

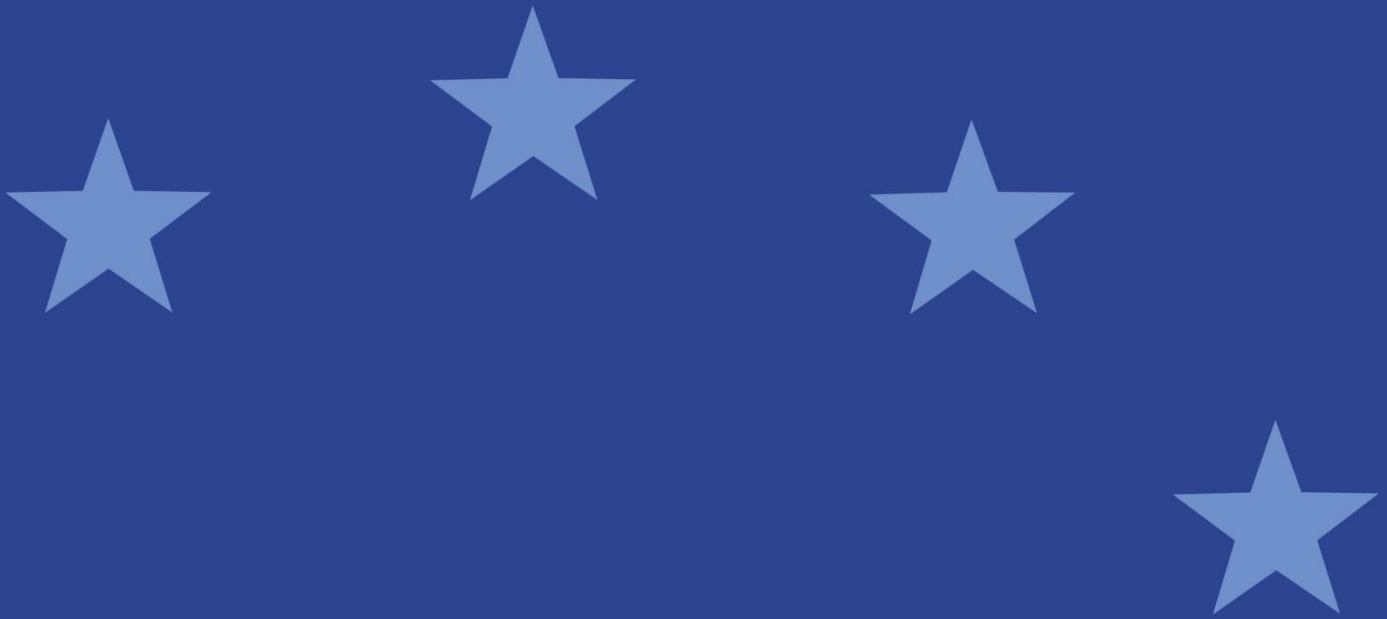


European Securities and
Markets Authority

TRV

ESMA Report on Trends, Risks and Vulnerabilities

No. 1, 2017



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Table of contents

Executive summary	4
Trends	6
Market environment	7
Securities markets	9
Investors	14
Infrastructures and services	19
Risks	26
ESMA Risk Dashboard	26
Securities markets	29
Investors	32
Infrastructures and services	34
Vulnerabilities	35
Investor protection	36
Monitoring retail markets via complaints data	36
Orderly markets	43
EU sovereign bond market liquidity	43
Financial stability	51
Haircuts in EU securities financing markets	51
Annexes	57
Statistics	58
Securities markets	58
Investors	71
Infrastructures and services	78
List of abbreviations	82

Executive summary

Trends and risks

ESMA risk assessment

Risk segments	Risk categories		Risk sources		Outlook		
	Risk	Outlook	Risk	Outlook			
Overall ESMA remit	●	➔	Liquidity	●	➔	Macroeconomic environment	↗
Systemic stress	●	➔	Market	●	➔	Low interest rate environment	➔
Securities markets	●	➔	Contagion	●	➔	EU sovereign debt markets	➔
Investors	●	➔	Credit	●	➔	Market functioning	➔
Infrastructures and services	●	➔	Operational	●	➔	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 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, 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: ESMA's 4Q16 overall risk assessment remains unchanged from 3Q16. In 4Q16 EU financial markets remained relatively calm, although very reactive to political events. An example was the US election. High reactivity was reflected in increased market expectations of near-term equity volatility. Investment fund liquidity remained a concern, with bond funds registering outflows after the US election. While market and credit risks remain very high, our outlook for market, liquidity, credit and contagion risk is stable. The low yield environment and related sustained concerns with regard to excessive risk-taking persisted. In an environment of high valuation risks, uncertainties around the growth outlook for the EU and the global economy, together with the confluence of political events, including the expected commencement of negotiations on the exit of the UK from the EU as well as several elections in EU Member States, are important risk drivers for 2017.

Market environment: The prevailing market and valuation risks notwithstanding, overall financial market conditions were relatively benign in 2H16 amid very high market risks and strong political and policy uncertainty (e.g., the UK referendum and the US election outcome). The post-UK referendum increase in market volatility abated, and monetary policy remained very supportive in the EU. Uncertainty about political developments in Europe remain an important source of risk against the background of concerns of potential abrupt swings in financial asset prices. Until the US elections, conditions in EU bond markets were characterised by improving market liquidity and declining credit risk premia. Since then EU sovereign bond yields have risen by between 50 and 80bps. The EU fund industry benefited from improved market conditions except for some property funds invested in the UK real estate sector. The very high volatility in foreign exchange markets around the UK referendum decreased in 2H16.

Securities markets: Conditions in EU securities markets were mixed in 2H16. Tensions related to the UK referendum eased and monetary policy remained very accommodative. Equity market volatility receded and banking sector shares recovered, although concerns over the health of EU banks lingered, as reflected in bank equity price volatility towards the end of the year. Conditions in bond markets were relatively benign through 3Q16, with central bank asset purchases supporting corporate bond prices and issuance activity. The US election was followed by a sell-off in global sovereign bond markets, including in the EU. The reaction in other fixed-income markets was more muted, but the potential for a repricing of credit risk remained, given extraordinarily low spreads between high- and low-rated debt securities.

Investors: Investment fund returns rebounded in 2H16 across fund categories, despite difficult market conditions in October. Assets under management of the Euro Area fund industry edged up slightly to EUR 10.8tn. Regarding asset allocation, investors initially showed a clear preference for fixed income funds over equity funds, but subsequently bond fund flows experienced some volatility and outflows following the US elections and the US Fed's interest rate decision. ETFs continued to see significant inflows, with an increase in assets under management by 14.8% since 1H16. Investors in search of yield focused on EM bonds, as evidenced by the highest inflows into EM bond funds for three years. Most alternative strategies reported

strong positive performance, especially as managers were able to take advantage of the recovery of commodity markets.

Infrastructures and services: Equity trading activity increased in the direct aftermath of the UK EU referendum but declined towards the end of the reporting period. It continued to take place mainly on regulated exchanges, although off-order book and dark pool shares did increase slightly. The October flash crash in Asian trading on the GBP currency market reinforced general concerns about liquidity resilience and the unknown interplay of algorithms. In derivatives markets, the first clearing obligation for interest-rate derivatives (IRDs) in G4 currencies took effect in June. One additional CCP was authorised under EMIR to operate in the EU while three third-country CCPs were recognised to operate in the Union. In 2H16 Euribor was designated a critical benchmark, and the first meeting of the college of supervisors took place in September 2016. Despite efforts to strengthen the integrity of financial benchmarks, the number of Euribor panel contributors contracted further in 2H16, from 22 to 20.

Vulnerabilities

Monitoring retail markets via complaints data: Complaints data are vital to NCAs in helping prioritise their supervision work and informing their policy and strategy. ESMA collects and analyses data and reports on trends in the retail market for financial products, as part of its remit to play a leading role in promoting transparency, simplicity and fairness in the market for consumer financial products and services across the Internal Market. An important tool ESMA has developed for this purpose is a regular survey of NCAs on complaints registered in their countries. Recent data indicate a renewal in the level of complaints relating to debt securities. In contrast, complaints relating to investment advice, in contrast, have decreased. Additionally, complaints collected via firms highlight that fees and charges are increasingly causing concern to retail investors, which is likely linked to the greater prominence of very low yields in the current market environment.

EU sovereign bond market liquidity: Over the last few years, market analysts have pointed out an overall reduction of liquidity in fixed income markets as well as changes in the role of banks as market makers and in their ability to facilitate liquidity, with a focus on the effects of new regulation. In the last TRV (No. 2, 2016) we offered evidence on recent developments in corporate bond markets. The present article provides a broad overview on different dimensions of liquidity in EU government bond markets, covering the period from July 2006 to December 2016. Our findings show that, having deteriorated during the financial and sovereign debt crisis, liquidity has since increased in government bond markets, potentially also due to the effects of supportive monetary policy in recent years.

Haircuts in EU securities financing markets: As one of the main sources of liquidity and high-quality collateral, securities financing markets are an essential component of the EU financial system. Securities financing transactions (SFTs), which include mainly repurchase agreements (repos) and securities lending, involve the temporary exchange of cash or securities against collateral. EU SFT markets are very large, with the value of collateral used in SFTs amounting to several trillions of euros. To cover for risks related to the characteristics of the collateral and counterparty creditworthiness, a discount known as a haircut is usually applied to the value of collateral. Haircuts are helpful risk management tools, but haircut levels are also part of the negotiation between counterparties trading bilaterally. Haircuts may thus change over time to reflect the evolution of market conditions, and can contribute to procyclicality and financial instability by reinforcing asset price movements. However, the data available on haircuts is sparse and little is known of current market practices. This article aims to shed some light on the level and the calculation methodology of the haircuts that are used in the EU by SFT market participants.

Trends

Market environment

The prevailing market and valuation risks notwithstanding, overall financial market conditions were relatively benign in 2H16 amid very high market risks and strong political and policy uncertainty (e.g., the UK referendum and the US election outcome). The post-UK referendum increase in market volatility abated, and monetary policy remained very supportive in the EU. Uncertainty about political developments in Europe remain an important source of risk against the background of concerns of potential abrupt swings in financial asset prices. Until the US elections, conditions in EU bond markets were characterised by improving market liquidity and declining credit risk premia. Since then EU sovereign bond yields have risen by between 50 and 80bps. The EU fund industry benefited from improved market conditions except for some property funds invested in the UK real estate sector. The very high volatility in foreign exchange markets around the UK referendum decreased in 2H16.

The **performance** of EU equity markets was positive in 2H16 (+10%) after markets had priced in the impact of the UK referendum, though political and policy uncertainty remained high, as evidenced in the run-up to and direct aftermath of the US presidential elections. Even though banking stock performance recovered in the latter part of 2H16, risks in the EU banking sector stemming from non-performing loans and low profitability persisted (T.9). Equity **volatility** decreased to around 20% in 2H16, compared to 40% around the UK referendum (T.2). The confluence of political events and other important political developments in the EU harbours the potential for further significant market uncertainty and volatility in 2017 (T.3), as documented in detail in our Risk Dashboard.

Moderately quiet conditions in securities markets were also reflected in the reduced volatility of **fund returns** (A.103), in particular alternative and bond funds. The fund industry was generally resilient after the UK referendum, although some property funds invested in UK real estate did experience significant outflows, and redemptions remained suspended until December 2016 for some UK open-ended real estate funds. Risk appetite and search for yield in financial markets characterised the period. The low interest rate environment prevailed, with continued supportive monetary policy in both the EA and UK, including a cut in the bank rate and further accommodative measures introduced by the BoE after the UK referendum.

The search-for-yield environment was also reflected in EA **portfolio flows**. Net inflows to EA securities remained negative (T.5) while EA residents continued to purchase large amounts of long-term foreign debt securities (T.7). Overall financial sector market **confidence** improved towards the end of the year, rising above the long term average (T.4).

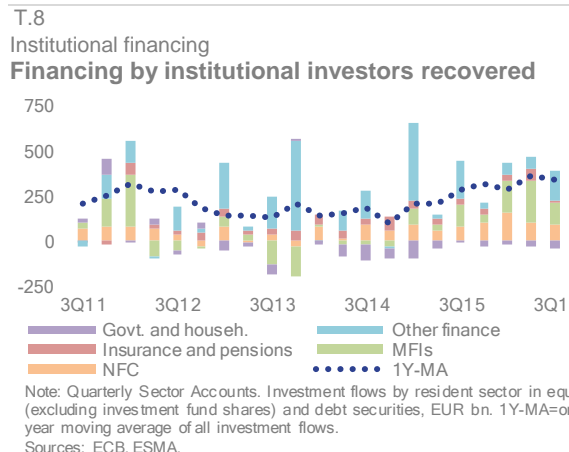
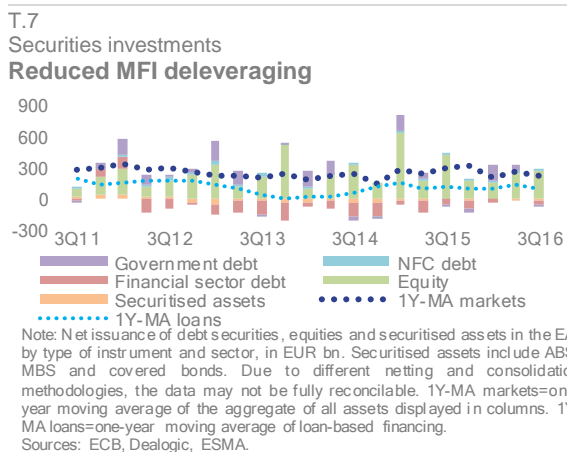
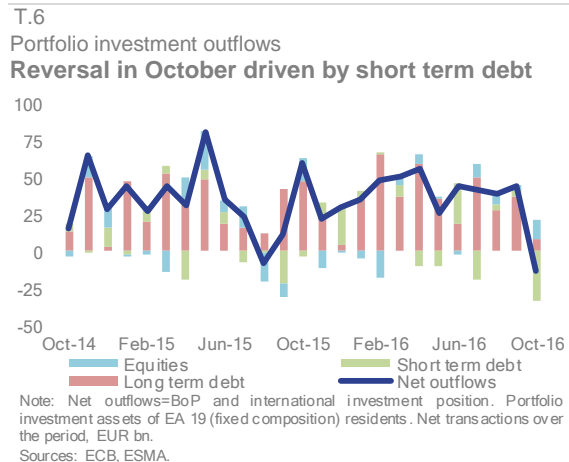
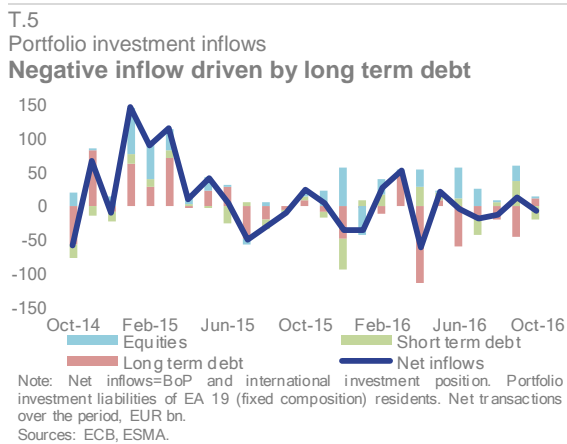
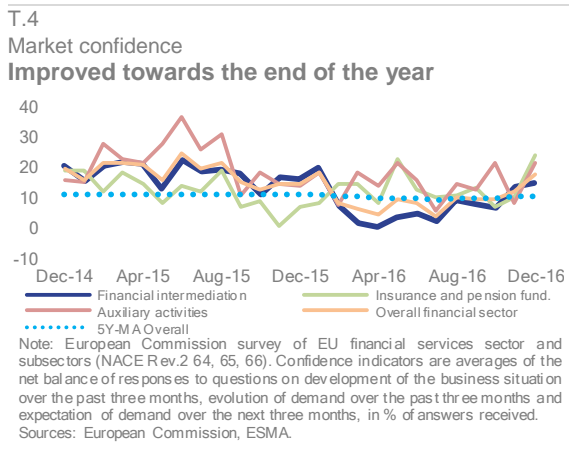
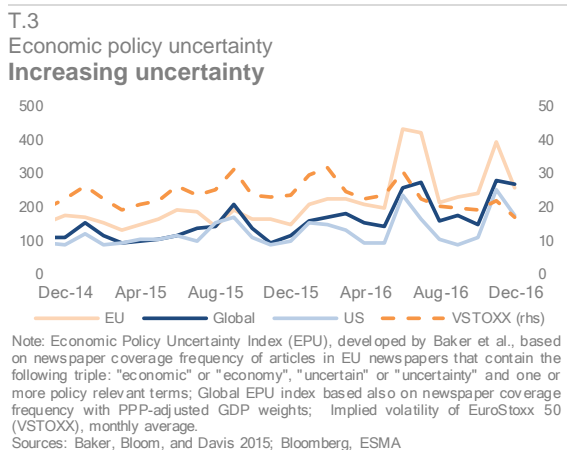
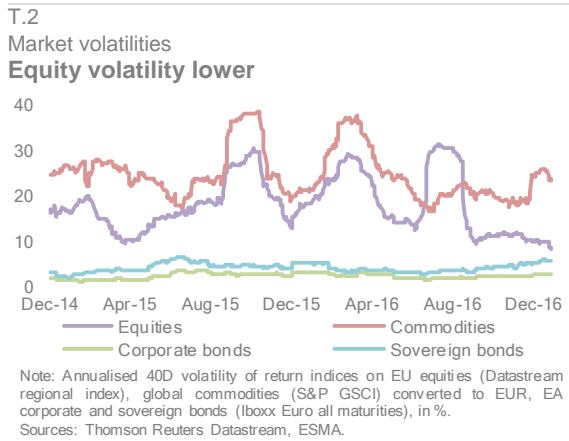
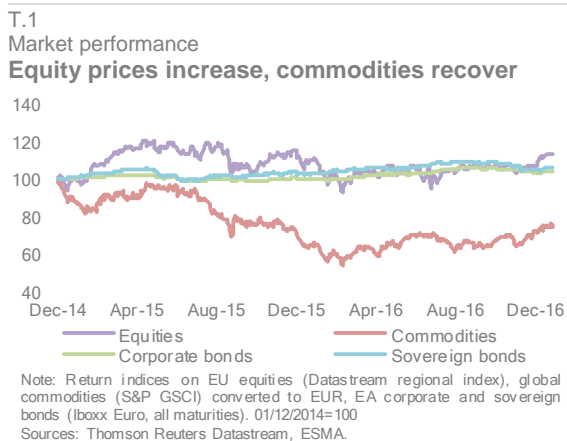
As widely expected by market participants, the Federal Reserve raised the target range for the

federal funds rate in December 2016, while the supportive policy stance continued in the EU, contributing to the benign conditions in EU bond markets. However, following the US election in November 2016 a sharp sell off in US and EU bonds caused an increase of 50 to 80bps in sovereign bond yields across EU countries (T.11). **Credit risk premia** narrowed in corporate bond markets, bolstered in the EA and UK by central bank asset purchases.

A mixed picture emerged on **market liquidity** in bond markets. Sovereign bond liquidity – though still at high levels – decreased slightly towards the end of the reporting period; corporate bond liquidity was broadly stable, with some signs of lower liquidity during periods of market stress (V-article on sovereign bond liquidity, pp. 45-52 and A.37, A.49, A.50).

After experiencing very high volatility around the UK referendum, **foreign exchange** market conditions stabilised, with the exception of a GBP exchange rate flash crash in Asian trading on 7 October, when the GBP fell more than 6% in a few minutes against the USD (Box T.34). The GBP continued to depreciate against most currencies, with GBP-EUR, GBP-USD and GBP-JPY exchange rates now 18%, 21% and 25%, respectively, lower than mid-2015 (T.18).

The evidence on **capital market financing** was mixed. Investment by EA residents in securities markets totalled EUR 1.1tn in 2015, twice the 2014 amount, and rose further in 1H16 (T.7). In contrast, there was a marked slowdown in the level of institutional financing, which amounted to EUR 278bn in 1H16, down 37% from 1H15 (T.8). This decline was driven by bond funds. On the issuance side, equities continued to constitute the bulk of EA securities issued. The volume of net financial sector debt issued continued to shrink while NFC debt issuance increased to almost EUR 50bn in 1H16.



Securities markets

Conditions in EU securities markets were mixed in 2H16. Tensions related to the UK referendum eased and monetary policy remained very accommodative. Equity market volatility receded and banking sector shares recovered, although concerns over the health of EU banks lingered, as reflected in bank equity price volatility towards the end of the year. Conditions in bond markets were relatively benign through 3Q16, with central bank asset purchases supporting corporate bond prices and issuance activity. The US election was followed by a sell-off in global sovereign bond markets, including in the EU. The reaction in other fixed-income markets was more muted, but the potential for a repricing of credit risk remained, given extraordinarily low spreads between high- and low-rated debt securities.

Equity prices edge up

Following a sharp sell-off in the aftermath of the UK referendum on EU membership in June, particularly in EA equity markets, EU **equity prices** made a strong recovery to gain 10% overall in 2H16, broadly in line with US equity markets. The recovery was observed across EU countries, with nine national equity indexes increasing by more than 15% in six months (A.18).

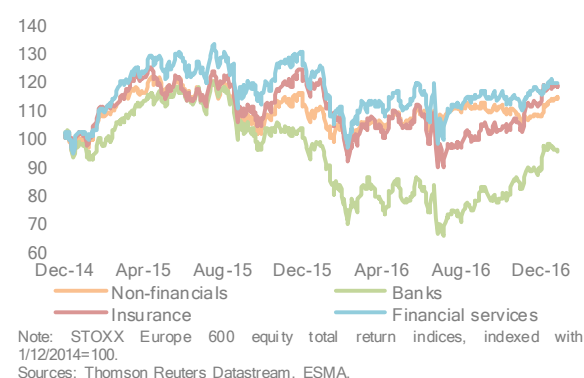
Reflecting the improvement in equity market conditions, short-term **implied volatility** receded. The VSTOXX averaged around 20% in 2H16 (down from 30% at the end of 1H16), despite a short-lived bout of volatility in early November as the US presidential elections approached (A.21).

After falling heavily in the wake of the UK referendum outcome, bank shares staged a strong recovery, gaining 37% from end-June 2016, in part from better-than-expected earnings during the third quarter. Nonetheless, the EU banking sector came under further stress in the course of September as concerns over the situation of some European banking institutions resurfaced. Based on Stoxx Europe 600 data, banking sector equities remained 2% below their level two years ago, compared to gains ranging between 15% to 20% over the same period for insurance sector equities, other financial services, and non-financials (T.9). This is mainly related to the amount of non-performing loans in EU bank portfolios, and the perceived ability of banks to meet regulatory capital requirements.

The banking sector in Italy came under renewed stress towards the end of the year due to mounting concerns over the liquidity position of one large bank, resulting in precautionary recapitalisation¹ by the State. Italian bank equity

volatility spiked in December, leading to a suspension of trading in the ailing bank's shares as from 21 December.

T.9
Equity markets
Bank equity prices recovered in 2H16



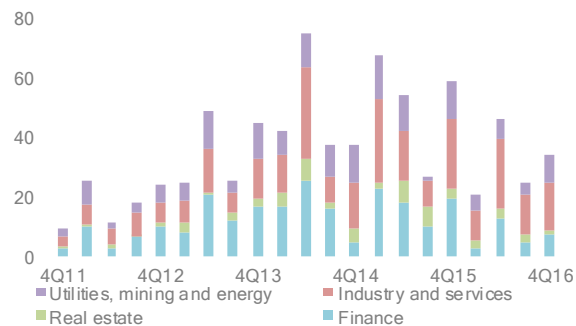
The deterioration in EU **equity market liquidity** observed in previous quarters seems to have levelled, with average bid-ask spreads unchanged in 2H16 at 6.7 basis points, below their long-term average of seven basis points (A.23). This stabilisation was also reflected in lower median dispersion of liquidity across national equity markets (A.24). However, a different picture emerges from ESMA's equity illiquidity indicator, showing worsened liquidity conditions (A.22).

In line with the downward trend of the last two years, the total value of EU **equity issuance** fell again in 2H16. Gross issuance amounted to EUR 58bn, down from EUR 67bn in 1H16 and EUR 86bn in 2H15 (A.15). This was driven mainly by another drop in financial sector issuance, reflecting the volatile conditions in banking sector equities. Financial sector equity issuance amounted to EUR 27bn in 2016, including EUR 11bn in 2H16, which was down 60% from the previous year (T.10). However, the decline in

¹ For more details, see Banca d'Italia: <https://www.bancaditalia.it/media/approfondimenti/2016/>

equity issuance was broad-based in 2016, falling 40% for utilities, mining and energy companies, and 18% for the industry and services sectors.

T.10
Equity markets
Financial sector equity issuance down again



Note: EU equity issuance by sector, EUR bn. Finance includes closed-end funds, finance corporations, holding companies and insurance companies. Sources: Dealogic, ESMA.

After a lower than usual seasonal peak during the second quarter, **securities lending** of EU equities remained broadly stable in 2H16, with an average EUR 174bn on loan (A.67). Banking sector shares are currently among the most expensive to borrow, reflecting high demand (including for short-selling activities) related to the sector's volatile performance in equity markets. This notwithstanding, the utilisation rate of EU equities, a proxy for short-selling borrowing demand, remained flat at around 6%, close to its long-term average (A.69).

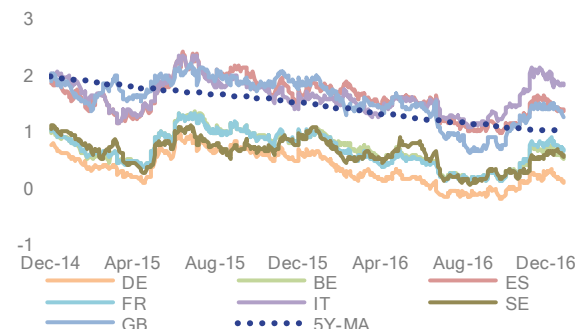
Global bond sell-off after US elections

The main development in sovereign bond markets was the large sell-off in US and EU bonds that followed the US elections in November. As expectations of a potentially large US fiscal stimulus took hold, market participants revised their long-term inflation forecasts, leading to a sharp steepening of the yield curve in the US. In parallel, the Federal Reserve raised the target range for the federal funds rate from 0.5% to 0.75% in December 2016, which had been widely expected by market participants.

The EA yield curve also experienced a – relatively smaller – steepening, likely resulting from contagion effects. As a result, EU **sovereign bond yields** rose 50 to 80bps from their end-September lows in just two months (T.11), while yield correlations increased noticeably (A.34). This was despite support from EU central banks' current policy stance and interest rate differentials with the US and other regions. As of the year-end, all EU ten-year sovereign bond yields were back in positive territory and stood on average 30bps higher than last June. While this

should help to ease the pressure on financial sector profitability from the low interest rate environment, it will increase borrowing costs for sovereigns, and (indirectly) private sector borrowers – although yields still remain very low by historical standards.

T.11
Sovereign bond markets
Yields up sharply in November



Note: Yields on 10Y sovereign bonds, selected EU members, in %. 5Y-MA=five-year moving average of EA 10Y bond indices computed by Datastream. Sources: Thomson Reuters Datastream, ESMA.

Ten-year EA **sovereign bond spreads** to Germany also widened in several countries, with e.g. spreads on French and Italian government bonds increasing 20bps from the end of June (A.31).

Sovereign bond issuance in 2H16 was down on previous years, at EUR 408bn, with overall 2016 issuance (EUR 998bn) 15% lower, due mainly to low issuance from EA sovereigns (A.25). The weighted-average quality of EU sovereign bond issuance has been recovering over the past two years and surpassed A+ in 4Q16, although remaining below its AA long-term average (A.26). Should this trend continue over the next few quarters, it would lead to a gradual stabilisation in the rating distribution of outstanding EU sovereign bonds.

The end of the year was marked by a deterioration in the **liquidity** conditions for EU sovereign bond markets, with 40-day bid-ask yield spreads rising 1.5bps to 3.5bps (A.37). Tighter sovereign bond liquidity may have contributed to the sharp drop in repo rates on 31 December (see p.13).

In contrast to cash sovereign bond markets, EU **sovereign CDS** spreads tightened slightly since the end of June, with no noticeable change following the US presidential elections (A.35). The notional value of outstanding CDS on EU sovereigns also declined in 2H16 in USD terms, although this was likely driven by currency valuation effects (A.36).

The balance of EU bonds on loan in **securities lending** markets fluctuated in 2H16, with an average EUR 290bn on loan, up 1% from 1H16 (A.67). The utilisation rate of EU government bonds declined to 26%, below the five-year average of 30% (A.69). This mainly reflected the EUR 100bn increase (to EUR 950bn) in EU government bonds made available for lending, with market participants increasingly seeking new sources of revenue in the current low interest rate environment.

Conditions in EA **corporate bond** markets remained benign, despite a 6bp increase in yields averaged across rating categories in 2H16; BBB-rated bond yields were the exception with a decline of 5bps. Compared to 1H16, credit risk premia receded again, with e.g. spreads on BBB-rated bonds declining 55bps to return close to their end-2014 levels (A.48). Corporate bond valuations were supported by EU central banks' asset purchases, leading in the EA to a decoupling from corporate CDS spreads (Box T.12). Exceptionally low spreads between high-rated and low-rated securities, together with the deteriorating average quality of outstanding bonds, suggest that potential vulnerability to credit risk repricing remains.

Favourable corporate bond market conditions and accommodative monetary policy bolstered an increase in **corporate bond issuance** in 2016. This amounted to EUR 979bn, including EUR 403bn in 2H16, up 11% from 2015 (A.39). Activity was particularly strong for investment-grade non-financial corporate bonds (+48% in 2016), which are eligible for central bank purchases. In contrast, covered bond issuance experienced a 20% decline. US companies have also been issuing record amounts of euro-denominated debt over the last two years, taking advantage of ultra-low borrowing costs: US issuance of EUR-denominated investment grade corporate bonds (excluding banks) has averaged EUR 24bn per quarter since early 2015, the highest on record and around 70% more than in 2013 and 2014.

Indicators of EU investment-grade **corporate bond market liquidity** sent somewhat mixed signals in 2H16. While average bid-ask spreads were unchanged from June, at around 0.5%, the Amihud index suggests that corporate bond markets experienced a temporary episode of illiquidity at the end of September (A.49), a view

reinforced by a decline in the average turnover ratio in September (A.50).

T.12

Bond market performance

ECB CSPP: Potential pricing effects

The ECB announced on 10 March 2016 the extension of its asset purchases to include investment-grade corporate bonds under its Corporate Sector Purchase Programme (CSPP). The CSPP targets non-bank corporate investment-grade (IG) bonds denominated in euros that meet eligibility criteria applicable to both the financial instrument and to the issuer. As of 31 December 2016, the Eurosystem had purchased almost EUR 52bn of these bonds, of which 14% on the primary market and 86% on the secondary market. This compares with an outstanding volume of around EUR 1.2tn in euro-denominated non-bank corporate IG bonds from EA issuers, i.e. asset purchases make up less than 5% of outstanding volumes.

Following announcement of the programme, market-price-based indicators for credit risk among EU non-financial corporates experienced a significant fall, as evident from both bond and CDS spreads. Furthermore, this led to spikes in trading volumes on the CDS market, which offers a liquid alternative to cash bonds for investors to gain risk exposure.²

After the official start of the programme in early June, a decoupling emerged between corporate bond and CDS spreads (T.13). ECB purchases have given a further boost to the cash market. On the CDS market, spreads have remained relatively stable since June. Euro-denominated non-financial corporate bond spreads lost 23bps from June to December, while the corresponding CDS spreads declined by 11bps. The gap has not closed since then. While both the bond yield spreads and the CDS spreads reflect underlying credit risks, bond yield spreads are more immediately influenced by current supply and demand dynamics in cash markets. The persistent gap in spreads can lead to higher risks of mispricing in the EUR corporate bond market.

T.13

Non-financial corporate bonds and CDS spreads

Decoupling of corporate bond and CDS markets

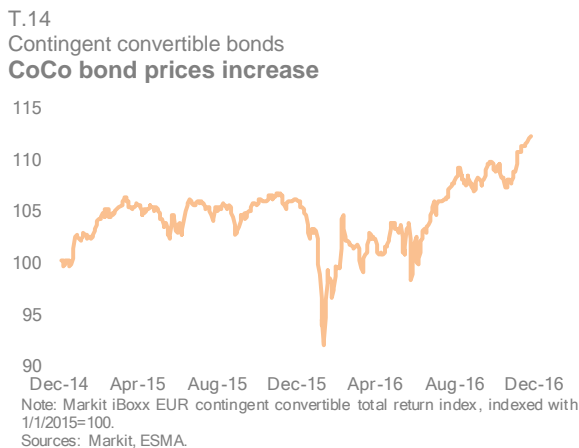


Note: Spread between iBoxx EUR non-financial corporate bond yield and ICAP Euro vs Euribor 10Y Swap, and iTraxx EUR 5Y corporate CDS index, in basis points. The blue line marks the beginning of ECB corporate bond purchases. Sources: Markit iBoxx, Thomson Reuters Datastream, ESMA.

Large issuances of contingent convertible (CoCos) bonds from EU issuers were also recorded during the second half of the year. The issuance of hybrid instruments, which include CoCos, rose to EUR 21bn in 2H16, compared to a total of EUR 12bn in 1H16. However, this remained relatively low compared to the volumes observed in early 2015. Following a volatile beginning of the

² <http://www.markit.com/Commentary/Get/12052016-Credit-iTraxx-net-notional-spikes-post-ECB-QE-decision>

year, average CoCo bond prices increased 12% in 2H16, likely reflecting search-for-yield behaviour, as high coupon rates attracted investors despite banking sector stress and uncertainties around future coupon payments from some issuing banks (T.14).



The average **credit quality** of outstanding corporate bonds deteriorated again in 2H16, albeit at a slower pace than in previous quarters. The share of AAA-rated bonds currently stands at 2% of the total volume of corporate bonds outstanding (A.43). A significant part of this trend was due to the deteriorating credit quality of issuers based in countries that were the most affected by the EA sovereign debt crisis (Box T.15).

Although **securitised product issuance** remained subdued, the volume issued in 2016 reached a four-year high of EUR 96bn despite a weak second half (EUR 37bn), which was down 10% compared to 2H15 (A.51). This was mainly on account of EUR 29bn in placed issuance during the second quarter, the highest quarterly volume since 2010.

Following a strong first half-year, **covered bond issuance** dropped sharply in 2H16 to EUR 35bn, taking the 2016 volumes to EUR 125bn, a 56% decline from 2015 (A.60). In contrast to credit spreads in other corporate fixed-income market segments, **covered bond spreads** rose 10 to 20bps across rating categories (A.59).

GBP flash crash

The very high volatility in **foreign exchange** markets following the UK EU referendum subsided in 2H16, with the notable exception of a GBP exchange rate flash crash on 7 October, when the GBP depreciated by more than 6% versus the USD in early Asian trading within a few minutes, before recovering (Box T.34). Short-term implied volatilities for the major currency

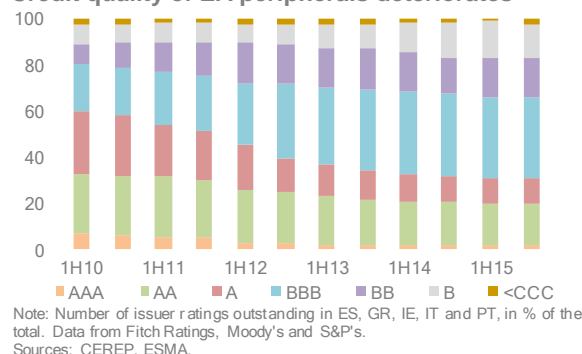
pairs (EUR-USD, EUR-GBP and GBP-USD) normalised to around 10%, closer to their long-term averages, after peaking above 20% at the end of June (A.5).

T.15
Corporate bond ratings
The credit quality of EU non-financial corporates

The credit quality of corporate bonds has evolved significantly in the EU over the past years. The macroeconomic (e.g. the sovereign crisis), regulatory (e.g. CRD IV) and political (e.g. developments in Greece) environments all contributed to a shift in the credit quality landscape in Europe and across various asset classes. Although not as significantly impacted relative to other asset classes, such as financials or sovereigns, EU non-financial corporates were not unaffected.

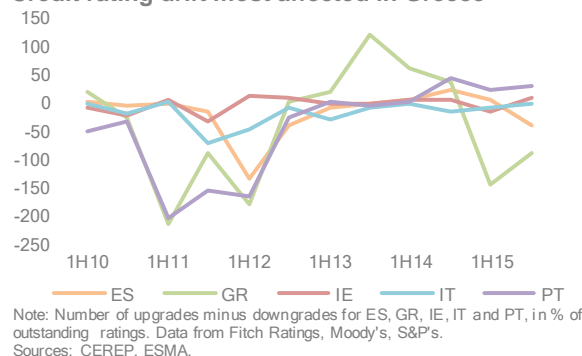
The most dynamic shifts in credit quality (here measured by assigned credit ratings) occurred in the so-called “peripheral EA countries” (Greece, Ireland, Italy, Portugal, Spain) that were most affected by the EA sovereign debt crisis. The share of non-investment grade (i.e. below BBB-) ratings increased from approximately 20% at the beginning of 2010 to nearly 30% by end 2015 (T.16). Similarly, the share of AAA, AA and A-rated non-financial corporate issuers shrank from nearly 60% to around 30% over the same time horizon.

T.16
Non-financial corporate issuer ratings
Credit quality of EA peripherals deteriorates



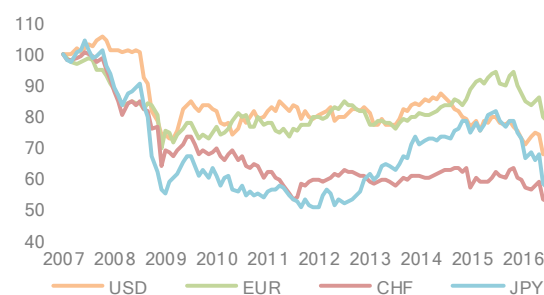
Non-financial corporates were not affected to the same degree across the sampled countries. The credit rating drift (essentially, the average direction of rating changes) of Greece, together with Portugal and followed by Spain, was by far the most negatively affected during the past sovereign debt crisis (T.17). Although issuers in Italy and Ireland also suffered from deteriorating credit quality, on average their credit profiles were much more stable over the time horizon. Importantly, as from 2013, trends have stabilised across all countries, and some issuers have even experienced improvements in credit quality. A notable exception is Greece, where companies underwent a second wave of downgrades in 2015.

T.17
Non-financial corporate issuer ratings
Credit rating drift most affected in Greece



The GBP continued to lose ground against most currencies (-4% against the EUR since end June 2016) amid uncertainty regarding negotiations on the future relationship of the UK with the EU. The GBP-EUR and GBP-USD exchange rates now stand 18% and 21% respectively below their July-2015 levels, and the GBP-JPY rate fell around 25% (T.18).

T.18
Foreign exchange
GBP exchange rate continues to weaken



Note: GBP exchange rates against selected currencies, monthly data, indexed 1/1/2007=100.
Sources: Thomson Reuters Datastream, ESMA.

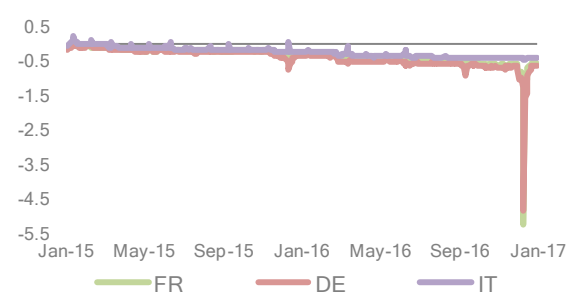
In other currency markets, developments were mixed, with the EUR down 5% against the USD in 2H16 but up 8% against the JPY (A.5). The steepening of the US and EA yield curves, reflecting changes in monetary policy expectations following the US elections and concerns around the potential economic impact of protectionist measures, contributed to substantial depreciation of several EM currencies, with e.g. the EUR up 16% against TRY and 7% against MXN.

EUR money market spreads tighten

Short-term euro **money market rates** continued to decline by a further few basis points, edging closer to the ECB deposit facility rate of -0.4% (A.81). EONIA lending volumes remained on a downward path, with average daily volumes 24% lower in 2H16 than in the first half of the year (A.83). The Euribor-OIS spread drifted down again, below 4bps. In contrast, the USD Libor-OIS which rose temporarily above 40bps in September – for the first time since 2012 – as priced-in expectations of a second Federal Reserve rate hike fluctuated. The GBP Libor-OIS spread rose around the UK referendum on EU membership, reflecting higher counterparty risk priced into the UK interbank market, but narrowed again in December.

Secured money market rates also continued to fall during most of 2H16, as reflected in EA **repo markets** rates, in line with unsecured money market rates. However, on 31 December 2016 several countries experienced an unprecedented drop in sovereign repo rates (T.19), mirrored by a comparable increase in securities lending fees. Market intelligence suggests that seasonal volatility (including from so-called “window dressing”) may have been reinforced by recent ECB QE announcements, contributing to fears of a shortage of high-quality collateral on EA markets. Finally, a slight deterioration in cash sovereign bond liquidity may likewise have contributed to this event.³

T.19
Sovereign repo rates
Sharp drop at year-end



Note: CCP-based bilateral repos with one-day maturity (over night, spot next and tomorrow next) using sovereign collateral from DE, FR and IT.
Sources: RepoFunds Rate (Broker Tec, MTS, ICAP), ESMA.

Moreover, spreads between General Collateral and special repo rates, a proxy for collateral scarcity premia, increased in 2H16, in particular for bonds in very high demand, for which the scarcity premium has doubled since June (A.74).

Other markets

Commodity prices increased in 2H16, with industrial metals gaining 10% between June and December and energy prices up 6%, driven by oil (+15%) following an agreement by OPEC countries on supply cuts (A.85). Historical volatilities remained broadly unchanged across commodity markets (A.86), although implied volatilities priced into energy options markets increased sharply above 40% in the weeks leading to the OPEC agreement, due to political tensions among OPEC members (A.88).

The size of the EU **shadow banking** system proxied by amounts of ABS and ABCP outstanding, the size of the EU repo market and EU securities on loan (collateralised with cash)

³ For more details, see ICMA: “The euro repo market at year-end 2016”. <http://www.icmagroup.org/News/news-in-brief/the-euro-repo-market-at-year-end-2/>

and liabilities of MMF, remained broadly stable during the second quarter. As of June 2016, EU shadow banking liabilities, based on a mapping

of activities, amounted to EUR 8.2tn (A.97). This was around 3% below the end-2015 volume.

