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TRV

ESMA Report on Trends, Risks and Vulnerabilities

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European Securities and Markets Authority (ESMA)
Risk Analysis and Economics Department
103, Rue de Grenelle
75007 Paris, FRANCE
risk.analysis@esma.europa.eu

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TRV Statistical Annex

In addition to the statistics presented in the Trends, Risks, and Vulnerabilities sections of this edition of the TRV, we provide extensive and up-to-date charts and tables with key data on the markets under ESMA's remit in the TRV Statistical Annex, which is published jointly with the TRV and can be accessed from <https://www.esma.europa.eu/market-analysis/financial-stability>.

Executive summary

Trends and Risks

ESMA risk assessment

Risk segments	Risk categories		Risk sources				
	Level	Outlook	Level	Outlook	Outlook		
Overall ESMA remit	●	→	Liquidity	●	→	Macroeconomic environment	→
Systemic stress	●	→	Market	●	→	Interest rate environment	↗
Securities markets	●	→	Contagion	●	→	EU sovereign debt markets	→
Infrastructures and services	●	→	Credit	●	→	Infrastructure disruptions, including cyber risks	→
Asset management	●	↗	Operational	●	→	Political and event risks	↗

Note: Assessment of the main risks by risk segments for markets under ESMA's remit since the last assessment, and outlook for the forthcoming quarter. Assessment of the main risks by risk categories and sources for markets under ESMA's remit since the last assessment, and outlook for the forthcoming quarter. Risk assessment based on categorisation of the European Supervisory Authorities (ESA) Joint Committee. Colours indicate current risk intensity. Coding: green=potential risk, yellow=elevated risk, orange=high risk, red=very high risk. Upward arrows indicate an increase in risk intensities, downward arrows a decrease and horizontal arrows no change. Change is measured with respect to the previous quarter; the outlook refers to the forthcoming quarter. ESMA risk assessment based on quantitative indicators and analyst judgement.

Risk summary: Risks in the markets under ESMA remit remained at high levels, reflecting very high risk in securities markets and elevated risks for asset management, infrastructures and services. Our assessment of the individual risk categories did not change from 1Q19, with market risk remaining very high due to asset valuations that seem to exceed levels justified by fundamentals, subdued economic growth prospects and geopolitical developments, as well as the flattening of yield curves. Liquidity risk was high, with isolated events highlighting pockets of risk in the asset management industry. While the level of credit risk is stable, the deteriorating quality of outstanding corporate debt, the growth in leveraged loans and collateralised loan obligations should warrant the attention of the public authorities. Our risk outlook for the asset management sector has deteriorated, as a result. Investor risks persist across a range of products, and under MiFIR product intervention powers, most NCAs have adopted permanent measures relating to binary options and contracts for differences. Going forward, weak economic fundamental and intensifying concerns over a no-deal Brexit remain key risk drivers for 2H19.

Securities markets: Global equity markets recovered in 1H19 from the end of 2018, supported by changes in investor expectations regarding the future monetary policy stance of major central banks. Discussions between the United States and China on a potential trade agreement, which had progressed since the beginning of the year, appeared to stall in May with the US government increasing customs duties, marking the return of equity market volatility and leading to a steep decline in prices over the summer. European bond markets experienced a significant narrowing in spreads, raising the spectre of a potential return of search-for-yield strategies, while the average quality of outstanding corporate bonds has significantly deteriorated in recent years. Securities financing markets continued to expand as market participants rely on SFTs to mobilise high-quality liquid assets and meet their collateral needs.

Infrastructures and services: Equity trading volumes in the EU increased in 1H19 but remained below their 2018 levels. More than a year after the entry into force of MiFID II/MiFIR and in particular the double volume cap mechanism, the share of dark-pool trading remained low relative to other types of trading, at around 9% of total trading. OTC trading remained important, with its share of trade increasing to 30%. For CCPs, new figures show increased volumes of cleared interest rate derivatives. New CSDR guidelines were published by ESMA, and the first quarterly reports on internalised settlement activity should be sent to NCAs in 2H19. Finally, the reform of financial benchmarks continues to progress with a new set of recommendations from the industry-led working group in charge of identifying and recommending risk-free rates to be used as an alternative to current benchmarks.

Asset management: In 1H19 funds inflows shifted from equity to bond funds, in a context of reduced risk appetite. Equity funds faced significant outflows despite the equity market recovery. In contrast, bond funds benefitted from investor flight-to-safety behaviour. ETFs recorded positive flows, driven by bond ETFs. ESMA raised its risk outlook for the asset management sector, in a context of deteriorating credit quality of the investment universe and renewed liquidity concerns following the suspension of redemptions by a large UCITS, and significant outflows affecting several funds holding illiquid exposures. Beyond UCITS, the publication of the first ESMA Annual Statistical Report on EU Alternative

Investment Funds is a major step in reducing data gaps in the EU fund industry. The report shows that risks are low on average but may be concentrated in some categories of AIFs such as hedge funds using leverage or real estate funds exposed to liquidity mismatches.

Retail consumers: Retail investors saw a recovery in returns in 1H19 following losses in 4Q18. Flows into equities and equity investment funds were lower in 4Q18, despite buoyant disposable income and a flat household investment rate, as sentiment regarding equity markets among EA households worsened. The impact of costs for retail investors in UCITS rose in 1H19, especially for money market funds. Investor complaints remained below the five-year average in 1Q19.

Products and innovation: The announcement to issue LIBRA as a new crypto-currency has revived market interest in initial coin offerings and crypto-assets, and new applications of distributed ledger technology, including the tokenisation of assets, continue to develop. The increasing adoption of artificial intelligence and use of big data in financial markets is likely to reduce costs for firms and investors. However, firms and authorities need to be alert to potential sources of bias from AI-based tools and consider issues of transparency, explicability, fairness and accountability in applications of the technology. Following the ESAs review, ESMA started monitoring trends in sustainable finance, starting with ESG equity performance and green bond markets in the EU.

Vulnerabilities

Leveraged loans, CLOs – trends and risks: Recent years have seen a significant pickup in the issuance of leveraged loans and collateralised loan obligations in the US and the EU. The surge in issuance occurred against a backdrop of looser underwriting standards, higher indebtedness of borrowers and compressed credit spreads. This article provides an overview of the leveraged loans and CLO markets in the EU. In particular, we assess exposures of the EU fund industry to leveraged loans and CLOs, which remain limited at the current juncture. In addition, the article uses a simulation analysis to show how model uncertainty can impact the credit ratings of CLOs, and potentially trigger forced sales from some types of investors.

Performance and cost of active and passive EU equity UCITS: We analyse the cost and performance of EU equity UCITS funds, distinguishing between active and passive investment management, and ETFs. In particular, we investigate the gross and net relative performance of actively and passively managed funds with respect to their prospectus benchmark. The main results show that on an aggregate basis, active funds have underperformed in past years passive funds and ETFs, in net terms, as well as their own benchmarks; ongoing costs had the largest impact on performance. The top 25% actively managed equity UCITS outperformed passively managed UCITS before and after costs, as well as their benchmarks. However, the group of top 25% actively managed equity UCITS changes over time, such that there is only limited opportunity for investors to pick consistently outperforming actively managed equity UCITS.

Use of derivatives by UCITS equity funds: We investigate the use of derivatives by EU UCITS equity funds, based on regulatory data on derivatives collected under the EU EMIR framework. The tendency and frequency of UCITS equity funds to trade derivatives is explained to a large extent by asset managers' characteristics, such as fund family and fund family size. At individual fund level, the investment strategy, size, geographic focus, base currency, or domicile of play only play a minor role. Over time, cash inflows as well as currency risk seem to have a significant influence, which suggests that derivatives are used for transaction cost or risk reduction purposes. Our analysis does not find indications that derivatives are primarily used for speculative or window-dressing purposes by UCITS equity funds.

Trends

Market environment

Following a slowdown during the second half of 2018, economic activity recovered somewhat in 1H19. While Brexit-related political risk receded as the United Kingdom and the EU postponed the final deadline to 31 October 2019, concerns over a potential no-deal Brexit have intensified since July and are likely to drive market sentiment in 2H19. While trade negotiations appeared to progress during the first quarter of 2019, tensions between the United States and China flared up again in May, marking the return of volatility in equity and commodity markets. Changes in investor expectations regarding the future monetary policy stance of major central banks provided support to asset prices, but a tense geopolitical environment continues to provide a risky backdrop to EU financial market activity.

In the first half of 2019, the **macroeconomic environment** improved somewhat, after a pronounced deceleration in economic activity last year. EU GDP growth rebounded to 0.4% during the first quarter, with annual growth expected to reach 1.4%. Global economic growth is also forecast to slow down but should remain nonetheless above 3.5%, thanks to robust growth in several large emerging markets.¹ The EU aggregate deficit continued to decline, with fiscal deficit in most EU countries below 3% of GDP. However, public- and private-sector debt levels remain high in several Member States.

Faced with slower economic activity and falling inflation expectations, the major central banks changed tack at the beginning of the year, leading to changes in investor expectations and in effect easing the **monetary policy stance**. In the US, the Federal Reserve ended its three-year tightening cycle last December, holding its rate range steady since then while signalling easing in the near future. The ECB also kept policy rates unchanged, extended its forward guidance on low rates until mid-2020, and indicated willingness to conduct further asset purchases.

Although the agreement reached between the UK and EU-27 on 11 April 2019 reduced the immediate risk of a disorderly UK exit from the Union, Brexit-related **political risk** remains a key source of concern for EU financial markets. The agreement helped to stabilise GBP **exchange rates**, which had grown increasingly volatile in the run up to 31 March 2019. The focus remains on the risk of potential cliff effects, which continues to warrant close vigilance by both market participants and public authorities. Market participants need to prepare for a potential exit without an agreement by 31 October 2019.

Moreover, the return of geopolitical tensions, in particular between the US and China, and the

recent escalation of broader protectionist measures represent a source of concern for investors that could have deleterious effects on the global economy and global financial stability. Consequently, **economic policy uncertainty** rose significantly in the US during the second quarter, while fluctuating in the EU (T.3).

EU market confidence recovered somewhat, however at a lower level in comparison to recent years, following a gradual decline throughout 2018 (T.4). This reflected an improvement in the business situation at regional level in 2Q19, although other business surveys pointed to continued deterioration. Against this background, the overall EU **financial conditions** improved during the first half of 2019, with major asset classes making strong gains (T.1), albeit with a generally volatile second quarter against the backdrop of global trade tensions (T.2).

Lagging indicators show that investor risk appetite recovered in 1Q19, in line with market prices, following a sharp deterioration in 4Q18. The EA balance of payment recorded large **portfolio investment outflows** in 1Q19 (EUR 142bn), as EA investors resumed their purchases of foreign equities and long-term debt (T.5). Significant divestments by EA residents at the end of 2018 had been primarily driven by non-bank financial entities, with investors withdrawing a record-high EUR 540bn from securities markets in just one quarter. This was followed by a strong rebound in 1Q19, with securities market investments amounting to EUR 430bn (T.6). Investment flows from EU collective investment vehicles increased accordingly, driven by insurances and pension funds (T.7).

Accordingly, **capital market financing** started growing again by 2% in 1Q19 from a year ago, driven primarily by a rebound in equity financing, and following a sharp decline in 4Q18 (T.8).

¹ European Commission, European Economic Forecast, Spring 2019 and IMF, World Economic Outlook Update, April 2019.

T.1
Market performance

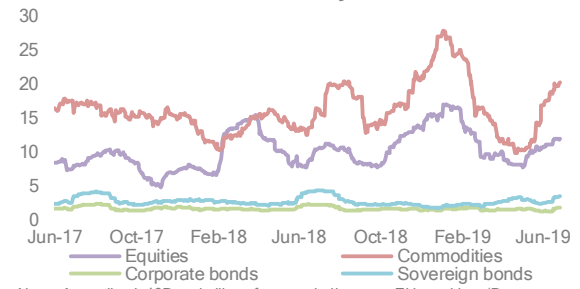
Equity and commodity prices fluctuated



Note: Return indices on EU equities (Datastream regional index), global commodities (S&P GSCI) converted to EUR, EA corporate and sovereign bonds (iBoxx EUR, all maturities). 01/06/2017=100.
Sources: Refinitiv Datastream, ESMA.

T.2
Market volatilities

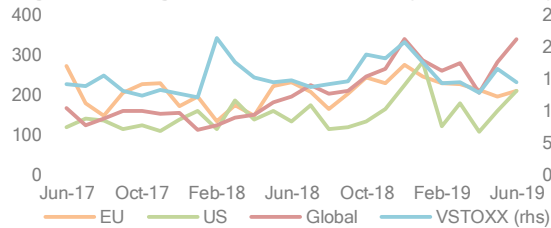
Trade tensions drive volatility



Note: Annualised 40D volatility of return indices on EU equities (Datastream regional index), global commodities (S&P GSCI) converted to EUR, EA corporate and sovereign bonds (iBoxx EUR, all maturities), in %.
Sources: Refinitiv Datastream, ESMA.

T.3
Economic policy uncertainty

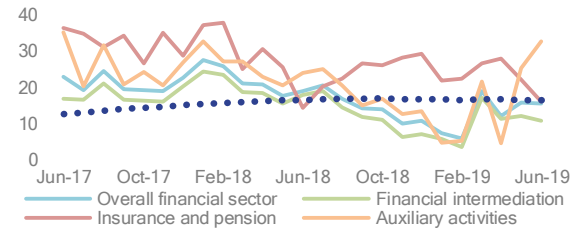
High level of global economic policy uncertainty



Note: Economic Policy Uncertainty Index (EPU), developed by Baker et al. (www.policyuncertainty.com), based on the frequency of articles in EU newspapers that contain the following triple: "economic" or "economy", "uncertain" or "uncertainty" and one or more policy-relevant terms. Global aggregation based on PPP-adjusted GDP weights. Implied volatility of EURO STOXX 50 (VSTOXX), monthly average, on the right-hand side.
Sources: Baker, Bloom, and Davis 2015; Refinitiv Datastream, ESMA.

T.4
Market confidence

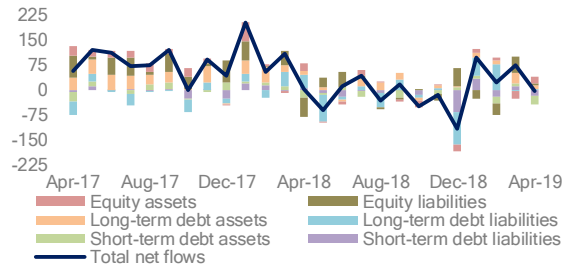
Confidence recovered



Note: European Commission survey of EU financial services sector and subsectors (NACE Rev.2 64, 65, 66). Confidence indicators are averages of the net balance of responses to questions on development of the business situation over the past three months, evolution of demand over the past three months and expectation of demand over the next three months, in % of answers received.
Sources: European Commission, ESMA.

T.5
Portfolio investment flows

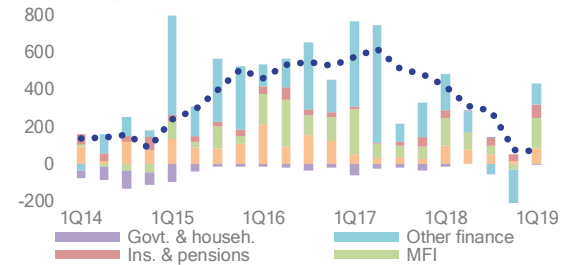
Net outflows from EA as risk appetite returns



Note: Balance of Payments statistics, financial accounts, portfolio investments by asset class. Assets=net purchases (net sales) of non-EA securities by EA investors. Liabilities=net sales (net purchases) of EA securities by non-EA investors. Total net flows=net outflows (inflows) from (into) the EA. EUR bn.
Sources: ECB, ESMA.

T.6
Investment flows by resident sector

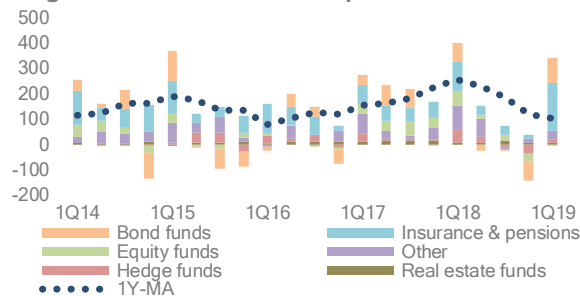
Recovery in financial sector investments



Note: Quarterly Sector Accounts. Investment flows by resident sector in equity (excluding investment fund shares) and debt securities, EUR bn. 1Y-MA=one-year moving average of all investment flows.
Sources: ECB, ESMA.

T.7
Institutional investment flows

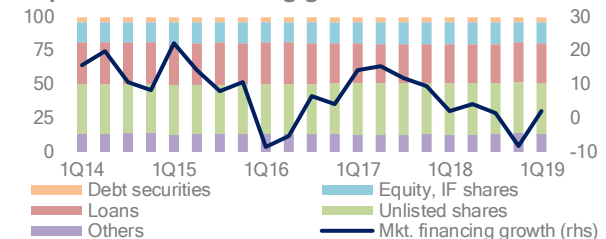
Large flows in insurance and pension funds



Note: EA institutional investment flows by type of investor, EUR bn. Other=financial vehicle corporations, mixed funds, other funds. 1Y-MA=one-year moving average of all investment flows.
Sources: ECB, ESMA.

T.8
Market financing

Capital market financing growth slows



Note: Quarterly Sector Accounts. Liabilities of non-financial corporations (NFC), by debt type as a share of total liabilities. Others include: financial derivatives and employee stock options; insurance, pensions and standardised guarantee schemes; trade credits and advances of NFC; other accounts receivable/payable. Mkt. financing growth (rhs)= annual growth in debt securities and equity and investment fund (IF) shares, right axis, in %.
Sources: ECB, ESMA.

Securities markets

Global equity markets recovered in 1H19 from the end of 2018, supported by changes in investor expectations regarding the future monetary policy stance of major central banks. Discussions between the United States and China on a potential trade agreement, which had progressed since the beginning of the year, appeared to stall in May with the US government increasing customs duties, marking the return of equity market volatility and leading to a steep decline in prices over the summer. European bond markets experienced a significant narrowing in spreads, raising the spectre of a potential return of search-for-yield strategies, while the average quality of outstanding corporate bonds has significantly deteriorated in recent years. Securities financing markets continued to expand as market participants rely on SFTs to mobilise high-quality liquid assets and meet their collateral needs.

Geopolitics drive equities²

The beginning of 2019 was characterised by a strong recovery in global **equity prices**, with EU and US equities gaining 16% and 18%, respectively, until the beginning of May. In Europe, the IT FTSE MIB outperformed other indices with a 19% increase over the same period.

Improved investor sentiment appeared to have been driven by two main factors. First, confronted with decelerating economic growth and falling inflation expectations, key central banks changed their language, in effect easing the policy stance. Second, positive news on the negotiations between the US and China fuelled the optimistic view that a trade agreement was in sight. However, by mid-May such a view appeared to have been misguided, with the US government raising tariffs from 10% to 25% on USD 200bn of Chinese exports, soon followed by retaliatory measures from the Chinese government on USD 60bn of US exports.

In the following weeks, equity prices declined heavily, and equity market **volatility** spiked anew. The VSTOXX reached an intraday high of 26% on 13 May, after trading around 15% during the first four months of 2019. Automobile manufacturers and basic resources suffered the most, with share prices in the two sectors losing 14% and 10% respectively in May (T.9).

Bank shares underperformed other sectors again, with prices up 5% in 1H19 compared with 18% for non-financials, and 22% for insurance companies. Concerns related to the EUR 200bn money-laundering scandal at Danske Bank have weighed on valuations, together with hefty losses in some large lenders.



Equity **issuance** was subdued, with 600 initial public offerings during the first half of 2019, compared with a half-yearly average of 780 between 2014 and 2018, and volumes down by three quarters. The quarterly volume of follow-on issuance was also down by more than 40% compared with the average of the last five years, in a sign that issuers – especially financial sector issuers – currently shy away from EU equity markets. Nonetheless, secondary equity market **liquidity** remained ample in 1H19, with average bid-ask spreads for the largest 200 European market capitalisations declining slightly.

Search for yield and credit quality

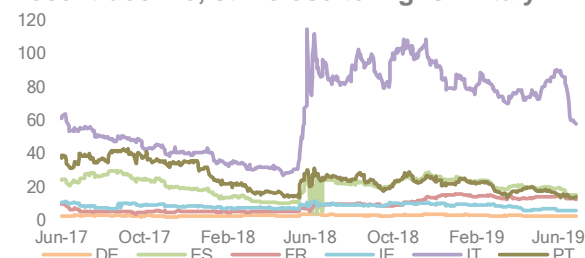
In 1H19 European bond **spreads** narrowed as investors shifted their portfolio allocation from equities to bonds. This was likely spurred by changes in monetary policy expectations and repricing of the forward rate curve, in a context of high cyclical valuations in equity markets, despite the 2H18 correction. As a result, most of the bond spread decompression witnessed in 2018 ended up being reversed.

² For the indicators used to develop the analysis in the “Securities markets” section, please see pp. 3-16 of the TRV Statistical Annex available on ESMA’s website.

In sovereign bond markets, ten-year yields declined by 70bps on average in 1H19, with German debt trading below the ECB deposit rate for the first time ever. Nonetheless, spreads to German bonds tightened significantly in ES, GR, and PT (up to 130bps). Italian bond spreads to German bonds narrowed by 11bps, with concerns over the government budget deficit forecast resurfaced in May, weighing on prices. Ten-year Italian bond yields remained above 2% (compared with 0.6% for the rest of the EU), while redenomination risk – measured as differences between spreads on sovereign CDS contracts – remained close to historical highs until the beginning of June.³

T.10

Redenomination risk

Recent decline, still close to highs in Italy

Note: Difference between 5Y CDS spreads under the 2014 ISDA definition (where debt redenomination is a credit event), and under the ISDA definition (where it is not), in bps. Sources: Refinitiv Datastream, ESMA.

Corporate bond yields also experienced a significant decline of around 80bps in 1H19, including more than 100bps for BBB-rated bonds (T.11).

T.11

Corporate bond spreads

Spread compression returns

Note: EA corporate bond option-adjusted spreads by rating, in bps. Sources: Refinitiv Datastream, ESMA.

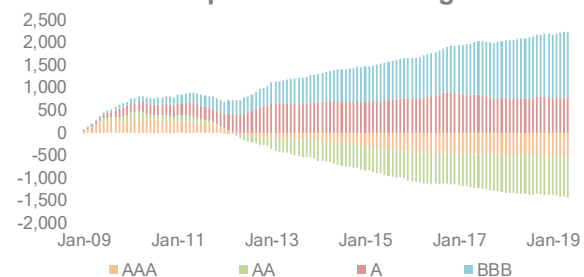
The resulting compression in bond spreads across rating categories suggests the return of

search-for-yield strategies, in a sign of increased risk-taking by financial firms and investors. This is of particular concern at this juncture, for three main reasons.

First, the average **credit quality** of outstanding corporate bonds from EU issuers has significantly deteriorated over the last decade. While investment-grade issuance remains the norm, the share of BBB-rated bonds has expanded from less than 10% in 2009 to almost 30% in 2019, reflecting a combination of rating downgrades and increased issuance from lower-rated corporates. The net issuance of BBB-rated bonds has averaged EUR 13.4bn per month since 2012, far outpacing all other investment-grade (IG) categories (T.12). Accordingly, the share of AAA-rated bonds dropped from 19% in 2009, to less than 4% in 2019. This makes investors and in particular corporate bond funds vulnerable to a larger-than-usual wave of downgrades.

T.12

Net issuance of investment-grade corporate bonds

BBB bonds outpace other IG categories

Note: Net cumulative issuance of investment-grade corporate bonds by EU issuers since 1 January 2009, monthly data in EUR bn. Sources: Refinitiv EIKON, ESMA.

This development may reflect to some extent capital structure management. Indeed, companies may choose to issue lower-rated bonds (i.e. debt securities with features that attract a lower credit rating, such as subordinated debt as opposed to senior debt) to take advantage of compressed borrowing costs.⁴ However, the IMF estimated that around 30% of the evolution in the European BBB corporate bond universe is the result of new entrants in the market, suggesting that the growth in market-based intermediation in the EU could explain part of the trend.⁵

Second, the potential return of search-for-yield strategies implies that investors are likely to pile up again in riskier assets, while the average

³ For more details on the measure redenomination risk, see <https://voxeu.org/article/italian-risk-spreads-fiscal-versus-redenomination-risk>.

⁴ In the EU regulation on credit rating agencies, ratings are defined as "an opinion regarding the creditworthiness of

an entity, a debt or financial obligation, debt security, preferred share or other financial instrument, or of an issuer [...]."

⁵ See IMF (2019), Global Financial Stability Report, April 2019, Chapter 1.

portfolio quality of investors, including EU bond funds, has already significantly deteriorated. In this context, the growth in **leveraged loans and collateralised loan obligations** (see article pp. 49-58) should be of particular concern for authorities. The recent rebound in hybrid capital issuance from EU banks (+54% from 2H18) also warrants close monitoring, considering uncertainties around the reliability of existing pricing models for instruments such as **contingent convertible debt** securities.

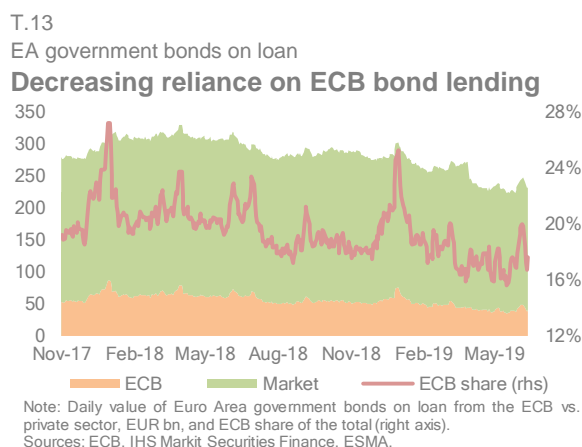
Third, the recent economic slowdown and US yield curve tightening point to a possible turnaround in the economic cycle, which is typically accompanied by lower corporate profits. Against this background, the build-up in lower-rated corporate sector debt, combined with higher buy-side exposure to risky assets, increases the potential impact of a sudden repricing of credit or market risk. In addition to the direct impact on the balance sheet of bond holders, this could lead to refinancing risks for corporate borrowers, accentuating the economic downturn in the medium term. Moody's estimates that around half of US corporate investment-grade bonds are now rated Baa – which is equivalent to BBB – i.e. particularly at risk of becoming fallen angels (downgraded to speculative grade) in case of economic downturn.

In the short term, the materialisation of these risks appears to be somewhat limited for the financial sector, given the favourable **debt redemption profile**. Debt redemptions in 2019 are expected to add up to less than EUR 800bn, the lowest volume since 2009. Moreover, concerns over the status of bond market **liquidity** seem to have receded for now, with indicators of sovereign and corporate bond market liquidity not displaying any noticeable changes, leaving aside a temporary decline in sovereign bond market turnover in June.

However, in the longer run, lower debt quality may turn out to be problematic in countries with high levels of corporate sector indebtedness – especially the non-financial corporate sector, where debt redemptions are expected to reach a historical high of EUR 280bn in 2019, up 20% from the average of the last five years.

Collateral tensions ease up

Tensions in the EU market for high-quality collateral continued to ease in 1H19. Repo specialness, a proxy for **collateral scarcity** premia, declined across Euro Area sovereign bonds – even for bonds in very high demand. This reflected to an extent the ECB securities lending programme, under which the central bank lends the government debt securities it has purchased through quantitative easing. While the daily on-loan balance has averaged EUR 55bn since the end of 2017, the share of EA government bonds on loan from the ECB and national central banks has been gradually declining (T.13). Nonetheless, the availability of these securities remains essential to assuage temporary collateral shortages, such as those typically experienced around the end of each year and reflected in ECB lending peaks.⁶



This trend and the continued growth in **centrally-cleared repos** using EA government bond collateral (+9% from 1H18) suggest that market participants continue to adapt to the post-crisis landscape. Indeed, while the volumes of EA government bonds issued continue to decline, the structural demand for collateral increases, stemming most recently from the phasing-in of **margin requirements** on non-centrally cleared derivatives. Addressing this conundrum requires the ability by market participants to efficiently mobilise assets using instruments such as SFTs.

The transparency of EU **derivatives markets** continues to progress thanks to the implementation of post-crisis reforms. The entry into force of MiFID II/MiFIR in January 2018 also marked the little-noticed beginning of a reporting obligation for positions held by trading venue

⁶ See ESMA Report on Trends, Risks and Vulnerabilities, No.2, 2017.

participants in exchange-traded commodity derivatives (Box T.14).

T.14

MiFID II commodity derivatives reporting obligation

Monitoring commodity futures positions

Over the past two decades, commodity prices have experienced some large swings. The net effects of such price movements are not easily assessed in economic terms, due to their multifold impact on income redistribution between producers and consumers, countries' terms of trades, headline inflation rates, or tax policy. However, commodity price booms – such as the one experienced during the first decade of the century – tend to be perceived negatively due to their effects on consumers, for example through food or petrol prices.

The 2003-2008 commodity price boom was supported by some fundamental factors, for example growing demand but low spare capacity for oil and metals, and high production costs and biofuel subsidies for food (World Bank, 2009⁷). However, the contemporaneous expansion of derivatives markets also fuelled the perception that speculation in commodity futures markets possibly amplified the upward swing in prices (e.g. FAO, 2011⁸). This led global authorities to promote greater transparency and supervision of commodity futures markets⁹ to address excessive commodity price volatility, and the eventual adoption of specific provisions as part of MiFID II.

MiFID II and commodity derivatives

There are two main measures that relate to commodity derivatives in MiFID II (Title IV):

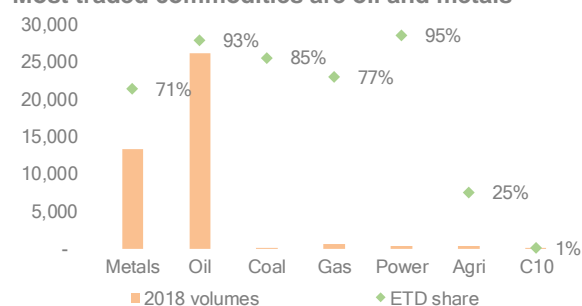
- quantitative thresholds for the maximum size of a position in a commodity derivative that persons can hold (Art.57);
- the publication of weekly position reports (Art.58).

Regarding quantitative thresholds, as of May 2019, ESMA had published multiple opinions on so-called “position limits” covering 38 contracts in energy, food, metals and freight. These opinions include a description of the market, including traded volumes (T.15) or deliverable supply, as well as the proposed limit and rationale behind it.

T.15

2018 volumes in exchange-traded commodity derivatives

Most traded commodities are oil and metals



Note: Annual trading volumes in exchange-traded commodity derivatives, 2018, in EUR bn. Share of total trading taking place on exchange (%), based on OTC volumes estimated with EMIR data.
Sources: ESMA.

In addition, starting in January 2018 ESMA made available on its website a public register¹⁰ containing information on weekly commodity futures positions reported by EU trading venues. For each contract in which trading exceeds a certain threshold¹¹, long and short positions are reported to ESMA by type of trading venue participants, split between risk-reducing positions directly related to commercial activities and other positions (without maturity breakdown).

Commodity futures position reports: case study

Although ESMA's public register is not yet fully complete (more contracts are expected to be reported in the future), it offers valuable insight into positioning in futures markets which investors can use to inform their investment decisions. For example, since January 2018 there have been more than 10 million positions reported on a weekly basis in oil futures, including almost 6 million in two crude oil contracts alone.

As highlighted, positions are split between risk-reducing (hedging) and other (speculative) positions. For crude oil contracts, the vast majority of hedging positions are held by commercial undertakings, as might be expected. Financial firms, on the other hand, mainly report speculative positions, and are long on a net basis in crude oil futures (T.16). Moreover, behaviours appear to differ by sector, with investment fund net positions highly correlated with oil prices (66%), whereas investment firm positions are negatively correlated (-21%), presumably reflecting their role as market makers.

⁷ World Bank, “Global Economic Prospects 2009”, Chapter 2.

⁸ Food and Agriculture Organization of the United Nations, “Economic and Social Perspectives, Policy Brief 9: price surges in food markets”, June 2010.

⁹ See for example “G20 Leaders Statement: The Pittsburgh Summit” (2009), paragraph 28, and “Communique of the G20 Finance Ministers and Central bank Governors” (2011), paragraph 6.

