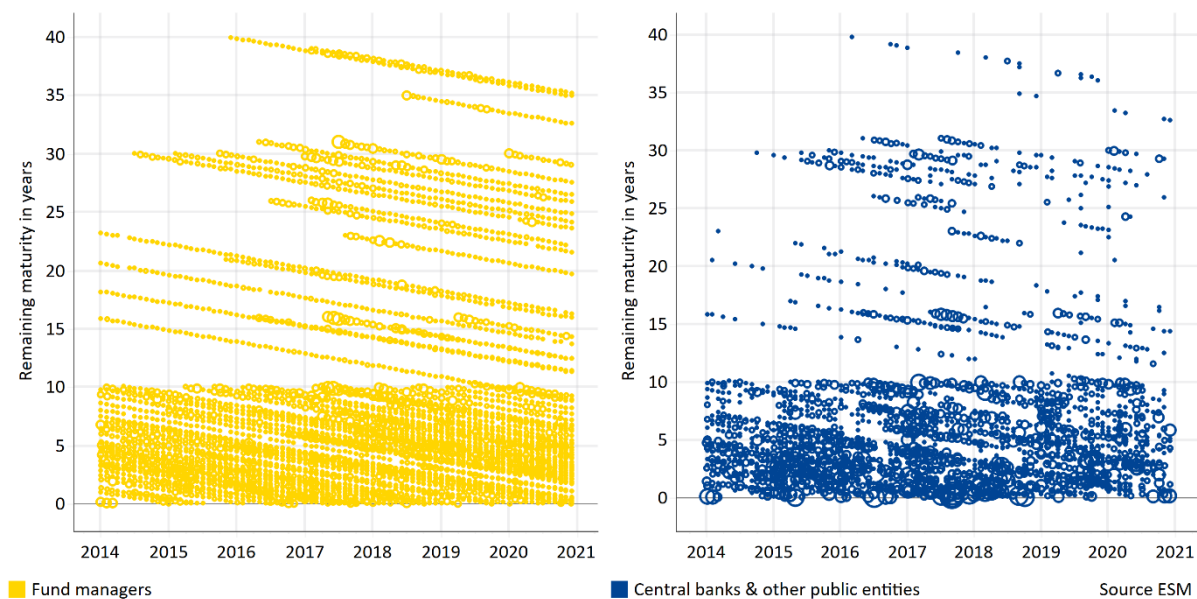


EFSF and ESM bonds secondary market.

Figure 1 shows the secondary market turnover of EFSF and ESM bonds for each investor type aggregated by month. The y-axis denotes the remaining maturity in years, which is steadily decreasing over time for each bond until its expiry. Each inclined sequence of points therefore represents trades in one specific bond. For every month, the turnover of a bond per investor type is shown as a coloured circle which is logarithmically sized in relation to the turnover volume.

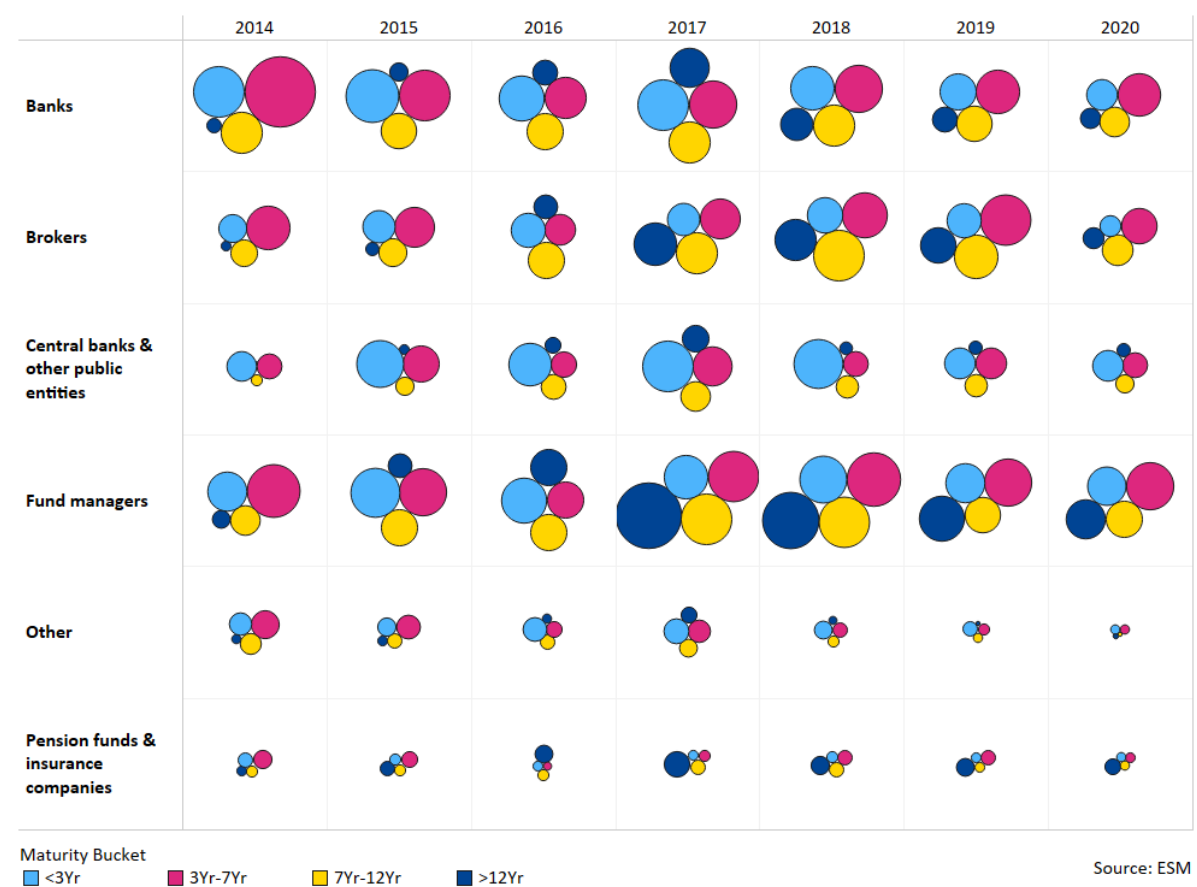
First of all, we see the maturity profile of EFSF and ESM bonds reflected in the turnover volumes, particularly the fact that most bonds have maturities below 10 years. Furthermore, we see different trading behaviours of the investor types: while central banks and other public entities are mainly active in the maturities below 10 years, we see that fund managers are trading across all maturities. We can observe these preferences also in Figure 2, where we display the turnover data from Figure 1 individually for fund managers and central banks and other public entities.

Figure 2: Monthly turnover per bond maturity for fund managers and central banks and other public entities from 2014 to 2020.



EFSF and ESM bonds secondary market.

Figure 3: Annual turnover volume per investor type and maturity bucket from 2014 to 2020.

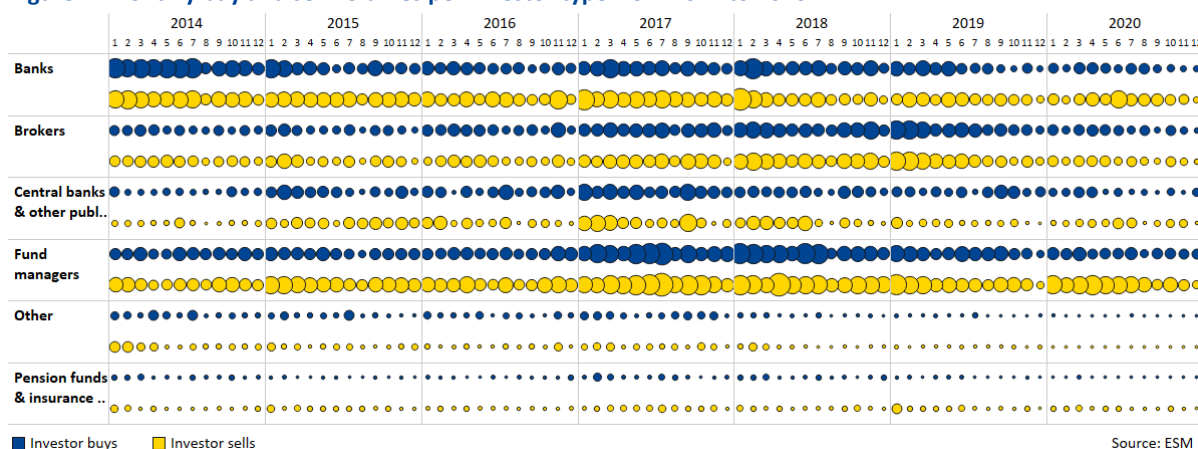


EFSF and ESM bonds secondary market.

In Figure 3 we take a closer look into the maturity preferences of different investor types. The chart shows the annual EFSF and ESM bonds turnover volume in the secondary market since 2014 per maturity bucket for different investor type categories. We observe a surge in total turnover from 2017 due to the large increase in primary market issuances of EFSF and ESM bonds. Central banks and other public entities (like sovereign wealth funds) are among the most active investors in short- and medium-term bonds across all years. Fund managers are active in the longest maturities and have become the dominating investor type in the longest maturities since 2017. Pension funds and insurance companies also prefer the long maturities; however, their secondary market activity is relatively small. Banks are especially active in the maturity bucket from 3 to 7 years, whereas brokers cover all maturity buckets with a fluctuating distribution across maturity buckets through the years.

3.2. TRADING ACTIVITY DYNAMICS

Figure 4: Monthly buy and sell volumes per investor type from 2014 to 2020.



