

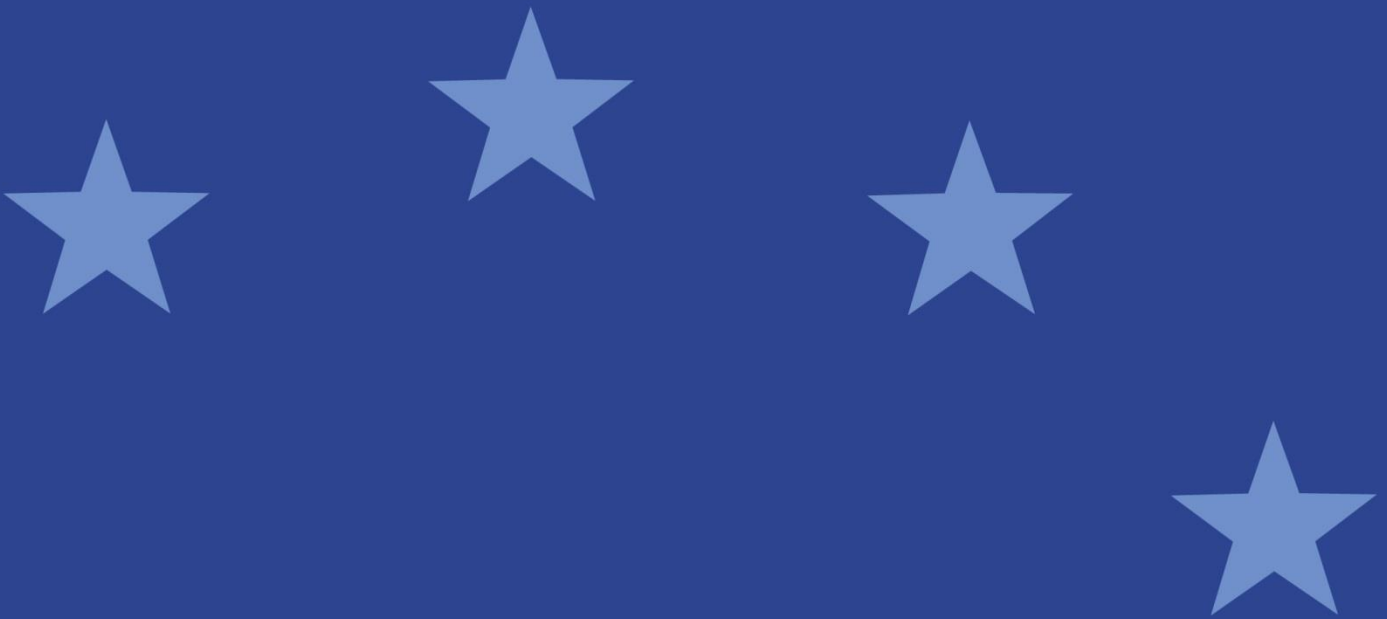


European Securities and  
Markets Authority

# TRV

ESMA Report on Trends, Risks and Vulnerabilities

No. 1, 2018



---

ESMA Report on Trends, Risks and Vulnerabilities  
No. 1, 2018

© European Securities and Markets Authority, Paris, 2018. All rights reserved. Brief excerpts may be reproduced or translated provided the source is cited adequately. The reporting period of this Report is 1 July 2017 to 31 December 2017, unless indicated otherwise. The reporting quarter of the Risk Dashboard in the Risk Section is 4Q17. Legal reference of this Report: Regulation (EU) No 1095/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Securities and Markets Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/77/EC, Article 32 "Assessment of market developments", 1. "The Authority shall monitor and assess market developments in the area of its competence and, where necessary, inform the European Supervisory Authority (European Banking Authority), and the European Supervisory Authority (European Insurance and Occupational Pensions Authority), the ESRB and the European Parliament, the Council and the Commission about the relevant micro-prudential trends, potential risks and vulnerabilities. The Authority shall include in its assessments an economic analysis of the markets in which financial market participants operate, and an assessment of the impact of potential market developments on such financial market participants." The information contained in this publication, including text, charts and data, exclusively serves analytical purposes. It does not provide forecasts or investment advice, and does not prejudice, preclude or influence in any way past, present or future regulatory or supervisory obligations on market participants.

The charts and analyses in this report are, fully or in parts, based on data not proprietary to ESMA, including from commercial data providers and public authorities. ESMA uses these data in good faith and does not take responsibility for their accuracy or completeness. ESMA is committed to constantly improving its data sources and reserves the right to alter data sources at any time. The third-party data used in this publication may be subject to provider-specific disclaimers, especially regarding its ownership, its reuse by non-customers and, in particular, the accuracy, completeness or timeliness of the data provided and the provider's liability related thereto. Please consult the websites of the individual data providers, whose names are detailed throughout this report, for more details on these disclaimers. Where third-party data are used to create any chart, table or analysis the third party is identified and credited as the source. In each case, ESMA is cited by default as a source, reflecting any data management, cleaning, processing, matching, analytical, editorial or other adjustments to raw data undertaken.

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

---

# Table of contents

<b>Executive summary</b>	<b>4</b>
<b>Trends</b>	<b>6</b>
Market environment	7
Securities markets	9
Investors	14
Infrastructures and services	23
<b>Risks</b>	<b>28</b>
ESMA Risk Dashboard	29
Securities markets	32
Investors	35
Infrastructures and services	37
<b>Vulnerabilities</b>	<b>39</b>
Investor protection	40
AIFMD – a framework for risk monitoring	40
Orderly markets	51
Exchange-traded derivatives in the EU – an overview	51
Financial stability	60
The public disclosure of net short positions	60
Methods	68
Operational risk assessment – the ESMA approach	68
<b>Annexes</b>	<b>76</b>
Statistics	77
Securities markets	77
Investors	90
Infrastructures and services	99
List of abbreviations	103

# Executive summary

## Trends and Risks

### ESMA risk assessment

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			Infrastructure disruptions, incl. cyber risks	
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:** Risks in the markets under ESMA's remit remained at high levels, reflecting very high risk in securities markets, and elevated risk for investors, infrastructures and services. ESMA's market risk assessment remained very high, reflecting the low interest rate environment, potential repricing of risk premia, valuation risk, and uncertainty on future geopolitical developments. While benign market conditions prevailed during the reporting period, February 2018 saw severe market corrections and the return of equity market volatility, confirming our prevailing valuation concerns. On the other hand, the level of credit risk eased from very high to high, reflecting a strengthening macroeconomic environment and higher credit ratings in several EU member states, although the deterioration in outstanding corporate ratings persisted. Liquidity risk in 4Q17 remained high despite improvements in securities markets. Operational risk was elevated, but with a deteriorating risk outlook as concerns mount over potential cyber-attacks. The risk outlook was stable across the other risk categories. On the perimeter of global securities markets, the latter months saw an extraordinary rise and subsequent fall in prices of virtual currencies, as well as growing issuance of Initial Coin Offerings (ICOs). ESMA has warned against the substantial risks associated with investments in virtual currencies and ICOs.

**Securities markets:** In 2H17 EU equity prices continued to increase while interest rates remained close to historical lows, with concerns around asset overvaluation mounting until the sharp equity market correction of February 2018. Implied volatility option prices remained at record lows during the reporting period, despite the flare-up in geopolitical tensions over the summer, raising the spectre of sudden risk repricing. However, volatility spiked in February 2018 as global equity markets experienced sharp declines. On the financing side, financial corporates tapped equity markets heavily in 2H17 and reduced their gross debt issuance. Sovereign bond market issuance declined as EU Member States consolidate public finances. Repo and securities lending market activities continued to grow amidst renewed signs of pressure in euro-denominated collateral markets, in particular due to greater demand for German and French government debt collateral.

**Investors:** Having rebounded in 1H17, investment fund returns declined in 2H17 amid a strengthening economic outlook and rising asset prices. Fixed income funds attracted the majority of the EUR 345bn of EU fund inflows. MMFs rebounded to register solid inflows in both the EU and the US. Within the bond fund category there was limited evidence of search-for-yield behaviour, with funds focusing on EM assets recording large inflows. ETFs continued to grow, nearly tripling their assets under management (AuM) in five years. Overall, at the end of 2017 EU investment funds had AuM worth EUR 12tn, an increase of 11% from December 2016. Sales of structured retail products fell again in 2H17, although retail investors increased their purchases of short-term products. Retail investor

sentiment continued to improve in 2H17, and disposable income and household asset holdings registered robust growth, although the impact of the February 2018 correction on investor confidence remains to be seen. Complaints reported to NCAs decreased in 1H17, with order execution remaining the chief cause for complaint.

**Infrastructures and services:** In 2H17 equity trading activity contracted. The composition of trading remained broadly stable, with the majority of transactions occurring via electronic order books. With respect to CCPs, the rate of centrally cleared products increased for both interest rate and credit derivatives. In 2H17 ESMA added three CCPs to its list of third-country central counterparties recognised to offer services and activities in the EU. In addition, the second delegated regulation requiring mandatory clearing of certain index CDS and IRS took effect for financial counterparties and AIFs above the EUR 8bn threshold of gross amounts outstanding. In the CRA industry, securitised products registered a peak in the size of downgrades in 2H17. With regard to financial benchmarks, the number of Euribor panel contributors remained stable at 20 banks and the dispersion of Euribor quotes submitted decreased overall.