Investors

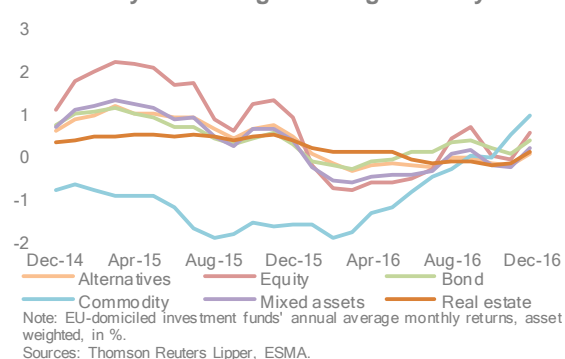
Investment fund returns rebounded in 2H16 across fund categories, despite difficult market conditions in October. Assets under management of the Euro Area fund industry edged up slightly to EUR 10.8tn. Regarding asset allocation, investors initially showed a clear preference for fixed income funds over equity funds, but subsequently bond fund flows experienced some volatility and outflows following the US elections and the US Fed's interest rate decision. ETFs continued to see significant inflows, with an increase in assets under management by 14.8% since 1H16. Investors in search of yield focused on EM bonds, as evidenced by the highest inflows into EM bond funds for three years. Most alternative strategies reported strong positive performance, especially as managers were able to take advantage of the recovery of commodity markets.

Investment fund returns improved

Investment **fund returns** rebounded in 2H16 across fund categories, despite difficult market conditions in October. Commodity fund returns increased by 1.81 percentage points over the reporting period and are now positive for the first time since July 2014. Bond and equity fund returns stood at 0.35% and 0.53% respectively, having been negative in 1H16 and rebounded strongly for equity funds at the beginning of 2H16. Finally, mixed and real estate fund returns were moderate, at 0.18% and 0.10% respectively (T.20).

Return volatilities receded markedly for equity funds after the peak experienced in early July in the wake of the UK referendum. Nevertheless, equity funds did see a temporary resurgence of volatility in 3Q16, reflecting underlying market uncertainty (A.104).

T.20
Fund returns
Commodity funds staged strong recovery

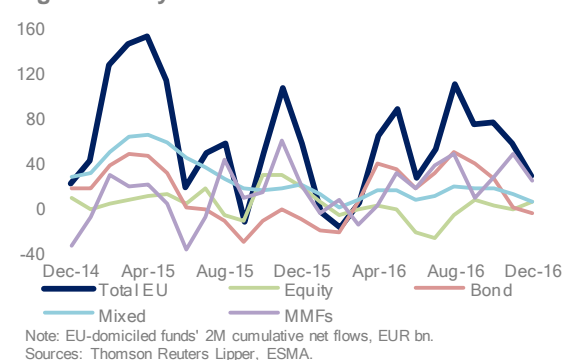


Overall, **fund flows** highlighted a clear investor preference for fixed income funds over equity funds in 2H16, with bond (EUR 68bn), mixed (EUR 40bn) and money market funds (EUR 98bn) representing the majority of the inflows collected by the industry (EUR 214bn in aggregate). However, the positive trend for bond funds came to a halt after the US elections, with outflows of EUR 6.5bn observed in November and December 2016. Earlier in 2H16, equity

funds faced redemptions in the immediate aftermath of the UK referendum. Overall, equity funds registered outflows of EUR 5bn over the reporting period. Other fund categories recorded moderate, or even zero inflows in the case of commodity funds (T.21).

Property funds invested in UK real estate, or in shares linked to UK property, saw significant outflows reflecting Brexit-related long-term valuation prospects. Rapid offloading of properties by some funds immediately after the referendum triggered sales at discounts as high as 15% on their asking prices. In response, seven funds suspended redemptions in July. While some of them rapidly lifted the ban on withdrawals, other funds continued to ban investors from taking out their money until December in order to have enough time to sell commercial property holdings. This episode highlights the vulnerability of funds offering daily redemptions while investing in illiquid assets, especially when these funds are offered to retail investors. However, once the initial impact had passed, the impact on the underlying real estate market was limited.

T.21
Fund flows
High volatility of fund flows



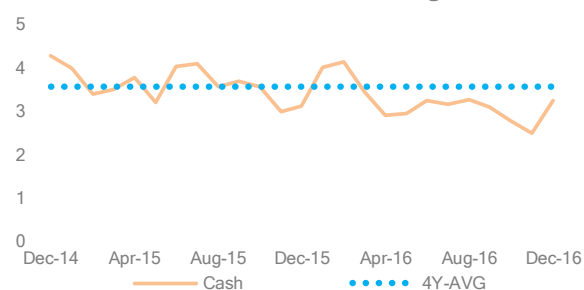
Investors in search of yield focused on emerging markets bond funds, which experienced their highest inflows in three years, at EUR 16bn in

2H16. This is significantly above the five-year average of quarterly flows into EM bond funds, at EUR 2.4bn. In comparison, flows into high yield bond funds over the same period are more limited (EUR 4.6bn). Also, funds have been extending the maturity of their assets for several years now, although this global evolution differs across different bond fund categories (A.119).

Corporate bond funds maintained the proportion of their cash holdings at 3.3% of their portfolio, below its long-term average (3.6%). This indicates possible vulnerability following the marked decline already observed in 2Q16 (T.22). However, the liquidity profile of high yield bond funds was stable, as evidenced by our synthetic indicator (A.119).

T.22

EU corporate BF cash position

Available cash reserves below average

Note: Cash in percentage of holdings.
Sources: Thomson Reuters Lipper, ESMA.

The AuM of the fund sector stood at EUR 10.8tn in the EA in October 2016, an increase of 3.8% compared to April 2016 (EUR 10.4tn). The sector's NAV increased 5.2% to EUR 9.8tn, implying stable leverage. The share of alternative funds in the sector's NAV remained virtually unchanged at slightly above one-third (A.109).

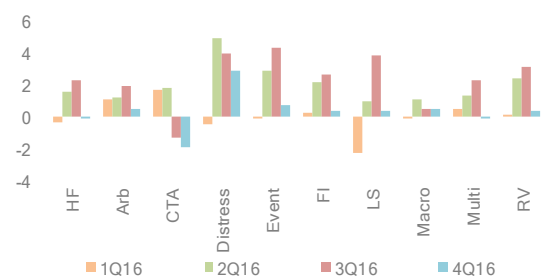
Interconnectedness between EA investment funds and MFIs continued to decline. As a share of total assets, EA investment fund loans and debt securities vis-a-vis EA banks stood at around 14% in 2Q16, down from more than 20% in 2011 (A.100).

Alternative funds posted solid gains before losing momentum

The global hedge fund industry index reported a return of 2.3% in 2H16, mainly due to 3Q16 performance (T.23). With the notable exception of Commodity Trading Advisor funds (CTAs) (-3.2%), all strategies performed strongly, with distressed debt (6.9%), event driven (5.0%) and long/short equity funds (4.2%) featuring most prominently. Distressed debt fund managers benefited especially from the recovery in commodity prices as assets purchased over the

past years have started to post gains. In contrast, CTA funds holding long positions in gold or short positions on the energy sector were negatively affected. Despite solid performance, redemptions have been gathering pace in the EU hedge fund industry, which saw the largest asset outflow on record since 2008.

T.23

Hedge fund performance by strategy
Positive performances, except CTA

Note: Growth in hedge fund performance indices by strategy: Hedge fund index, arbitrage, Commodity Trading Advisor, distressed debt, event driven, fixed income, long/short equity, macro, multi-strategy, relative values; in %.
Sources: Eurekahedge, ESMA.

EU hedge funds increased their exposure to EU banks substantially during 2016, from 7.3% to 12.8% of total assets. In the context of recent difficulties at some EU banks, the larger share of assets associated with fixed income strategies in hedge funds' total assets and the relatively strong performance by distressed debt strategies in 2016, stressed bank debt and securities disposed of by stressed banks may have contributed to such higher exposure and suggest a transfer of risks to the hedge fund sector (A.100).

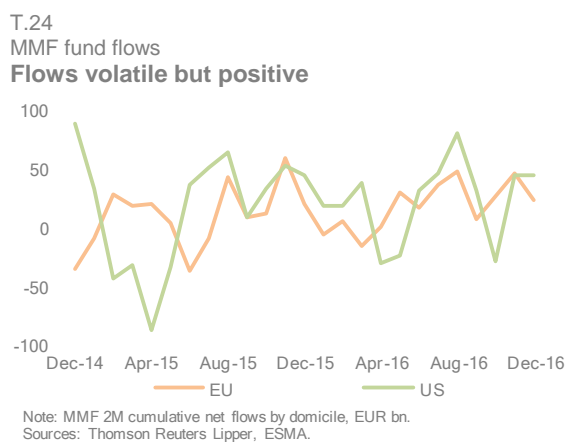
Outflows caused the NAV of EA hedge funds to shrink by EUR 32bn to EUR 190bn in October. Their AuM fell even more steeply (by EUR 72bn), to EUR 235bn in October. The decline was greater as this development was accompanied by a reduction in external funding. As a result, financial leverage declined to 1.23 from 1.4 at the end of 1H16 (A.129).

MMF attracted investors despite subdued revenues

In the context of a persistently low interest rate environment the average return of EU MMFs remained negative at -0.15%. The dispersion of fund performance remained significant as the lowest performing funds now exhibit returns below -1.15%, driven by the impact of foreign exchange rate movements for GBP-denominated funds (A.121). Nevertheless, EU MMFs continued to attract investors, realising inflows of EUR 98bn. US MMFs experienced more volatile but still positive flows, totalling EUR 97bn of inflows in 2H16 despite redemptions of

EUR 25.5bn in September (T.24). Flows in USD-denominated EU MMFs were also volatile around the UK referendum, driven mostly by investors seizing attractive investment entry points. In total, the AuM and the NAV of EA MMFs increased roughly in line by 3% each to EUR 1.1tn, implying stable financial leverage at 1.02 (A.124).

MMFs were cautiously positioned ahead of the UK referendum to contain the impact of potentially material outflows and market volatility. After peaking in June, MMFs had overnight and one-week liquidity of 28% and 40% on average at end-September (compared to 30% and 42% around the UK referendum). Similarly, the weighted-average maturity and life of prime fund assets decreased to 40 and 58 days around the referendum before lengthening to 43 and 60 days as of August 2016 (A.101).

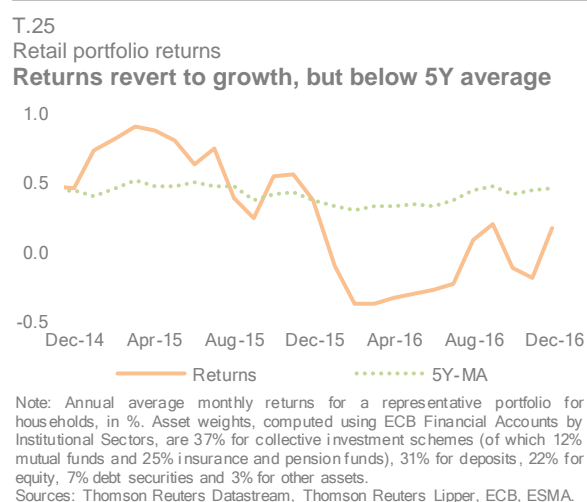


ETF inflows despite low returns

EU exchange traded funds (ETFs) resumed positive returns in 2H16, up to 0.65%, following several months of negative performance (A.131). In the meantime, volatility receded to 6.9% from the peak of 13.9% experienced in July, and ETFs' benchmark-tracking errors improved slightly to 0.39% but remained high compared to their 2014 level of 0.26% (A.135). EU ETFs' NAV continued its rapid rise, reaching EUR 504bn in December 2016, an increase of 14.8% since June 2016 (A.133) and more than twice the ETF NAV of EUR 246bn in 3Q13.

Retail investors: Recovery in returns

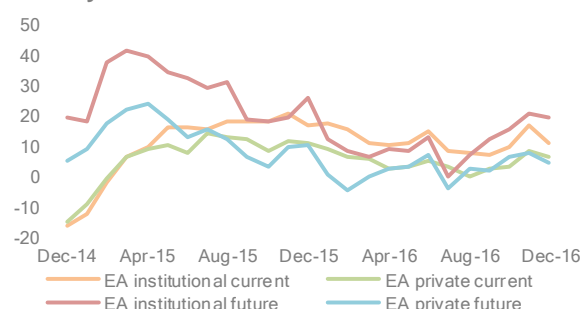
Retail investor **portfolio returns** remained fairly subdued, though average returns on a representative portfolio for 2H16 were positive, having been negative during 1H16. Average monthly returns in 2016, at 0.16%, remained low even compared to the modest levels of the previous five years. However, this figure includes significant negative monthly returns in January 2016, for example, when equity prices dropped sharply, around 2.5% over the month. In contrast to the average performance over 2016 as a whole, monthly returns on the representative portfolio in October, November and December 2016 were -0.3%, 0.5% and 2.0% respectively, averaging around 0.7% (T.25). The strong growth in December was largely driven by equity performance.



Investor sentiment continued muted as returns recovered. It appears that expectations among both institutional and retail investors have adjusted to the low yield environment since early 2015. Current sentiment showed little decline over 2016, remaining roughly neutral and above zero (T.26). Expectations of future EA performance are broadly neutral too, though they seem slightly more volatile than current sentiment. Investor sentiment appears not to be very reactive to market and political events in EU Member States and elsewhere.

T.26

Investor sentiment

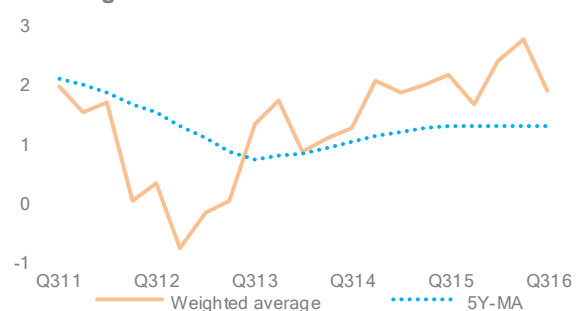
Broadly neutral

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: Thomson Reuters Datastream, ESMA.

Disposable income growth among EA countries remained firm in 3Q16 at 1.9% on an annualised basis, though falling from 2.8% the previous quarter, which had marked a five-year high. Solid growth in household disposable incomes may have supported investor confidence (T.27).

T.27

Disposable income

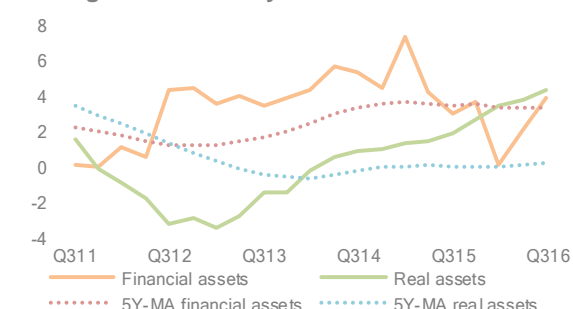
Income growth remains solid

Note: Annualised growth rate of weighted-average gross disposable income for 11 countries (AT, BE, DE, ES, FI, FR, IE, IT, NL, PT, SI), in %.
Sources: Eurostat, Thomson Reuters Datastream, ESMA.

Turning to the financial and non-financial assets held by Euro area households, **annualised financial asset growth** climbed to 3.9% in 3Q16, against a backdrop of loosening monetary policy and cheaper mortgages to finance real estate purchases. For the first time since 2011, growth in real assets in 1H16 outstripped growth in households' financial assets, which averaged at around 1.1%. The weaker growth in financial assets was due to low returns – especially in equities, which returned -1.7% – together with an absence of large inflows (T.28).

T.28

Financial vs non-financial assets held by households

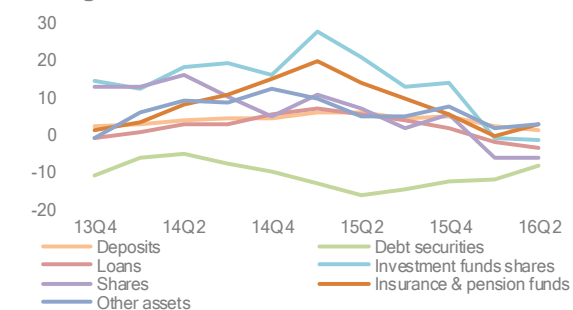
Asset growth driven by real assets

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.

Dispersion in growth rates between classes of household financial assets was narrower in 1H16 than it had been for the previous 2 years. As returns were generally small, the low dispersion suggests there were no major aggregate shifts in investors' **asset allocation**. However, in the case of debt securities held by households, negative annualised growth of -8.5% in 2Q16 was explained by outflows, as returns on bonds over that period were close to zero. Indeed, the near-zero returns may have been a prominent reason for investors to exit the bond market (T.29).

T.29

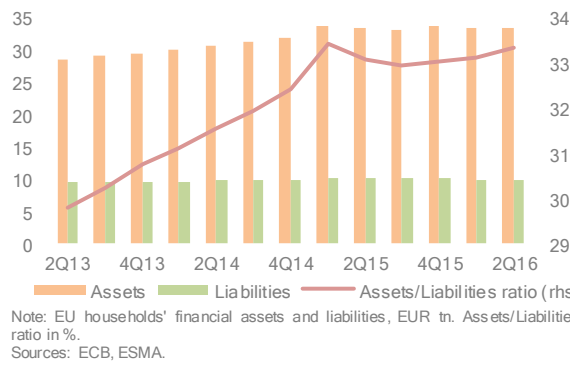
Household financial assets

No large shifts in asset allocation

Note: Average annualised growth rates of financial asset classes held by EU households, %.
Other assets=other accounts receivable/payable.
Sources: ECB, ESMA.

EU households held EUR 33tn of financial assets compared to around EUR 10tn of financial liabilities in 1Q16. The asset-to-liability ratio remained largely unchanged from the level throughout 2015, a stable reading reached through continual deleveraging by the household sector from late 2012 to 1Q15 (T.30). Both household financial assets and loans have seen near-zero growth in the face of low yields and limited availability of credit to households.

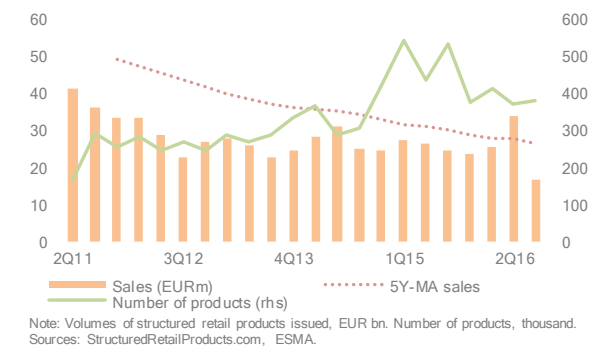
T.30
Household assets-to-liabilities ratio
Broadly stable since 1Q15



Finally, demand among retail investors for **structured products** was mixed in 2016. Quarterly sales reached a four-year high of EUR 34.5bn for 2Q16, before falling back to 21.5bn for 3Q16. This was once more below the five-year average, which persisted in its steady decline. These typically complex products

continue to offer retail investors higher yields – at a time when the search for yield carries on driving much investment behaviour – by exposing them to underlying upside and downside risks (T.31).

T.31
Structured retail products
Sales volumes fall back below 5Y average



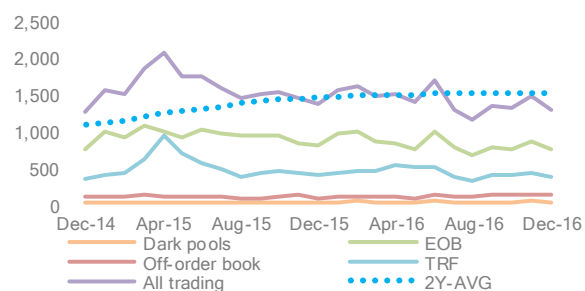
Infrastructures and services

Equity trading activity increased in the direct aftermath of the UK EU referendum but declined towards the end of the reporting period. It continued to take place mainly on regulated exchanges, although off-order book and dark pool shares did increase slightly. The October flash crash in Asian trading on the GBP currency market reinforced general concerns about liquidity resilience and the unknown interplay of algorithms. In derivatives markets, the first clearing obligation for interest-rate derivatives (IRDs) in G4 currencies took effect in June. One additional CCP was authorised under EMIR to operate in the EU while three third-country CCPs were recognised to operate in the Union. In 2H16 Euribor was designated a critical benchmark, and the first meeting of the college of supervisors took place in September 2016. Despite efforts to strengthen the integrity of financial benchmarks, the number of Euribor panel contributors contracted further in 2H16, from 22 to 20.

Trading venues: Low turnover

Around the UK EU referendum, **equity trading** rose above its long-term average in June, with electronic order book transactions increasing by 30% from the previous month. In particular, trading volumes surged for equities, bonds and derivatives in the direct aftermath of the UK referendum with, for example, a notional equity value of EUR 20.7bn traded on Chi-X Europe on 24 June, compared with an average EUR 8bn on the five preceding days. This event-driven peak was followed by a marked decline, with trading activity in August at its lowest level in two years, well below the two-year average. However, towards the end of the reporting period activity picked up again to almost match the two-year average (T.32).

T.32
Equity turnover by transaction type
Decline after spike related to UK referendum

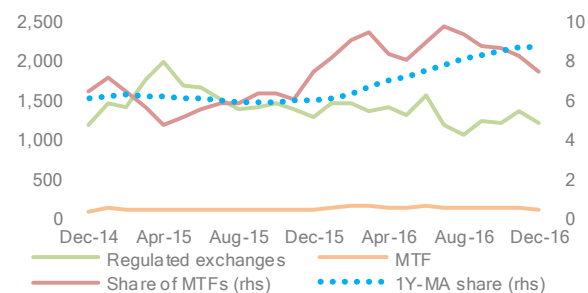


Note: Monthly equity turnover on EU trading venues by transaction type. EUR bn. 2Y-AVG=two-year average of all trading, EOB=Electronic Order Book, TRF=Trade Reporting Facilities.
Sources: FESE, ESMA.

The shares of equity trading conducted via **electronic order books (EOB)**, **off-EOB** and **dark pools** increased slightly against the same period of 2015. In 2H16, trading continued to be transacted mainly through electronic order books which comprised 58% of the turnover. The share of trades transacted via trade reporting facilities

stood at 29%, and 10.4% of transactions were off-order books. The share of dark pools remained limited, amounting to less than 3% of total turnover.⁴ Meanwhile, the proportion of trading on multilateral trading facilities declined over the reporting period to 7.5% in December, below the one-year moving average. Most of the trading continued to take place on regulated exchanges (T.33).

T.33
Equity turnover by trading venue type
Decreased trading on RMs and MTFs



Note: Monthly equity turnover by type of EU trading venue, in EUR bn. Trading on multilateral trading facilities as % of total trading on the right axis. 1Y-MA share=one-year moving average share of MTFs.
Sources: FESE, ESMA.

Trading **turnover** on exchanges remained dominated by equity trading, which accounted for 66% of the total turnover at the beginning of 2H16. Around 32% of the transactions were bonds, while ETFs and UCITS amounted to 1.2% and 0.2% respectively (A.163).

⁴ <http://www.bloomberg.com/news/articles/2016-01-14/european-dark-pools-expand-in-face-of-rules-limiting-their-use>

T.34

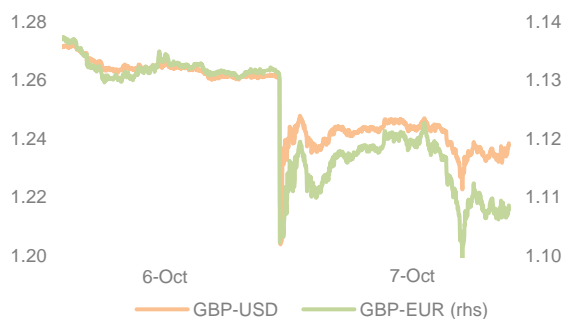
Currency market flash crash

GBP flash crash episode

On 7 October the foreign exchange market experienced a flash crash episode, with the GBP losing more than 6% versus the USD in less than ten minutes in early Asian trading. Market reports suggest that the event may be potentially related to algorithm-driven sales, aggravated by narrow markets as both EU and US markets were closed at the time. According to a BIS report published in January 2017 the combination of fragile market conditions, poorly controlled algorithms and inexperienced staff created a “mechanical cessation of trading on the futures exchange and the exhaustion of the limited liquidity on the primary spot FX trading platform, which encouraged further withdrawal of liquidity by providers reliant on data from those venues”.⁵

T.35

GBP flash crash

Loss of 6% in less than 10 minutes

Note: GBP exchange rates on 6 and 7 October 2016, one-minute data.

Sources: Thomson Reuters Eikon, ESMA.

This was the latest in a series of flash crashes in recent years. Nonetheless, the crash came as a surprise to most market participants, as it took place in a market usually considered very liquid, and, thus, in theory, less prone to such extreme movements.

Although the dynamics in foreign exchange markets differ markedly from those in securities markets, the event contributed to discussion around the importance of appropriate volatility interruption mechanisms, such as circuit breakers (“Circuit breakers in the EU – use and effects”, TRV N.2, 2016).

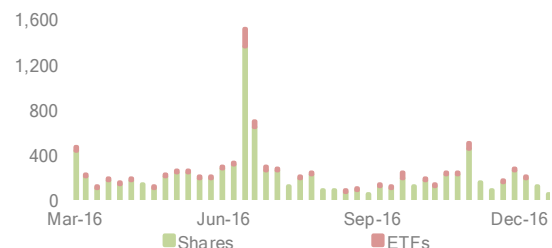
According to ESMA’s register on suspensions and removals, at the end of 2H16 18 financial instruments had been suspended from trading on EEA trading venues. A large part of these ongoing suspensions is due to market management arrangements (9 suspensions) (A.157). In the same period 50 financial instruments were removed from trading. In 2H16, the average duration of on-going suspensions was two years and has been steadily increasing over the past two years. The average duration of suspensions that were not live at the end of 2H16 increased

slightly in 2H16 by 1.3 days reaching 8.7 days in December 2016.

In the reporting period the number of **circuit breakers** triggered on financial instruments traded on EU trading venues was in line with pre-UK referendum levels. Circuit breakers are 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 affected securities are put into auctions. Based on commercial data on a sample of 10,000 financial instruments traded on EU venues, in 2H16 we observed a spike of 190 circuit breakers triggered on equities on Tuesday, 2 August 2016. The stocks halted pertain to the banking sector, which suffered from the combination of concern over the impact of negative interest rates on the banking sector and a protracted crisis in EU banking sector investor confidence, despite the overall positive results of the EBA EU-wide stress tests published some days before (T.36). Additionally, following the outcome of the US Presidential elections, 179 and 189 circuit breakers were triggered on 9 and 10 November 2016 respectively. On average during 2H16 197 circuit breakers were triggered weekly on stocks and 28 on ETFs.

T.36

Circuit breakers

Financial sector drives August spike

Note: Number of daily circuit breaker trigger events by type of financial instrument. Results displayed as weekly aggregates. The analysis is based on a sample of 10,000 securities, including all constituents of the STOXX Europe 200 Large/Mid/Small caps and a large sample of ETFs tracking the STOXX index or sub-index.

Sources: Morningstar Real-Time Data, ESMA.

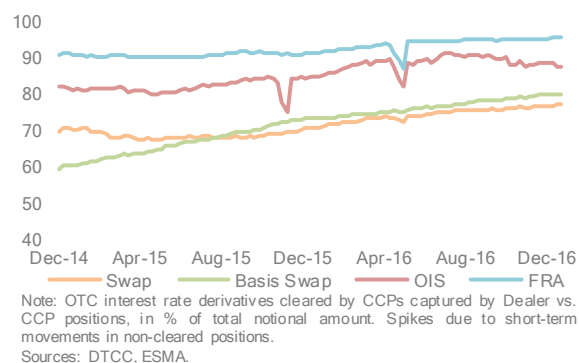
CCPs: No increase in central clearing

In 2H16, ESMA added ICE Clear Europe Ltd to its list of **authorised CCPs** under EMIR, thus bringing the number of authorised CCPs to 17. In addition, three new CCPs established in the US have been recognised to offer services and activities in the EU. This brings the number of third-country CCPs recognised in the EU to 22 institutions established in nine countries. At the end of 1H16, the first phase of the clearing

⁵ BIS (2017) “The sterling ‘flash event’ of 7 October 2016”, January 2017.

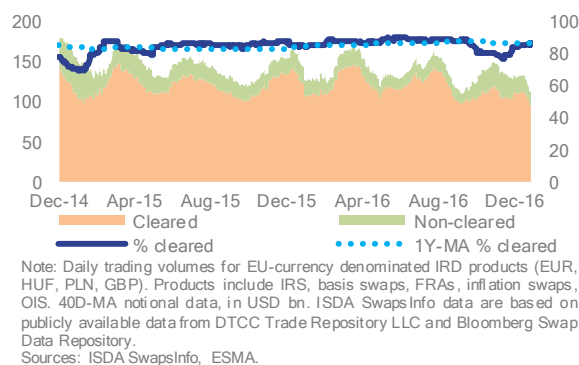
obligation for IRS denominated in G4 currencies (GBP, EUR, JPY and USD) took effect. Clearing members for the designated asset class are now subject to the clearing obligation, while other types of counterparties will have a phase-in period.

T.37
IRS CCP clearing
CCP clearing decreased for OIS



The trend towards **central clearing** of interest rate derivatives continued, even if earlier growth dynamics have levelled off recently. Indeed, the share of OIS that are centrally cleared decreased over the reporting period to end slightly below 90%. The share of centrally-cleared basis swaps rose from around 76% in 1H16 to 80% at the end of the reporting period, while vanilla swap contracts remained around 77% (against 66% at the beginning of 2H14) and at 95% for FRAs (against 55% at the beginning of 2H14). While the first phase of the clearing obligation entered into force, IRS central clearing initially decreased. Based on daily trading volumes, the share of interest rate derivatives that are centrally cleared fell to 77% in November, below the one-year average, only to rebound towards the end of the reporting period (T.38), while it remained around 80% for some of the main European CDS indices.

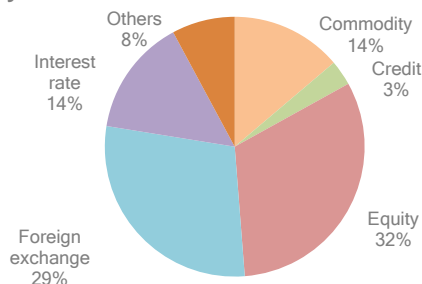
T.38
Daily trading activity for CDS indices
IRD central clearing decreased



T.39
EU derivatives
An initial analysis of EU TRs' Trade State reports

EMIR mandates the reporting of all derivatives trading to Trade Repositories (TRs), which collect and maintain the records of all derivative contracts, thus playing a central role in enhancing transparency and mitigating risks. This box provides initial analysis based on the Trade State reports submitted by the TRs authorised to operate in the EU. Trade state reports refer to the most updated value of all the derivative contracts with open interest at the end of a given day. The TR reports used for this analysis are from 1 July 2016. The charts in the box display data as provided by TRs, without deduplication of trades.

T.40
Reporting by asset class
Equity and forex derivatives dominant



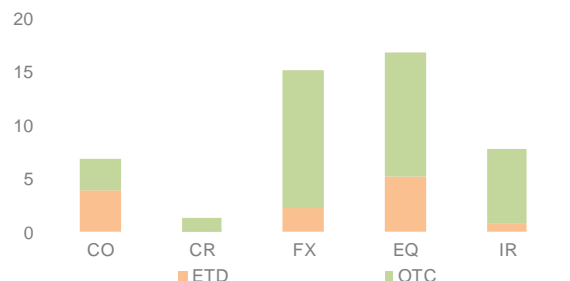
Note: Number of records by asset class. No data for ICE at the time of the analysis.
Sources: TR data, ESMA.

In terms of the number of transactions, equity and foreign exchange derivatives are the two biggest asset classes, making up 61% of all derivatives traded in the EU, while both interest rates and commodity derivatives amount to 14% and credit derivatives to 3% of all transactions (T.40).

In some markets, the reporting can also be concentrated. This is the case for interest and credit derivatives, where 76% and 84% respectively of the trades are reported to one particular TR.

The proportion of trades that are traded on venue also varies across TRs and asset classes. While a majority of trades are OTC derivatives, we can see that the share of exchange traded derivatives (ETDs) is higher for some TRs, usually those that are linked to a trading venue (T.41).

T.41
ETD vs OTC derivatives
OTC transactions dominate



Note: Number of records for OTC and ETD, breakdown by asset class. Commodity (CO), Credit (CR), Foreign Exchange (FX), Equity (EQ), Interest Rate (IR) derivatives. No data for ICE at the time of the analysis.
Sources: TR data, ESMA.

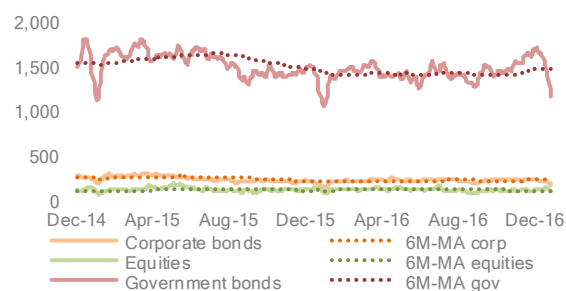
CSDs: Stable settlement activity

In 2H16 ESMA continued its regulatory effort as part of the implementation of the Central Securities Depository Regulation (CSDR) by

publishing its draft technical standard on improving securities settlement in the EU and on central securities depositories. This final report includes feedback from public consultations and proposes changes in key areas including CSD requirements and internalised settlement.

T.42

Settlement activity

Increasing activity for government bonds

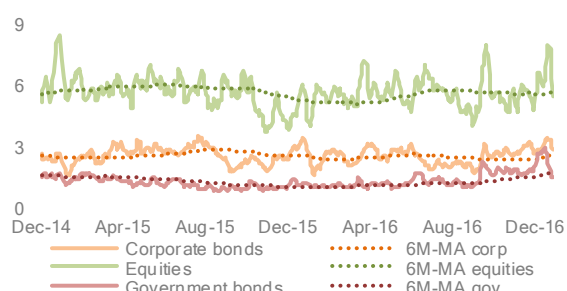
Note: Total value of settled transactions in the EU as reported by NCAs, in EUR bn, one-week moving averages. 6M-MA=six-month moving average. Free-of-payment transactions not considered.

Sources: National Competent Authorities, ESMA.

Settlement activity was stable for corporate bonds and equities, and increased for government bonds (T.42)⁶.

T.43

Settlement fails

More volatile for equities

Note: Share of failed settlement instructions in the EU, in % of value, one-week moving averages. 6M-MA=six-month moving average. Free-of-payment transactions not considered.

Sources: National Competent Authorities, ESMA.

Across markets, the percentage of **settlement fails** was, as usual, higher for equities. The fail rate remained at a lower and similar level for government and corporate bonds (below 3%; T.43). The increase in settlement fails in September across asset classes can potentially be linked to bank equity price movements. The number of settlement fails returned to lower levels after the spike at the end of 2016.

CRAs: Minor rating changes

In 2016 a number of trends related to **credit rating changes** (i.e. upgrades and downgrades) were confirmed. First, rating changes on corporate issuers (T.44) tend to be, on average,

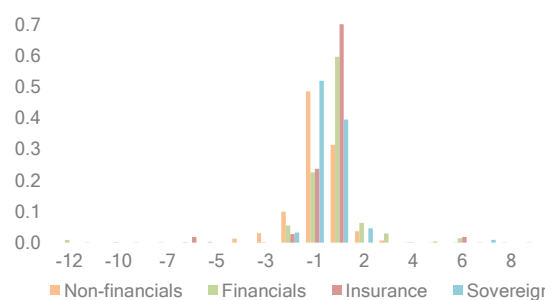
relatively small. Indeed, the majority of rating changes measured in notches occur in the +1/-1 range.

Notably, however, corporate financials have, overall, benefited from many more upgrades than corporate non-financials (as can be seen in the right-sided skew of the distribution). These changes in credit ratings have been driven mainly by changes in methodologies (as opposed to changes in the creditworthiness of the entities themselves) of some CRAs, which have elevated credits in some more vulnerable countries, in particular.

The **frequency distribution** of sovereign issuer credit ratings (including public entities, sub-sovereigns and sovereigns) was very narrow in 2016 as the asset class experienced only minor recalibrations in credit ratings. The frequency distribution of rating changes for financial instruments closely mirrors the distribution of issuer credit ratings. This is not surprising, as the creditworthiness of bonds is very closely tied to the creditworthiness of their issuer. However, it is worth highlighting the positive trend in covered bonds, as the asset class has made significant strides in terms of positive rating drift (i.e. many more upgrades than downgrades).

T.44

Frequency distribution of issuer credit ratings changes

Very narrow for sovereign

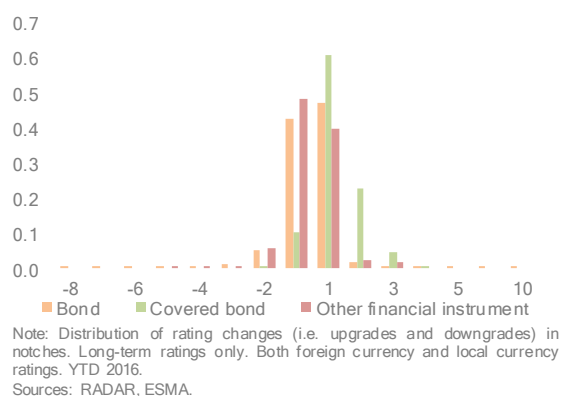
Note: Distribution of rating changes (i.e. upgrades and downgrades) in notches. Long-term ratings only. Both foreign currency and local currency ratings. YTD 2016.

Sources: RADAR, ESMA.

These changes are related to positive regulatory treatment of the asset class and changes in the underlying rating methodologies (T.45).

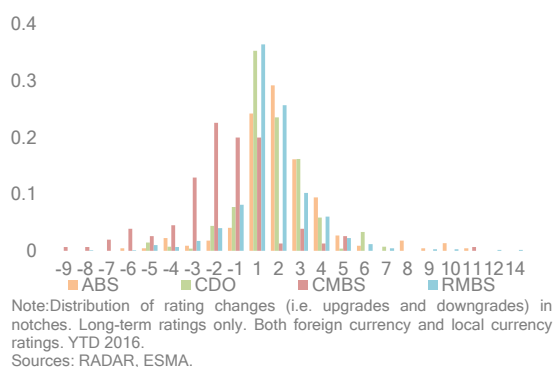
⁶ The downward spike at the end of the year for government bonds is seasonal.

T.45
Frequency distribution of financial instrument ratings changes
Closely related to issuers



The **rating change distribution** for securitised products is much wider (i.e. multi-notch rating changes occur more frequently) than in the above cases. Overall, most asset classes (i.e. ABS, CDO and RMBS) have experienced a positive drift implying an improvement in the average credit rating value. In some cases, the drivers of this positive trend has been continuous deleveraging. However, as in the above, changes in the credit rating methodologies have positively affected the outstanding credit ratings. CMBS transactions continue to suffer from the weak commercial real-estate sector (CRE) in Europe and, in turn, experienced a large number of downgrades by up to -9 notches (T.46).

T.46
Frequency distribution of securitised products
Closely related to issuers



Financial benchmarks: Euribor designated as a critical benchmark

On 30 June 2016, the **Financial Benchmarks Regulation** entered into force. It will not be applicable in its entirety until 1 January 2018. However, certain provisions took immediate effect. Most importantly, these include the power to designate a benchmark as critical and

enhanced supervisory powers for the designated critical benchmarks (Box T.47).

A potential failure of a critical benchmark may have major negative consequences on market integrity, financial stability and the financing of households. For this reason, the Regulation provides for additional requirements to be applied to ensure the **robustness and integrity** of critical benchmarks. One of the key requirements for critical benchmarks is the formation of a college of supervisors which brings together the supervisors of all banks taking part in the critical benchmark, as well as the supervisors of the Member States for which the critical benchmark is of systemic importance. Moreover, in the event that the representativeness of a critical benchmark is put at risk, the Benchmark Regulation grants the relevant competent authority the power, with the agreement of the college of supervisors, to mandate contributions of input data.

T.47
EU financial benchmarks
EU Benchmarks Regulation

In September 2013, in the wake of the manipulation of various benchmarks, the European Commission proposed a draft Regulation on indices used as benchmarks in financial instruments and financial contracts (Benchmarks Regulation).

The Benchmarks Regulation (Regulation (EU) 2016/1011) was published in the Official Journal of the EU on 29 June 2016 and entered into force on 30 June 2016. ESMA is mandated by the European Commission to develop more than ten Technical Standards by April 2017.

On 11 February 2016 ESMA received a request from the European Commission for technical advice on possible delegated acts. The technical advice is to be delivered within four months after entry into force of the Regulation.

On 15 February 2016 ESMA published a Discussion Paper on the Benchmarks Regulation. The DP included ESMA's policy orientations and initial proposals on both the technical advice to the Commission and the draft technical standards under the Benchmarks Regulation.

On 27 May 2016 ESMA published a Consultation Paper on the draft technical advice.

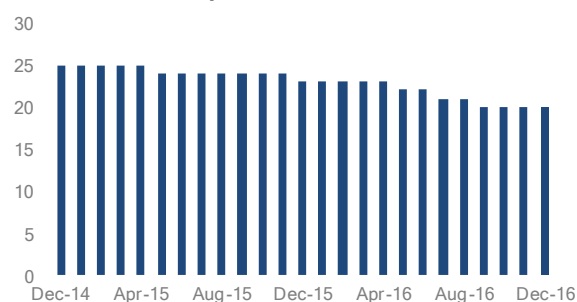
On 29 September 2016 ESMA published a Consultation Paper on the draft technical standards under the Benchmarks Regulation, including those on oversight function, code of conduct for contributors and authorisation/registration of administrators. The consultation period ended on 2 December 2016.

On 10 November 2016 the Final Report on the Technical Advice was submitted to the Commission.

In August 2016 the European Commission designated Euribor a **critical benchmark**, with a total estimated value of instruments referenced on it of at least EUR 500bn on the basis of all the ranges of maturities and tenors – the volume required by the Regulation to classify a benchmark as critical. It is estimated that Euribor is referenced by more than EUR 180tn worth of contracts, mostly interest rate swaps but also

EUR 1tn of retail mortgages. As of end-2016, Euribor is the only benchmark to have been designated as critical by the European Commission. The Euribor college of supervisors first met on 21 September 2016 and is composed of 16 NCAs from EU Member States and ESMA⁷. The full enforcement of new powers and secure continuity of the Euribor is a priority of the NCAs and the college. Despite the efforts made to strengthen the integrity of Euribor, its panel of contributors continued to decline in 2H16, when the total number of banks composing the panel dropped from 22 to 20 (T.48).