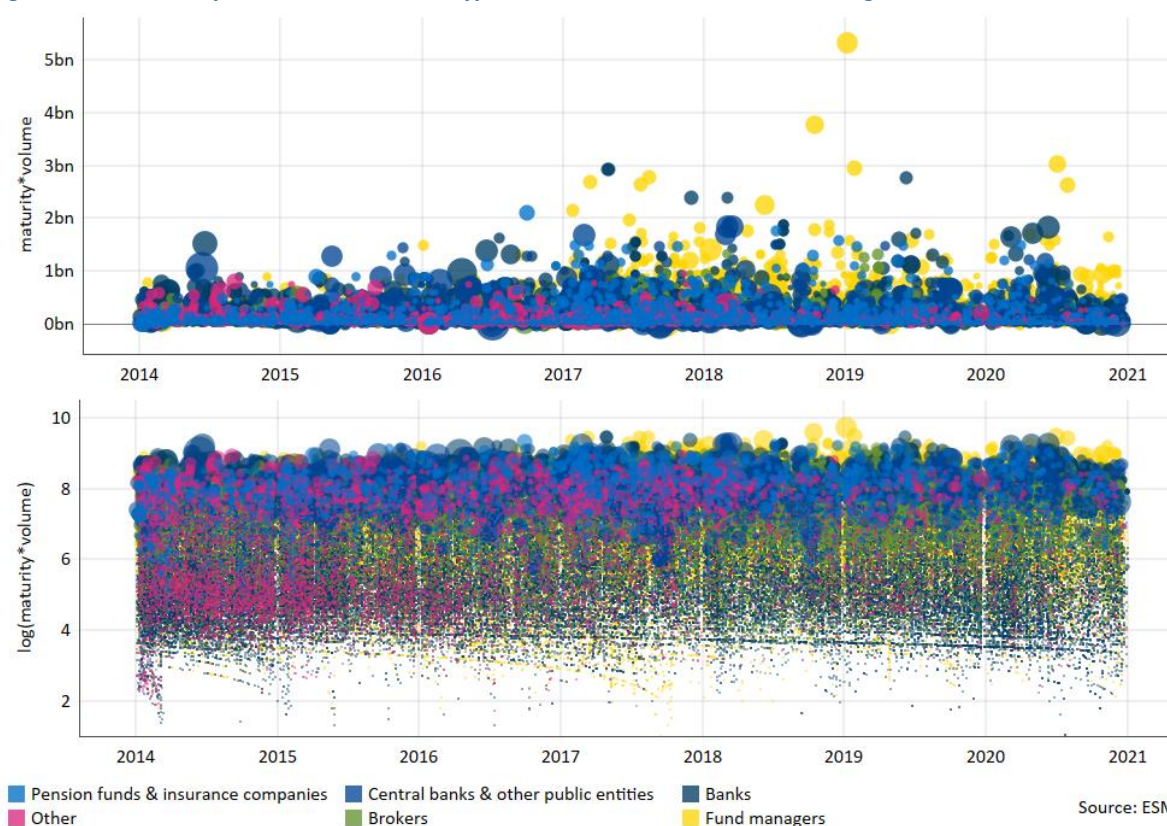
EFSF and ESM bonds secondary market.

For each investor type category, Figure 4 shows the aggregated volume of secondary market buying and selling of EFSF and ESM bonds on a monthly basis from 2014 to 2020. The surge in secondary market activity across all investor types at the beginning of 2017 is confirmed once again by this view. Alongside primary market investment flows, we observe a surge in secondary market activity at the beginning of each calendar year and a slowdown during the summer. Beyond this annual seasonality, we do not observe more specific cycles. In the cross-section of investor types, buying and selling activities show varying patterns: the buying and selling lag structure of banks at the beginning of 2017 seems to be inversely mirrored by fund managers, which could reflect a different motivation to trade. Central banks and other public entities do not show a lag pattern between buying and selling activities, but instead display steady buying and eventually selling. Brokers match buy and sell orders and therefore show a balanced pattern.

3.3. RISK APPETITE

In Figure 5, we assess the interest rate risk of each trade and discriminate between investor types with a colour code. The interest rate risk of a trade is assessed by the product of time to maturity and its volume which is roughly proportional to an aggregable risk measure such as DV01.

Figure 5: Market risk per trade and investor type from 2014 to 2020 in linear and logarithmic scales.



EFSF and ESM bonds secondary market.

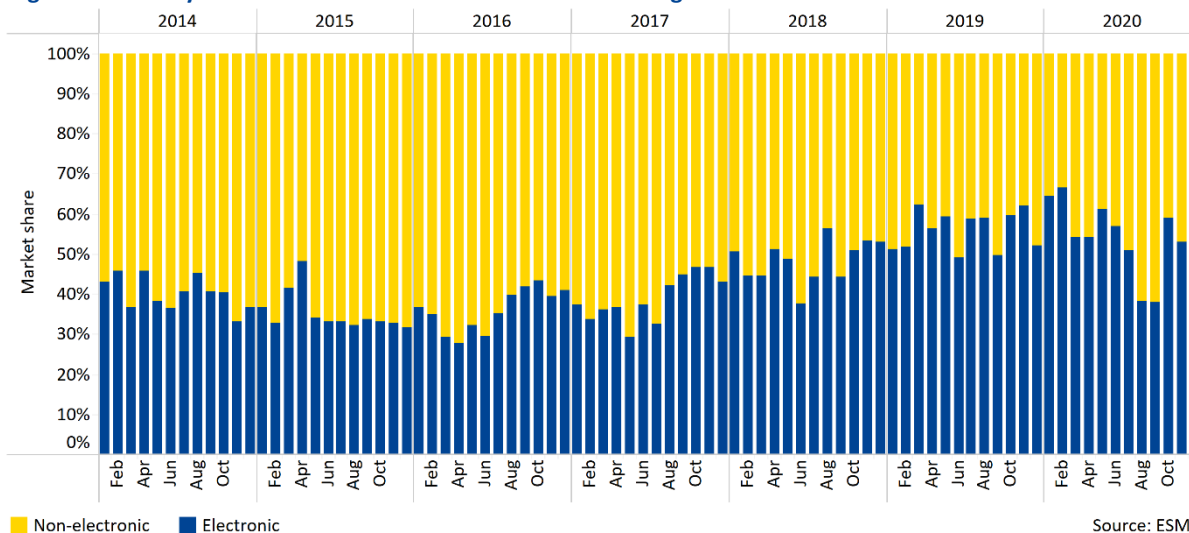
This risk proxy is plotted for each trade over time. The upper graph shows the risk on a linear scale and the lower graph shows it on a logarithmic scale to increase the visibility of small trades. Furthermore, every trade is coloured by the investor type and sized in relation to the turnover volume. Before 2017, most duration risk was traded by central banks and other public entities with very large volumes in low maturities. After 2017, the high-duration trades come from fund managers by medium to large volumes in long maturities. Moreover, for a category denoted as “Other” which includes also retail and other corporates there is a decreasing trend in trades since 2018. In fact, the shift from banks to fund managers in the large risk-bearing trades is significant (see Appendix A).

3.4. ELECTRONIFICATION

An obvious fact is that digital transformation and innovation are changing every part of the economy in all industry branches. In secondary bond markets, this is particularly reflected in how trading is done: apart from the traditional way of executing a deal per voice trading, there are several different electronic trading platforms that automatically match buyers and sellers. In the subsequent analysis, we look at the market share of electronic trading platforms as a measure for the digital progress of investors in their secondary market activities.

The percentage of electronic against non-electronic trading in the secondary market is shown for EFSF and ESM bonds in Figure 6.

Figure 6: Monthly share of non-electronic and electronic trading from 2014 to 2020.

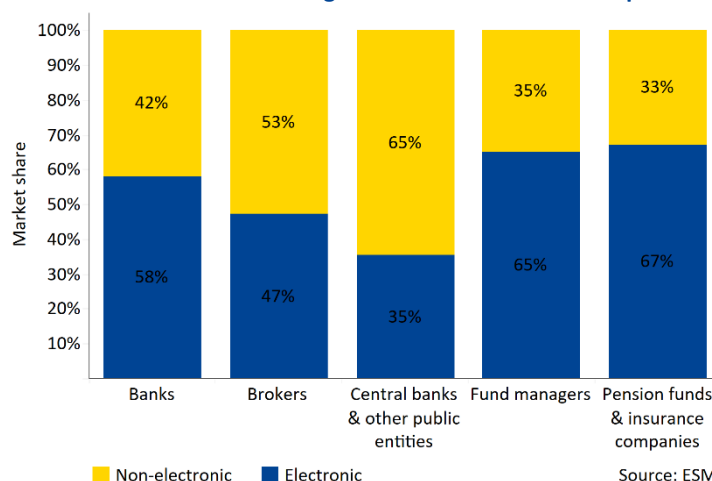


EFSF and ESM bonds secondary market.

The trend is clear: the share of electronic trading has been increasing since 2016. The significance of this trend is shown in Appendix B. A closer look at Figure 6 shows that this trend was slightly interrupted during the pandemic.

That said, there are substantial differences in the trading technologies used by different investor types, both in terms of level of electronification and rate of adoption. We observe these differences in Figure 7 which shows market shares of electronic and non-electronic trading for different investor types in the EFSF and ESM bonds secondary market between 2019 and 2020. The same trend is seen for the period 2014-2020 but is less pronounced with a smaller electronic share overall.

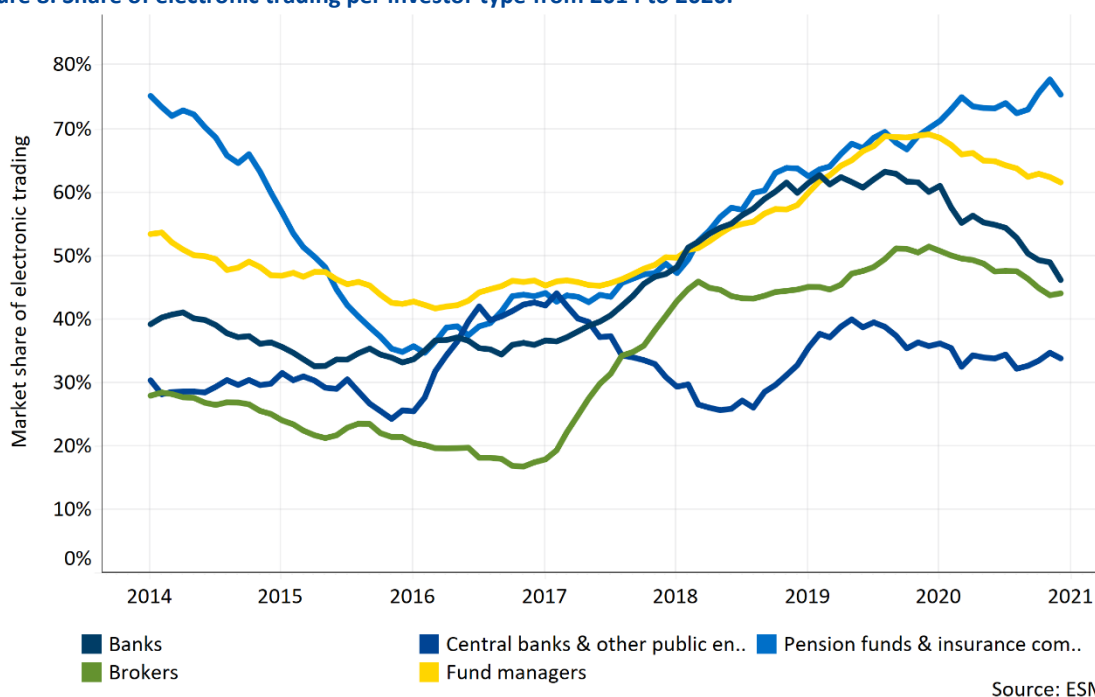
Figure 7: Share of non-electronic and electronic trading in between 2019 and 2020 per investor type.