## Vulnerabilities

**AIFMD – a framework for risk monitoring:** We provide first-time EU-wide evidence on the Alternative Investment Fund (AIF) market, based on AIFMD data. It discusses the distinctive features of the AIFMD in the light of their role in enhancing market integrity and their impact on financial stability. The extensive reporting obligations introduced by the AIFMD for AIFs and their managers (AIFMs) allow National Competent Authorities to oversee whether AIFMs are properly addressing micro-prudential risks, and to assess the potential systemic consequences of the individual or collective AIFM activities. By providing a first analysis of the structure and main risks stemming from the AIF market, this article helps to build an operational framework for monitoring risks in the AIFM sector.

**Exchange traded derivatives in the EU – an overview:** ESMA presents an overview of the EU exchange-traded derivatives (ETD) market on the basis of data collected before the implementation of MiFID II/MiFIR. The forthcoming regulatory framework will have a profound impact on the structure of EU financial markets. Therefore, a comparison between pre- and post-MiFID II ETD market structures will improve our understanding of structural changes and this article is laying the foundations for such a comparison. Our main findings show that, as of 2H16, the EEA ETD market size was around EUR 200tn in terms of trading volumes, and products were more standardised than in the Over-The-Counter (OTC) market.

**The public disclosure of net short positions:** As part of the latest Review of the EU Short Selling Regulation, ESMA conducted an analysis of net short positions in EU shares and the impact of public disclosure on investor behaviour. Short-selling activities in EU equities are highly concentrated, with short sellers (excluding market makers and primary dealers) mainly located in the US and UK, and a few investors active on a large number of EU shares. The public disclosure threshold influences the market outcome of net short positions, which seems driven by investors seeking to avoid crossing the threshold in order to keep their strategy secret. The article also investigates herd behaviour in the context of public disclosure.

**Operational risk assessment – the ESMA approach:** Operational challenges for financial market participants have intensified in recent years. Consequently, regulatory and supervisory attention on operational risk monitoring has increased. This article introduces our new systematic, comprehensive, analytical approach to operational risk monitoring in EU markets. Going forward, in line with our general risk assessment methodology we will take a wide range of quantitative indicators into consideration, complemented by in-depth market intelligence. In doing so, we focus on three priority risk areas of specific relevance to ESMA and the markets in our remit: market misconduct, infrastructure disruptions, and cyber attacks.

# Trends

# Market environment

The market environment continued to improve in 2H17, mainly against the backdrop of strengthening macroeconomic conditions. However, political risk remained significant, with Brexit a critical source of potential instability for EU financial markets and geopolitical tensions outside the EU on the rise. Nonetheless, financial conditions remained benign, with continued support from monetary policy and investors focusing on ECB announcements regarding its asset purchase programmes. Overall, EU financial markets and investment vehicles performed positively in 2H17, bolstered by improved economic sentiment and the cyclical recovery. Rebalancing of the EU financial system continues, with strong growth in market financing.

In the second half of 2017, the **macroeconomic environment** continued to improve. Global GDP growth was forecast to accelerate to 3.6% in 2017, and EU growth to 2.3% in 2017 and 2.1% in 2018 thanks to the cyclical recovery taking hold.<sup>1</sup> The improvement was broad-based, with fiscal deficit in most EU countries below 3% of GDP. However, public and private sector debt levels remain high in several Member States, despite the encouraging deleveraging trend.

**Political risk** remained significant, with uncertainty around the outcome of the Brexit negotiations a key source of concern for EU financial markets. The focus remains on the risk of potential cliff effects, which still warrants close vigilance by both public authorities and market participants, considering in particular that asset prices have shown limited reactivity to political developments – currency movement aside. In the Brexit context, ESMA has issued sector-specific (investment firms, investment management and secondary markets) principles regarding potential business relocations from the UK to the EU 27.<sup>2</sup>

Moreover, questions remain around the continued support for the global financial regulatory framework and reforms implemented since the financial crisis, which may affect global commitment to a sounder and more stable financial system. However, given the absence of concrete developments in this area, economic policy uncertainty has so far remained limited (T.3). Lastly, the escalation in geopolitical tensions around the Korean peninsula and resultant uncertainty during the summer affected Asian markets, although the spillover into EU markets was limited.

Against this background, **financial conditions** were benign during the second half of 2017, with

continued support from monetary policy, asset price volatilities at historical lows, and positive steps being taken to address non-performing loan issues in EU countries. Given the improving economic environment, market participants have turned their attention to announcements regarding the ECB's future monetary policy stance.

The **market performance** of EU securities and investment vehicles during the reporting period mirrored the enhanced macroeconomic and financial environment, with some commodity markets performing particularly strongly (T.1). Investors remained largely indifferent to political risks, as reflected in low volatilities (T.2) and sustained high economic and market sentiment (T.4), despite the return of equity market volatility in February 2018.

Developments in 2017 **capital flows** were mainly characterised by increased risk appetite from EA investors. Net monthly purchases of foreign equities by EA residents averaged EUR 17bn through October, compared with a ten-year average of EUR 5bn, and long-term debt purchases remained very high (T.5). EU institutional investment flows continued to expand across sectors (T.7).

The growth in EU **capital market financing** continues unabated, as EU economies further diversify their sources of financing (T.8). As part of the Capital Markets Union initiative, the European Commission proposed strengthening the ESAs' mandate to promote further EU financial market integration. This includes new direct capital markets supervisory powers and the extension of convergence powers for ESMA.<sup>3</sup>

<sup>1</sup> IMF, World Economic Outlook, October 2017, and European Commission, Autumn Forecast 2017.

<sup>2</sup> For further information, see Opinions to support supervisory convergence in the context of the UK withdrawal from the European Union:

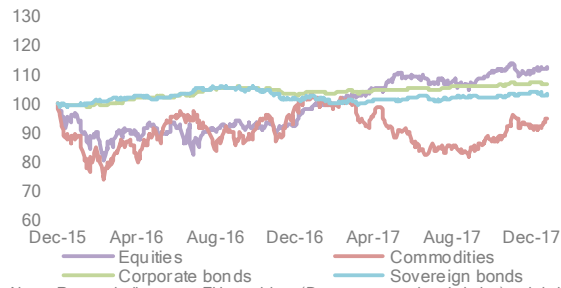
<https://www.esma.europa.eu/press-news/esma-news/esma-issues-sector-specific-principles-relocations-uk-eu27>

<sup>3</sup> For more details on the proposal, see: [http://europa.eu/rapid/press-release\\_IP-17-3308\\_en.htm](http://europa.eu/rapid/press-release_IP-17-3308_en.htm)

T.1

Market performance

Equity prices continued to increase

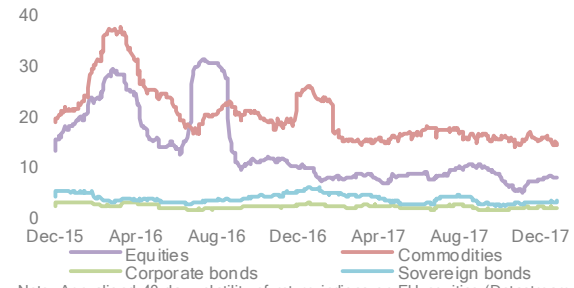


Note: Return indices on EU equities (Datastream regional index), global commodities (S&P GSCI) converted to EUR, EA corporate and sovereign bonds (iBoxx Euro, all maturities). 01/12/2015=100.  
Sources: Thomson Reuters Datastream, ESMA.

T.2

Market volatilities

Volatility low and stable

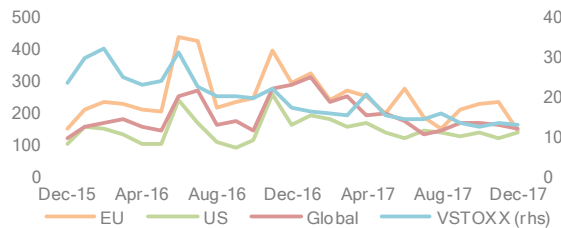


Note: Annualised 40-day volatility of return indices on EU equities (Datastream regional index), global commodities (S&P GSCI) converted to EUR, EA corporate and sovereign bonds (iBoxx Euro, all maturities), in %.  
Sources: Thomson Reuters Datastream, ESMA.