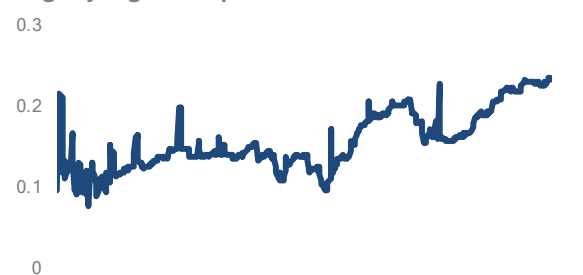
T.48
Euribor panel
Panel membership continues to decrease



Note: Number of banks contributing to the Euribor panel; non-viability is assumed at 12 contributing banks
Sources: European Money Markets Institute, ESMA

Our **risk indicators** do not suggest that any significant irregularities in the submission and calculation occurred in the reporting period.⁸ The **maximum difference** between the quotes submitted and Euribor across all maturities increased slightly in 2H16, with the maximum difference observed on the six-month tenors (T.49). However, the limited increase coupled with the continued absence of spikes confirms the improved reliability and quality of Euribor quotes submitted.

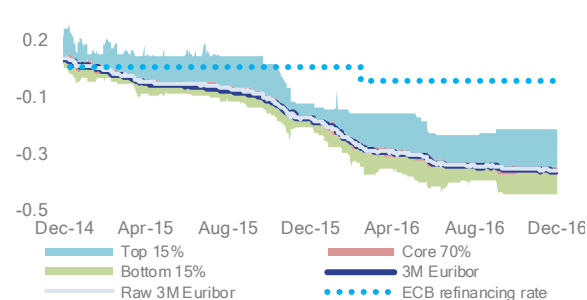
T.49
Euribor contributions
Slightly higher dispersion



Note: Normalised difference in percentage points between the highest contribution submitted by panel banks and the corresponding Euribor rate. The chart shows the maximum difference across the 8 Euribor tenors.
Sources: European Money Markets Institute, ESMA.

The actual Euribor is calculated by eliminating the highest and lowest 15% of quotes in order to prevent any individual contributors from influencing the rate. The remaining quotes are then averaged. The gap between the actual Euribor and the non-trimmed average for the three-month tenor was broadly stable in the reporting period (T.50).

T.50
Dispersion of submission levels
Stable in 2H16



Note: Dispersion of 3M Euribor submissions, in %. The "Raw 3M Euribor" rate is calculated without trimming the top and bottom submissions of the panel for the 3M Euribor.
Sources: European Money Markets Institute, ESMA.

In 2H16 the three-month Euribor fell continuously, with 13% of banks lowering the previous-day submission, only 5% raising their quotes and 81% keeping them unchanged. Finally, in 2016 the three-month Euribor remained below the ECB interest rate for the main refinancing operations. In the UK, the Bank of England (BoE) has recently published a consultation paper⁹ on the reform of SONIA, the widely used sterling unsecured overnight interest rate benchmark. In particular, the BoE, as the SONIA administrator, is proposing to switch to measuring the average.

⁷ The 16 NCAs include the Belgian FSMA, which is the designated supervisory authority of EMMI, the Brussels-based entity that administrates the Euribor benchmark.

⁸ Our risk indicators are based on the data publicly available on the European Money Markets Institute website.

⁹ Bank of England (2016), "The Reform of SONIA".

Risks

ESMA Risk Dashboard

R.1

Main risks

Risk segments	Risk categories		Risk sources			
	Risk	Outlook	Risk	Outlook	Outlook	
Overall ESMA remit	●	➔	Liquidity	● ➔	Macroeconomic environment	➔
Systemic stress	●	➔	Market	● ➔	Low interest rate environment	➔
Securities markets	●	➔	Contagion	● ➔	EU sovereign debt markets	➔
Investors	●	➔	Credit	● ➔	Market functioning	➔
Infrastructures and services	●	➔	Operational	● ➔	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 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, 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.

ESMA's 4Q16 overall risk assessment remains unchanged from 3Q16. In 4Q16 EU financial markets remained relatively calm, although very reactive to political events. An example was the US election. High reactivity was reflected in increased market expectations of near-term equity volatility. Investment fund liquidity remained a concern, with bond funds registering outflows after the US election. While market and credit risks remain very high, our outlook for market, liquidity, credit and contagion risk is stable. The low yield environment and related sustained concerns with regard to excessive risk-taking persisted. In an environment of high valuation risks, uncertainties around the growth outlook for the EU and the global economy, together with the confluence of political events, including the expected commencement of negotiations on the exit of the UK from the EU as well as several elections in EU Member States, are important risk drivers for 2017.

Risk summary

In 4Q16, risks in the markets under ESMA remit remained at high levels, reflecting very high risk in securities markets, and elevated risk for investors, infrastructures and services. Our assessment of the individual risk categories did not change from 3Q16, with market and credit risk remaining very high due to the persisting low-interest rate environment, high uncertainty over EU growth prospects and geopolitical developments, and due to recent pressures in the sovereign bond market. Liquidity risk in 4Q16 is still assessed as high, as liquidity pressures were registered in equity markets and in segments of the fund industry. Contagion risk remains high, driven by high levels of interconnectedness between different segments of financial markets amplified by the low-yield environment and associated incentives for high risk taking. The risk outlook is stable across all risk categories, reflecting market signs of absorption of the uncertainty and volatility following the UK referendum and US Presidential election.

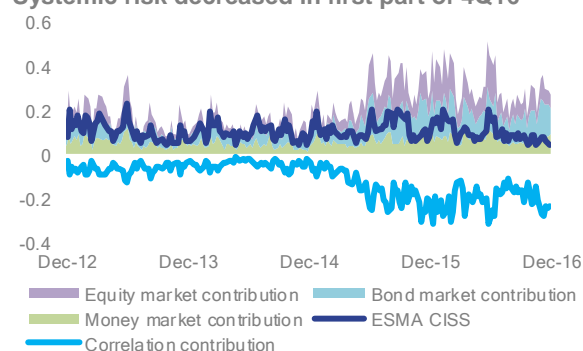
Systemic stress was broadly stable in 4Q16, abating slightly only after the US Presidential

election outcome (R.2). However, in the medium-term outlook, risks may arise from the macroeconomic environment. Market uncertainty over potential changes in the European monetary policy stance prevailed. EU economic growth is still weak and uneven, and political events could create additional uncertainty for financial markets (Brexit, important elections in EU Member States, geopolitical events).

R.2

ESMA composite systemic stress indicator

Systemic risk decreased in first part of 4Q16



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: EU economic recovery in 4Q16 is forecast to continue at a moderate and steady pace, although uneven across EU Member States. Investments started to pick up in the second part of 2016 and EA inflation reached 1.1% in December 2016, its highest level since September 2013. Employment is growing, driven by the sustained expansion in domestic demand and moderate wage growth, as well as fiscal policy measures and structural reforms implemented in some Member States. However, downside risks to the EU economic growth outlook have intensified: high uncertainty over geopolitical developments inside and outside the EU as well as slower growth in non-EU advanced economies.¹⁰

Low-interest-rate environment: In 4Q16, ECB and BoE monetary policies remained highly accommodative, not least to mitigate the financial market impact of the UK EU referendum. In this regard, the low-interest-rate environment and related search-for-yield strategies still represent a source of concern. In 4Q16 EU funds investing in emerging market and high-yield fixed-income products registered positive flows (EUR 4.3bn and 1.9bn, respectively), albeit decreasing towards the end of the quarter. On the other hand, government bond funds recorded high net redemptions (EUR -12bn) (R.26). Investments in EU equity funds fell in early 4Q16, as the high reactivity of equity markets to political events may have reduced investors' appetite for this type of funds. In this context, excessive risk-taking and capital misallocation remain sources of risk in the medium-term outlook.

EU sovereign debt markets: In 4Q16, EU sovereign bond yields increased sharply, mirroring the behaviour of US government bonds following the outcome of the US Presidential elections. After the elections, ten-year EU government bond yields quickly rose by 50 to 80bps versus compared to their 3Q16 levels and the yield curve steepened slightly. In December 2016 EU sovereign bond yields remained at this higher level, following the developments on the US markets after the US Fed interest rate increase.

Market functioning: No significant disruptions in the functioning of EU markets were observed in 4Q16. In November 2016, the European

Commission adopted a package of legislative acts¹¹ to ensure that central securities depositories are prudentially sound, have high-quality risk management and corporate governance standards and meet appropriate capital requirements. The new rules also set penalties for settlement failures and put in place measures to ensure the transparency of internalised settlements which take place outside central securities depositories.

Political and event risk: The UK EU referendum created substantial uncertainty about the future economic outlook and EU institutional arrangements, with the exit and post-exit conditions planned to be negotiated over the coming months. Focus on the news flow and announcements may result in intensified political and event risk, contributing to uncertainty and greater asset price volatility in EU markets. In November, financial markets experienced a period of additional market volatility in the run-up to the US Presidential elections as electoral uncertainties weighed on market sentiment. The unexpected election outcome triggered initial falls in equity markets, which were however quickly reversed, and a potential uptrend in US sovereign bonds yields, with spill-overs to EU sovereign bond yields. Going forward, additional market uncertainties may result from important electoral events in some EU Member States (Dutch parliamentary elections in March 2017, French presidential elections in April and May 2017, German parliamentary elections in autumn 2017) and from broader geopolitical risks.

Risk categories

Market risk – very high, outlook stable: In particular, markets continued to be highly reactive to political and event risks. In 4Q16 EU equity markets were relatively calm, with the financial sector completely recovering the losses reported after the UK referendum (+ 32% from 27 June 2016) (R.6). Some short-lived volatility was registered before the electoral events in 4Q16 as investors quickly adjusted their positions reacting to news. The near-term volatility VSTOXX1M rose by 50% in the week before the US elections and by 20% before the Italian referendum (R.7). On the day after the unexpected US election outcome, EU markets opened 3.4% down, before recovering during the day. Similarly, the outcome of the Italian referendum had a short-lived impact

¹⁰ European Commission, "European Economic Forecast, Autumn 2016".

¹¹ European Commission "Adoption of a delegated act as well as regulatory and implementing technical standards for Regulation (EU) No 909/2014 on improving securities

settlement in the EU and on central securities depositories", 11 November 2016.

on equity prices. In both cases the banking sector was the most affected. In options markets, implied volatility for GBP increased in 4Q16 (+8% on average from 3Q16), peaking in the days following the GBP flash crash of 7 October, when the GBP fell by more than 6% versus the USD in less than ten minutes in early Asian trading. However, volatility levels remained moderate compared with the moves seen around the UK referendum; for example, the three-month tenor GBP-EUR implied volatility rose from 10% at end-3Q16 to 12% after the GBP flash crash, compared with a high of 17.2% in the run-up to the UK referendum (R.8).

Liquidity risk – high, outlook stable: In 4Q16 the equity market illiquidity index increased above the two-year moving average (R.4). On the other hand, equity bid-ask spreads were stable at 6.7 basis points, below their long-term average of seven basis points. EU corporate bond markets registered slightly better liquidity conditions over the reporting period, despite the Amihud illiquidity indicator flagging a temporary episode of illiquidity in early 4Q16 (R.14). Sovereign bid-ask spreads increased on average by 50% in 4Q16 across EU countries (R.10). Signs of stress were observed in EA government bond collateral markets, with the collateral scarcity premia increasing again in 4Q16 (R.12). The sharp drop in repo rates observed at the end of the year (T.19) resulted in greater dispersion between the scarcity premia on bonds that are in very high demand (the highest percentiles) and the median premium. Liquidity pressures were observed in the EU investment fund industry, where both equity and bond fund categories registered net redemptions of EUR 14bn each in 4Q16. Developments in the volatility of investment fund returns were mixed in 4Q16, with commodity and real estate fund return volatility registering the highest increase (+19%) and decrease (-50%) respectively.

Contagion risk – high, stable outlook: In the sovereign bond market, the correlation between German and other EU countries' ten-year bond yields increased throughout 4Q16. However, one

peripheral country's sovereign bond market was driving the bottom 25% dispersion at the end of the reporting period with a negative correlation (-0.8) to German bond yields (R.17). In the asset management industry, concerns remained over the asset management sector's interconnectedness with the banking and insurance sectors and the associated potential for spillovers. Within the hedge fund industry intra-sectorial contagion decreased in 4Q16, following the previous quarter marked increase in reaction to the UK referendum result (R.32).

Credit risk – very high, outlook stable: In 4Q16 issuance of high-yield securities decreased by 48% from 3Q16 and 7% from 4Q15. Corporate bond spreads remained at 3Q16 levels, although ticking up in early December 2016 ahead of the ECB meeting. High valuations in the corporate bond markets fuelled by the combination of the accommodative monetary policy and search-for-yield strategies may indicate inadequately low default risk premia. In fact, in 4Q16 spreads in the corporate bond and corporate CDS markets remained decoupled (-50bps and -11bps since the start of the ECB's Corporate Purchase Programme).

Operational risk – elevated, stable outlook: Technology and conduct risks remain a key concern both within and outside the EU. In 4Q16, a small UK bank suffered from a significant cyber-attack: 20,000 current accounts were hacked with loss of client money, while suspicious activity was reported on another 20,000 accounts. On a positive note, in 4Q16 no trading disruptions were observed on EU financial markets. However, operational risk issues were highlighted by the latest flash-crash event: On 7 October 2016 the GBP suffered a sudden fall of 6% in two minutes on Asian venues against the USD before recovering most of its losses. Although the dynamics in foreign exchange markets differ markedly from those in securities markets, this flash-crash-style event does highlight the importance of appropriate trading halt mechanisms.

Securities markets

R.3

Risk summary

Risk level

Risk change from 3Q16

Outlook for 1Q17



Risk drivers

- Asset revaluation and risk re-assessment.
- Low-interest-rate environment and excessive risk taking.
- Low inflation and uneven EU growth.
- Weak market confidence related to the banking sector.
- Political and event risks.

Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for forthcoming quarter. Risk assessment based on categorisation of the 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 a risk increase, downward arrows a risk decrease. ESMA risk assessment based on quantitative indicators and analyst judgement.

R.4

Equity illiquidity

Illiquidity index above long-term average

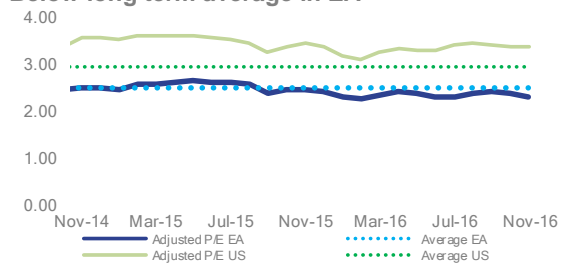


Note: Composite indicator of illiquidity in the equity market for the current Eurostoxx 200 constituents, computed by applying the principal component methodology to six input liquidity measures (Amihud illiquidity coefficient, bid-ask spread, Hui-Heubel ratio, turnover value, inverse turnover ratio,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

R.5

Equity valuation

Below long term average in EA

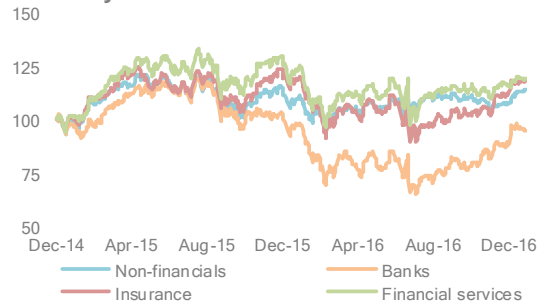


Note: Monthly earnings adjusted for trends and cyclical factors via Kalman filter methodology based on OECD leading indicators; units of standard deviation; averages computed from 8Y. Data available until the end of November 2016. Sources: Thomson Reuters Datastream, ESMA.

R.6

Equity prices

Recovery continued in 4Q16

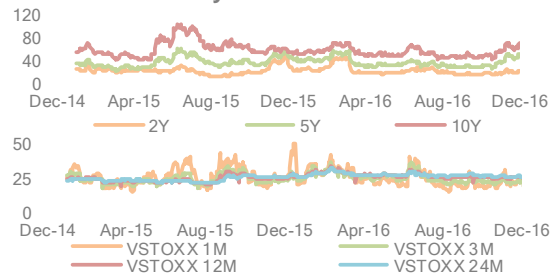


Note: STOXX Europe 600 equity total return indices. 03/11/2014=100. Sources: Thomson Reuters Datastream, ESMA.

R.7

Financial instruments volatilities

Increased volatility around market events

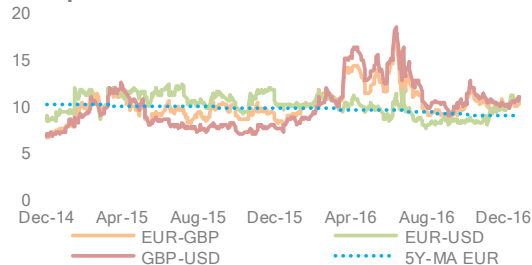


Note: Top panel: implied volatilities on 1M forward ICAP Euro vs. 6M Euribor swaps based on the Normal volatility model, in bp; Bottom panel: Euro Stoxx 50 implied volatilities, measured as price indices, in %. Sources: Bloomberg, Thomson Reuters Datastream, ESMA.

R.8

Exchange rate volatilities

GBP peaked around the flash-crash event

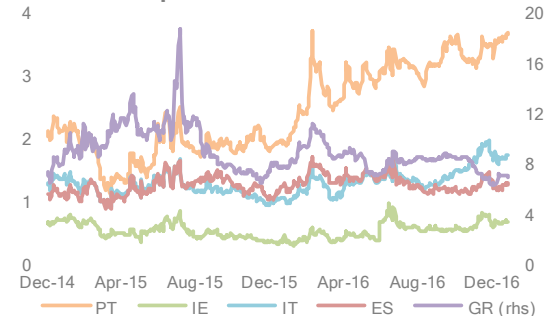


Note: Implied volatilities for 3M options on exchange rates. 5Y-MA EUR is the five-year moving average of the implied volatility for 3M options on EUR-USD exchange rate. Sources: Bloomberg, ESMA.

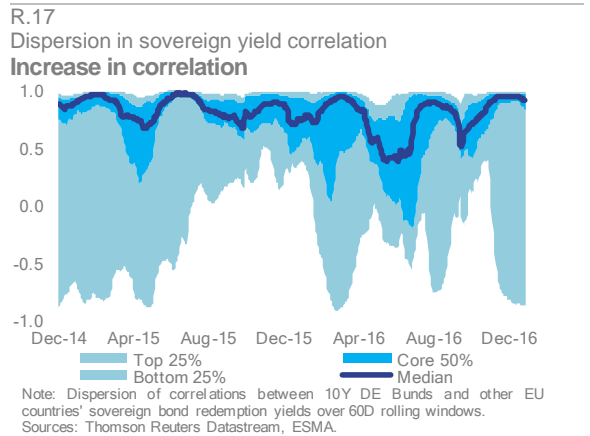
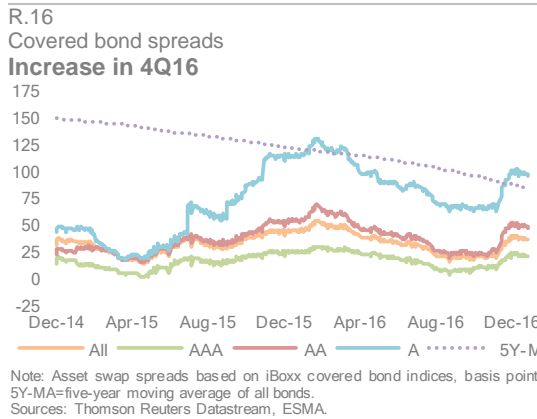
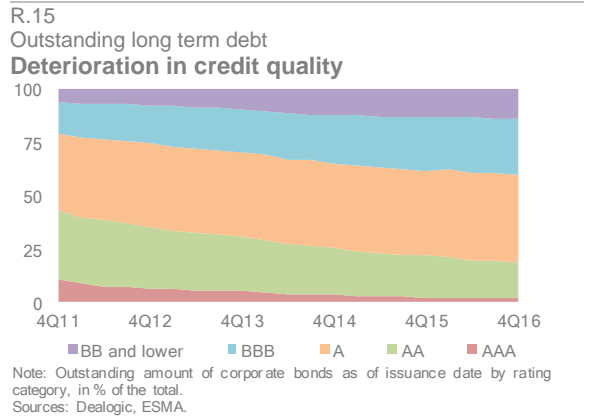
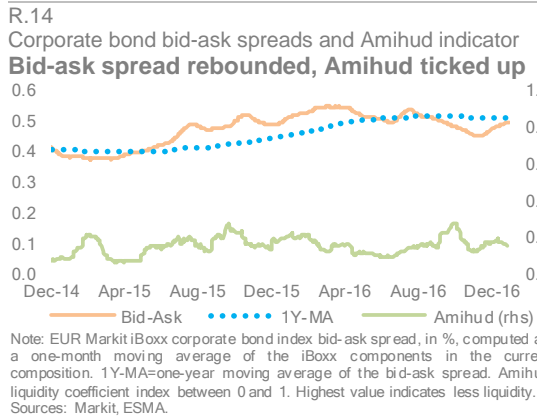
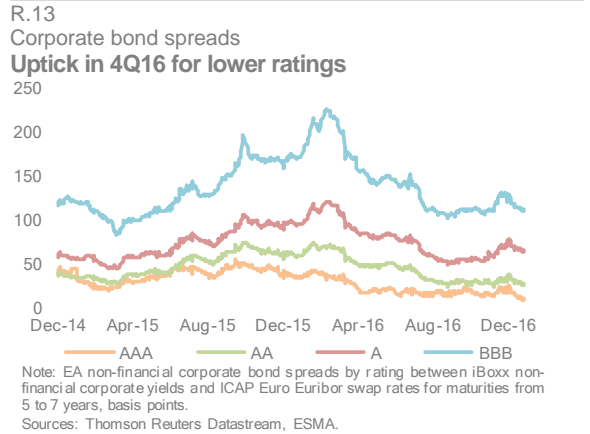
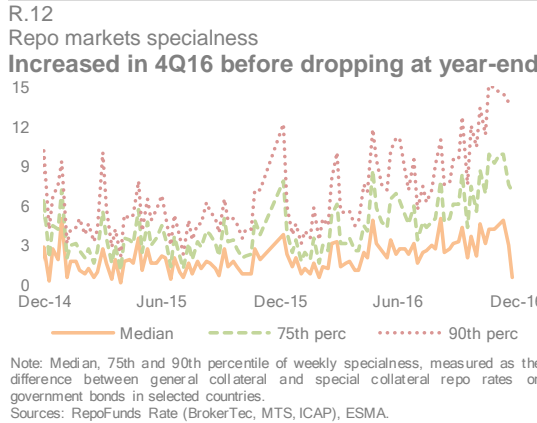
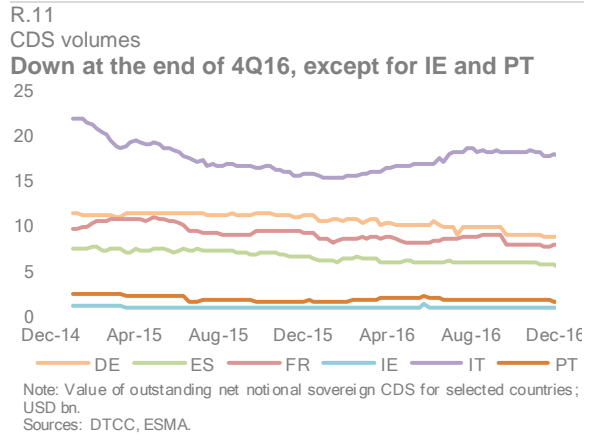
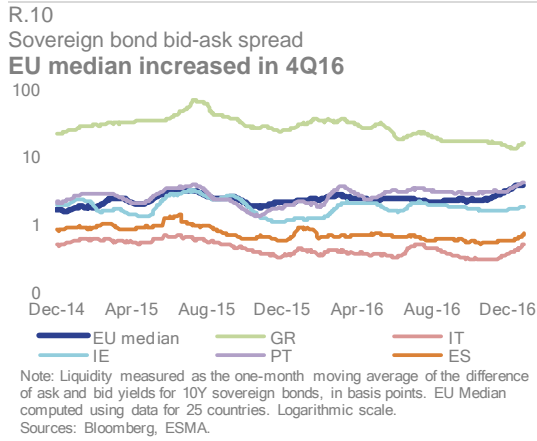
R.9

Sovereign risk premia

Mixed development across EA countries



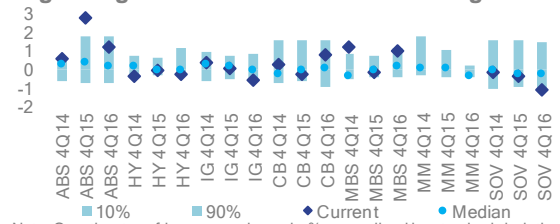
Note: Selected 10Y EA sovereign bond risk premia (vs. DE Bunds), in %. Sources: Thomson Reuters Datastream, ESMA.



R.18

Debt issuance growth

Negative growth rate in 4Q16 for sovereign

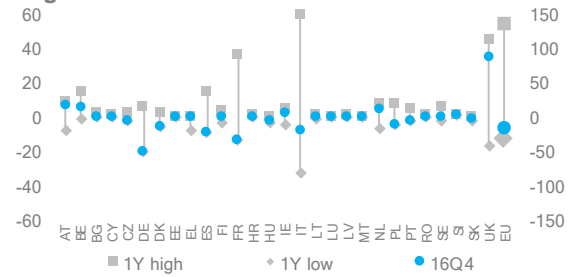


Note: Growth rates of issuance volume, in %, normalised by standard deviation for the following bond classes: asset backed securities (ABS); high-yield (HY); investment grade (IG); covered bonds (CB); mortgage backed securities (MBS); money market (MM); sovereign (SOV). Percentiles computed from 12Q rolling window. All data include securities with a maturity higher than 18M. Bars denote the range of values between the 10th and 90th percentiles. Missing diamond indicates no issuance for previous quarter. Sources: Dealogic, ESMA.

R.19

Net sovereign debt issuance

Negative for EU

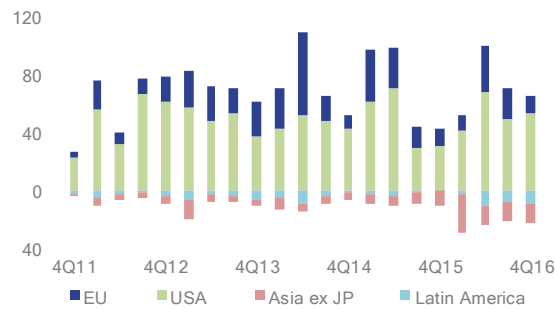


Note: Quarterly net issuance of EU sovereign debt by country, EUR bn. Net issuance calculated as the difference between new issuance over the quarter and outstanding debt maturing over the quarter. Highest and lowest quarterly net issuance in the past year are reported. EU total on right-hand scale. Sources: Dealogic, ESMA.

R.20

HY issuance

Marked reduction in EU HY issuance

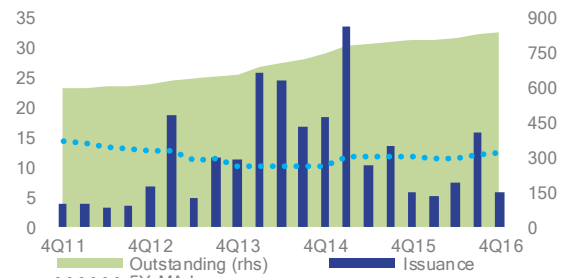


Note: Quarterly data on high-yield corporate bond issuance by region of issuance, in EUR bn. Sources: Dealogic, ESMA.

R.21

Hybrid capital issuance and outstanding

Reduced issuance

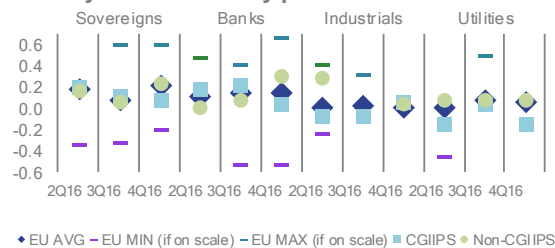


Note: Outstanding amount computed as the cumulative sum of previously issued debt minus the cumulative sum of matured debt prior to reference date, EUR bn. According to Dealogic classification, hybrid capital refers to subordinated debt Tier 1 capital mainly with perpetual maturity. Sources: Dealogic, ESMA.

R.22

Debt maturity

Broadly stable maturity profile

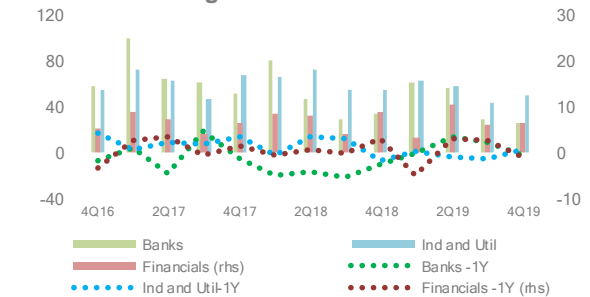


Note: Quarterly change in maturity of outstanding debt by sector and country groups in the EU, years. CGIIPS include CY, GR, IT, IE, PT and ES. Min and Max may not be displayed where they are out of the scale provided in the graph. Sources: Dealogic, ESMA.

R.23

Debt redemption profile

Banks' financing needs in the medium-term



Note: Quarterly redemptions over a 3Y-horizon by European private corporates (banks, non-bank financials, and industrials and utilities), current and change over last year (dotted lines), EUR bn. Excluding bank redemptions to central banks. Sources: Dealogic, ESMA.

Investors

R.24

Risk summary

Risk level

Risk change from 3Q16

Outlook for 1Q17



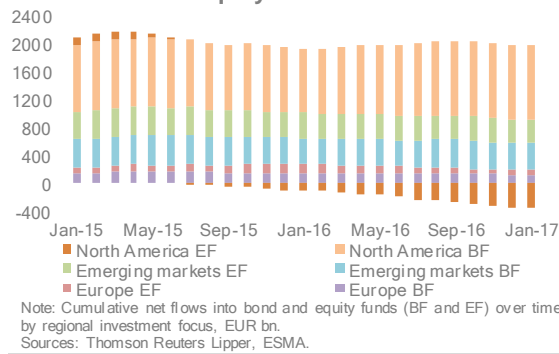
Risk drivers

- Sustained search for yield.
- Correlation in asset prices and increase in redemptions.
- Deterioration in quality of securities in portfolios.
- Uncertainty related to economic outlook and political developments in EU.

Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for forthcoming quarter. Risk assessment based on categorisation of the 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 a risk increase, downward arrows a risk decrease. ESMA risk assessment based on quantitative indicators and analyst judgement.

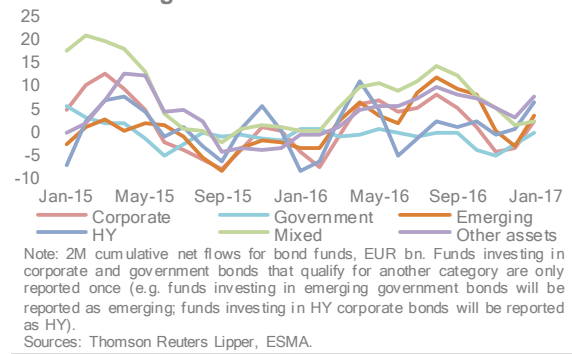
R.25

Cumulative global investment fund flows Outflows for EU equity and bond funds



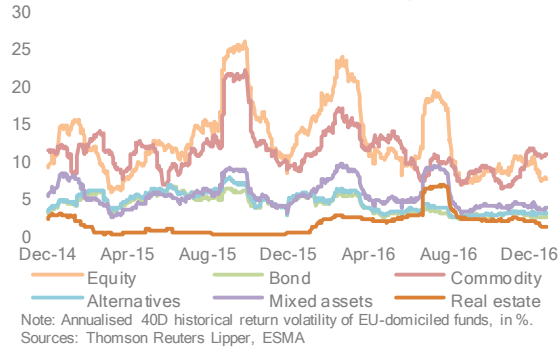
R.26

EU bond fund net flows Outflows for government bond funds



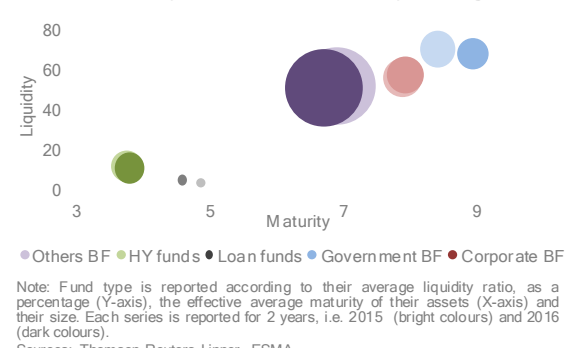
R.27

RoR volatilities by fund type Volatilities increased for commodity funds



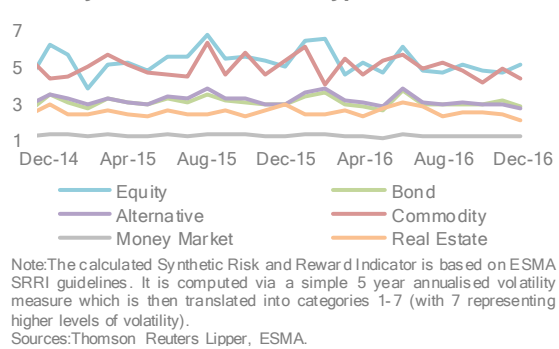
R.28

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



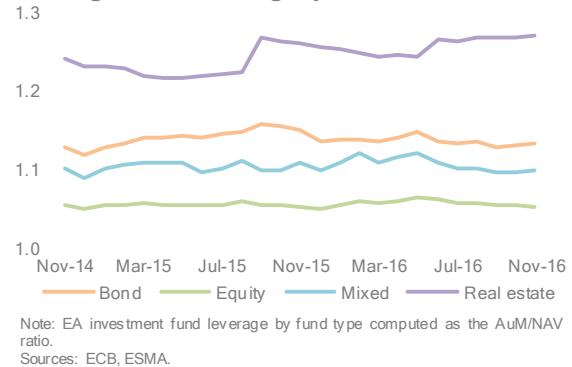
R.29

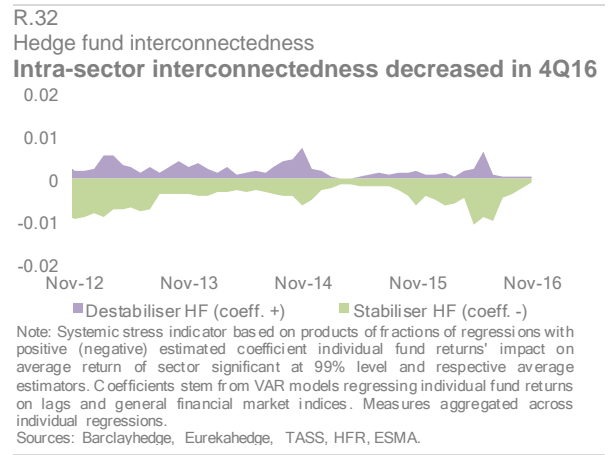
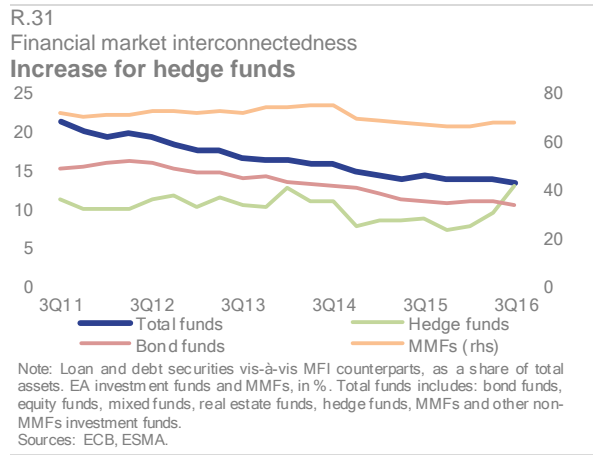
Retail fund synthetic risk and reward indicator Broadly stable across fund types



R.30

Leverage by investment fund type Leverage increased slightly for real-estate funds





Infrastructures and services

R.33

Risk summary

Risk level

Risk change from 3Q16

Outlook for 1Q17



Risk drivers

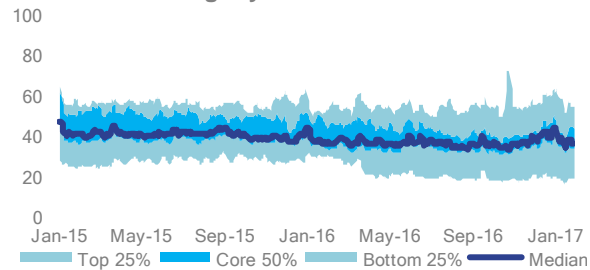
- Operational risks, incl. insufficient technology management, cyber-attacks, integrity of benchmark panels.
- Conduct risk, incl. intentional or accidental behaviour by individuals, market abuse.
- Systemic relevance of individual operations, incl. market share, complexity of operations, interconnectedness with other infrastructures or financial activities, system substitutability.

Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for forthcoming quarter. Risk assessment based on categorisation of the 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 a risk increase, downward arrows a risk decrease. ESMA risk assessment based on quantitative indicators and analyst judgement.

R.34

Equity market concentration

Concentration slightly increased

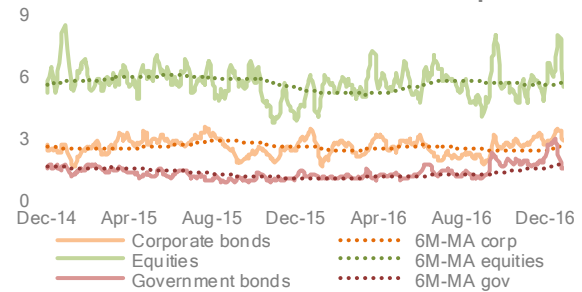


Note: Concentration of notional value of equity trading by national indices computed as a 1M-MA of the Herfindahl-Hirschman Index, in %. Indices included are FTSE100, CAC40, DAX, FTSE MIB, IBEX35, AEX, OMXS30, BEL20, OMXC20, OMXH25, PSI20, ATX. Sources: BATS, ESMA.

R.35

Settlement fails

Return to lower levels after end of 2016 spike

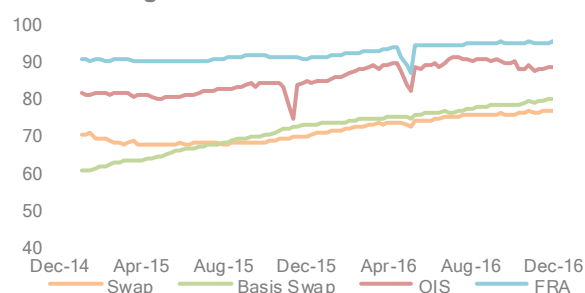


Note: Share of failed settlement instructions in the EU, in % of value, one-week moving averages. 6M-MA=six-month moving average. Free-of-payment transactions not considered. Sources: National Competent Authorities, ESMA.

R.36

IRS CCP clearing

CCP clearing decreased for OIS



Note: OTC interest rate derivatives cleared by CCPs captured by Dealer vs. CCP positions, in % of total notional amount. Spikes due to short term movements out of the Dealer vs CCP positions. Sources: DTCC, ESMA.

R.37

Euribor contributions

Slightly higher dispersion

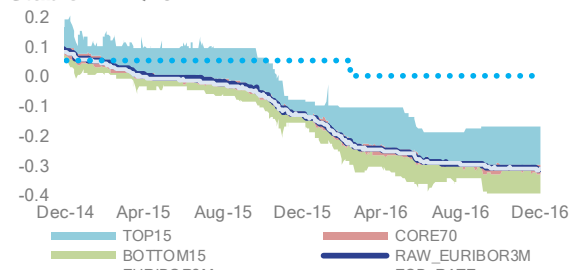


Note: Normalised difference in percentage points between the highest contribution submitted by panel banks and the corresponding Euribor rate. The chart shows the maximum difference across the 8 Euribor tenors. Sources: European Money Markets Institute, ESMA.

R.38

Euribor – Dispersion of submission levels

Stable in 4Q16

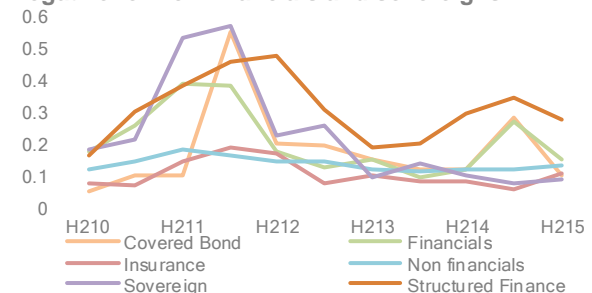


Note: Dispersion of 3M Euribor submissions, in %. The "Raw 3M Euribor" rate is calculated without trimming the top and bottom submissions of the panel for the 3M Euribor. Sources: European Money Markets Institute, ESMA.

R.39

Rating changes

Negative for non-financials and sovereigns



Note: Volatility of ratings by all credit rating agencies, excluding CERVED and ICAP, for corporates, financials, insurances, sovereigns and structured finance, computed as number of rating changes over number of outstanding ratings. Sources: CEREP, ESMA.

Vulnerabilities

Investor protection

Monitoring retail markets via complaints data

Contact: alexander.harris@esma.europa.eu

Complaints data are vital to NCAs in helping prioritise their supervision work and informing their policy and strategy. ESMA collects and analyses data and reports on trends in the retail market for financial products, as part of its remit to play a leading role in promoting transparency, simplicity and fairness in the market for consumer financial products and services across the Internal Market. An important tool ESMA has developed for this purpose is a regular survey of NCAs on complaints registered in their countries. Recent data indicate a renewal in the level of complaints relating to debt securities. In contrast, complaints relating to investment advice, in contrast, have decreased. Additionally, complaints collected via firms highlight that fees and charges are increasingly causing concern to retail investors, which is likely linked to the greater prominence of very low yields in the current market environment.

Introduction

If a consumer is dissatisfied with a financial product or service, he or she may make a formal complaint to the firm that provided it. The process the consumer needs to follow in order to lodge the complaint will differ from firm to firm and will depend in part on industry standards as well as national regulations. Third party institutions, such as National Competent Authorities (NCAs) and national Ombudsmen, may also be involved in the process. Typically, the consumer may make the complaint either orally or in writing. By pursuing a formal complaint, consumers can bring about corrective actions and promote better practice in the future.