¹⁰ See Commodities Derivatives Weekly Position Reporting System on ESMA's website:

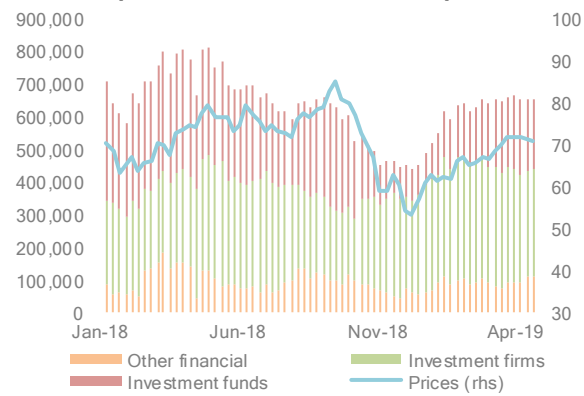
https://registers.esma.europa.eu/publication/searchRegister?core=esma_registers_coder58

¹¹ Trading venue participants must report their positions if 20 or more position holders in a contract exist on a venue and open interest is at least four times the deliverable supply in the underlying commodity.

T.16

Net speculative positions of financial firms in oil futures

Fund net positions correlated with oil prices



Note: Number of net (long minus short) non risk-reducing positions in crude oil futures by sector, and crude oil prices in USD per barrel (rhs).
Sources: Thomson Reuters EIKON, ESMA Registers.

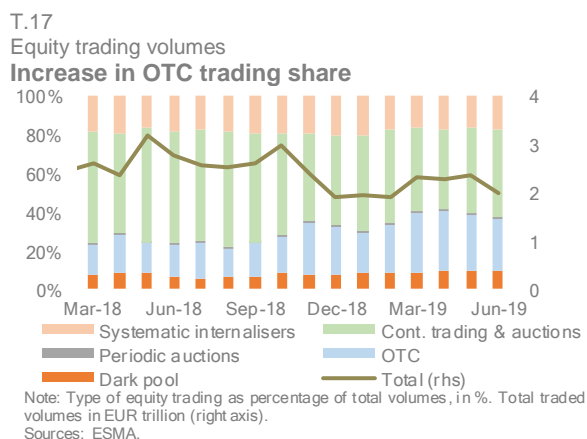
This information can also be used to assess the exposure of each sector to major commodities. For example, the Brent crude oil futures contract size is 1,000 barrels, meaning that for a crude oil price of USD 65 per barrel on 1 March 2019, the gross exposure of investment firms was around USD 46bn on the long side and USD 23bn on the short side.

Infrastructures and services

Equity trading volumes in the EU increased in 1H19 but remained below their 2018 levels. More than a year after the entry into force of MiFID II/MiFIR, and in particular the double volume cap (DVC) mechanism, the share of dark-pool trading remained low relative to other types of trading, at around 9% of total trading. OTC trading remained important, with its share of trade increasing in 1H19 to around 30%. For CCPs, new figures show increased volumes of cleared IRDs. New CSDR guidelines were published by ESMA, and the first quarterly reports on internalised settlement activity should be sent to NCAs in 2H19. Finally, the reform of financial benchmarks continues to progress with a new set of recommendations from the industry-led working group in charge of identifying and recommending risk-free rates to be used as an alternative to current benchmarks.

Trading venues: Increased share of OTC equity trading¹²

More than a year after the entry into force of MiFID II/MiFIR on 3 January 2018, the new regulatory requirements, and in particular the double volume cap mechanism – which limits the amount of dark trading under the reference price waiver and one type of the negotiated transaction waiver – had a significant impact on trading.¹³ In 1H19, the share of **dark-pool trading** remained at relatively low levels compared to other types of trading – i.e. around 9% of the total (T.17). The share of OTC trading has been very volatile since the beginning of 2018, oscillating between 14% (in August 2018) and 31% (in March 2019).



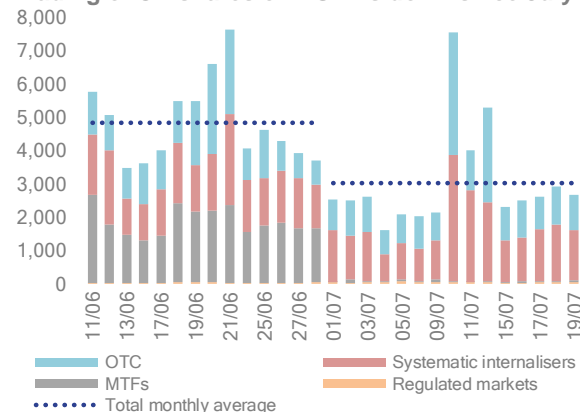
In 1H19 the share of trading occurring on lit markets (continuous trading and auctions) fluctuated between 42% in April 2019, and 50% in January 2019, and ended the semester at 45%. OTC trading increased from 21% of total volumes in January to 27% in June, with a peak of 31% in March. The share of trading on

systematic internalisers remained between 15% (March 2019) and 20% (January 2019). Finally, the share of periodic auctions more than tripled since early 2018, but only to reach 1% of total equity trading in 1H19.

T.18 MiFID II Share Trading Obligation Swiss share trading in the EU

On 30 June 2019, the equivalence decision by the European Commission enabling EU investment firms to trade on Swiss trading venues lapsed. In turn, Switzerland banned the trading of Swiss shares on EU markets, with the exception of 16 shares that were granted an exemption by the Swiss Financial Market Supervisory Authority.¹⁴

T.19 MiFID II Share Trading Obligation Trading of CH shares on EU TVs down since July



As a consequence, trading in Swiss shares on EU trading venues (TVs) all but stopped on 1 July, with the shares either delisted or suspended from all regulated markets (T.19). Trading volumes on EU venues, which averaged EUR 1.9bn

¹² For the indicators used to develop the analysis in the “Infrastructures and services” section, please see pp. 17-20 of the TRV Statistical Annex available on ESMA’s website.

¹³ See “DVC mechanism – impact on EU equity markets”, ESMA Report on Trends, Risks and Vulnerabilities, No.1, 2019, pp. 54-61.

¹⁴ See Commission Implementing Decision (EU) 2018/2047 of 20 December 2018 on the equivalence of the legal and supervisory framework applicable to stock exchanges in Switzerland; and the Swiss Federal Council “Ordinance on the recognition of foreign trading venues for the trading of equity securities of companies with registered office in Switzerland”, 30 November 2018.

per day in June, declined by 98%, with residual volumes only in the 16 shares falling under the exemption.

On 1 July 2019, volumes on SIX for the 20 shares that compose the Swiss Market Index rose by 4% compared with the previous ten days. Since then, daily volumes have increased by 25% compared with the daily average in May and June, i.e. around EUR 600mn. Trading on systematic internalisers and OTC activity failed to display any permanent increase in volumes traded. Finally, while only a few Swiss shares are listed in the US, no significant increase in volumes could be observed there. These elements suggest the absence of large migration of trading volumes from EU TVs to alternative venues or locations so far.

Trading **turnover** based on MiFID II data has thus increased in 1H19, mainly reflecting an increase in OTC trading. However, it remained lower in 1Q19 than in early 2018: Total volumes declined by around a third between 1Q18 and 1Q19. The decreasing trend of trading turnover on equity markets observed over the last few years has thus not been reversed. However, falling equity market turnover appears not to have impacted liquidity. Liquidity in equity markets remained ample during 1H19, as shown in the “Securities markets” section of this report (see p. 9).

The number of weekly **circuit-breaker** occurrences was 58 on average in 1H19, with a maximum of 103 occurrences reached in May amid higher volatility.¹⁵ Overall, the weekly number of circuit-breaker occurrences was far below 1H18 levels (135 on average) and their long-term average.¹⁶

CCPs: Impact of the clearing obligation visible

EMIR includes the obligation to centrally clear certain types of derivatives contracts. It also includes criteria to identify classes of OTC derivative contracts suitable for mandatory clearing.¹⁷ There have been recent developments in cleared volumes as well as in CCP market structure.

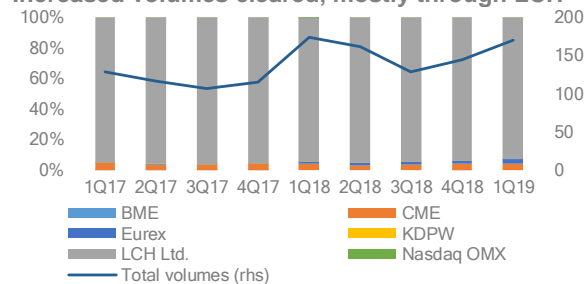
Interest rate derivatives were the first class of derivatives subject to the clearing obligation. The first phase of the clearing obligation came into force on 21 June 2016, applying to basis swaps, fixed-to-float swaps, forward rate agreements (FRAs) and overnight interest rate swaps in EUR, GBP, JPY and USD. On 9 February 2017, FRAs

and fixed-to-float denominated in NOK, PLN and SEK became subject to the clearing obligation.

T.20

Interest rate derivatives clearing

Increased volumes cleared, mostly through LCH



Note: Market share on central clearing of basis swaps, fixed-float swaps, FRAs and OIS in EUR, USD, JPY or GBP, in %. Quarterly notional volumes cleared, in EUR trillion (right axis).

Sources: Clarus Financial Technology, ESMA.

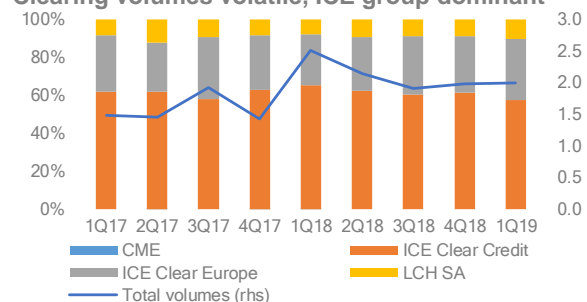
The quarterly volumes of interest rate derivatives cleared have increased during the last two years, from a low of EUR 107tn in 3Q17 to EUR 170tn in 1Q19. Most were cleared by LCH Ltd, which has a market share of between 96% (2Q17) and 92% (1Q19). CME's market share was broadly stable at just under 5% while Eurex Clearing increased its market share from 0.1% at the beginning of 2017 to 3% in 1Q19 (T.20).

For **credit derivatives**, two CDS indices are subject to the clearing obligation in the EU since 9 February 2017: iTraxx Europe and iTraxx Crossover. Cleared volumes for these derivatives have been volatile, ranging from EUR 1.4tn in 4Q17 to EUR 2.5tn in 1Q18, and stood at EUR 2.0tn in 1Q19 (T.21).

T.21

Index CDS clearing

Clearing volumes volatile, ICE group dominant



Note: Market share on central clearing of iTraxx Europe and iTraxx Crossover, in %. Quarterly notional volumes cleared, in EUR trillion (right axis).

Sources: Clarus Financial Technology, ESMA.

The clearing structure has been broadly stable, with one third-country CCP (ICE Clear Credit) clearing 58% of the total volumes cleared in 1Q19

¹⁵ Circuit breakers are trading-venue-based mechanisms designed to manage periods of high volatility by halting trading whenever the price of a security falls out of a predetermined price range; trading resumes after the securities affected are put into auction.

¹⁶ The figures on circuit-breaker occurrences on EU trading venues do not cover XETRA, Euronext or the Irish Stock Exchange.

¹⁷ Among these, the expected volume of the relevant class of OTC derivatives as well the number of CCPs clearing this asset class are key.

and two smaller ones clearing 32% for ICE Clear Europe and 10% for LCH SA. Nevertheless, two of these three CCPs are part of the same consolidated group (ICE), which brings the market share of this group to 90% of the total volume cleared for these two CDS indices.

T.22

Forthcoming changes to CCP supervision

Agreement reached on EMIR 2.2

In March 2019 an agreement was reached between the European Parliament and Member States on “EMIR 2.2”.¹⁸ The legislative text aims at strengthening the supervisory framework of CCPs that serve EU-based counterparties and trading venues.

The changes establish a Supervisory Committee within ESMA with independent members, national supervisors and central banks. It introduces an approach to the supervision of third-country CCPs based on the system of equivalence, with particular focus on third-country CCPs of systemic importance, for which ESMA also obtains additional supervisory tools. If these are insufficient, the Commission can, at ESMA’s request, decide that a CCP can only provide certain services in the EU if it becomes established in the EU.

The final text is pending final adoption by the European Parliament and the Council before publication in the EU Official Journal.

While on the clearing of **euro-denominated repos**, LCH, a key CCP in euro-repo clearing, announced in February 2019 that most of its euro-dominated repo and government debt had moved from the UK to France.¹⁹

On 3 April 2019 ESMA launched the third EU-wide CCP stress-test exercise²⁰ to assess CCP resilience to macro-economic scenarios that can have an EU-wide impact. It will cover the 16 CCPs authorised in the EU, including UK CCPs (except in case of no-deal Brexit). For this exercise, ESMA has added a concentration risk component, in addition to the assessment of credit and liquidity risks. This will be used to assess the impact of liquidation costs for concentrated positions. ESMA will also carry out analyses of CCP inter-connectedness, concentration of CCPs’ credit and liquidity exposures and a clearing member knock-on analysis. Publication of the final report and results is scheduled for 2Q20.

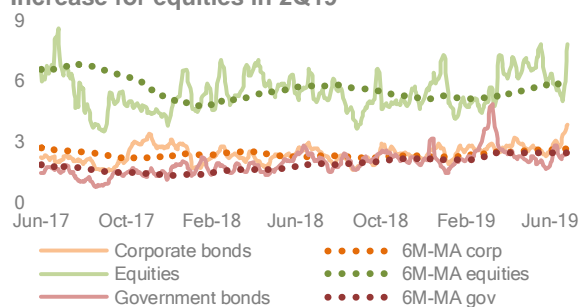
CSDs: Temporary increases in settlement fails

The level of **settlement fails** spiked temporarily at the end of March for government bonds due to large fails in one Member State while it rose generally for equities in 1H19 amid an increase in global equity prices in April and an increase in equity volatility in May (T.23).

T.23

Settlement fails

Increase for equities in 2Q19



Note: Share of failed settlement instructions in the EU, in % of value, and six-month moving averages.

Sources: National Competent Authorities, ESMA.

In terms of regulatory developments, ESMA published the official translation of its “Guidelines on internalised settlement reporting under Article 9 of CSDR” at the end of April.²¹ These reports will enable the NCAs and ESMA to monitor the trends and assess the potential risks related to this activity.

CRAs: Structured finance ratings drifted upwards

In **credit rating trends**, structured finance ratings drifted upwards in early 2019, with numbers of upgrades exceeding downgrades by up to 3% (T.24). This contrasts with other sectors where numbers of upgrades and downgrades were similar.

¹⁸ See

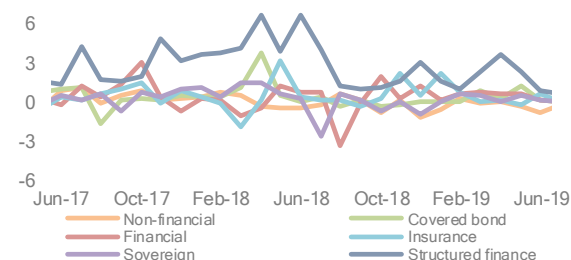
http://europa.eu/rapid/press-release_IP-19-1657_en.htm

¹⁹ See <https://www.reuters.com/article/us-britain-eu-clearing/lch-says-bulk-of-euro-repo-debt-now-cleared-in-paris-unit-idUSKCN1QA2EY>

²⁰ <https://www.esma.europa.eu/press-news/esma-news/esma-launches-third-eu-wide-ccp-stress-test-exercise>

²¹ The NCAs to which these guidelines apply must notify ESMA whether they comply or intend to comply with the guidelines by 30 June. By 12 July, settlement internalisers will have to send the NCAs the first quarterly reports on their internalised settlement activity, which will then be sent by NCAs to ESMA.

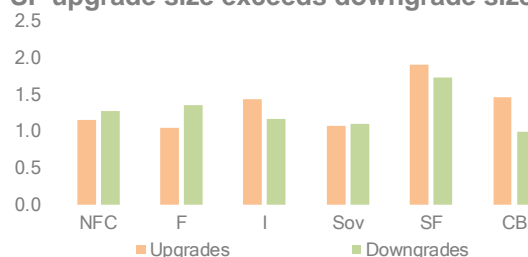
T.24
Ratings drift by sector
Structured finance ratings drifted upwards



Note: Net change in ratings from all credit rating agencies, excluding CERVED and ICAP, by asset class computed as a percentage number of upgrades minus percentage number of downgrades over number of outstanding ratings.
Sources: RADAR, ESMA.

Average upgrade size was also higher than downgrade size for structured finance products (T.25). Also, the average size of rating changes, both for upgrades and downgrades, in structured finance ratings was notably higher than for other products.

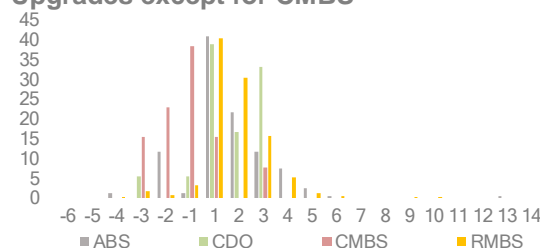
T.25
Average upgrades and downgrades sizes by sector
SF upgrade size exceeds downgrade size



Note: Average size of upgrades and downgrades, excluding CERVED and ICAP, by asset class for 1H19, in number of notches. NFC=non financials, F=financials, I=insurance, Sov=sovereign, SF=structured finance, CB=covered bonds.
Sources: RADAR, ESMA.

The distributions of structured finance rating changes also show upgrades tended to occur across all types of structured finance products, with the clear exception of commercial mortgage-backed securities (CMBS) where changes tended to be downgrades (T.26).

T.26
Distribution of structured finance rating changes 2019
Upgrades except for CMBS



Note: Distribution of rating changes on structured finance products (i.e. upgrades and downgrades) in notches. Long-term ratings only. ABS=asset-backed securities; CDO=collateralised debt obligations; CMBS=commercial mortgage-backed securities; RMBS=residential mortgage-backed securities. ABS excluding CDO, CMBS and RMBS. Data for 2019 year-to-date.
Sources: RADAR, ESMA.

The ratings growth of structured finance products in a period of otherwise steady ratings suggests the structure of these products is driving ratings growth, rather than improving credit quality in the underlying debt. Provided ratings are accurate, this reflects the benefit that structuring products can have in reducing credit risk. However, if there are weaknesses in the ways structured products are rated (model risk) then the relative ratings strength of structured finance products could be a prelude to sudden rating corrections in periods of stress.²²

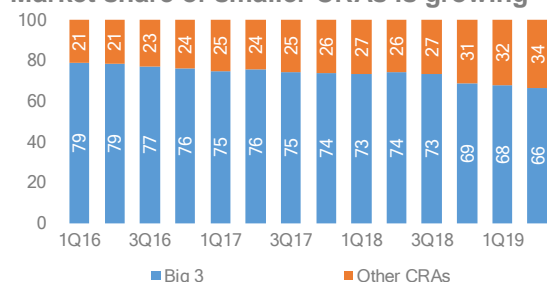
In terms of **market shares**, the big three CRAs – S&P, Moody's and Fitch – still account for most of the ratings business in the EU. They earned over 90% of the annual turnover from EU ratings business in 2018.²³ In terms of numbers of ratings, they account for well over half of all outstanding ratings. However, the share of the ratings issued by the other smaller CRAs also continues to grow. Ratings by these firms accounted for a third of all outstanding ratings in 2Q19 (T.27).

²² For a related discussion of the issues of model risk for CLOs and leveraged loans, see article (pp. 49-58).

²³ See <https://www.esma.europa.eu/sites/default/files/library/cra>

T.27

Market share of outstanding ratings

Market share of smaller CRAs is growing

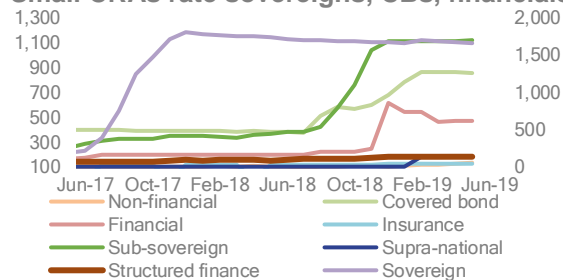
Note: Share of outstanding ratings from S&P, Moody's and Fitch, and ratings from all other CRAs, in %.

Sources: RADAR, ESMA.

The rating activity of the smaller CRAs is predominantly in the rating of sovereign, covered bonds and financials, with some recent growth also notable in covered bond ratings (T.28).

T.28

Outstanding ratings excluding the big 3 CRAs

Small CRAs rate sovereigns, CBs, financials

Note: Evolution of outstanding ratings by asset type. All CRAs excluding S&P's, Moody's and Fitch (01/07/2015=100). Sovereign on right axis.

Sources: RADAR, ESMA.

The number of EU-registered CRAs also increased. Inbonis SA, which intends to issue corporate ratings, was registered on 27 May 2019. Moody's Investor Service (MIS) EMEA was deregistered on 2 July 2019, having transferred its rating activity to other affiliated MIS CRAs based in the EU. This brings the total number of CRAs registered in the EU to 28.²⁴

T.29

CRA Regulation enforcement developments

Record fines on Fitch, Swedish bank appeal

ESMA issued record fines on several CRAs in March – totalling EUR 5,132,500. The fines were imposed on three subsidiaries of the Fitch Group (Fitch UK, Fitch France and Fitch Spain) and related to negligent failures to comply with CRA Regulation (CRAR) requirements on conflicts of interest.²⁵

Also in March, the Joint Board of Appeal of the ESAs (BoA) decided on appeals brought by four Swedish banks (Svenska Handelsbanken, SEB, Swedbank and Nordea Bank) against ESMA's July 2018 decision to fine them for negligently infringing the CRAR by issuing credit ratings without being registered. The BoA confirmed the infringements but judged the banks did not act negligently. It remitted the case to ESMA to amend its decisions.²⁶ In response ESMA dropped the fines in July.

Also, as announced in its 2019 supervision work programme,²⁷ ESMA surveyed a group of EU-registered CRAs to assess **cybersecurity risk** and defences. This showed that CRAs perceive complex and diverse cyber threats, with risks of cyber-attacks, cyber-attack vectors and threat agents. CRAs reported having business continuity plans, and administrative, technical and management controls to mitigate these risks.²⁸

Financial benchmarks: Reform in progress

As of July 2019, the number of administrators of financial benchmarks which have been authorised or registered in the EU (44) or recognised or endorsed for administrators located in a third country (3) under the **Benchmarks Regulation** (BMR)²⁹ stands at 47. The BMR sets 1 January 2020 as a deadline for EU administrators of benchmarks to apply for authorisation or registration to the relevant NCAs.

In the EA the focus is on the current EONIA and Euribor benchmarks, both administered by the European Money Markets Institute (EMMI).³⁰ The methodologies of these two rates are in the

²⁴ Four of these 28 CRAs operate as groups, with multiple registered entities, so the total number of legal entities registered as CRAs is currently 42. The list of registered and certified CRAs under CRAR is published by ESMA at <https://www.esma.europa.eu/supervision/credit-rating-agencies/risk>

²⁵ See

<https://www.esma.europa.eu/press-news/esma-news/esma-fines-fitch-€5132500-breaches-conflict-interest-requirements>

²⁶ See

<https://www.esma.europa.eu/press-news/esma-news/esas-joint-board-appeal-decides-four-appeals-under-credit-rating-agencies>

²⁷ See

https://www.esma.europa.eu/sites/default/files/library/pre_ss_release_supervision_wp.pdf

²⁸ The survey also revealed that CRAs test their controls with a range of tools: vulnerability assessments, penetration tests, audits and red-teaming tests.

²⁹ Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016.

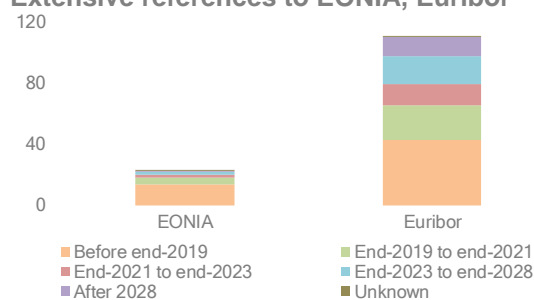
³⁰ On 6 May 2019 EMMI publicly announced that it had applied to the Belgian Financial Services and Markets Authority for authorisation.

process of evolving to ensure compliance with the BMR. Euribor is in the process of adopting a new, hybrid methodology and it has been authorised by the FSMA on 2 July. Starting in October 2019, EONIA will be calculated as €STR +8.5bps and a decision on its authorisation should take place in 4Q19.

As of the end of March 2019, there was significant referencing by outstanding derivative contracts to both EONIA and Euribor benchmark rates. Derivatives with a gross notional totalling about EUR 110tn referenced Euribor, and derivatives with gross notional of about EUR 20tn referenced EONIA (T.30).

Most of this notional was in derivatives that matured before 2022, with around 80% of the gross notional of EONIA-linked derivatives and 60% of the gross notional of Euribor-linked derivatives maturing before then.

T.30
Derivatives linked to EONIA and Euribor by maturity
Extensive references to EONIA, Euribor



Note: Gross notional amount of derivatives outstanding referencing EONIA and Euribor, by maturity date. Data as at end-March 2019, EUR tn. Sources: TRs, ESMA.

The €STR (previously ESTER) as a new euro short-term reference risk-free rate. It will begin publishing €STR by October 2019.³¹ It will be calculated entirely on actual individual transactions in euros that are reported by banks in accordance with the ECB's Money Market Statistical Reporting.³²

Until €STR is available, the ECB will publish figures referred to as pre-€STR, which market participants can use to assess the suitability of the new rate.³³

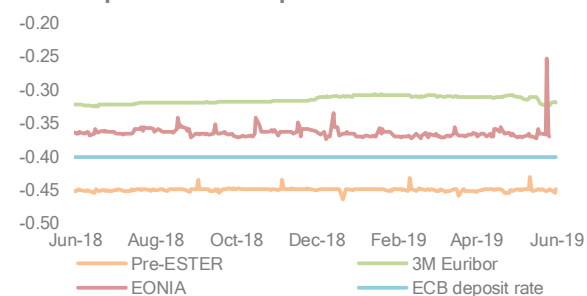
³¹ See

https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/euro_short-term_rate/html/index.en.html

³² See

https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/money_market/html/index.en.html

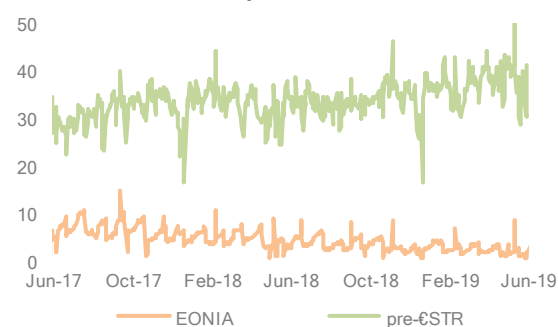
T.31
Financial benchmarks and money market rates
Stable spread between pre-€STR and EONIA



Note: Money market rates, in %. Sources: Refinitiv Datastream, ECB, ESMA.

During 1H19 the spread between pre-€STR and EONIA has been stable, ranging between 8bps and 5bps below the ECB deposit rate, except for one day where EONIA jumped following a meeting of the ECB Governing Council in which it extended its forward guidance on policy rates (T.31).

T.32
Pre-€STR and EONIA volumes
Pre-€STR volumes up-, EONIA volumes down



Note: Daily volumes, in EUR bn. Sources: ECB, ESMA.

Daily volumes of unsecured borrowing of instruments eligible for pre-€STR have increased, to EUR 37tn, while EONIA continued its decreasing trend, with daily volumes at EUR 2.7tn on average in 1H19 (compared to EUR 8tn on average in 1H17; T.32).

T.33
The euro risk-free rate industry group recommendations
Transitioning to €STR

In March 2019, the industry-led working group in charge of identifying and recommending new euro risk-free rates made a set of recommendations.³⁴

It recommended that:

³³ See

https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/shared/pdf/ecb.Pre-€STR.en.pdf

³⁴ See

https://www.ecb.europa.eu/paym/pdf/cons/euro_risk-free_rates/ecb.eoniatransitionreport201812.en.pdf

- market participants gradually replace EONIA with €STR as a reference rate for all products and contracts.
- EMMI modify the EONIA methodology to become €STR plus a fixed spread of 8.5bps until end-2021 to facilitate the transition from EONIA to €STR, with publication of EONIA stopping at the end of 2021. These recommendations were later developed by EMMI in its implementation plan for recalibrating EONIA, published on 31 May 2019.³⁵
- A methodology based on overnight index swap tradeable quotes for calculating a €STR-based forward-looking term

structure could be used as a fall back in Euribor-linked contracts.

Finally, the working group published in May the results of a consultation paper on the "EONIA to €STR legal action plan"³⁶, reaching out to market participants about the need to implement a legal action plan to ensure a smooth transition from EONIA to €STR in new and legacy contracts.

³⁵ See https://www.emmi-benchmarks.eu/assets/files/D0194C-2019%20EONIA_consultation_feedback_press_release.pdf.

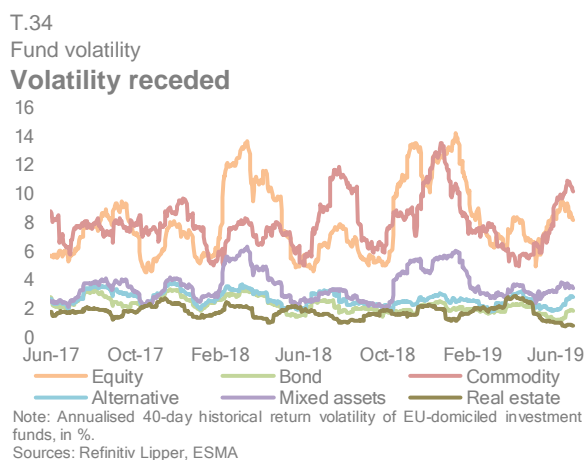
³⁶ See https://www.ecb.europa.eu/paym/pdf/cons/euro_risk-free_rates/ecb.consultation_details_201905.en.pdf

Asset management

In 1H19 funds inflows shifted from equity to bond funds, in a context of reduced risk appetite. Equity funds faced significant outflows despite the equity market recovery. In contrast, bond funds benefitted from investor flight-to-safety behaviour. ETFs recorded positive flows, driven by bond ETFs. ESMA raised its risk outlook for the asset management sector, in a context of deteriorating credit quality of the investment universe and renewed liquidity concerns following the suspension of redemptions by a large UCITS, and significant outflows affecting several funds holding illiquid exposures. Beyond UCITS, the publication of the first ESMA Annual Statistical Report on EU Alternative Investment Funds is a major step in reducing data gaps in the EU fund industry. The report shows that risks are low on average but may be concentrated in some categories of AIFs such as hedge funds using leverage or real estate funds exposed to liquidity mismatches.

Fund flows: Rebalancing between equity and bond funds³⁷

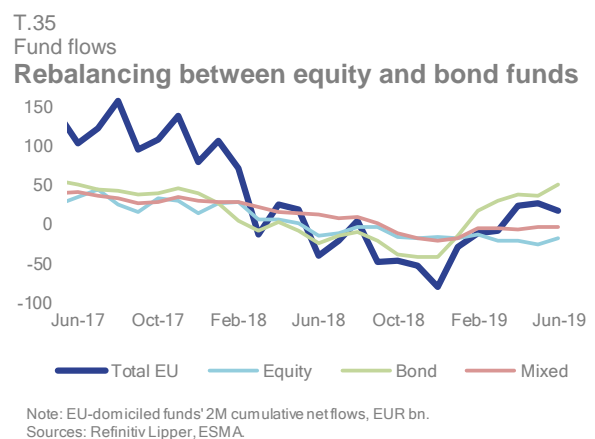
Most fund categories displayed positive but modest performance in 1H19. Equity fund average monthly returns came back into positive territory in 1H19 (0.4%), increasing by 1.1ppt (percentage point) since the end of 2018 amid equity market recovery. Commodity funds were the only category with negative performance (-0.3%). In addition, the 40-day volatility dropped markedly especially for equity funds (from 13% to 8%), but remained at a relatively high level for both equity and commodity funds (T.34).



After the large net outflows observed in 2018, EU funds experienced positive flows of EUR 28bn in 1H19 (T.35). However, there was a diverging trend between equity and fixed income funds: despite the rebound in equity markets, equity funds faced important outflows (EUR -54bn), followed by mixed funds (EUR -16bn). For equity funds especially, these were the largest outflows experienced over one semester since 2011. In contrast, bond funds experienced large inflows (EUR 100bn). They seem to have benefitted from

flight-to-safety, due to ongoing concerns about economic growth and global trade tensions. Bond funds tend to offer steadier returns, which have been on average three times less volatile than equity funds over the last two years.

The total assets under management of investment funds continued to increase in the EA, up to EUR 13.3tn in 1H19, driven by positive valuation effects related to the performance of the underlying markets.