T.3

Economic policy uncertainty

Less economic policy uncertainty in 2H17

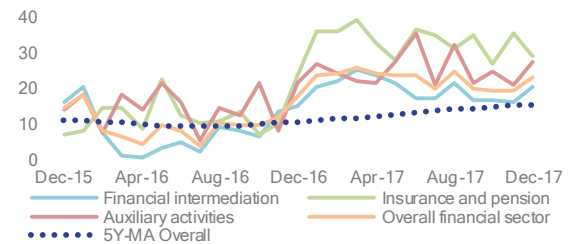


Note: Economic Policy Uncertainty Index (EPU), developed by Baker et al. (www.policyuncertainty.com), based on the frequency of articles in EU newspapers that contain the following triple: "economic" or "economy", "uncertain" or "uncertainty" and one or more policy-relevant terms. Global aggregation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

T.4

Market confidence

Confidence lower but still above average

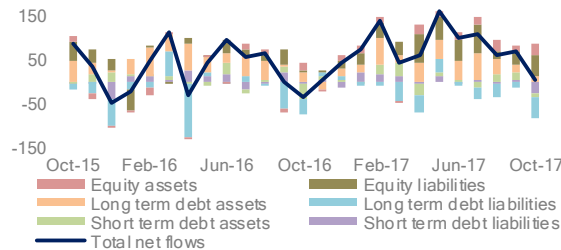


Note: European Commission survey of EU financial services sector and subsectors (NACE Rev.2 64, 65, 66). Confidence indicators are averages of the net balance of responses to questions on development of the business situation over the past three months, evolution of demand over the past three months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

T.5

Portfolio investment flows

Sustained net outflows from Euro Area

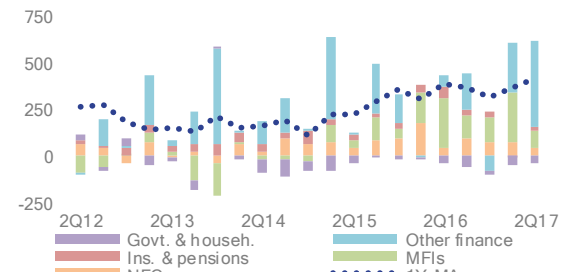


Note: Balance of Payments statistics, financial accounts, portfolio investments by asset class. Assets=net purchases (net sales) of non-EA securities by EA investors. Liabilities=net sales (net purchases) of EA securities by non-EA investors. Total net flows=net outflows (inflows) from (into) the EA.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

T.6

Investment flows by resident sector

Large increase in non-bank investments

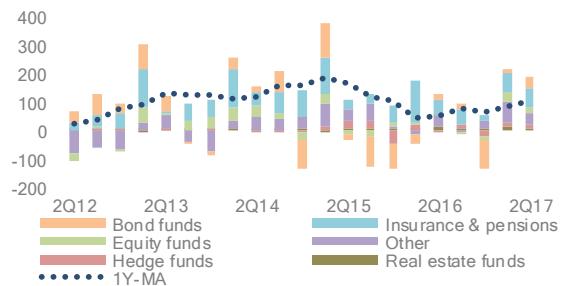


Note: Quarterly Sector Accounts. Investment flows by resident sector in equity (excluding investment fund shares) and debt securities, EUR bn. 1Y-MA=one-year moving average of all investment flows.  
Sources: ECB, ESMA.

T.7

Institutional investment flows

Broad-based inflows in 1H17

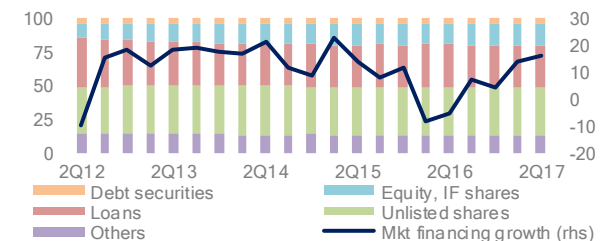


Note: EA institutional investment flows by type of investor, EUR bn. Other=financial vehicle corporations, mixed funds, other funds. 1Y-MA=one-year moving average of all investment flows.  
Sources: ECB, ESMA.

T.8

Market financing

Capital market financing growth continues



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



# Securities markets

In 2H17 EU equity prices continued to increase while interest rates remained close to historical lows, with concerns around asset overvaluation mounting until the sharp equity market correction February 2018. Implied volatility option prices remained at record lows during the reporting period, despite the flare-up in geopolitical tensions over the summer, raising the spectre of sudden risk repricing. However, equity market volatility returned in February 2018, as global equity markets experienced sharp declines. On the financing side, financial corporates tapped equity markets heavily in 2H17 and reduced their gross debt issuance. Sovereign bond market issuance declined as EU Member States consolidate public finances. Repo and securities lending market activities continued to grow amidst renewed signs of pressure in euro-denominated collateral markets, in particular due to greater demand for German and French government debt collateral.

## Equity: rising valuations

Global equity markets continued to rally in 2H17. US **equity prices** gained more than 19% in 2017, taking cumulative gains since early 2016 to 31% (A.15). EU equity prices rose almost 10% in 2017 after remaining flat in 2016 and despite stalling over the summer as the stronger euro reduced the appeal of EA shares to foreign investors. European bank shares underperformed somewhat before recovering towards the end of the year (A.17).

The prolonged rally in equity prices has fuelled fears of overvaluation, especially in US equity markets, possibly contributing to the sharp equity market correction of February 2018. Price-earnings ratios adjusted for the business cycle do indeed show that current **equity valuations** are high in the US relative to their long-term average. On the other hand, despite having risen above their long-term average, EA equity valuations nonetheless remain below previous peaks observed in 1998, 2000 and 2007 (T.9).



Note: Monthly earnings adjusted for trends and cyclical factors via Kalman filter methodology based on OECD leading indicators; units of standard deviation on 25-year averages excluding 1998-2000 asset bubble.  
Sources: Thomson Reuters Datastream, ESMA.

There were some noteworthy differences in the relative performance of national equity indices within the EU, although overall price **dispersion** remained quite low (A.19). The IBEX 35

underperformed, reflecting investor concerns as regional tensions flared up after the summer (-4% in 2H17).

**Equity market volatility** remained very low by historical standards in 2H17, with the VSTOXX declining to around 13%, far below its long-term average of 20% (A.20). This was despite geopolitical tensions increasing in the Korean peninsula, which could have a direct impact on the economic environment and global financial stability (Box T.10). While low volatility during the reporting period reflected to some extent expectations of continued monetary policy support, the absence of market reaction to geopolitical events could possibly heighten investor complacency and the probability of sudden risk repricing. This might have contributed to the return of global equity market volatility in February 2018, with the S&P 500 losing 4.1% in one day and the VIX climbing above 40%, its highest reading in several years.

Inter-sectoral **correlations** may have reinforced the low volatility that prevailed during most of 2017. Low correlation allows for greater equity portfolio diversification and reduces aggregate volatility at index level. Correlation between the banking sector index and the overall equity index in Europe dropped below 0.5 in 2H17, the lowest in 15 years (A.22).

## T.10 Geopolitical risk

### Transmission channels and measurement

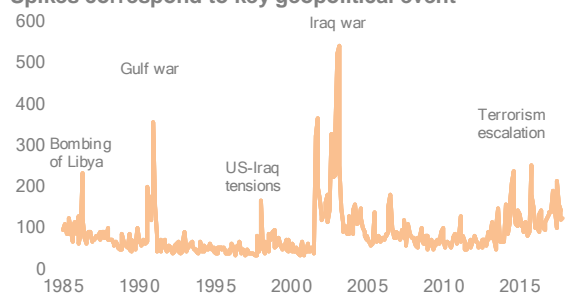
Measures of geopolitical risk have risen in recent periods, and recent research shows that higher geopolitical tensions can weigh on global activity. In the 2017 Bank of England systemic risk survey, 61% of market participants cited geopolitical risk as one of the risks to the UK financial system. In a Wells Fargo/Gallup May 2017 survey of more than 1,000 investors, 75% were worried about the impact of the various military and diplomatic conflicts occurring around the world, ranking geopolitical risk ahead of political and economic uncertainty.

Geopolitical risk can be defined as the risk associated with wars, terrorist acts, and tensions between states that affect the normal course of domestic politics and international

relations (Caldara and Iacoviello, 2017).<sup>4</sup>

Rising geopolitical tensions and domestic political discord can hurt global market sentiment, placing a burden on economic activity. Additionally, geopolitical risk may reduce foreign investor appetite for local currency debt, creating challenges for domestic debt rollover and its long-term sustainability. Lenain et al. (2002)<sup>5</sup> describe three channels through which geopolitical risk can influence economic activity: shrinking insurance coverage stemming from the perception of greater risk, higher trade costs, and stepped-up security spending. Eckstein and Tsiddon (2004)<sup>6</sup> present a model in which the materialisation of terror risk reduces investment, income, and consumption. Glick and Taylor (2010)<sup>7</sup> find large and persistent impacts of wars on trade, national income and global economic welfare.

T.11  
Geopolitical Risk Index  
Spikes correspond to key geopolitical event

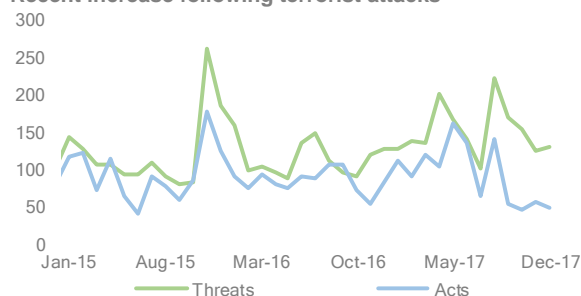


Note: Geopolitical Risk Index, computed from January 1985 to December 2017. Sources: Caldara, D. and M. Iacoviello, "Measuring Geopolitical Risk", Working Paper, Board of Governors of the Federal Reserve Board, December 2017.

Caldara and Iacoviello (2017) developed a monthly, quantitative index of global geopolitical risk – the GPR index – constructed by counting the occurrence of words related to geopolitical tensions in eleven leading national and international newspapers. As shown in T.11 above, the index is characterised by several spikes corresponding to key geopolitical events that led to higher tensions. The spikes correspond for example to the crisis in Libya, events around the Gulf War, and the war in Iraq in the early 2000s.