EFSF and ESM bonds secondary market.

Asset managers as well as pension funds and insurance companies execute about two-third of their trades on electronic platforms, while the same share is only one-third for central banks and other public entities. Banks and brokers have electronic trading shares in-between, with 58% and 47% respectively.

Figure 8: Share of electronic trading per investor type from 2014 to 2020.



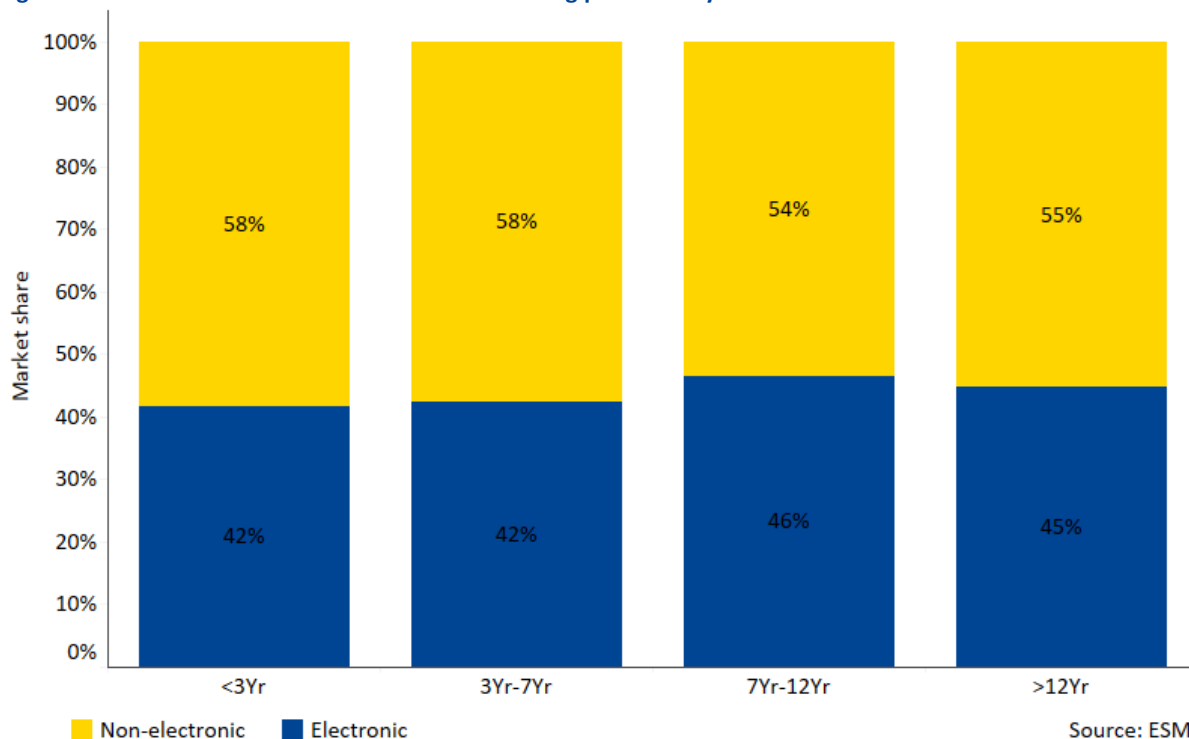
EFSF and ESM bonds secondary market.

We can also observe interesting trends when analysing the full period under observation. In Figure 8, the share of electronic trading since 2014 per investor type is plotted as a symmetric moving average of the current and the six preceding and following months. The upward trend of electronic trading is obvious for all investor types except for central banks and other public entities.

The different investor types have different business models, hence they generally act differently on the markets, so it is worth evaluating whether the observed differences in the electronification level of central banks and other public entities is a direct investor type specific characteristic, or if this is just an indirect consequence of different market activities, e.g. preferred trading of long or short maturities, or predominant trading in small or large “tickets”.

Interestingly, the electronic trading shares do not differ substantially across maturities, as can be seen in Figure 9.

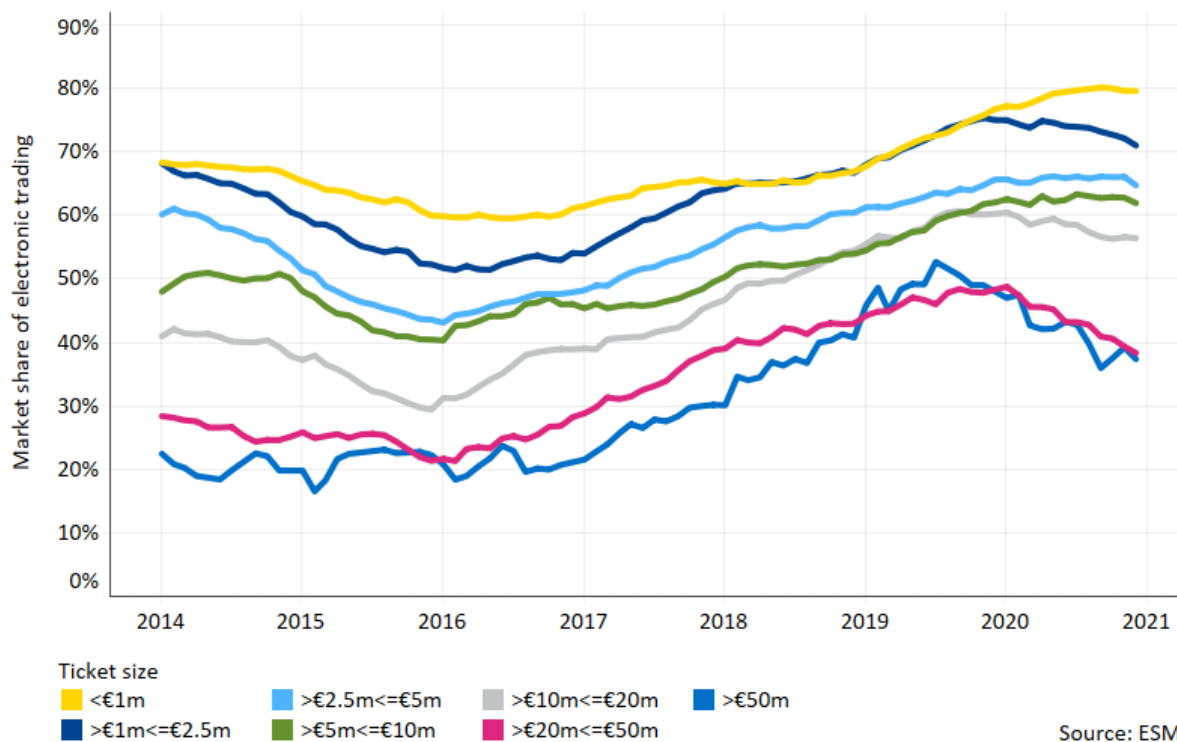
Figure 9: Share of non-electronic and electronic trading per maturity bucket between 2014 and 2020.



EFSF and ESM bonds secondary market.

On the other hand, the trade size is relevant when it comes to electronic trading (see Figure 10), where we plot the same moving average as in Figure 8, yet for different ticket size categories.

Figure 10: Share of electronic trading per ticket size category by month from 2014 to 2020 (moving average applied).

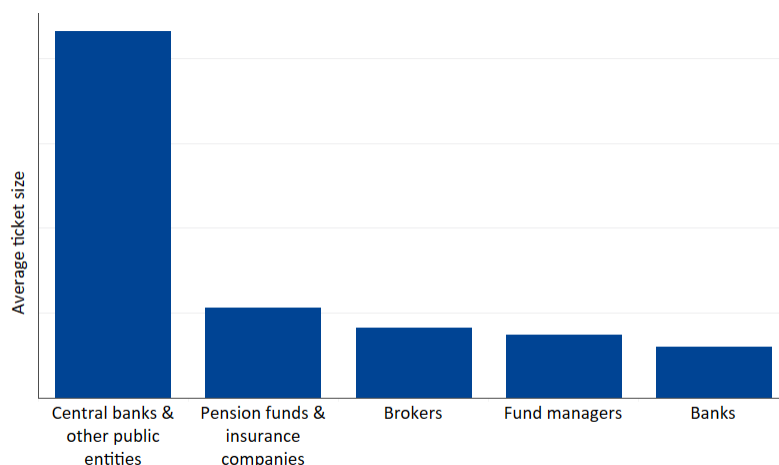


EFSF and ESM bonds secondary market.

The pattern is clear: the larger the trade size, the smaller the share of electronic trading. This can be explained by the fact that there are far more small trades than large ones executed and hence a trade matching is more easily and quickly done for small trades, while large trades more often need a brokering intermediary.

This might be an explanation for the smaller electronic trading share of central banks: central banks and other public entities on average trade larger sizes than other investor types (see Figure 11).

Figure 11: Average trade ticket size per investor type between 2014 and 2020.

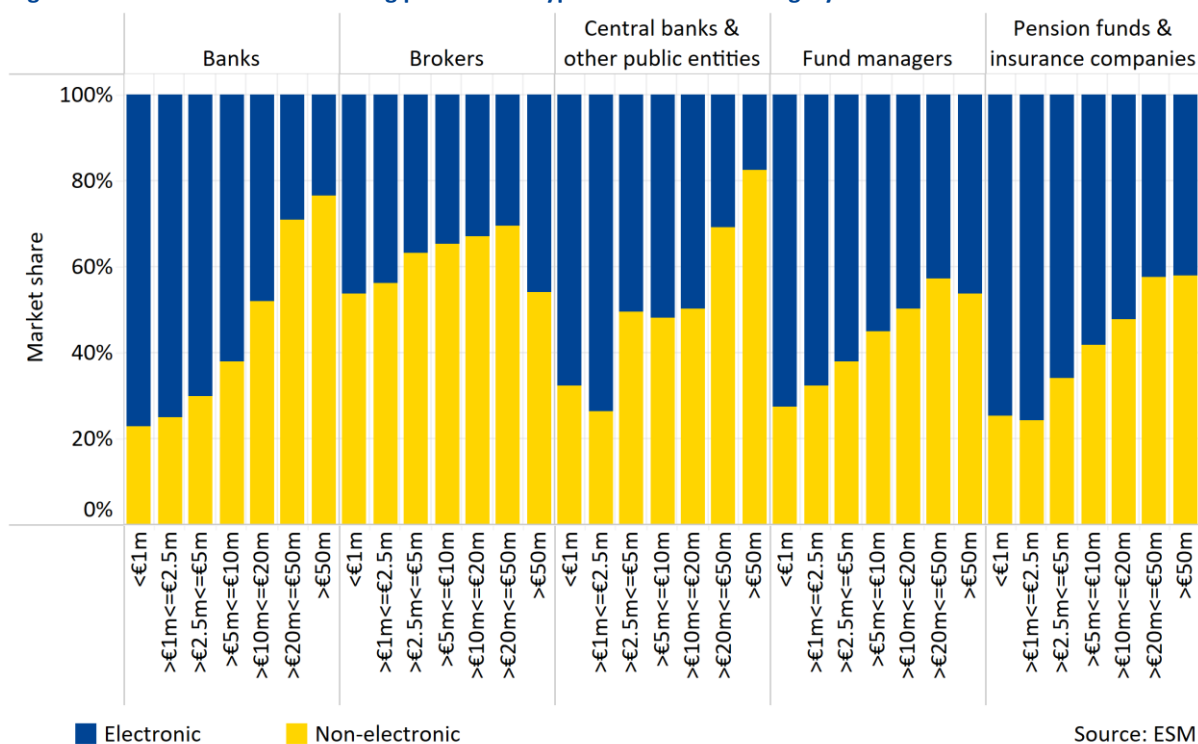


Source: ESM

EFSF and ESM bonds secondary market.