Risk outlook: Increase amid credit quality and liquidity concerns

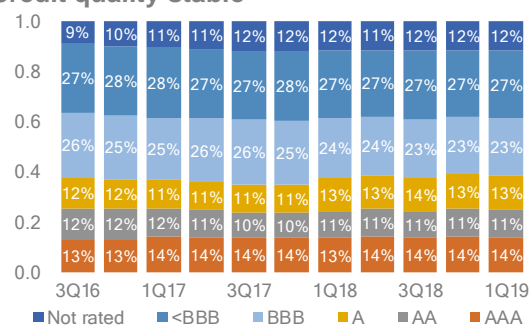
The credit quality of assets held in bond fund portfolios was stable year-on-year, with 61% of bonds rated investment grade, of which 23% were rated BBB (T.34). However, fund exposures to CLOs, bank loans and leveraged loans have raised increasing concerns due to the potential underpricing of risk by investors. The total exposures of UCITS to loans amounted to EUR 7.4bn as of the end of 2018. Most of the exposure was concentrated in a few UCITS, with the top 20 accounting for 80% of loans exposures. Regarding AIFs, their exposures to

³⁷ For the indicators used to develop the analysis in the "Asset management" section, please see pp. 21-26 of the TRV Statistical Annex available on ESMA's website.

leveraged loans amounted to EUR 71bn at the end of 2017, and exposures to CDO and CLOs to EUR 17bn, which corresponded to, respectively, 7% of the leveraged loan market and 5% of the CLO market at that time.³⁸

T.36

Bond fund portfolio rating

Credit quality stable

Note: Ratings of bonds held by EU bond funds, data in % of total assets.
Sources: Thomson Reuters Lipper, ESMA and Standard & Poor's.

The economic slowdown increases potential **credit risk** related to rating migration. In 1H19 corporate bond funds held 39% of BBB-rated bonds, the most susceptible rating category to migrate to high-yield and become so-called “fallen angels”. While the average share of BBB-rated corporate bonds downgraded to high-yield is historically below 5% per year, it peaked up to 16% during the financial crisis in 2009.³⁹ If BBB bonds were downgraded to high-yield, some investors may be forced to sell those securities if their mandate does not allow for high-yield bonds. For example, funds tracking an investment grade index may be forced to sell downgraded securities that fall out of the index. Eventually, significant sales could affect bond prices beyond fundamentals and put additional pressure on their funding conditions.

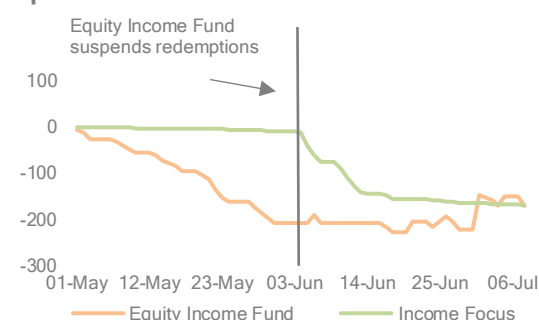
Two events affecting UCITS in June 2019 heightened **liquidity risk** concerns. First, LF Woodford Equity Income Fund, a UCITS domiciled in the UK, decided to suspend redemptions. In a context of increased outflows (EUR 2bn over the preceding twelve months), the fund faced redemption orders of 8% of its net asset value (NAV) in one day, which led it to suspending redemptions. This action was taken with the objective of protecting remaining investors. Otherwise, the fund would either have had to sell unquoted and less liquid stocks at

prices below current values, or it would have had to sell the remaining most liquid assets, leaving investors exposed to a less liquid portfolio, potentially in breach of the 10% limit on illiquid assets.

After the suspension, another fund managed by the same manager, albeit with a more liquid investment strategy, also experienced large outflows, thus pointing at a possible contagion effect (T.37). UK funds with similar investment styles (“UK Equity Income”) also saw large and sustained outflows over the preceding twelve months, totalling EUR 16bn (22% of their assets under management (AuM)). UK Equity Income funds had AuM of EUR 52bn as of the end of May 2019, against EUR 67bn a year ago.

T.37

Woodford fund net flows and redemption suspension

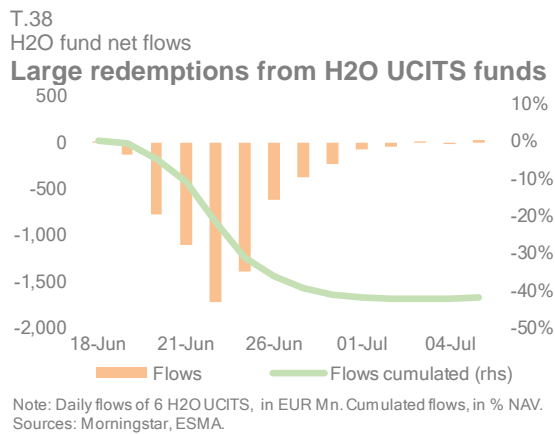
Spillover to other Woodford funds

Note: Cumulated netflows since 1 May 2019, in GBP Mn.
Sources: Morningstar, ESMA.

Second, a range of UCITS funds managed by H2O, a UK-based fund management company and part of the French Natixis Group, experienced large outflows in June, totalling 30% of NAV within one week. Cumulated outflows in June amounted to EUR 6.5bn (34% of NAV) and the funds had a combined decline in NAV of EUR 6.9bn (36%). While, as in the case of the Woodford funds, a final and comprehensive analysis of events needs to be seen, initial read-outs suggest that the large redemptions affecting H2O UCITS were not caused by poor performance as in the Woodford case, but rather by concerns over potential illiquid bonds exposures (T.38).

³⁸ See also the article on leveraged loans and CLOs (pp. 49-58).

³⁹ ESMA's central repository (CEREP) for rating activity statistics and rating performance statistics of credit rating agencies.



To mitigate the impact of redemptions on remaining investors, the asset management company announced on Monday 24 June the use of a liquidity management tool (swing pricing) on its UCITS.

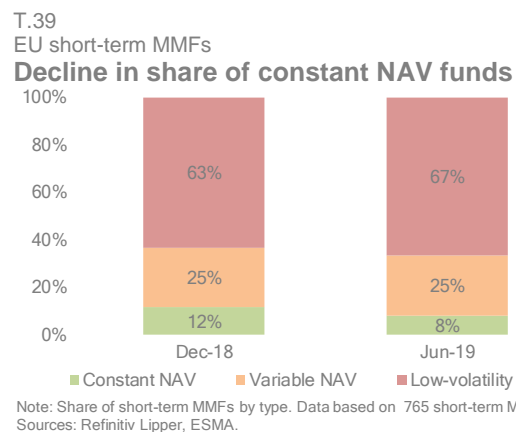
Returning to the EU fund industry as a whole, the weighted average effective **maturity** of fixed income assets slightly increased from 8.5 to 8.7 years, close to the duration of global government bond indices (8.1 years for BofA-ML index). A higher duration of the portfolio exposes funds to interest rate risk, as an increase in yields would have a larger impact on the market value of the bonds: a 100bps increase in yields would lead to losses of 8.1% of NAV, which could trigger investor outflows.

MMFs: Smooth transition to the new regime

MMFs' average monthly **returns** were slightly positive, at 0.1%. Funds denominated in USD registered better performance, with average monthly returns above 0.25% over the reporting period. MMFs denominated in USD and GBP account for 27% and 21% of the sector, respectively.

EU MMFs received positive **flows** in 1H19 (EUR 3.6bn). There was also a rebalancing between the different types of short-term MMFs following the entry into force of the new MMF Regulation.⁴⁰ These funds had until 1Q19 to opt for one of the new regulatory categories: Around two thirds of short-term MMFs opted for low

volatility NAV (LVNAV), followed by short-term variable NAV (25%) and constant NAV (8%) funds (T.39). LVNAV funds offer NAV stability but are less restricted than constant NAV funds, which are only authorised to invest in short-term public debt and accounted for less than 10% of short-term MMF assets in June 2019. Overall, short-term MMFs account for 60% of the MMF sector, while standard MMFs (which are all variable NAV) represent around 40%.



As part of the implementation of the MMF Regulation, ESMA published reporting guidelines and stress-testing guidelines.^{41,42} They will include comments received during the public consultations. The stress-testing guidelines give managers of MMFs the appropriate information on these fields to complete in the reporting template.

Alternative funds: Leverage concentrated in hedge funds

ESMA published its first statistical report on EU Alternative Investment Funds⁴³ in March 2019, providing a comprehensive market-level view of EU Alternative Investment Funds. Based on AIFMD data, the AIF industry NAV was EUR 4.9tn at the end of 2017 and includes all alternative funds managed by EU managers. While funds of funds accounted for 16% of the NAV of EU AIFs and real estate for 11%, the majority of AIFs (63% in terms of NAV) belonged to a range of diverse strategies, with fixed income and equity strategies accounting for 44% of the NAV. The report shows that the use of leverage

⁴⁰ Regulation (EU) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds.

⁴¹ See <https://www.esma.europa.eu/press-news/esma-news/esma-readies-stress-testing-requirements-money-market-funds>

⁴² See <https://www.esma.europa.eu/press-news/esma-news/esma-consults-stress-testing-rules-money-market-funds>

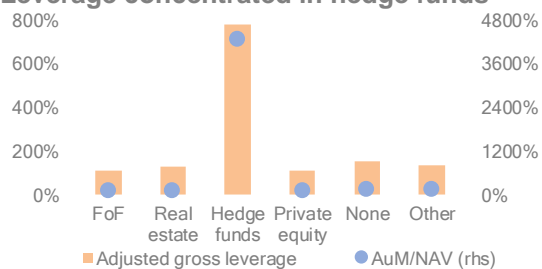
⁴³ ESMA Annual Statistical Report, EU Alternative Investment funds, 2019.

by AIFs is limited, with the notable exception of hedge funds. There are signs of potential liquidity risks at short-term horizons, especially in real estate funds, as the liquidity offered to investors is greater than the liquidity of their assets. Hedge funds registered under AIFMD are substantially leveraged, up to 7.8 times their NAV for some strategies reliant on derivatives (T.40).

T.40

AIF leverage

Leverage concentrated in hedge funds



Note: Adjusted gross leverage of AIFs managed and/or marketed by authorised EU AIFMs, end of 2017, in % of NAV. Adjusted gross leverage does not include IRDs. FoF= Fund of Funds; None=No predominant type. Data for 24 EEA countries. Sources: AIFMD database, National Competent Authorities, ESMA.

Hedge funds domiciled in the EA represented EUR 564bn of assets under management in 1H19 (+7.8%) based on ECB data. Contrary to AIFMD, ECB data include UCITS hedge funds, but not alternative funds domiciled outside of the EA. UCITS hedge funds especially are subject to leverage or value-at-risk limits. Overall, in 1H19 the financial leverage measured as the ratio between AuM and NAV was 1.33 in the EA.

ETFs: Continuous growth amid financial stability concerns

ETF performance was close to equity fund performance in 1H19 (0.6%). As for other investment fund types, **inflows** (EUR 31.2bn) were driven by bond ETFs (EUR 22.9bn) although flows in equity ETFs remained positive over the reporting period (EUR 7.4bn).

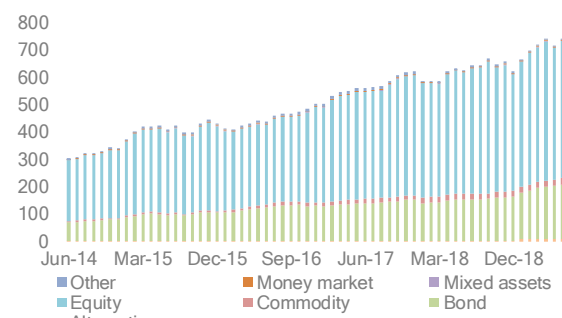
EU ETFs had EUR 741bn of **assets under management** in 1H19, of which 68% were equity and 27% were bond ETFs. Within the equity ETF category, investors prefer US and global equity over EU equity.⁴⁴ Other assets are marginal, with

commodity ETFs amounting to only 3% of the sector (T.41).

T.41

ETF NAV by asset type

Equities represent the main asset type



Note: NAV of EU ETFs by asset type, EUR bn. Sources: Refinitiv Lipper, ESMA.

The growth of the ETF market, by 156% in five years at the global level (EUR 4.2tn), as well as concerns over liquidity risks and interconnectedness with the banking sector and investment firms through the use of “authorised participants” (APs), makes it relevant from a financial stability perspective. The IOSCO is collaborating with the FSB to assess potential **financial stability risks** arising from ETFs. Concerns focus on the resilience of the arbitrage mechanism and the risk that the APs, which ensure the liquidity of the ETF market, withdraw during a market crisis as they are not legally obliged to carry out this function. Another concern for regulators is whether ETFs have the potential to exacerbate broader liquidity problems in underlying markets, especially when ETFs invest in less liquid assets, by creating demand for assets that cannot easily be traded. Indeed, the ETF mechanism can in theory be used to replicate any type of asset. In the US the Securities and Exchange Commission delayed ruling on bitcoin ETFs until summer 2019 at the earliest.⁴⁵ In particular, the US regulator wants to make sure that the price of the underlying is free from market manipulation.

⁴⁴ See

<https://www.iosco.org/library/pubdocs/pdf/IOSCOPD625.pdf>

⁴⁵ See

<https://www.sec.gov/rules/sro/cboebzx/2019/34-85896.pdf>

Retail investors

Retail investors saw a recovery in returns in 1H19 following losses in 4Q18. Retail flows into equities and equity investment funds were lower in 4Q18, despite buoyant disposable income and a flat household investment rate, amid worsening sentiment regarding equity markets among EA households and negative performance of EU equity markets. Costs for retail investors in UCITS rose in 1H19, especially for MMFs. Investor complaints reported directly to NCAs remained below the five-year average in 1Q19.

Investment resources available to households⁴⁶

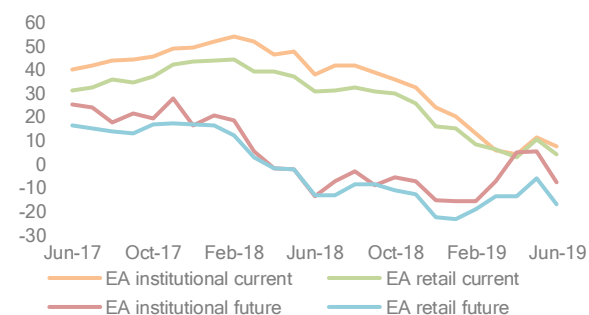
The annual growth rate of **disposable income** in EA countries was 2.3% in 1Q19, lower than in 4Q18 when it was 3.1%, yet in line with the five-year average of 2.3%.

The household **savings ratio** was 12.3% in 1Q19, slightly up from the 11.9% of the previous quarter and above its five-year average of 12%. The **investment rate** was just above 9%, continuing its growth that started in early 2016 and reaching its highest value since 2011.

EU households held around EUR 34.4tn of financial assets in 4Q18, versus EUR 11tn of financial liabilities. Values of liabilities slightly grew while financial assets decreased significantly in 4Q18, in line with market performance. This implied a decrease in the **household asset-to-liability ratio** during 4Q18.

Investor sentiment of current market performance worsened markedly over 2018 and 1H19. Sentiment over a ten-year horizon declined throughout 2018 but recovered somewhat in 1Q19, to then decline again in 2Q19 (T.42). The mismatch between current and future expectations, though narrowing for retail investors and disappearing for institutional investors in 1Q19, may be explained in part by relatively high valuations in asset markets. Greater uncertainty on economic developments may also be a driver of the deterioration in current sentiment, as reflected in increased implied volatilities in 4Q18.

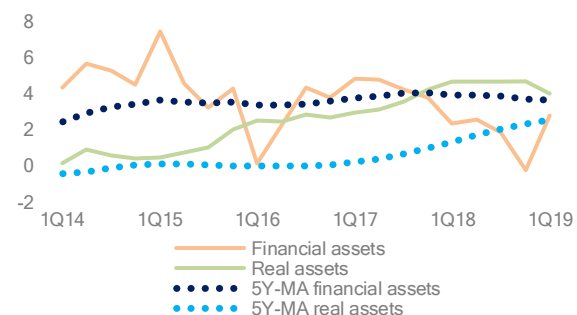
T.42
Investor sentiment
Current and future sentiment declining



Note: Sentix Sentiment Indicators for Euro Area private and current institutional investors on a 10Y horizon. The zero benchmark is a risk-neutral position. Sources: Refinitiv Datastream, ESMA.

Following underlying market trends, **financial assets held by EA households**, grew by 2.8% in 1Q19. In the same period real assets grew at annualised rates of around 4% in 1Q19, significantly above its five-year average of around 2%, reflecting positive valuation effects in housing markets (T.43).

T.43
Asset growth
Increasing real asset growth



Note: Annualised growth rate of EA-19 households' real and financial assets, in %. 5Y-MA=five-year moving average of the growth rate. Sources: ECB, ESMA.

Asset allocation by retail investors

In terms of stock of **household financial assets** by asset class, currency and deposits stayed at around 31% of total financial assets, against 8%,

⁴⁶ For the indicators used to develop the analysis in the "Retail investors" section, please see pp. 27-29 of the TRV Statistical Annex available on ESMA's website.

17% and 18% respectively for investment fund shares, equity and insurance (T.44).

T.44

EU household financial assets by asset class

Stock holdings twice as large as fund shares

	Net holdings	Share of total
Currency and deposits	10.7	31%
Debt securities	0.6	2%
Equities	5.9	17%
Insurance	6.2	18%
Investment funds	2.6	8%
Pension funds	7.2	21%
Others	1.0	3%
Total	34.4	100%

Note: Figures for end of 2018. Totals may not sum due to rounding. Net holdings in EUR tn.

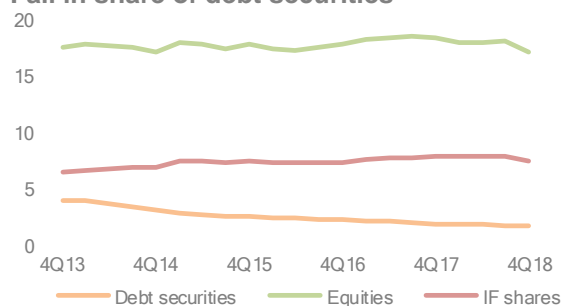
Sources: Eurostat, ESMA.

The shares of retail holdings in equities and investment funds has remained stable over recent years, despite record-low interest rates. The share of debt securities has fallen over the same period to reach 2% of total assets in 2018 (T.45). However, there is a high degree of heterogeneity in household investment patterns between Member States.

T.45

Securities investments share in household financial assets

Fall in share of debt securities



Note: Debt securities, equity and IF shares as a share of total household financial assets, %. IF shares=investmentfund shares.

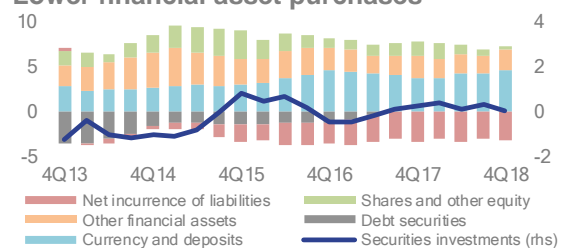
Sources: Eurostat, ESMA

Asset growth reflects both valuation effects and **net financial asset acquisitions** by investors. Examining the latter in more detail gives further insight into allocation decisions. The distribution of the stock of assets across classes is broadly stable. In 2018, equity acquisitions accounted for 1% of household disposable income on average, versus 4% for currency and deposits (T.46). In contrast, the share of debt securities in household financial assets was close to zero.

T.46

Net financial asset acquisition by type

Lower financial asset purchases



Note: Net incurrence of liabilities and securities investments for households in the euro area, % of disposable income. Other Financial Assets = Insurance technical reserves, financial derivatives, loans granted and other accounts receivable; Securities investments = Net acquisition of shares, other equity and debt securities.

Sources: Eurostat, ESMA

In addition to market developments and investor sentiment, other factors may impact investor trends and decision-making as recent academic research, both empirical and theoretical, suggests (Box T.47). Market developments may have uneven effects on retail investors depending on demographic characteristics such as age.

T.47

Retail investor behaviour

Drivers of retail investment strategies

A topic recently examined by Betermier, Calvet and Sodini (2017) is the drivers of 'growth' versus 'value' investing among households.⁴⁷ 'Value' stocks are equities that have low prices relative to fundamentals such as earnings and dividends, while 'growth' stocks are relatively highly priced due to higher market expectations of future growth in fundamentals. Empirical evidence suggests that on average, value stocks outperform growth stocks. A long-standing debate in the literature is whether this value premium is attributable to sources of risk other than market price risk. For example, Campbell and Vuolteenaho (2004) provide empirical evidence that value stocks tend to be more sensitive to news about future cash flows than growth stocks are.⁴⁸ The alternative view is that the value premium is primarily sentiment-driven, indicating significant market inefficiency.

Betermier, Calvet and Sodini study a randomly-sampled panel of around 70,000 Swedish households observed annually between 1999 and 2007, together with equity price data used to calculate the value premium for reported household stockholdings via a four-factor model. The calculations imply a 'value loading' for each household, i.e. the extent to which the household is invested in value stocks.

The authors find that value-loading increases with age, leading to older investors receiving around 5ppt higher annual returns than younger investors. The findings support intertemporal hedging explanations offered in the theoretical literature, such as in Jurek and Viceira (2011),⁴⁹ assuming findings by Campbell and Vuolteenaho that value stocks are more sensitive to news relevant to future cash flows.

Compared to growth investors, Betermier, Calvet and Sodini find that value investors are not only older but tend to have higher financial and real estate wealth, lower leverage and lower income risk, and are more likely to be female. Furthermore, employment in sectors with high macroeconomic sensitivity is a predictor of value investing, consistent with the hypothesis that younger investors have a strong motive to hedge against future income risk.

These findings have implications for monitoring retail risks and trends. For example, monitoring indices based on equity investment strategies (such as growth versus value investing) may yield insight into how market developments impact household differently by characteristics. Likewise, the research highlights an important caveat when interpreting indicators of retail portfolio performance, namely that average returns among investors generally may differ significantly from returns averaged over, for example, investors within a certain age cohort.

UCITS costs and performance

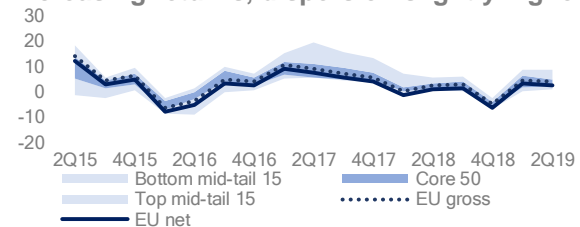
Annual **gross returns** for EU UCITS, reported on a quarterly basis, followed underlying market developments, turning negative in 4Q18, at around -5% across asset classes. They recovered in 1H19 – again in line with market trends – to just above 4% in 2Q19. Annual **net returns**, equal to gross returns minus ongoing

costs, subscription and redemption fees,⁵⁰ were consequently also negative in 4Q18 (lower than -5%) but turned positive in 2Q19 (below 3%) (T.48). Return dispersion, despite increasing from the end of 2018, remained low.

T.48

Net returns of UCITS funds

Increasing returns, dispersion slightly higher



Note: Net returns of UCITS, retail investors, adjusted for total expense ratio and load fees, in %. Distribution represents selected EU markets. Top mid-tail 15=distribution between the 75th and 90th percentile. Bottom mid-tail 15=distribution between the 10th and 25th percentile.
Sources: Refinitiv Lipper, ESMA.

Confirming the findings of the ESMA annual statistical report on performance and costs, gross returns are more volatile than costs. Costs tend to remain broadly constant or change only slightly over time. This impacts net returns: the lower the gross performance, the higher the impact of costs. Moreover, retail investors incur higher costs than institutional investors, with net annual returns on average lower across asset classes. In 1H19 net annual performance was around 0.6ppt lower than gross annual performance for institutional investors, while it was 1.5ppt lower for retail investors. This is in line with institutional investors having better information and potentially benefiting from economies of scale.

Total costs (ongoing costs, subscription and redemption fees), measured by the difference between gross and net annual returns, increased for all asset classes in 1H19 (T.49). For MMFs, even if very small in terms of market size for retail investors, the increase of the costs has been notable, at 0.6ppt in 2Q19 versus below 0.3ppt one year ago. Most of this increase seems to come from higher subscription fees. Alternative UCITS had the highest costs, around 1.8ppt. For equity and mixed funds costs were above 1.7ppt. Consistent with ESMA's annual statistical report, costs are higher for retail than institutional investors: for example, for equity UCITS costs

⁴⁷ Betermier, S., Calvet, L. and Sodini, P. (2017), "Who are the value and growth investors", *Journal of Finance*, Vol. 72, No.1, pp. 5-46.

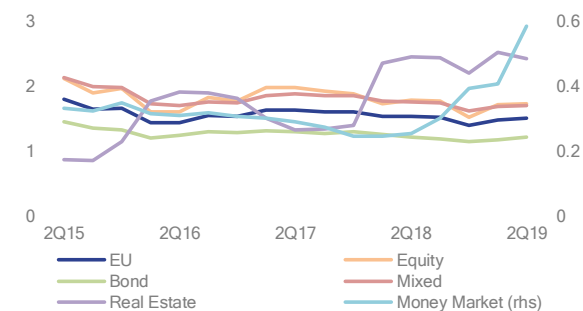
⁴⁸ Campbell, J. Y. and Vuolteenaho, T. (2004), "Bad beta, good beta", *The American Economic Review*, Vol. 94, No.5, pp. 1249-1275.

⁴⁹ Jurek, J. W. and Viceira, L., M. (2011), "Optimal value and growth tilts in long-horizon portfolios", *Review of Finance*, Vol.15, No.1, pp. 29-74.

⁵⁰ For more details on definitions and calculation of annual performance and costs see ESMA Annual Statistical Report – Performance and costs of retail investment products in the EU, January 2019.

are above 1.7ppt for retail and just above 0.9ppt for institutional investors.

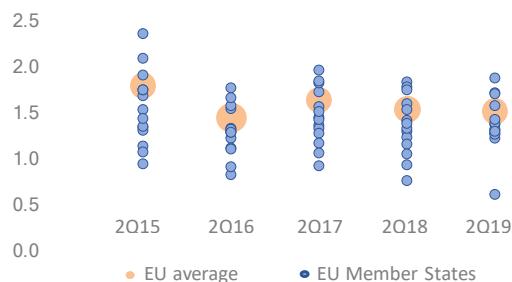
T.49
Total costs for UCITS by asset class
Higher in 1H19, especially for MMFs



Note: Total costs (ongoing costs, subscription and redemption fees) of UCITS funds, computed as the difference between gross and net returns, retail investors, %.
Sources: Refinitiv Lipper, ESMA.

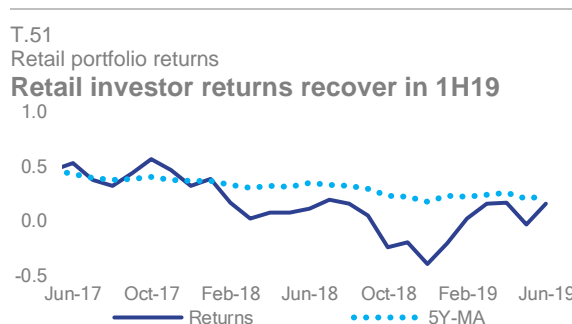
At the end of 2Q19, cost dispersion was generally lower compared to previous years. Total cost levels were concentrated between 1% and 1.5%, with fewer Member States significantly above these levels and one Member State with significantly lower cost levels (T.50).

T.50
Dispersion in the absolute costs across countries
Overall lower dispersion



Note: Dispersion of total costs (ongoing costs, subscription and redemption fees) of UCITS funds, computed as the difference between gross and net returns, retail investors, %.
Sources: Refinitiv Lipper, ESMA.

Retail investor **portfolio returns** recovered to just below 0.2% as of June 2019, close to their five-year average (T.51). This recovery in returns, from -4% in 4Q18, mirrors the recovery in equity valuations over 1H19.



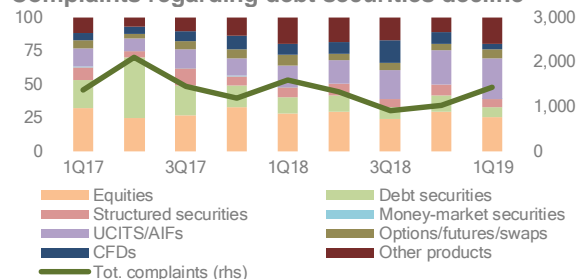
Note: Annual average gross returns for a stylised household portfolio, in %. Asset weights, computed using ECB Financial Accounts by Institutional Sectors, are 37% for collective investment schemes (of which 12% mutual funds and 25% insurance and pension funds), 31% for deposits, 22% for equity, 7% debt securities and 3% for other assets. Costs, fees and other charges incurred for buying, holding or selling these instruments are not taken into account.
Sources: Refinitiv Datastream, Refinitiv Lipper, ECB, ESMA.

Investor complaints

The overall number of **consumer complaints** made to NCAs rose in 1Q19, the highest level in a year. Interpretation of the trends requires comparison with events from the past few years. In particular, 1H16 had seen a spike in aggregate complaints, attributable to underlying issues in relation to contracts for differences (CFDs) and binary options in 2015 – complaints being a lagging indicator – and issues around bank resolutions.

The two primary **causes of complaints** filed with NCAs in 1Q19 were the execution of orders (33%) and unauthorised business (14%). The execution of orders has been a leading cause of complaint since 2016. Complaints relating to investment advice, which had been the second-most common cause in 2017, were lower in much of 2018 and in 1Q19. One reason for this trend was a spike in complaints recorded with one NCA in 2H17 about the provision of advice concerning certain investment vehicles.

T.52
Complaints filed directly with NCAs, by instrument
Complaints regarding debt securities decline



Note: Complaints reported directly to 17 NCAs: AT, BG, CY, CZ, DE, DK, EE, ES, HR, HU, IT, LT, LU, MT, PT, RO, SI. Line shows total number of these complaints. Bars show % of total volume by type of financial instrument. CFDs=Contracts for Differences.
Source: ESMA complaints database.

Regarding the **type of financial instrument** cited in complaints, the proportion of complaints referring to debt securities fell substantially over the last two years, at 7% in 1Q19 compared with

46% in 2Q17 (T.52). This trend was driven by firm credit events and bank resolutions in more than one country that had previously led to complaints.

Products and innovation

The announcement to issue LIBRA as a new crypto-currency has revived market interest in initial coin offerings and crypto-assets, and new applications of distributed ledger technology, including the tokenisation of assets, continue to develop. The increasing adoption of artificial intelligence (AI) and use of big data in financial markets is likely to reduce costs for firms and investors. However, firms and authorities will need to be alert to potential sources of bias around the use of AI-based tools and consider issues of transparency, explicability, fairness and accountability in various applications of the technology. Following the ESAs' review, ESMA started monitoring trends in sustainable finance, starting with ESG equity performance and green bond markets in the EU.

Key innovative areas⁵¹

T.53

Financial innovation scoreboard

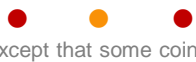
Innovation



CAs

IP: mostly outside of the regulated space and extreme price volatility. FS: comparatively small in size but requires monitoring. MI: most CA trading platforms are unregulated and are therefore prone to market manipulation and operational flaws.

ICOs



IP, FS, MI: similar to CAs above, except that some coins or tokens issued through ICOs have rights attached, e.g. profit rights, meaning that they could be less speculative over time. In addition, ICOs could provide a useful alternative source of funding.

DLT



IP: no major risks and has the potential to improve outcomes for consumers. FS: applications are still limited in scope, but scalability, interoperability and cyber resilience challenges will require monitoring as DLT develops. MI: anonymity and potential significant governance and privacy issues.

Crowdfunding



IP: the projects funded have an inherently high rate of failure. FS: no particular risk at this point. In addition, crowdfunding improves access to funding for start-ups and other small businesses. MI: the relative anonymity of investing through a crowdfunding platform may increase the potential for fraud.

RegTech/SupTech



IP, FS, MI: the widespread adoption of RegTech/SupTech may reduce certain risks. For example, the use of machine learning tools to monitor potential market abuse practices has the potential to promote market integrity.

AI and big data



IP: the increasing adoption of AI and big data helps financial services companies to be more efficient and therefore may lead to cost reductions for investors. Operational risks are present, as are risks around explicability of AI-based recommendations, strategies and analysis. FS: not of systemic importance at present. MI: may be used for SupTech tools, though effectiveness depends on quality of underlying data.

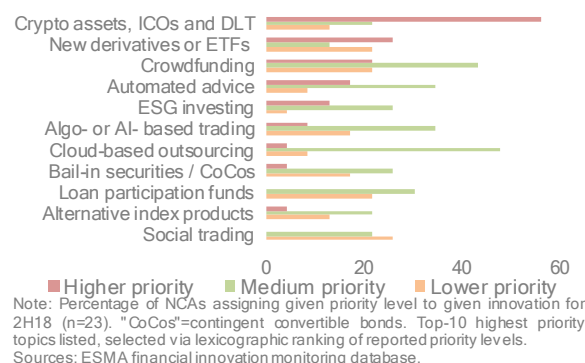
Note: Assessment of the risk financial innovation poses to investor protection (IP), financial stability (FS) and market integrity (MI). Green=low risk, yellow=elevated risk, orange=high risk, red=very high risk.