The index has increased in recent years. A breakdown of the index between actual adverse geopolitical events ("Acts") and pure risk ("Threats") shows that the latter has been the main driver of geopolitical tensions in recent months (T.12). Political and event risks have been identified as a key risk source in recent ESMA Risk Dashboards, which may adversely affect all market segments under ESMA's remit.

T.12  
Geopolitical Risk Index  
Recent increase following terrorist attacks



Note: Geopolitical Risk Index from January 2015 to December 2017. Sources: Caldara, D. and M. Iacoviello, "Measuring Geopolitical Risk", Working Paper, Board of Governors of the Federal Reserve Board, December 2017.

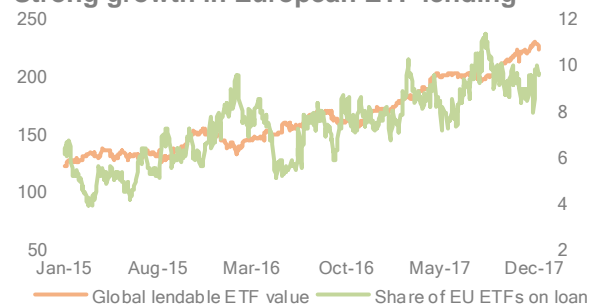
<sup>4</sup> Caldara, D. and M. Iacoviello (2017), "Measuring Geopolitical Risk", Working Paper, Board of Governors of the Federal Reserve Board.

<sup>5</sup> Lenain, P., M. Bonturi, and V. Koen (2002), "The economic consequences of terrorism", OECD Economics Department Working Paper, No. 334.

**Equity issuance** amounted to EUR 73bn in 2H17, lower than in the first part of the year (EUR 93bn) but increasing with respect to the same period in 2016 (when it was around EUR 50bn; A.13). Financial sector issuance was particularly strong relative to 2016, with EUR 70bn issued during 2017 (including EUR 27bn in 2H17), compared to less than EUR 31bn in the previous year (A.14).

**Securities lending** activity in EU equities also increased, with an average EUR 179bn on loan in 2H17, up 3% from the same year-earlier period (A.72). However, equity utilisation rates decreased compared to 1H17 as inventory levels continued to rise (A.73). Notably, the global inventory of lendable ETFs has doubled in the last three years, to EUR 200bn. While the share of EU ETF lending activity remains limited (around EUR 3bn or 10% of global ETF value on loan), it has been rising in recent years, reflecting the growth of the European ETF industry (T.13).

T.13  
Lendable ETF inventories and value on loan  
Strong growth in European ETF lending



Note: Global lendable value of exchange-traded funds, in USD, and share of European ETFs in global value on loan (right axis), in %. Sources: Markit Securities Finance, ESMA.

## Bond markets: issuance declines

Conditions in EU bond markets were broadly unchanged from the first half of the year. **Sovereign yields** remained low (A.30), with limited dispersion across countries. Ten-year spreads to German bunds were stable (A.31), aside from Portugal where a credit rating upgrade contributed to a sharp decline in the country's borrowing costs (Box T.14). While still ample, liquidity in sovereign bond markets did decrease towards the end of the year, as reflected in higher bid-ask spreads and an increase in the ESMA composite liquidity indicator (A.37 to A.39).

<sup>6</sup> Eckstein, Z., and D. Tsiddon (2004), "Macroeconomic consequences of terror: theory and the case of Israel", *Journal of Monetary Economics*, 51(5), 971-1002.

<sup>7</sup> Glick, R., and A. M. Taylor. (2010), "Collateral damage: Trade disruption and the economic impact of war", *The Review of Economics and Statistics*, 92(1), 102-127.

T.14

Sovereign credit ratings

### The impact of investment grade ratings

The credit ratings of sovereigns that were downgraded during the EA debt crisis have improved in recent quarters. Recent upgrades were driven by a combination of improved public finances and stronger macroeconomic fundamentals, reflecting structural adjustments as well as cyclical developments, which were largely manifested in lower borrowing costs (A.30).

For example, on 15 September 2017, S&P's increased Portugal's long-term foreign currency issuer rating to BBB-, granting the country investment-grade (IG) status (T.15) and leading to several other positive rating actions in the non-financial corporate sector (A.60). The rating upgrade contributed to a decline in the ten-year sovereign yield of 27 basis points in just one day.

T.15

EA long-term foreign currency sovereign debt ratings

### Improvement in EA sovereign ratings

	DBRS	Fitch	Moody's	S&P's
Greece	CCC(H)	<u>B-</u>	<u>Caa2</u>	B-
Ireland	A(H)	<u>A+</u>	<u>A2</u>	A+
Italy	BBB(H)	BBB	Baa2	<u>BBB</u>
Portugal	BBB(L)	<u>BBB</u>	Ba1	<u>BBB-</u>
Spain	A(L)	BBB+	Baa2	BBB+

Note: Credit ratings on selected long-term foreign currency Euro area sovereign debt issuers from four CRAs, as of 31/12/2017. The ratings underlined were upgraded in the course of 2017.

Source: European Rating Platform, ESMA.

From ESMA's perspective, the significance of gaining IG status has implications for a variety of areas, some of which may lead to higher demand and are also reflected in improved financing costs.

First, IG status allows a larger number of investors to hold this debt in their portfolio, reflecting either reliance on External Credit Assessment as part of existing regulatory requirements or collective investment vehicles' strategies.

Second, it has a direct impact on the composition of benchmarks that require IG status, bringing several billion euros in potential additional investments. For example, the Citi Euro Broad Investment Grade Bond Index alone has a market value of more than EUR 9tn.

Third, IG debt is more readily acceptable by market participants as eligible collateral to meet margining requirements, for example in the context of central clearing or in bilateral derivatives and securities financing trades.

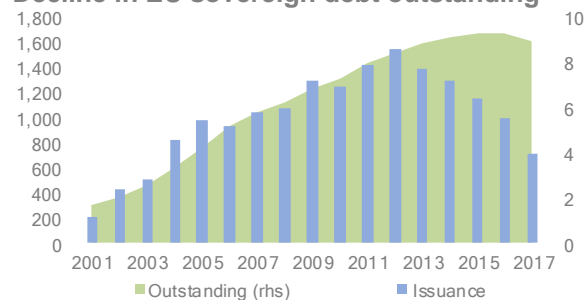
From a supervisory perspective, ESMA monitors the performance of credit ratings to inform its risk-based supervision of CRAs. Deteriorating rating performance may be indicative of broader non-compliance with certain provisions of the CRA Regulation.

The long-term trend in EU sovereign debt outstanding seems to have reversed, with a gradual decline in EU **sovereign bond issuance** leading to a reduction in the stock of EU sovereign bonds (T.16). Issuance in 2H17 amounted to EUR 270bn, 16% below the 2H16 amount (A.25). Outstanding EU sovereign debt is now EUR 770bn below its peak in early 2016.

T.16

Sovereign bond issuance and outstanding

### Decline in EU sovereign debt outstanding



Note: Annual EU sovereign bond issuance, EUR bn, and outstanding amount, EUR tn (right axis).  
Sources: Thomson Reuters EIKON, ESMA.

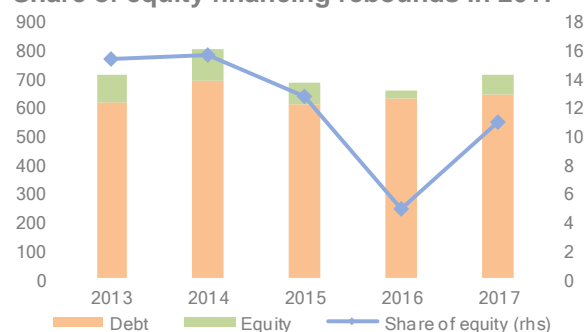
Yield developments in corporate bond markets were similar to those in sovereign bond markets, with broadly stable **corporate bond yields** across rating categories (A.47). **Corporate bond market liquidity** indicators show a general improvement in liquidity conditions, with an increase in the turnover ratio in 2H17, a broadly stable Amihud liquidity coefficient, and a gradual decline in bid-ask spreads (A.49-A.50).

**Corporate bond issuance** dropped sharply in 2H17 to EUR 391bn, EUR 122bn less than in 2H16. The 35% decline in investment-grade issuance from 2H16 (to EUR 278bn) was the main driver of this decrease (A.41). This was due to reduced financial sector debt issuance as some EU banks sought to increase equity financing, reduce leverage and shore up investor confidence (T.17).

T.17

Financial sector: market financing

### Share of equity financing rebounds in 2017



Note: Annual debt and equity issuance by EU-domiciled financial corporates, EUR bn, and share of equity in total market financing, in % (right axis).  
Sources: Thomson Reuters EIKON, ESMA.