ESMA gathers aggregate data on customer complaints relating to the provision of financial instruments, identifies trends, and analyses likely drivers for these trends. Together with other sources of information, such as market intelligence, it is possible to form a picture of the events that have given rise to trends in the data, and in turn to identify potential investor protection issues occurring across different EU Member States. If a widespread issue is identified, ESMA can facilitate the sharing of information and evidence among those Member States affected, as well as coordinating supervisory or policy actions (such as clarifying the application of relevant requirements). In this way, collecting complaints data provides a tool for ESMA in fulfilling its remit to promote fairness, simplicity and transparency for consumers in the market.

This article first describes ESMA's work in building and maintaining a dataset on retail investors' complaints. It then sets out a number

of factors relevant to interpreting the data from the perspective of protecting investors. The final section of the article provides an analysis of some key trends in the recent data.

ESMA's approach to managing complaints data

Over the last few years, ESMA has worked closely with NCAs to collate data on complaints on a consistent, regular basis. NCAs report the number of complaints made to firms, the number filed directly with the NCA and (where applicable) the number made to the national Ombudsman. Each of these totals is then subdivided along three dimensions: first, by cause (e.g. quality of information received by the customer); second, by type of firm (e.g. non-bank investment firm); and third, by type of financial instrument (e.g. equities). This breakdown along different dimensions, in addition to yielding insight into relevant trends, helps to identify and reconcile any potential errors or discrepancies in the data.

A key issue in handling these data is the heterogeneity in how responsibilities are allocated between firms and authorities within Member States, and what processes are in place for handling complaints. One common feature is that consumers can generally make complaints directly to firms wherever they are located. In general, however, the role played in the complaints process by the NCA, firms and (if applicable) the Ombudsman differs from country

to country.¹² The vast majority of NCAs have the facility to register complaints directly from consumers. In addition, in most Member States, consumers have the option of filing a complaint with a national Ombudsman or an alternative resolution body, though only a minority of NCAs have access to data on these complaints. The order in which different institutions become involved in handling a complaint varies. In around half of the countries, consumers must file a complaint with the firm or NCA before going to the Ombudsman.

The complexity and diversity of institutional arrangements clearly poses some challenges in analysing the data. One issue is double counting; care is taken – on a case-by-case basis – to ensure that complaints passing through more than one institution are not recorded more than once. Another consideration is data coverage where NCAs cannot obtain data from one source, e.g. Ombudsman data, and whether this is likely to lead to significant bias. Finally, data coverage and quality may be affected by firms' record-keeping.¹³

Factors to consider in interpreting the data

As with any data, it is important to proceed with caution when drawing inferences from complaints records. At the level of individual complaints, it may be possible to gain some detailed insight into the particular underlying circumstances. For example, textual analysis of particular records may yield insight as to the exact nature and severity of the event that triggered the complaint. At the aggregate level, however, data cannot capture these nuances. As a result, it may not be straightforward to determine to what extent a trend in complaints data indicates an investor protection concern. While a complaint indicates a client's dissatisfaction, it does not necessarily indicate wrongdoing by firms. If settlement between firms and clients is not reached, independent bodies (such as Ombudsmen and courts) will be able to intervene to solve individual disagreements.

In some cases, customers may complain about provision of a product for a good reason that is not directly related to investor protection, e.g. if a customer receives a terse reply to an enquiry. In other cases, an increase in complaints may not indicate a current risk to investors. For example, a court case might set a precedent for investors to win compensation for historic cases of mis-selling by lodging complaints.

Trends in aggregate complaints data, then, may not always be simply attributable to investor protection issues. Rather, a number of factors can determine an individual's propensity to complain, i.e. their inherent tendency to complain if they experience dissatisfaction.¹⁴ When interpreting the data it is therefore important to bear in mind a range of such factors, including the following.

Constraints in reporting

One inevitable drawback of using complaints data for the purpose of monitoring is the time lag in receiving the data. It can take time for customers to become aware of problems and then to decide to complain. In addition, the process through which complaints are filed and reported to NCAs (sometimes via firms) and then to ESMA can be lengthy, with the frequency of such reporting varying by country. As a result, complaints are a lagging indicator of their underlying causes.

Personal incentives for making a complaint

Making a formal complaint is costly to the individual concerned. These costs are primarily the time taken and effort expended during the process of lodging the complaint, but the individual may also bear some monetary costs from communicating via phone or mail. Despite these costs, consumers often – though by no means always – register their displeasure.¹⁵

Across sectors, consumers are motivated to take the time and effort to complain for various reasons. Economic, sociological and psychological theory may provide clues as to what motivates a particular individual to make a

¹² Indeed, in a few countries the NCA is unable to obtain the data on the complaints made directly to firms.

¹³ ESMA's founding regulation (EU Regulation No 1095/2010) requires NCAs and firms to follow certain guidelines for handling and reporting complaints. See also the Joint Committee Final Report on complaints handling, published 13 June 2014.

¹⁴ This definition is based on Kowalski (1996).

¹⁵ Complaint rates tend to differ according to the type of underlying problem. Surveys by Technical Assistance

Research Programs (TARP) in 20 countries and across industries indicate that consumers complain in over half of cases where a problem leads to monetary loss, whereas only a minority of service quality problems elicit a formal complaint. For example, TARP found that among a sample of consumers unhappy about their airline meal, none complained to company headquarters or to a consumer affairs department. See Goodman (1999).

complaint, depending on the situation. A person may be driven to complain because they seek corrective actions or financial redress for having received poor service. However, even in the absence of financial compensation they may wish to complain as a way to promote better practice in future, or simply to achieve some justice, mindful of the effect that a complaint may have on a firm's reputation.¹⁶ Finally, in a minority of cases complaints may be vexatious. Such complaints, if recorded, are likely to be too few in number to drive trends, however.

Cultural factors can also affect a person's propensity to complain, as individuals seek to conform to social norms and follow prevalent local practices.¹⁷

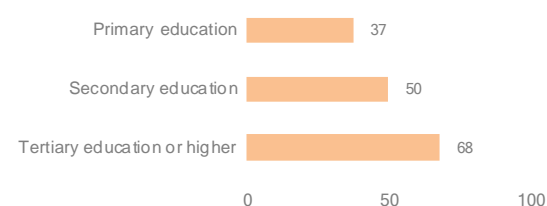
Incorporating the personal motivations listed above into an interpretation of trends in aggregate complaints data is simplified on the basis that these motivating factors are likely to be fairly constant over the short or medium term.¹⁸ While they may well affect any geographical analysis – as will the aforementioned heterogeneity in institutions and processes across Member States – they are less of a concern in explaining shifts and trends in the Europe-wide data.

In marked contrast, however, cost factors may well change in the space of a few years. For example, if the cost (in terms of time and effort) of filing a complaint is materially reduced by the provision of online forms, then complaint numbers may be expected to increase. Likewise, if it becomes cheaper and easier for consumers to gain exposure to more financial instruments, a higher volume and range of retail transactions may increase the number of complaints in absolute terms.

Some demographic factors may mean that issues with certain products are more likely to be reflected in the data than others. To take a baseline example, 55% of respondents to the European Commission's 2015 Consumer Markets Monitoring Survey who had experienced a problem with an investment product said they had complained to the retailer or provider. This figure was true of both men and women, i.e. gender was not predictive of propensity to

complain.¹⁹ However, from the same survey results it appears that education level, in contrast, is a demographic factor associated with the propensity to complain (V.1). This pattern is relevant in interpreting headline figures from the ESMA complaints database, since it suggests that types of problem disproportionately affecting consumers with lower education levels will tend to be picked up less in the data.

V.1
Propensity to complain among European retail investors
Education level associated with propensity to complain



Note: Consumers of investment products who complain to a retailer/provider, as % of all those experiencing a problem, for a given level of education. 'Primary' = ISCED levels 0-2. 'Secondary' = ISCED levels 3-4. 'Tertiary or higher' = ISCED levels 5-8.
Sources: European Commission Consumer Markets Monitoring Survey 2015, ESMA.

Market conditions

Market trends and conditions are of particular interest in this context, as they can highlight the crystallising of major risks borne by investors of which they may not have been fully aware. For example, complaints may be associated with the poor performance of an investment product, which in turn could be due to market performance. Drawing on other sources of monitoring, such as insight of market participants and retail consumer representative bodies, as well as direct monitoring of financial markets and the macroeconomy, helps attribute trends in complaints data to changes in macroeconomic conditions.

Firm- or sector-specific events

In addition to thinking about macroeconomic factors, another key possibility to take into account in explaining trends in the data is that a particular event has affected a firm or a group of firms within part of the financial sector. These events may in turn be linked to conditions in the

¹⁶ In a few social situations another motivation for complaining may be to signal having certain attributes. For instance, a customer in a restaurant may send back food to try to appear sophisticated, as suggested in Varma (2015). In the case of complaining to financial sector firms, however, the setting is private rather than public.

¹⁷ See e.g. North (2000).

¹⁸ Two surveys of Danish consumers posing the same six hypothetical situations in 1978 and 1992 suggest there was no change in the propensity to complain in the population over that period. See Juhl et al (2006).

¹⁹ The figures for men and women were 55.4% and 55.1% respectively. The sample size was around 500 per country except for LU, MT, CY and IS, where it was 250.

markets or wider economy. For instance, the collapse of a financial institution following a rapid downward correction in asset prices may lead to complaints from investors who were unaware of the credit risk they were bearing.

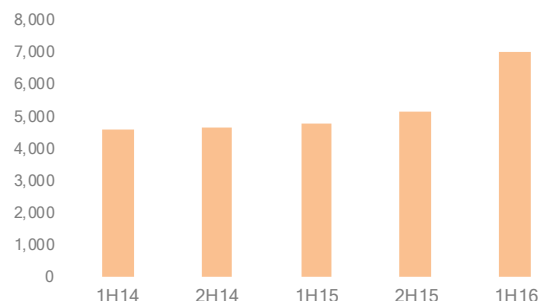
Implications for conducting data analysis

In summary, although we cannot know whether the severity of the incidents driving complaints is constant, and we cannot know to what extent complaints data provides full coverage (as not everyone may report), interpreting the data requires some justification for whether the propensity to complain is likely to remain roughly constant, or whether it would be expected to change (and if so, how). Additionally, when assessing market trends in terms of ESMA’s objectives, it is important to bear in mind that what people complain about may not entirely coincide with, say, phenomena that put investors at risk. This is another reason why it is vital to consider trends in the data in the round alongside other forms of market intelligence.

Trends in EU complaints

The analysis in this section focuses on complaints that consumers raise directly with NCAs, as this allows for good coverage across many NCAs, without risking double counting. The data is presented in percentage terms for clarity, though one point of note is that in 1H16 there was a jump in total volumes of complaints reported directly to NCAs, which had seen only a very gradual increase over the previous two years (V.2). The total number of complaints reported on this basis across the EU was 7,026 in 1H16.

V.2
Total complaints consumers report directly to NCAs
Recent jump in absolute numbers

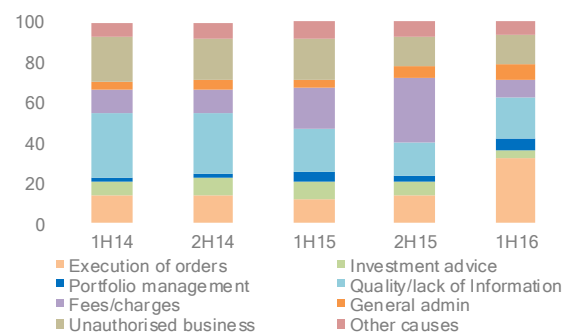


Note: Total complaints reported directly to NCAs. Data collected by NCAs. Source: ESMA complaints database.

In 1H16 there was a sharp increase in the percentage of complaints attributable to problems with the execution of orders (V.3). The share of

complaints with this cause more than doubled from a roughly constant share over 2014 and 2015 (14% in 2H15) to 31% in 1H16. This was largely attributable to events in a single NCA, where resolution measures involving several banks have led to an increase in the overall volume of complaints. The reason that the “execution of orders” category is strongly affected is connected with the specificities of the NCA’s data-gathering procedure, which in turn reflects certain features of the domestic market. In the domestic market, many intermediaries provide advice alongside execution services. The NCA includes a wide range of distribution channels, including execution only, in a single data category. Bank resolutions can therefore have a sizeable impact on complaints in that category, while they would typically have less impact on the “investment advice” category than might otherwise be expected.

V.3
Complaints reported directly to NCAs
Jump in issues with execution of orders



Note: Complaints reported directly to NCAs by financial instrument, % of total. Data collected by NCAs. Source: ESMA complaints database.

Another noticeable feature of V.3 is an apparent drop in complaints attributable to fees and charges between 2H15 and 1H16. This effect is in fact partly due to a change in the way in which one NCA collects complaints data, resulting in more complaints being reported via firms compared to being lodged directly with the NCA. Further analysis of the underlying data indicates that the share of fees and charges is roughly constant. This illustrates the importance of paying attention to particular institutional arrangements when collecting the data discussed in the previous section of this article.

The three most common causes among complaints reported directly to NCAs in 1H16 were execution of orders (31%), quality/lack of information (19%) and unauthorised business (15%) (V.4).

V.4

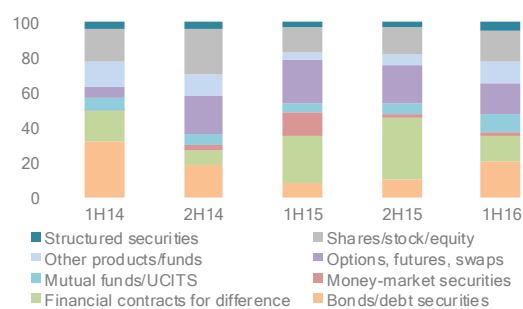
Complaints reported directly to NCAs: top 3 causes

Cause	Percentage of total
Execution of orders	31%
Quality/lack of information	19%
Unauthorised business	15%

Source: ESMA complaints database.

Turning to complaints categorised by the financial instrument cited (V.5, V.6), the leading types of instrument generating complaints in 1H16 were bonds and other debt securities (20%), shares, stock and equity (17%), options, futures and swaps (17%) and financial contracts for difference, or CFDs (15%). One clear trend was an increase in the proportion of complaints relating to bonds and other debt securities, to become the most complained-about instrument. One reason for the increase is that resolution measures towards a single bank have been taken by a central bank in a Member State (separate to the bank resolutions driving the trend around execution of orders in V.3).²⁰ The level of complaints for bonds and other debt securities was on a scale not seen since 1H14 when retail investors in a few Member States had problems with preference shares relating to a particular institution, which are included in this category. There is evidence that some recent complaints about debt securities relate to issues arising several years ago in connection with investors' exposure to sovereign bonds.

V.5

Complaints reported directly to NCAs**Renewed focus on bonds and debt securities**

Note: Complaints reported by financial instrument, % of total. Data collected by NCAs. Source: ESMA complaints database.

V.6

Complaints reported directly to NCAs: top 3 types of financial instrument

Financial instrument type	Percentage of total
Bonds / debt securities	20%
Shares / stock / equity	17%
Options, futures and swaps	17%

Source: ESMA complaints database.

The recent apparent drop in complaints relating to CFDs is partly due to the change in the basis of data collection mentioned above. Nonetheless, there was also some underlying decrease in these complaints in 1H16, following a large increase in reported complaints from 9% to 36% from 2H14 to 2H15.²¹ This trend relates to a known issue relating to CFD providers. One point to note is that some of the complaints involved are currently subject to review by a national Ombudsman, and so the figures may subsequently be revised down. Nonetheless, the complaints data were highly useful in drawing attention to underlying issues, and those NCAs most affected have been coordinating actions with ESMA in a dedicated workstream.²² Finally, complaints relating to investment advice have fallen to their lowest level since the start of the time series, possibly reflecting measures taken

²⁰ Related to this topic, on 2 June 2016 ESMA published a statement on MiFID practices for firms selling financial instruments subject to the BRRD resolution regime, available online from the ESMA website at https://www.esma.europa.eu/sites/default/files/library/2016-902_statement_brrd.pdf

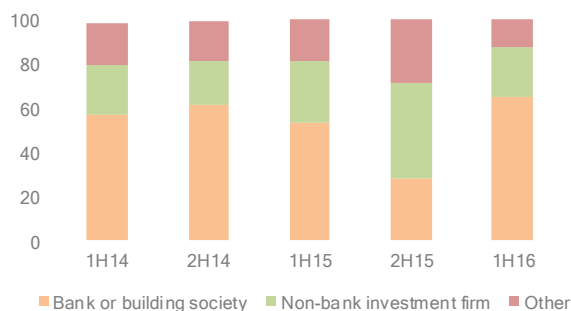
²¹ On 25 July 2016 ESMA published a warning about CFDs, binary options and other speculative products, available online from the ESMA website at https://www.esma.europa.eu/sites/default/files/library/20161166_warning_on_cfds_binary_options_and_other_speculative_products.pdf

161166_warning_on_cfds_binary_options_and_other_speculative_products.pdf

²² One output of this work has been a Q&A on CFDs and other speculative retail products, available online from the ESMA website at <https://www.esma.europa.eu/press-news/esma-news/esma-publishes-updated-qa-cfds-and-other-speculative-products-1>

by NCAs and ESMA to improve outcomes for consumers.²³

V.7
Complaints reported directly to NCAs
Breakdown by firm type

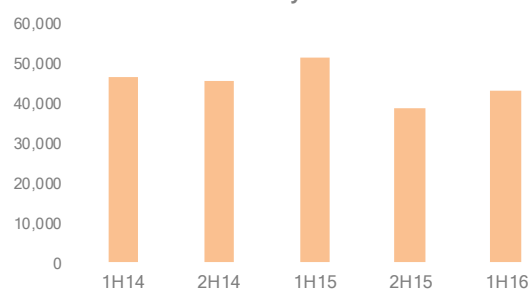


Note: Complaints reported via firms by type of firm, % of total. Data collected by NCAs.
Source: ESMA complaints database.

The final way available to split the data on complaints directly reported to NCAs by investors is in terms of the type of firm involved (V.7). In 1H16 around 64% of complaints to NCAs related to a bank or building society, which is in line with the average from 1H14 to 1H15. Around 23% of complaints referred to non-bank investment firms, a significant drop from a share of 43% in 2H15, though similar in level to previous quarters. This pattern – a return in the share of complaints about non-bank investment firms to its medium-term average following a spike in 2H15 – is again attributable to the fact that one NCA, which has seen a large number of recorded complaints regarding CFDs since early 2015, has changed the basis on which it collects complaints.

The total number of complaints that NCAs collect via firms remains several times higher than the volume of complaints that consumers file directly with NCAs themselves (V.8). The reason for the marked difference is that one NCA reports its complaints data solely via firms and is responsible for a large majority of the data (around 88% of complaints via firms in 1H16). This reflects the fact that it supervises over 50,000 firms, more than any other NCA. Consequently, while data collected via firms give insight into a larger number of complaints, they do not give the same overview of patterns of complaints across the EU as data on complaints reported directly to NCAs.

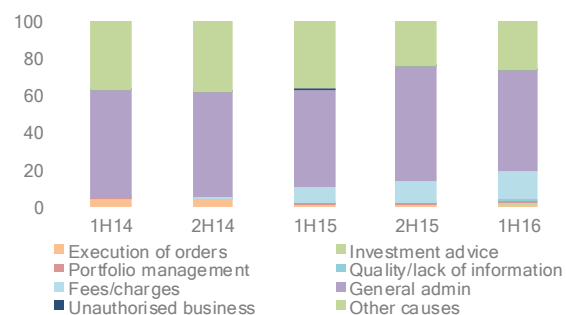
V.8
Total complaints collected via firms
Volumes in line with recent years



Note: Total complaints collected via firms. Data collected by NCAs.
Source: ESMA complaints database.

In the case of complaints reported via firms, the breakdown in terms of causes (V.9) provides a clearer picture than that into financial instruments, as many of the instruments involved straddle categories and are therefore simply classed as 'other' instruments.

V.9
Complaints NCAs collect via firms
General admin issues remain the primary cause



Note: Complaints reported via firms by cause, % of total. Data collected by NCAs.
Source: ESMA complaints database.

As shown in V.9, 1H16 saw 56% of complaints caused by general administrative issues, broadly in line with the average for the previous two years, while 15% of complaints concerned fees and charges, rising from an average of less than 1% in 2014. The heavy skew in the sample towards a single NCA notwithstanding, this trend indicates that fees and charges are increasingly causing retail investors to complain. One reason for this may be that in the current environment of historically low yields, fees and charges have risen in prominence as they tend to make up a larger proportion of overall returns.²⁴

²³ For example, on 21 August 2012 ESMA published its Guidelines on certain aspects of the MiFID suitability requirement, available online at https://www.esma.europa.eu/sites/default/files/library/2015/11/2012-387_en.pdf. Another example is ESMA's Opinion on MiFID practices for firms selling complex products, published on 7 February 2014 and available

online at https://www.esma.europa.eu/sites/default/files/library/2015/11/ipisc_complex_products_-_opinion_20140105.pdf

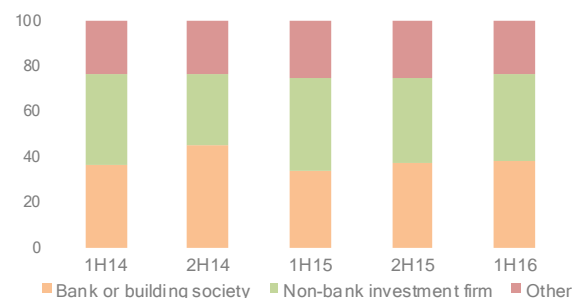
²⁴ Both MiFIR and PRIIPs will introduce new obligations for firms in respect of communicating information on fees and charges to investors.

Turning to the type of firm involved in complaints reported via firms (V.10), in 1H16 there was an even split between complaints about banks and building societies (38%) and those concerning non-bank investment firms (39%). These shares are broadly in line with those since 1H2014.

V.10

Complaints NCAs collect via firms

Stable split between bank and non-bank firms



Note: Complaints data reported via firms by type of firm, % of total. Data collected by NCAs.

Source: ESMA complaints database.

Conclusions

Complaints data provide an important tool for ESMA and NCAs to analyse trends in retail markets, which can identify high-priority issues affecting different Member States. In these cases, ESMA can facilitate information-sharing and coordinate a regulatory response as appropriate to address underlying issues. In particular, complaints records are a major source of information for supervisors in prioritising their work, as well as forming evidence relevant to NCAs' policy and strategy. Discerning the reasons for complaints often requires careful attention to the diversity of institutional arrangements across Member States, and any interpretation should reflect known time lags in reporting. A careful analysis of trends should bear in mind the underlying motivations consumers have for making complaints. For example, when considering overall volumes of complaints at a broad level, the potential for technology to make it easier to file a complaint may be a relevant factor.

Complaints data are especially valuable when analysed together with other sources of market intelligence. ESMA works closely with NCAs to gain insight into the issues facing European retail investors and how those issues have evolved over time. In 1H2016, looking at complaints reported directly to NCAs – which give the best picture of EU-wide trends – one notable issue is a renewal in the level of complaints relating to debt securities. Complaints relating to investment advice, in contrast, have fallen markedly over recent years, which may be associated with measures taken by NCAs and ESMA. Additionally, complaints collected via firms highlight that fees and charges are increasingly causing concern to retail investors, which is likely to be linked to their increased prominence in the current market environment of very low yields.

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Orderly markets

EU sovereign bond market liquidity

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Over the last few years, market analysts have pointed out an overall reduction of liquidity in fixed income markets as well as changes in the role of banks as market makers and in their ability to facilitate liquidity, with a focus on the effects of new regulation. In the last TRV (No. 2, 2016) we offered evidence on recent developments in corporate bond markets. The present article provides a broad overview on different dimensions of liquidity in EU government bond markets, covering the period from July 2006 to December 2016. Our findings show that, having deteriorated during the financial and sovereign debt crisis, liquidity has since increased in government bond markets, potentially also due to the effects of supportive monetary policy in recent years.

Introduction

Episodes of short-term volatility and liquidity stress across several markets² over the past few years have increased concerns about the worsening of secondary market liquidity, in particular in the fixed income segment. Market analysts continue to point at an overall reduction in liquidity, at changes in the role of banks as market makers and at their willingness and ability to facilitate liquidity.³

The sovereign bond crisis, rating downgrades across EU countries and related increases in the cost of debt, the subsequent contagion transfer from the sovereign to the banking system and the role played by sovereign securities in the collateral determination have spawned a significant amount of research on the sovereign bond segment.⁴ The measurement of sovereign bond market liquidity is of fundamental importance for market participants (for instance when hedging positions, correctly pricing other securities, etc.) and policy makers alike. Market liquidity plays a central role in the decision making process when issuing new debt, in the

transmission of monetary policy and, more generally, in ensuring the orderly functioning of financial markets and financial stability.

Like a preceding article published in the TRV No. 2, 2016⁵ on corporate bond market liquidity, the main aim of this analysis is to delineate a comprehensive picture of market liquidity developments in the EU government bond segment. This work – using data from the MTS database⁶ – focuses on the time period from 2006 to 2016.⁷

The article provides a broad overview of market liquidity across several EU sovereign bond markets, reporting on different dimensions of market liquidity (tightness, breadth, depth and resilience)⁸ through several market liquidity proxies and a composite liquidity index. It is organised as follows: brief overview of the EU sovereign debt market; description of the MTS platform and dataset; development of liquidity metrics and conclusions.

¹ This article was authored by Tania De Renzis, Claudia Guagliano, Giuseppe Loiacono and William Paris.

² See “EU corporate bond market liquidity – recent evidence”, TRV No.2 2016, ESMA. The article does not suggest a systematic drop in market liquidity in the analysed period (2014-2016). When wider market conditions deteriorate, however, episodes of decreasing market liquidity are observed.

³ ESMA, “Primary dealer funding constraints and sovereign bond liquidity”, TRV No.2, 2015.

⁴ Among others see: Pelizzon *et al.*, 2013; Bai *et al.*, 2012; Coluzzi *et al.*, 2008.

⁵ “EU corporate bond market –recent evidence”, TRV No.2 2016, ESMA.

⁶ MTS is one of Europe’s largest electronic fixed income trading markets, with over 500 unique counterparties and average daily volumes exceeding EUR 100bn. MTS, “Discover MTS Markets”, MTS Corporate Brochure 2013.

⁷ The long time series refers to a period covering both normal and more turbulent times and characterised by structural market changes, related to both technological as well as policy developments. This allow us to be able to capture various market dynamics related to both short-term and more structural forces.

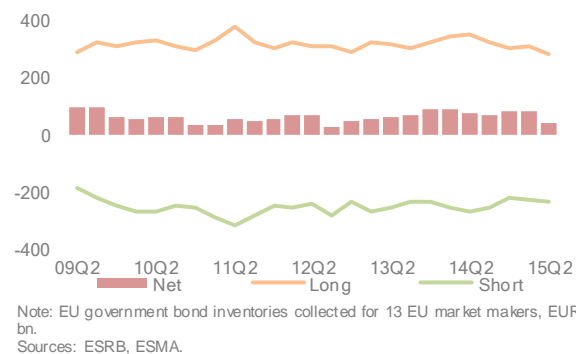
⁸ The definition of market liquidity across different dimensions is widespread in academic literature. A comprehensive overview of liquidity proxies is given in “Measuring liquidity in financial markets”, IMF, 2002.

Overall, our findings show that liquidity has been relatively ample in the sovereign segment, potentially also due to the effects of supportive economic policies over more recent years.⁹ This differs from our findings in the corporate bond market, where in latter years we observed episodes of decreasing market liquidity when market conditions deteriorated.¹⁰

The EU sovereign bond market

In terms of the liquidity debate, it is important to distinguish between primary and secondary EU sovereign bond markets. The primary market is the market related to new debt issuance: It is influenced by the financing needs and policies of the different EU Member States carried out by the respective national debt management agencies. The secondary market for sovereign bonds concentrates mainly on wholesale interdealer platforms.

V.11
Market-maker government bond inventories
Broadly stable over the last two years



The debate around market liquidity has been focusing on issues related to reduced market makers' inventories, unbalanced supply and demand and the need to review trading strategies, with the tendency now to place a higher number of trades of smaller volume. This seems to be the case in the corporate bond market.¹¹ In the sovereign segment, however, developments are different (V.11). Focusing on net inventory positions, which reflect the level of risk that a market maker is willing or able to assume, following a decline during the crisis period, they have remained stable in recent years (data available until Q215) at around EUR 4bn.

⁹ This is in line with previous research and analysis. See, PWC, Global financial markets liquidity study, 2015.

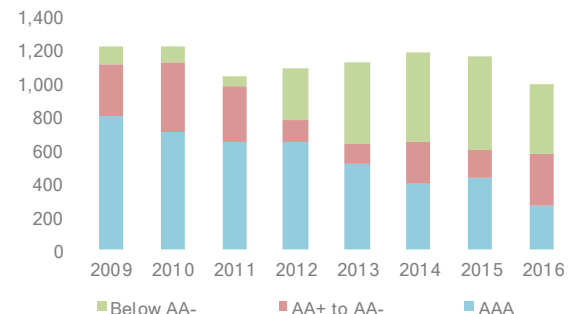
¹⁰ "EU corporate bond market liquidity – recent evidence", TRV No.2 2016, ESMA.

¹¹ ESMA, EU corporate bond market liquidity – recent evidence, TRV No. 2 2016.

¹² Data from Dealogic.

This compares to an outstanding amount of EUR 12tn¹² and Eurosystem holdings under the public sector purchase programme of about EUR 1.27tn¹³.

V.12
Rating distribution of sovereign bonds in the EU
Increase in lower-rated bonds



Note: Yearly sovereign bond issuance in the EU by rating, ratings at launch, EUR bn.
Sources: Dealogic, ESMA.

Total sovereign bond issuance in the EU and developments in rating quality also confirm this picture (V.12). Both issuance volumes and rating quality decreased significantly during crisis periods. In 2011 and 2012, at the peak of the EU sovereign crisis, issuance declined by 15% and 11% compared to 2009. This corresponds to a general growth in spreads and to a rebalancing of public finances across several EU members and may be related to heightened risk aversion, country specific risks as well as contagion risk. In more recent years, also following supportive economic policies and amid the sustained low interest rate environment, gross issuance has picked up again. However, the rating quality has been significantly lower compared to pre-crisis levels: While the share of gross issuance of below-AA-rated securities accounted 9% of the total in 2009, it topped 40% in 2016.

MTS: Broad overview

MTS is the largest wholesale interdealer platform for Euro-denominated sovereign debt securities. Introduced by the Italian Treasury in 1988 and then privatised in 1997, the MTS system was gradually expanded to other euro-denominated countries.¹⁴ Several domestic MTS markets were then formed, followed by the creation of the EuroMTS platform.¹⁵ This coincided with the definition of standards in terms of issuance

¹³ Updated data available from the ECB, Asset purchase programmes – Expanded asset purchase programme.

¹⁴ MTS Group also includes also MTS US, which operates on the US electronic fixed income market. See MTS, "Discover MTS Markets", MTS Corporate Brochure 2013.

¹⁵ Art 2.1, EuroMTS Market Rules, active from 4th April 2016.

policy, transparency and quotation requirements and the origination of the so-called *Liquidity Pact*.¹⁶ Within this framework, market makers are required to make double-sided quotes above a given minimum size, for a certain number of hours per day, within a maximum bid-offer spread according to bond maturity and liquidity.¹⁷

The main idea was to foster secondary market liquidity through a common platform where issuers and dealers could trade, committing to a few simple rules.¹⁸ It should be noted that while there are some common characteristics governing MTS trading platforms, regulatory responsibilities remain within national borders, implying differences across domestic markets.

Sample description

The article is based on MTS daily data for domestic and EuroMTS platforms and refers to daily price statistics of MTS markets for the cash market.¹⁹ Among other information these data include: trading date, ISIN, type of bond, description of each bond, market type (domestic and EuroMTS), actual transaction price for the last trade of the day, average daily bid-ask spread, total daily volume.

Our dataset covers daily data for sovereign bonds for ten EU members from January 2006 to December 2016.²⁰ The sample period allows us to capture liquidity developments across both stressed and more benign market conditions. The sample includes 2,680 sovereign bonds traded on the domestic MTS platform, of which 1,892 are also traded on EuroMTS. The number of bonds in the domestic market is usually higher than that of EuroMTS. As already mentioned above, while every bond can be quoted on the domestic platforms, this is not the case for EuroMTS, as certain conditions on minimum size need to be met. In our sample, in most cases, bonds are quoted on both platforms, with domestic MTS platforms including those securities quoted on EuroMTS (V.13).

This is in line with previous research, whose findings show that most dealers participate in both markets.²¹ The analysis and our liquidity

metrics therefore, consider both the domestic and the EuroMTS markets.

V.13

Bonds by country, number and volume

Differences across countries and market type

	Number of bonds		Traded volume	
	EuroMTS	Domestic	EuroMTS	Domestic
AT				
M < 1				
1<M<5	3			
5<M<10	10	10	8.6	48.1
10<M<30	22	22	11.0	80.4
BE				
M < 1		124		908.0
1<M<5	2	23	17.4	542.0
5<M<10	11	13	25.4	351.0
10<M<30	24	32	24.3	303.0
DE				
M < 1	203	217	2.0	72.2
1<M<5	57	58	19.3	73.3
5<M<10	41	48	14.5	84.8
10<M<30	35	53	17.0	104.0
ES				
M < 1	21	25	18.4	165.0
1<M<5	118	177	28.0	204.0
5<M<10	16	79	34.6	59.5
10<M<30	32	135	27.9	53.8
FI				
M < 1				
1<M<5	1	1	22.5	43.5
5<M<10	10	10	30.9	177.0
10<M<30	16	17	31.4	225.0
FR				
M < 1	482	510	19.3	193.0
1<M<5	81	91	23.6	146.0
5<M<10	29	31	39.1	200.0
10<M<30	48	68	23.1	171.0
IE				
M < 1	16	47	1.7	20.8
1<M<5	6	7	8.5	54.3
5<M<10	4	4	23.3	62.3
10<M<30	12	12	14.3	61.8
IT				
M < 1	173	225	57.2	1150.0
1<M<5	172	195	64.0	1210.0
5<M<10	57	68	72.0	945.0
10<M<30	49	58	60.2	788.0
NL				
M < 1	51	153	35.0	498.0
1<M<5	11	12	40.6	333.0
5<M<10	8	8	59.3	312.0
10<M<30	18	28	47.9	273.0
PT				
M < 1	20	69	26.5	291.0
1<M<5	11	24	46.6	300.0
5<M<10	5	5	36.3	254.0
10<M<30	17	21	41.7	301.0

Note: M = Maturity in years. Volumes, monthly average, in EUR mn.

Significant differences, however, can be observed across countries. In terms of market size, some markets are significantly larger than

¹⁶ Coluzzi *et al.*, 2008.

¹⁷ MTS Associated Markets Common Market Rules, May 2016.

¹⁸ For example, as documented by Coluzzi *et al.*, 2008, the assets required to be held by market makers in order to gain access to the respective domestic MTS platform may vary across countries.

¹⁹ The overall MTS Data is sourced directly from the MTS interdealer market and includes benchmark real-time data, reference data, reference prices and historical data.

²⁰ The countries considered are: AT, BE, DE, ES, FI, FR, IE, IT, NL, PT.

²¹ See Caporale and Girardi, 2011; Pelizzon *et al.*, 2013.

others: Looking at the EuroMTS, in our sample, volumes traded in IT are around 43% of the total volume traded in 2016 with only 15% in FR and an even smaller share if we consider other markets (e.g. 1.6% AT, 8.8% NL, 9.3% ES).²² Interesting is the case of DE whose share of volume traded is extremely low (only 7.8% on EuroMTS market and 1% on domestic MTS platform in 2016) especially considering the importance and the role of the German market as the EU benchmark market.²³

Notable variations are observed not only in terms of size but also maturity profiles. For some countries like BE, ES, IT, trading is concentrated in short maturities. For others, as shown in table V.13, we observe higher trading volumes in longer maturities (e.g., AT, FI). This is in line with developments in the EU sovereign bond market since the sovereign bond crisis. Market intelligence documents that more vulnerable countries, such as IT and ES, reacted to increased yields by issuing bonds at shorter maturities to reduce refinancing costs, with maturity at issuance being extended only more recently. On the other hand, less vulnerable economies have taken the opportunity to obtain long-term refinancing at historically low interest rates thus increasing the average maturity of their debt.²⁴

Against this background, heterogeneity stands out as a distinctive feature of the EU sovereign debt market: EU member countries are structurally different in terms of debt profiles, market size and therefore liquidity.

Market liquidity

Definition

A market can be considered liquid when trades can be executed at very low costs, in a timely manner and with large trades having only limited impact on market prices (Foucault *et al.*, 2013). It is widely recognised that liquidity is not a concept that can be directly observed or uniquely defined. Various definitions and, in turn, various metrics

exist capturing a specific liquidity dimension according to the focus of the analysis.

It is generally accepted that liquidity in financial markets is measured across five dimensions: tightness; immediacy; depth; breadth; and resilience.²⁵ Some of those features require order level data to measure liquidity more precisely, as in the case of immediacy, considered as the speed at which orders can be executed. For the others, however, liquidity proxies can be meaningfully developed that also rely on trade level data. Tightness identifies the possibility of executing transactions at a low cost. Depth, which refers to the existence of sufficient orders at prices above or below market price using order level data, can also be proxied meaningfully by looking at volumes of trades. Breadth can be defined as the ability to transact large volumes with a minimum impact on prices. Finally, resilience refers to the availability of liquidity, also in periods of higher volatility and market stress.

V.14

Measuring market liquidity

Liquidity dimensions	Liquidity metrics
Tightness	Bid-Ask spreads Roll
Depth and Breadth	Volumes traded Turnover ratio Average trade size Amihud illiquidity coefficient

Given data availability, this article focuses on analysing the dimensions which can be represented using trade level data (V.14). Moreover, a synthetic indicator, computed by applying the principal component methodology, is estimated using the input measures above.²⁶

Measures of liquidity

Reduced market liquidity was observed at the peak of the financial and of the EU sovereign bond crisis, while it was buoyant in more recent years as the beneficial effects of monetary policy measures unfolded. This is reflected in reduced trade execution costs in the EU countries considered in the analysis.

²² There are structural differences across markets: in IT the stock of debt is significantly higher than in other EU countries.

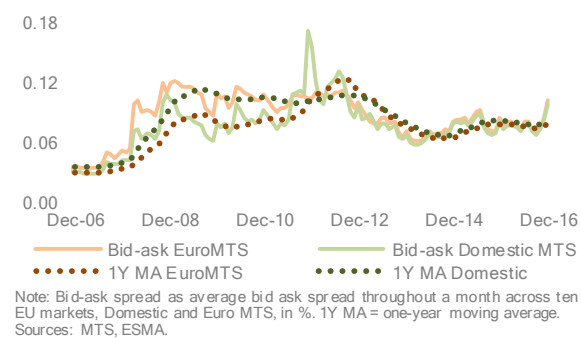
²³ See Cheung *et al.*, 2005, ECB Working Paper Series. The German market is comparatively liquid. The reasons behind low volumes on MTS are related to the fact that a significant amount of trading is carried out via EUREX, and to the existence of successful futures contracts on EUREX and LIFFE providing investors a low-cost, margin-based trading mechanism.

²⁴ Bonds with maturities exceeding 30 years were excluded from the sample. Therefore, the estimated average maturity in our sample could be lower than the actual life, especially considering that, in the last year, the maturity of new issuance increased considerably. In the first half of 2016, BE, ES and FR issued bonds at fifty-year maturity, taking advantage of the very low interest rates.

²⁵ Sarr and Lybek, 2002.

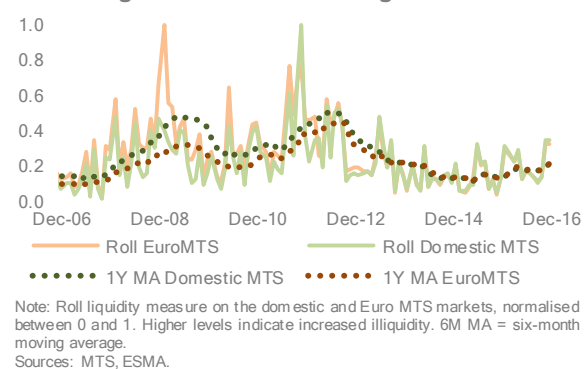
²⁶ Four measures are used to build the synthetic liquidity indicator: Bid-ask spreads; Amihud; Roll and turnover ratio.

V.15
Bid ask spreads on EU sovereign bonds
Decrease from end 2012, flat in recent times



Bid-ask spreads have decreased, in both domestic and Euro MTS markets since end-2012 (V.15). They have stabilised on average at around 8bp for both EuroMTS and domestic MTS, at a level higher than in pre-financial crisis times. Bid-ask spreads widened significantly in the very last month of the reporting period, driven by a broad increase across countries – also large markets – that seem to correspond to a reduction in volumes. We are monitoring this to better identify the underlying cause and future developments that might be of concern. It is worth noting that, in terms of size, bid-ask spreads for sovereigns are lower than those for corporate bonds – likely reflecting higher liquidity in the sovereign bond market.²⁷

V.16
Roll measure
Oscillating at low levels following the crises

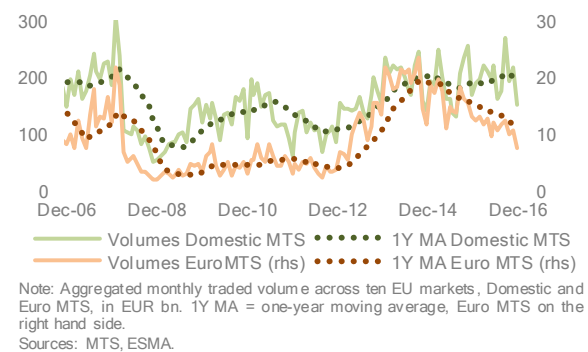


An alternative transaction-cost-based liquidity metric is the Roll measure, which is based on observed market prices or returns and calculated from the negative autocovariance of returns.²⁸ It assumes that with more negative return autocorrelation market illiquidity is higher. Chart

V.16 shows how periods of market stress between 2008 and 2012 correspond to higher market illiquidity.²⁹

Within these general trends, for both measures, there are significant differences across countries. Such heterogeneity reflects concerns around debt sustainability for peripheral countries against the safe-heavens role assumed by core countries during this period.