On the other hand, even the trading in large tickets (>€50 million) shows an increasing trend in electronic trading in Figure 10, which is not the case for central banks and other public entities (see Figure 8). Therefore, a large average ticket size does not fully explain the low share of electronic trading of central banks.

Figure 12: Share of electronic trading per investor type and ticket size category between 2014 and 2020.



Source: ESM

EFSF and ESM bonds secondary market.

Indeed, not only is the share of large trades higher than for other counterparties, also the electronic share in the >€50 million ticket size bucket is far lower for central banks than that of other investor types (see Figure 12).

We conclude that central banks and other public entities use electronic trading platforms to a far lesser extent than other investor types, but they also show no trend towards further electronification. This can only partially be explained by their predominant trading of large sizes which are more often traded non-electronically. There seems to be a lower motivation among public institutions to change trading channels than for private sector investors.

4. INVESTOR BASE DIVERSIFICATION AND LIQUIDITY

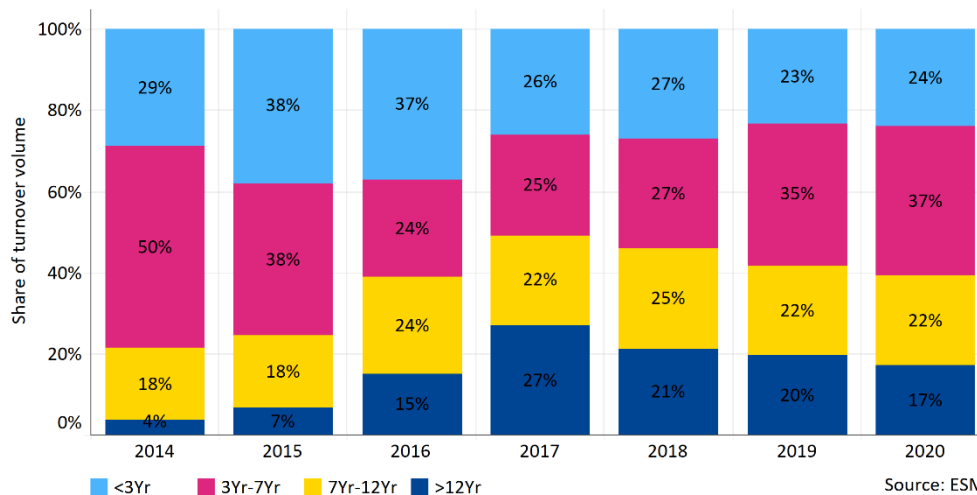
Investor base diversification is a main objective of investor relations activities, as a broader investor base is expected to improve capital market access for the issuer and improve bond market liquidity. In this chapter, we investigate how investor diversification has evolved, and to what extent it is impacted by the size of the primary dealer group.

4.1. INVESTOR DIVERSIFICATION IN LONG MATURITIES

In the period from 2014 to 2017, decreasing interest rates strongly affected the market structure with respect to bond tenors (time to maturity): low interest rates close to, or even below zero in the short end (short maturities) made absolute value investments unprofitable and hence incentivised investors of different types to increasingly engage in longer maturities. At the same time, even bonds with long tenors became cheaper for issuers, who then issued more bonds in the long end to reduce the refinancing risk.

We can find this development reflected in the increasing turnover volume share of the long maturities from 2014 until 2017 (see Figure 13).

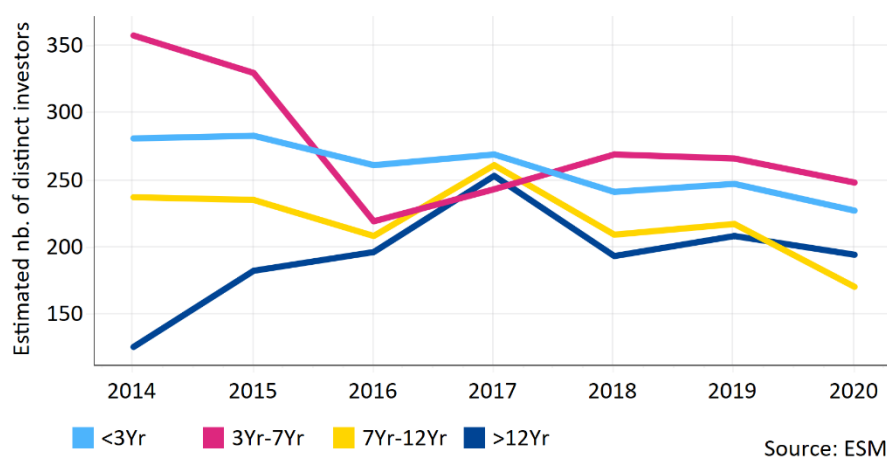
Figure 13: Annual share of secondary market turnover per maturity bucket.



EFSF and ESM bonds secondary market.

The volume share alone does not indicate that the long maturities market segment has left its niche status. It is also a broader and more diverse global investor base that has been reached. Consequently, the number of different investors trading long maturities in the secondary market more than doubled until 2017, as shown in Figure 14, whereas fewer investors traded maturities below 7 years. We estimated the annual number of distinct investors by counting distinct combinations of investor type, country, and trading system for the reported trades in a single year.

Figure 14: Estimated number of distinct investors per maturity bucket from 2014 to 2020.



EFSF and ESM bonds secondary market.

To further quantify investor diversity in the secondary market, we use the Herfindahl Index (or Herfindahl-Hirschman Index, HHI). For any market, HHI is a measure of how much the market is

concentrated amongst the market participants. It is calculated as the squared sum over each participant's market share. Let v be the total market volume, n the number of market participants and v_i the market volume of market member i . Then the Herfindahl index is

$$HHI = s_1^2 + s_2^2 + \dots + s_n^2, \quad \text{where } s_i = \frac{v_i}{v}.$$

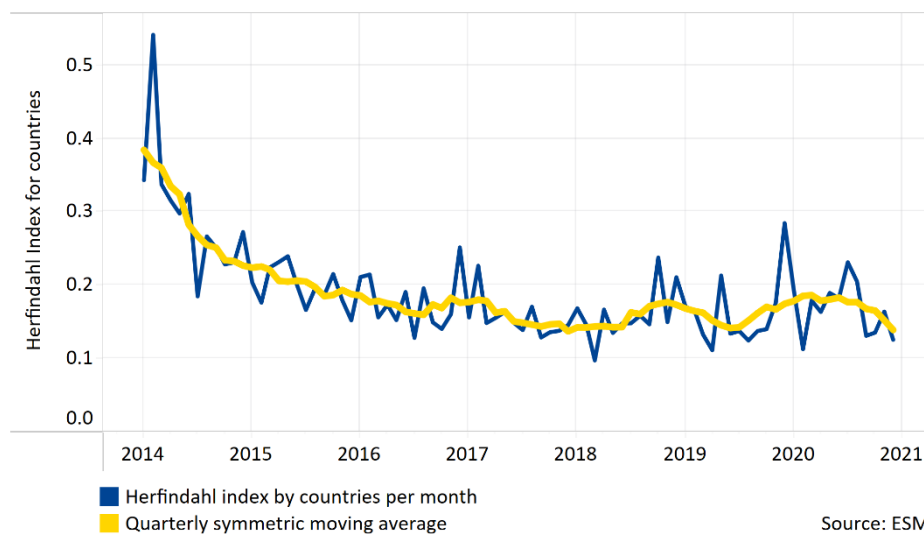
This means that $1/n \leq HHI \leq 1$ where $HHI = 1$ is a market totally concentrated on one participant and $HHI = 1/n$ implies that the market is evenly distributed such that each member has the share $1/n$.

In order to better compare the concentration in different data subsets, which all have different numbers of participants, we use a *normalised Herfindahl index*

$$HHI_N = \frac{HHI - \frac{1}{n}}{1 - \frac{1}{n}}.$$

The index is now independent from n with $0 \leq HHI_N \leq 1$, where 1 means a total concentration and 0 an even distribution.

Figure 15: Secondary market concentration (HHI) by countries per month in long maturities (>12 years).

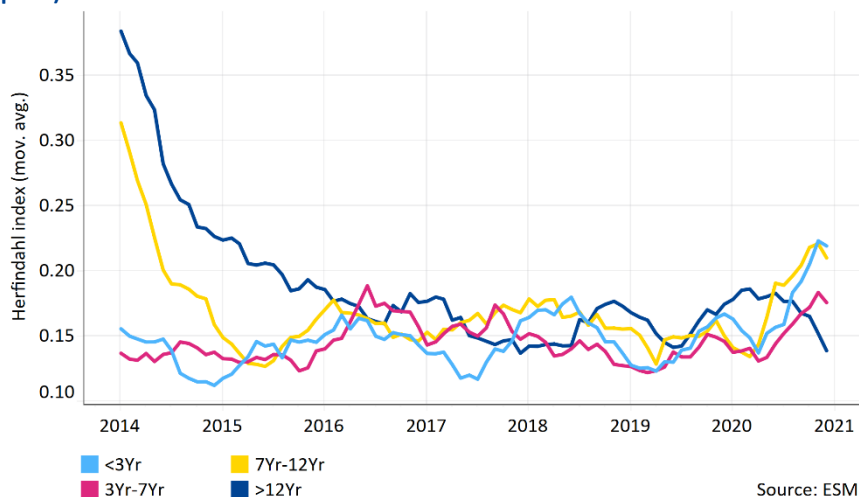


EFSF and ESM bonds secondary market.