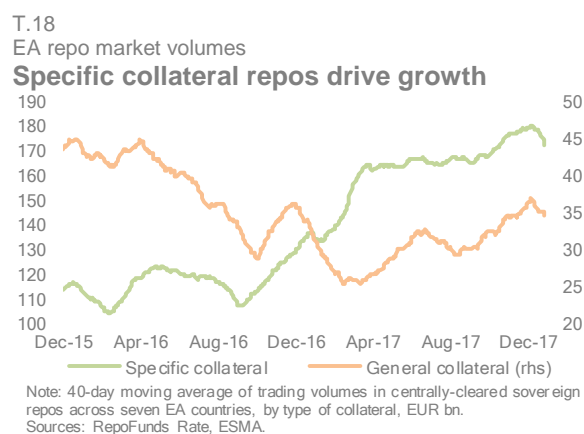
In the same period the issuance of high-yield corporate bonds increased by EUR 26bn (to EUR 112bn), as persisting search-for-yield strategies continued to bolster strong demand for low-rated bonds. The rating distribution of EU corporate bonds continued to deteriorate, albeit ever more slowly (A.44).

Global issuance of green bonds, a growing segment of the corporate bond market, amounted to USD 155bn in 2017, according to Moody's.<sup>8</sup> This was a 66% increase from the previous year.

### Repo markets: growth continues

Average EA sovereign **repo rates** remained unchanged at -0.5% and with very limited dispersion, although seasonal volatility persisted. Indeed, rates reiterated the sharp end-of-year drop already witnessed in 2016<sup>9</sup> (A.71), although low trading volumes on the last trading day of the year might have reinforced the movement. The collateral scarcity premium, proxied by the specialness of government bond repos,<sup>10</sup> edged up in 2H17 and peaked at the end of the year, signalling the return of local tensions in collateral availability (A.68).

Directly related to this, centrally cleared sovereign **repo market volumes** grew substantially in 2H17, averaging more than EUR 200bn per day, up more than 30% from the same year-earlier period (A.67). Most of the growth came from specific collateral repos (i.e. security-driven rather than liquidity-driven repo transactions) (T.18). In particular, the volume of repos using German and French government bond collateral increased 37% in one year. Recent market reports confirm the robust growth of repo market volumes and relative decline in the share of general collateral financing trades.<sup>11</sup> A recent ECB speech highlighted that the share of centrally cleared repos is on the rise, with central bank asset purchases contributing to the recent growth in special collateral transactions (i.e. repos where the collateral exchanged is in high demand).<sup>12</sup>



### Other market activities

In other asset markets, the volume of **covered bonds** issued contracted in 2H17 to EUR 78bn, down 14% from 2H16 (A.79). This marked the lowest half-yearly amount issued since 2002. Issuance of securitised products totalled EUR 48bn in 3Q17, including EUR 23bn placed, with cumulative issuance down 12% so far in 2017 from the same period last year. Mirroring this long-term trend, the net change in the number of outstanding structured finance instruments and covered bond ratings stayed firmly in negative territory (A.57-A.58). Although RMBS remains the main type of securitised instrument, its relative share has been gradually declining (A.51-A.52).

Overnight **interbank market activity** in the GBP market continued to expand, in contrast to activity in EUR-denominated markets, which has dropped from EUR 10bn in 2H16 to a daily average of less than EUR 7bn (T.19).

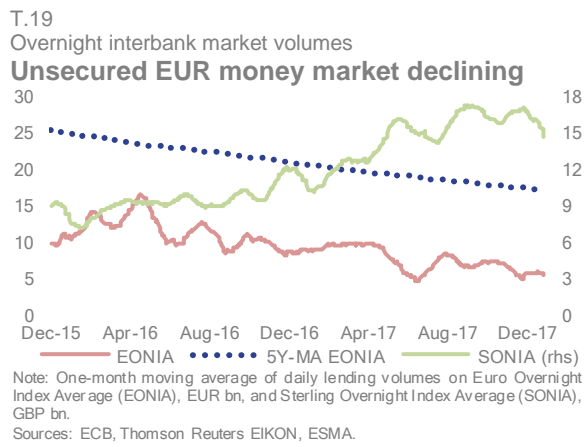
<sup>8</sup> [https://www.moody.com/research/Moodys-Following-a-record-year-green-bond-issuance-is-set--PR\\_378972](https://www.moody.com/research/Moodys-Following-a-record-year-green-bond-issuance-is-set--PR_378972)

<sup>9</sup> See ESMA Report on Trends, Risks and Vulnerabilities No.2, 2017, for an analysis of seasonality in repo markets.

<sup>10</sup> For an in-depth analysis of repo market specialness, see "Collateral scarcity premia in Euro Area repo markets", ESMA Working Paper No.1, 2017.

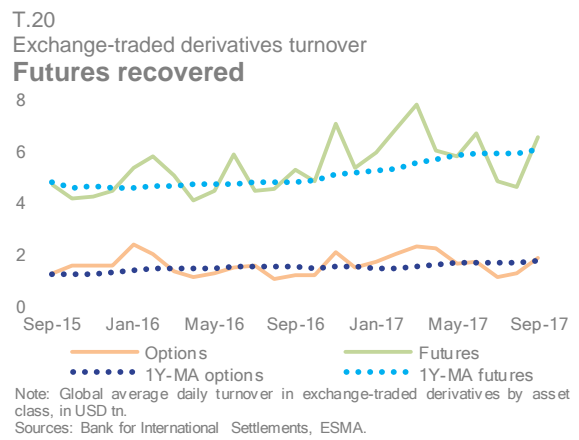
<sup>11</sup> ICMA European Repo Market Survey, No. 33 (June 2017).

<sup>12</sup> B. Coeuré, "Asset purchases, financial regulation and repo market activity", 14 November 2017: [https://www.ecb.europa.eu/press/key/date/2017/html/ecb.sp171114\\_1.en.html](https://www.ecb.europa.eu/press/key/date/2017/html/ecb.sp171114_1.en.html).



The volume of **exchange-traded derivatives** continued to grow in 3Q17, measured in both notional terms and turnover, led by interest rate derivative contracts (A.99-A.100). The turnover in futures market recovered somewhat from its recent decline (T.20). In a similar vein, the open interest on energy commodity futures has been growing at a brisk pace, despite the mixed

performance of energy **commodity prices** (A.93-A.95). An article in this TRV explores the structure of the exchange-traded derivatives market using granular MiFID data (see pp. 51-58).



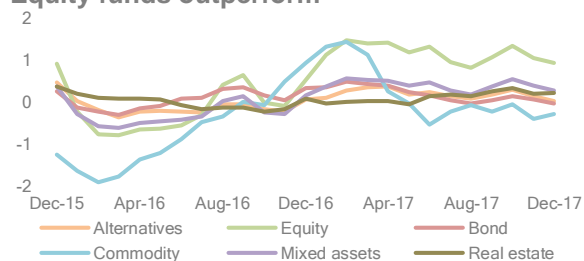
# Investors

Having rebounded in 1H17, investment fund returns declined in 2H17 amid a strengthening economic outlook and rising asset prices. Despite stronger returns for equity funds, investors channelled their investments into fixed income funds, which attracted the majority of the EUR 345bn of EU-domiciled fund inflows. MMFs rebounded strongly to register solid inflows in both the EU and the US. Within the bond fund category there was limited evidence of search-for-yield behaviour, with funds focusing on EM assets recording large inflows. ETFs continued to grow, nearly tripling their AuM in five years. Overall, at the end of 2017 EU investment funds had AuM worth EUR 12tn, an increase of 11% from December 2016. Sales of structured retail products fell again in 2H17, although retail investors increased their purchases of short-term products. Retail investor sentiment continued to improve, and disposable income and household asset holdings registered robust growth, although the impact of the February 2018 correction remains to be seen. Complaints reported to NCAs decreased in 1H17, with order execution remaining the chief cause for complaint.

## Investment funds: fixed-income fund inflows continued

Investment **fund performance** declined in 2H17 for most fund categories. While shrinking, equity fund returns outperformed other fund categories by far with monthly returns of 0.9%. Similarly, ETFs performed better than other funds, with an average monthly return of 0.6% calculated over a one-year period. Commodity fund returns remained slightly negative despite a 0.3 percentage-point (pp) rebound in 2H17. Other asset classes delivered returns close to zero, including mixed (0.3%), bond (0.0%), alternative (0.0%) and real estate funds (0.2%) (T.21).

T.21  
Fund performance  
**Equity funds outperform**

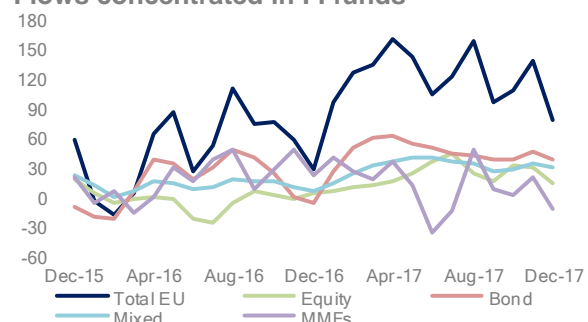


Note: EU-domiciled investment funds' annual average monthly returns, asset-weighted, in %.  
Sources: Thomson Reuters Lipper, ESMA.

**Fund flows** continued to focus on fixed-income funds in 2H17, with bond funds (EUR 119bn) and mixed funds (EUR 91bn) attracting the bulk of new investment (EUR 345bn in total). Against their positive performance, investment in equity funds, while increasing with EUR 71bn of inflows, was still lower than in fixed-income funds, (T.22). Within the bond fund category, there was mixed evidence on search for yield behaviour; EM funds

registered net inflows of EUR 25bn, while HY funds saw net redemptions of EUR 8bn (A.115, A.117). Funds investing mainly in government bonds continued to experience outflows (EUR 3bn).