V.17
Volumes traded
Lower during crisis periods



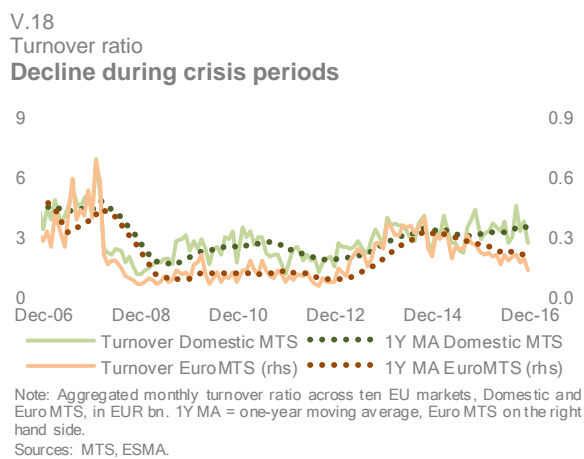
In terms of depth and breadth of the market the overall trend reflects previous findings: During the financial and sovereign crises, market liquidity decreased and then picked up in the last four years. The dynamics in both volumes traded and turnover show a decline in liquidity between 2008 and 2012, yet a subsequent improvement (V.17, V.18). Volumes are higher for domestic MTS, reflecting the MTS market structure: The size of the domestic MTS is bigger than the EuroMTS. It is interesting to note that between end-2012 and end-2014, the growth in volume traded, as well as in turnover, on the EuroMTS is significantly higher than on the domestic MTS. The trend reverses as from the second half of 2015. In 2014, there is a significant increase in trading activity in a few small and more sound economies, on the EuroMTS platform compared to the domestic MTS. Conversely, trading activity remains more limited for some large and more vulnerable markets that operate mainly on the domestic MTS platform. This trend is reversed in 2015. A steep decline was observed at the end of 2016, driven by a reduction in trading volumes in one large country.

²⁷ ESMA, EU corporate bond market liquidity – recent evidence, TRV No. 2, 2016; ESMA TRV No. 1 2017, Statistical Annex.

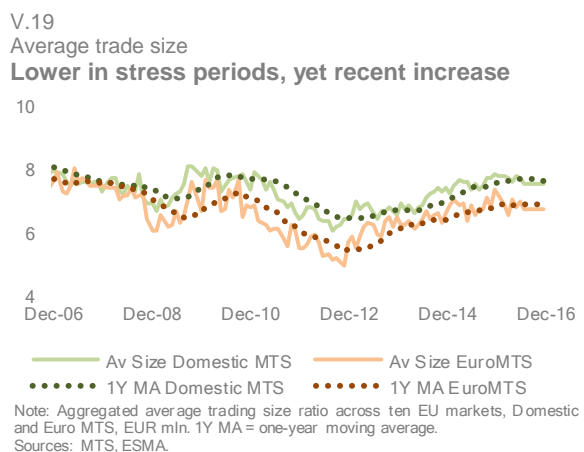
²⁸ Shestag *et al.*, 2016.

²⁹ The large spike in the EuroMTS relative to the domestic MTS platform might be linked to the structure of the

domestic and EuroMTS platforms. The volumes of trade in the domestic markets are higher than that of EuroMTS, as specific conditions need to be met to quote on the latter, which is inherently more liquid.



The turnover ratio again reflects substantial heterogeneity across markets. Moreover, during crisis periods, there is a significant drop in volumes in vulnerable countries, with especially very low secondary market liquidity in programme countries in particular an increase in trading in core economies as heightened risk aversion pushed investor towards safer strategies.



The above dynamics are also confirmed by the average trade size developments: Declines corresponding to the peaks of both the financial and sovereign bond crises are observed. This may reflect the reduction in volumes and increase in number of trades signalling reduced availability of market liquidity and the need for market agents to rely on smaller trades (V.19).

The indicators reported so far point at increased overall liquidity in the market, following the stress characterising the financial and sovereign crises. Similar conclusions can also be inferred by looking at price impact measures like the Amihud coefficient. Very high illiquidity was observed around September 2008, 2011 and 2012 characterised by heightened stress in peripheral

countries including IT (V.20). Since the end of 2012, however, markets seem calmer and liquidity ampler (V.20). The Amihud illiquidity coefficient points to a relative increase in stress at the end of 2016 in the domestic MTS platform and, as for volumes, this may be driven by one large country.

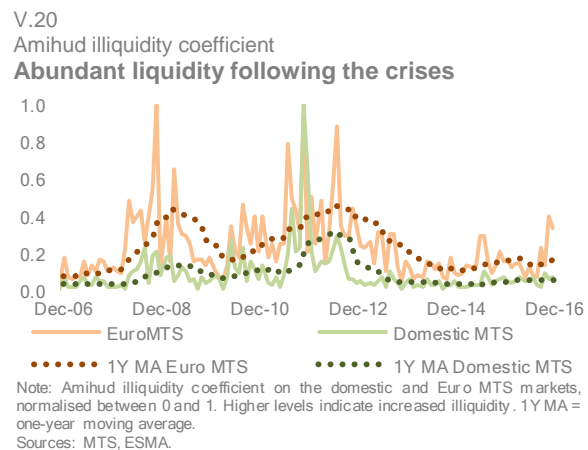
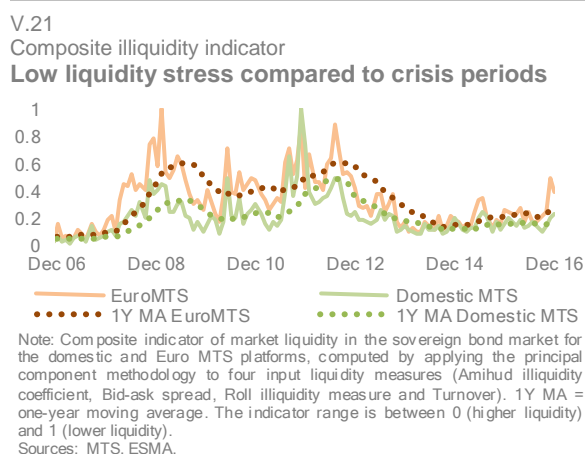


Chart V.21 shows lower liquidity in the EuroMTS relative to the domestic MTS platform except for the period corresponding to the peak of the sovereign bond crisis. This could be related to the fact that volumes on the domestic market are higher than those of EuroMTS, as specific conditions need to be met to quote on the latter. The sharp increase in liquidity stress on the domestic MTS platform in 2011 is believed to be related to the dynamics of the Italian market whose trades are concentrated on the domestic MTS platform. On the other hand, the dynamics within another large market, Germany, which is widely accepted as the benchmark for euro denominated government bonds, are not reflected in the developments affecting the domestic MTS platform as the volume traded on it is relatively low.³⁰

³⁰ Cheung *et al.*, 2005, document how the EUREX Bond trading platform is comparable to the MTS system.



Finally, our composite indicator, constructed by applying the principal component methodology, corroborates previous findings.

Conclusions

Since the financial crisis, several episodes of short-term volatility and liquidity stress have been observed in fixed income markets. Concerns related to sudden increases in liquidity risks linger, as market analysts continue to pinpoint at an overall reduction in liquidity also in relation to changes in the role of market makers and in their ability to facilitate liquidity.

Moreover, given the role played by government securities, including their used as benchmarks for pricing of other securities and as safe assets when overall risks increase, the measurement of sovereign bond market liquidity assumes a fundamental importance.

This article aims to complement previous studies by giving an overview of market liquidity conditions across several EU sovereign bond markets. It focuses on different liquidity dimensions, providing several liquidity proxies over a long period of time covering both stressed and more tranquil periods. The following metrics are considered: Bid-ask spread and Roll indicator (tightness); trading volume, average trading size, turnover ratio and Amihud illiquidity coefficient (depth and breadth). Moreover, a synthetic indicator is estimated using the input measures above.

Our findings confirm the negative effects of both the financial and sovereign crises on market liquidity. Both price-based and volume-based indicators signal increased liquidity stress at the time of the financial and sovereign debt crisis. Bid-ask and Roll rose during the crises as did the Amihud, while volume, turnover and average size declined. More recently, in a supportive economic policy environment, market liquidity seems to

have improved in the sovereign bond segment. This stands in contrast to the corporate bond sector, in which we have been observing phases of lower liquidity in more stressed periods. Indeed, all the proxies, measuring different dimensions of market liquidity point to ample overall liquidity.

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Financial stability

Haircuts in EU securities financing markets

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As one of the main sources of liquidity and high-quality collateral, securities financing markets are an essential component of the EU financial system. Securities financing transactions (SFTs), which include mainly repurchase agreements (repos) and securities lending, involve the temporary exchange of cash or securities against collateral. EU SFT markets are very large, with the value of collateral used in SFTs amounting to several trillions of euros. To cover for risks related to the characteristics of the collateral and counterparty creditworthiness, a discount known as a haircut is usually applied to the value of collateral. Haircuts are helpful risk management tools, but haircut levels are also part of the negotiation between counterparties trading bilaterally. Haircuts may thus change over time to reflect the evolution of market conditions, and can contribute to procyclicality and financial instability by reinforcing asset price movements. However, the data available on haircuts is sparse and little is known of current market practices. This article aims to shed some light on the level and the calculation methodology of the haircuts that are used in the EU by SFT market participants.

Introduction

Securities financing transactions include repurchase agreements (repos), buy-sell backs, securities lending and margin lending.² Although SFTs have similar economic effects, each market is organised differently, bringing together multiple actors to serve a variety of purposes such as short-term financing, sourcing collateral, covering short positions, avoiding settlement fails, and generating returns.

EU SFT markets are very large. Industry surveys put the gross amount of outstanding repos by European counterparties at around EUR 5.4tn, and the global amount of securities on loan at EUR 1.9tn.³ The latter includes around EUR 500bn in EU securities on loan.

All SFTs involve the use of collateral. If the collateral giver defaults, the trade counterparty retains the collateral to cover potential losses. However, the use of collateral is not exempt from risks: The value of collateral assets can fluctuate and potentially give rise to liquidation risk, or the

issuer of the securities used as collateral may default. To mitigate such risks, a discount percentage, known as a haircut, is usually applied to the market value of the collateral. SFT haircuts mainly reflect risks related to the characteristics of the collateral, but also to counterparty creditworthiness.

The role that SFT haircuts played in the global financial crisis has been extensively documented⁴ but remains somewhat controversial nonetheless, particularly in view of SFT data limitations in terms of availability and granularity.⁵ Addressing financial stability risks arising from the procyclicality⁶ of haircuts has become a priority for global regulatory policy, and may have broader implications for the EU regulatory framework. This article aims to inform future discussions by shedding light on current market practices for haircuts used in EU SFT markets.⁷

¹ This article was authored by Julien Mazzacurati (julien.mazzacurati@esma.europa.eu) and draws on the ESMA "Report on securities financing transactions and leverage". See ESMA (2016a).

² For the legal definitions of SFTs, see Regulation (EU) 2015/2635 of 25 November 2015 on the transparency of securities financing transactions and of re-use.

³ See ICMA (2016), and ISLA (2016).

⁴ See CGFS (2010), Gorton and Metrick (2012), and FSB (2013).

⁵ See Comotto (2012), Copeland et al. (2014), and ESMA (2016a) p.17.

⁶ The definition of procyclicality in this article follows CPSS-IOSCO (2012), "changes in risk management requirements or practices that are positively correlated with business or credit cycle fluctuations and that may cause or exacerbate financial instability".

⁷ The meaning of haircuts in centrally-cleared transactions differs somewhat and is not addressed in this article. For more information, see ESMA (2016a) p.13.

Policy background

The EU Regulation on Transparency of Securities Financing Transactions and of Reuse (SFTR) is part of a globally coordinated effort initiated by the Financial Stability Board (FSB) to reduce financial stability risks arising from shadow banking activities, including SFTs. The key component of SFTR is a transaction reporting requirement by SFT counterparties.⁸

In addition to setting out the global standards for SFT data collection that inspired some of the reporting requirements under SFTR, the FSB published a regulatory framework for haircuts on non-centrally cleared SFTs.⁹ This framework includes several recommendations intended to limit the build-up of leverage outside the banking system and to reduce procyclicality, based on two pillars:

- qualitative standards for methodologies used by market participants to calculate haircuts;
- numerical haircut floors on non-centrally cleared SFTs, in which financing against collateral other than government debt securities is provided to non-banks.¹⁰

To illustrate the potential implications for the EU, the next two sections describe the collateral landscape in SFT markets and the methodology and level of haircuts used by market participants.

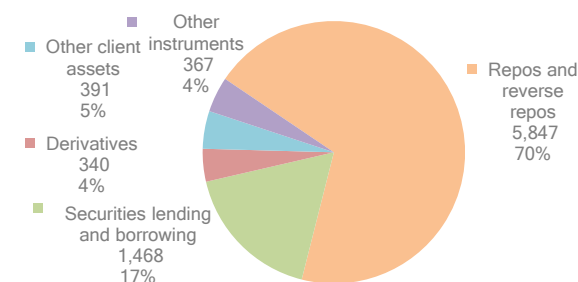
Collateral and SFTs in the EU

The broad shift away from unsecured funding since 2008, together with regulatory changes introduced since the crisis, has resulted in the growing importance of collateral for the global financial system. European SFT markets are very large, measured both by notional outstanding or turnover.¹¹ In the largest EU banks, SFTs are the main choice of instrument in terms of collateral flows, with the collateral posted in repos and received from reverse repos amounting to around EUR 6tn.¹² Collateral related to securities lending and borrowing arrangements amounts to close to EUR 1.5tn. This compares to a total amount of

collateral posted in and received from e.g. derivatives of EUR 340bn (V.22).

V.22

Collateral posted and received by instrument
SFTs are the main instrument for collateral flows



Note: Sum of collateral received and posted by the 38 largest EU banks, by instrument, in EUR bn and %. Buy/sell-backs and sell/buy-backs are included in "Other instruments". Data as of February 2013. Sources: ESRB, ESMA.

However, there are substantial differences in the structure of SFT markets, the sector of market participants, and the collateral used, all of which have relevant implications for SFT haircuts. These specificities are spelled out below for repo and securities lending markets, which are usually considered the main types of SFTs and on which relatively more information is available.

Collateral in repo markets

In a repo, cash is exchanged against collateral in the form of securities. According to an industry survey, around 90% of European repo transactions are collateralised with fixed income securities, with the very large majority issued by sovereign, quasi sovereign or supranational entities.¹³ More than half of this fixed-income collateral originates from Germany, the UK, France and Italy.

Repos can be traded bilaterally, with or without CCPs, or through tri-party agents that are in charge of post-trading services (e.g. allocation of collateral across clients, settlement, etc.), that offer efficiency benefits and help reduce operational costs. Market participants may opt for one market segment or the other based on their specific needs and demands.¹⁴ While the bilateral repo market is essentially interdealer, tri-party

⁸ ESMA is currently working on drafting implementing and regulatory technical standards. For more information, see ESMA (2016b).

⁹ See FSB (2015).

¹⁰ Under SFTR Article 29(3), ESMA was tasked with preparing a report on SFTs, leverage and procyclicality, taking into consideration the FSB recommendations. For more information, see ESMA (2016a).

¹¹ For a more detailed overview of EU SFT markets, see ESMA (2016a) pp.42-48.

¹² Based on 2013 data, see ESRB (2014). Updated data on collateral used in SFTs will become available after SFTR reporting begins.

¹³ See ICMA (2016).

¹⁴ Among the factors considered are, for example, the purpose of the transaction (financing versus sourcing collateral), its characteristics (bespoke versus standardised), capital charges, the availability or liquidity of securities, and the ability to access each market.

repos bring together dealers and customers, including buy-side firms.¹⁵

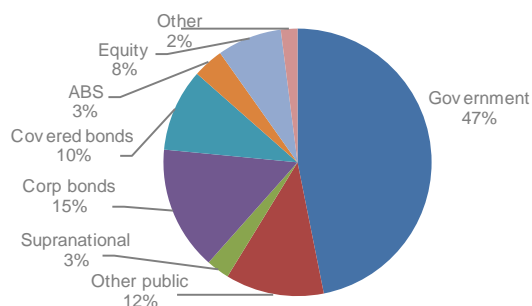
In recent years, CCP-based repos have gained prominence, reflecting EU banks increasing preference for conducting their secured money market transactions against so-called general collateral transactions and with limited counterparty risk.¹⁶ Whether centrally cleared or not, a very significant majority of bilateral repos relies on government bond collateral.

The tri-party repo market segment constitutes around 10% of EU repo markets and is typically used for financing purposes. It is highly concentrated, with five banks accounting for almost 75% of the EA repo market, according to ECB data. The collateral tends to be more diversified than in bilateral repos, although government debt still dominates: The debt issued by sovereigns, supnationals and other public entities accounts for around 60% of the total, while corporate bonds, equities, covered bonds and securitised assets make up a combined share of 35% (V.23). The quality of collateral remains high nonetheless, with more than 50% of all fixed-income securities rated AA or higher.

V.23

Collateral used in tri-party repos

Government bond collateral dominates



Note: Share of collateral used in tri-party repos by type of collateral, data as of December 2015. ABS includes RMBS, CMBS, CDOs, CLOs, etc. Sources: ICMA, ESMA

Collateral in securities lending markets

In contrast to repos, securities loans involve the lending of securities against either cash or non-cash collateral (i.e. other securities). When non-cash collateral is used, this is sometimes referred to as collateral transformation.¹⁷

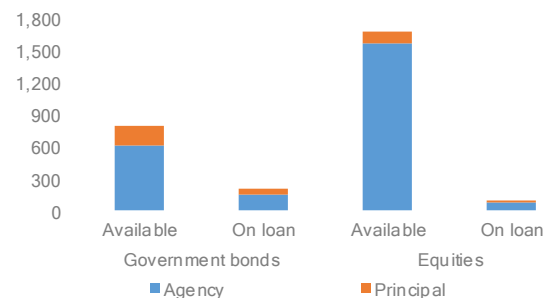
Most EU securities on loan are collateralised with non-cash, especially in the case of EU government bond loans (A.70), and to a lesser extent, equity loans. Market intelligence suggests that a sizeable share of EU securities lending markets involves bank to non-bank transactions, while the volume of non-bank to non-bank transactions is very limited.¹⁸ Data collected by ESMA on SFTs from annual reports show that the largest EU investment funds tend to trade only with banking sector counterparties, and high SFT counterparty concentration.

Securities lending arrangements may involve the use of tri-party agents, or third-party custodians, as in repo transactions. However, a specificity of this market is the heavy reliance on agent lenders (around 75% of EU government bond lending, and 90% of EU equity lending; V.24).

V.24

Principal versus agency securities lending

EU securities lent mainly through agents



Note: EU government bonds and equities available for lending and on loan, EUR bn. Data as of 11 July 2016. Sources: Markit Securities Finance, ESMA.

Agent lenders are usually large custodian banks and asset managers that lend securities on behalf of clients known as *beneficial owners*. They act as intermediaries and do not bear counterparty risk, although they can provide indemnifications to their clients for losses associated with the non-return of securities lent.¹⁹ When cash collateral is received, it is automatically reinvested. When non-cash collateral is received, agent lenders reportedly do not re-use it.²⁰

Agent lenders in Europe offer their services to both EU-based and non-EU based clients (e.g. from the Middle East and Asia). The majority of

¹⁵ See FSB (2012).

¹⁶ See ECB (2015).

¹⁷ For example, the FSB (2015) defines a “collateral upgrade” as borrowing securities as collateral against other securities that attract higher haircuts.

¹⁸ In the US, the very large majority of securities borrowers are broker-dealers or banks, while the majority of securities owners are pension funds, government

agencies, insurance companies and investment firms. See Baklanova et al. (2016).

¹⁹ See FSB (2016).

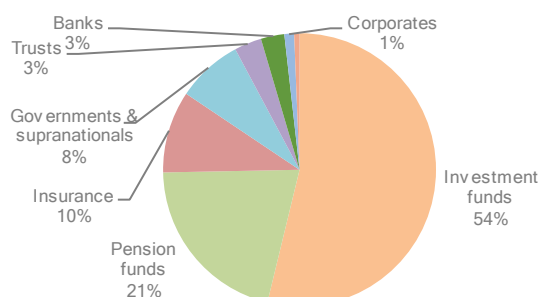
²⁰ See for example the RMA/ISLA/PASLA response to the FSB consultation on the Standards and Processes for Global Securities Financing Data Collection and Aggregation (p.6): <http://www.fsb.org/wp-content/uploads/RMA-ISLA-PASLA-on-1411DEG.pdf>

assets available for lending by agents is from non-EU clients (75%), and the share of non-cash collateral received against securities loans varies significantly based on the origin of the beneficial owners: around 40% for EU entities, more than 60% for non-EU entities.²¹ This may reflect their specific sector and business purposes, as well as the different regulatory requirements (e.g. on the use of collateral or on cash collateral reinvestment restrictions) that apply in each jurisdiction.

This particular set-up brings together a broad range of institutions, compared to other SFT types. For example, institutional investors and banks own the largest shares of EU government bonds made available for lending, with respectively EUR 275bn (44%) and EUR 124bn (20%) of the total lendable value. For EU equities, the largest share of securities available for lending is owned by investment funds, with EUR 719bn available (54% of the total) including EUR 206bn owned by UCITS, followed by pension funds and insurance companies (V.25).

V.25

EU equities available for lending by beneficial owner
Available assets owned mainly by buy-side firms



Note: Share of EU equities available for lending, by sector. Data as of 11 July 2016.

Sources: Markit Securities Finance, ESMA.

This description of the EU SFT market landscape illustrates two main points: first, the diversity of purposes, collateral assets and entities that are associated with each market; second, the instrumental role played by intermediaries such as CCPs, tri-party agents and agent lenders in facilitating transactions, at the potential cost of concentrating risks within a few entities. Both of these points hold valuable information for consideration in the implementation of any new regulatory requirement on haircuts.

Haircuts in EU SFT markets

Methodologies used by market participants²²

The methodologies used by market participants for calculating haircuts can be qualitative, quantitative or a combination of the two. Quantitative methodologies tend to be used more frequently in repo markets, possibly reflecting the relative importance of banking counterparties. Quantitative methodologies sometimes involve back-testing or regular stress-testing using different scenarios. However, the factors and complexity of haircut methodologies vary greatly from one entity to another. A single firm may also rely on quantitative methods for conventional transactions, but qualitative methods for other types of transactions (e.g. bespoke transactions, or trades with non-banking counterparties).

Haircuts are often, but not systematically, used as a pricing mechanism following internal discussions between the credit (or risk) department and trading desks. In securities lending markets, some entities rely on haircut grids pre-determined internally, from which traders can deviate up to a certain percentage, but the tolerance band for such deviations depends on the characteristics of the collateral and the entity's risk appetite.²³

Collateral and counterparty analysis are the two key components used to determine haircuts. Counterparty credit risk plays a role prior to the transaction, in deciding whether or not to trade, and during negotiation on the terms of the trade. Factors considered in the counterparty analysis include creditworthiness, exposures and concentration. Factors considered in the collateral analysis include historical volatility of the asset, residual maturity, market risk, wrong-way risk, currency mismatch, and asset class (for tri-party repos). Other minor factors may also influence haircuts, including for example the type of collateral ownership (title transfer versus collateral pledge).

Following the internal risk assessment, trading desks usually engage in negotiations with their counterparty, which often include haircuts. Haircuts are one of the price components, together with repo rates or securities lending fees, that traders may use to strike a deal.

²¹ See ESRB (2014), p.38.

²² The information in this sub-section is based on feedback directly collected from market participants and industry associations. For more information and the complete feedback, see ESMA (2016a) p.11 and pp.54-58.

²³ In securities lending markets, market participants usually refer to *margins* rather than haircuts, although both terms are conceptually identical in this context. To avoid confusion with *margins* in other contexts (e.g. CCPs), the latter is used throughout this article.

Similarly, haircuts are just one of the possible levers for risk managers.

Haircuts can also play a role in determining the volume of financing that counterparties are willing to borrow. They are sometimes used across different assets traded with a single counterparty (e.g. for bundled transactions, or at portfolio level), for example by agent lenders. In the tri-party repo market segment, haircuts are determined by the tri-party agents; thus there are no possible bilateral negotiations on haircuts between counterparties.

Haircut levels in EU repo markets

Tables V.26 and V.27 depict mean haircuts used in one-month reverse repos reported by European banks, where the banks provided financing and accepted collateral.²⁴ Haircuts are “counterparty-risk free”, i.e. they reflect risks related to the collateral but not to the repo counterparty credit risk. These haircuts exclude country-counterparty correlation risk add-ons, which are widespread for government bond repos, especially in the case of peripheral bonds.

V.26

Repo haircuts on government bond collateral

Haircuts increase with issuer risk, maturity

Bond issuer	Bond maturity		
	5Y	10Y	20Y
<i>Concentration limit: EUR 50mn</i>			
Core EA	0.9%	1.3%	2.8%
Peripheral EA	2.3%	3.2%	4.5%
Core non-EA	0.9%	1.4%	3.2%
<i>Concentration limit: EUR 500mn</i>			
Core EA	0.7%	1.3%	3.2%
Peripheral EA	2.2%	3.5%	4.9%
Core non-EA	0.8%	1.4%	3.1%

Note: Mean counterparty risk-free haircuts reported by European banks on government bond collateral used in non-centrally-cleared repo markets. EA=Euro Area. Data as of April 2016. Source: ICMA, ESMA.

Table V.26 shows that haircuts on government bond collateral tend to increase with issuer risk and maturity.²⁵ However, not all survey respondents factored in these parameters in when calculating haircuts. For example, 15% of respondents do not change haircuts based on issuer risk.

The haircut ranges (highest minus lowest haircut) also reflect risk dimensions: The maximum haircut for five or ten-year core EA bond collateral at the lower concentration limit is below 3%, but it stands at 10% for 20-year peripheral EA bonds.

Repo haircuts tend to be much higher when the collateral is not a government debt security, as illustrated by Table V.27. They increase with issuer risk (i.e. domicile, quality and sector) and concentration limit. Moreover, eligibility criteria tend to be stricter than for government bonds, with 31% of respondents not accepting high-yield bonds, and 23% not accepting peripheral EA bank bonds.

V.27

Repo haircuts on other fixed-income collateral

Haircuts increase with issuer risk, concentration

Bond issuer	Cov. <1Y	Bond type and maturity			CoCo >9Y
		Bank 3Y	Corp. 6Y	HY 6Y	
<i>Concentration limit: EUR 1mn</i>					
Core EA	2.3%	4.7%	4.8%	20.3%	16.3%
Peripheral EA	5.0%	12.6%	5.8%	20.6%	-
<i>Concentration limit: EUR 25mn</i>					
Core EA	4.0%	6.9%	6.4%	22.3%	17.8%
Peripheral EA	6.5%	18.9%	7.2%	21.7%	-

Note: Mean counterparty-risk free haircuts reported by European banks on fixed income collateral used in non-centrally-cleared repo markets. EA=Euro Area. Cov=covered bond, Bank=bank bond, Corp=corporate bond, HY=high-yield bond, CoCo=contingent convertible bond. Data as of April 2016. Source: ICMA, ESMA.

There are several important takeaways: First, the methodologies used by market participants seem to be heterogeneous and are not always driven by quantitative considerations. Second, haircuts are sometimes part of the negotiation and, therefore, of the price discovery mechanism. Third, haircuts are frequently used as a risk management tool, but other levers may also be used, including for example counterparty eligibility, collateral eligibility, lending volumes and other transaction terms.

Conclusions

Public authorities' understanding and analysis of the risks in SFT markets are currently hampered by the lack of granular data, including in the EU, and will remain so until the reporting obligation under SFTR begins in the course of 2018.

²⁴ The data and information in this sub-section were collected from ICMA European Repo and Collateral Council members in April 2016. Respondents accounted for around 40% of the December 2015 ICMA European Repo Market Survey (based on volumes). For more information and the complete dataset, see ESMA (2016a) pp.51-54 and pp.66-67.

²⁵ Other relevant factors available in the full dataset include country-counterparty correlation risk and bond structuring (i.e. index-linked). Although it cannot be observed from the data, haircuts also increase with the repo term.

With these limitations in mind, this article provides a simple description of the collateral landscape in EU SFT markets, and an overview of the haircut methodologies and levels currently used by market participants.

Until SFTR data becomes available, the implementation and calibration of policy instruments run the danger of being based on partial or inconclusive empirical evidence. This would increase the risk of unintended consequences and could reduce the probability of achieving financial stability objectives in the context of haircuts.

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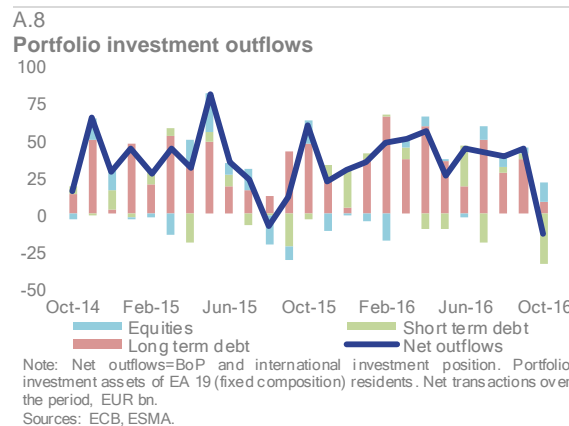
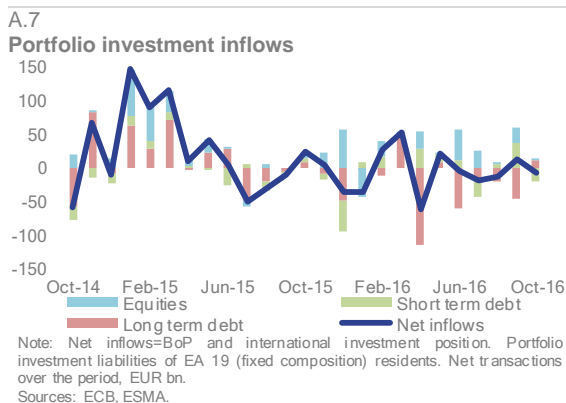
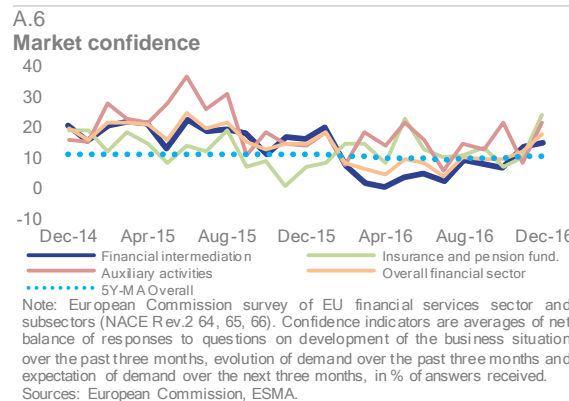
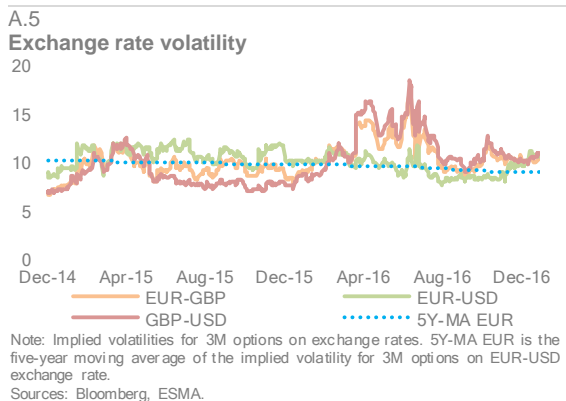
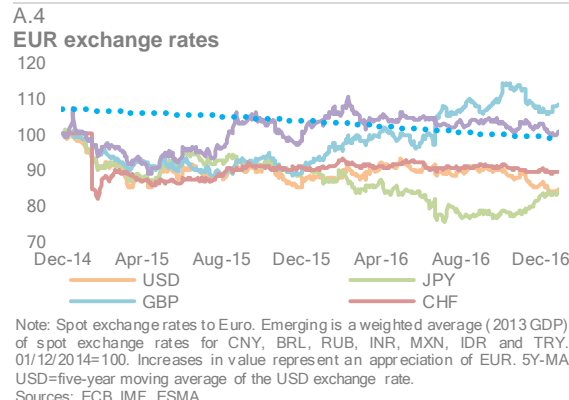
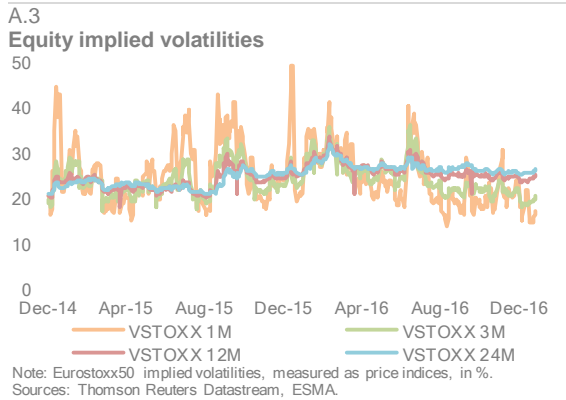
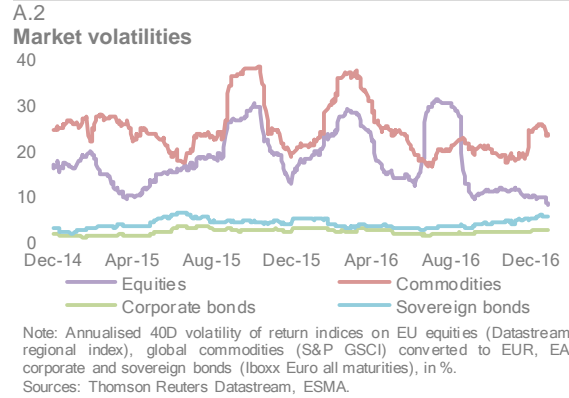
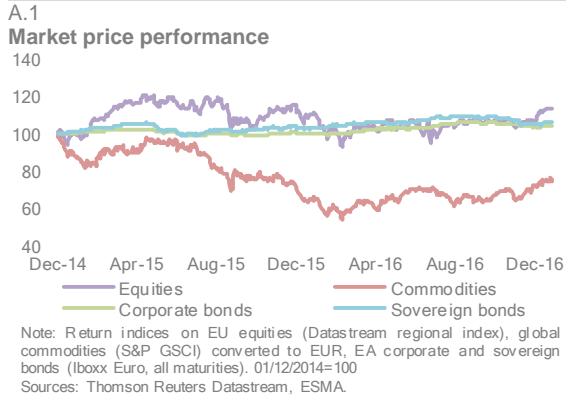
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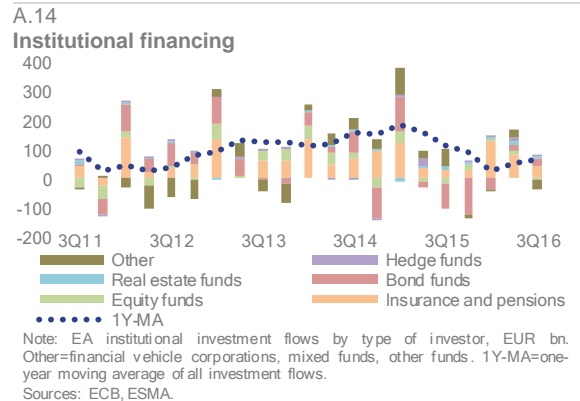
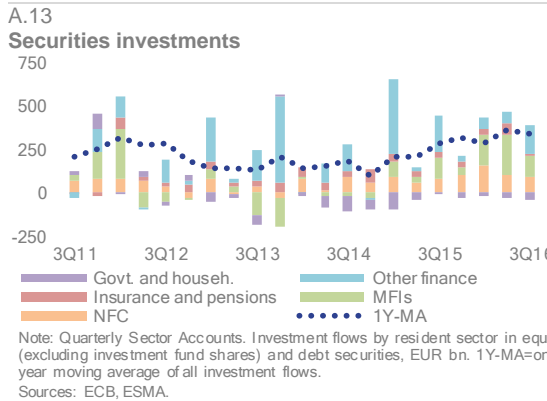
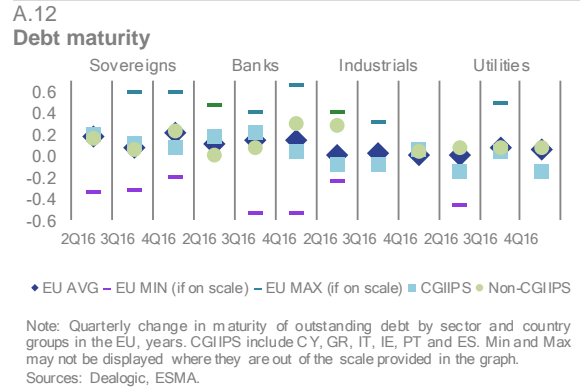
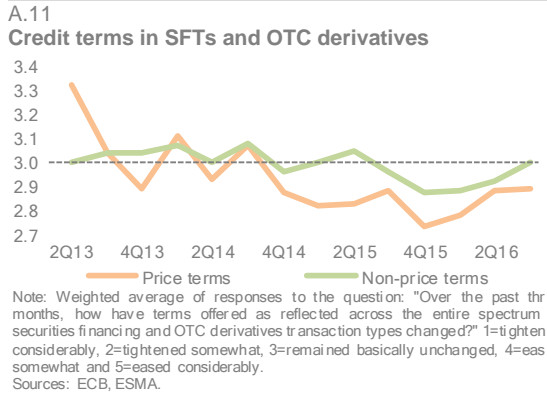
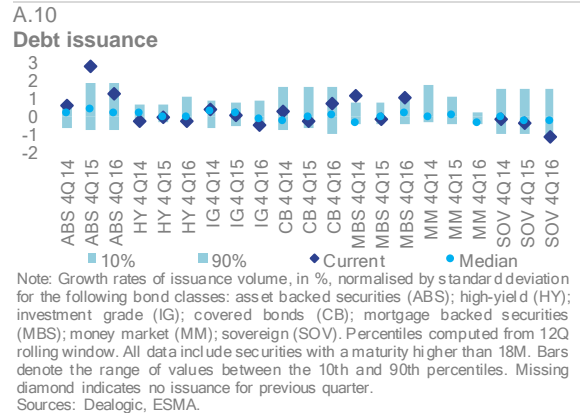
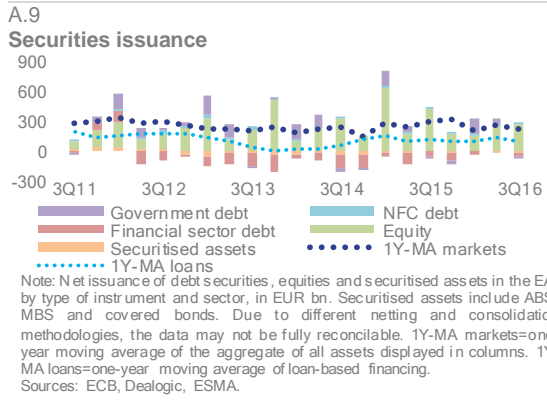
Annexes

Statistics

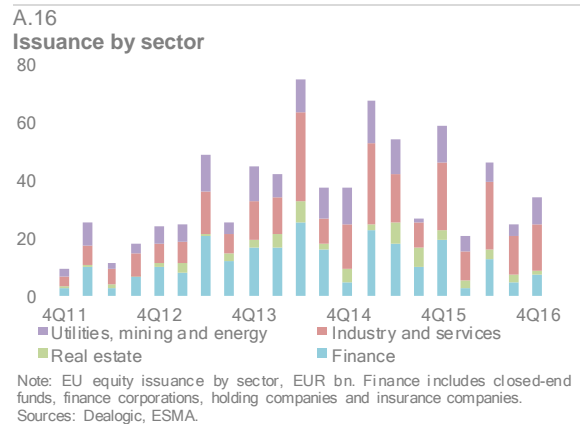
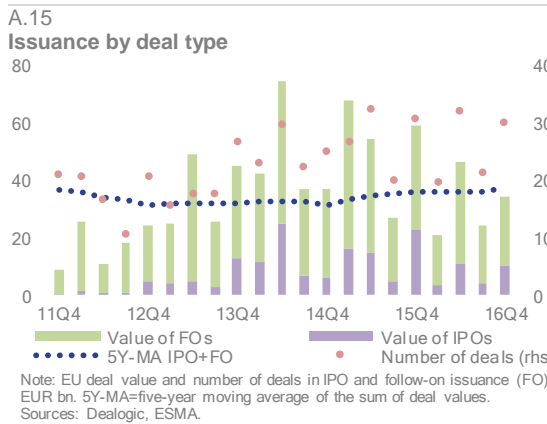
Securities markets

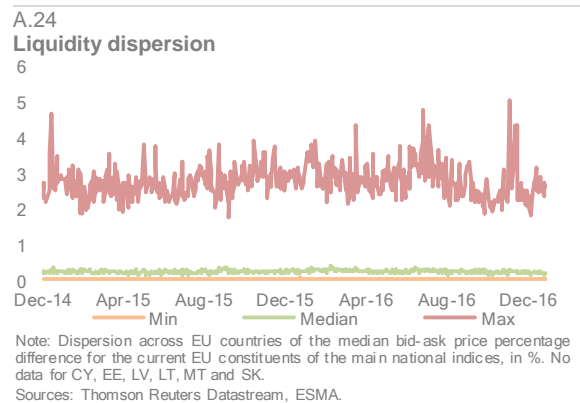
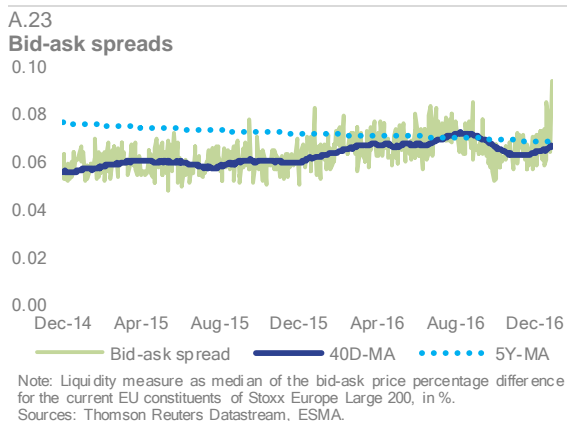
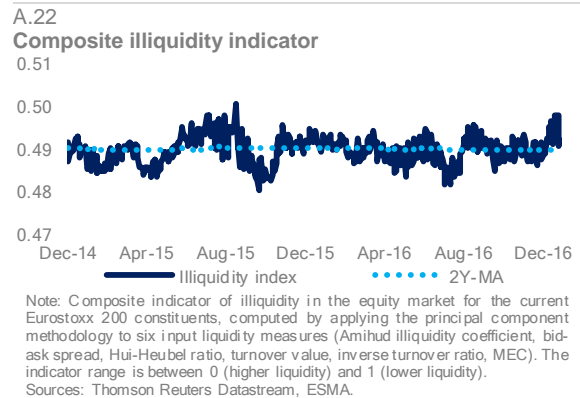
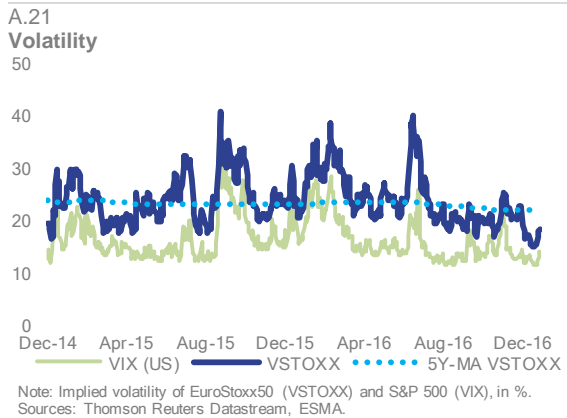
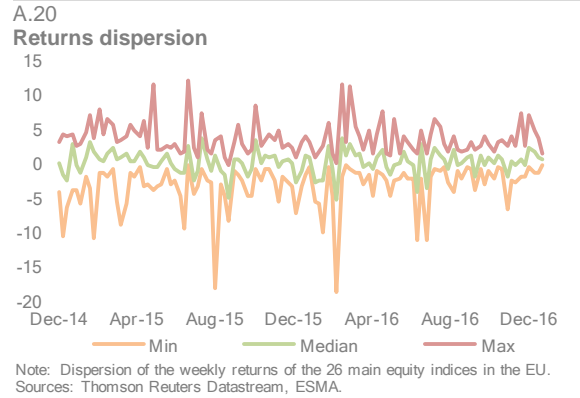
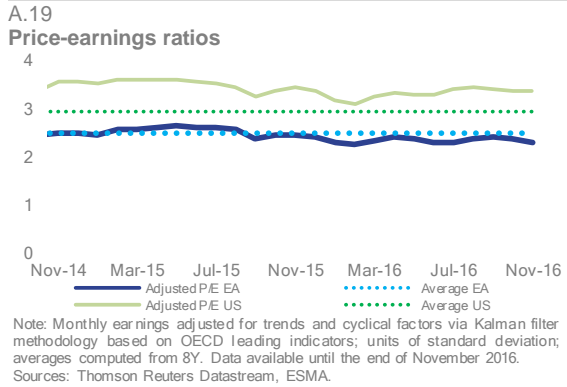
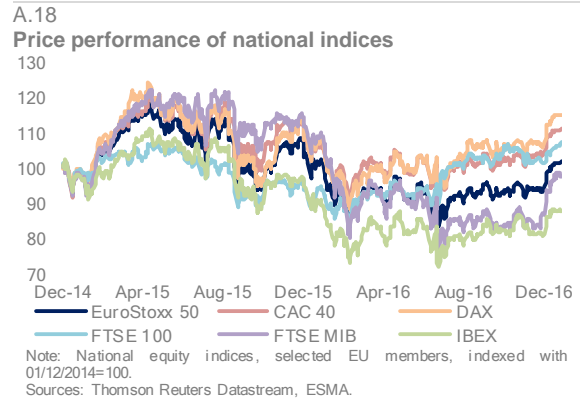
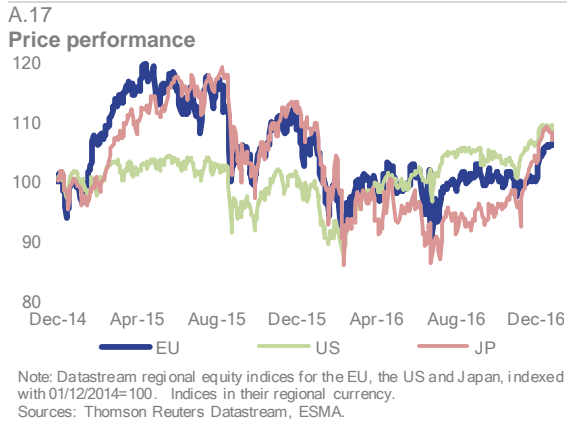
Market environment





Equity markets

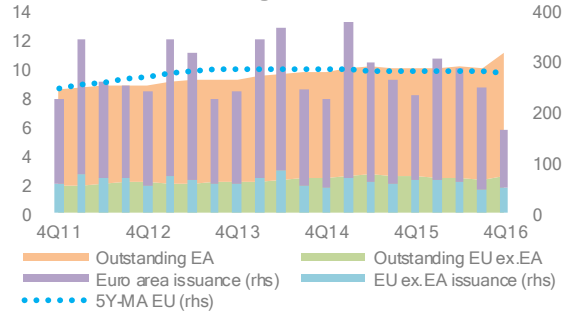




Sovereign-bond markets

A.25

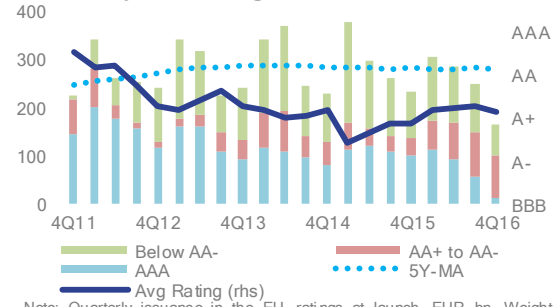
Issuance and outstanding



Note: Quarterly issuance (rhs), EUR bn, and outstanding debt (lhs), EUR tn. Amounts outstanding after 16Q2 forecasted.
 Sources: Dealogic, Eurostat, AMECO, ESMA.