ESMA has been closely monitoring developments in relation to DLT, including CAs,

ICOs and tokenisation of assets (TA), in line with monitoring priorities reported by many NCAs (T.54). Crowdfunding and cloud-based outsourcing were other key areas of focus in 2H18 for most NCAs. Many NCAs also paid close attention to new derivatives or ETFs, ESG investing and automated advice.

T.54

Monitoring of financial innovation by NCAs in 2H18
Focus on CAs, ICOs, DLT and TA



Compared with the previous six months, NCA innovation monitoring priorities in 2H18 were fairly stable, although certain topics such as crowdfunding and new derivatives or ETFs received slightly more emphasis for monitoring purposes (T.55).

⁵¹ For the indicators used to develop the analysis in the "Products and innovation" section, please see pp. 30-31

of the TRV Statistical Annex available on ESMA's website.

T.55

Changes in NCA innovation monitoring

Diverse prioritisation among NCAs

Market developments

T.56

European Commission FinTech Action Plan

ESMA delivers on FinTech Action Plan

On 8 March 2018, the European Commission launched its FinTech Action Plan, for a more competitive and innovative financial sector in the EU.⁵² The Action Plan set out targeted initiatives for the EU to embrace digitalisation of the financial sector, including several deliverables for ESMA.

One initiative in the Action Plan focused on how to achieve clear and consistent **FinTech licensing requirements**, enabling innovative business models to scale up across the EU. To support this objective, ESMA has published a Report⁵³ to the Commission summarising the licensing regimes of EU FinTech firms and identifying potential gaps and issues in the existing EU regulatory framework. The Report also stresses the link between the FinTech licensing regime and innovation facilitators and confirms that cyber security risks underlining FinTech business models call for provisions addressing these risks at the EU level.

A related aim of the Action Plan was to facilitate the emergence of innovative business models across the EU through innovation facilitators. On 9 January 2019, ESMA and the other ESAs published a joint **Report on regulatory sandboxes and innovation hubs**.⁵⁴ The Report provides a comparative analysis of innovation facilitators in Europe, focusing on two types of innovation facilitators: 'innovation hubs' and 'regulatory sandboxes', and sets out best practices regarding the design and operation of innovation facilitators.

Another key ESMA deliverable as part of the Action Plan was an assessment of the suitability of the current EU regulatory framework with regard to ICOs and CAs more generally. On 9 January 2019, ESMA published its **Advice to the EU Institutions on ICOs and CAs**.⁵⁵ The Advice clarifies the existing EU rules applicable to CAs that qualify as financial instruments and provides ESMA's position on gaps and

issues in the current EU financial regulatory framework for consideration by EU policymakers.

The Action Plan called for ESMA to assess the need for guidelines on **cloud-based outsourcing**. ESMA believes that such guidelines would help ensure clear supervisory expectations and plans to start work on such guidelines later in 2019.

The Action Plan also focused on the important topic of **cybersecurity in the EU financial sector**. Reflecting the cross-sectoral nature of cyber threats and the need for a consistent approach, the ESAs published two pieces of joint Advice to the Commission on 10 April 2019. ESMA's work in this area was informed by a mapping exercise of its NCAs carried out in 2018. One piece of Advice proposes legislative improvements relating to ICT risk management requirements in the EU financial sector, guided by the objective that every relevant entity should be subject to clear general requirements on governance of ICT, including cybersecurity. The other Advice examines the case for a coherent cyber resilience testing framework for significant market participants and infrastructures within the EU financial sector. The ESAs see clear benefits of such a framework, but more work is first needed to achieve a sufficient, proportionate level of resilience among regulated entities.

Crypto-assets

Following the publication of its Advice⁵⁶ to the EU Institutions in January 2019, ESMA continues to closely monitor developments for CAs and ICOs.

The **market capitalisation** of CAs is on the rise since the beginning of 2019 but remains well below its peak of January 2018. As of the end of June 2019, it stood at EUR 290bn globally, to be compared with EUR 700bn in January 2018. While the number of CAs now exceeds 2,000 globally, a small group of virtual currencies comprise most of the market capitalisation. Bitcoin continues to take the largest market share at more than 60%. Ether and Ripple's coin come second and third, with a market share that fluctuates between 5% and 10% for both.

Both Bitcoin and Ether have had a strong performance in 2019, with prices more than doubling between January 2019 and June 2019. However, the sharp price correction that both suffered between late 2017 and early 2018 means that they remain below their peaks. Bitcoin currently trades at two thirds of its

⁵² Communication from the Commission to the European Parliament, the Council, the European Central Bank, The European Economic and Social Committee and the Committee of the Regions FinTech Action plan: For a more competitive and innovative European financial sector. COM/2018/0109 final.

⁵³ See https://www.esma.europa.eu/sites/default/files/library/esma50-164-2430_licensing_of_fintech.pdf

⁵⁴ Joint Committee of the ESAs, 2019, "FinTech: Regulatory sandboxes and innovation hubs":

<https://eiopa.europa.eu/Publications/Reports/JC%202018%2074%20Joint%20Report%20on%20Regulatory%20Sandboxes%20and%20Innovation%20Hubs.pdf>

⁵⁵ ESMA, 2019, "Advice on initial coin offerings and crypto-assets":

<https://www.esma.europa.eu/press-news/esma-news/crypto-assets-need-common-eu-wide-approach-ensure-investor-protection>

⁵⁶ ESMA, 2019, "Advice on initial coin offerings and crypto-assets":

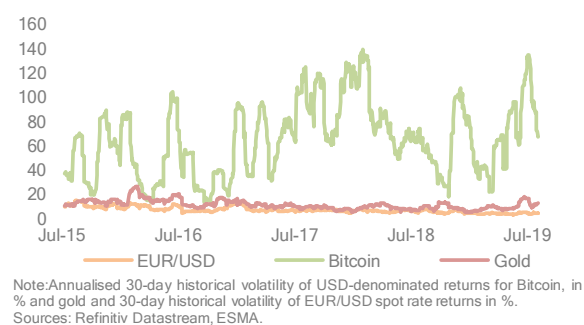
<https://www.esma.europa.eu/press-news/esma-news/crypto-assets-need-common-eu-wide-approach-ensure-investor-protection>

historical peak. The current price of Ether is at a quarter of its high point (T.57).



The volatility of CAs shows no signs of abating. Shallow liquidity and speculative behaviour from investors in a mostly unregulated market drive sharp price movements. By way of comparison, the volatility of CAs is considerably higher than that of commodities or currencies (T.58). Since January 2018, the Bitcoin average 30-day rolling volatility has oscillated between 20% and 140%. In comparison, the volatility of gold reached a maximum of 60% in October 2008 during the financial crisis and has remained quite stable at around 10% since then.

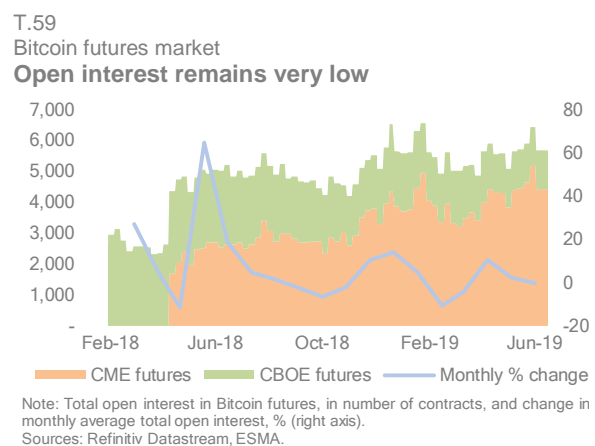
T.58
Crypto-asset price volatility
Extreme volatility compared with gold or FX



Stablecoins, a specific category of CAs, have recently attracted growing interest from DLT supporters for their capacity to possibly facilitate cross-border money transfers and on-chain

settlement. Stablecoins effectively aim at maintaining the benefits of decentralization while providing price stability. There are now more than 50 stablecoins outstanding, of which about a half are active. Tether, which was the first stablecoin to be issued in 2014, is the largest in size with a market capitalisation of almost USD 3bn. Circle's stablecoin (USDC) is the second largest, with a market capitalisation of around USD 350mn.

The Chicago Board Options Exchange (CBOE) and CME launched cash-settled **futures contracts** on Bitcoin in December 2017.⁵⁷ Volumes remain very small at this point, with open interest at around 7,000 contracts in June 2019 (T.59). CBOE announced that it would not add a contract for trading in March, meaning that after the last currently traded futures expire in June, this market will essentially come to a halt at CBOE.



With CAs, another important source of risk for investors, beyond extreme price volatility, lies with the safekeeping of assets and private keys. **CA trading platforms** acting as custodial wallet providers are particularly vulnerable to cyber-attacks. From 2011 to 2018, cyber-attacks on CA platforms have resulted in at least EUR 2.9bn in losses globally.⁵⁸ More recently, on 7 May 2019, Binance said that it had suffered a large-scale security breach.⁵⁹ Decentralised platforms are partially mitigating the risk of severe losses through hacks, as users keep control of their private keys. However, processing transactions

⁵⁷ Intercontinental Exchange, a parent of the New York Stock Exchange, originally planned to list physically-settled Bitcoin futures contracts through a newly formed crypto-currency start-up in December 2018. The launch, which was subsequently deferred, is now expected by July 2019. Yet, it still awaits the Commodity Futures Trading Commission's approval:

<https://www.wsj.com/articles/bitcoin-futures-launch-hits-regulatory-snaag-11553204037>

⁵⁸ Landau, J. P. and Genais, A. (2018), "Les cryptomonnaies", Rapport au Ministre de l'Economie et Des Finances.

⁵⁹ Hackers stole the equivalent of around EUR 36m in BTC 2,000 from Binance's hot wallets, representing around 2% of their total BTC holdings. Binance stated that they would compensate clients on their own funds.

<https://www.binance.com/en/support/>

on decentralised platforms raises other challenges, for example scalability, and governance issues, including from a regulatory standpoint.

CAs do not pose material risks to financial stability at this point, considering their small size. However, global regulators acknowledge the need for a coordinated international-level response, because of the specific challenges that CAs raise and their cross-border nature. Following on from their 2018 report,⁶⁰ the FSB published a crypto-assets regulators directory in April 2019.⁶¹

The latest key CA development is launch of the Libra project by Facebook on 18 June 2019. Box T.60 describes the key features and risks of Libra.

T.60

Crypto-currencies

Facebook's LIBRA project

On 18 June 2019, Facebook formally launched the Libra project and published a set of White Papers outlining the initiative. Given the 2.4 billion users of Facebook, the launch attracted global attention. It also immediately attracted the attention of central banks and regulators who raised investor protection, financial stability and market integrity concerns. Among those publicly weighing in were the Financial Stability Board, the US Federal Reserve, and the Bank of England, Bundesbank and Banque de France. The very day of the launch, the G7 announced the formation of a high-level forum, to be led by Benoit Coeure from the ECB's Executive Board, to examine the risks stablecoins, including Facebook's planned Libra, posed to the financial system.

Libra is made up of the following elements that will work together:

- The Libra stable coin is built on the permissioned Libra blockchain. The initial processing and validating nodes will be the members of the Libra Association. The coin is expected to be a more efficient and less costly means of allowing transactions for remittances and payments for people with limited access to banking services when compared to traditional payment alternatives. An additional potential area of focus is the e-commerce market, dispersing money in a different place, to reduce cost and increase speed.
- Libra is fully backed by a reserve of real assets. A basket of bank deposits and short-term government securities will be held in the Libra Reserve for every Libra that is created. The value of the stablecoin will be backed by a basket of fiat currencies and low risk securities such as government debt. The exact proportion has yet to be determined. The goal of the basket is to reduce volatility to a minimum to avoid the variance of non-pegged tokens, such as Bitcoin.
- Libra is governed by the independent not-for-profit Libra Association, based in Geneva. There are currently 28

members of the association expected to grow to around 100 in 1H20. The association is governed by the Libra Association Council, which is comprised of one representative per validator node. Together, they make decisions on the governance of the network and reserve. Calibra, a Facebook US-headquartered entity, is one of the founding members of the association.

At this stage, there remain too many unanswered questions related to the structure of Libra to have a precise risk assessment and potential regulatory response. ESMA will monitor developments and agree to a course of action with other EU and national authorities in the future, as appropriate.

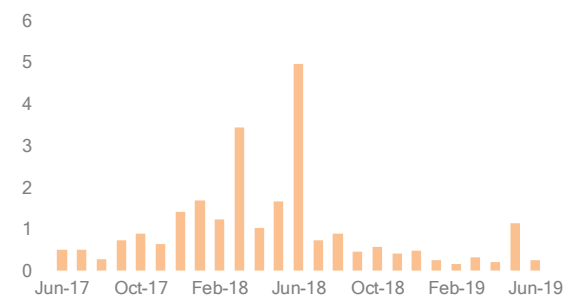
Initial coin offerings

The equivalent of around EUR 0.8bn were raised through ICOs in 1Q19, in comparison with around EUR 8.6bn in 1Q18, i.e. a tenfold decrease year on year. 2018 was a record year for ICOs with a total of EUR 17bn raised. Notably, almost 90% of the volumes raised in 2018 were collected in the first half of the year, meaning that ICO volumes have materially fallen and stayed at comparatively low volumes since mid-2018. However, May 2019 saw a spike in ICO volumes to EUR 1.1 bn, largely explained by the ICO of the crypto-currency exchange Bitfinex, which raised EUR 0.9 bn (T.61).⁶² Data about ICO volumes need to be taken with caution in the absence of extensive and reliable sources.

T.61

ICO issuances

Uptick in May ICO volumes to 2018 levels



Note: Global monthly volumes raised in ICOs expressed in EUR bn.
Sources: Coinschedule.com, ESMA.

ICOs vary widely in size and type of projects. With the equivalent of EUR 3.3bn raised, EOS remains the record ICO.⁶³ Projects funded through ICOs cover a wide range of sectors, including business services, banking, asset management, real estate and retail consumer services. ICOs are typically used by innovative businesses to raise

⁶⁰ FSB, 2019, 'Crypto-asset markets: potential channels for future financial stability implications:

<https://www.fsb.org/2018/10/crypto-asset-markets-potential-channels-for-future-financial-stability-implications/>

⁶¹ FSB, 2019, 'Crypto-assets regulators directory':

<https://www.fsb.org/wp-content/uploads/P050419.pdf>

⁶² See

<https://www.coindesk.com/bitfinexs-private-token-sale-raised-1-billion-in-10-days-exec-says>

⁶³ See

<https://www.crowdfundinsider.com/2018/06/134320-eos-raised-4-billion-in-largest-ico-ever-now-they-are-launching-their-platform/>

capital at an early stage of development. However, some well-established companies have also launched ICOs.⁶⁴

AI and big data

As applications of AI continue to develop in the financial sector and elsewhere, authorities are examining their likely impact, risks and benefits. One topic that is receiving considerable attention from authorities is the ethical implications of using AI. In June 2018, as part of its AI strategy the European Commission established its High-Level Expert Group on AI. The group published guidelines in April 2019⁶⁵ that list seven key requirements that AI systems should meet to be trustworthy: (i) human agency and oversight; (ii) technical robustness and safety; (iii) privacy and data governance; (iv) transparency; (v) diversity, non-discrimination and fairness; (vi) societal and environmental well-being; (vii) accountability. The guidelines set out ways to implement these requirements in practice. Firms are also examining related issues, as seen in a White Paper on governance issues in AI.⁶⁶

Emerging topics

Tokenisation can be defined as the representation of traditional assets, for example financial instruments or a basket of collateral or real assets, on DLT.⁶⁷ Tokenised assets therefore retain traditional ownership structures, which is not necessarily the case with CAs. The concept of tokenisation is not entirely new, with the first corporate bond on DLT issued in 2015. In 2016 and 2017, several initiatives that aimed at enhancing post-trade processes building on the technology involved the representation of traditional assets on DLT. These projects did not develop into large-scale applications at the time, yet the concept continues to receive attention. For example, in August 2018, the World Bank

proceeded to issue short-term bonds worth AUD 110mn using a private permissioned DLT as proof of concept.⁶⁸ Other private sector initiatives have followed since.

Tokenisation could potentially bring certain benefits to capital markets, including enhanced capital formation, greater liquidity and reduced risks, yet tokenisation is not exempt from challenges and risks. These include the 'scalability trilemma', i.e. the fact that it is technologically impossible for DLT to achieve decentralisation, security and scalability simultaneously.⁶⁹

In addition, there are challenges that are specific to tokenisation, and again they will vary depending on circumstances. For example, tokenisation may create tokens that are designed to represent assets that already exist, independently of DLT. This is the case for example of the Deutsche Boerse collateral project. Important considerations therefore include whether the possible counterparty risks vis-à-vis the tokenising entity are adequately addressed and whether investors in the tokens effectively own a claim on the 'reference' asset. Other tokens, for example the World Bank bonds, 'are' the assets. They are effectively 'DLT-native' assets, not meant to be transferred and recorded outside of DLT. An important implication is that their entire lifecycle is dependent on DLT, with the challenges already discussed.

Product intervention

CFDs and binary options

ESMA did not renew its temporary measures, under MiFIR product intervention powers, restricting the offer of CFDs to retail investors and prohibiting the offer of binary options to retail investors, as most NCAs introduced their own permanent intervention measures on a national

⁶⁴ For example, Telegram raised USD 1.7bn in 2018, see <https://www.coindesk.com/6-3-billion-2018-ico-funding-already-outpaced-2017>

⁶⁵ European Commission High-Level Expert Group on AI, "Ethics guidelines for trustworthy AI", 8 April 2019:

See

<https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai>

⁶⁶ Google, "Perspectives on Issues in AI Governance", 22 January 2019. See:

See

<https://ai.google/static/documents/perspectives-on-issues-in-ai-governance.pdf>

⁶⁷ The FSB has defined tokenisation as 'the practice of issuing digital tokens', which are 'any digital representation of an interest, which may be of value, a

right to receive a benefit or perform specified functions or may not have a specified purpose or use'. See FSB (2019), 'Crypto-assets: work underway, regulatory approaches and potential gaps', available at: <https://www.fsb.org/wp-content/uploads/P310519.pdf>

⁶⁸ See

<https://www.worldbank.org/en/news/press-release/2018/08/23/world-bank-prices-first-global-blockchain-bond-raising-a110-million>

⁶⁹ Ethereum's founder, Vitalik Buterin, coined the term 'scalability trilemma'. Buterin believes that at a fundamental level, DLTs can only achieve two out of three of these traits at one time.

basis that are at least as stringent as ESMA's measures. ESMA's measures in relation to binary options and CFDs, which applied throughout the Union, applied for one year from 2 July 2018 and 1 August 2018, respectively. ESMA, along with NCAs, identified a significant investor protection concern in relation to CFDs and binary options offered to retail investors.

Sustainable finance

Sustainable finance is a core driver of the ongoing developments in the EU financial markets.⁷⁰ The ESAs review added sustainability as a new key consideration for the ESAs,⁷¹ and the Commission's Sustainable Finance Action Plan set out a certain number of deliverables for ESMA (Box T.62).

T.62

European Commission Sustainable Finance Action Plan Sustainability regulatory measures

On 8 March 2018 the European Commission launched the Action Plan on Sustainable Finance (the 'Action Plan') with three main objectives: reorient capital flows towards sustainable investment to achieve sustainable and inclusive growth; manage financial risks stemming from climate change, environmental degradation and social issues; and foster transparency and long-termism in financial and economic activity.

With the objective of integrating sustainability considerations into the EU financial policy framework, the European Commission has adopted a package of measures implementing several key actions announced in its Action Plan. Among those measures are:

- a proposal for establishing the framework to gradually create a unified classification system ('taxonomy') on what can be considered an environmentally sustainable economic activity. The regulation is now under review.⁷²
- a proposal for a regulation for a new category of benchmarks comprising low-carbon and positive carbon impact benchmarks.⁷³

In addition, the Commission intends to amend MiFID II to include ESG considerations into the advice that investment

firms offer to individual clients. Furthermore, the Commission plans to clarify how asset managers and investment advisors should integrate sustainability risks and, where relevant, other sustainability factors in the areas of organisational requirements, operating conditions, risk management and target market assessment. ESMA, in its turn, is focusing on the following tasks:

- Together with other ESAs, ESMA is developing a report which will present initial evidence on potential pressures from the financial sector on corporations to prioritise near-term shareholder interests over long-term growth of the firm.
- ESMA includes provisions on sustainability preferences in its guidelines on the suitability assessment. Namely, ESMA has already published i) a consultation paper with the draft technical advice to the Commission on suggested changes to MiFID II Level 2, and suggested changes to the ESMA guidelines on suitability and ESMA guidelines on product governance;⁷⁴ ii) a final technical advice to the Commission on suggested changes to MiFID II Level 2.⁷⁵ By the end of 2019 or early 2020 ESMA will finalise the guidelines on suitability and product governance.
- With regards to CRAs, ESMA assesses current practices in the credit rating market, how ESG considerations are taken into account; and prescribes how ESG information should be disclosed.

Green bonds

EU-based investors are showing a growing interest in green and sustainable finance, which is reflected in the strong expansion (both in terms of size and market coverage) of the global green bond market. Since 2007, when the European Investment Bank issued the first green bond, green bond issuance has been increasing in the EU, reaching an outstanding amount of EUR 236bn in June 2019 (T.63). As to the distribution of green bond issuers by sector, 27% of the outstanding green bonds have been issued by non-financial corporates, 22% by the financial sector, 21% by agencies, 18% by sovereigns, and 13% by supranationals.

⁷⁰ The European Commission defines sustainable finance as the provision of finance to investments taking into account environmental, social and governance (ESG) considerations or 'factors'. See:

https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance_en.

Environmental considerations can include natural resource use, carbon emissions, energy efficiency, pollution, waste, sustainability initiatives; social factors include such topics as workforce health and safety, diversity/opportunity policies, employee training, human rights, privacy/data security and community programs; and governance factors cover board independence and diversity, shareholder rights, remuneration policy and business ethics (BoFA-Merrill Lynch US Equity and US Quant Strategy).

⁷¹ The ESA review was agreed in March 2019. See <https://data.consilium.europa.eu/doc/document/ST-7940-2019-ADD-2/en/pdf>

⁷² The latest taxonomy report setting out the basis for a future EU taxonomy in legislation was published on 18 June 2019. For more information, see

https://ec.europa.eu/info/files/190618-sustainable-finance-teg-report-taxonomy_en

⁷³ The interim report on methodologies for climate benchmarks published on 18 June 2019 is available at:

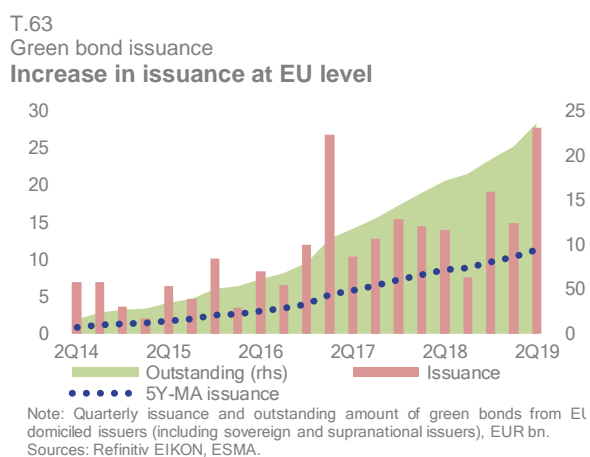
https://ec.europa.eu/info/files/190618-sustainable-finance-teg-report-climate-benchmarks-and-disclosures_en

⁷⁴ See

https://www.esma.europa.eu/sites/default/files/library/2018-esma35-43-1210-_ipisc_cp_mifid_ii_sustainability.pdf

⁷⁵ See

https://www.esma.europa.eu/sites/default/files/library/esma35-43-1737_final_report_on_integrating_sustainability_risks_and_factors_in_the_mifid_ii.pdf



Compared to total bond issuance, green bonds represent a limited, but fast-growing share of the overall market: According to recent industry research, green bond issuances represent more than 2% of the global bond issuances in the last two years, rising to 4.4% in the last quarter of 2018.⁷⁶

The developments in the green bond market are defined by growing consensus on what constitutes a green bond. The first standardisation initiative took place in 2014 with the emergence of the “Green Bond Principles”, a self-regulatory initiative designed to promote transparency and disclosure in the market and adopted by the vast majority of interested market participants.⁷⁷ To achieve further progress in Europe, the Commission’s Technical Expert Group is now developing a draft EU Green Bond Standard that is intended to address barriers to market development and provide support in channelling substantial financial flows to green projects. It is also considering creating a centralised accreditation regime for external verifiers.⁷⁸

It is important to stress that green bonds represent an innovation through their focus on environmentally appropriate use of proceeds, impact reporting, external reviews and enabling bond markets to become a force in green and climate mitigation finance. This demonstrates the strong link between sustainability and innovation.

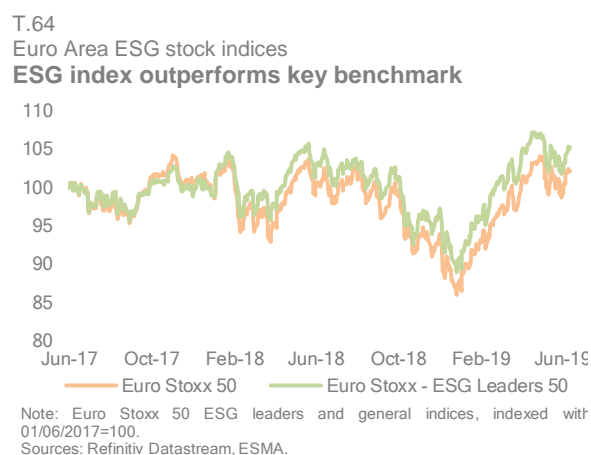
ESG investing

Another area where financial markets enable sustainability is through the use of ESG-based indices and ESG ratings of issuers, both for

passive and active investing. Investors are increasingly integrating ESG assets into their portfolios and are considering ESG factors alongside traditional financial factors in the investment decision-making process. One of the drivers is the growing desire of investors to be considered responsible, i.e. to align investing with societal values. At the same time, it is expected that ESG investing does not compromise financial returns for social considerations. Rather, it seeks to maximise returns within a process of better incorporating long-term ESG risk, such as climate change or good governance, in the investment process. Moreover, there is growing evidence that ESG investing through equity and credit markets allows for risk-adjusted performance that is equal to or superior than that of traditional indices.

To facilitate ESG investing through funds and ETFs, which rely on indices from which active and passive strategies can be developed, a number of analytical firms have produced ESG scores and indices that rely on company disclosures.

Over the past two years, the ESG Leaders 50 index has generally outperformed the corresponding main index benchmark (the Euro Stoxx 50; T.64). While the time period of two years is comparatively short, it does indicate that, at least over this period, investors do not need to sacrifice return goals to meet their ESG objective.



Although the data on returns for ESG do not allow for a firm conclusion, there is some indication (especially before 2019) that ESG indices tend to deliver a higher risk-adjusted performance in the long term, thanks to the lower average volatility of

⁷⁶ Moody’s Investor Services (2019), “Global Green Bond Outlook”, 31 January 2019.

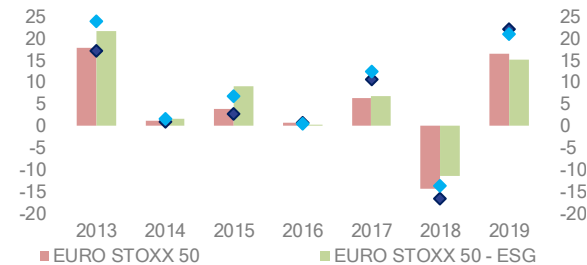
⁷⁷ Green Bond Principles, ICMA.

⁷⁸ In June 2018, the Commission set up a technical expert group on sustainable finance to assist several key areas

of the Action Plan and one of its subgroups works on a Green Bond Standard. For more information, see https://ec.europa.eu/info/publications/sustainable-finance-technical-expert-group_en

the underlying assets (T.65). The link between ESG and financial performance has been thoroughly explored in the academic literature, with a majority of studies confirming the existence of a positive relation between the two.⁷⁹

T.65
ESG index risk-adjusted returns
Risk-adjusted returns for ESG



Note: Annual returns of the EURO STOXX 50 and its ESG leaders subindex, in %. Risk-adjusted returns measured as Sharpe ratios. Current year data year-to-date.
Sources: Refinitiv Datastream, ESMA.

Emissions trading

The data available on carbon emission allowances show that the emission allowance price has grown steadily since June 2017, from EUR 5 per tonne of carbon to around EUR 25 as of June 2019 (T.66).⁸⁰ Monthly turnover has increased accordingly, from EUR 15mn in mid-2017 to EUR 85mn in April 2019.

T.66
Emission allowance prices
Upward trend since mid-2017



Note: Daily settlement price of European Emission Allowances (EUA) on European Energy Exchange spot market, in EUR/tCO₂.
Sources: Refinitiv Datastream, ESMA.

These market developments are directly related to Commission measures to reinforce the market stability reserve, a mechanism established in 2015 to reduce the surplus of emission allowances in the carbon market and improve the EU ETS's resilience to future shocks. The EU legislator aims to increase the pace of annual reductions in allowances to 2.2% as of 2021. Therefore prices are steadily rising in reaction to the demand for emission rights and emerging permit shortage.

⁷⁹ For example, Friede, G., Busch, T., and Bassen, A. (2017), "ESG and financial performance: aggregated evidence from more than 2000 empirical studies", *Journal of Sustainable Finance and Investment*, Vol.5, No.4, pp. 210-233.

⁸⁰ Emission allowances are part of the EU emissions trading system (EU ETS) aiming to combat climate change and reduce greenhouse gas emissions cost-effectively. The EU ETS works on the 'cap-and-trade' principle. A cap limits the total amount of certain greenhouse gases that

can be emitted by installations covered by the system. The cap is reduced over time so that total emissions fall. Within the cap, companies receive or buy emission allowances which they can trade with one another as needed. After each year a company must surrender enough allowances to cover all its emissions, otherwise heavy fines are imposed. This system is meant to cut emissions and to promote investment in clean, low-carbon technologies. For further details, see https://ec.europa.eu/clima/policies/ets_en

Risks

ESMA Risk Dashboard

R.1

Main risks

Risk segments	Level Outlook		Risk categories		Risk sources	Outlook
	Level	Outlook	Level	Outlook		
Overall ESMA remit	Orange	→	Liquidity	Orange →	Macroeconomic environment	→
Systemic stress	Yellow	→	Market	Red →	Interest rate environment	↗
Securities markets	Red	→	Contagion	Orange →	EU sovereign debt markets	→
Infrastructures and services	Yellow	→	Credit	Orange →	Infrastructure disruptions, incl. cyber risks	→
Asset management	Yellow	↗	Operational	Yellow →	Political and event risks	↗

Note: Assessment of main risks by risk segments for markets under ESMA remit since last assessment, and outlook for forthcoming quarter. Assessment of main risks by risk categories and sources for markets under ESMA remit since last assessment, and outlook for forthcoming quarter. Risk assessment based on categorisation of the ESAs Joint Committee. Colours indicate current risk intensity. Coding: green=potential risk, yellow=elevated risk, orange=high risk, red=very high risk. Upward arrows indicate an increase in risk intensities, downward arrows a decrease, horizontal arrows no change. Change is measured with respect to the previous quarter; the outlook refers to the forthcoming quarter. ESMA risk assessment based on quantitative indicators and analyst judgement.

The risk landscape in 2Q19 remains largely unchanged compared with the previous quarter. In 2Q19 EU financial markets were characterised by increasing equity market prices and stable liquidity supply in secondary bond markets, with volatility episodes resulting from breakdowns in trade negotiations. Securities markets remain the key risk area based on high valuation by historic standards. Renewed concerns about weak economic growth and trade tensions have fuelled the demand of safe-haven bonds. The decoupling between equities and bond yields, together with the rapid rise in asset valuations, could be a sign of investors' complacency and underappreciation of market risks. Looking ahead, downside risks to growth for the EU and the global economy, the escalation of trade tensions and the rise of protectionist measures, the reignited search-for-yield behaviour and the persisting uncertainty about the ultimate Brexit outcome continue to be the most important risks to EU financial stability.