T.22  
Fund flows  
**Flows concentrated in FI funds**



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

The proportion of **cash holdings** in corporate bond fund portfolios dropped by 2pps year-on-year (2.8%), well below the four-year average (3.2%) (A.120). Cash holdings seem to display seasonal behaviour, tending to increase each year during the third quarter before receding again. Beyond this seasonal pattern, there is however a trend, as the one-year moving average declined by nearly 1pp in two years.

## Cost-adjusted UCITS fund returns: increasing

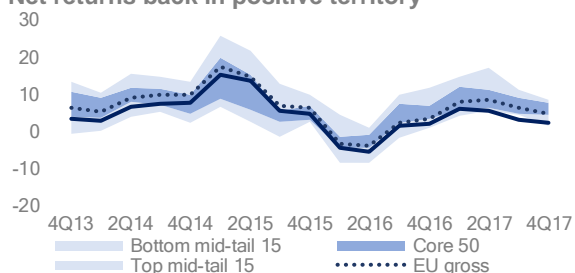
After slipping into negative territory in 1H16, **real returns** net of all charges to funds and inflation climbed back to positive levels in 2H16 and stayed in positive territory throughout 2017 (T.23).<sup>13</sup> In 4Q17, with an average annual level of

<sup>13</sup> For additional information on the impact of fees and charges on fund returns, see "The impact of charges on

mutual fund returns", ESMA Report on Trends Risks and Vulnerabilities No.2, 2017 (pp. 36-44).

real cost-adjusted returns of 2.3pps, the UCITS fund industry performed at levels broadly comparable to 4Q16.

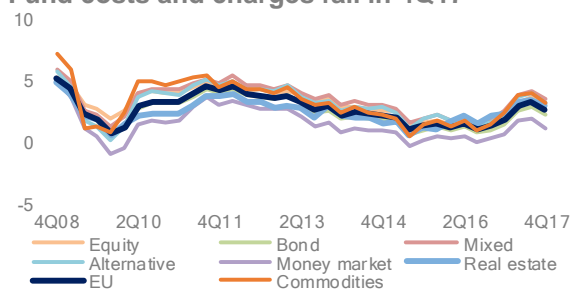
T.23  
Net real returns of UCITS funds  
**Net returns back in positive territory**



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

**Absolute reductions in returns** on EU fund shares, generated by all fees and charges levied by funds and inflation, vary across time and asset classes. Reductions vary across countries and are related to differences in cost structures and inflation.

T.24  
Absolute reduction in UCITS share returns by asset class  
**Fund costs and charges fall in 4Q17**



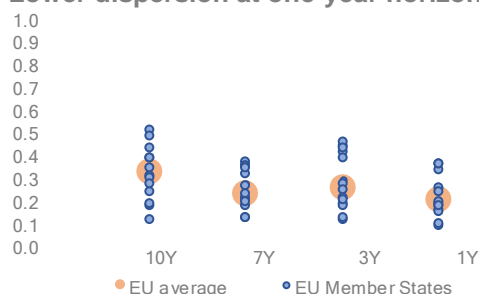
Note: Absolute reduction in UCITS fund share classes' gross returns through costs and charges levied by funds and generated by inflation, in percentage points. Negative reductions potentially generated by deflation. Sources: Thomson Reuters Lipper, ECB, ESMA.

Following an increase in the first three quarters of 2017, absolute return reductions decreased in 4Q17 (T.24). The difference between gross and net returns was lower across all asset classes. The highest reduction in this difference was recorded for commodities, from 3.94pps in 3Q17 to 3.11pps in 4Q17, and the lowest for equities, down from 3.55pps in 3Q17 to 3.03pps in 4Q17.

The impact of fund expenses on the performance of an investor's portfolio can be significant in the long run. At the EU level the **average relative reduction** of a UCITS retail fund share return varies on average from 32% over a ten-year horizon to 25% and 19% respectively at three- and one-year horizons (T.25). Compared to retail clients, institutional clients experienced lower reductions in returns at both the ten-year horizon (17%) and the three- and one-year horizons (13%

each). As shown in T.25, there are significant differences across EU Member States. For example, relative return reductions vary from 11% to 50% at a ten-year horizon.

T.25  
Dispersion in relative reduction of UCITS retail share returns  
**Lower dispersion at one-year horizon**

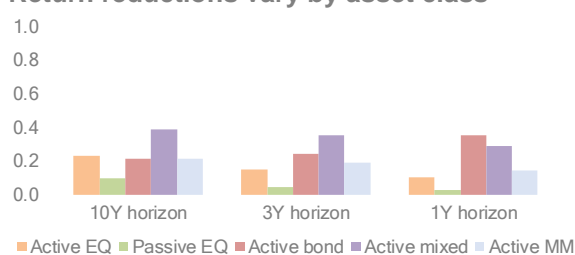


Note: Relative reductions in gross returns on UCITS retail fund shares due to fees and charges, %, per investment horizon. All time horizons end on the final day of 4Q17.

Sources: Thomson Reuters Lipper, ECB, ESMA.

Looking at different asset classes, the pattern of an increasing impact of charges with increasing time horizons is confirmed, with the exception of active bond and money market funds (T.26). Here two different factors are at play. First, the return reductions by charges are cumulative over time – hence one expects the relative return reductions to be higher for longer time horizons. However, in the case of MMFs and active bond funds this effect is offset over short time horizons by low gross returns in these asset classes due to the low interest rate environment. In such a market environment, costs and charges account for a larger relative return reduction even if their levels have not increased.

T.26  
Relative reduction in UCITS share returns by asset class  
**Return reductions vary by asset class**



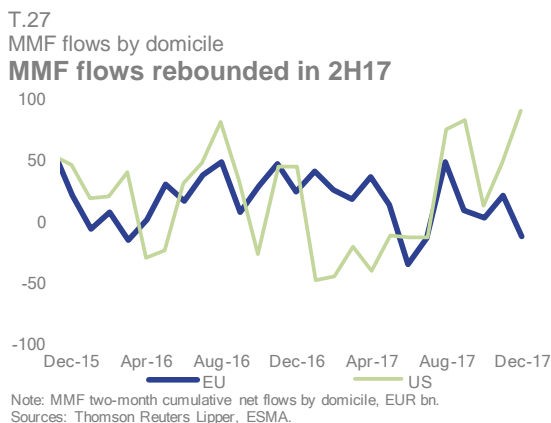
Note: Relative reductions in returns on UCITS shares due to costs and charges to investors, %, per investment horizon. Results for Passive Bond, Passive MM and Passive mixed funds are omitted due to the low sample sizes. EQ=equity; MM=money market.

Sources: Thomson Reuters Lipper, ECB, ESMA.

### MMFs: flows recover

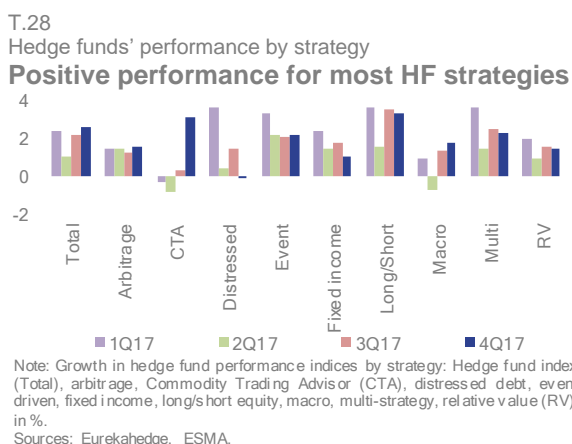
The average return on **EU money market funds** further declined to -0.3%, which was still moderate in a low interest rate environment. The lowest-performing funds posted average monthly returns below -1.0% (A.123). EU MMF flows nevertheless rebounded slightly (EUR 38bn),

while surging in the US (EUR 178bn) (T.27). This compensates for the outflows observed in 1H17 in the US in the wake of implementation of the new MMF reform. US MMFs also benefitted from a nine-year-high yield differential to US Treasuries. MMF flows may remain volatile in the near future as investors position themselves for a possible change in monetary policy.



**Alternative funds: strong performances by most strategies**

The global alternative fund industry reported positive returns for most strategies in 2H17 (T.28). Long/short (6.9%), multi strategies (4.8%) and event-driven (4.3%) strategies stood out, benefitting from the growth in global equity prices as well as the improving economic outlook. CTA (3.5%) recovered noticeably after several quarters of zero or negative returns. CTA strategies benefitted from strengthening oil prices in a context of production cuts and increased global demand forecasts.



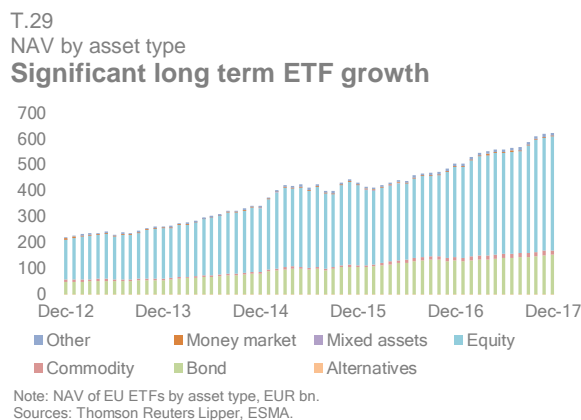
EA hedge fund AuM increased by 1.7% at EUR 443bn from March to October 2017. Similarly, their NAV increased by 2.2%, to

EUR 351bn. As a result, financial leverage (measured as the ratio of AuM to NAV) decreased slightly to 1.26 in October 2017 from 1.27 in March (A.137). In this TRV, a first analysis of AIFMD data provides an overview of the EU alternative investment fund market (pp. 40-50).