A.26

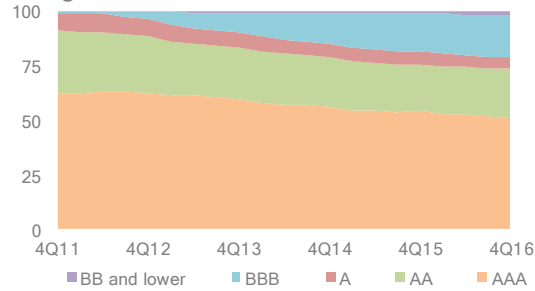
Issuance by credit rating



Note: Quarterly issuance in the EU, ratings at launch, EUR bn. Weighted average rating computed by converting ratings into a numeric scale (AAA=1, AA+=2, etc.).
 Sources: Dealogic, ESMA.

A.27

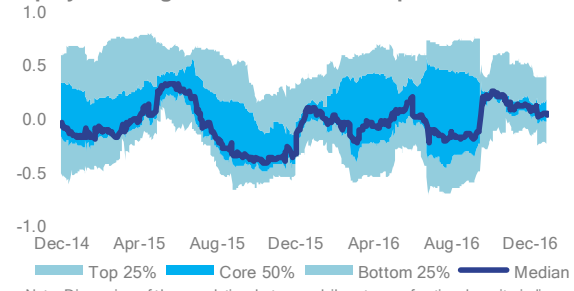
Rating distribution



Note: Outstanding amount of sovereign bonds as of issuance date by rating category, in % of the total.
 Sources: Dealogic, ESMA.

A.28

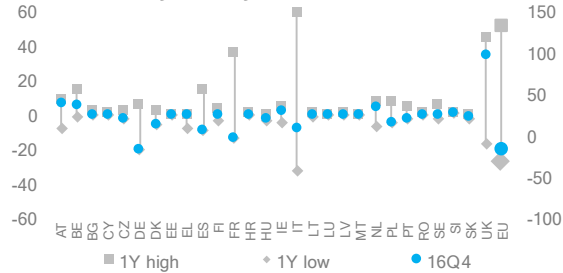
Equity-sovereign bond correlation dispersion



Note: Dispersion of the correlation between daily returns of national equity indices and national sovereign debt return index, for 16 countries in the EU, over 60D rolling windows.
 Sources: Thomson Reuters Datastream, ESMA.

A.29

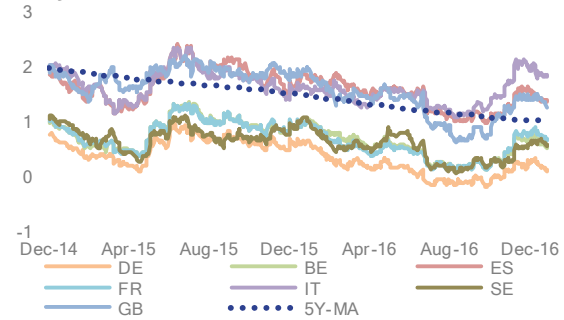
Net issuance by country



Note: Quarterly net issuance of EU sovereign debt by country, EUR bn. Net issuance calculated as the difference between new issuance over the quarter and outstanding debt maturing over the quarter. Highest and lowest quarterly net issuance in the past year are reported. EU total on right-hand scale.
 Sources: Dealogic, ESMA.

A.30

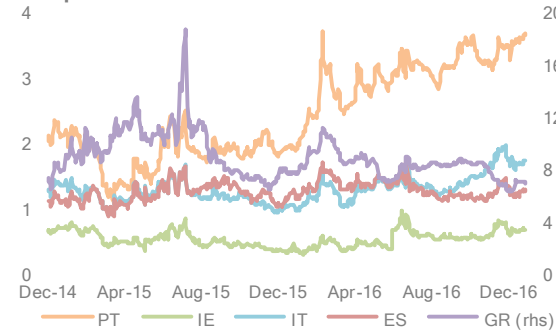
10Y yields



Note: Yields on 10Y sovereign bonds, selected EU members, in %. 5Y-MA=five-year moving average of EA 10Y bond indices computed by Datastream.
 Sources: Thomson Reuters Datastream, ESMA.

A.31

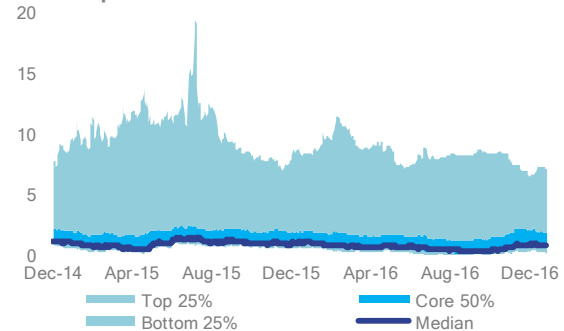
10Y spreads



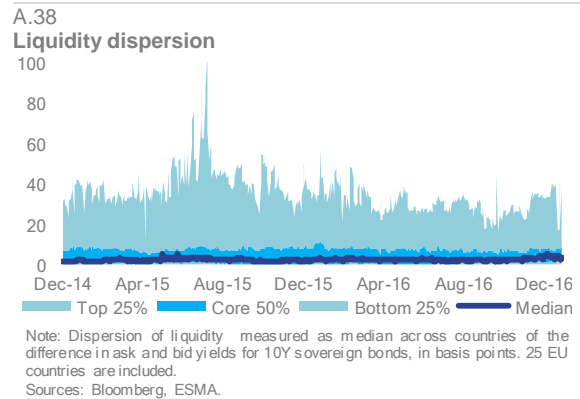
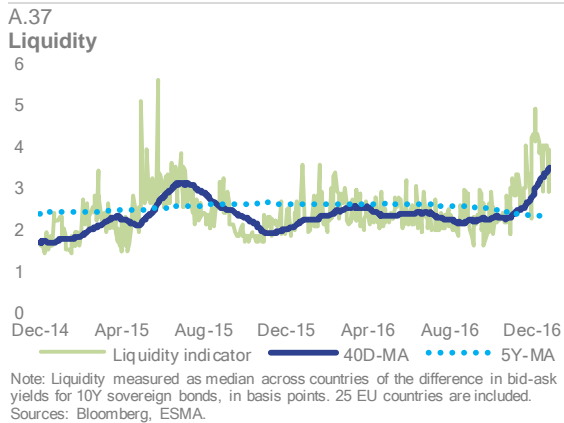
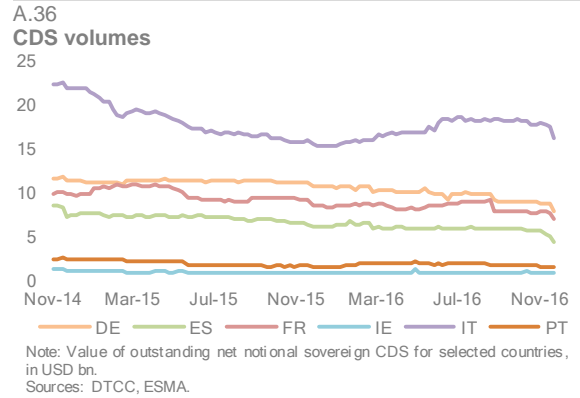
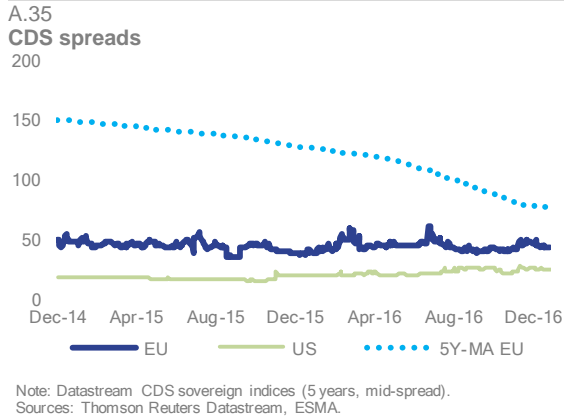
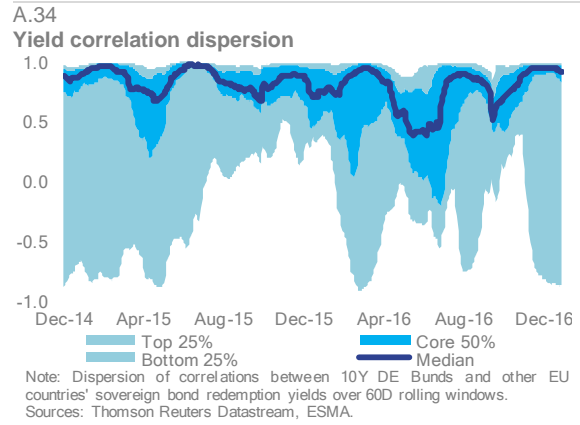
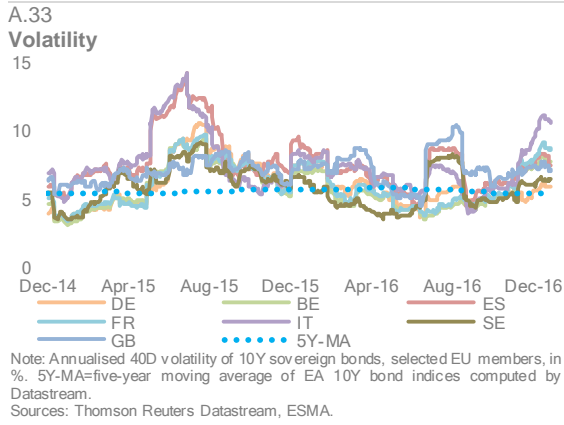
Note: Selected 10Y EA sovereign bond risk premia (vs. DE Bunds), in %.
 Sources: Thomson Reuters Datastream, ESMA.

A.32

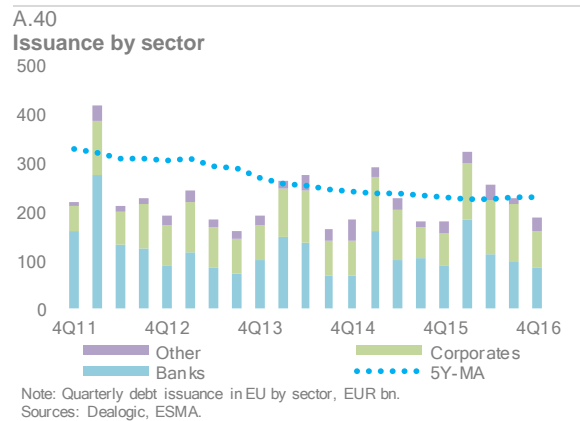
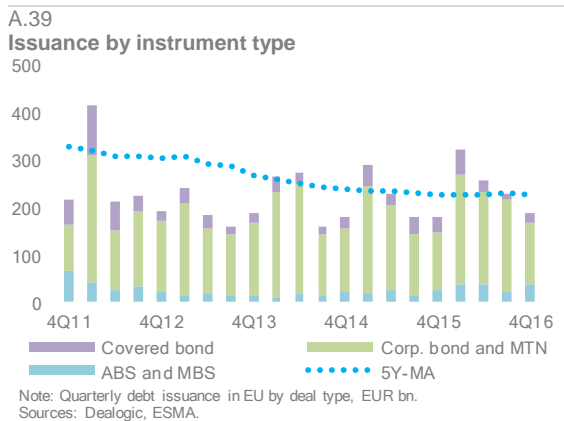
Yield dispersion



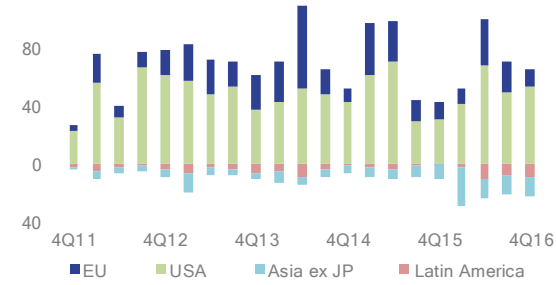
Note: Dispersion of yields on 10Y sovereign bonds of EU 17 countries, in %.
 Sources: Thomson Reuters Datastream, ESMA.



Corporate-bond markets

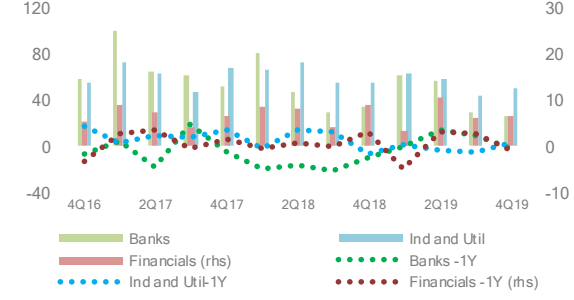


A.41 High-yield issuance



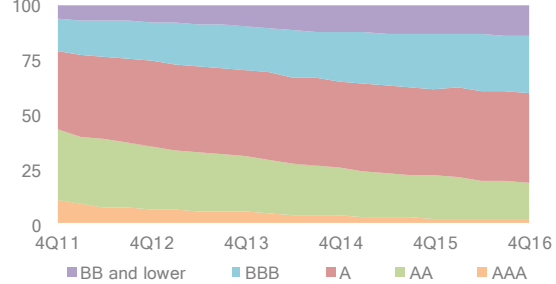
Note: Quarterly data on high-yield corporate bond issuance by region of issuance, in EUR bn.
Sources: Dealogic, ESMA.

A.42 Debt redemption profile by sector



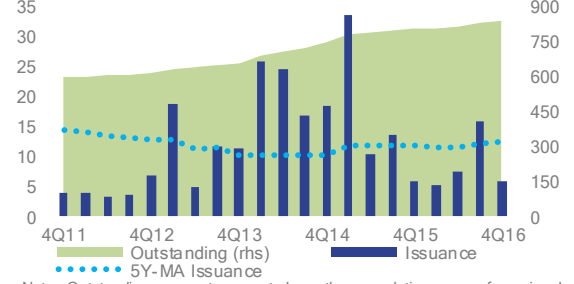
Note: Quarterly redemptions over a 3Y-horizon by European private corporates (banks, non-bank financials, and industrials and utilities), current and change over last year (dotted lines), EUR bn. Excluding bank redemptions to central banks.
Sources: Dealogic, ESMA.

A.43 Rating distribution



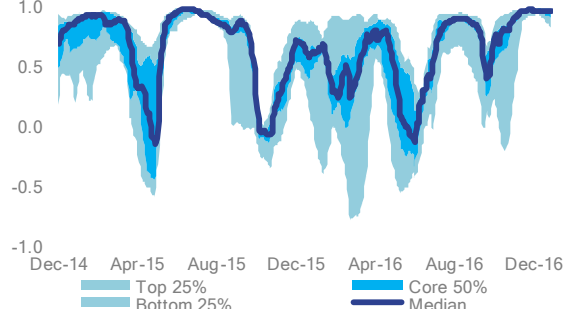
Note: Outstanding amount of corporate bonds as of issuance date by rating category, in % of the total.
Sources: Dealogic, ESMA.

A.44 Hybrid capital instruments



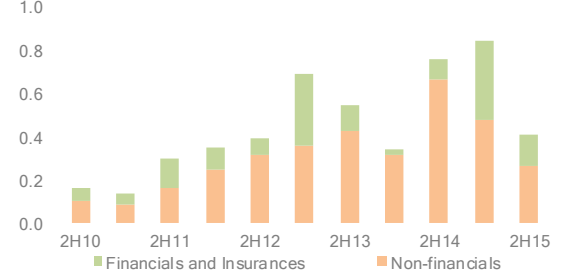
Note: Outstanding amount computed as the cumulative sum of previously issued debt minus the cumulative sum of matured debt prior to reference date, EUR bn. According to Dealogic classification, hybrid capital refers to subordinated debt Tier 1 capital mainly with perpetual maturity.
Sources: Dealogic, ESMA.

A.45 Sovereign-corporate yield correlation



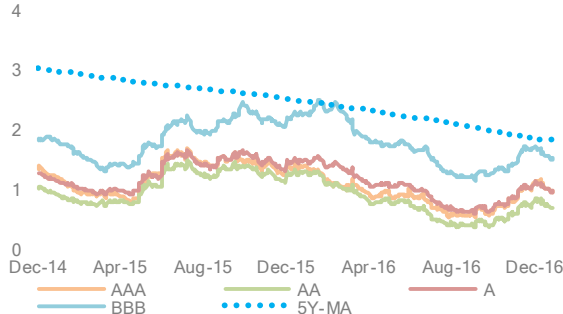
Note: Dispersion of correlation between Barclays Aggregate for corporate and 10Y sovereign bond redemption yields for AT, BE, ES, FI, FR, IT, NL.
Sources: Thomson Reuters Datastream, ESMA.

A.46 Default rates



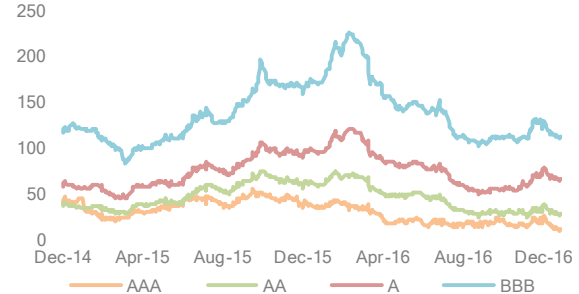
Note: Default rate of rated corporate bond issuers by sub-asset class, in % of total number of rated corporate bond issuers. Data from ICAP and CERVED are excluded as most rated entities are small corporates.
Sources: CEREP, ESMA.

A.47 Yields by credit rating

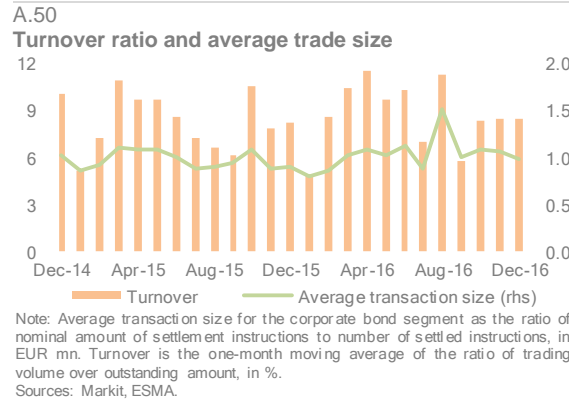
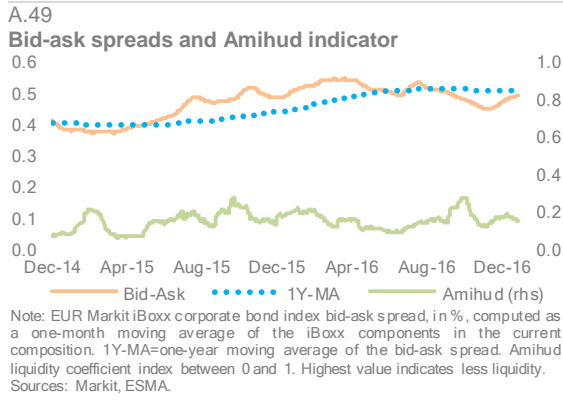


Note: Markit iBoxx euro corporate bond indices for maturities 5-7 years, in %.
5Y-MA=five-year moving average of all indices.
Sources: Thomson Reuters Datastream, ESMA.

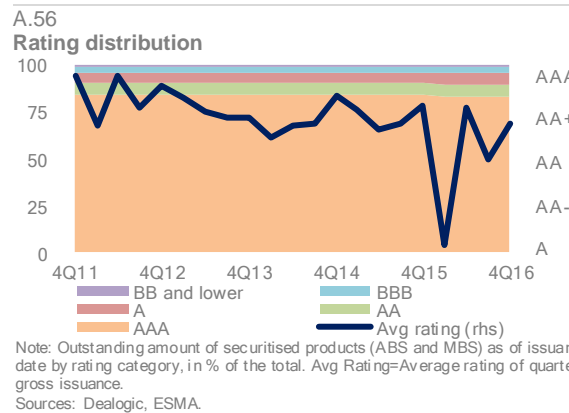
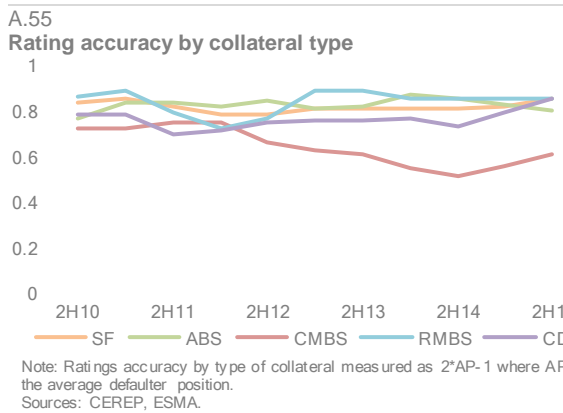
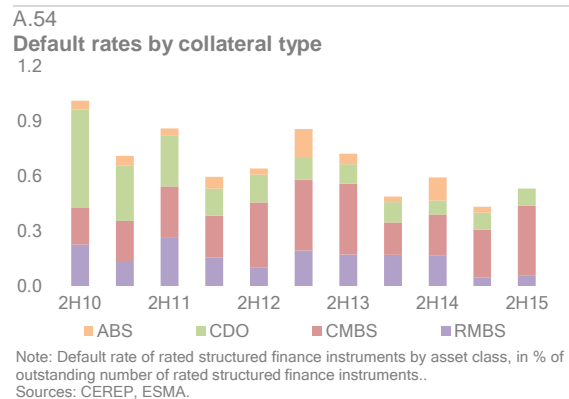
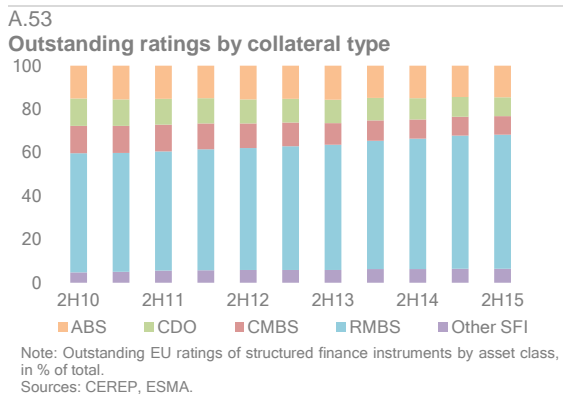
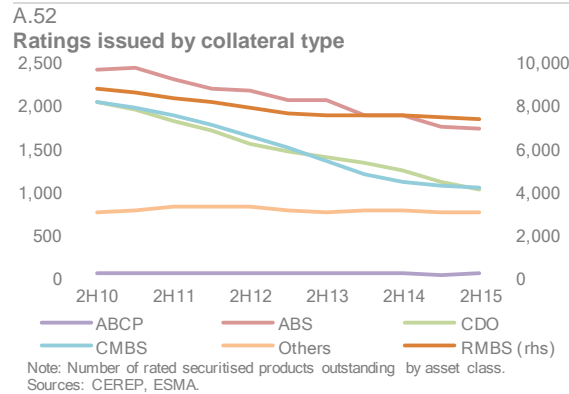
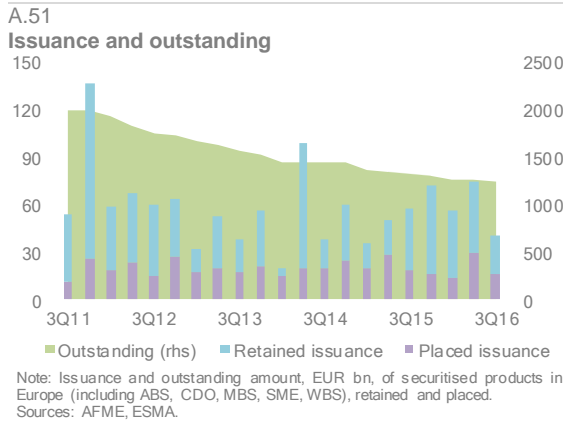
A.48 Spreads by credit rating

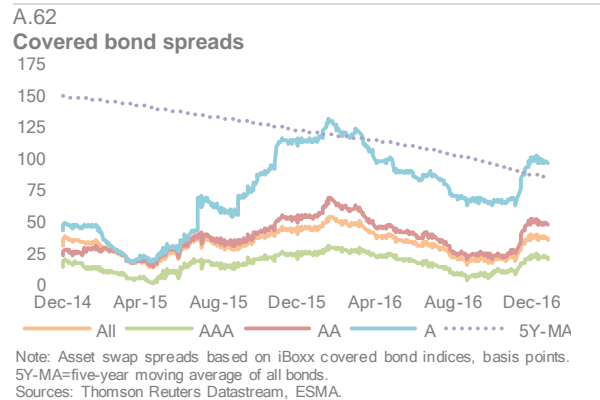
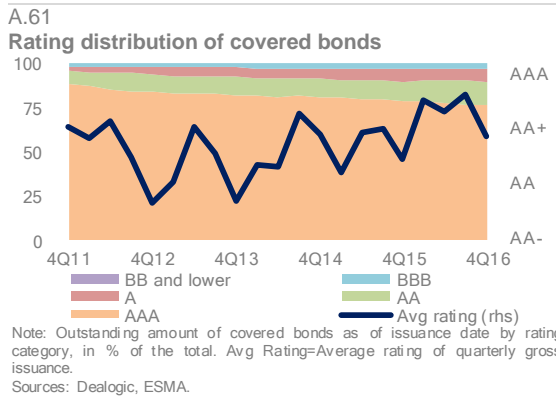
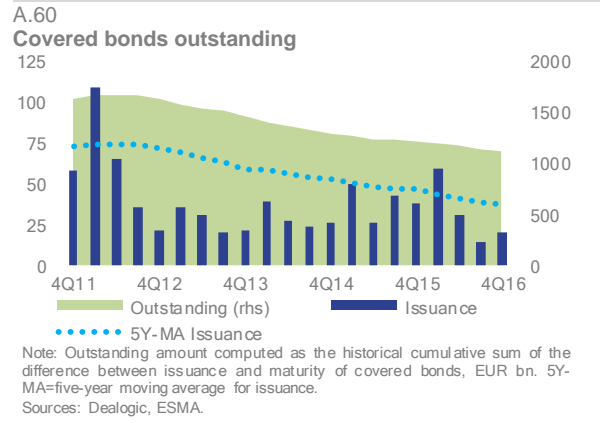
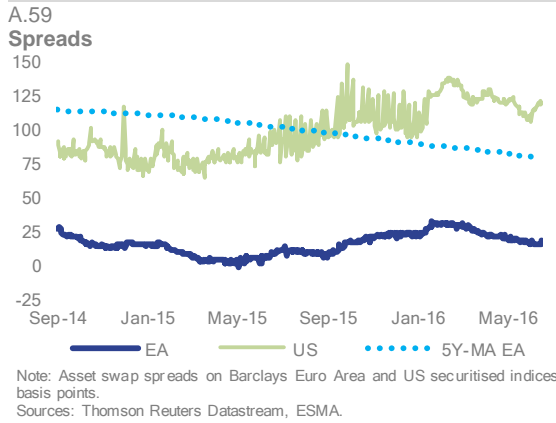
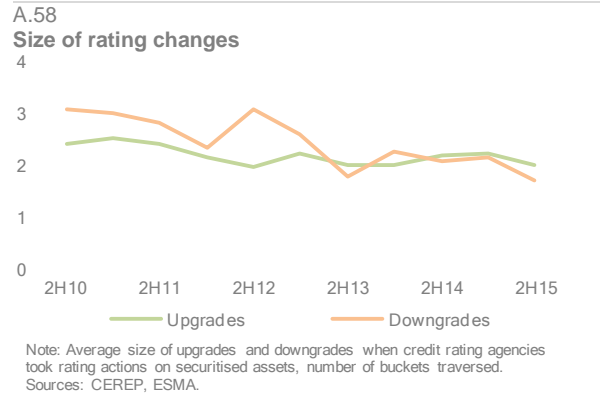
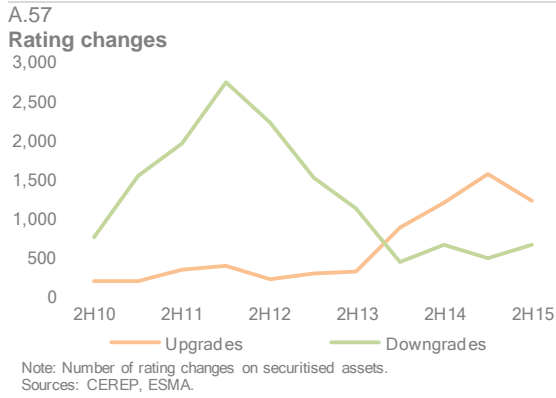


Note: EA non-financial corporate bond spreads by rating between iBoxx non-financial corporate yields and ICAP Euro Euribor swap rates for maturities from 5 to 7 years, basis points.
Sources: Thomson Reuters Datastream, ESMA.

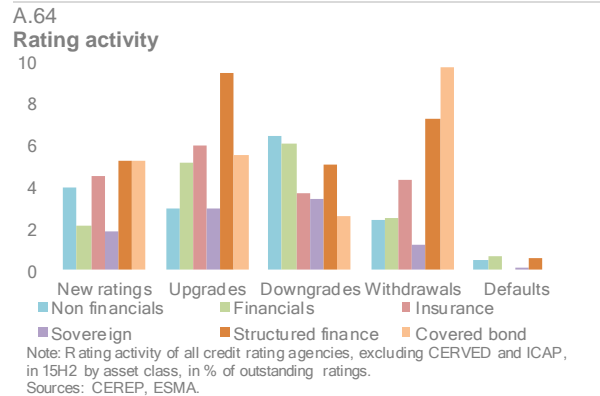
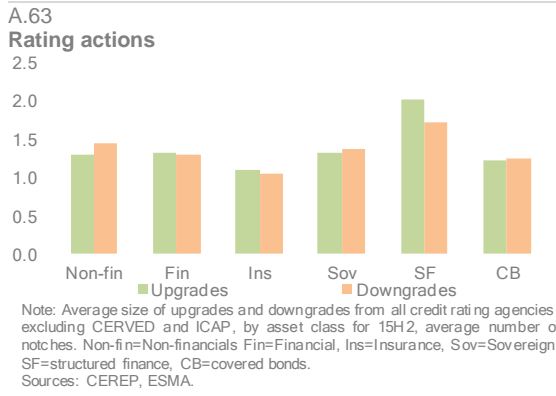


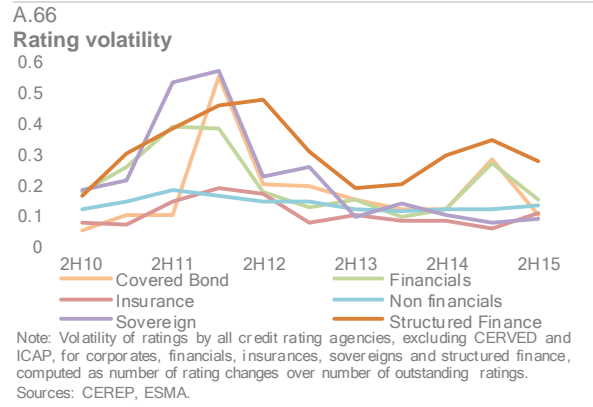
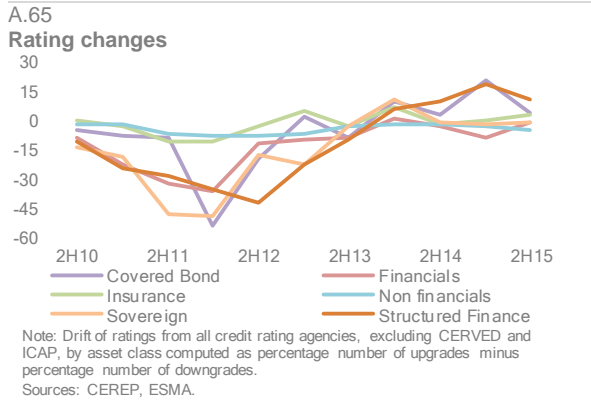
Securitised assets and covered bonds



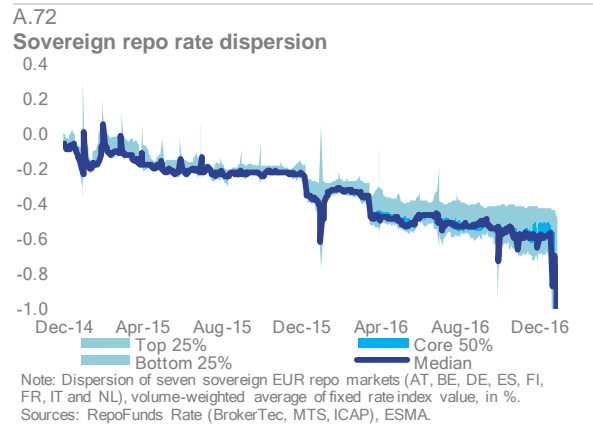
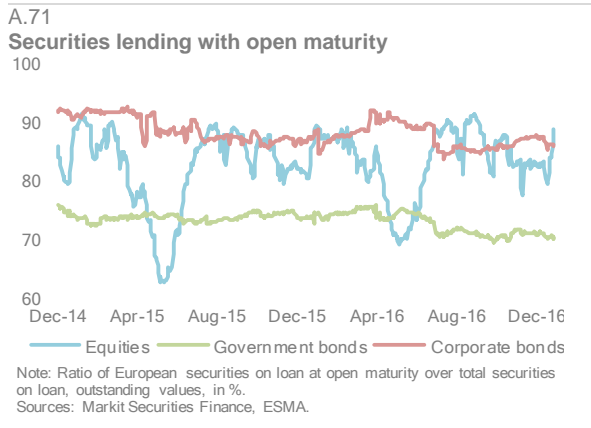
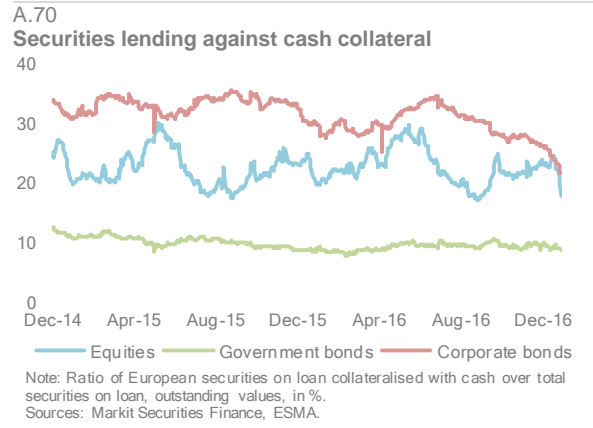
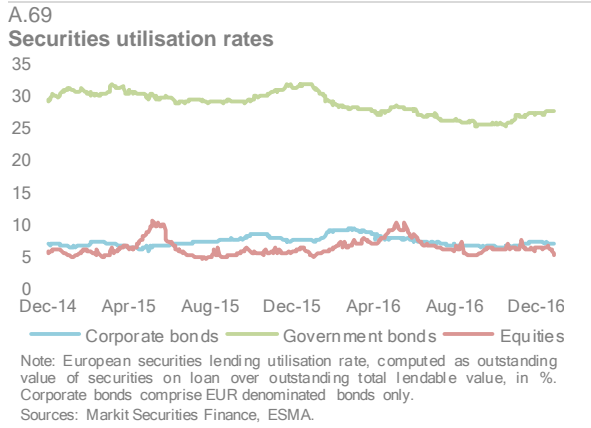
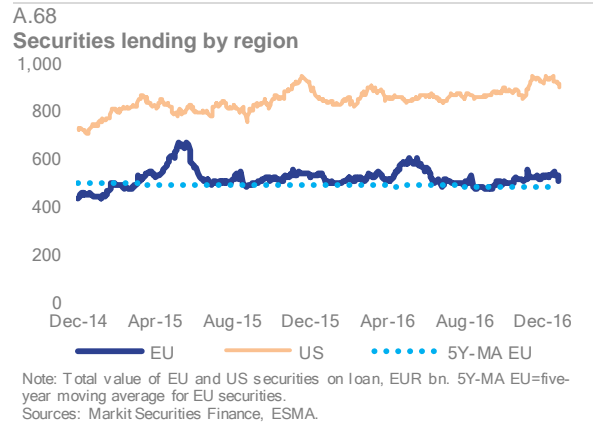
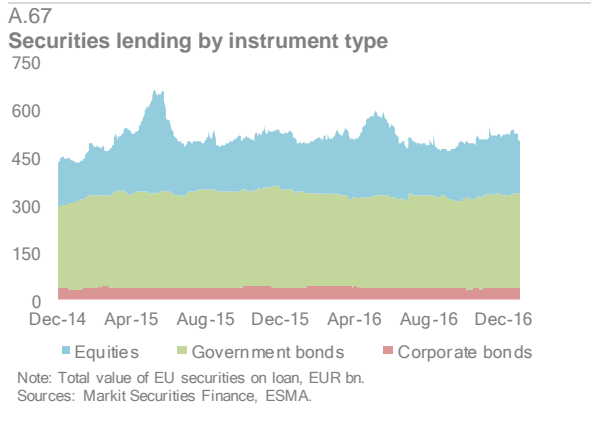


Credit quality



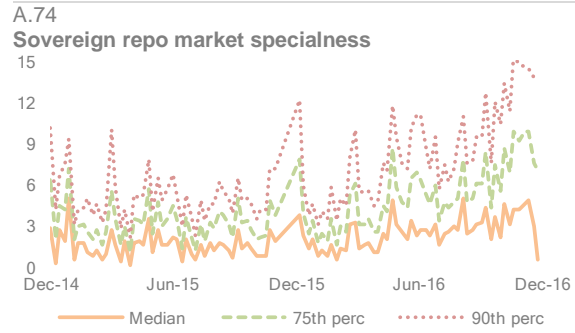


Securities financing and collateral

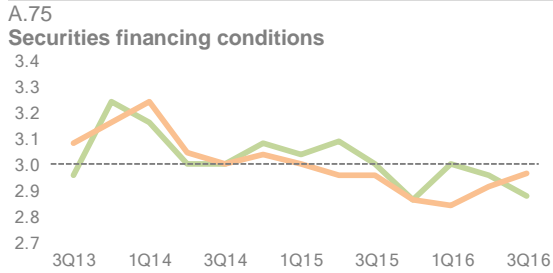




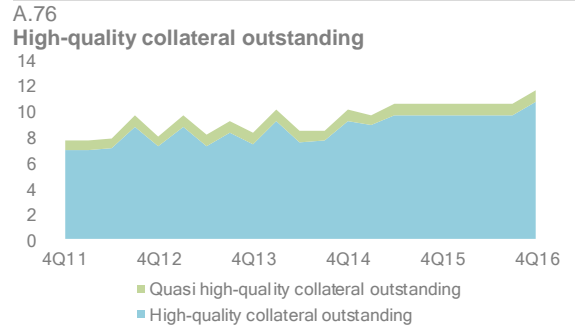
Note: 20D-MA of specific and general collateral transaction volumes executed through CCPs in eight sovereign EUR repo markets (AT, BE, DE, ES, FI, FR, IT and NL), EUR bn. Index volumes filter out atypical transactions.
Sources: RepoFunds Rate (BrokerTec, MTS, ICAP), ESMA.