Risk summary

Risks in the markets under ESMA remit remained at high levels, reflecting very high risk in securities markets and elevated risks for asset management, infrastructures and services. Our assessment of the individual risk categories did not change from 1Q19, with market risk remaining very high due to asset valuations that seem to exceed levels justified by fundamentals, subdued economic growth prospects and geopolitical developments as well as the flattening of yield curves. Liquidity risk was high, with isolated events highlighting pockets of risk in the asset management industry. While the level of credit risk is stable, the deteriorating quality of outstanding corporate debt, and the growth in leveraged loans and collateralised loan obligations should warrant attention of the public authorities. Our risk outlook for the asset management sector has deteriorated, as a result. Contagion risk remained high, driven by high levels of interconnectedness between different segments of financial markets and amplified by the low-yield environment and associated incentives for risk-taking. Operational risk was elevated as Brexit-related risks to business operations remain a major concern. Investor risks persist across a range of products, and under the MiFIR product intervention powers, most NCAs have adopted permanent measures relating to

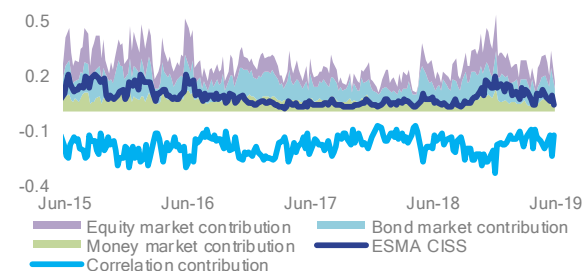
binary options and contracts for differences. Going forward, weak economic fundamental and intensifying concerns over a no-deal Brexit remain key risk drivers for 2H19.

Systemic risk was broadly stable in 2Q19, decreasing slightly with respect to the relatively high levels reached in 1Q19. Equity markets register the highest contribution to the systemic stress measure. Risks linked to the macroeconomic environment and to political events could bring additional uncertainty to financial markets.

R.2

ESMA composite systemic stress indicator

Systemic stress driven by equities



Note: ESMA version of the ECB-CISS indicator measuring systemic stress in securities markets. It focuses on three financial market segments: equity, bond and money markets, aggregated through standard portfolio theory. It is based on securities market indicators such as volatilities and risk spreads.
Sources: ECB, ESMA.

Risk sources

Macroeconomic environment: The softening growth momentum continued in the first half of 2019 after the slowdown experienced in 2018. Economic expansion in the EU is expected to reach 1.4% in 2019,⁸¹ slightly below the European Commission's winter projections. Similarly, the EA continues to grow at a moderate pace, with the GDP estimated increase revised downwards to 1.2%. The EU aggregate deficit reached 0.6% of GDP, its lowest level since 2000. However, budget deficits in the EU are expected to rise due to subdued economic growth. The global GDP outlook (excluding the EU) is expected to slow to 3.6%, sustained by emerging market economies. Global trade tensions and the uncertainty surrounding their evolution still pose risks for the global economy and continue to be reflected in market volatility.

Interest rate environment: The major central banks have reassessed their monetary policy stances and signalled that monetary policy easing could be implemented in the near term. The ECB has adjusted its forward guidance and announced a new round of quarterly targeted long-term refinancing operations. As market participants have adjusted their expectations towards a persisting low interest rate environment, market developments point to the return of risks associated with search-for-yield strategies. Risk premia compression became more pronounced, especially in corporate and covered bond markets (R.15, R.17) and equity valuations continued to increase.

EU sovereign debt markets: Vulnerabilities are pronounced in the sovereign sector, as a more persistent growth slowdown could raise concerns over the sustainability of sovereign debt. The reinforced demand for safe-haven assets contributed to a further reduction in European sovereign bond yields. Germany's ten-year benchmark bond yield fell again below zero in May and further declined, reaching a record low and trading below the ECB's deposit rate for the first time. On average, the ten-year sovereign yields decreased by 0.4% in 2Q19.

Market functioning: A disorderly UK exit from the EU continues to be a possibility even though the extension of Article 50(3) of the Treaty on European Union (TEU) until 31 October 2019 has postponed the Brexit deadline. To limit the potential adverse effects associated with a no-deal scenario, ESMA has taken important steps to reassure markets and limit operational uncertainties, as the equivalence decisions for the UK CSD and UK CCPs. Market participants have been repeatedly called upon to prepare for the impact that a no-deal Brexit would have on

their activities and business operations. Despite the uncertainty surrounding the Brexit outcome, trading conditions in European financial markets have been orderly over the period. The number of circuit breakers triggered in 2Q19 (43 per week on average) was at low levels compared to previous quarters. Financial firms are increasingly outsourcing some operational functions to cloud-based systems. However, the use of third-party cloud services may also pose risks related to information security, in addition to risks in areas such as governance and business continuity. Moreover, from a systemic perspective the use of third-party providers is associated with concentration risk. The transition from the existing interbank offered rates to the new risk-free rates raises risks associated with the repricing of existing financial products and derivative positions for both banks and counterparties. The €STR, an overnight funding rate used for euro swaps discounting, will be published by the ECB starting from October 2019 and will complement existing benchmark rates produced by the private sector. EU supervised entities may continue to use the Euribor, as the benchmark is considered BMR-compliant.

Political and event risk: Brexit remains the most important source of political risk for EU financial markets, although the decision taken by the European Council on 11 April to extend Article 50(3) TEU has reduced the immediate risk of a disorderly transition of the UK out of the EU. Coupled with increasing trade-related risks, political uncertainty and the potential for deteriorating public finances could undermine the sustainability of the economic recovery with potential adverse consequences on EU markets. In this perspective, concerns over debt sustainability for sovereigns could hamper investors' confidence and lead to a pullback in private investment.

Risk categories

Market risk – very high, outlook stable: European equities continued their recovery in 2Q19, albeit under more volatile market conditions with intermittent market corrections linked to trade tensions. Financials and insurance shares rose by around 8%. Non-financial equities' weaker performance (+3%) was likely due to the impact of protectionist trade measures. Bank equities, in a sharp reversal, retreated to the level of early January, potentially related to the global downward trend in bond yields following changed expectations towards accommodative monetary policies. The changed expectations could boost investors' risk appetite and reignite search-for-yield strategies. This is reflected in the diverging performance at the sector level together with the

⁸¹ European Commission, European Economic Forecast, Spring 2019.

decoupling between equities and bonds, indicating that market risks are potentially being underpriced. This could leave investors vulnerable to volatility episodes and abrupt shifts in market sentiment, that in the past quarter have appeared to be driven by political developments in Europe, geopolitical events and the flattening of yield curves (R.6, R.7). The ongoing trade tensions appear to have introduced a new stream of uncertainty into EU markets, resulting in further market volatility. The near-term volatility VSTOXX1M reacted strongly to the announcements of protectionist measures. The three-month GBP/EUR implied volatility pulled back and stabilised after the postponement of the Brexit deadline. With persisting uncertainties related to Brexit negotiations, the risk of volatility rising sharply as new key deadlines approach remains high.

Liquidity risk – high, outlook stable: In 2Q19 liquidity remained relatively ample on equity markets and fluctuated around its long-term average (R.4). EU corporate bond market liquidity conditions improved moderately over the reporting period, with bid-ask spreads slightly narrowing (R.16). On sovereign bond markets, liquidity deteriorated in June as a result of lower turnover levels compared to the previous months (R.11). On the other hand, scarcity premia on EA government bond collateral continued their decline (R.14), and turnover in sovereign repo markets increased (R.13). The rotation from equity to bonds continued in 2Q19, sustained by the increased risk appetite and leading some funds to invest in less liquid assets. Against the backdrop of more volatile flows, the longer portfolio duration exposes bond funds to a higher interest -rate risk. Moreover, the activation of liquidity management tools following large outflows, including the suspension of redemptions, highlighted the existence of pockets of liquidity risk in the asset management industry.

Contagion risk – high, stable outlook: With most yields on ten-year benchmark sovereign bonds decreasing and German Bund yields turning negative, the correlation between German and other EU countries' bond yields remained high. The dynamics of the dispersion levels potentially reflected the slightly lower degree of differentiation between core and peripheral EA countries amid mounting evidence of the economic slowdown (R.19). Against this backdrop, concerns over debt sustainability may weigh on financial markets, and renew worries over the sovereign-financial sector nexus. Investment fund interconnectedness with more traditional banking activities, in particular for MMFs and hedge funds, remained at a high level (R.39).

Credit risk – high, stable outlook: The credit risk environment has been characterised by renewed credit spread compression in a context of continuing deterioration of overall credit quality. These are strong indications for renewed search-for-yield behaviour. Sovereign bond yields have declined in 2019 (R.9). Corporate spreads continue tightening in parallel with historically high valuations. Credit spread premia on lower-rated investment grade (BBB) non-financial corporate bonds returned to the 3Q18 levels, decreasing about 36% with respect to the end-of-year peak, in line with the receding risk aversion observed in all market segments. Issuance in the high-yield market increased substantially in 2Q19, close to the record levels observed in 2017. Credit quality continues to deteriorate in the investment-grade segment of the credit market, with the share of newly issued BBB-rated EU corporate debt reaching 30% (R.17). The growth of leveraged loans and CLOs is becoming a concern, as investor protection standards have reportedly been diluted, with covenant-lite contracts now dominating the market (>80%). Even though the EU leveraged loan market has remained relatively small, post-crisis record-new issuance in 2018 and high concentration warrant enhanced monitoring. European funds exposures to leveraged loans and CLOs remain limited (around EUR 130bn).⁸² Overall, investors remain exposed to a swift repricing of risky assets.

Operational risk – elevated, stable outlook: Brexit remains a source of concern for operational risk, as a disorderly UK exit from the EU could impact cross-border financial services arrangements and increase operational and contractual uncertainties. Policymakers, including ESMA, have worked on policy mitigation measures aiming to maintain well-functioning markets. The ECB and Bank of England have opened a swap line to provide EUR to UK banks and lend GBP to EA banks, should the need arise. ESMA and NCAs have identified several significant investor-protection and conduct-risk concerns in the EU. Under ESMA's product intervention powers provided in MiFIR, the temporary restrictions related to contracts for differences and the temporary prohibition on binary options have were not renewed after one year of application, as most NCAs have taken permanent national product measures that are at least as stringent as ESMA's measures. Concerns over cyber risks persist, especially with respect to the integrity of proprietary data as financial data breaches are more frequent in comparison to breaches in other sectors (R.33).

⁸² See article on leveraged loans and CLOs (pp. 49-58).

Securities markets

R.3

Risk summary

Risk level



Risk change from 1Q19



Outlook for 3Q19



Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for forthcoming quarter. Systemic risk assessment based on categorisation of the ESAs Joint Committee. Colours indicate current risk intensity. Coding: green=potential risk, yellow=elevated risk, orange=high risk, red=very high risk. Upward arrows indicate a risk increase, downward arrows a risk decrease. ESMA risk assessment based on quantitative indicators and analyst judgment.

Risk drivers

- Asset revaluation and risk re-assessment
- Low interest rate environment and excessing risk taking
- Political risk
- Geopolitical and event risks, especially trade tensions

R.4

ESMA composite equity illiquidity index

Liquidity aligned to long-term trend

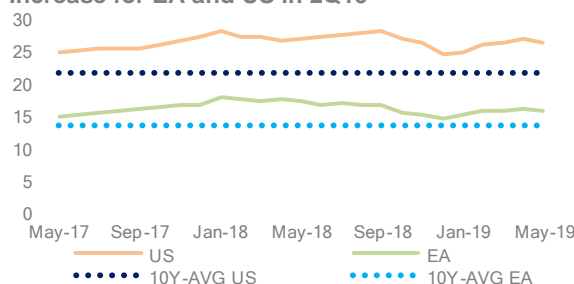


Note: Composite indicator of illiquidity in the equity market for the current STOXX Europe Large 200 constituents, computed by applying the principal component methodology to six input liquidity measures (Amihud illiquidity coefficient, bid-ask spread, Hui-Heubel ratio, turnover value, inverse turnover ratio and market efficiency coefficient). The indicator range is between 0 (higher liquidity) and 1 (lower liquidity).
Sources: Thomson Reuters Datastream, ESMA.

R.5

Equity valuation

Increase for EA and US in 2Q19



Note: Price-earnings ratios based on average inflation-adjusted earnings from the previous 10 years (cyclically adjusted price-earnings ratios). Averages computed from the most recent data point up to 10 years before.
Sources: Refinitiv Datastream, ESMA.

R.6

Equity prices

Continued increase, except for banks

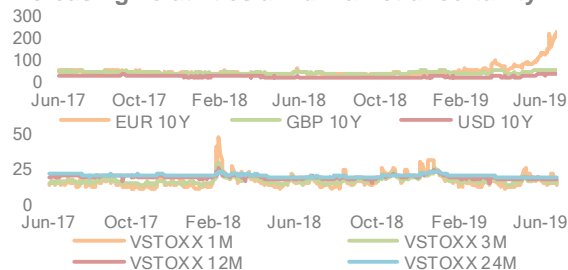


Note: STOXX Europe 600 equity total return indices. 01/06/2017=100.
Sources: Refinitiv Datastream, ESMA.

R.7

Financial instrument volatilities

Increasing volatilities amid market uncertainty

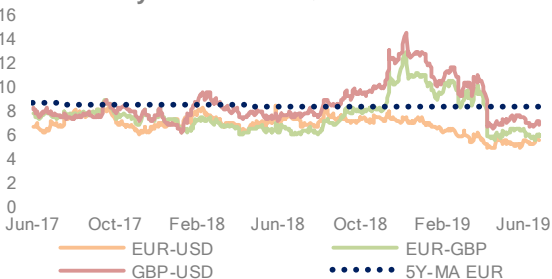


Note: Top panel: implied volatilities on one-month Euro-Euribor, UK Pound Sterling-GBP Libor and US Dollar-USD Libor swaptions measured as price indices, in %; bottom panel: EURO STOXX 50 implied volatilities, measured as price indices, in %.
Sources: Refinitiv EIKON, Refinitiv Datastream, ESMA.

R.8

Exchange rate volatilities

GBP volatility receded to 3Q18 levels

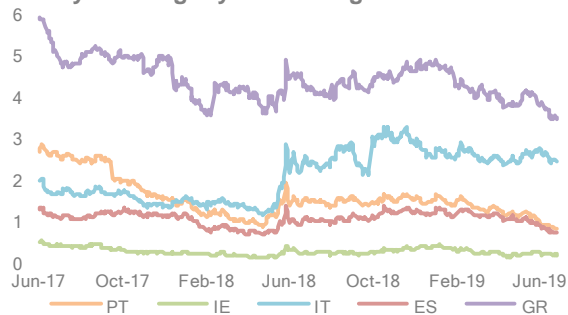


Note: Implied volatilities for 3M options on exchange rates, in %. 5Y-MA EUR is the five-year moving average of the implied volatility for 3M options on EUR-USD exchange rate.
Sources: Refinitiv EIKON, ESMA.

R.9

Sovereign risk premia

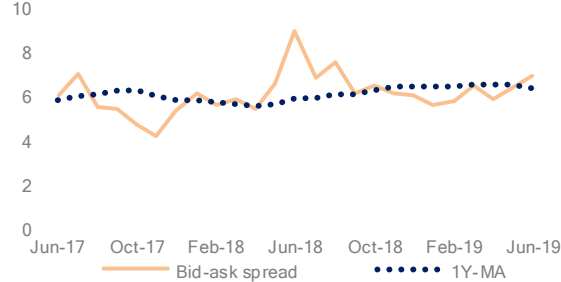
Most yields slightly decreasing



Note: Selected 10Y EA sovereign bond risk premia (vs. DE Bunds), in %.
Sources: Refinitiv Datastream, ESMA.

R.10 Sovereign bond bid-ask spreads

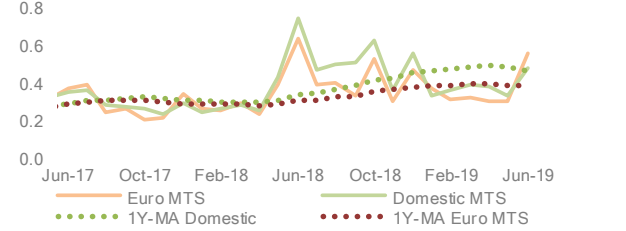
Round-trip costs slightly above long-term trend



Note: Bid-ask spread as weighted average of bid-ask spreads throughout a month weighted by trading volume across 10 EU domestic markets (AT, BE, DE, ES, FI, FR, IE, IT, NL and PT) and Euro MTS, in bps. Sources: MTS, ESMA.

R.11 ESMA composite sovereign bond illiquidity index

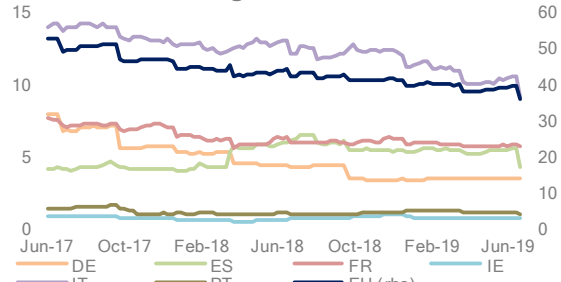
Lower turnover levels at the end of 2Q19



Note: Composite indicator of market liquidity in the sovereign bond market for the domestic and Euro MTS platforms, computed by applying the principal component methodology to four input liquidity measures (Amihud illiquidity coefficient, Bid-ask spread, Roll illiquidity measure and Turnover). The indicator range is between 0 (higher liquidity) and 1 (lower liquidity). Sources: MTS, ESMA.

R.12 Sovereign CDS volumes

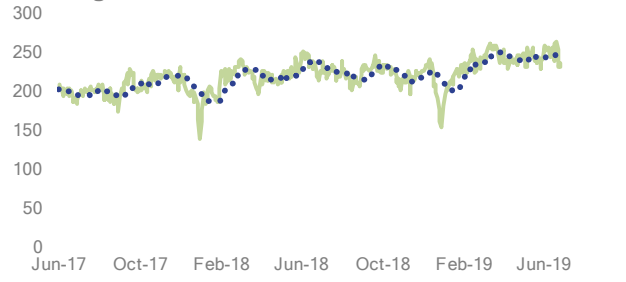
Stable or decreasing



Note: Value of outstanding net notional sovereign CDS for selected countries, in USD bn. Sources: DTCC, ESMA.

R.13 Sovereign repo volumes

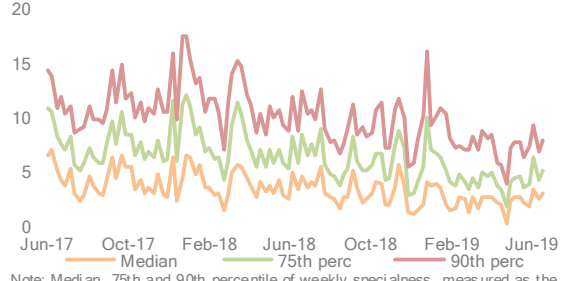
Growing volumes



Note: Repo transaction volumes executed through CCPs in 7 sovereign EUR repo markets (AT, BE, DE, FI, FR, IT and NL), EUR bn. Sources: RepoFunds Rate, ESMA.

R.14 Repo market specialness

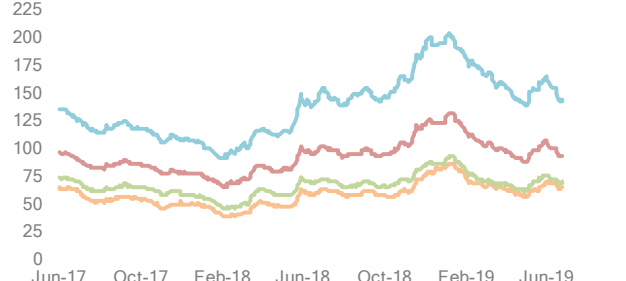
Reduced scarcity premia



Note: Median, 75th and 90th percentile of weekly specialness, measured as the difference between general collateral and special collateral repo rates on government bonds in selected countries. Sources: RepoFunds Rate, ESMA.

R.15 Corporate bond spreads

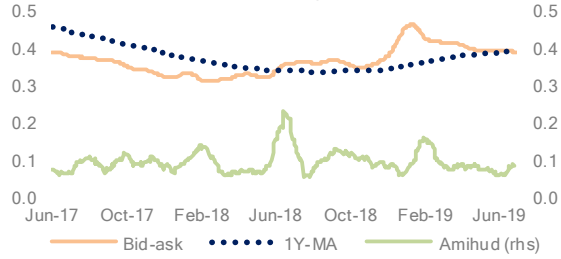
Strong reduction combined with spread compression



Note: EA corporate bond option-adjusted spreads by rating, in bps. Sources: Refinitiv Datastream, ESMA.

R.16 Corporate bond bid-ask spreads and Amihud indicator

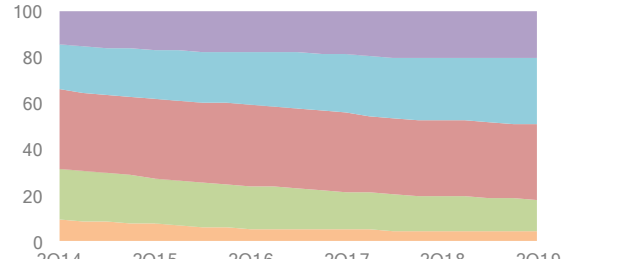
Signals of liquidity recovery



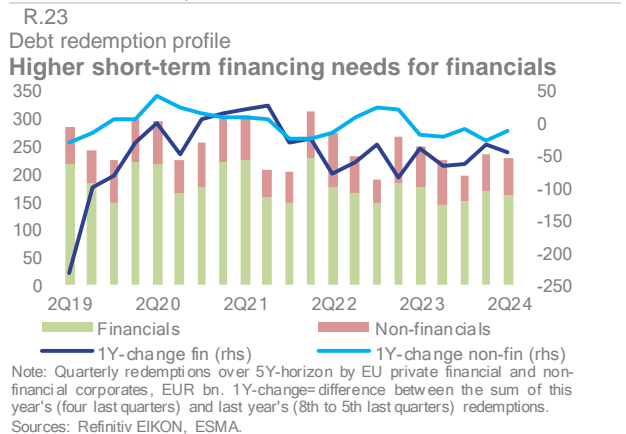
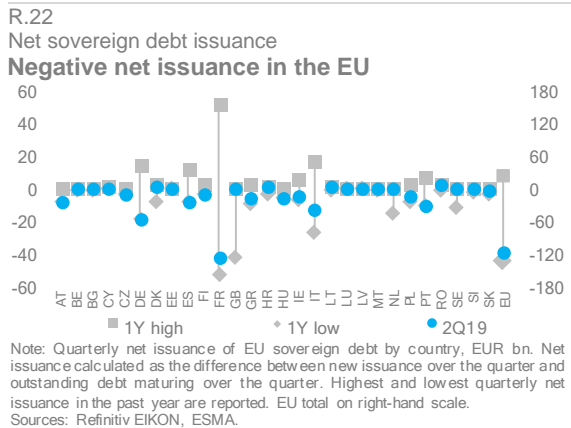
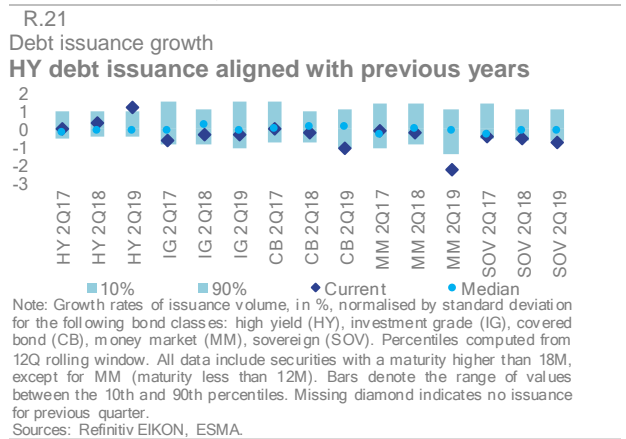
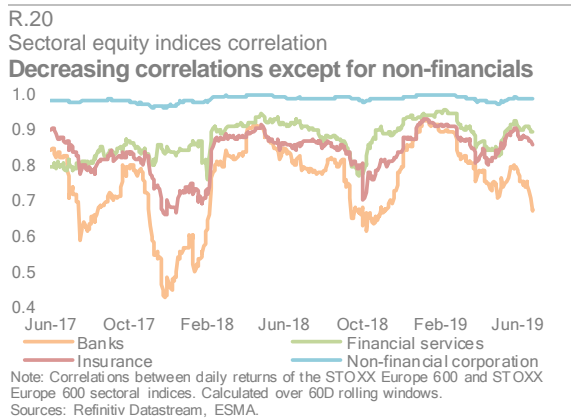
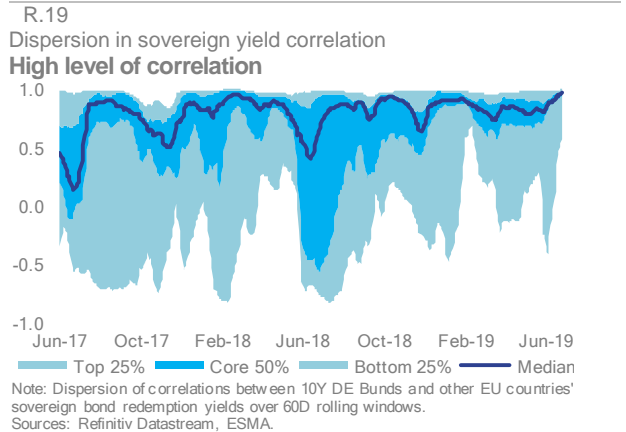
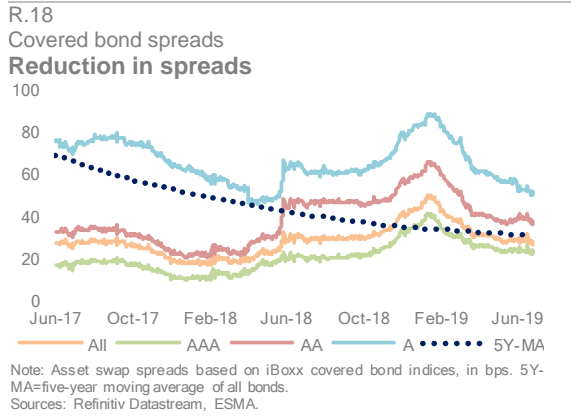
Note: Markit iBoxx EUR corporate bond index bid-ask spread, in %, computed as a one-month moving average of the iBoxx components in the current composition. 1Y-MA=one-year moving average of the bid-ask spread. Amihud liquidity coefficient index between 0 and 1. Higher value indicates less liquidity. Sources: IHS Markit, ESMA.

R.17 Long-term corporate debt outstanding

Rating distribution slightly deteriorating



Note: Outstanding amount of corporate bonds in the EU as of issuance date by rating category, in% of the total. Sources: Refinitiv EIKON, ESMA.



Infrastructures and services

R.24

Risk summary

Risk level



Risk change from 1Q19



Outlook for 3Q19



Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for forthcoming quarter. Systemic risk assessment based on categorisation of the ESAs Joint Committee. Colours indicate current risk intensity. Coding: green=potential risk, yellow=elevated risk, orange=high risk, red=very high risk. Upward arrows indicate a risk increase, downward arrows a risk decrease. ESMA risk assessment based on quantitative indicators and analyst judgment.

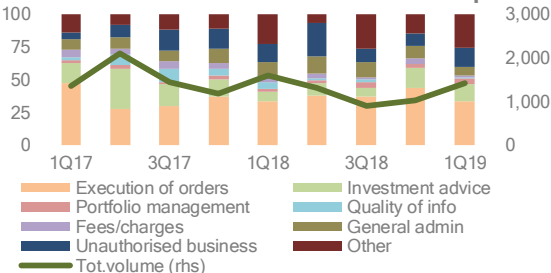
Risk drivers

- Operational risks, incl. cyber and Brexit-related risks
- Conduct risk, incl. intentional or accidental behaviour by individuals, market abuse
- Systemic relevance, interconnectedness between infrastructures or financial activities, system substitutability

R.25

Complaints indicator by rationale

Execution of orders as main cause for complaints

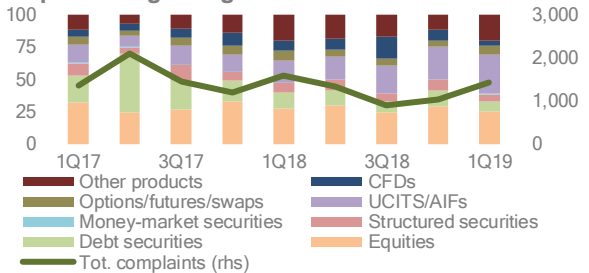


Note: Complaints reported directly to 17 NCAs: AT, BG, CY, CZ, DE, DK, EE, ES, HR, HU, IT, LT, LU, MT, PT, RO, SI. Line shows total volume of these complaints. Bars show % of total volume by cause. Data collected by NCAs. Source: ESMA complaints database

R.26

Complaints indicator by instrument

Complaints regarding debt securities decline

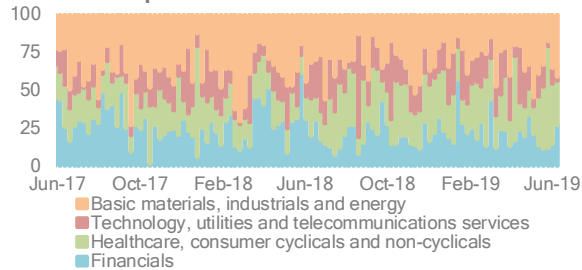


Note: Complaints reported directly to 17 NCAs: AT, BG, CY, CZ, DE, DK, EE, ES, HR, HU, IT, LT, LU, MT, PT, RO, SI. Line shows total number of these complaints. Bars show % of total volume by type of financial instrument. CFDs=Contracts for Differences. Source: ESMA complaints database.

R.27

Circuit-breaker-trigger events by sector

No sectorial pattern

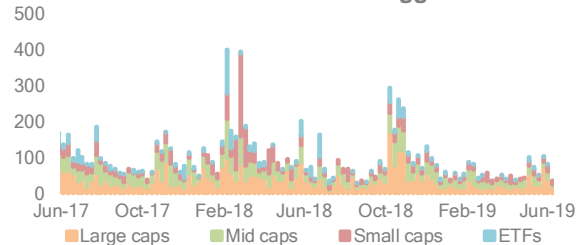


Note: Percentage of circuit-breaker trigger events by economic sector registered on 34 EEA trading venues for all constituents of the STOXX Europe Large/Mid/Small 200 and a large sample of ETFs tracking these indices or some of their subindices. Results displayed as weekly aggregates. Sources: Morningstar Real-Time Data, ESMA.

R.28

Circuit-breaker occurrences by market capitalisation

Low number of circuit breakers triggered in 2Q19

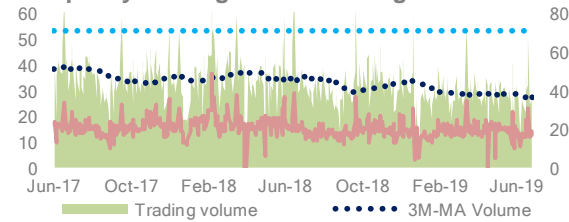


Note: Number of daily circuit-breaker trigger events by type of financial instrument and by market cap registered on 34 EEA trading venues for all constituents of the STOXX Europe Large/Mid/Small 200 and a large sample of ETFs tracking these indices or some of their subindices. Results displayed as weekly aggregates. Sources: Morningstar Real-Time Data, ESMA.

R.29

Trading system capacity proxy

No capacity shortage on EU trading venues

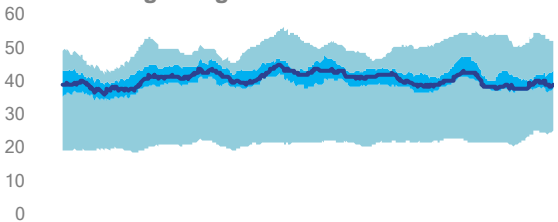


Note: Daily and 3M-MA of trading volumes registered on 34 EEA trading venues for all constituents of the STOXX Europe Large/Mid/Small 200 and a large sample of ETFs tracking these indices or some of their subindices, in EUR bn. Capacity computed as the average across trading venues of the ratio of daily trading volume over maximum volume observed since 31/03/2016, in %. Sources: Morningstar Real-Time Data, ESMA.

R.30

Equity market concentration

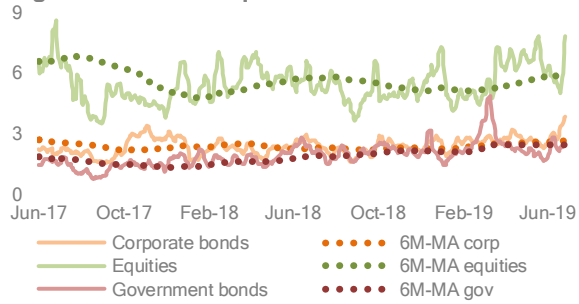
Hike at the beginning of 2Q19



Note: Concentration of notional value of equity trading by national indices computed as a 1M-MA of the Herfindahl-Hirschman Index, in %. Indices included are AEX, ATX, BEL20, CAC 40, DAX, FTSE 100, FTSE MIB, IBEX 35, OMXC20, OMXH25, OMXS30, PSI20. Sources: BATS, ESMA.