**ETFs: steady growth**

In 2H17, EU ETF performance was characterised by positive returns, persistently low volatility and decreasing tracking error. EU ETF NAV stood at EUR 627bn in 2H17, with inflows of EUR 40bn. The industry has experienced remarkable growth of 183% in five years, including 11.7% in 2H17 alone.

Equity funds represent the bulk of the ETF industry with 70% of assets under management, followed by bond funds (25%) (T.29). ETFs are growing even in less liquid markets such as commodity or high yield. However, recent examples of US high-yield bond ETFs have shown such asset classes to be more volatile. Following disappointing results for their underlying assets, the performance of several funds deteriorated. This triggered significant outflows in 4Q17 but did not affect the funds' ability to meet reimbursement requests.



Synthetic strategies represent approximately 23% of the market in the EA (A.147). They are used in particular to replicate less liquid markets such as EM debt and equities by contracting a total return swap with a third party, typically a bank. As pointed out by the FSB, they are exposed to counterparty risk.<sup>14</sup> However, this can also be the case with physical replication ETFs, which may increasingly rely on securities lending activities in the future.<sup>15</sup> Therefore, monitoring both types of ETFs is relevant from a financial stability risk perspective.

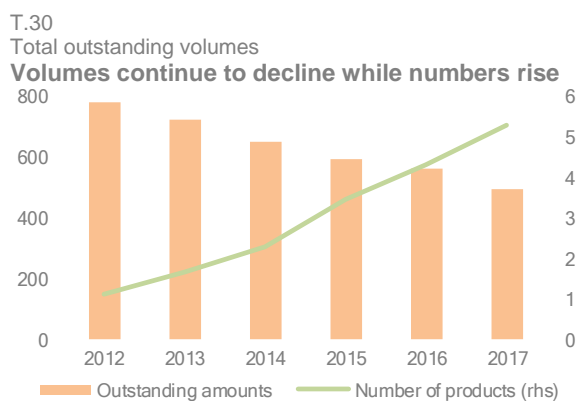
<sup>14</sup> Potential financial stability issues arising from recent trends in Exchange-Traded Funds, FSB, 2011.

<sup>15</sup> "ETFs: Characteristics, overview and risk analysis – the case of the French market", AMF, February 2017.



## Structured retail products: share of capital-protected products decreases

Total outstanding volumes of **structured retail products** issued to retail investors in the EU over the five-year period from 2012 to 2017 contracted steadily (T.30). In 2017, volumes outstanding stood at around EUR 500bn, down from almost EUR 800bn in 2012. At the same time, numbers of outstanding contracts continued to rise, reaching around five million.



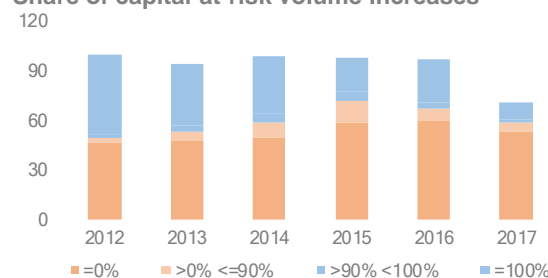
This decline may be related to the supply side, also in the light of changes in market practices, and the regulatory environment. An increasing number of products have been listed on exchanges. On-exchange products tend to be issued in smaller volumes than OTC products, the latter typically being sold through large distribution networks. Several regulatory changes have characterised this market in recent years, both country-specific and EU-wide, aimed at enhancing consumer and investor protection.<sup>16</sup>

**Growth products**, which offer a potential capital return, represent more than half of this market. The proportion of growth products is fairly stable, peaking in 2015 with a share of 61% against **income products** and products mixed between growth and income. This suggests that the majority of retail investors who buy structured products do not have pressing liquidity needs.

Structured products can be classified by the level of **capital protection** they offer the investor, ranging from products with a capital guarantee of greater than 100% (i.e. a guaranteed return) to those with no capital protection (i.e. the capital is at risk if underlying assets fall in value). In the six years to 2017, the share of 100% capital-protected products declined whereas that of capital-at-risk products increased (T.31). This

trend is likely to be at least partly attributable to the low interest rate environment and the consequent search for yield by investors. Consistently, more than 99% of products issued by number (as opposed to around two thirds of market share by volume) have zero capital protection. Capital-protected products tend to be more standardised and so are typically larger in volume but far fewer in number than capital-at-risk products.

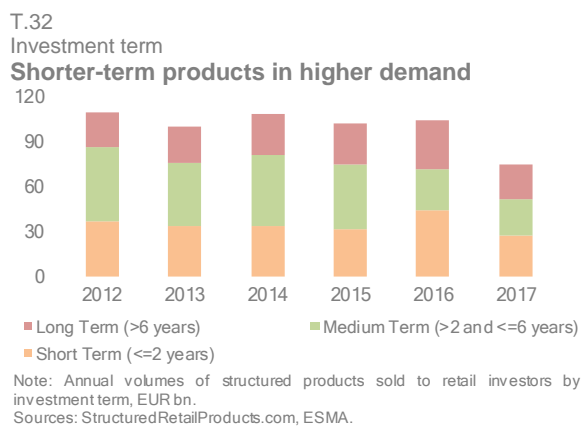
T.31  
Capital protection  
**Share of capital-at-risk volume increases**



Note: Volumes of structured products sold to retail investors by level of capital protection, EUR bn.  
Sources: StructuredRetailProducts.com, ESMA.

While the vast majority of structured retail products (in terms of the number of products issued) are short-term (i.e. less than two years' duration), as regards volumes there is a more even split between short-term, medium-term (two to five years' duration) and long-term (greater than five years' duration) products. In 2016 short-term products registered higher sales than either long- or medium-term products for the first time in five years, with 43% of total sales by volume (T.32). Preliminary data for 2017 indicates a less marked but somewhat similar split among the different term categories of structured retail products, with short-term products still making up a larger share of sales volumes than from 2012 to 2015.

<sup>16</sup> For further details on the evolution of the EU regulatory framework, see ESMA Opinion, 2014, "Structured Retail



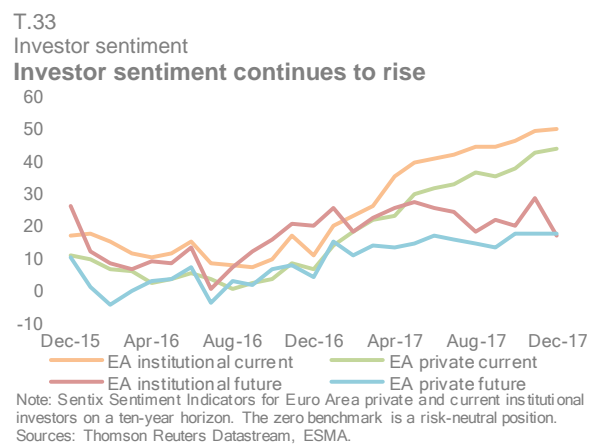
One explanatory factor for the increase in the share of short-term products is that investors appear to be more optimistic about the near-term market outlook than over longer time horizons. Moreover, the higher returns offered by short-term products have become more attractive for savers and investors in a low-interest-rate environment and may reflect search-for-yield behaviour.

### Retail investors: confidence builds

Retail investor **portfolio returns** stood at a monthly average rate of 0.3% over the year to December 2017, close to the five-year average of 0.4% (A.149). Monthly average returns over the period continued to be driven largely by the performance of direct and indirect equity investments (at 0.8% and 0.9% respectively), in line with the broader performance of equity markets during the reporting period.

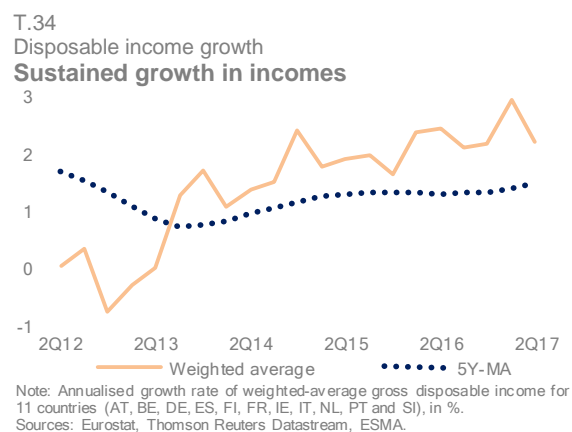
In 2H17 **investor sentiment** among retail investors rose strongly, continuing a trend from the first half of the year, with the measure of current sentiment reaching its highest level since 2007 (T.33). Institutional investors appeared even more confident with regard to current investment prospects. However, the impact of the February 2018 market correction on investor confidence remains to be seen.

These high levels of confidence emerged despite a backdrop of political risks, suggesting that the materialization of such risks could have a large impact on the EU financial system. Expectations were more moderate, however, among both retail and institutional investors, possibly affected by the prospect of future monetary tightening following several years of expansive policy.