In Figure 15, we see the Herfindahl index measuring the monthly concentration of trading turnover by countries for maturities larger than 12 years together with the corresponding symmetric moving average to illustrate the trend. Here we focus on customers (in contrast to dealers): central banks and other public entities, pension funds/insurance companies, fund managers, corporate and retail. The Herfindahl index decreases by more than 50% during the initial years from 2014 to 2016 and oscillates when averaged between 0.10 and 0.20 since then. We also see a slightly increasing concentration during the first wave of the COVID-19 pandemic in Q1-2020. The main trend, the concentration decrease between 2014 and 2017 is statistically significant, as shown in Appendix C.

Figure 16 shows the moving averages of the Herfindahl index for each maturity bucket. The Herfindahl index for long maturities (>12 years) was much higher than for the other maturity buckets in 2014 and converged to the levels of the other maturities until 2016. Since then, the long maturities bucket does no longer show characteristics of a niche market with a narrow investor base but instead has established a broad investor base with a diversity level equivalent to the maturity buckets around the highly liquid 5- and 10-year tenors.

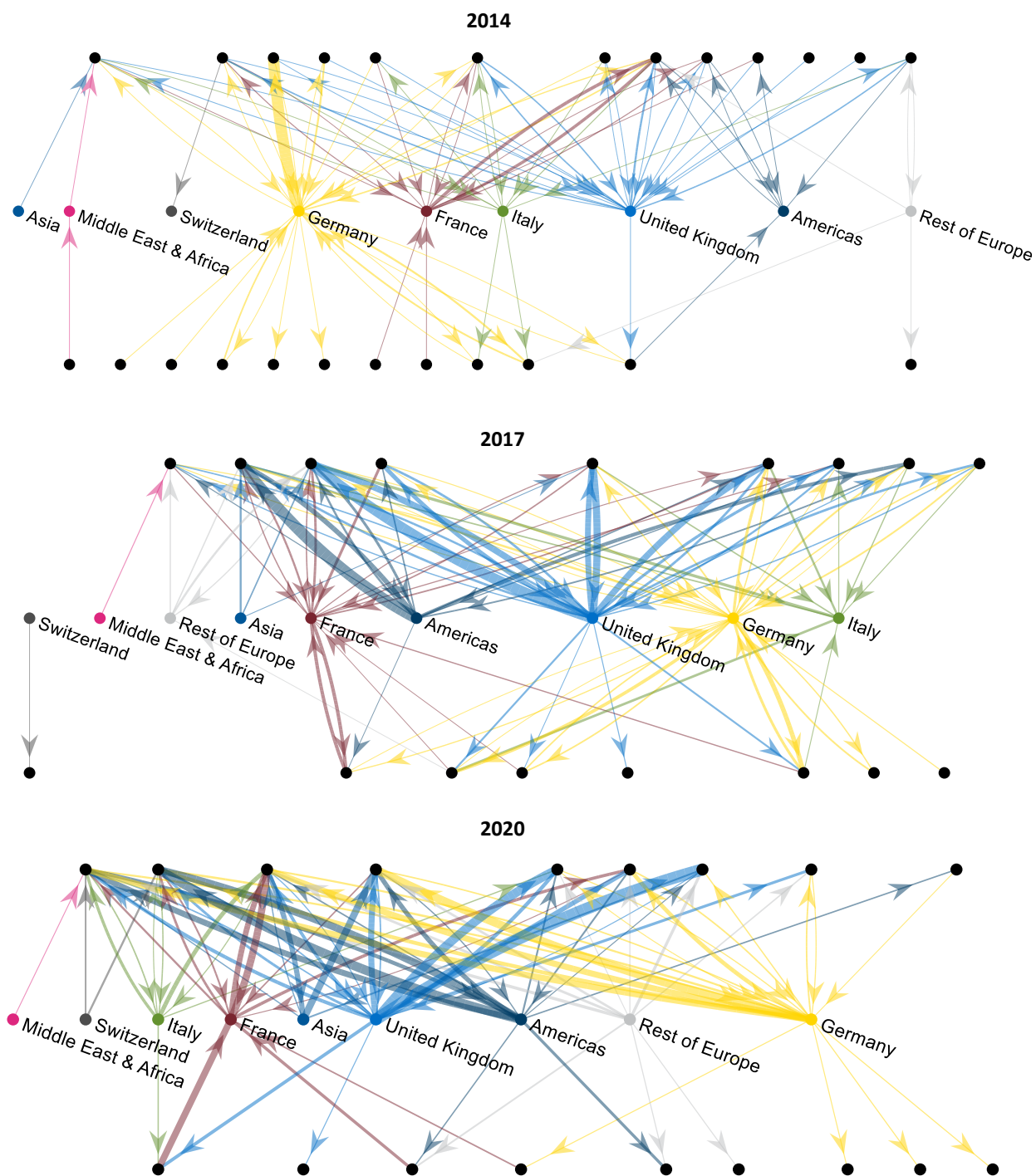
Figure 16: Secondary market concentration (HHI) by countries per maturity bucket (quarterly symmetric moving average filter applied).



EFSF and ESM bonds secondary market.

The reason for decreasing country concentration across time in the longer maturities is further illustrated by the turnover networks shown in Figure 17. Whereas secondary market trading was concentrated mostly in Germany in 2014, the trading network is spread over diverse countries in 2017 and 2020 where it covers prominently the UK, France, Asia, and the Americas, among others. The names of the individual dealers are anonymised, but consistent across time.

Figure 17: Flows above 0.25% of total annual turnover between dealers and countries/regions for all investor types without brokers/banks for EFSF/ESM bonds with maturities longer than 7 years in 2014, 2017 and 2020.



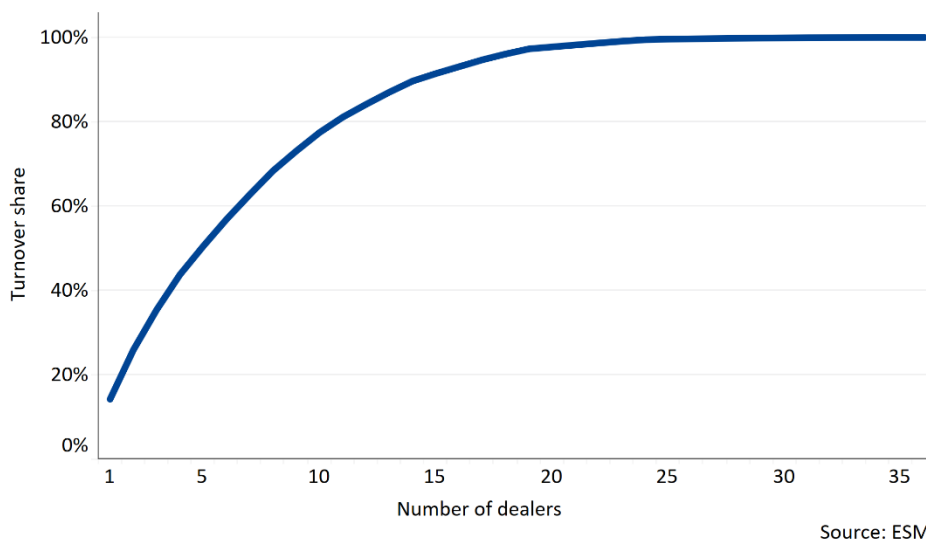
EFSF and ESM bonds secondary market.

4.2. CONTRIBUTION OF PRIMARY DEALER NETWORK TO SECONDARY MARKET LIQUIDITY

In this chapter, we characterise the primary dealers regarding their role in secondary market trading. The primary dealer group of EFSF and ESM, also called the Market Group, consists of around 40

global, regional and local banks of different sizes. The current composition of the Market Group is transparently communicated to the public on the EFSF/ESM and Deutsche Bundesbank websites⁵.

Figure 18: Turnover share per aggregated number of top primary dealers in 2020.

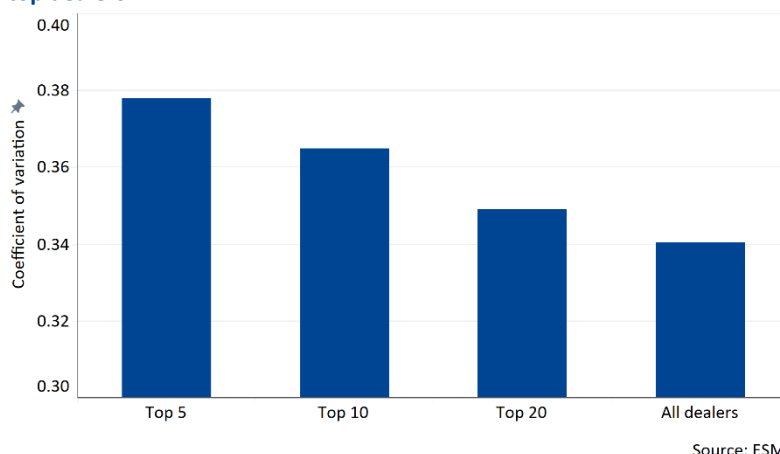


EFSF and ESM bonds secondary market.

Figure 18 shows the cumulative turnover share in the secondary market of EFSF and ESM bonds in 2020 as a function of the number of dealers in the order of their turnover contribution. Generally, trading volume mainly stems from the global and regional banks, with the top 10 dealers contributing about 80% of the volume. The 15 smaller dealers seem to contribute little to overall turnover. This motivates the question what benefit for the secondary market smaller dealers can achieve. To answer this question, Figure 19 shows the coefficient of variation (standard deviation / mean) of monthly turnover volume since 2014 for an increasing number of dealers in four buckets. The coefficient of variation decreases significantly across the dealer buckets, even from the third to the last bucket of dealers that includes the local banks. We therefore conclude that inclusion of small banks helps to stabilise secondary market liquidity.

⁵ <https://www.esm.europa.eu/investors/efsf/funding-strategy>
<https://www.esm.europa.eu/investors/esm/funding-strategy>
[Members of the ESM/EFMF Market Group | Deutsche Bundesbank](#)

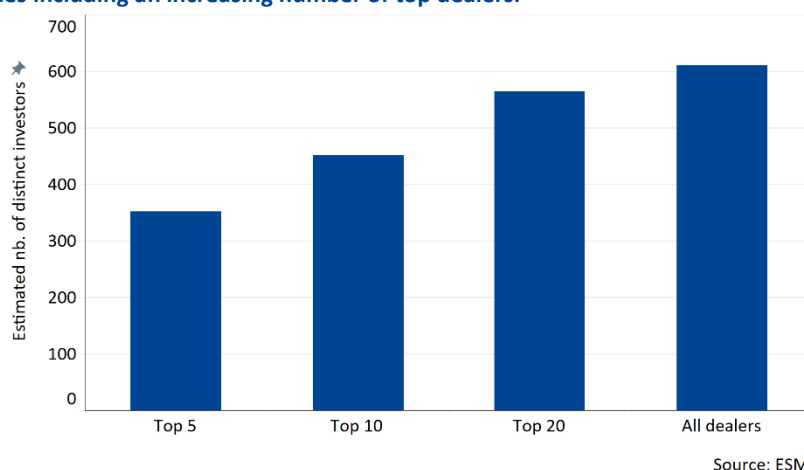
Figure 19: Coefficient of variation in monthly turnover between 2014 and 2020 per category including a different number of top dealers.