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 (BrokerTec, MTS, ICAP), ESMA.

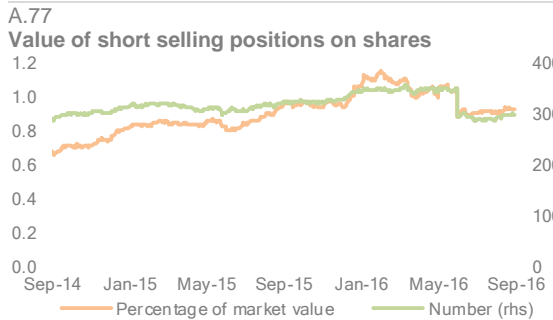


Note: Weighted average of responses to the questions: "Over the past 3M, how has demand for funding / how have liquidity and functioning for all collateral types changed?" 1= decreased / deteriorated considerably, 2= decreased / deteriorated somewhat, 3= remained basically unchanged, 4= increased / improved somewhat, and 5= increased / improved considerably.
Sources: ECB, ESMA.

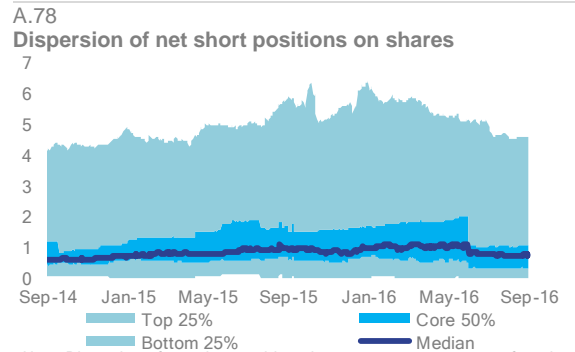


Note: Amount outstanding and quarterly change, EUR tn. High-quality collateral is the sum of outstanding debt securities issued by EU governments with a rating equal to or higher than BBB. Quasi high-quality is outstanding corporate debt with a rating equal to or higher than AA-.
Sources: Dealogic, Eurostat, AMECO, Standard & Poor's, ESMA.

Short selling



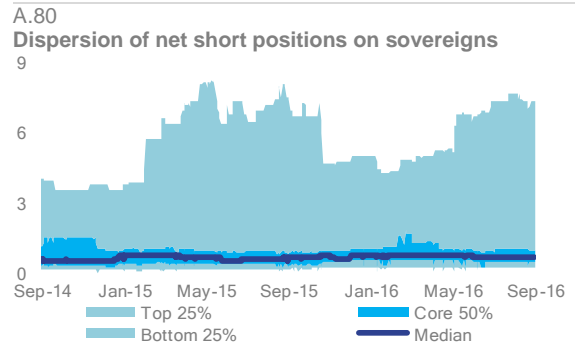
Note: Market value of short selling positions as percentage of total market value in the EU (lhs). Number of listed shares on which short positions were reported by NCAs under EU Short Selling Regulation (rhs).
Sources: National Competent Authorities, Datastream, ESMA.



Note: Dispersion of net short positions by country as percentage of market value of those positions relative to each country's blue chip index market value. Sample consists of all equities that were reported since 01/11/2012.
Sources: National Competent Authorities, Datastream, ESMA.

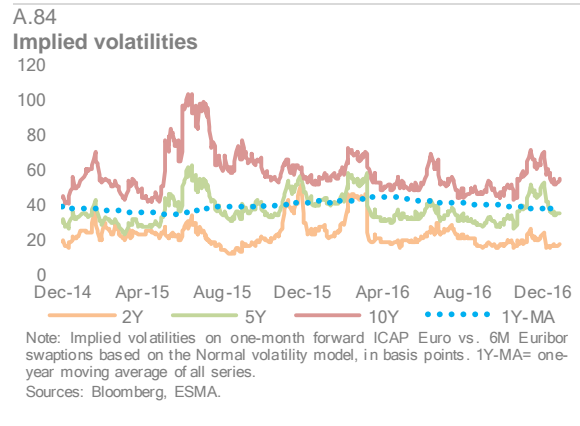
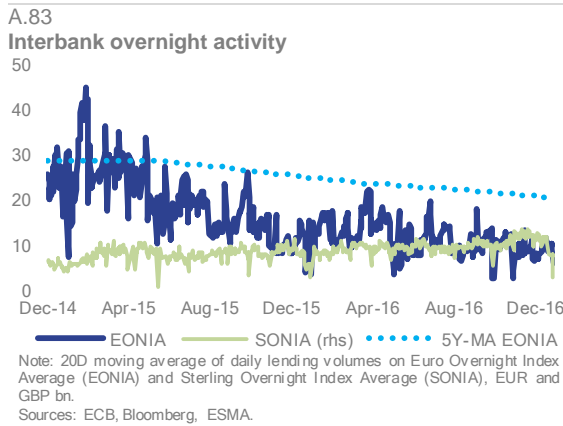
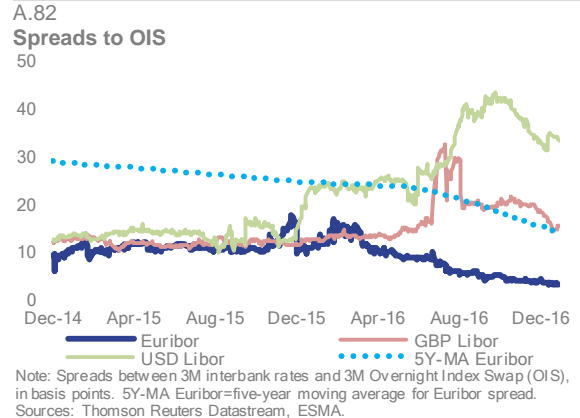
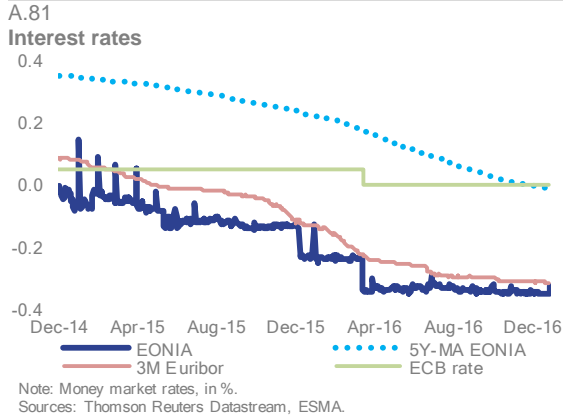


Note: Net short positions held on sovereigns, in % of total debt securities in EU. Sample consists of all EU Member States that reported since 01/11/2012.
Sources: National Competent Authorities, ESMA.

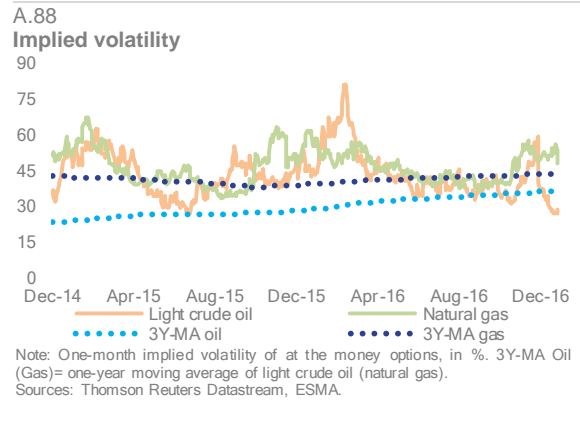
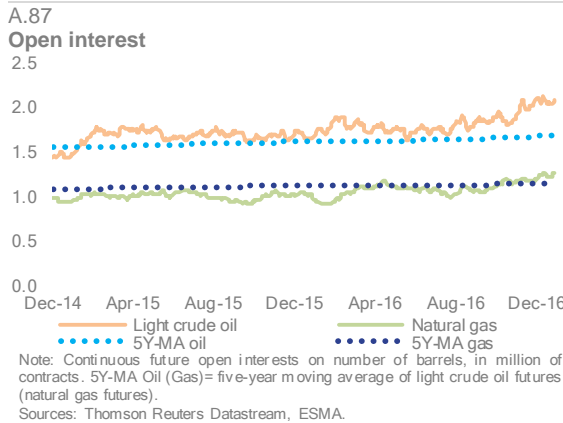
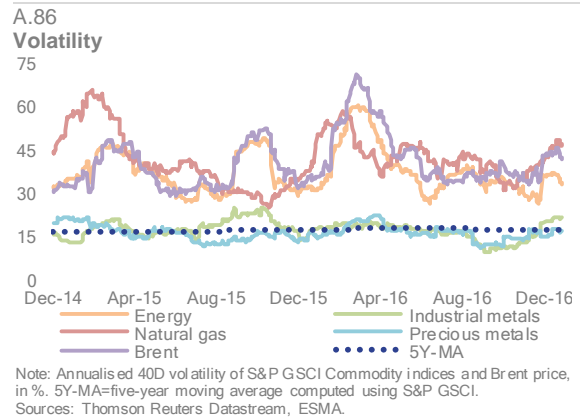
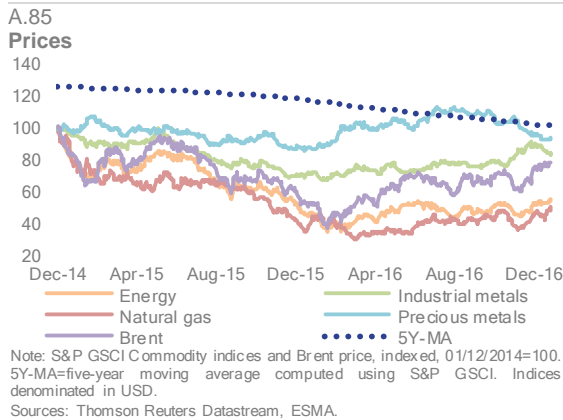


Note: Dispersion of net short positions held on selected sovereigns, in % of each country's total debt securities. Sample consists of all equities that were reported since 01/11/2012.
Sources: National Competent Authorities, ESMA.

Money markets



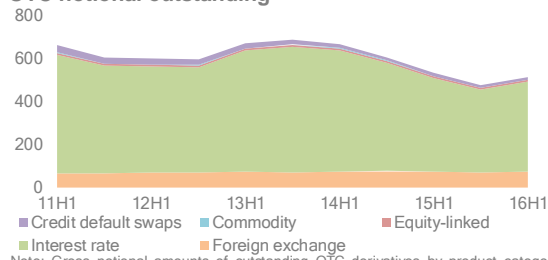
Commodity markets



Derivatives markets

A.89

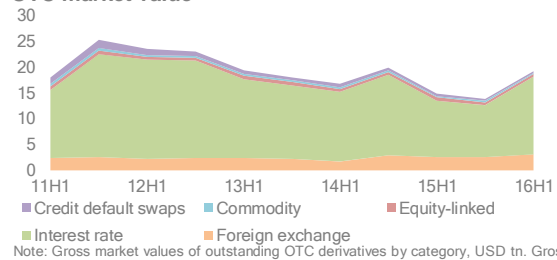
OTC notional outstanding



Note: Gross notional amounts of outstanding OTC derivatives by product category, USD tn.
Sources: Bank for International Settlements, ESMA.

A.90

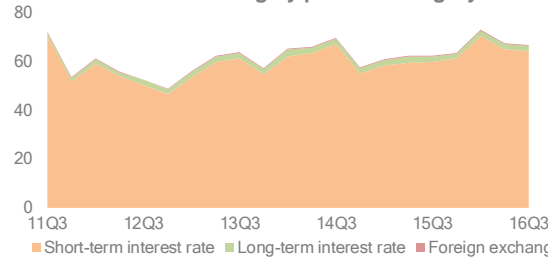
OTC market value



Note: Gross market values of outstanding OTC derivatives by category, USD tn. Gross market values represent the cost of replacing all open contracts at the prevailing market prices.
Sources: Bank for International Settlements, ESMA.

A.91

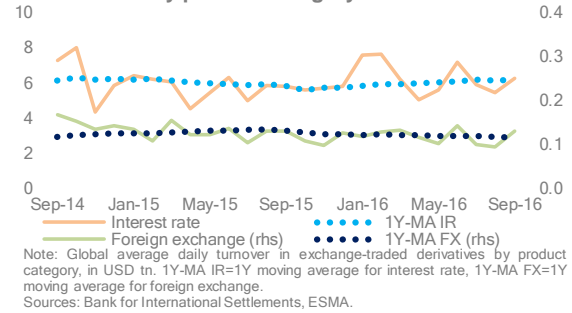
ETD notional outstanding by product category



Note: Open interest in exchange-traded derivatives by product category, in USD tn.
Sources: Bank for International Settlements, ESMA.

A.92

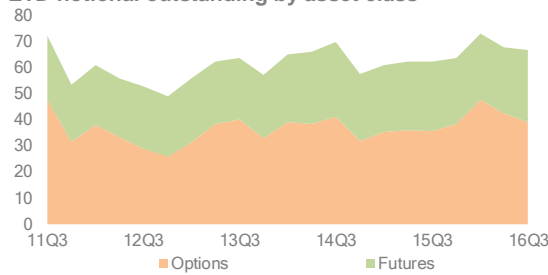
ETD turnover by product category



Note: Global average daily turnover in exchange-traded derivatives by product category, in USD tn. 1Y-MA IR=1Y moving average for interest rate, 1Y-MA FX=1Y moving average for foreign exchange.
Sources: Bank for International Settlements, ESMA.

A.93

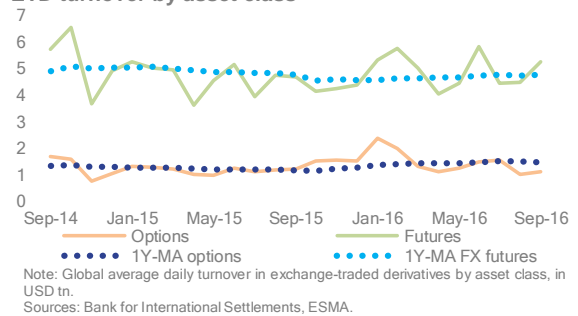
ETD notional outstanding by asset class



Note: Open interest in exchange-traded derivatives by asset class, in USD tn.
Sources: Bank for International Settlements, ESMA.

A.94

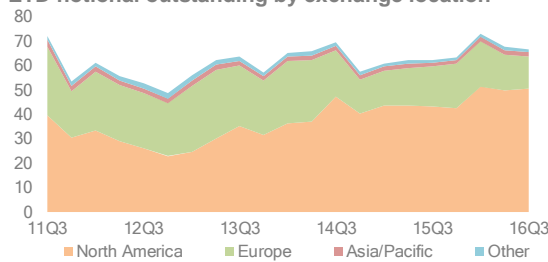
ETD turnover by asset class



Note: Global average daily turnover in exchange-traded derivatives by asset class, in USD tn.
Sources: Bank for International Settlements, ESMA.

A.95

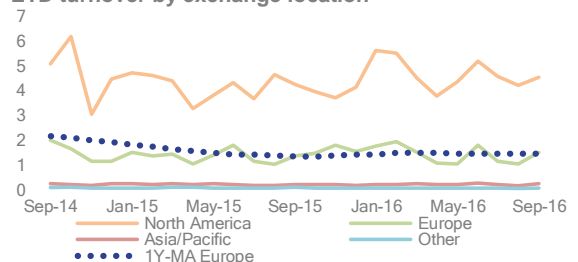
ETD notional outstanding by exchange location



Note: Open interest in exchange-traded derivatives by exchange location, in USD tn.
Sources: Bank for International Settlements, ESMA.

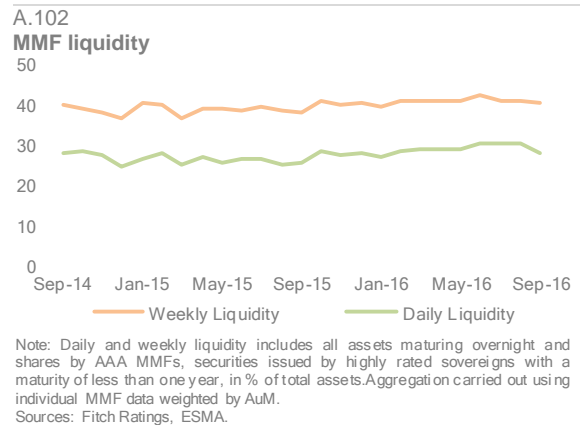
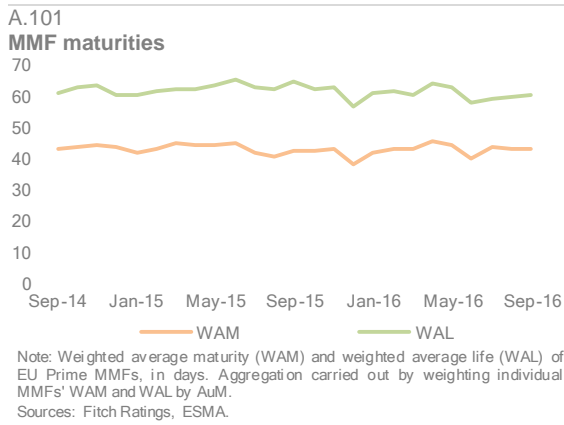
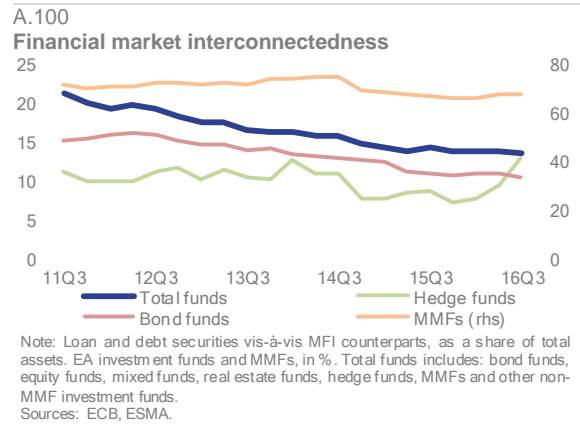
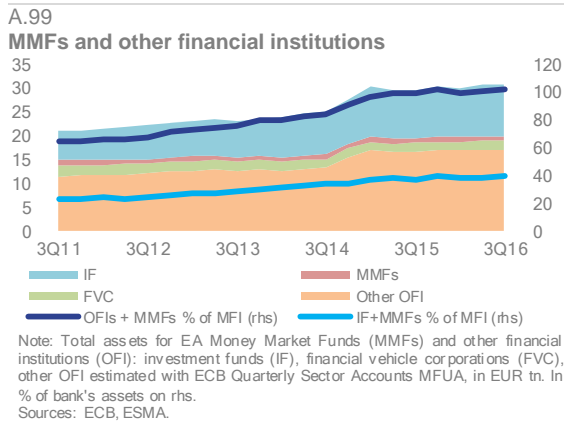
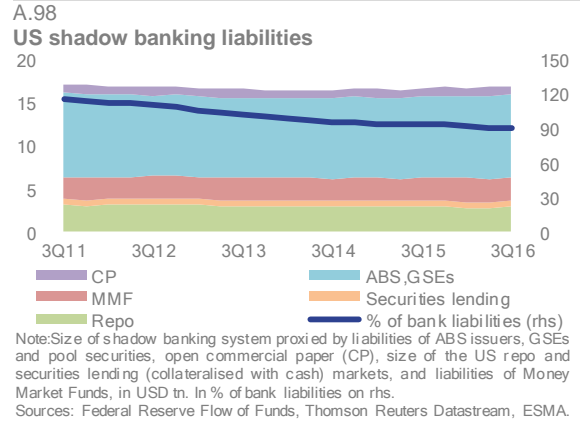
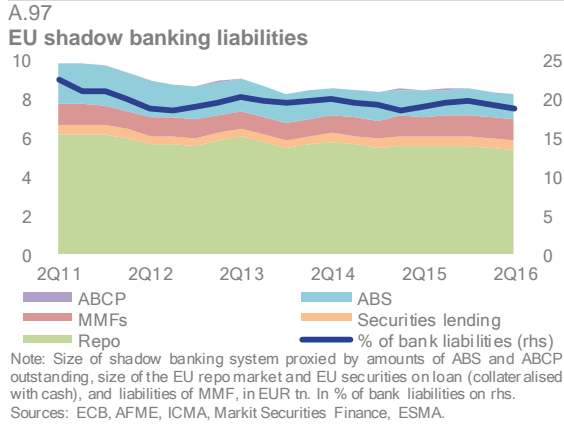
A.96

ETD turnover by exchange location



Note: Global average daily turnover in exchange-traded derivatives by exchange location, in USD tn. "Europe" as defined by BIS.
Sources: Bank for International Settlements, ESMA.

Shadow banking and market-based credit intermediation

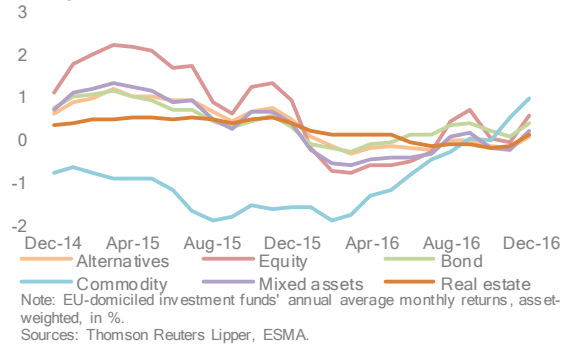


Investors

Fund industry

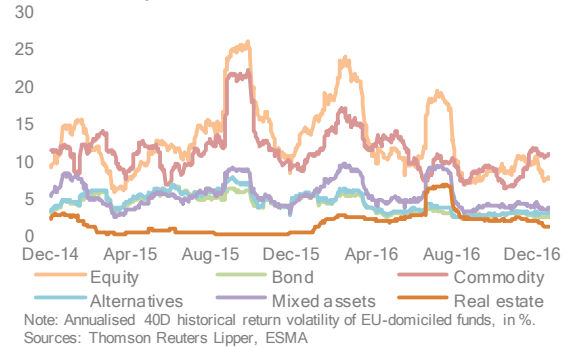
A.103

Fund performance



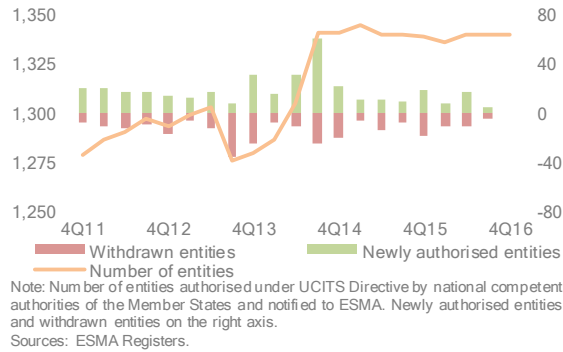
A.104

Fund volatility



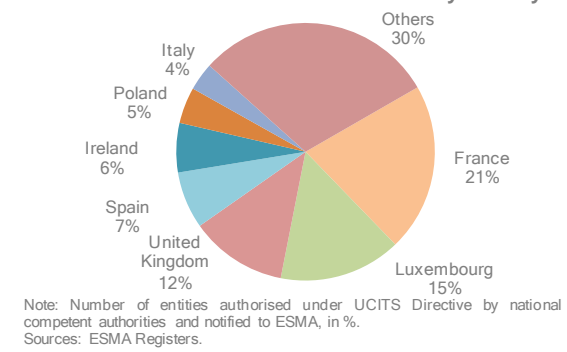
A.105

Entities authorised under UCITS



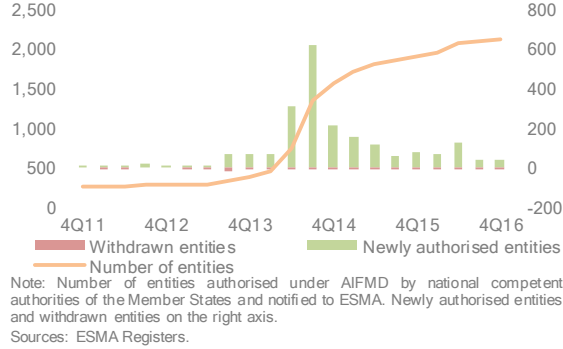
A.106

Share of entities authorised under UCITS by country



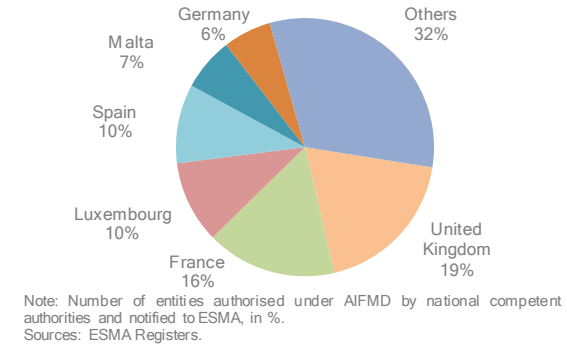
A.107

Entities authorised under AIFMD



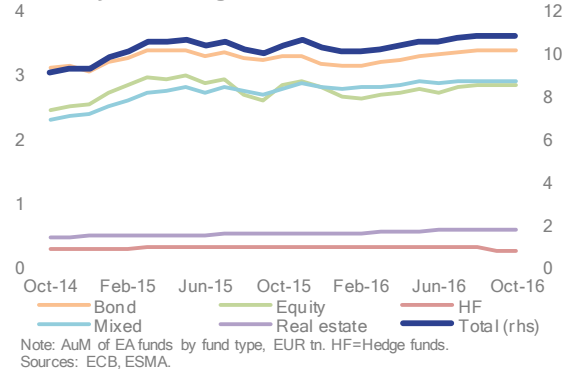
A.108

Share of entities authorised under AIFMD by country



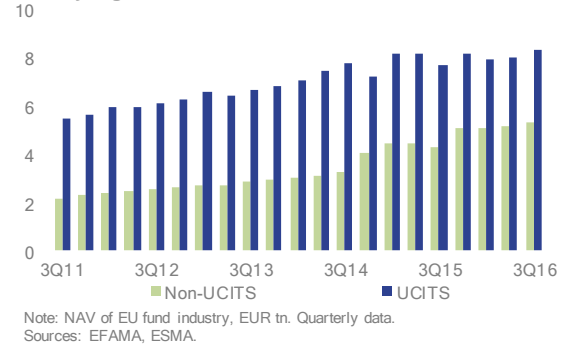
A.109

Assets by market segment

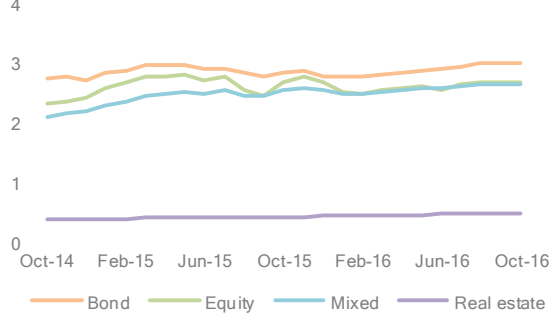


A.110

NAV by legal form

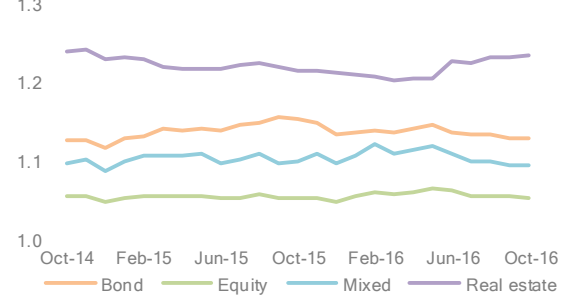


A.111
NAV by fund market segment



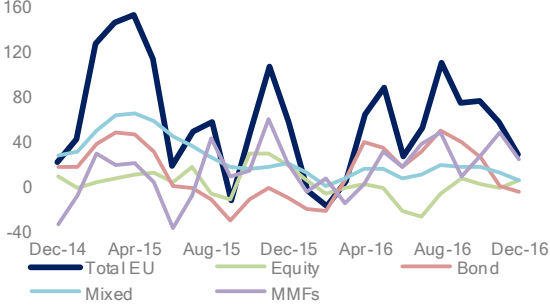
Note: EA Investment funds' NAV by fund type, EUR tn.
Sources: ECB, ESMA.

A.112
Leverage by market segment



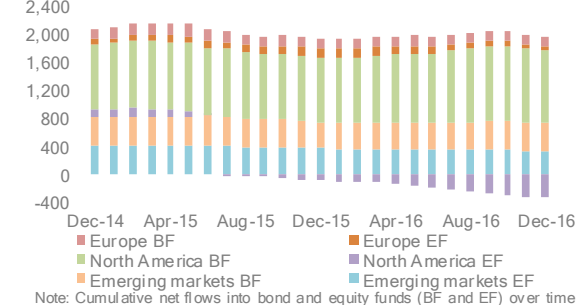
Note: EA Investment funds' leverage by fund type computed as the AuM/NAV ratio.
Sources: ECB, ESMA.

A.113
Fund flows by fund type



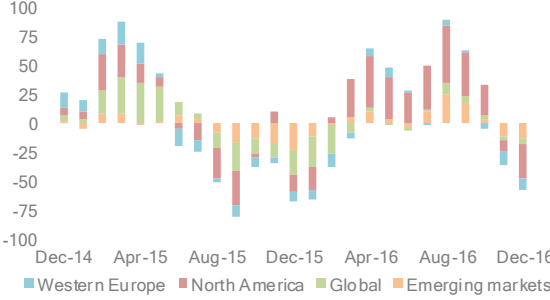
Note: EU-domiciled funds' 2M cumulative net flows, EUR bn.
Sources: Thomson Reuters Lipper, ESMA.

A.114
Fund flows by regional investment focus



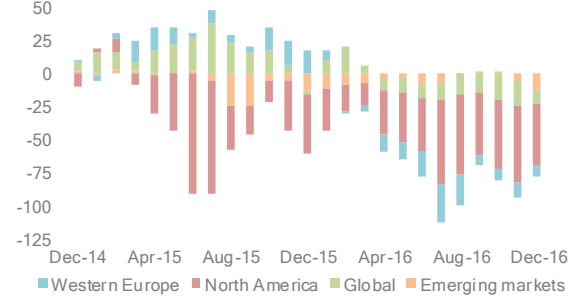
Note: Cumulative net flows into bond and equity funds (BF and EF) over time since 2004 by regional investment focus, EUR bn.
Sources: Thomson Reuters Lipper, ESMA.

A.115
Bond fund flows by regional investment focus



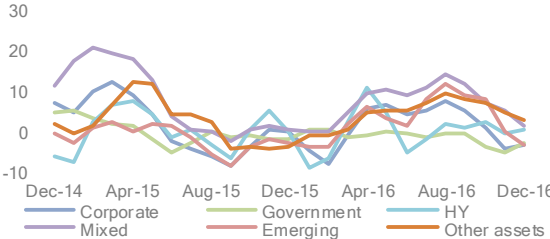
Note: 2M cumulative bond flows by regional investment focus, EUR bn.
Sources: Thomson Reuters Lipper, ESMA.

A.116
Equity fund flows by regional investment focus



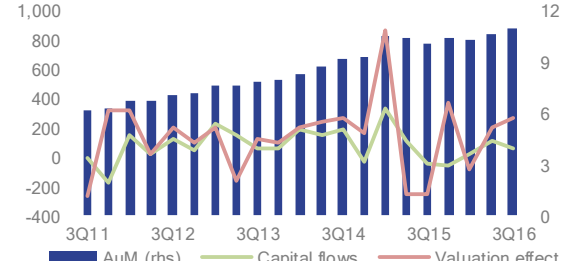
Note: 2M cumulative equity flows by regional investment focus, EUR bn.
Sources: Thomson Reuters Lipper, ESMA.

A.117
Net flows for bond funds



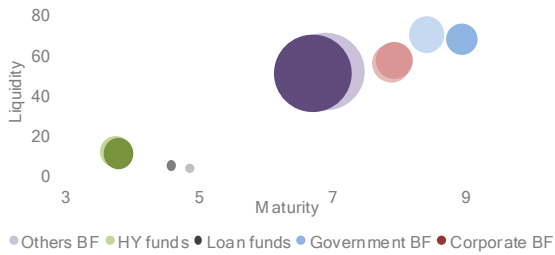
Note: 2M cumulative net flows for bond funds, EUR bn. Funds investing in corporate and government bonds that qualify for another category are only reported once (e.g. funds investing in emerging government bonds will be reported as emerging; funds investing in HY corporate bonds will be reported as HY).
Sources: Thomson Reuters Lipper, ESMA.

A.118
Net asset valuation



Note: Net valuation effect related to the AuM of EA investment funds, computed as the intraperiod change in AuM, net of flows received in the respective period. Capital flows and valuation effects in EUR bn. AuM expressed in EUR tn.
Sources: ECB, ESMA.

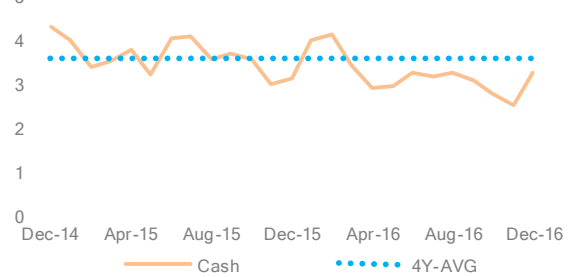
A.119 Liquidity risk profile of EU BF



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. 2015 (bright colours) and 2016 (dark colours).

Sources: Thomson Reuters Lipper, ESMA.

A.120 Cash as a percentage of assets in corporate BF portfolios

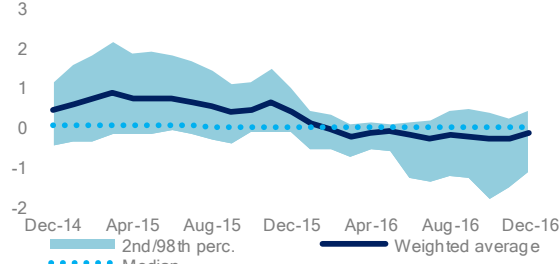


Note: Cash in percentage of holdings, in %. Short positions can have a negative value.

Sources: Thomson Reuters Lipper, ESMA.

Money market funds

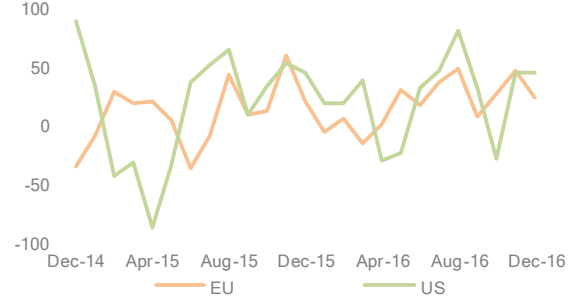
A.121 MMF performance



Note: EU-domiciled MMFs' annual average monthly returns, asset-weighted, in %. The graph shows the median and average asset-weighted returns and the difference between the returns corresponding to the 98th and 2nd percentile.

Sources: Thomson Reuters Lipper, ESMA.

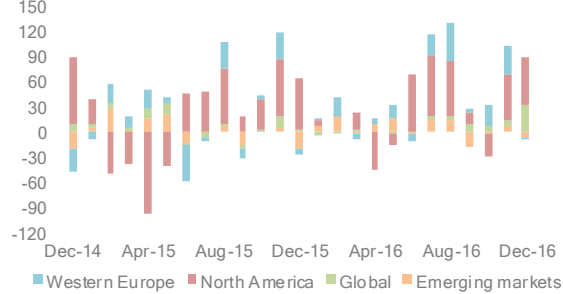
A.122 MMF flows by domicile



Note: MMF 2M cumulative net flows by domicile, EUR bn.

Sources: Thomson Reuters Lipper, ESMA.

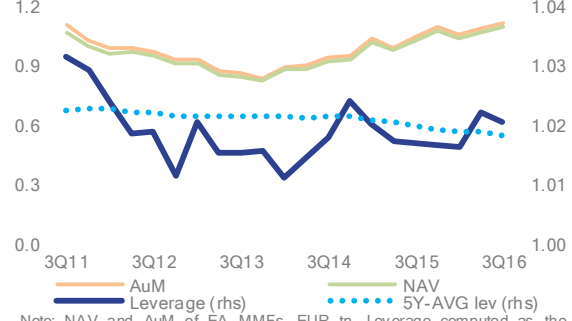
A.123 MMF flows by geographical focus



Note: MMF 2M cumulative net flows by geographical focus, EUR bn.

Sources: Thomson Reuters Lipper, ESMA.

A.124 Assets and leverage

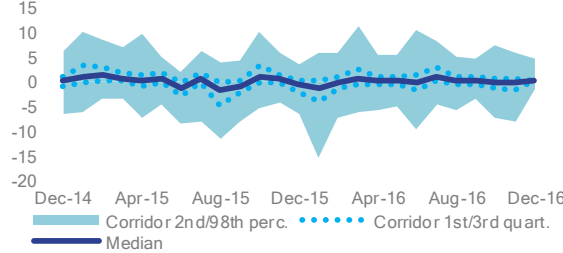


Note: NAV and AuM of EA MMFs, EUR tn. Leverage computed as the AuM/NAV ratio. 5Y-MA lev=five-year moving average for the leverage ratio.

Sources: ECB, ESMA.

Alternative funds

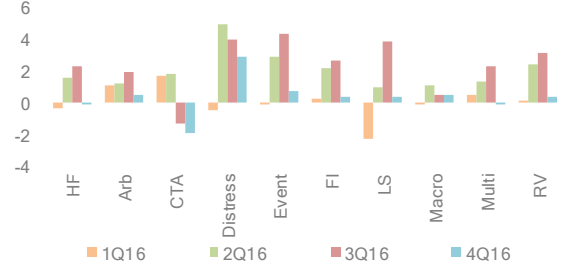
A.125 Hedge fund returns



Note: EU-domiciled hedge funds' monthly returns, in %. The graph shows the median returns, the difference between the returns corresponding to the 2nd and 98th percentiles and the difference between the returns corresponding to the 1st and 3rd quartiles.

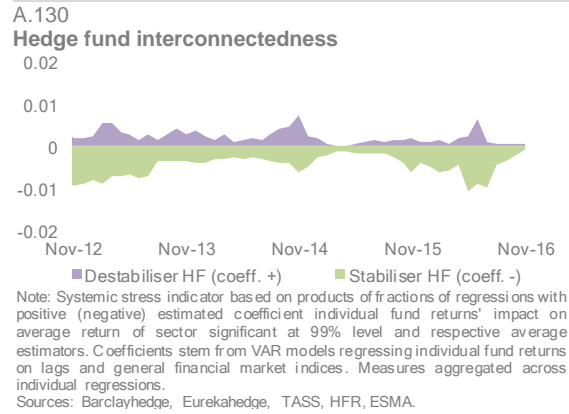
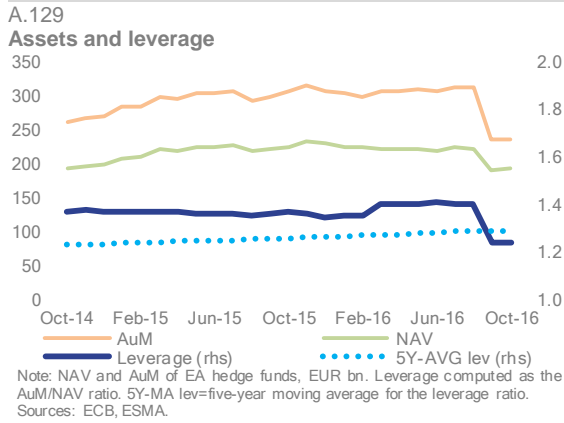
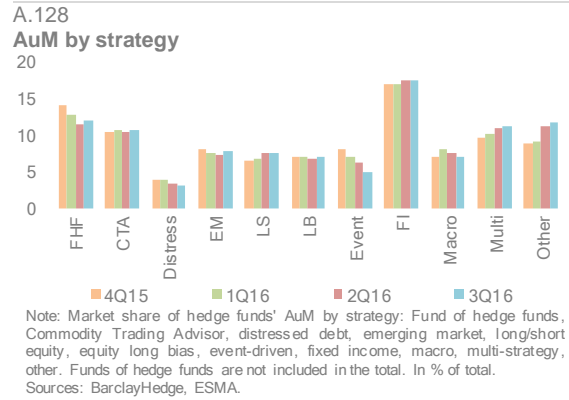
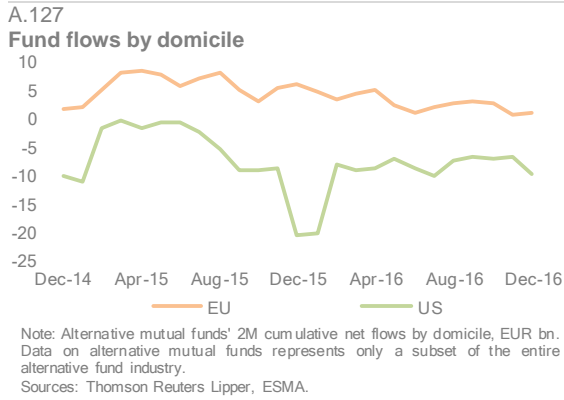
Sources: Barclayhedge, Eurekahedge, TASS, HFR, ESMA.