R.31

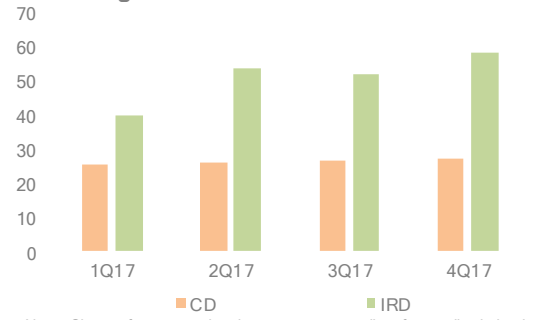
Settlement fails
Higher in June for equities



Note: Share of failed settlement instructions in the EU, in % of value, and six-month moving averages.
Sources: National Competent Authorities, ESMA.

R.32

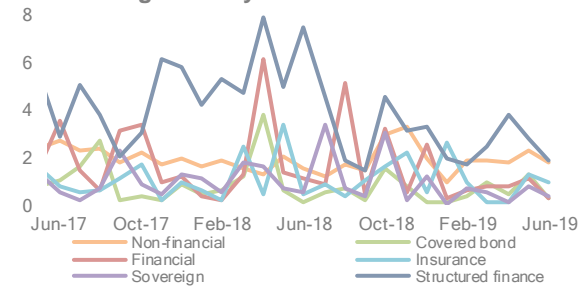
OTC central clearing rates
Increasing for CD and IRDs in 2017



Note: Share of gross notional amount outstanding for credit derivatives (CD) and interest rate derivatives (IRD), in %.
Sources: TRs, ESMA.

R.33

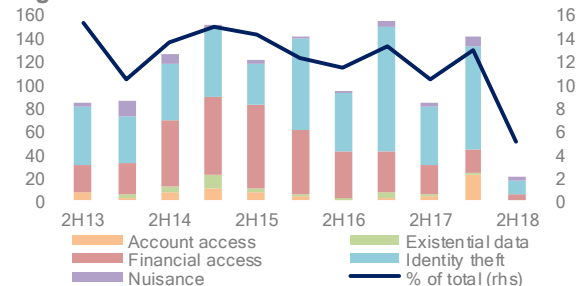
Rating changes
Lower rating volatility



Note: Volatility of ratings by all credit rating agencies, in %, excluding CERVED and ICAP, by asset class computed as number of rating changes over number of outstanding ratings.
Sources: RADAR, ESMA.

R.34

Financial services data breaches
Higher risk for financials



Note: Estimated number of data breaches, financial services only, worldwide, by type. Breaches in financial services sector as % of total data breaches across all sectors on right-hand scale.
Sources: Gemalto Breach Level Index, ESMA.

Asset management

R.35

Risk summary

Risk level



Risk change from 1Q19



Outlook for 3Q19



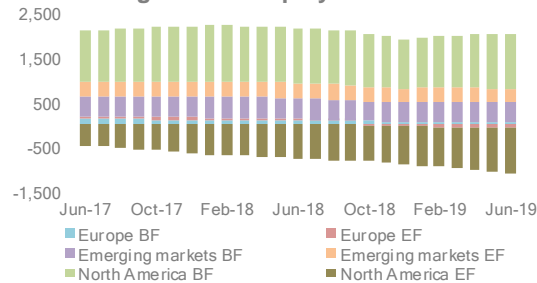
Risk drivers

- Asset re-valuation and risk re-assessment
- Uncertainty on economic outlook and political developments in EU
- Correlation in asset prices
- Search-for-yield behaviour leading to investments in less liquid assets

Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for forthcoming quarter. Systemic risk assessment based on categorisation of the ESAs Joint Committee. Colours indicate current risk intensity. Coding: green=potential risk, yellow=elevated risk, orange=high risk, red=very high risk. Upward arrows indicate a risk increase, downward arrows a risk decrease. ESMA risk assessment based on quantitative indicators and analyst judgment.

R.36

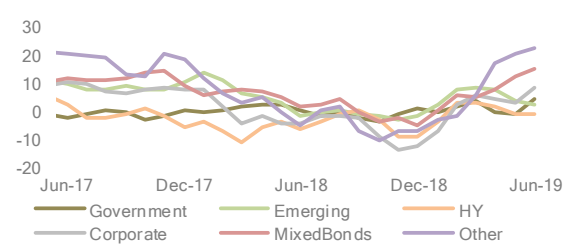
Cumulative global investment fund Rebalancing between equity and bond funds



Note: Cumulative net flows into bond and equity funds (BF and EF) over time since 2004 by regional investment focus, EUR bn. Sources: REFINITIV Lipper, ESMA.

R.37

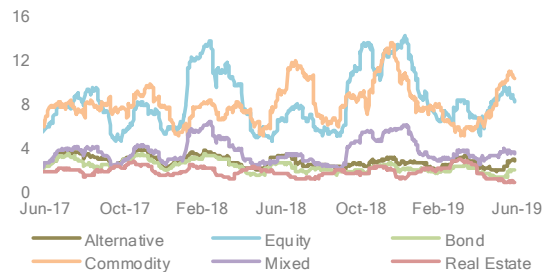
EU bond fund net flows Inflows into mixed bond funds



Note: Two-month cumulative net flows for bond funds, EUR bn. Funds investing in corporate and government bonds that qualify for another category are only reported once e.g. funds investing in emerging government bonds reported as Emerging; funds investing in HY corporate bonds reported as HY). Sources: REFINITIV Lipper, ESMA.

R.38

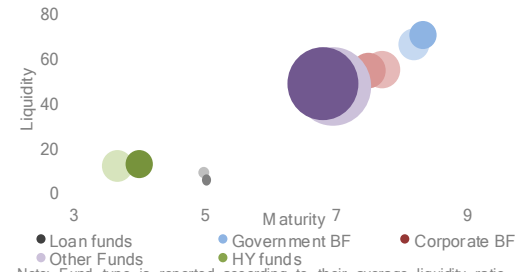
Rate of return volatilities by fund type Volatility receding for all asset classes



Note: Annualised 40D historical return volatility of EU domiciled mutual funds, in%. Sources: REFINITIV Lipper, ESMA.

R.39

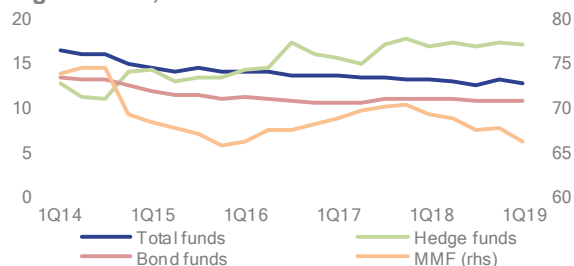
Liquidity risk profile of EU bond funds Stable liquidity and mixed maturity changes



Note: Fund type is reported according to their average liquidity ratio, as a percentage (Y-axis), the effective average maturity of their assets (X-axis) and their size. Each series is reported for 2 years, i.e. 2017 (bright colours) and 2018 (dark colours). Sources: Thomson Reuters Lipper, ESMA.

R.40

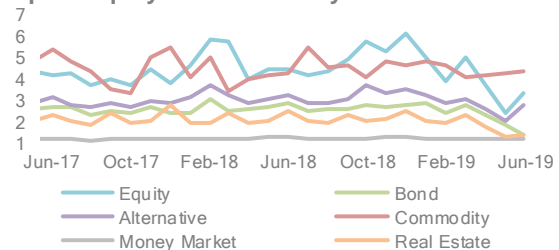
Financial market interconnectedness High for HFs, stable for MMFs



Note: Loan and debt securities vis-à-vis MFI counterparts, as a share of total assets. EA investment funds and MMF, in%. Total funds includes: bond funds, equity funds, mixed funds, real estate funds, hedge funds, MMFs and other non-MMF investment funds. Sources: ECB, ESMA.

R.41

Retail fund synthetic risk and reward indicator Up for equity and commodity funds



Note: The calculated Synthetic Risk and Reward Indicator is based on ESMA SRR1 guidelines. It is computed via a simple 5 year annualised volatility measure which is then translated into categories 1-7 (with 7 representing higher levels of volatility). Sources: Refinitiv Lipper, ESMA.

Vulnerabilities

Financial stability

Leveraged loans, CLOs – trends and risks

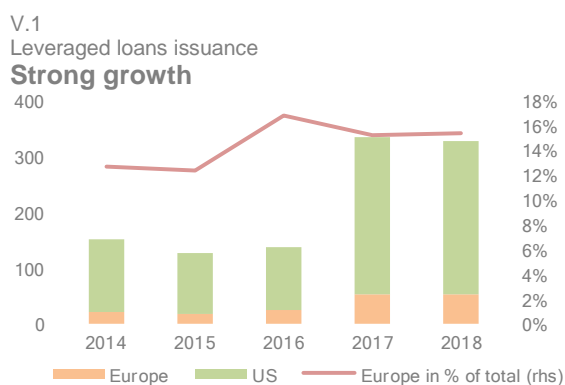
Contact: antoine.bouveret@esma.europa.eu⁸³

Recent years have seen a significant pickup in the issuance of leveraged loans and collateralised loan obligations (CLOs) in the US and the EU. The surge in issuance occurred against a backdrop of looser underwriting standards, higher indebtedness of borrowers and compressed credit spreads. This article provides an overview of the leveraged loans and CLO markets in the EU. In particular, we assess exposures of the EU fund industry to leveraged loans and CLOs, which remain limited at the current juncture. In addition, the article uses a simulation analysis to show how model uncertainty can impact the credit ratings of CLOs, and potentially trigger forced sales from some types of investors.

Introduction

Overview of the leveraged loan market

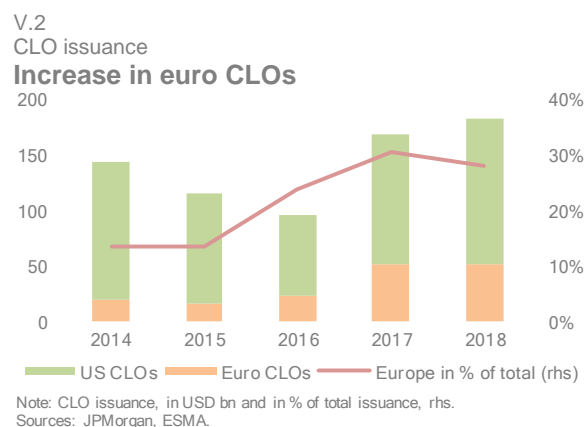
Recent years have seen a strong pickup in issuance of leveraged loans (V.1) and a compression of credit spreads, in a context of buoyant risk appetite from investors. Estimates of the size of the global leveraged loan market range from USD 1,350bn as of 1Q19 according to J.P. Morgan (against USD 983bn in 2016) to around USD 2,200bn according to the Bank of England (Bank of England, 2018). US loans account for 85% of the global leveraged loan market.⁸⁴



In addition, leveraged loans markets have been supported by increased activity through CLOs. Indeed, CLOs have also experienced significant

growth in issuance, especially over the last two years, in a context of compressed spreads (V.2). The global CLO market is estimated to amount to around USD 740bn globally, which implies that CLOs hold around 50% of the global leveraged loan market according to J.P. Morgan.

CLOs are securitisation products issued by a CLO structure. On the asset side, the structure holds leveraged loans, which are funded, on the liability side, by the issuance of tranches with different degrees of seniority, the highest tranches enjoying high credit ratings.



Drivers of leveraged loans and CLO issuance

In a context of low interest rates, investors have supported leveraged loan issuance as these

borrower (ECB, 2017). Leveraged loans are usually secured loans and are senior to bonds in case of default of the borrower.

⁸³ This article was authored by Antoine Bouveret, Sylvain Canto and Eugeniu Colesnic.

⁸⁴ Leveraged loans are loans to highly indebted firms, where the total debt to earnings ratio before interest, tax, depreciation and amortisation (EBITDA) is higher than 4x, and the borrowing firm is not an investment grade

instruments offer higher yields than investment-grade corporate bonds. Reflective of the strong investor demand, underwriting standards have loosened (IMF, 2018b), enabling corporate leverage to increase in the US and in the EU (ECB, 2018). Overall, the leverage of leveraged loan borrowers (measured by total debt to EBITDA) is slightly higher in the EU than in the US (at respectively 5.6 and 5.3).

Regarding looser underwriting standards, the share of covenant-lite loans – loans where investors do not require borrowers to be subject to financial maintenance tests to measure their debt service capacity – increased recently in both the US and the EU, accounting for around 87% of leveraged loan issuance in 2018, against 72% in 2016 (J.P. Morgan, 2019a).

Leveraged loans and CLOs for issuers and investors

Leveraged loans and CLOs may provide benefits to both issuers and investors. For issuers, leveraged loans allow corporates to diversify their funding sources beyond bank loans or bond issuance, thereby facilitating credit to the real economy. For investors, leveraged loans and CLOs can offer attractive returns, with low interest rate risk as those financial instruments are typically floating-rate. The risk-return features of leveraged loans can also improve the performance of a diversified portfolio, since leveraged loans tend to have a low correlation with bond indices (Armstrong and Turulja, 2015). In addition, in the case of CLOs, the issuance of different tranches with varying degrees of credit risk can cater to a diversified investor base, with banks, insurance companies and pension funds acquiring the highest-rated tranches, and asset managers and hedge funds focusing on the riskier tranches offering higher yields.

From a financial stability perspective, investment funds holding leveraged loans and CLOs might reduce risks, as funds exposures are diversified, and fund investors are highly heterogeneous.

A closer look at investors' exposures

Overview of exposures and data gaps

Regarding leveraged loans, the Bank of England estimates that around 40% are held by banks, 46% by non-bank financial institutions (Bank of England, 2018) and the remaining 14% by other investors. Within non-banks, CLO structures hold around 25% of the leveraged loan market, followed by investment funds (7%), mainly

through US loan funds, while direct exposures of insurance and pension funds are more limited at around 4% of the total.

For CLOs, it is estimated that banks hold around one third of the tranches, while around two thirds of tranches are held by non-banks, in particular insurance, investment and pension funds. Banks typically hold higher-rated CLO tranches – half of AAA tranches are held by banks (Federal Reserve, 2019) – while riskier tranches are primarily held by asset managers, hedge funds and insurance companies. However, when CLOs are privately placed, data on investors and the underlying leveraged loans are scarce. In that context, the EU Securitisation Regulation – which entered into force in 2019 – has imposed new transparency requirements including loan-by-loan reporting which also cover CLOs. Looking forward, ESMA's securitisation templates will help close some of the data gaps (Box V.3).

V.3

Data gaps on CLOs

ESMA's securitisation disclosure templates

The EU Securitisation Regulation includes a number of due diligence and monitoring requirements for investors. In particular, the draft technical standards designed by ESMA should help improve the transparency of the securitisation market, including for CLOs (Amzallag, 2018).

The draft disclosure templates developed by ESMA and submitted to the European Commission for adoption include specific information on borrower financial variables (such as EBITDA) as well as leveraged loan characteristics (such as syndication and loan repayment profiles).

In addition to tracking information on CLO tranches and on the counterparties involved in the CLO, ESMA's securitisation templates also include dedicated sections requiring information on the CLO-specific features of the securitisation, as well as the profile and performance of the CLO manager (ESMA, 2019a). Even if it is difficult to track which parties are directly or indirectly exposed to CLOs, ESMA's templates seek to facilitate the assessment and monitoring of the evolution in risks contained in these instruments. Reporting of these templates is expected to begin later in 2019, once adopted by the European Parliament, Council and Commission. The templates must be made available and updated on a quarterly basis for investors and supervisory authorities.

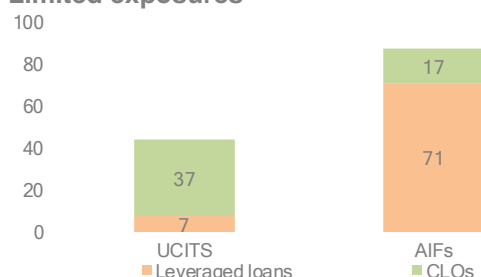
EU investment funds exposures

The EU investment management legislation distinguishes between investment funds that qualify as UCITS and those that qualify as AIFs. UCITS can be marketed to retail investors and are subject to specific product requirements set out in the UCITS Directive. These requirements include, inter alia, diversification rules, limits on leverage and restrictions on assets they can invest in. In general, leveraged loans are not considered eligible assets for UCITS. Relatedly, UCITS can invest in CLOs, as long as the CLO is considered a transferable security.⁸⁵

In contrast, AIFs are funds that typically target professional investors. They can invest in a wide range of assets (including asset classes not eligible for UCITS) and typically have no restrictions on leverage, although, at a national level, investment restrictions and leverage limits may exist.

Overall, EU funds exposures to leveraged loans and CLOs are limited, amounting to EUR 54bn for CLOs and EUR 78bn for leveraged loans (V.4)

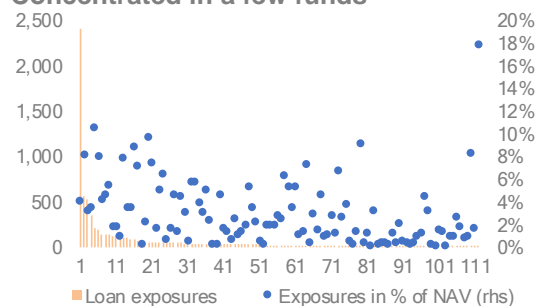
V.4
EU funds exposures to leveraged loans and CLOs
Limited exposures



Note: Exposures of UCITS and AIFs in EUR bn. For UCITS, leveraged loans also include bank loans, and CLOs include CMOs and CDOs. For AIFs, CLOs include also CDOs. Data for 2017 for AIFs and 2018 for UCITS. Sources: Morningstar, AIFMD database, National Competent Authorities, ESMA.

The total exposures of UCITS to loans (which includes bank loans and leveraged loans) amounted to EUR 7.4bn as of the end of 2018, based on a sample of 1,365 funds (V.4).⁸⁶ Most of the exposure is concentrated in a few UCITS, with the top 20 accounting for 80% of loan exposures (V.5).

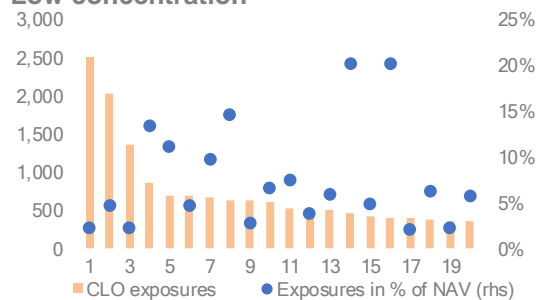
V.5
UCITS exposures to loans
Concentrated in a few funds



Note: Individual UCITS exposures to bank loans (top 112 UCITS in terms of loan exposures, x-axis), in EUR bn and in % of NAV (right axis). Sources: Morningstar Direct, ESMA.

UCITS exposures to CLOs were larger, but still limited, at around EUR 36bn at the end of 2018 across 3,843 funds. Concentration is lower, with the top 20 accounting for 40% of CLO exposures (V.6). However, the data also include collateralised debt obligations (CDOs) and should therefore be interpreted as a maximum.

V.6
UCITS exposures to CLOs
Low concentration



Note: Individual UCITS exposures to CDO/CLOs (top 20, x-axis), in EUR mn and in % of NAV (right axis). Sources: Morningstar Direct, ESMA.

Around 500 UCITS have exposures to both loans and CLOs. Only a few UCITS invest in both asset classes and have a combined exposure higher than 5% of NAV. For these funds, CLOs and loans account for less than 50% of their NAV.

The EU Alternative Investment Funds Managers Directive (AIFMD) introduces reporting requirements that cover AIFs' exposures to loans and CLOs (see ESMA, 2019b for an overview of the AIF market).⁸⁷ In particular, AIFs have to separately report their gross exposures to

⁸⁵ Commission Directive 2007/16/EC.

⁸⁶ Since there are no proprietary data on UCITS at the EU level, we use commercial data to estimate UCITS exposures. The data come with the following shortcomings: loans include both leveraged loans and bank loans, while CLOs are bundled with collateralised mortgage obligations and collateralised debt obligations, without a breakdown by instrument.

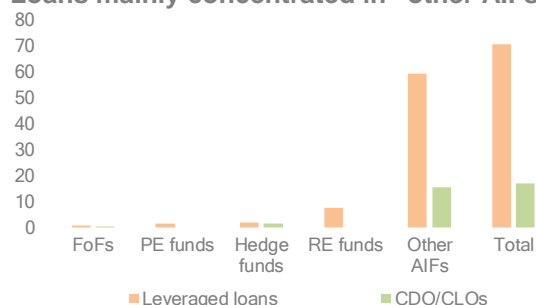
⁸⁷ The AIFMD sets out extensive reporting requirements to NCAs for AIFMs. The reporting requirements include data on the characteristics of the AIF (type, strategy, concentration of investors) along with detailed information on assets (principal exposures, exposures by asset type and regional investment focus), as well as several risk features (market risk, liquidity profile, use of leverage and stress test results).

leveraged loans and to CDO/CLOs along with their ten largest individual exposures. Overall, based on data from the end of 2017, AIFs exposures to leveraged loans amount to EUR 71bn, and exposures to CDO/CLOs to EUR 17bn (V.7). This corresponds to 7% of the leveraged loan market and 5% of the CLO market at the end of 2017.⁸⁸ Exposures are spread across more than 500 AIFs, with a combined NAV of EUR 475bn, accounting for less than 10% of all AIFs. Looking at exposures by AIF types, around 85% of exposures are concentrated in ‘other AIFs’, a residual category, followed by real estate funds which account for 10% of AIF exposures to leveraged loans. This finding is in line with ESMA’s report (ESMA, 2019b) which shows that ‘other AIFs’ account for close to two third of the NAV of the sector.

V.7

AIFs exposures by type

Loans mainly concentrated in “other AIFs”



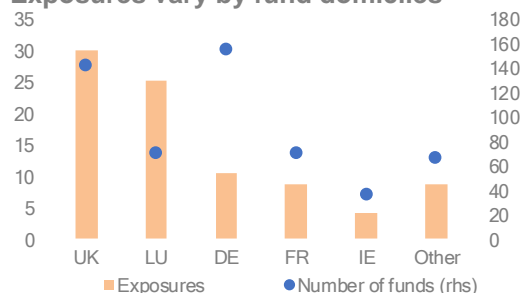
Note: Gross exposures, in EUR bn. Sources: AIFMD database, National Competent Authorities, ESMA.

Most AIFs with exposures to those markets are domiciled in a few EU countries, with the top five countries accounting for 90% of exposures (V.8).

V.8

AIFs exposures by country

Exposures vary by fund domiciles



Note: Exposures to leveraged loans and CLOs by domicile of the AIFM, in EUR bn. Sources: AIFMD database, National Competent Authorities, ESMA.

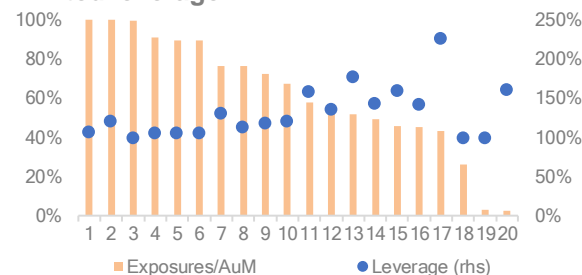
Most exposures are concentrated in a few funds, with the top 20 accounting for close to 50% of all exposures and the top 50 for 64%. AIFs with the

largest exposures to leveraged loans and CLOs tend to invest mainly in these two asset classes: on average, they account for 60% of assets under management for the top 20 AIFs. For those AIFs, leverage – as measured by the ratio of AuM to NAV – is relatively limited, ranging from 100% to 200% with an average value of 130% (V.9).

V.9

Exposures of top 20 AIFs

Limited leverage



Note: Gross exposures to leveraged loans and CDO/CLOs in % of AuM and leverage defined as AuM to NAV. Data for the top 20 AIFs with the largest exposures to leveraged loans and CDO/CLOs in absolute amounts. Sources: AIFMD database, National Competent Authorities, ESMA.

Finally, we look at potential liquidity mismatch for the 50 AIFs with the highest exposures to leveraged loans and CLOs. Redemptions from investors, in a context of stress in the leveraged loan and CLO markets, could force fund managers to liquidate their assets, thereby amplifying shocks to the financial system. Liquidity mismatch is assessed by comparing the liquidity of the portfolio and the investors’ liquidity. Under AIFMD, AIFs have to report their liquidity profile by indicating the share of their NAV that can be redeemed over a set of specified time buckets (less than one day, between two and seven days, etc.), and the same information for their portfolio of assets. We aggregate indicators for 50 AIFs, to compute the weighted average measure of portfolio liquidity. Taking the weighted average of portfolio and investor liquidity based on the NAV of the AIF could introduce some bias, as funds with ‘excess liquidity’ (portfolio liquidity higher than investor liquidity) could compensate funds with liquidity mismatch. Therefore, we do not take into account the ‘excess liquidity’ of AIFs.

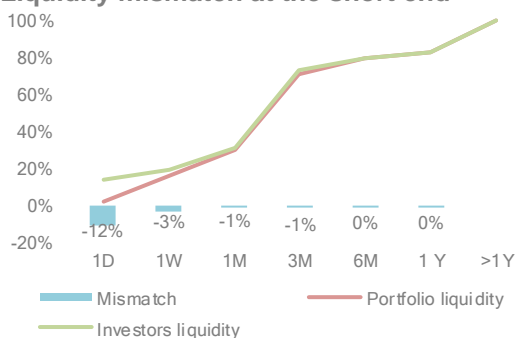
The top 50 AIFs face a liquidity mismatch in the short term: Investors can redeem up to 13% of the NAV within a day, while only 1% of the assets can be liquidated over this time frame, resulting in a liquidity mismatch equal to 12% of NAV (V.10). The liquidity mismatch is concentrated in a few funds – accounting for 12% of NAV – which offer daily liquidity to investors, while investing in

⁸⁸ The analysis covers only AIFs managed by EU AIFMs. AIFs managed by non-EU AIFMs operating under National Private Placement Regimes are excluded.

leveraged loans and CLOs. Over longer time horizons the mismatch is limited, with 3% over one week and close to zero afterwards.

Overall, the analysis points to limited risks for AIFs as overall exposures are relatively limited (less than 2% of AIFs' NAV), and AIFs with the highest exposures are not highly leveraged. However, residual risks exist regarding liquidity mismatch for the few AIFs that offer daily liquidity to investors and for AIFs which have concentrated exposures to leveraged loans and CLOs.

V.10
Liquidity profile of top 50 AIFs
Liquidity mismatch at the short end



Note: Portfolio and investor liquidity, in % of NAV, weighted average. D=Day, W=Week, M=Month and Y=Year. Portfolio liquidity indicates the cumulative share of the NAV that can be liquidated over time, and investor liquidity the cumulative share of the NAV that can be redeemed over the same time horizon.
Sources: AIFMD database, National Competent Authorities, ESMA.

Risks in the leveraged loan and CLO markets

Deterioration of loan credit quality and liquidity risk

The average credit ratings of outstanding leveraged loans have recently deteriorated (IMF, 2019). With signs of a global economic slowdown, there is a risk that the next recession might lead to a wave of defaults among leveraged loans borrowers, with corresponding losses for investors in the leveraged loan market.

Since leveraged loans are positioned higher in the capital structure than HY bonds, the recovery rate has tended to be higher in the past (and yields on HY bonds were therefore higher than on loans). In the case of a default, HY bondholders absorb losses before leveraged loans creditors.

However, in recent months, the HY-leveraged loan spread has turned negative, reflecting concerns that the recovery rate in case of default will be lower for leveraged loans, given that borrowers are more indebted than before, and

some of them did not issue bonds (which absorb losses before loans; V.11).

V.11
HY bonds - leveraged loans spread
Spread turned negative

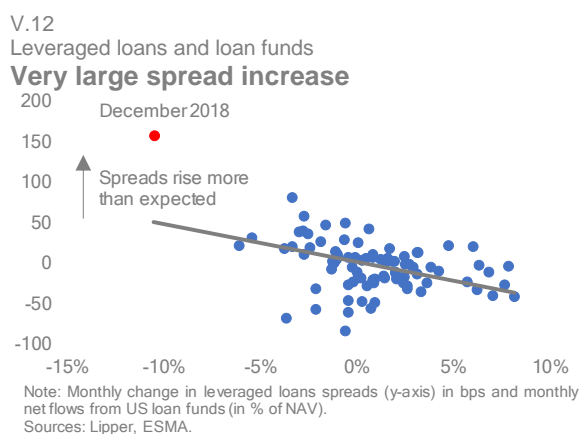


— Spread HY-leveraged loans Average since 2011
Note: Spread between yields on US HY index and US leveraged loan index.
Sources: Thomson Reuters Datastream, JPMorgan, ESMA.

In that context, it is unclear to what extent CLO managers and investors would be able to absorb those losses seamlessly. Indeed, if the credit quality of leveraged loans were to deteriorate significantly, some investors might need to sell loans, potentially creating negative price spirals and feedback loops. Materialisation of this risk depends on a range of factors, including the structure of the investor base (retail, institutional investors or banks) or the existence of a potential liquidity mismatch.

US mutual loan funds might be more exposed than UCITS to this type of risk, as US loan funds have no limit on leveraged loans exposures. They invest in leveraged loans while providing daily liquidity to investors (Haquin, 2015, and Federal Reserve, 2019). If investors were to redeem on a large scale, loan funds would need to liquidate their holdings of leveraged loans, with a potential sharp impact on the market. In addition, leveraged loan transactions typically settle within 30 days, which exposes fund investors to settlement risk.

The market turbulence of December 2018 provides an example of this dynamic: US loan funds experienced their largest outflows on record (higher than 10% of NAV), while spreads on leveraged loans increased sharply. Spreads were particularly sensitive to fund outflows, as they increased by more than suggested by historical relationships (V.12; see red dot above the black line).



However, loan funds proved resilient during the episode, as no fund was forced to suspend redemptions. In addition, CLO structures have limited maturity risk, as the duration of the leveraged loans held are in line with the duration of CLO tranches issued, which reduces rollover risk.

Finally, an additional risk lies in the potential for a wave of rating downgrades, which could have procyclical effects, as holders of leveraged loans might need to liquidate some of their holdings. Usually, CLO managers or trustees value leveraged loans at face value when calculating over-collateralisation requirements (i.e. the amount by which the par amount of the collateral must exceed the par amount of the issued CLO tranches). However, when the share of leveraged loans rated below B- exceeds a specified percentage, the excess is valued at market value (Fitch, 2018). Therefore, CLOs might need to sell the loans to meet the overcollateralisation requirement, at a time where the liquidity in the underlying loan market could deteriorate, thereby amplifying the price decline.

In that context, the credit ratings of CLO tranches are a key parameter for CLO investors, as some investors such as banks will only invest in the highest-rated (AAA) tranches. However, the complexity of CLO structures might lead to model risk, especially regarding the modelling of default correlation among leveraged loans in the CLO portfolio. An unexpected rise in default rates correlation could lead to ratings downgrades which could result in forced sales from investors, thereby putting downward pressure on the CLO and leveraged loans markets. In addition, there tends to be a large overlap among CLO, as CLOs are exposed to the same borrowers. Based on a sample of 902 CLOs, J.P. Morgan reports that 92% have exposure to at least one of the top 50 borrowers (J.P. Morgan, 2019b). A default of the borrower would then impact several CLOs at the

same time. Therefore, we analyse model risk more precisely in the next section using a simulation framework.

Model uncertainty and risks of rating downgrades for CLOs

Credit ratings and modelling risks

The potential for an underestimation of default risks and the possibility of sudden CLO rating downgrades represent a risk for markets and investors. The global financial crisis has shown how flawed rating methodologies can lead to inflated ratings and amplify shocks to the financial system. Moreover, this risk is generally not anticipated. Indeed, investors use credit rating to assess their exposure to credit risk, but they may not consider the possibility that this assessment could underestimate this risk, eventually exposing them to higher credit risk.

The risk of being misled by a model is called model risk. Coval et al. (2009) have shown how in the run-up to the global financial crisis, credit ratings were extremely sensitive to the parameters used by CRAs. The authors show how changes in default probability and correlation of defaults can lead to dramatic changes to credit ratings. More recently, Nickerson and Griffin (2017) find that CRAs tend to underestimate default correlation. The authors estimate that CRAs assume a default correlation of 3%, against a higher estimate of 12% based on a model that includes observable and unobservable risk factors. The authors conclude that credit risk is understated by 26% when comparing their estimates of default correlation with the assumptions used by CRAs.

Correlation of defaults and credit ratings

To illustrate how model and parameter uncertainty can impact credit ratings, we conduct a simulation exercise. We construct a CLO composed of 100 leveraged loans with the same probability of default of 20%, which corresponds to the five-year average default probability of B-rated loans. The CLO structure is divided into four "tranches" corresponding to different levels of risk. The equity tranche is the riskiest and absorbs the first 8% of losses, followed by the junior tranche (up to 20%), the mezzanine tranche (up to 40%) and finally the senior tranche (V.13 and V.14). For example, if losses reach 10%, the equity tranche is wiped out and the junior tranche absorbs the remaining losses, i.e. 2%. For simplicity, we do not consider prepayment or interest rate risk in the model, in order

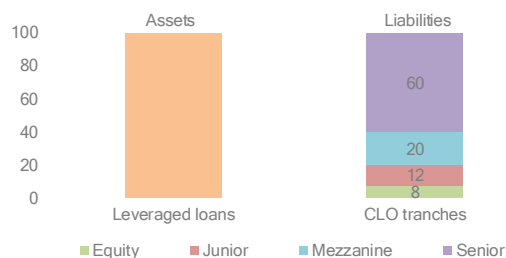
to focus mainly on correlation, nor any overcollateralisation of the CLO (where the face value of the leveraged loans is higher than CLO liabilities).