EFSF and ESM bonds secondary market.

Local banks also help to further diversify the investor base in the secondary market regarding different investor types, countries, and trading platforms: Figure 20 shows as an absolute measure of diversity, the number of combinations of investor type, country, and trading platform, that the respective sub-group of dealers was trading with in 2020. We observe that the investor diversity is increasing with the growing sub-group of dealers. Even the local banks which are not part of the top 20 banks but included in the figure for all dealers are significantly increasing the diversity in terms of trading with different investor types in different countries on different trading platforms, see also Appendix D. We conclude that even the local dealers cover a potentially important group of additional investors who might become important in unexpected future stress situations.

Figure 20: Number of investors (approximated by distinct country/investor type/trading system combinations) in 2020 by categories including an increasing number of top dealers.



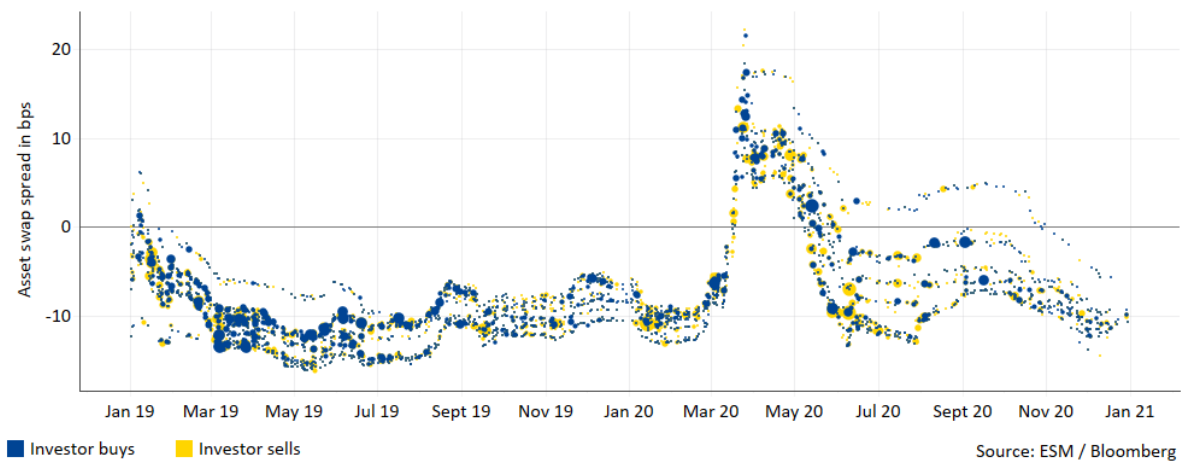
EFSF and ESM bonds secondary market.

5. RESILIENCE IN CRISIS TIMES: THE COVID-19 CASE

In this chapter, we look at the secondary market's reaction to the COVID-19 crisis for EFSF and ESM bonds. We analyse the behaviour during the first wave (March to June 2020), the summer months with lower infection rates and the beginning of the second wave in November 2020. We noted that the clearest effect can be seen for the maturities from 7 to 12 years (in the other maturity buckets, the effect is slightly less clear). We discuss the market spread levels, the traded volumes, and the reactions by different investors.

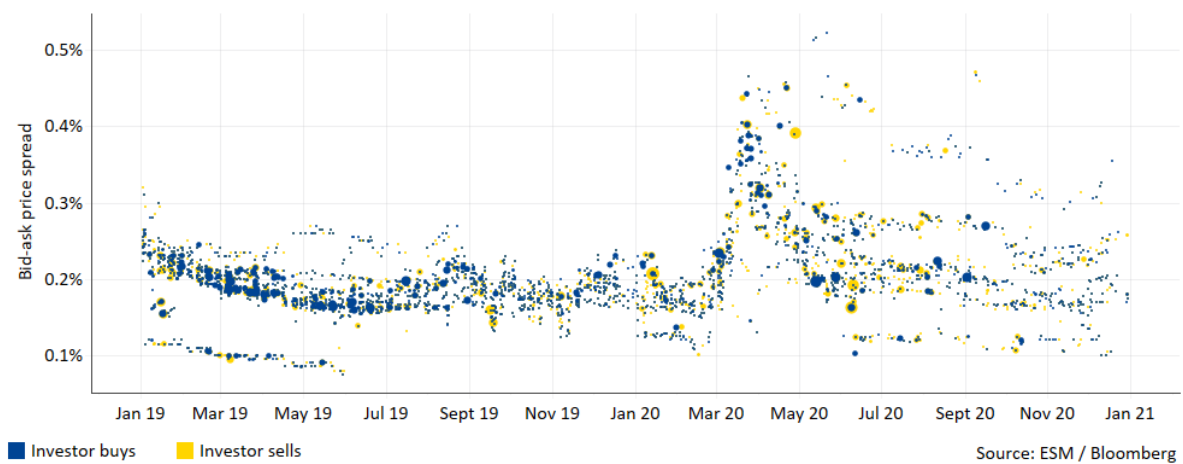
5.1. REACTION OF SPREADS VS TURNOVER VOLUME

Figure 21: Asset swap spread for all bonds maturing in 7 – 12 years.



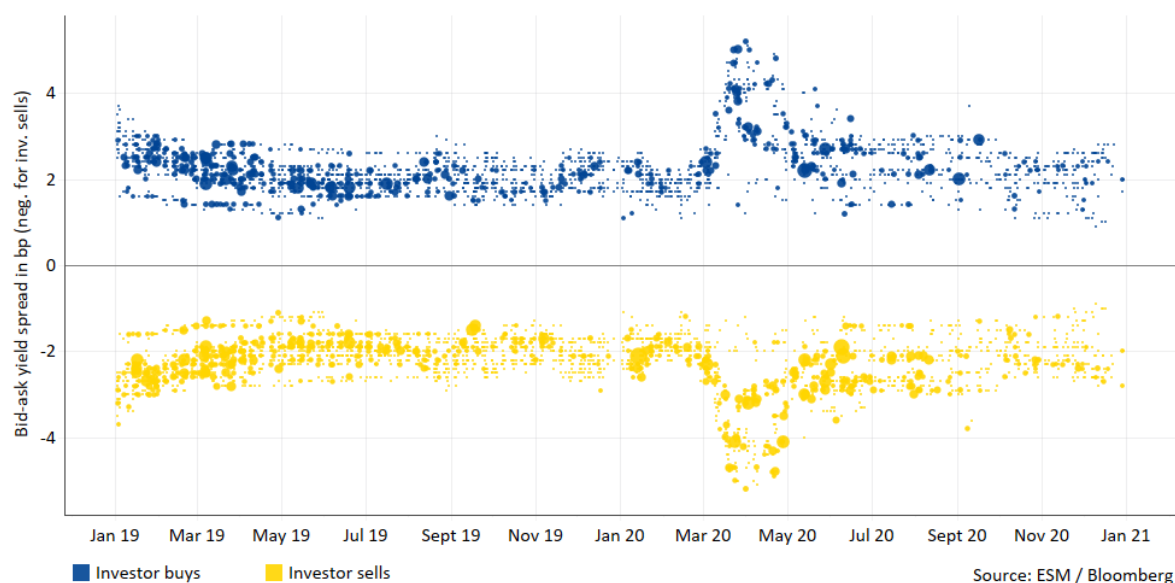
EFSF and ESM bonds secondary market.

Figure 22: Bid-ask price spread for all bonds maturing in 7 – 12 years.



EFSF and ESM bonds secondary market.

Figure 23: Bid-ask yield spread for all bonds maturing in 7 – 12 years.



EFSF and ESM bonds secondary market.

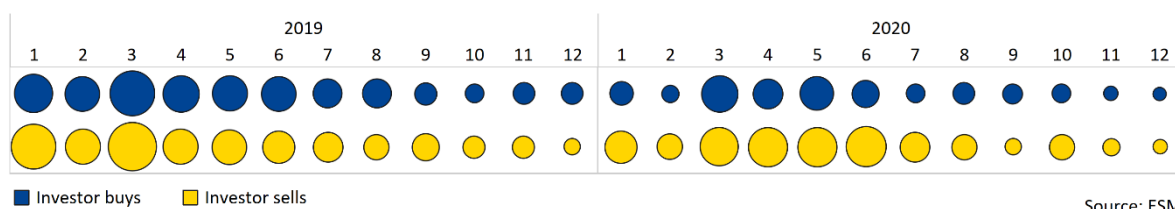
Figure 21, Figure 22 and Figure 23 show the secondary market trades of the EFSF and ESM bonds with maturities between 7 and 12 years in 2019 and 2020. Each figure shows a different spread at the point in time when the trade took place. Figure 21 depicts the asset swap spread of the specific EFSF/ESM issue, Figure 22 the bid-ask price spread and Figure 23 the bid-ask yield spread. Therefore, Figure 21 shows a credit risk premium, whereas Figure 22 and Figure 23 show a secondary market liquidity spread. Furthermore, the circles are coloured blue or yellow depending on whether the investor was buying or selling and sized in relation to volume of the trade.

First of all, we see that selling and buying was happening during all times of the pandemic, with the larger trades taking place between February and June 2020. The turnover was high during the first COVID-19 wave but stayed low in the second wave. In the second half of February and during March, all three spreads were widening strongly. The bid-ask yield spreads doubled from 2bp to 4bp, and the asset swap spread jumped from about -10bp to 10bp. These high spread levels persisted throughout April, followed by a decrease of spreads in May and stable levels in June, July, and August. The impact of the second wave was considerably weaker: in September, the asset swap spreads rose steadily by about 5bp, but fell by the same amount already October and November. Moreover, there was no widening in price or yield spreads observed.

We see, however, that after the market had calmed down during the summer, the deviation of spread levels across bonds was larger than before the crisis. The deviations in credit risk and liquidity cannot be explained by large differences in duration, as all bonds belong to the same 7-12 year maturity bucket. This seems consistent with the lower trading volumes during summer.

Figure 24 confirms the increased trading volume during the first wave of the pandemic.

Figure 24: Monthly flows for all bonds maturing in 7 – 12 years between 2019 and 2020.