A.126 Hedge fund performance by strategy

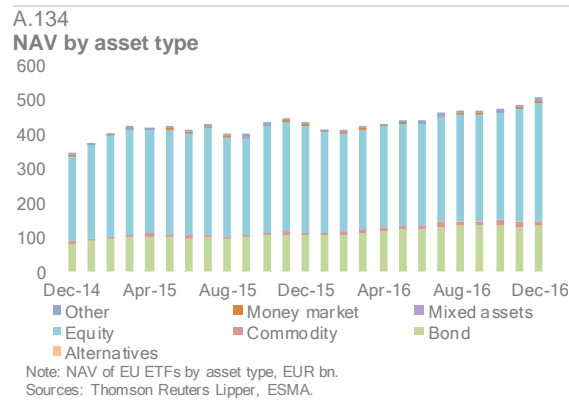
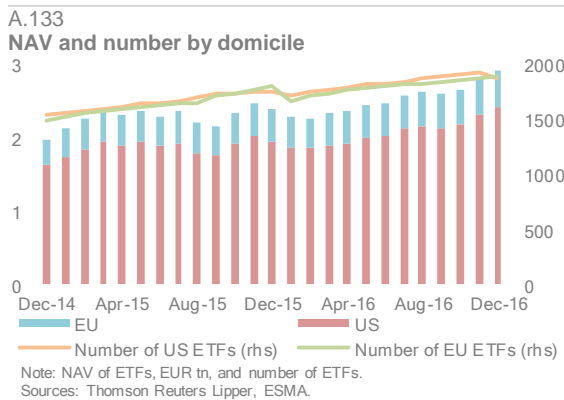
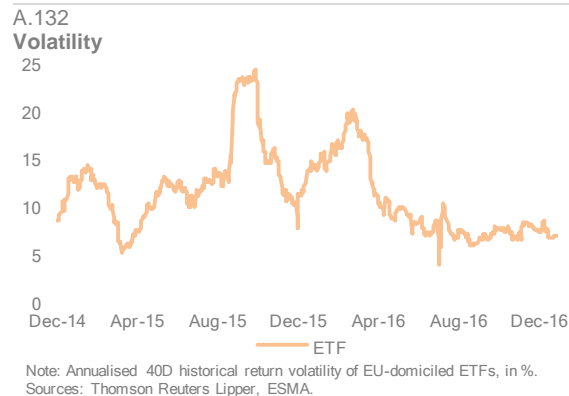
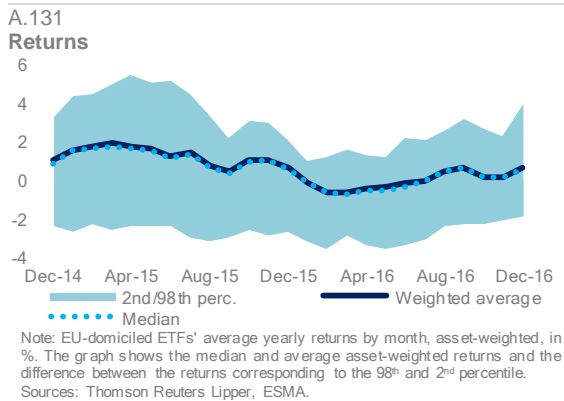


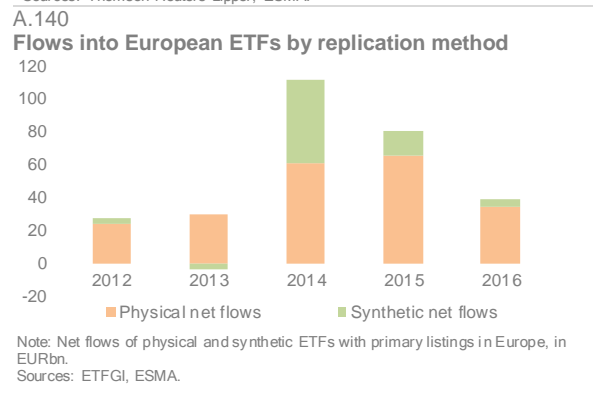
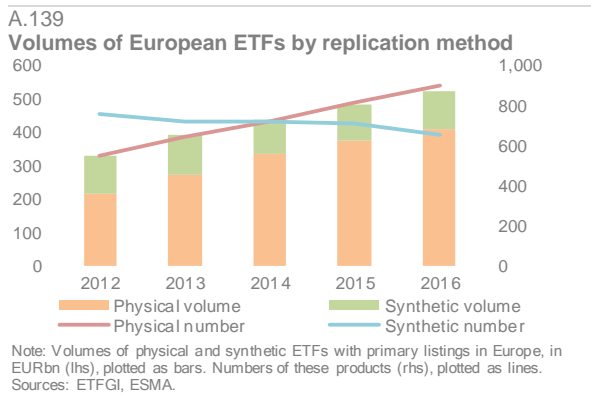
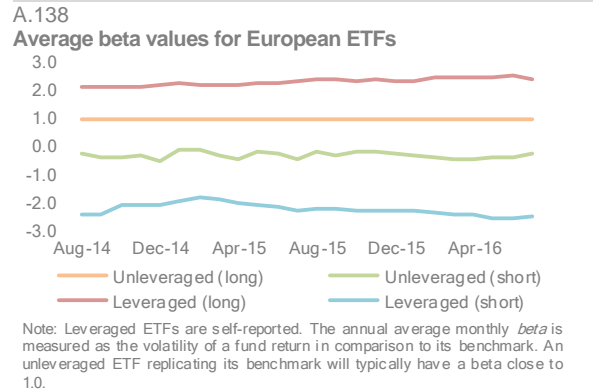
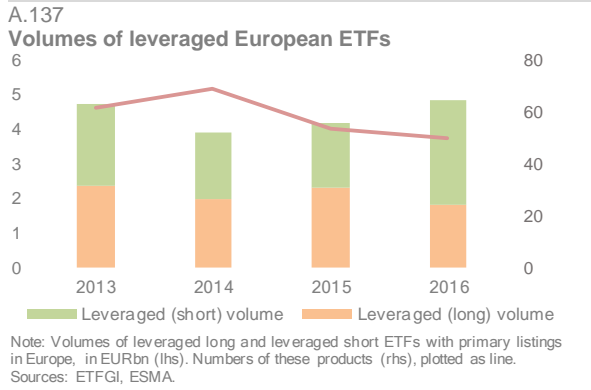
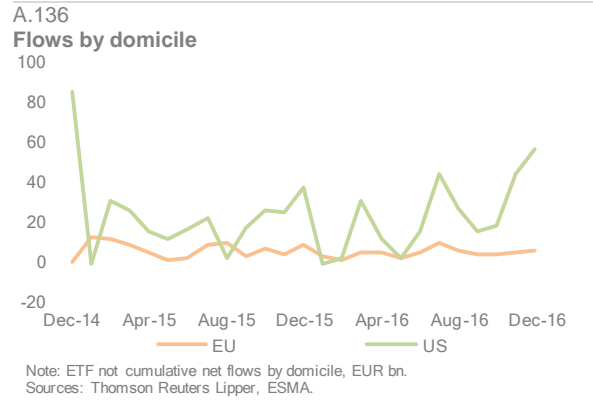
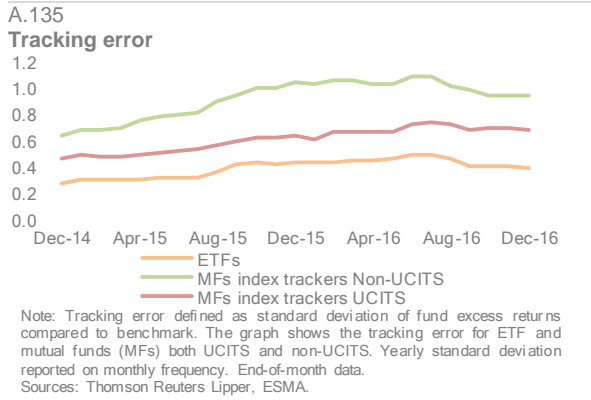
Note: Growth in hedge fund performance indices by strategy: Hedge fund index, arbitrage, CommodityTrading Advisor, distressed debt, event-driven, fixed income, long/short equity, macro, multi-strategy, relative values; in %.

Sources: Eurekahedge, ESMA.

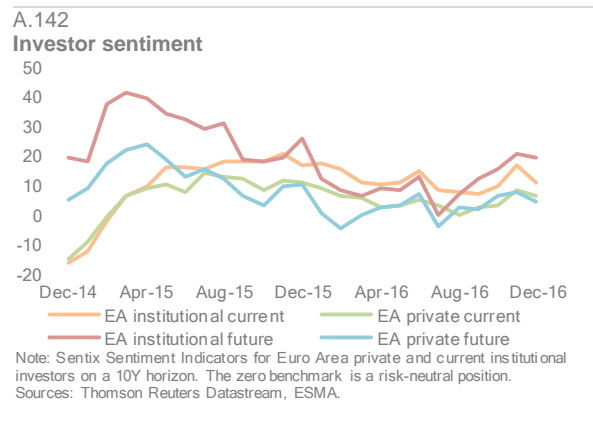
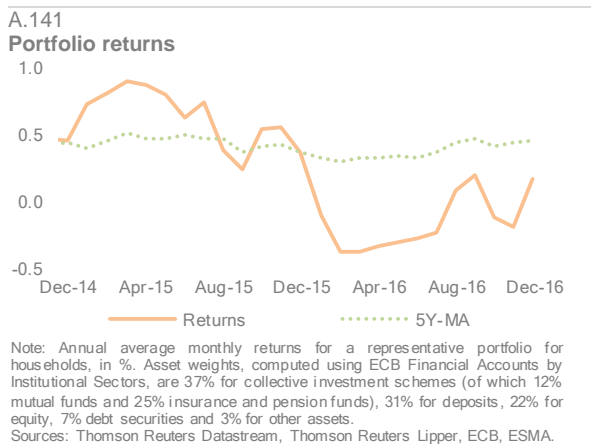


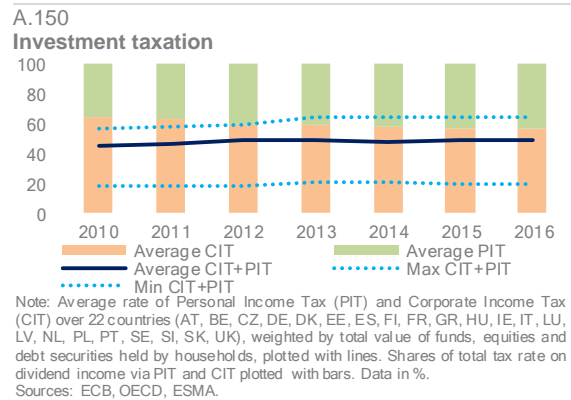
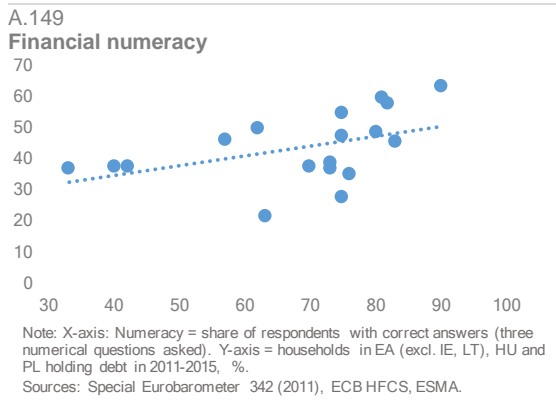
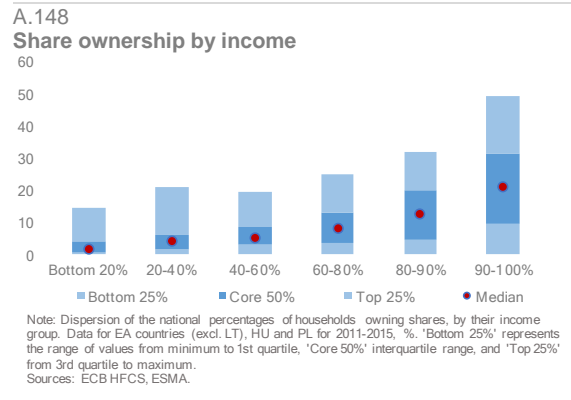
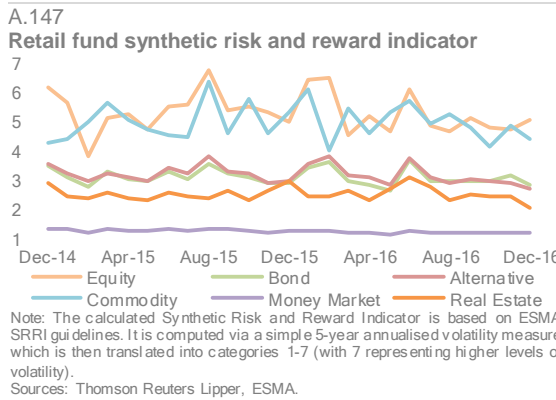
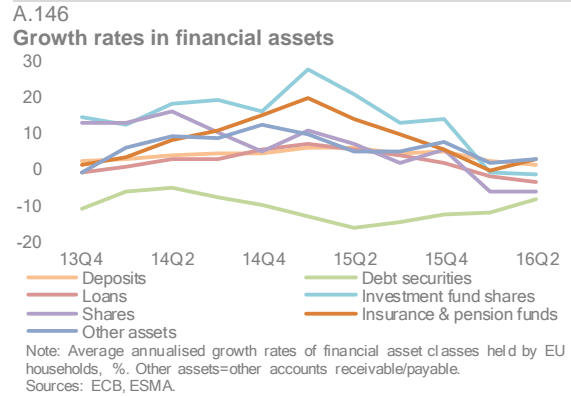
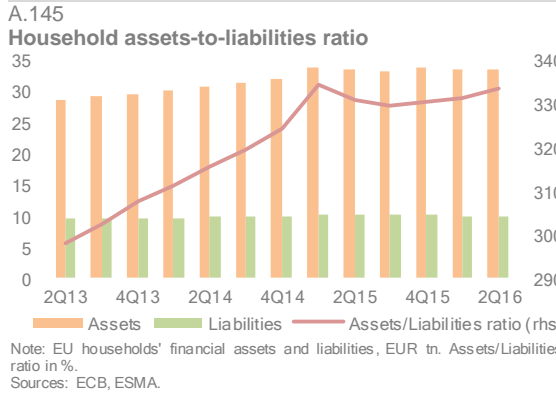
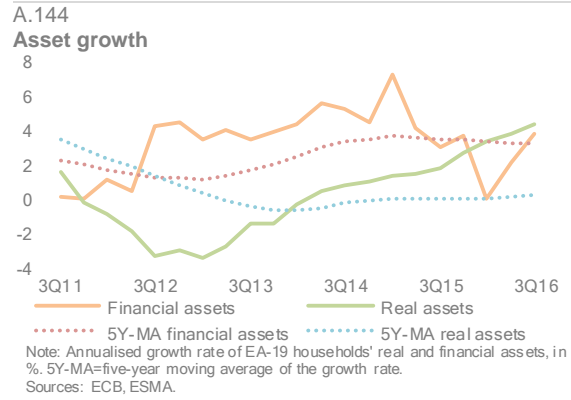
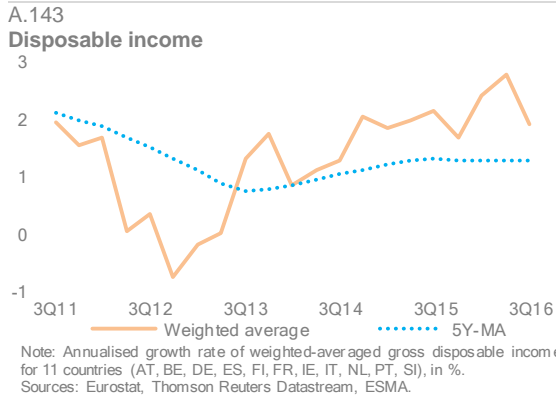
Exchange-traded funds





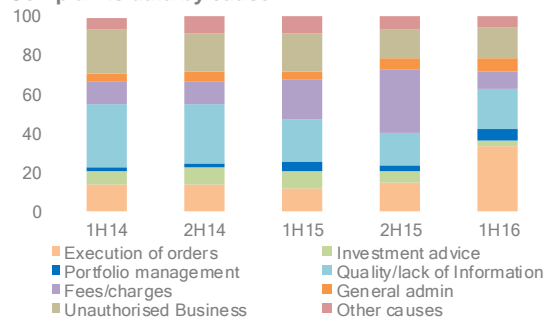
Retail investors





A.151

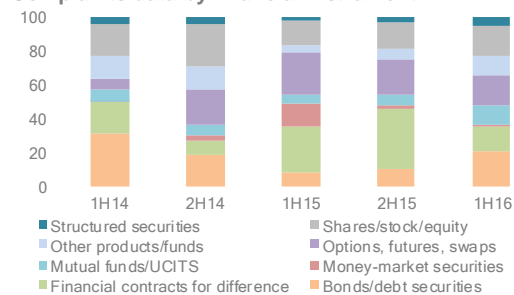
Complaints data by cause



Note: Complaints reported directly to NCAs by financial instrument, % of total. Data collected by NCAs. Source: ESMA complaints database.

A.152

Complaints data by financial instrument

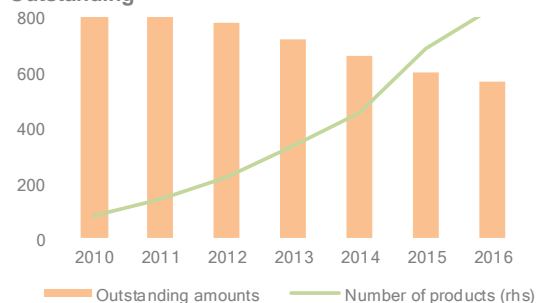


Note: Complaints reported by financial instrument, % of total. Data collected by NCAs. Source: ESMA complaints database.

Structured retail products

A.153

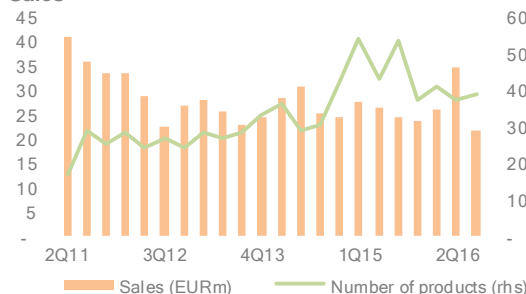
Outstanding



Note: Outstanding amounts, EUR bn. Number of products, mn. Sources: StructuredRetailProducts.com, ESMA.

A.154

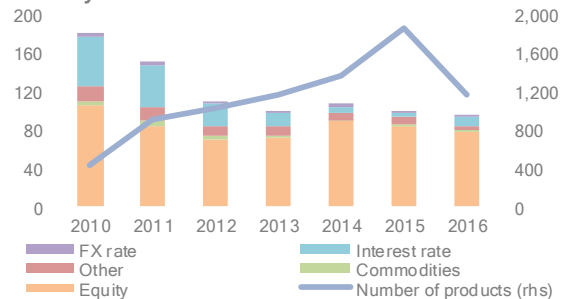
Sales



Note: Volumes of structured retail products issued by quarter, EUR bn. Number of products, thousand. Sources: StructuredRetailProducts.com, ESMA.

A.155

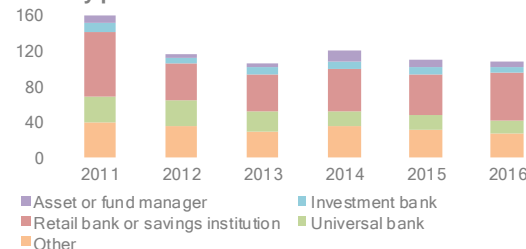
Sales by asset class



Note: Volumes of structured products sold to retail investors by asset class, EUR bn. Number of products sold, thousand. 2016 data year-to-date. Sources: StructuredRetailProducts.com, ESMA.

A.156

Sales by provider



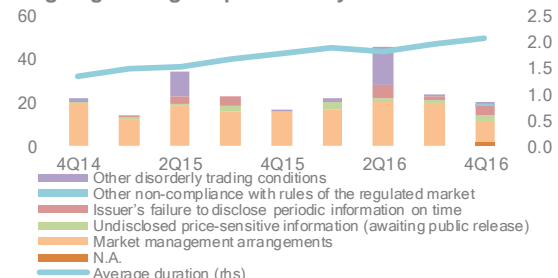
Note: Annual volumes of structured products sold to retail investors by provider, EUR bn. Others include: academic institutions; asset or fund managers; brokerage; commercial banks; independent financial advisers; insurance and pension companies; private banks or wealth managers; securities companies; SPV. Sources: StructuredRetailProducts.com, ESMA.

Infrastructures and services

Trading venues

A.157

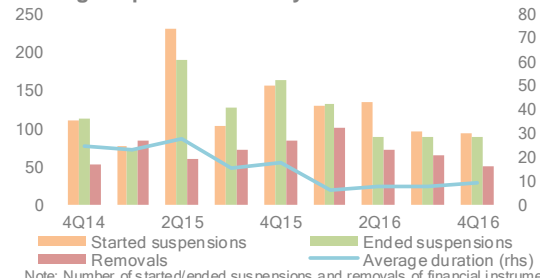
On-going trading suspensions by rationale



Note: Number of on-going suspensions of financial instruments traded in EEA trading venues, grouped by rationale. On-going suspensions are those that were live as of latest data point. Average duration in years plotted on right axis. Sources: ESMA Register on Suspensions and Removals.

A.158

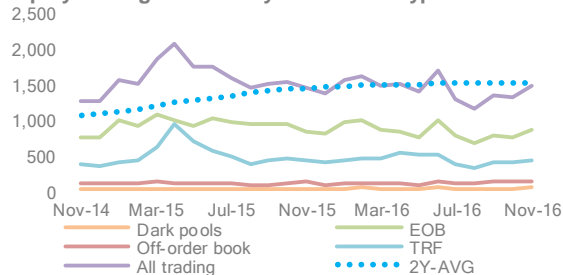
Trading suspensions – lifecycle and removal



Note: Number of started/ended suspensions and removals of financial instruments traded on EEA trading venues. Ended suspensions are those that were not live as of latest data point. Average duration of ended suspensions in days plotted on right axis. Sources: ESMA Register on Suspensions and Removals.

A.159

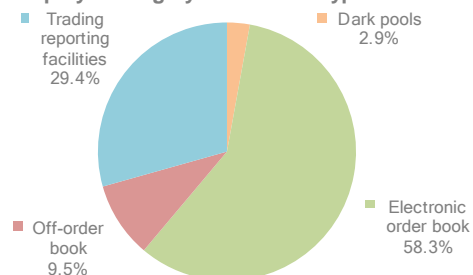
Equity trading turnover by transaction type



Note: Monthly equity turnover on EU trading venues by transaction type. EUR bn. 2Y-AVG=two-year average of all trading, EOB=Electronic Order Book, TRF=Trade Reporting Facilities. Sources: FESE, ESMA.

A.160

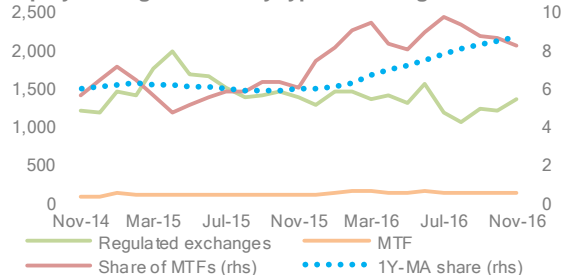
Share of equity trading by transaction type



Note: Share of equity turnover by transaction type over the reporting period, as % of total. Sources: FESE, ESMA.

A.161

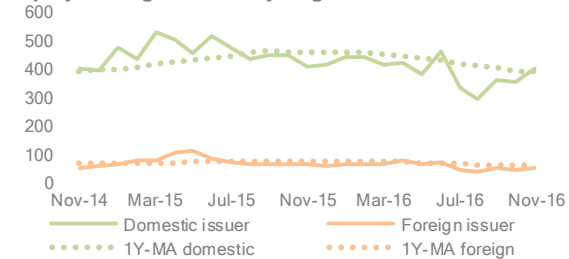
Equity trading turnover by type of trading venue



Note: Monthly equity turnover by type of EU trading venue, in EUR bn. Trading on multilateral trading facilities as % of total trading on the right axis. 1Y-MA share=one-year moving average share of MTFs. Sources: FESE, ESMA.

A.162

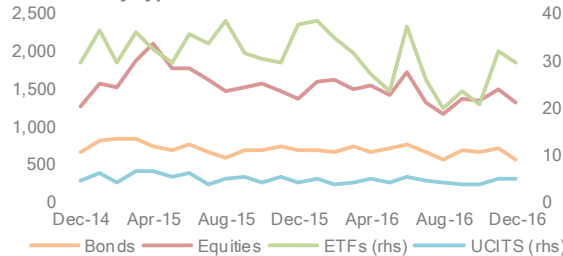
Equity trading turnover by origin of issuer



Note: Monthly equity turnover on EU trading venues by origin of the traded equity, in EUR bn. Data for London Stock Exchange, Equiduct and BATS Chi-X Europe are not reported. Foreign equities are issued in a country other than that of the trading venue. Sources: FESE, ESMA.

A.163

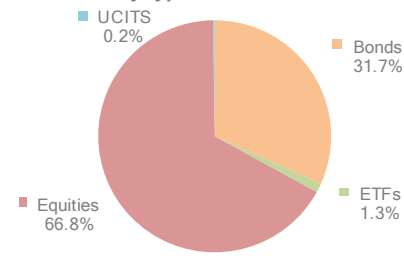
Turnover by type of assets



Note: Monthly turnover on EU trading venues by type of assets, in EUR bn. Data for Aquis Exchange, BATS Chi-x Europe, Equiduct, London Stock Exchange, TOM MTF and Turquoise are not reported for bonds, ETFs and UCITS. Sources: FESE, ESMA.

A.164

Share of turnover by type of assets

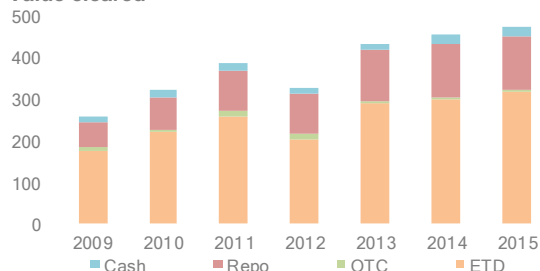


Note: Share of turnover by asset classes, in % of total turnover over the reporting period. Data for Aquis Exchange, BATS Chi-x Europe, Equiduct, London Stock Exchange, TOM MTF and Turquoise are not reported for bonds, ETFs and UCITS. Sources: FESE, ESMA.

Central counterparties

A.165

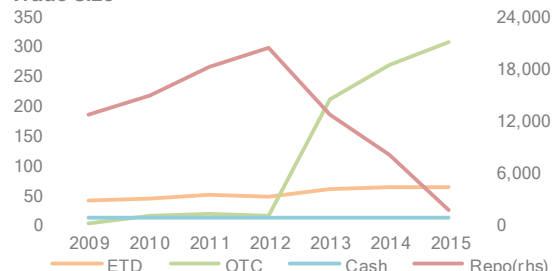
Value cleared



Note: Volume of transactions cleared by reporting CCPs. Annual data, EUR tn, for Cash, Repos, non-OTC and OTC derivatives. LCH. Clearnet Ltd. not included as there is uneven reporting during the period. Sources: ECB, ESMA.

A.166

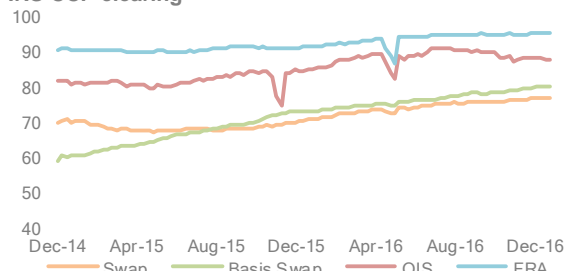
Trade size



Note: Average size of transactions cleared by reporting CCPs, for Cash, Repos, non-OTC and OTC derivatives. Annual data, EUR thousand. LCH. Clearnet Ltd. not included as there is uneven reporting during the period. Sources: ECB, ESMA.

A.167

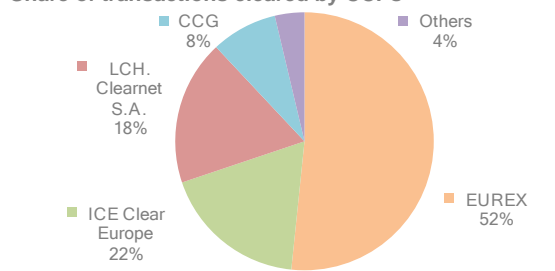
IRS CCP clearing



Note: OTC interest rate derivatives cleared by CCPs captured by Dealer vs. CCP positions, in % of total notional amount. Spikes due to short-term movements out of the Dealer vs CCP positions. Sources: DTCC, ESMA.

A.168

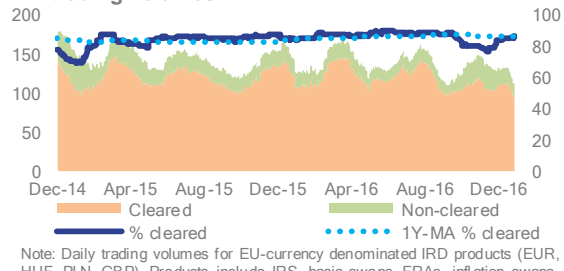
Share of transactions cleared by CCPs



Note: Share of volume of transactions cleared by reporting CCPs for Cash, Repos, non-OTC and OTC derivatives, 2015. LCH. Clearnet Ltd. not included as there is uneven reporting during the period. Sources: ECB, ESMA.

A.169

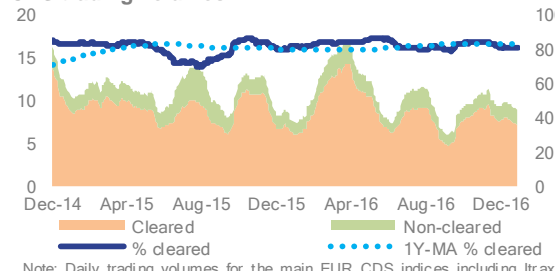
IRD trading volumes



Note: Daily trading volumes for EU-currency denominated IRD products (EUR, HUF, PLN, GBP). Products include IRS, basis swaps, FRAs, inflation swaps, OIS. 40D-MA notional data, in USD bn. ISDASwapsInfo data are based on publicly available data from DTCC Trade Repository LLC and Bloomberg Swap Data Repository. Sources: ISDA SwapsInfo, ESMA.

A.170

CDS trading volumes

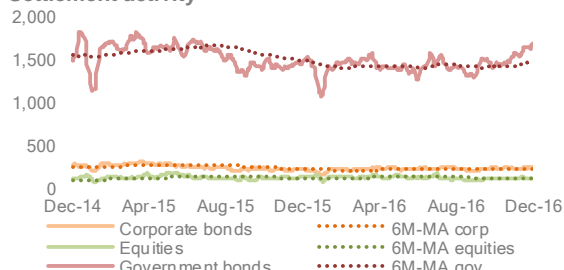


Note: Daily trading volumes for the main EUR CDS indices including Itraxx Europe, Itraxx Europe Crossover, Itraxx Europe Senior Financials. 40D-MA notional data, in USD bn. ISDASwapsInfo data are based on publicly available data from DTCC Trade Repository LLC and Bloomberg Swap Data Repository. Sources: ISDA SwapsInfo, ESMA.

Central securities depositories

A.171

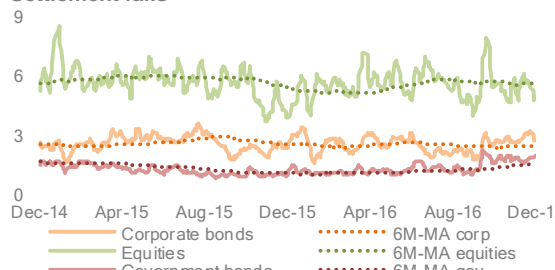
Settlement activity



Note: Total value of settled transactions in the EU as reported by NCAs, in EUR bn, one-week moving averages. 6M-MA=six-month moving average. Free-of-payment transactions not considered. Sources: National Competent Authorities, ESMA.

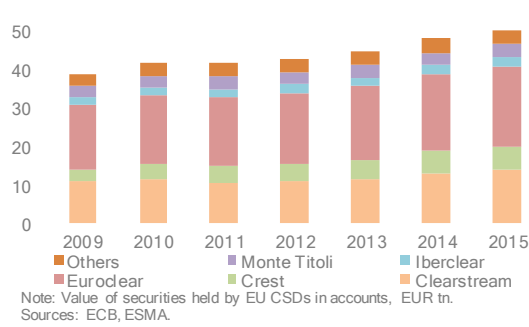
A.172

Settlement fails

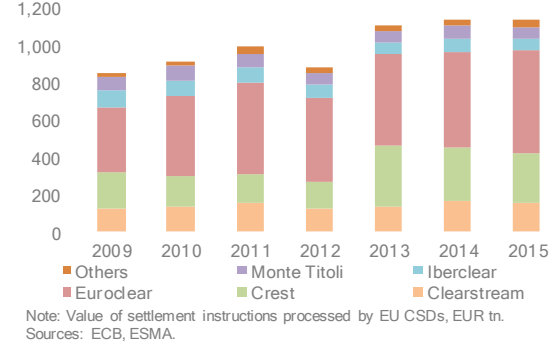


Note: Share of failed settlement instructions in the EU, in % of value, one-week moving averages. 6M-MA=six-month moving average. Free-of-payment transactions not considered. Sources: National Competent Authorities, ESMA.

A.173
Securities held in CSD accounts

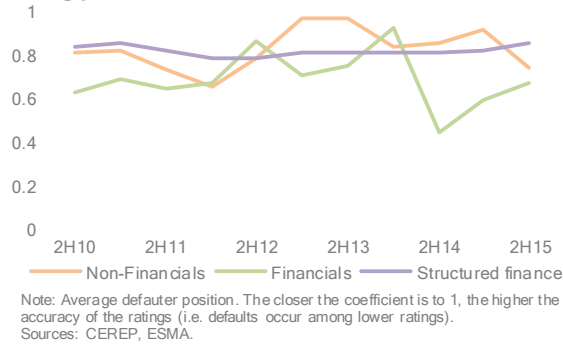


A.174
Value of settled transactions

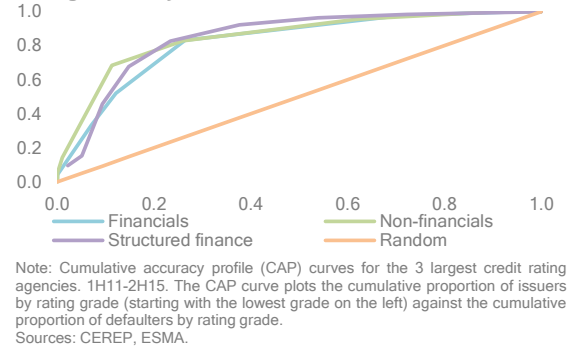


Credit rating agencies

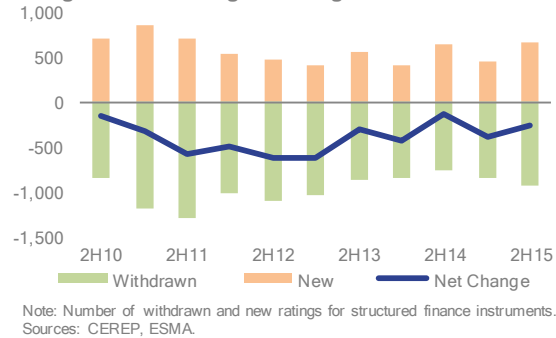
A.175
Rating performance



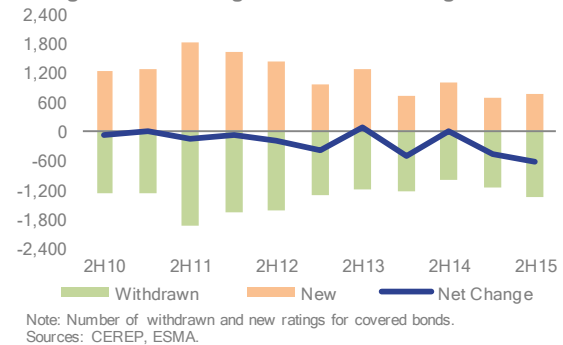
A.176
Rating accuracy



A.177
Change in outstanding SFI ratings

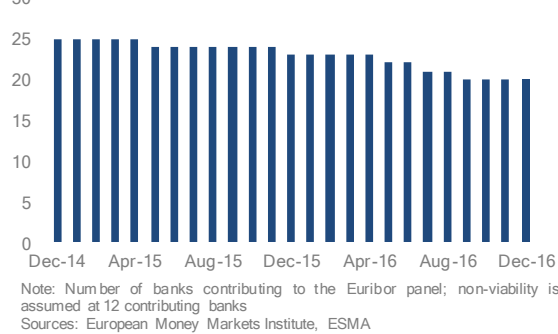


A.178
Change in outstanding covered bond ratings

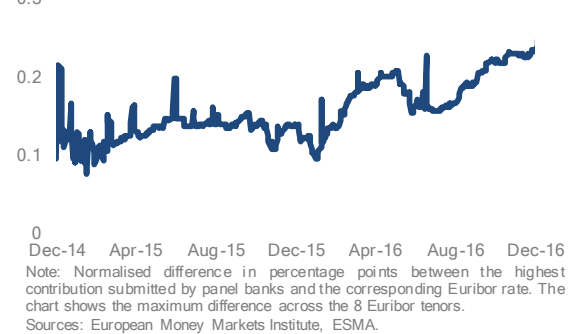


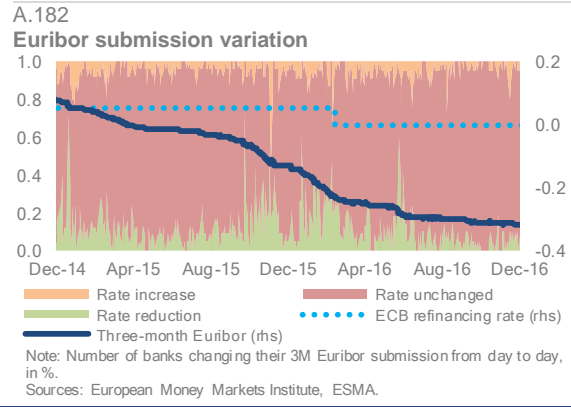
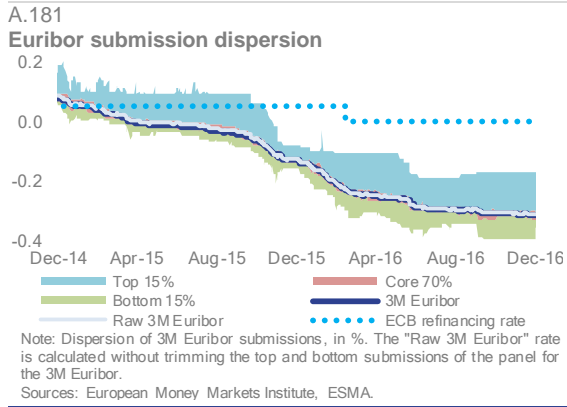
Financial benchmarks

A.179
Number of Euribor panel banks

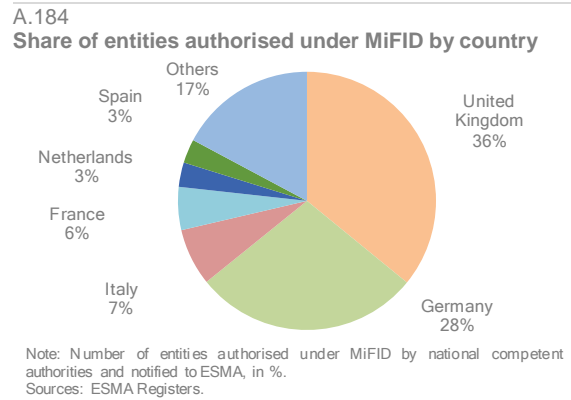
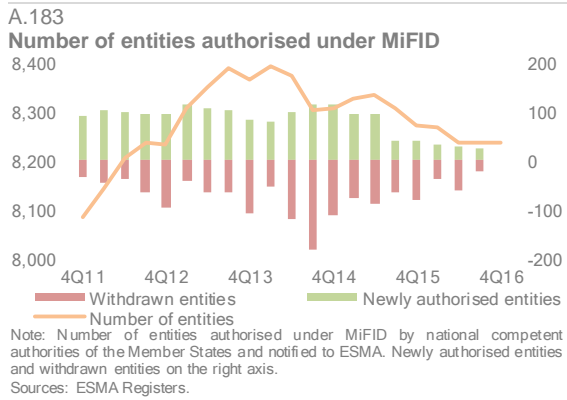


A.180
Dispersion in Euribor contributions





MiFID entities



List of abbreviations

ABS	Asset-Backed Securities
AuM	Assets under Management
AVG	Average
BF	Bond fund
BPS	Basis points
CAP	Cumulative Accuracy Profile
CCP	Central Counterparty
CDO	Collateralised Debt Obligation
CDS	Credit Default Swap
CRA	Credit Rating Agency
CTA	Commodity Trading Advisors funds
DTCC	Depository Trust and Clearing Corporation
EA	Euro Area
EBA	European Banking Authority
ECB	European Central Bank
EF	Equity fund
EFAMA	European Fund and Asset Management Association
EIOPA	European Insurance and Occupational Pensions Authority
EM	Emerging market
EMIR	European Market Infrastructure Regulation
EOB	Electronic Order Book
EONIA	Euro Overnight Index Average
ESMA	European Securities and Markets Authority
ETF	Exchange Traded Fund
EU	European Union
FRA	Forward Rate Agreement
IMF	International Monetary Fund
IPO	Initial Public Offering
IRD	Interest Rate Derivative
IRS	Interest Rate Swap
LTRO	Long-Term Refinancing Operation
MA	Moving Average
MBS	Mortgage-Backed Securities
MMF	Money Market Funds
MTN	Medium Term Note
NAV	Net Asset Value
NCA	National Competent Authority
OIS	Overnight Index Swap
OMT	Outright Monetary Transactions
OTC	Over the Counter
RMBS	Residential Mortgage-Backed Securities
SCDS	Sovereign Credit Default Swap
SF	Structured Finance
SFT	Securities Financing Transaction
UCITS	Undertaking for Collective Investment in Transferable Securities
YTD	Year to Date

Countries abbreviated according to ISO standards

Currencies abbreviated according to ISO standards



European Securities and
Markets Authority