V.13
CLO modelling
Summary of assumptions

	Parameter
Number of leveraged loans	100
Maturity	5 years
Recovery rate	50%
Default rate	20%
Default correlation	0%
Equity tranche	[0%, 8%]
Junior	[8%, 20%]
Mezzanine	[20%, 40%]
Senior	[40%, 100%]

Source: ESMA.

V.14
Simplified CLO structure
Assets and liabilities



Note: Structure of the CLO used in the simulation. Figures refer to the percentage of tranches outstanding by seniority. Sources: ESMA.

We run 100,000 simulations and compute the default rate for each tranche (see Box V.15 for details), using different values for the correlation of defaults.

V.15
CLO modelling
Estimation of default probabilities

Given the structure of the CLO, as long as the losses are absorbed by the lower tranches, the senior tranches get fully repaid. If losses are higher than the attachment point *A* but lower than the detachment point *D*, the subordinated tranches (i.e. equity and junior tranches) get partially repaid to all of that tranche's noteholder on a pro-rata basis. Finally, if losses are higher than the detachment point, the cumulative losses are equal to the overall size of the subordinated tranches, wiping out the tranches entirely. For example, if losses are equal to 20% of notional, the equity and the junior tranches are entirely wiped out, but the higher tranches (i.e. mezzanine and senior) get fully repaid.

Let L_M denote the cumulative loss on a given tranche and L be the cumulative loss on the whole portfolio of loans. The expected loss for each tranche M , given its attachment A_M and detachment points D_M is equal to

$$E[L_M] = \frac{1}{M} \sum_{i=1}^M \left\{ \frac{\max(L_i - A_M; 0) - \max(L_i - D_M; 0)}{D_M - A_M} \right\}$$

Given the expected loss, we can compute the market price, assuming risk-neutral investors:

$$e^{-(r+s_M)T} = (1 - E[L_M])e^{-rT}$$

Setting the risk-free rate to zero for simplicity yields the following expression for the spread:

$$s_M = -\frac{1}{T} \ln(1 - E[L_M])$$

Finally, the default rate p_M derived from spreads is given by:

$$p_M = 1 - e^{\left(\frac{-s_M T}{1-R}\right)}$$

Credit ratings for higher tranches are directly impacted by the default correlation (Table V.16). In particular, for correlations higher than 0, the mezzanine tranche loses its AAA rating. For correlations higher than 35%, the senior tranche also loses its AAA rating. Similar results are found by S&P (2015) when increasing asset correlation within and between industries.

V.16
CLO modelling
Market-implied ratings

	$\rho = 0$	$\rho = 0.2$	$\rho = 0.4$	$\rho = 0.6$	$\rho = 0.8$
Junior	B-	CCC+	CCC+	CCC+	CCC+
Mezzanine	AAA	BBB-	BB-	B+	B-
Senior	AAA	AAA	AA+	A	BBB

Note: Credit ratings implied by the 5-year expected default rate as a function of the correlation of defaults ρ . Sources: ESMA.

Although the assumption related to the correlation of defaults is key to assessing credit risk for CLOs, it is challenging to estimate this parameter given that defaults are infrequent. Qi et al. (2019), using data from 1970 to 2014, estimate a default correlation of 10% over five years for B-rated bonds and 19% for C-rated bonds. Using data on US firms over the period between 1992 and 2013, Li and Chen (2018) report higher values, with a five-year correlation of defaults among firms with low credit quality (lower than BB) as high as 38%, which can almost double during crisis periods.

Modelling joint extreme events

Another source of model uncertainty is related to the modelling of joint extreme events. Indeed, simultaneous defaults on leveraged loans might be more likely to occur during recessions than during economic expansions. However, in the EU and the US, most CLO models use the Gaussian copula, where the default dependence is entirely characterised by the correlation coefficient (Fitch, 2018). This implies that the occurrence of extreme events – such as the simultaneous

defaults of leveraged loan borrowers – is underestimated.

Some copulas, such as the Student copula and the Clayton copula, integrate more complex dependence structures which can account for the possibility of large simultaneous defaults on leveraged loans (for details see Burtshell et al., 2009, and Yoshida, 2015). Box V.17 outlines how the dependence structure can be modelled using different types of copulas.

V.17
CLO modelling

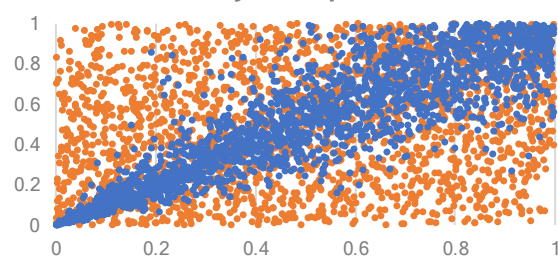
Modelling complex dependence structures

The occurrence of simultaneous defaults is a key factor in the evaluation of CLOs. In the case of a Gaussian copula, the full dependence structure depends on one parameter: the correlation. In other words, the probability of having simultaneous defaults in good, normal or bad states of the world is identical. One drawback is that this type of copula is not able to model joint extreme events. In other copula models, it is possible to introduce a more complex dependence structure, where default arrivals can change depending on the tail of the distribution (tail dependence). For example, Student copulas exhibit symmetrical tail dependence while Clayton copulas have left-tail dependence.

Chart V.18 shows a sample of 2,000 points randomly drawn from a Gaussian copula (in orange) and a Clayton copula (in blue), characterised by high left-tail dependence. For the Gaussian copula, the points are spread all over the area, with no specific pattern in the tails. In contrast, when values are close to zero, points are clustered in the case of the Clayton copula. This indicates that in bad states of the economy, simultaneous defaults are more likely to occur.

V.18
Dependence structure

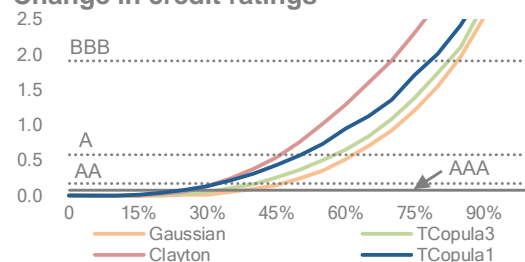
Gaussian and Clayton copulas



Note: Sample points using a correlation of 20% for a Gaussian copula (orange) and a Clayton copula (blue) with a parameter of 5.
Sources: ESMA.

We compare the implied credit ratings of the CLO for the senior tranche using different copula models. The Gaussian copula provides the highest credit ratings, since the tranche is rated A or lower only when the correlation is higher than 65% (V.19). For Student and Clayton copulas, an equivalent rating is obtained with lower correlation values (around 40-50%; Table V.20). This example illustrates how changes in modelling approaches can have a significant impact on credit ratings.

V.19
Senior tranche
Change in credit ratings



Note: 5-year default rates of the senior tranche in function of default correlation. TCopula with 1 and 3 degrees of freedom.
Sources: ESMA.

V.20
CLO modelling

Market-implied ratings

	$\rho = 0$	$\rho = 0.2$	$\rho = 0.4$	$\rho = 0.6$	$\rho = 0.8$
	Mezzanine				
Gaussian	AAA	BBB-	BB-	B+	B-
Student	A	BB+	BB-	B	B-
Clayton	AAA	BB	B+	B-	B-
	Senior				
Gaussian	AAA	AAA	AA+	A	BBB
Student	AAA	AAA	AA	A-	BBB
Clayton	AAA	AAA	A+	BBB	BBB-

Note: Credit ratings implied by the 5-year expected default rate as function of the correlation of defaults ρ and the copula. Student copula with three degrees of freedom. The parameter for the Clayton copula is chosen based on the corresponding Kendall's tau for each correlation coefficient.
Sources: ESMA.

Lower recovery rates and the next recession

Given the deteriorating credit quality of borrowers and the decline in underwriting standards, recovery rates could be substantially lower than in the past in the event of a default (IMF, 2018a).

To assess the impact of lower recovery rates on credit ratings, we assume a recovery rate of 35%, in line with the level reached by defaulted leveraged loans in 2009. Intuitively, credit ratings would be lower for all tranches and across models compared to the baseline recovery rate of 50%, with the largest downgrades for models exhibiting tail dependence (Table V.21).

V.21

Lower recovery rates

Market-implied ratings

	Baseline	Lower recovery rates
	Mezzanine	
Gaussian	BBB-	BB-
Student	BB+	B+
Clayton	BB	B+
	Senior	
Gaussian	AAA	AA+
Student	AAA	A+
Clayton	AAA	A

Note: Credit ratings implied by the 5-year expected default rate as function of recovery rate and the copula. Student copula with three degrees of freedom. The parameter for the Clayton copula is chosen based on the corresponding Kendall's tau for each correlation coefficient.

Sources: ESMA.

The results presented in this section illustrate how model risk can lead to a revision of credit ratings. Those risks crystallised during the global financial crisis in the case of CDOs, leading to numerous ratings downgrades and peaks in default rates. However, some of the risks might be mitigated in the current context.

Following the global financial crisis, CRAs have revised their methodologies. In particular, some CRAs include correlation add-ons when the underlying collateral belong to the same industry and/or regions (S&P's, 2016, Fitch, 2018, Moody's, 2019). Also, a regulatory and supervisory framework has been developed in the EU, with ESMA as the supervisor of CRAs. ESMA intends to further enhance its monitoring activities in this area, so as to ensure that CRAs comply with the relevant requirements set out in the CRA Regulation.

In addition, current CLO structures (so-called CLO 2.0) have a range of differences compared to pre-crisis CLOs. Under the CLO 2.0 structure, equity tranches are thicker, which implies a higher required level of default for AAA tranches to be affected. Relatedly, CLOs 2.0 have tighter collateral eligibility requirements (including on the place of issue of leveraged loans) and shorter reinvestment periods, which reduce interest rate risk for investors. Finally, the risk retention rule set out in EU regulations after the crisis requires that the originator of the CLO retains at least 5% of the risk of the exposure on its balance sheet, in contrast to the originate-and-distribute model used before.

Conclusion

The surge in the issuance of leveraged loans and CLOs is an indication of how market-based finance can supplement bank credit to finance the real economy, and in particular borrowers, with substandard credit quality. At the same time, the deterioration of underwriting standards coupled with low spreads on leveraged loans point to a potential underpricing of risk.

It is therefore crucial to actively monitor the leveraged loan and CLO markets' developments and continue to address data gaps to ensure an adequate coverage of financial institutions exposures to those markets.

At this stage, based on data from the end of 2017, EU fund exposures appear relatively limited, and concentrated in a few AIFs and UCITS. The AIFs with large leveraged loans and CLO exposures use limited leverage and do not face a significant liquidity mismatch, with the exception of a few AIFs offering daily liquidity to investors.

Since the credit ratings of CLO tranches are a key parameter for CLO investors, the potential for sudden CLO rating downgrades represents a risk for markets and investors. Simulations show that an increase in the correlation of defaults can lead to substantial credit rating downgrades, especially when the possibility of extreme events is considered. This shows that investors should take into account model uncertainty for CLOs in their investment decisions.

Looking ahead, it is crucial to make sure that CRA methodologies used for assessing the credit ratings of CLOs remain robust – paying particular attention to the modelling of defaults among the underlying collateral – and that investors perform proper due diligence. In 2019 ESMA will review the quality of CLOs' rating processes and methodologies. Among others, ESMA will look into the rigorousness, validation and historical back-testing of CLO rating methodologies, their systematic application as well as the adequacy of CRAs' arrangements to incorporate new information into CLO ratings in a timely manner.

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Investor protection

Net performance of active and passive equity UCITS

Contact: tania.derenzis@esma.europa.eu⁸⁹

In this article we analyse the cost and performance of EU equity UCITS funds, distinguishing between active and passive investment management, and ETFs. In particular, we investigate the gross and net relative performance of actively and passively managed funds with respect to their prospectus benchmark. The main results show that on an aggregate basis, active funds have underperformed in past years passive funds and ETFs, in net terms, as well as their benchmarks; ongoing costs had the largest impact on performance. The top 25% actively managed equity UCITS outperformed passively managed UCITS before and after costs, as well as their benchmarks. However, the group of top 25% actively managed equity UCITS change over time, such that there is only limited opportunity for investors to pick consistently outperforming actively managed equity UCITS.

Introduction

Over the last decade, the debate on the merits of active and passive fund management has intensified in Europe following the increased development of passive investment options, in particular in the equity market segment.

Academic researchers as well as investment associations and supervisors have focused on the study of costs and benefits related to active and passive fund management.⁹⁰

In this article, we focus on the EU UCITS equity market,⁹¹ distinguishing between active and passive management. We first propose a definition of active and passive management and provide background on the EU equity fund market landscape and its regulation. We then analyse equity fund performance dynamics before and after costs, and the relative performance of actively managed EU UCITS funds. Finally, we investigate the performance of the top and bottom performers and that of the largest and smallest funds.

With this article – as with our Annual Statistical Report on the performance and costs of retail investment products – we aim to increase transparency on fund costs and narrow potential gaps in information and communication that are detrimental to investor protection.

The equity fund market

Active and passive management

We analyse EU UCITS equity actively managed funds, passively managed funds and ETFs.

Broadly speaking, passive portfolio management, or “index strategy” is an investment strategy that tracks the returns of a market benchmark. Given that stock selection is determined by the index followed and tracking a benchmark implies low trading activity by the fund manager, passively managed funds can generally be offered at lower overall costs and fees to investors.

Active management of a portfolio, instead, implies stock selection and active trading in order to generate higher returns compared to a given benchmark. An active portfolio manager looks for higher returns through “stock picking”, choosing specific stocks outside a market benchmark, and/or relying on different weights for stocks that are part of a market benchmark. This requires greater knowledge and skills of the management team, matched with higher compensation and consequently larger fees and costs for investors.

UCITS ETFs can mostly be considered as passively managed funds; actively managed ETFs are a small part of the ETF market. We analyse ETFs separately in this article, given their

⁸⁹ This article was authored by Lorenzo Danieli, Tania De Renzis and Line Farah.

⁹⁰ ESMA (2019), Annual Statistical Report, “Performance and costs of retail investment products in the EU”.

⁹¹ Other asset categories not included in the analysis as in the EU the share of passive funds is negligible for categories other than equity.

particular features⁹² and the large expansion of the ETF market over the past years.

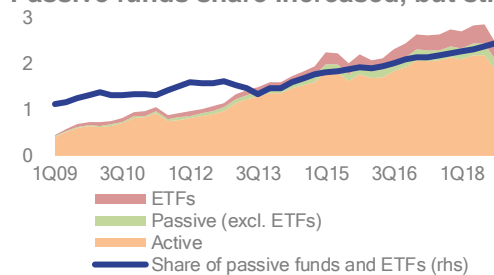
EU equity UCITS market

Overall, at the end of 2018, the EU equity UCITS market size reached EUR 2.5tn. ETFs investing in equity amounted to EUR 368bn.⁹³ Between 2014 and 2018, the share of passively managed equity funds and equity ETFs increased significantly (V.23).

V.23

Equity UCITS market size

Passive funds share increased, but still low



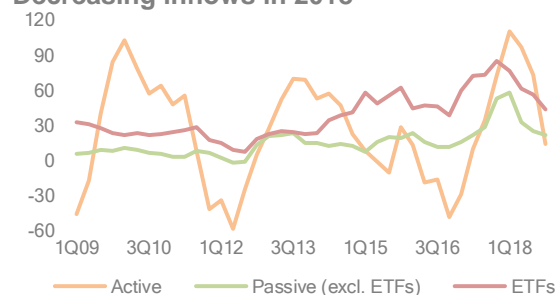
Note: Market size of EU-domiciled UCITS equity funds and ETFs, EUR tn, and share of passive funds and ETFs, in % (right axis). Sample includes funds for which information on fund value, fund performance, net flows, subscription and redemption fees is available.
Sources: Refinitiv Lipper, ESMA.

UCITS active funds accounted for almost 75% of the overall market in 2018. Passive funds and ETFs accounted respectively for the remaining 10% and 15%, up from only 8% and 10% in 2014. Between 2014 and 2018, passive UCITS and ETFs assets increased respectively by 61% and 85%, while actively managed UCITS assets increased by 16%, illustrating a significant shift towards passive management. In 2018, fund assets decreased across categories. The decline was relevant in particular for active equity funds (-13%) while it was more limited for passive ones (-3%) and ETFs (-2%). This decrease is related to declining equity market valuation, likely to be partly compensated by inflows for passive equity UCITS and ETFs.⁹⁴

V.24

Net flows of equity UCITS

Decreasing inflows in 2018



Note: Annual net flows of EU-domiciled equity UCITS by management type and equity ETFs. Quarterly data, EUR bn.
Sources: Refinitiv Lipper, ESMA.

Fund flows are much more volatile in the case of active funds compared to passive funds or ETFs. This is probably related to the difference in the management style, as passive flows are less sensitive to past performance (Anadu et al., 2018). Between 2014 and 2016 flows have shown a declining trend for actively managed UCITS. For ETFs the trend is reversed (V.24). This seems to be in line with US evidence. In the US, as of December 2017, passive equity funds, including mutual funds and ETFs, accounted for 45% of total assets under management, increasing from 5% in 2005 (Anadu et al., 2018).

This market shift has fuelled the debate on active and passive fund management at academic and industry level (Malkiel, 1995; Busse et al., 2014; SPIVA Europe Scorecard; Vanguard, 2017; J.P. Morgan 2019). It has also attracted the attention of supervisors and regulators (Financial Conduct Authority, 2018; ESMA, 2019; Anadu et al., 2018; Sushko and Turner, 2018), in particular with reference to investor protection and financial stability. The two are significantly interconnected, as the choice of a certain investment strategy is related to market information, price discovery and ultimately market efficiency.

Investor protection concerns relate to the benefits and costs of investing in active and passive strategies, or, in other words, to the performance of active UCITS versus their own benchmarks or versus passive UCITS and ETFs, before and after costs. This becomes an even stronger

⁹² One of the main features of an ETF is that ETFs trade like a common security on a trading venue and, as such, experience price changes throughout the day as they are bought and sold. Moreover, there are also ETFs following so-called "quasi-active" approaches such as ETFs following smart-beta strategies. The manager passively follows an index that is based on factors aiming to outperform the market. For details on performance and risk please refer to ESMA, "Performance and risks of exchange-traded funds", Report on Trends, Risks and Vulnerabilities, No. 2, 2014.

⁹³ The data reported refers to our sample. The European Fund and Asset Management Association (EFAMA) quarterly statistical release in 2018 reports overall equity UCITS assets at 3.5tn with UCITS ETF assets standing at EUR 624bn in 2018, more than 65% more than 2015. See:

https://www.efama.org/Publications/Statistics/Quarterly/Quarterly%20Statistical%20Reports/190308_Quarterly%20Statistical%20Release%20Q4%202018.pdf

⁹⁴ See ESMA, Report on Trends, Risks and Vulnerabilities No. 1, 2019.

concern when considering retail investors specifically, as retail investors have less access to *ex ante* information and therefore might be more exposed to losses than informed agents.

From the financial stability perspective, the discussion focuses on the implications of a structural move from active to passive investments, such as the effects on liquidity transformation and redemption risks, market volatility, concentration in the asset-management industry, asset valuations and co-movements (Anadu et al., 2018; Sushko and Turner, 2018). Active fund management through selection of stocks as opposed to passively following an index also has an important role to play in terms of efficient allocation of capital in the economy and ensuring high levels of capital market efficiency.⁹⁵

In terms of active equity fund performance Davydoff and Klages (2014) report mixed evidence for the EU, with equity funds outperforming their benchmark in some EU countries and underperforming in others (returns are in nominal terms net of ongoing costs and before subscription and redemption fees).⁹⁶ The Financial Conduct Authority (2017) reports that, on average, active equity funds underperform their benchmarks in terms of net returns. More recently, in its Annual Statistical Report on Cost and Performance, ESMA (2019) observed that actively managed equity funds have on average lower performance net of costs compared to passive equity funds with high heterogeneity across EU national markets.⁹⁷

Regulatory background

In the past ten years, the financial crisis and the rise of new risks and weaknesses in the market have highlighted the importance of the joint development of analytical, policy and legislative actions to ensure effective market surveillance.

In the fund industry, this has resulted in the implementation of a series of new or strengthened regulatory measures. Among others, a common goal of these different pieces of regulation is to guarantee a higher level of transparency, increased market efficiency and investor protection:

- UCITS⁹⁸ have specific restrictions in terms of eligible assets and limits to the concentration of investments and leverage, have to be open-ended funds and have a Key Investor Information Document (KIID)⁹⁹ with prescribed common investor information.
- AIFMD¹⁰⁰ regulates actors and activities that might entail significant risks for investors. It introduces a coherent European framework for regulating alternative investment fund managers (AIFMs). Its scope applies to EU AIFMs managing AIFs, whether these are domiciled inside or outside the EU, and to all non-EU AIFMs that manage one or more EU AIFs or market one or more AIFs in the EU.
- MiFID II¹⁰¹ strengthens the requirements on the disclosure to clients of information on costs and charges in order to ensure that all categories of clients benefit from such increased transparency.¹⁰²
- PRIIPs¹⁰³ is a set of rules on cost disclosure to the retail investor. It foresees a presentation of all costs of the product in the corresponding cost section of the Key Information Document (KID)¹⁰⁴, including information on the overall cost of the product and on the different cost components.

Focusing on aspects related to passive and active management, the UCITS KIID document includes benchmark disclosures and past performance disclosure obligations.¹⁰⁵ These

⁹⁵ See, for example Grossman and Stiglitz (1980), or Pace et al. (2016).

⁹⁶ Davydoff and Klages define their performance indicators as “[...] based on the variation of the net asset value (NAV) of each fund. The NAV is calculated as the net value of the portfolio of a fund, divided by the number of the fund’s shares held by investors. Each day, operating costs, trading costs and management fees are already deducted pro-rata from the value of the portfolio for the calculation of the NAV. [...], entry fees and redemption fees should be deducted from the performance, on the first and last year of the period under review”. For additional details please see Davydoff and Klages (2014).

⁹⁷ ESMA, 2019, Annual Statistical Report, “Performance and costs of retail investment products in the EU”.

⁹⁸ Directive 2009/65/EC.

⁹⁹ Commission Regulation (EU) No 583/2010 of 1 July 2010 implementing Directive 2009/65/EC. See also the

Question and Answers on the application of the UCITS Directive, last updated 29 March 2019.

¹⁰⁰ Directive 2011/61/EU.

¹⁰¹ Directive 2014/65/EU.

¹⁰² The MIFID II requirements entered into application on 3 January 2018. In some Member States the date has been delayed because of late transposition. ESMA is continuing to issue Q&As to clarify aspects that may arise such as the relationship between the PRIIPs and MiFID II disclosure requirements.

¹⁰³ Regulation (EU) No 1286/2014.

¹⁰⁴ Commission Delegated Regulation (EU) 2017/586 of 14 July 2016 supplementing Directive 2014/65/EU.

¹⁰⁵ Commission Regulation (EU) No 583/2010 of 1 July 2010 implementing Directive 2009/65/EC, Article 7(1)(d) and 18(1).

provisions are crucial in more efficiently identifying the management strategy of a fund.

Performance and costs of EU equity UCITS

The analysis of actively and passively managed EU equity UCITS and EU equity UCITS ETFs, based on data from 2009 to 2018, resulted in the following main findings: (i) net annual performance for active equity UCITS was lower than that of passive and ETFs equity UCITS; (ii) actively managed EU equity funds have underperformed in net terms relative to their prospectus benchmarks, across time horizons; (iii) ongoing costs, proxied by the total expense ratio (TER),¹⁰⁶ have had the largest impact on performance; (iv) across time horizons, active top performers (top 25% of active equity UCITS) have performed better than their benchmark and passively managed funds, before and after costs. In aggregate terms, similar results are observable, at one- and three-years horizons. However, the cohort of the top 25% performers does not remain constant over time, making it difficult for investors to choose outperforming active equity UCITS.¹⁰⁷

Data and methodology

We analyse performance and costs by focusing on equity funds. In the EU, as clarified above, passive and ETFs UCITS are concentrated in the equity market segment. The analysis includes:

- A comparison between EU active and passive equity UCITS and ETF UCITS. A distinction is made between passive UCITS and UCITS ETFs to highlight the particular features of the latter.
- A comparison between actively managed EU equity UCITS and their prospectus benchmarks.¹⁰⁸
- An analysis of the best and worst performers (top/bottom 25% of UCITS actively and

passively managed funds in terms of performance).

- An analysis of the largest and smallest active UCITS funds (top/bottom 25% in terms of asset size).

As in the ESMA report on performance and costs, data are from Refinitiv Lipper and cover a ten-year period from 2009 to 2018.¹⁰⁹ The sample choice is determined by the joint availability of data on performance, prospectus benchmarks, front and back loads, TER, net flows and fund values.¹¹⁰ This reduces our sample of EU equity UCITS to EUR 2.1tn and equity ETFs to EUR 528bn in 2018, around 60% and 85% of each market.¹¹¹

Performance of active and passive equity funds

Across all time horizons, focusing on the period from 2009 to 2018, gross performance is on average slightly higher for actively managed equity funds than for passively managed equity funds and equity ETFs (V.25). At the seven-year horizon, gross performance for active funds is 10.4% on average, against 10.3% and 10% respectively for passive funds and ETFs. At the three-year horizon, gross performance is estimated to be 5.8% for active funds, and 5.5 % and 5.6% respectively for passive funds and ETFs.

¹⁰⁶ For details on data definitions and limitations please see ESMA (2019), Annual Statistical Report, "Performance and costs of retail investment products in the EU".

¹⁰⁷ Results on the persistence of performance are diverse. There have been several academic studies focusing on this issue. As well as more recent analyses, the seminal analysis of Carhart (1997) did not find a strong persistence of the performance of mutual funds.

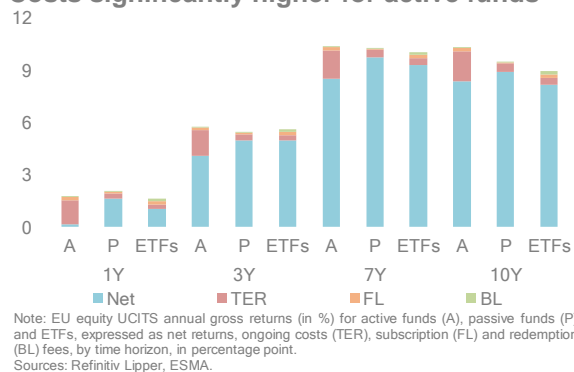
¹⁰⁸ The choice of prospectus benchmarks over technical benchmarks is linked to the focus on retail investors. Retail investors have access to UCITS prospectuses or UCITS KIID information. Technical benchmarks are usually developed by data providers and may not be accessible or known by retail investors.

¹⁰⁹ The period analysed starts one year later than the ESMA report on performance and costs published in January. The analysis covers the EU equity UCITS performances over the year 2018 that have been much lower, and even negative, across different funds than in 2017.

¹¹⁰ Data refer to surviving funds as previous analysis carried out within ESMA has not shown significant difference between the sample used and a full sample. However, investigation of more recent data is ongoing.

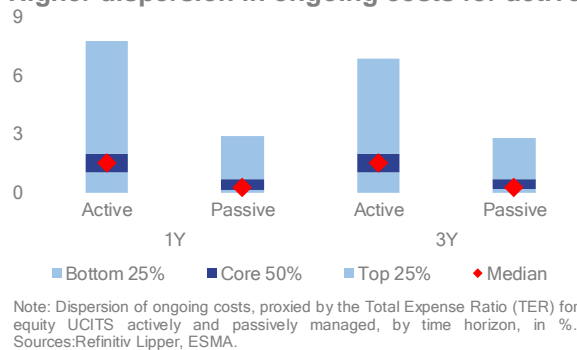
¹¹¹ According to the EFAMA quarterly statistical release in 2018 equity UCITS assets were EUR 3.5tn with equity UCITS ETF assets standing at EUR 624bn in 2018.

V.25
Equity UCITS funds and ETFs net performance
Costs significantly higher for active funds



The picture is different when considering net performance. Focusing on the three-year horizon, net performance for actively managed equity UCITS drops to around 4% and for passive funds and ETFs to around 5%. Similar patterns can be observed for longer time horizons. At a one-year horizon, overall fund performance drops across all types of management, as valuation for underlying equity declined, especially in the second half of 2018.¹¹² This has a particularly strong impact on actively managed equity UCITS. They underperform passive and ETFs equity UCITS both in gross and net terms.

V.26
Dispersion of ongoing costs across management type
Higher dispersion in ongoing costs for active



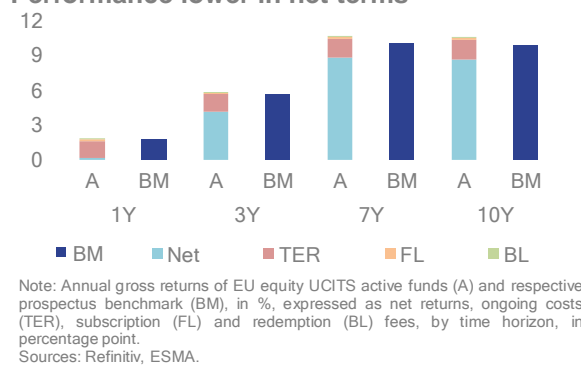
On average across time horizons, ongoing costs account for more than 80% of total costs and fees for active funds. For passive funds and ETFs, they are around 70% and 45% respectively.¹¹³ For actively managed UCITS, these costs are much higher than for passive and ETFs UCITS, as well as being more dispersed (V.26). While for

actively managed UCITS ongoing costs are, on average, around 1.5ppt, for passive and ETFs UCITS they hover around 0.3ppt.

Relative performance of active funds

A second key layer of analysis is the performance of actively managed funds against their prospectus benchmarks.¹¹⁴ Based on our sample covering the period from 2009 to 2018, actively managed funds outperform prospectus benchmarks in gross terms (10.6% versus 10% at the seven-year horizon respectively and 10.5% versus 9.8% at the ten-year horizon (V.27)). Over three- and one-year horizons, though, gross performances are equal between actively managed funds and their related benchmarks: around 5.7% over three years and 1.8% over one year.

V.27
Active equity UCITS and prospectus benchmarks
Performance lower in net terms



Looking at net performances, instead, active funds underperform their benchmarks across time horizons. Focusing on the three-year horizon, net performance is just above 4% for actively managed while it reaches 5.7% for their benchmarks. Gross performance is strongly reduced by ongoing costs. As previously reported, ongoing costs reduce gross returns by 1.5ppt on average. This implies that, focusing on the one-year horizon, accounting only for ongoing costs, returns fall to 0.4% (0.2% when subscription and redemption fees are also included).¹¹⁵

In addition, returns are much more volatile than costs over time. This implies that, when gross

¹¹² ESMA Report on Trends, Risks and Vulnerabilities No.1, 2019.

¹¹³ The higher relative importance of one-off loads in terms of costs for ETFs may be related to ETFs being traded as securities on trading venues.

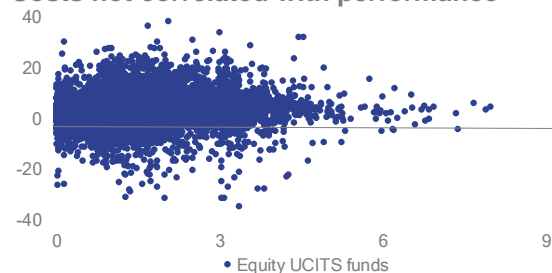
¹¹⁴ Please note that only funds for which the prospectus benchmark is available are considered.

¹¹⁵ The reduction is expressed in absolute terms. Reductions due to ongoing costs, plus subscription and redemption fees, are simply the difference between gross and net performance. For more details on definitions and the calculation of annual performance and costs see ESMA (2019), Annual Statistical Report, "Performance and costs of retail investment products in the EU".

returns are lower, a similar level of costs has a higher impact on gross performance. In 2018, when equity performances have been very low and even negative for most fund shares, total costs took out around 90% of gross returns. Over the three-year period, between 2016 and 2018, total costs took out 29% of gross returns, as the three-year return calculation¹¹⁶ included the year 2017, in which equity valuations were very high. Investors take an extra hit in case of an overall lower gross return.

When analysing the relationship between gross returns and ongoing costs for the overall EU equity UCITS segment (i.e. actively and passively managed UCITS), we observe that higher costs do not correspond to higher performance (V.28), i.e. no correlation is observed between fund costs and performance.¹¹⁷

V.28
Distribution of performance and costs for equity UCITS
Costs not correlated with performance



Note: EU equity UCITS active and passive, gross annual performance (Y-axis) and ongoing costs (x-axis), proxied by the total expense ratio (TER), %, three-year horizon.
Sources: Refinitiv Lipper, ESMA.