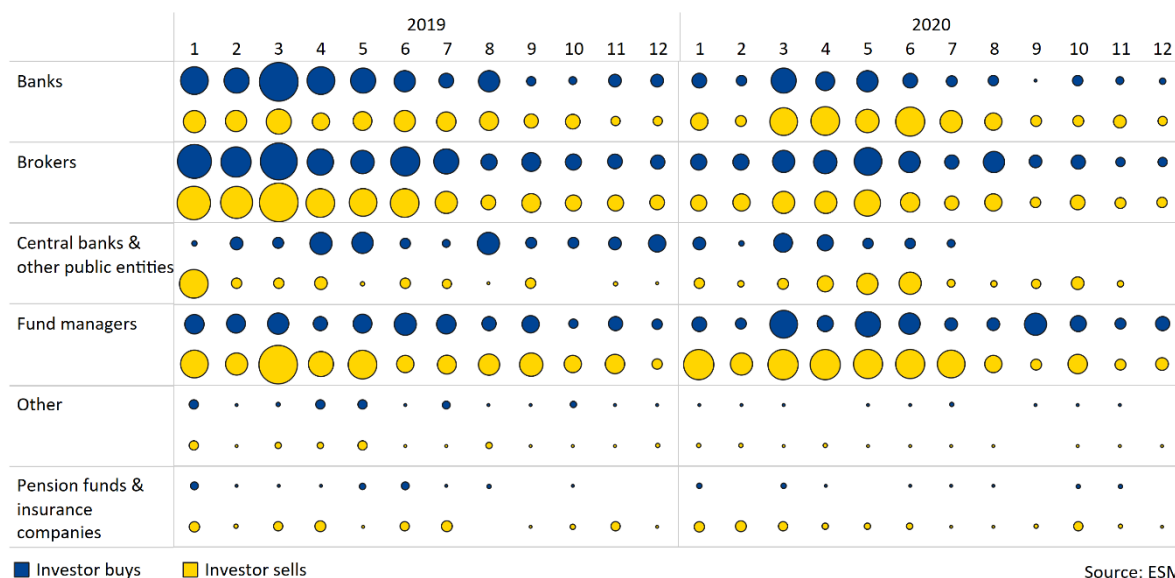


Source: ESM

EFSF and ESM bonds secondary market.

5.2. INVESTOR REACTION

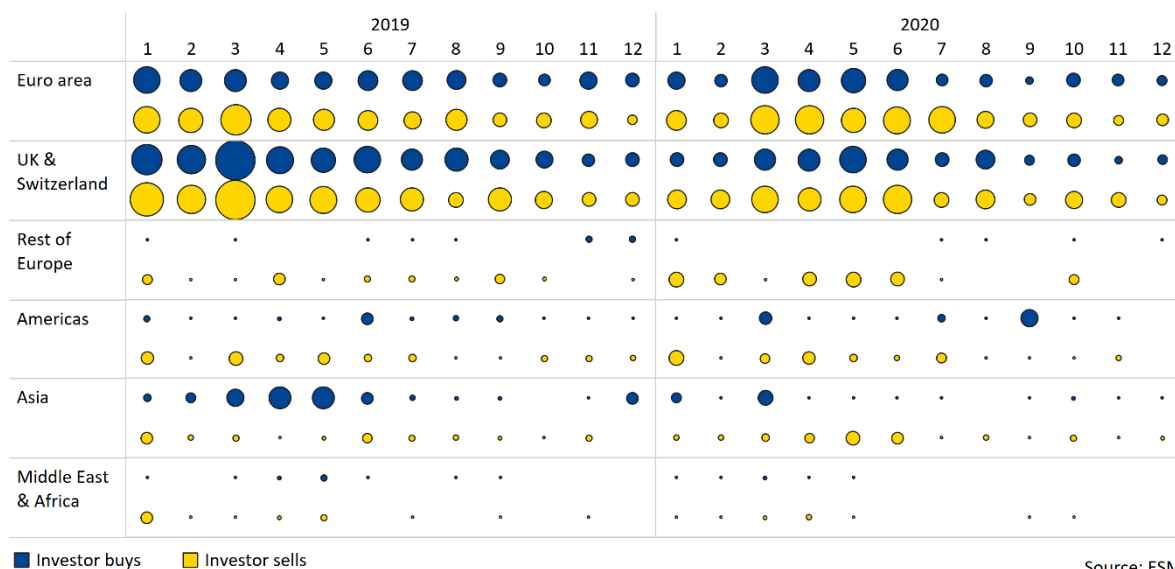
Figure 25: Monthly turnover of all bonds maturing in 7 – 12 years per investor type.



Source: ESM

EFSF and ESM bonds secondary market.

Figure 26: Monthly turnover of all bonds maturing in 7 – 12 years per region.



Source: ESM

EFSF and ESM bonds secondary market.

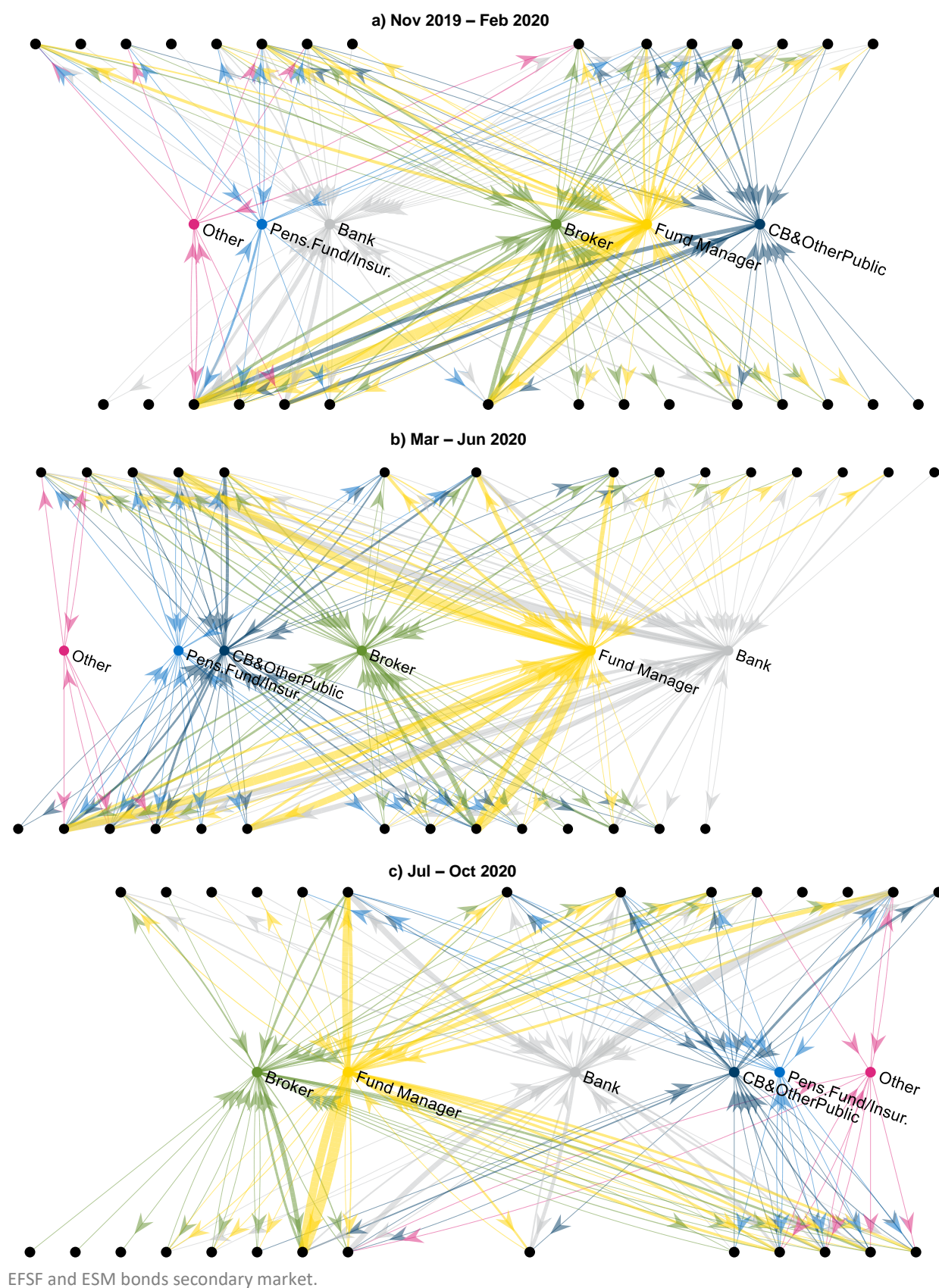
Figure 25 and Figure 26 show the monthly secondary market flows for all EFSF and ESM bonds with a current maturity between 7 and 12 years in 2019 and 2020. Figure 25 depicts these flows for the different investor types and Figure 26 for the different regions.

From March to July 2020, we see net selling by all investor types except for brokers and central banks and other public entities, whereas fund managers and pension funds/insurance companies started net selling already in January.

Comparing the regions, we see a strong net selling from investors outside the euro area and UK and Switzerland from March to June 2020. Furthermore, UK-based and Swiss investors were less active in the market than in 2019. This means that during the crisis, the market in the euro area became the most important for EFSF and ESM bonds.

Figure 27 and Figure 28 show the aggregated flows above €10 million between dealers and investor types or regions, respectively. We focus on three different periods: the pre-crisis months from November 2019 - February 2020, the first wave in Europe (March 2020 - June 2020) and the period with lower infection rates during summer (July 2020 - October 2020). Figure 27b confirms the strong role of private sector investors during the peak of the pandemic. Figure 28 shows, on a regional level, that UK-based investors still played a strong role during the pandemic – which is remarkable considering this was in the year when Brexit became effective. That said, trading volumes from British investors are overall lower than the aggregated euro area volumes in that period. In the period from July 2020 - October 2020 (Figure 28c), investor trading patterns seem to return to the pre-crisis period of November 2019 – February 2020 (Figure 28c) again. Appendix E shows statistics of the monthly turnover and dealer buy share in the first wave of the pandemic compared to normal times.

Figure 27: Flows above 10mn between dealers and investor types for three periods during COVID-19 pandemic.



EFSF and ESM bonds secondary market.

Figure 28: Flows above 10mn between dealers and regions for three periods during COVID-19 pandemic.



EFSF and ESM bonds secondary market.

6. CONCLUSIONS

Based on a database of reported secondary market trades in EFSF and ESM bonds from 2014 to 2020, we first characterise the trades by instrument features and by investor types. We recognise the growing impact of private sector investors on secondary market liquidity. Particularly, fund managers are increasingly active in executing trades with a large market risk exposure stemming from the combination of large ticket size and long maturity.

Second, we discuss the secondary bond market reaction to the first impact wave of the COVID-19 crisis in Europe. We confirm the mechanics outlined by Broner et al. (2013) of investors repatriating their capital in times of stress, but quickly entering the market as they re-evaluate the risk situation. This supports the modern literature view about funding cost advantages and long-term stabilising effects of private capital markets despite trading-induced short-term volatility.