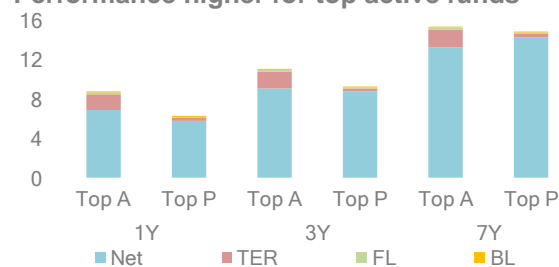
The above holds across management type, even if for passively managed funds costs are lower: the majority of ongoing costs, for passive, lies between 0% and 1%,¹¹⁸ whereas actively managed UCITS report ongoing costs between 1% and 3%. A similar relation holds at the one-year horizon.

Top performing funds

When focusing on the top 25% of actively and passively managed EU equity UCITS, the results become more nuanced.¹¹⁹ Chart V.29 shows that, for the period under analysis, active funds outperform passively managed funds when the

top 25% of funds are considered, both in gross and net terms (except over the seven-year horizon).¹²⁰

V.29
Top performing active and passive equity UCITS
Performance higher for top active funds



Note: EU UCITS equity funds annual gross returns in % for top-performing active funds (Top A) and top-performing passive funds (Top P), expressed as net returns, ongoing costs (TER), subscription (FL) and redemption (BL) fees, by time horizon, in percentage point.
Sources: Refinitiv Lipper, ESMA.

Over one year, gross and net performances for active funds are higher, at 8.8% and 7% respectively against 6.3% and 5.8% for passive funds. This holds, to a lesser extent, over the three-year horizon, with gross and net performances for active funds at 11% and 9.1%, and gross and net performances for passive funds at 9.2% and 8.8%. This is however different at the seven-year horizon. In gross terms, actively managed funds have a gross performance of 15.4%, while passive funds gross performance is at 14.8%. After costs, this is reversed with active funds underperforming passive funds (13.3% against 14.4% respectively).

The top performing active funds also show performances, before and after costs, higher than their prospectus benchmarks (V.30). Focusing on the one- and three-year horizons, the net performance of top-performing active UCITS is around 7% and 9%, versus 5% and around 8% for their prospectus benchmarks. As above, this pattern starts to reverse when looking at the seven-year horizon, with net performance of top-performing active UCITS at 13.3% compared to 13.7% for their benchmarks.

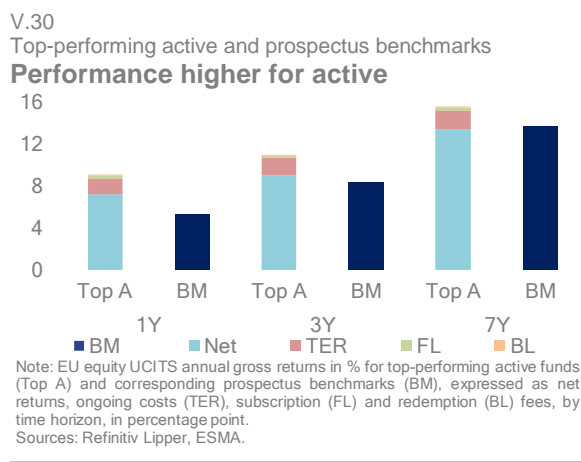
¹¹⁶ For details on the calculation methods please refer to ESMA (2019), Annual Statistical Report, "Performance and costs of retail investment products in the EU".

¹¹⁷ The analyses of Ramiro Losada (2016), "Managerial ability, risk preferences and the incentives for active management", and Cambon Murcia (2011), "Spanish mutual fund performance: an analysis of the determinants", focusing on the Spanish market and published by the CNMV, reach similar conclusions on the relation between costs and performance.

¹¹⁸ The analysis provided in V.31 and the related chart covers the entire sample of equity funds actively and passively managed. It is also available by subsample for active, passive and ETF equity funds.

¹¹⁹ ETFs are not included in this analysis due to the relatively small sample size for ETF funds in the EU

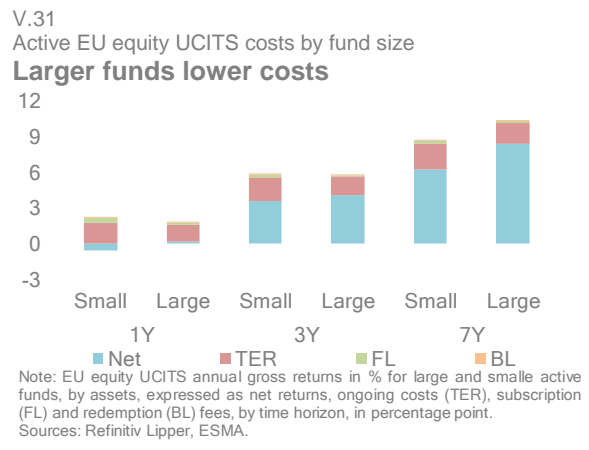
¹²⁰ The results look at the average of the cohort of top-performing funds. This cohort is not constant across time.



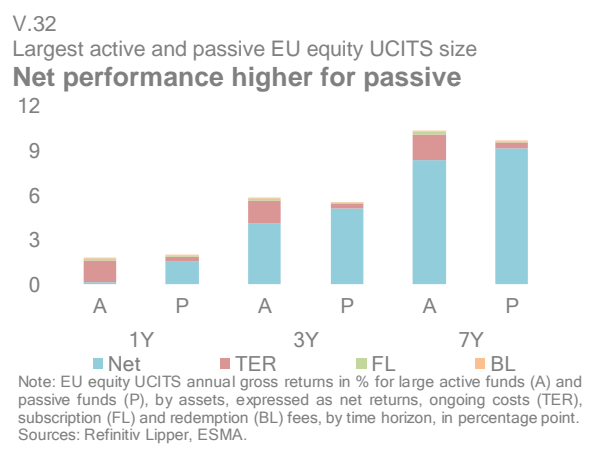
The results for longer time horizons already point at an important result of this analysis – funds which are among the 25% of top-performing active equity UCITS in 2018 are not necessarily among the top-performers in preceding years. Our analysis shows that the composition of the top 25% of actively managed equity UCITS changes materially over time. This is important, as the past outperformance of a fund is therefore not necessarily a predictor of future outperformance. As such, there is only limited opportunity for investors to pick consistently outperforming actively managed equity UCITS.¹²¹

Additional analysis has been carried out in terms of the bottom 25% performing funds, across management styles and relative to their benchmarks. The main results show that actively managed funds underperform passively managed funds and respective benchmarks across all time horizons considered.

Larger funds have better performance



Some attention has also been given to the size of UCITS in terms of assets (top and bottom 25% in terms of NAV)¹²² and its impact on performance and costs. On average, larger funds have higher performance both in gross and net terms, possibly related to lower costs as a consequence of economies of scale. This result holds both for active (V.31) and passive equity UCITS.



Looking at larger active and passive funds (V.32), if from a gross return perspective active funds always outperform passive funds, this is not the case when we account for costs. Over one year, net returns were around 0.2% for larger active funds while being 1.6% for larger passive funds. Over three years, returns after costs were higher for passively managed funds: 4% for active funds and 5% for passive funds. Ongoing costs have the largest impact. They account for more than the 80% of overall costs.

¹²¹ See Carhart (1997), Hereil et al. (2010). Also, a recent study by Morningstar (January 2016) highlighted that while there is some evidence that relative fund performance persists in the short term, this is not the case over the long term. Overall, results indicate that long-term investors cannot select funds based on past performance alone. They should combine performance analysis with

an assessment of other quantitative and qualitative factors.
¹²² As an example, at the one-year time horizon the average size of a fund in the bottom 25% is EUR 8mn compared to around EUR 610mn for a fund in the top 25%.

Conclusion

In this article, first we provided an overview of the EU equity UCITS market and its regulatory environment. Second, we analysed the gross and net performance of actively and passively managed equity UCITS as well as equity ETFs and also compared fund performance against the fund benchmark performance.

The share of passive investing in the equity fund market segment has been increasing materially. In 2018, active equity UCITS account for about the 75% of the overall equity market. The remaining 25% is divided between passive equity UCITS (10%) and ETFs UCITS (15%) respectively, up from 8% and 10% in 2014.

Regarding the performance of active and passive equity funds, and equity ETFs, based on data from 2009 to 2018, the main findings are as follows.

- Active equity UCITS have underperformed on average, in net terms, passive and ETF equity UCITS as well as their prospectus benchmarks.
- Across time horizons, the top 25% of actively managed equity UCITS outperformed passively managed UCITS before and after costs, as well as their benchmarks. However, the group of the top 25% of actively managed equity UCITS changes over time, such that there is only limited opportunity for investors to pick consistently outperforming actively managed equity UCITS.
- Larger equity UCITS have tended to outperform smaller ones, especially on a net basis. However, they underperformed passive equity UCITS after costs.

This analysis contributes to ESMA's broader efforts to promote transparency on fund costs and performances, which aims to support retail investors' investment decision-making.

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Investor protection

Use of derivatives by UCITS equity funds

Contact: claudia.guagliano@esma.europa.eu¹²³

We investigate the use of derivatives by EU UCITS equity funds, based on regulatory data on derivatives collected under the EU EMIR framework. Our results indicate that the tendency and frequency of EU UCITS equity funds to trade derivatives is to a large extent embedded in asset managers' characteristics, such as fund family and fund family size. On the contrary, we find that on the individual fund level the investment strategy, size, geographic focus, base currency, or domicile of the fund play a minor role. Over time, cash inflows as well as currency risk seem to have a significant and robust influence, which suggests that derivatives are used for transaction cost or risk reduction purposes. Our analysis does not find strong indications that derivatives are primarily used for speculative or window-dressing purposes by UCITS equity funds.

Introduction

After the financial crisis in 2008, global regulators started to shed more light on derivatives markets, including the use of derivatives by market participants. Under various regulatory frameworks (such as EMIR in the EU) derivatives transactions are reported to the authorities, enabling a granular analysis of derivatives transactions. In this article EMIR data is used to foster the understanding of derivatives usage by EU equity investment funds.

ESMA (2018) gives a broad overview of the EU derivatives market and shows that investment firms and credit institutions are the main participants in derivatives markets. They account for more than 95% of trading activity in notional terms. Alternative investment funds seem to be active mostly in credit derivatives (around 6% of the market notional amount) and interest rate derivatives markets (around 3% of the market notional amount). UCITS funds are minor players in the derivatives market. Their exposure is higher than 2% of the total notional amount only in the credit and equity derivatives segments. While UCITS make up a relatively small portion of the overall EU derivatives market, the estimate is based on gross amounts. A gross measure might underestimate the market share of UCITS compared to a net measure (Braunsteffer et al. 2019).

In this article we focus on equity funds, which represent 37% of the EU UCITS net assets.¹²⁴ We analyse (i) what types of derivatives are traded by UCITS equity funds, (ii) why some UCITS equity funds trade derivatives, while others do not, (iii) what makes some of them more active traders, and (iv) to what extent derivatives trading is a reaction to daily changes in fund and market conditions. While there is some literature dealing with (i) and (ii), research on (iii) and (iv) is currently still very limited.

We contribute to the literature on derivatives use by investment funds in multiple ways. First, we complement previous evidence on which types of derivatives equity funds use (e.g. Fong et al., 2005; Cao et al., 2011; Cici and Palacios, 2015; Natter et al., 2016). This article shows that three types of contracts (forward, futures and options) account for about 80% of all trades.

Second, we add to the literature on which funds are using derivatives. Previous literature has documented various characteristics of funds which trade derivatives (e.g. Cao, Ghysels and Hatheway, 2011; Cici and Palacios, 2015; Deli and Varma, 2002; Guagliano et al., 2019; Koski and Pontiff, 1999; Johnson and Yu, 2004; Natter et al., 2016). We emphasise the role of the management company of the fund (also called "fund family") in a fund's decision to use derivatives.

¹²³ This article was authored by Daniel Bias (daniel.bias@tum.de), Claudia Guagliano, Martin Haferkorn, Michael Haimann (michael.haimann@tum.de) and Christoph Kaserer (christoph.kaserer@tum.de).

¹²⁴ See https://www.efama.org/Publications/Statistics/Quarterly/Quarterly%20Statistical%20Reports/190308_Quarterly%20Statistical%20Release%20Q4%202018.pdf

Data

To identify the sample of funds for our analysis we use data from the Morningstar Direct database. The sample construction starts with all UCITS funds classified as equity funds, domiciled in the EU, with an inception date before or equal to 31 December 2015. Furthermore, we exclude funds with missing information on the ISIN or the benchmark. In line with related papers (e.g. Natter et al., 2016), we exclude funds with a net asset value below 5mn USD (converted from the original currency) to deal with the incubation bias (Evans, 2010). These criteria are fulfilled by 5,038 equity funds.

The UCITS equity fund sample is then merged to the derivatives dataset coming from EMIR. In EMIR data, counterparties of a derivative trade are identified by the Legal Entity Identifier (LEI). We follow Braunsteffer et al. (2019) to link fund data (identified by ISIN) with EMIR data (identified by LEI).

Data originating from EMIR are provided to the authorities at different levels of granularity. The highest level of granularity is trade activity (also referred to as flow data), which provides various messages to update the status of open transactions. Each message has a certain action type that defines the content and consequently the status of the transaction (e.g. new trade, modified, cancelled/terminated; ESMA, 2018).

For our investigation, we use trade activity data from 1 July to 31 December 2016, which is collected from the six relevant Trade Repositories (TRs) in 2016 (i.e. CME, DTCC, ICE, KDPW, Regis-TR and UnaVista). We filter out only new transactions. EMIR data provide a variety of fields to describe the complex universe of derivative transactions. We extract the main EMIR fields to identify the central properties of these contracts: asset class, contract type, counterparty side (buy/sell), and notional amount.¹²⁵ Further, we apply various cleaning steps to filter out unrealistic or unexpected values.

Using our Morningstar sample, 1,388 of the 5,038 equity funds are identified in the EMIR data, i.e. 27.6% of the equity funds make at least one derivative trade in the analysed period. As a result, our sample includes 181,746 fund-day observations.

We construct the following three different aggregated measures at a fund-day level: (i) a derivative trading dummy equal to one if a fund trades a derivative on a certain day and zero otherwise; (ii) the number of trades per day; (iii) the traded notional amount per day. Considering only the funds trading derivatives, we find that on average each fund trades on 40% of the days and makes about 2.6 trades per day when it trades.

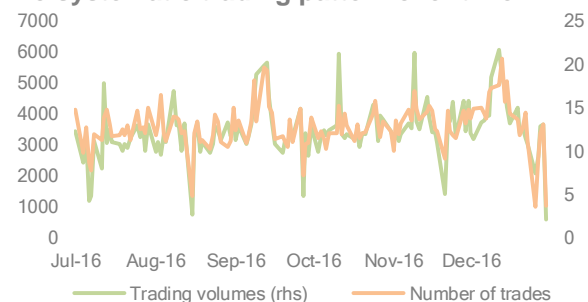
Derivatives use by equity funds

Trade activity data from EMIR allows possible trading patterns over time to be identified and the shedding of light on underlying asset classes and used derivative types. In the period from 1 July to 31 December 2016, the 1,388 funds make 472,757 trades. As expected, the number of trades and the trading volume are highly correlated. Over our sample period, we do not observe a clear time trend in funds' daily trading activities. Rather, we observe several peaks in both the number of trades and the trading volume (V.33).

V.33

Derivatives trading of funds

No systematic trading pattern over time



Note: Total number of derivatives transactions reported under EMIR, and gross notional amounts traded (right axis), EUR bn.
Sources: TRs, ESMA.

Three types of contract account for almost 80% of all trades, with forward contracts on currencies being responsible for 53% and future or option contracts on equities for 26% together (14% and 12%, respectively). In terms of the relative distribution of the notional amount of trades, these three types of contract still account for 72%. However, the relative importance changes. While the portion of forward contracts on currencies decreases to 27%, the share of future equity contracts increases to 35%. This shows that on average the notional amount of futures used in funds is higher than for forwards which could be

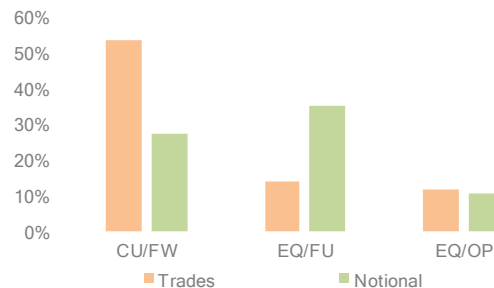
¹²⁵ For the exchange-traded derivatives, the reporting of asset class and contract type is not standardised, thus we

use a methodology developed and tested by ESMA to populate this information.

driven by the design of these contracts. Options on equity remain almost unchanged with 10% (V.34).

V.34

Derivatives contract types

Concentrated around three contract types

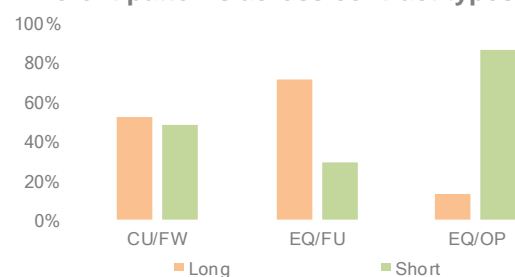
Note: Share of the top 3 derivatives contracts, in % of all derivatives trades and total notional. CU/FW=currency forwards; EQ/FU=equity futures; EQ/OP=equity options.

Sources: TRs, ESMA.

Forward trades on currencies are almost equally balanced across long and short trades (52% to 48%). For futures on equities, long trades are dominating, with 71% indicating that they aim to mirror direct exposure to the underlying. By contrast, equity UCITS funds write an option to receive a premium in 87% of the trades (V.35), which potentially shows the usage of covered call strategies.

V.35

Share of long and short positions for the main contract types

Different patterns across contract types

Note: Share of long and short positions for the top 3 derivatives contracts, in % of trades in each contract. CU/FW=currency forwards; EQ/FU=equity futures; EQ/OP=equity options.

Sources: TRs, ESMA.

Empirical approach

Which equity funds use derivatives?

To provide insights into an equity fund's decision to use derivatives or not, we analyse the role of the fund family and the fund's characteristics. Technically, we use the following regression model.

$$\begin{aligned} \text{Derivatives}_i = & \alpha + \lambda_{\text{family size}} + \lambda_{\text{family}} \\ & + \lambda_{\text{invarea}} + \lambda_{\text{currency}} + \lambda_{\text{domicile}} \\ & + \lambda_{\text{benchmark}} + \lambda_{\text{size}} + \epsilon_i \end{aligned}$$

where:

- the dependent variable Derivatives_i is equal to one if the fund is using derivatives and equal to zero otherwise;
- i denotes a fund and ϵ_i is the error term;
- $\lambda_{\text{familysize}}$ is fund-family-size-decile fixed effects;
- λ_{family} is fund-family fixed effects;
- λ_{invarea} is investment area fixed effects;
- $\lambda_{\text{currency}}$ is base-currency fixed effects;
- $\lambda_{\text{domicile}}$ is fund-country fixed effects;
- $\lambda_{\text{benchmark}}$ is benchmark fixed effects;
- λ_{size} is fund-size-decile fixed effects.

The statistic of interest here is the explanatory power. It indicates which part of the overall variation in funds' decisions to use or not use derivatives can be explained by these characteristics.

According to previous results in the literature, we expect the geographic investment focus as measured by the investment area, the investment strategy as measured by the benchmark as well as the fund's size or the size of the fund family (i.e. the total assets under management of the fund management company) to play an important role.

In the first step, we include variables for the fund family size based on the number of funds belonging to a family. Family size effects can only explain 1.1% of the overall variation. Next, we add fund-family effects to the model. This increases the explanatory power to 25.7%. Hence, a fund's affiliation to a certain fund family can explain a substantial part of the decision to use derivatives or not. Successively, we add further variables for the investment area, base currency, domicile, benchmark, and fund size. Although each of these variables on its own can explain between 2.6% and 5.0% of the overall variation, they are only able to further increase the explanatory power to 29.3%, on top of the fund-family effects (V.36).

V.36

Fund characteristics and the decision to use derivatives

Asset managers drive the decision to use derivatives

	Individual	Combined model	
	Adj. R2	Adj. R2	Obs.
Family size FE	0.011	0.011	5,038
Family FE	0.257	0.257	4,780
Investment Area FE	0.028	0.269	4,775
Currency FE	0.026	0.270	4,772
Domicile FE	0.050	0.272	4,772
Benchmark FE	0.045	0.272	4,359
Fund size FE	0.040	0.293	4,349

Note: Estimates from linear regressions of the derivatives trading dummy (equal to one if a fund makes at least one derivative trade during our sample period) on various fixed effects (FEs). The fixed effects control for size of the fund family, fund family, investment area, currency, domicile, benchmark, and deciles of fund size. They are successively added to the model. The sample consists of derivatives trading and non-derivatives trading funds. We report for each fixed effect the individual adjusted R-squared (from a regression model with only this fixed effect) and the adjusted R-squared of the combined model (with this fixed effect and all fixed effects listed above) as well as the number of observations of the combined model (Obs.).
Sources: ESMA.

How do funds use derivatives?

To analyse the propensity and extent of a fund's derivative use, we aggregate the trade-level data on fund-day level and construct two measures for a fund's daily derivative use:

- Notional_{i,t} is the natural logarithm of the total notional of a fund's derivatives trades on day t;
- DTD_{i,t} is the daily derivatives trading dummy that equals one if a fund *i* makes at least one derivative trade on day t.

We focus on the 1,388 equity funds using derivatives and we analyse which fund characteristics describe a fund that makes active use of derivatives.

Notional_{i,t} and DTD_{i,t} are the dependent variables of the followed fixed effects approach to identify fund characteristics that can explain the propensity and extent of funds' daily derivative use. In this step we also include fund effects (λ_i).

The relative activity of a fund in derivatives markets depends on the decision of the related asset managers, i.e. the fund family (31.8% of the overall variation in the daily notional). Only a minor part of this (3.1%) relates to the size of the fund family. Investment area, currency, domicile, benchmark, and fund size are minor drivers (they increase the adjusted R-squared to 41.3%). Interestingly, a fund's benchmark seems to be important since it can explain on its own 13.8% of the overall variance. The fund fixed effects further increase the explanatory power to 57.6% (V.37 panel A). The same analysis is run for the

derivatives trading dummy that equals one if a fund makes at least one trade on a day. The results are very similar. Together, all fixed effects can explain 53.0% (V.37 panel B).

V.37

Fund characteristics and active derivatives users

Benchmark and fund characteristics explain activity

	Individual	Combined model	
	Adj. R2	Adj. R2	Obs.
Panel A: Notional per day			
Family size FE	0.031	0.031	181,746
Family FE	0.318	0.318	181,746
Investment Area FE	0.032	0.332	181,746
Currency FE	0.024	0.333	181,746
Domicile FE	0.027	0.340	181,746
Benchmark FE	0.138	0.395	181,746
Fund size FE	0.064	0.413	181,746
Fund FE	0.568	0.576	181,746
Panel B: Daily derivatives trading dummy			
Family size FE	0.035	0.035	181,746
Family FE	0.296	0.296	181,746
Investment Area FE	0.035	0.310	181,746
Currency FE	0.030	0.312	181,746
Domicile FE	0.024	0.319	181,746
Benchmark FE	0.137	0.372	181,746
Fund size FE	0.049	0.383	166,749
Fund FE	0.519	0.530	166,747

Note: Estimates from linear regressions of two dependent variables on various fixed effects. In panel A the dependent variable is the natural logarithm of a fund's traded notional per day. In panel B the dependent variable is the daily derivatives trading dummy which equals to one if a fund makes at least one derivative trade on a day and zero otherwise. The fixed effects (FEs) control for size of the fund family, fund family, investment area, currency, domicile, benchmark, deciles of fund size and fund. They are successively added to the model. The sample consists of derivatives trading funds. We report, for each fixed effect, the individual adjusted R-squared (from a regression model with only this fixed effect) and the adjusted R-squared of the combined model (with this fixed effect and all fixed effects listed above) as well as the number of observations of the combined model (Obs.).
Sources: ESMA.

Is equity funds derivatives use a reaction to changing fund and market conditions?

Finally, we analyse the role of time-varying fund and market characteristics for derivatives trading activities. To test which time-varying characteristics matter, we estimate the following linear probability model:

$$DTD_{i,t} = \alpha + \beta x_{i,t-1} + \lambda_{fund} + \lambda_{invararea} + \lambda_{benchmark} + \epsilon_{it}$$

where DTD_{i,t} is the daily derivatives trading dummy and the main coefficient of interest is the β on a lagged fund characteristic $x_{i,t-1}$. As fund characteristics x , we follow the literature and test various proxies for fund flows, fund risks, and fund returns. Besides day and fund fixed effects, all models also include investment area-day and

benchmark-day fixed effects. These fixed effects control for (unobserved) time-varying characteristics that are relevant to funds in the same investment area (e.g. Europe-wide, worldwide) and with the same benchmark (e.g. MSCI World, DAX).¹²⁶

First, we focus on fund flows. The hypothesis is that funds may use derivatives to manage flows in a cost-efficient way. Results show that net flows are positively related to the probability of using derivatives (technically, a one-standard deviation increase of the net flow increases the probability of a trade by 0.26 percentage points). Positive net flows increase the probability of using derivatives while negative net flows do not seem to be relevant. This finding supports the hypothesis that funds use derivatives to manage inflows (V.38 panel A). A possible explanation could be that funds directly invest inflows using derivatives to minimise the tracking error and to save transaction costs. Further, they can use their reserve for small outflows and might liquidate positions for large outflows.

Second, we analyse the relation between fund risk and the probability to use derivatives. Fund risk is proxied by:

- Currency risk, measured by the rolling one-month standard deviation of the exchange rate of a fund's base currency to EUR. If the base currency is EUR, it is set to zero;
- The rolling one-month standard deviation of the fund return;
- The rolling one-month tracking error.

We find that currency risk raises the probability of a trade by two percentage points (the coefficient is 7.717 and statistically significant at the 1%-level). This suggests that equity funds may use derivatives to manage currency risk. The fund risk measured by the standard deviation of the fund return does not seem to affect the probability of using derivatives. The coefficient on the tracking error is 2.030 and statistically significant at the 5%-level (V.38 panel B).¹²⁷

Third, we analyse the relation between a fund's return and the daily decision to trade a derivative. We consider both the monthly absolute fund

return and the monthly relative fund return in comparison to the benchmark. The coefficients are not statistically significant. Hence, there does not seem to be a linear relation between a fund's past performance and the decision to use derivatives (V.38 panel C).

V.38

Fund characteristics and flows, risks and performance Inflows increase probability of using derivatives

Panel A: Fund flows			
	Net flow	Positive net flow	Negative net flow
Flow	0.261*** (3.66)	0.432*** (3.64)	0.168 (1.38)
Day FE	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes
Day * investment area FE	Yes	Yes	Yes
Day * benchmark FE	Yes	Yes	Yes
Observations	145,470	145,470	145,470
Adjusted R2	0.555	0.555	0.555
Panel B: Fund risks			
	Currency	Sd(return)	Tracking error
Risk	7.717*** (4.00)	0.872 (0.76)	2.030** (2.35)
Day FE	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes
Day * investment area FE	Yes	Yes	Yes
Day * benchmark FE	Yes	Yes	Yes
Observations	145,346	145,471	130,084
Adjusted R2	0.555	0.555	0.552
Panel C: Fund returns			
	Return	Return-benchmark	
Return	0.127 (1.36)	0.128 (1.16)	
Day FE	Yes	Yes	
Fund FE	Yes	Yes	
Day * investment area FE	Yes	Yes	
Day * benchmark FE	Yes	Yes	
Observations	145,471	130,084	
Adjusted R2	0.555	0.552	

Note: Estimates from linear regressions of the derivatives trading dummy on various fixed effects. This dummy equals one if a fund makes at least one derivative trade during our sample period. In panel A, we use the rolling 5-day net flows (column 1), the rolling 5-day positive net flows (column 2) and the rolling 5-day negative net flows (column 3). In panel B, we look at the rolling one-month currency risk (column 1), the one-month standard deviation of returns (column 2) and the one-month rolling tracking error (column 3). In panel C, we rely on two proxies for the fund performance. These are the rolling one-month fund return (column 1) and the rolling one-month relative return to the benchmark (column 2). All models include day and fund fixed effects. Z-statistics based on Huber/White robust standard errors clustered by firms are presented in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.
Sources: ESMA.

¹²⁶ Since our dependent variable is a dummy, we also estimate a conditional logit model as a robustness test. These models only establish a correlation between a lagged fund or market characteristic and a fund's propensity to trade on a certain date. They do not identify a causal relation from the fund characteristic to the use of

derivatives. For this, we need an exogenous variation in a fund characteristic or a shock to only some of our funds.

¹²⁷ However, we do not obtain a significant estimate if we measure the tracking error over 5, 10, 15 or 30 days. Therefore, we are very careful with interpreting this coefficient.

Conclusion

In this article, we use derivatives data originating from EMIR to shed light on derivative use by equity UCITS funds. In detail, we provide new insights into the following questions: (i) what type of derivatives are traded by mutual funds, (ii) why some of them trade derivatives, while others do not, (iii) what makes some more active traders, and (iv) to what extent is derivatives trading a reaction to daily changes in fund and market conditions.

- Equity funds primarily trade three types of contracts: forwards on currencies (50% of all trades), futures and options on equities (less than 30%).
- The fund management company appears to play a relatively strong role in the decision to use derivatives.
- Once the decision to use derivatives is taken by the relevant asset manager, fund characteristics can explain 56% of the overall variation in a fund's daily traded notional and the propensity to trade.
- It also turns out that the investment strategy (measured by the fund's benchmark) has a predictive power of 14%.
- We find evidence of a positive relation between lagged net positive flows and the use of derivatives suggesting that funds may invest inflows using derivatives (to minimise the tracking error and save transaction costs), and between the lagged currency risk and the use of derivatives, indicating that equity funds may use derivatives to manage currency risk.

Our preliminary results indicate that the tendency and frequency of trading derivatives is to a large extent embedded in asset manager characteristics. On the contrary, the investment strategy, size, geographic focus, base currency, or domicile of the fund play a minor role. Moreover, the results point to equity UCITS funds primarily trading derivatives in order to minimise transaction costs or to mitigate risks.

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List of abbreviations

1H19	First half of 2019
1Q19	First quarter of 2019
AI	Artificial Intelligence
AIF	Alternative Investment Fund
AIFM	Alternative Investment Fund Manager
AIFMD	Directive on Alternative Investment Fund Managers
BMR	Benchmarks Regulation
bps	basis points
CA	Crypto-Asset
CCP	Central counterparty
CDS	Credit Default Swap
CFD	Contract For Differences
CLO	Collateralised Loan Obligation
CNAV	Constant Net Asset Value
CRA	Credit Rating Agency
CSD	Central Securities Depository
DLT	Distributed Ledger Technology
EA	Euro Area
ECB	European Central Bank
EEA	European Economic Area
EFAMA	European Fund and Asset Management Association
EM	Emerging Market
EMIR	European Market Infrastructure Regulation
EMMI	European Money Market Institute
EONIA	Euro Overnight Index Average
ESA	European Supervisory Authorities
ESG	Environmental, Social and Governance
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
ESTER	Euro Short-term Rate
ETF	Exchange-Traded Fund
EU	European Union
ETS	Emissions Trading System
Euribor	Euro Interbank Offered Rate
FCA	Financial Conduct Authority
FinTech	Financial Technology
FRA	Forward Rate Agreement
FSB	Financial Stability Board
GDP	Gross Domestic Product
HY	High Yield
ICO	Initial Coin Offering
IG	Investment Grade
IMF	International Monetary Fund
IRD	Interest-Rate Derivative
IRS	Interest Rate Swap
ISIN	International Securities Identification Number
KID	Key Information Document
LEI	Legal Entity Identifier

LVNAV	Low-Volatility Net Asset Value
MiFID II	Directive on Markets in Financial Instruments repealing Directive 2004/39/EC
MiFIR	Regulation on Markets in Financial Instruments
MMF	Money Market Fund
MTF	Multilateral Trading Facility
NAV	Net Asset Value
NCA	National Competent Authority
OIS	Overnight Indexed Swaps
OTC	Over The Counter
ppt	percentage point
PRIIP	Packaged Retail and Insurance-based Investment Product
RegTech	Regulatory Technology
SFT	Securities Financing Transaction
SupTech	Supervisory Technology
TV	Trading Venue
UCITS	Undertakings for Collective Investment in Transferable Securities

Countries abbreviated in accordance with ISO standards except for Greece (GR) and the United Kingdom (UK)

Currencies abbreviated in accordance with ISO standards



European Securities and
Markets Authority