Third, we show evidence that investors were broadly becoming more active in the long-term market segment in reaction to the low yield environment, leading to a large and diversified market of long maturities. Not only has the turnover in maturities above 12 years steadily increased since 2014, it reached volumes of the other maturity buckets in 2017. Also, the investor base has further diversified since 2014 and reached the diversity level of the other maturity buckets with respect to regional distribution in 2017. In this sense, long maturities above 12 years became “normal” liquid instruments.

Fourth, we assess the long-term developments in fixed income markets, namely the digitalisation and automation in the form of electronic trading platforms. We show evidence of a trend towards digitalisation in the secondary market, indicated by an increasing share of electronic trading since 2017, which was only paused during the pandemic in 2020. This trend is shown for all ticket sizes, where in the average the electronic trading share is larger for smaller ticket sizes. This fact only partially explains that central banks and other public entities, who have an exceptionally large average ticket size, are showing a substantially lower electronic trading share than the other investor types. Also, they do not show any trend towards further electronification. It seems that these investors have less pressure and/or less motivation to switch to electronic trading platforms than other investor types. Regarding the effect of electronification as discussed by Bouveret et al. (2015) and Vanguard (2016), we see neither negative nor positive impact on secondary bond market liquidity as the digital transformation has been a rather continuous and non-disruptive process in the past five years.

Finally, we characterise the primary dealers’ transaction network for different dealer subsets. We find recognisable regional and institutional dealer habitats, which supports the strategy to maintain a large Market Group of banks to support liquidity even in difficult market situations. Particularly, we show that local banks contribute to the secondary market beyond their quantitative turnover. On the other hand, they stabilise the turnover volume across time and, moreover, they contribute to investor diversity in terms trading with additional investor types in different countries on different trading platforms.

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APPENDIX

A. SIGNIFICANCE FOR THE INCREASING ROLE OF FUND MANAGERS FOR HIGH RISK BEARING TRADES

The hypothesis is that high risk-bearing trades, here defined as trades where the product of trade volume and time to maturity exceeds the threshold of 250 million, are mainly traded by banks (in terms of trade volume) before 2017 and mainly traded by fund managers since 2017.

Hence we carry out two two-sample t-tests comparing the monthly volume of high risk-bearing trades of banks and asset managers, separately for two time periods:

	Avg monthly turnover volume above risk threshold before 2017, in million €	Avg monthly turnover volume above risk threshold after 2017, in million €
Fund managers	379	1235
Banks	707	723
Hypotheses	$H_0 : vol_{FM} \geq vol_{Banks}$ against $H_1 : vol_{FM} < vol_{Banks}$	$H_0 : vol_{Banks} \geq vol_{FM}$ against $H_1 : vol_{Banks} < vol_{FM}$
p-value	0.0001	0.0001

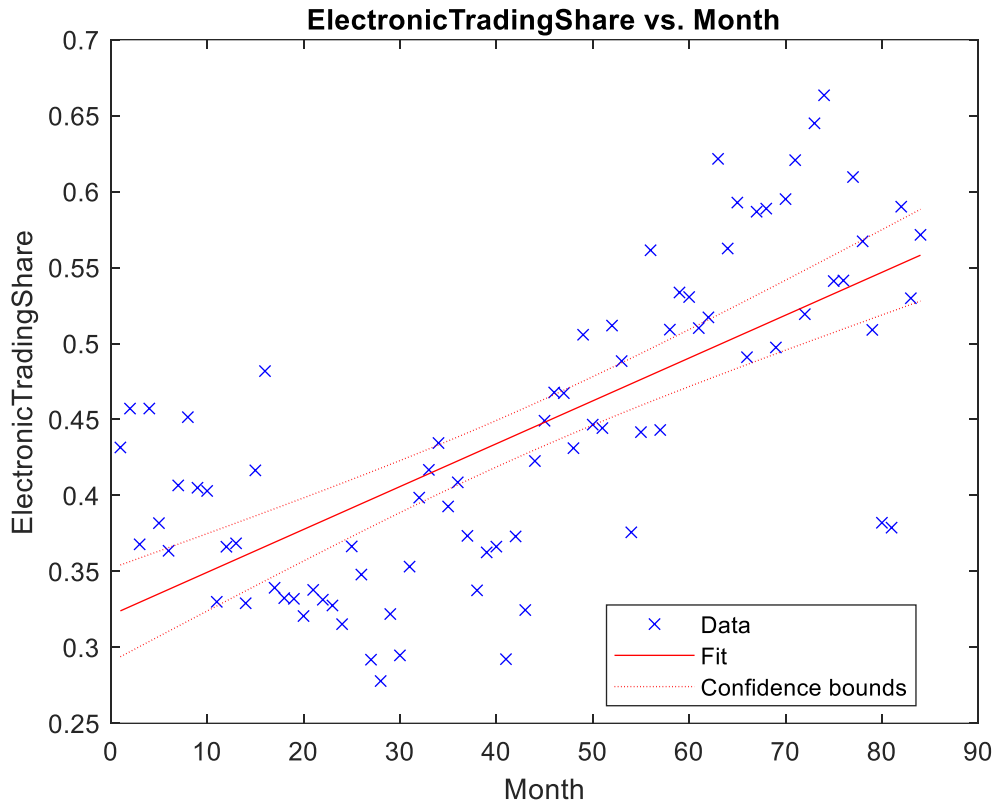
We conclude that banks had significantly more high risk-bearing trade volume before 2017 and fund managers thereafter.

B. SIGNIFICANCE FOR THE INCREASING USE OF ELECTRONIC TRADING PLATFORMS

The hypothesis is that the trading share that has taken place on electronic trading platforms follows significantly a positive trend from 2014 to 2020. We calculate the monthly electronic trading share and fit a linear model:

	Estimate	SE
Intercept	0.32118	0.015452
Beta	0.002821	0.00031581
Observations	84	
R-squared	0.493	
p-value	< 1e-13	

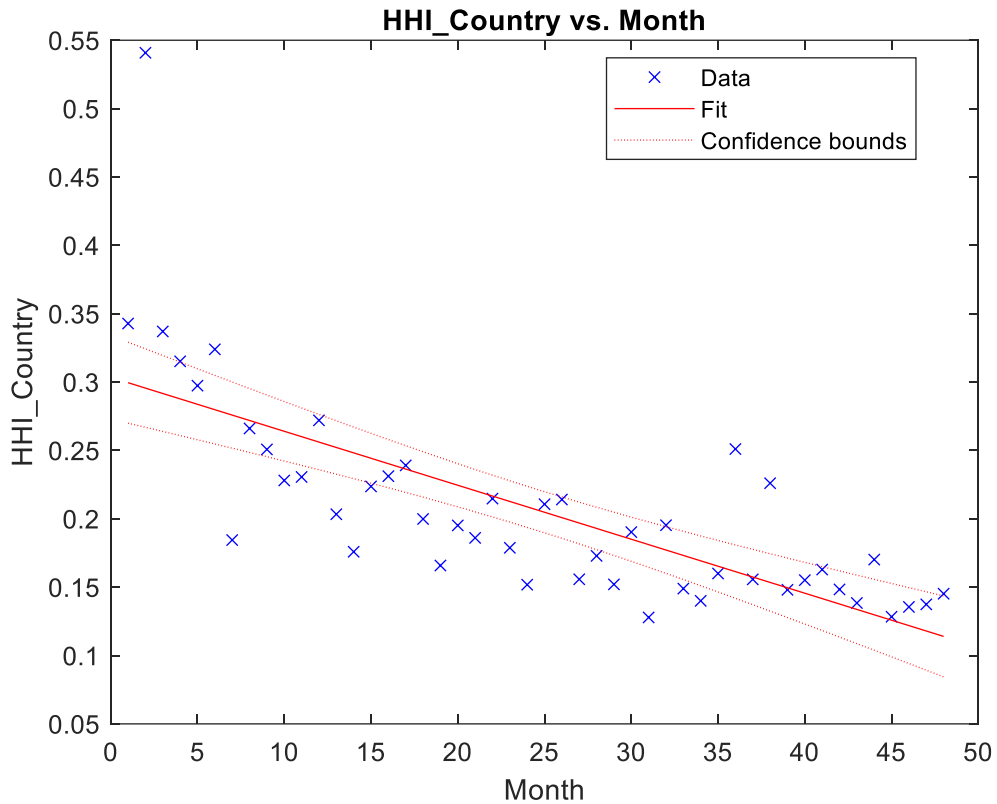
As can be seen, the linear component is highly significant and therewith the positive trend of electrification.



C. SIGNIFICANCE FOR THE DECREASING INVESTOR CONCENTRATION

The hypothesis is that the investor concentration by country, measured by the Herfindahl index as defined in Chapter 4.1, is significantly decreasing during the period from 2014 to 2017. This is shown by fitting a linear model to the series of Herfindahl indices of the monthly trading per country and assessing the significance of the linear component. Statistical results below show that the linear component is highly significant.

	Estimate	SE
Intercept	0.30347	0.015171
Beta	-0.0039477	0.00053903
Observations	48	
R-squared	0.538	
p-value	< 1e-08	



D. SIGNIFICANCE OF DEALER IMPACT

The hypothesis is that the number of distinct investors is significantly increased by the smallest 20 dealers (according to dealers' trading volume). As an estimate for the number of distinct investors, we use the distinct count of combinations of investor type, electronic trading platform and country. We work with the period between 2014 and 2020.

With a two-sample t-test we show that the number of distinct investors from all dealers is significantly higher (with a p-value <0.001) than the number of distinct investors from the top twenty dealers.

	<i>NumInv</i> - Number of distinct investors according to investor type, country, and trading platform, per month
Top 20 dealers	196
All dealers	211
Hypotheses	$H_0 : NumInv_{Top20} \geq NumInv_{All}$ against $H_1 : NumInv_{Top20} < NumInv_{All}$
p-value	<0.0001

E. PANDEMIC RESILIENCE

The table below shows some basic statistics that underline the steady secondary market liquidity in terms of turnover volume. The *buy share* denotes the share of turnover where investors are buying from dealers (banks that act as market makers). A share in the low 1-digit range could indicate panic selling from investors.

	First pandemic wave (March - June 2020)	Normal times (Jan 2014 - Feb 2020 and Jul 2020 - Jan 2021)
Monthly turnover volume (in million €)		
Min	1,251	243
Median	1,441	1,046
Mean	1,433	1,153
Max	1,598	3,015
Monthly buy share		
Min	28%	20%
Median	32%	46%
Mean	35%	46%
Max	50%	76%

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