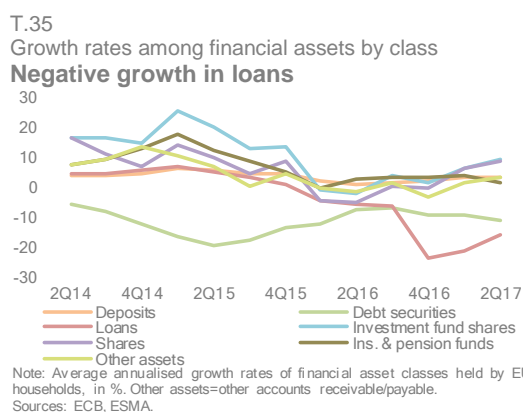


**Disposable income growth** among EA countries stayed solid in 2Q17 at 2.2% on an annualised basis, remaining above the five-year average of 1.5% (T.34). This sustained growth in household disposable incomes may have boosted private investor confidence.

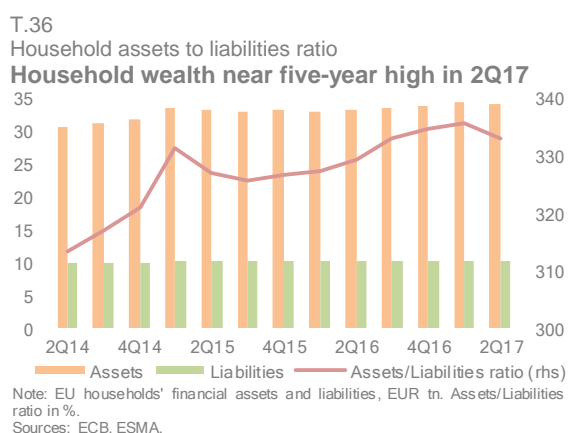
Both financial and non-financial **assets held by EA households** saw robust growth in 2017, with annualised rates at 4.2% and 4.9% respectively in 2Q17. In the case of real assets, growth was comfortably above its five-year average of less than 1% (A.152). In contrast, in the four years to end-2015 financial asset growth had outstripped that of real assets, although the gap had been narrowing for some time against a backdrop of loosening monetary policy and cheaper mortgages to finance real-estate purchases.



Growth rates across asset classes of EA **household financial assets** picked up in 2Q17 compared to 2Q16 (T.35), especially for shares (+14pps) and investment fund shares (+11pps). In contrast, the growth rate in loans was negative over last year, namely -10pps. This decline is probably also related to investors seeking higher returns.



EU households held around EUR 34tn of financial assets in 2Q17, versus EUR 10tn of financial liabilities (T.36). The **household asset-to-liability ratio** reached a five-year peak during the first half of the year, underpinned by asset growth, having previously peaked in 1Q15 following several quarters of roughly constant deleveraging in the sector. The rate of growth in both household financial assets and loans remained broadly flat, however, in the face of low yields and limited availability of credit to households.



Virtual currencies (VCs) have attracted a lot of attention from both investors and regulators, with market capitalisations increasing several times over while prices experienced extreme levels of volatility. Box T.37 retraces the current debate on VCs and recent market developments.

T.37  
Virtual Currencies  
**Bubble fears confirmed**

Virtual Currencies (VCs), such as Bitcoin and Ether, have seen an extraordinary rise in prices in recent months.

<sup>17</sup> See: [https://www.esma.europa.eu/sites/default/files/library/esma50-164-1284\\_joint\\_esas\\_warning\\_on\\_virtual\\_currenciesl.pdf](https://www.esma.europa.eu/sites/default/files/library/esma50-164-1284_joint_esas_warning_on_virtual_currenciesl.pdf)

<sup>18</sup> See: [https://www.ecb.europa.eu/pub/pdf/other/virtualcurrency\\_schemesen.pdf](https://www.ecb.europa.eu/pub/pdf/other/virtualcurrency_schemesen.pdf)

Recently, their value collapsed by more than 60% compared to the December 2017 peaks. On 12 February 2018, the three ESAs issued a pan-EU Warning regarding the risks of buying VCs, alerting investors to high valuation, volatility and operational risks associated with these innovative products.<sup>17</sup>

Buying and trading VCs remains very high-risk, and consumers could lose most or all of the capital invested. Further, as VC platforms are not regulated under EU law, consumers do not enjoy any of the specific safeguards and legal protections that are associated with regulated financial services. Other risks include the lack of a robust secondary market and price transparency as well as operational disruptions.

A Virtual Currency is a digital representation of value, not issued by a central bank, a credit institution or e-money institution, which in some circumstances can be used as an alternative to money.<sup>18</sup> Unlike traditional currencies, VCs are not legal tender.<sup>19</sup> VCs as we know them today do not fully meet the three functions of money defined in economic literature: i) medium of exchange (money is used as an intermediary in trade to avoid the inconveniences of a barter system); ii) store of value (money can be saved and retrieved in the future); and iii) unit of account (money acts as a standard numerical unit for the measurement of value and costs of goods, services, assets and liabilities).

VCs have a limited function as a medium of exchange because they have a low level of acceptance among the general public. In addition, the high volatility of their exchange rates relative to fiat currencies – and, therefore, in terms of most goods and services – renders VCs uncertain as a store of value even over short time periods, let alone for the purpose of acting as a longer-term savings instrument. Finally, both the low level of acceptance and the high volatility of their exchange rates and thus purchasing power make them unsuitable as a unit of account.



The VC market has so far been dominated largely by Bitcoin and Ether. As can be seen in Chart T.38, in 2017 the market capitalisation of Bitcoin and Ether rose, respectively, from EUR 14bn to EUR 250bn (i.e. more than 70% of the current total market value of VCs) and from EUR 700mn to EUR 54bn (around 20% of the current total market value of VCs). The growth in value of the price of Bitcoin and Ether has been the primary driver of the increase in VC market capitalisation.

In 1H17, the price of Bitcoin multiplied by a factor of 2.5 and from July onward it increased sharply to reach EUR 16,000 in mid-December. Since mid-December, Bitcoin's price volatility

<sup>19</sup> While precise definitions may vary between jurisdictions, a means of payment is legal tender in a jurisdiction if it is generally valid for meeting financial obligations. The concept is a narrow one, however, in that in many contexts counterparties to a contract may agree on means of payment that are not legal tender, such as credit card payments.

has persisted, with prices falling 65% to EUR 5,600 as of 5 February 2018.

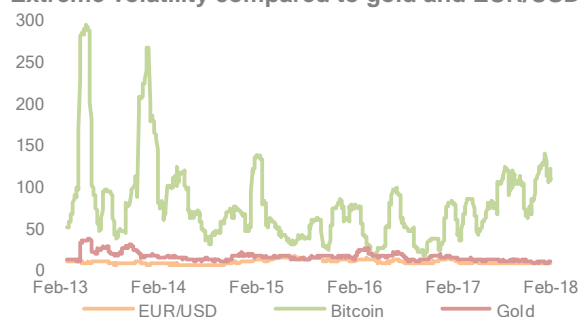
The growth in the value of Bitcoin in 2017 can be largely explained by its use as a means of payment for ICO tokens that flourished in early 2017. Meanwhile, the strong rally in Bitcoin in late 2017 was fuelled by demand for the underlying VC. While demand for Bitcoin was largely driven by Chinese consumers prior to the fall of 2017, it shifted to Japan and Korea once the Chinese government outlawed ICOs and began intense supervision of VC exchanges in 3Q17.

The sharp increase in the value of Ether can also be explained by the phenomenon of ICOs, which grew rapidly in 2017. Ether, in addition to being a means of payment for ICO tokens, like Bitcoin, uses a protocol on which many ICOs are based, a feature that generated further interest in the VC. In 1H17, the value of Ether increased sharply from EUR 10 to EUR 330 before it suddenly fell below EUR 200 in July, coinciding with the Chinese government's ban on ICOs. Indeed, more than 50% of the ICOs were using the Ethereum protocol (up to 70% in October 2017). Despite a short-lived recovery in December 2017, Ether prices continued to decline and dropped below EUR 600 in early February 2018.

T.39

Virtual Currency price volatility

### Extreme volatility compared to gold and EUR/USD



Note: Annualised 30-day historical volatility of USD-denominated returns for Bitcoin and gold, in %, and 30-day historical volatility of EUR/USD spot rate returns, in %. Sources: Thomson Reuters EIKON, ESMA.

As shown in Chart T.39, VCs are highly volatile products. At some point in 2017, the 30-day-rolling volatility of Ether exceeded 250%, a level of volatility even higher than Bitcoin, whose 30-day rolling volatility was oscillating between 50% and 150%. Yet another relatively long-established VC, Ripple, rose more than 50% within a 24-hour period in mid-December 2017 while Bitcoin's value fell from EUR 16,200 on 17 December to EUR 11,700 on 22 December. As mentioned above, between 15 January and 17 January 2018, Bitcoin lost 33% of its value.

The volatility of VCs is considerably higher than that of commodities or currencies. Indeed, if we look at the last ten years, the 30-day rolling volatility of gold reached a maximum of 60% in October 2008 during the financial crises and, aside from occasional modest spikes, has remained quite stable around 10%. The volatility of the USD/EUR spot rate remained very stable at around 5% during the same period, except in January 2009 when it reached 30%.

## Retail investor complaints: falling

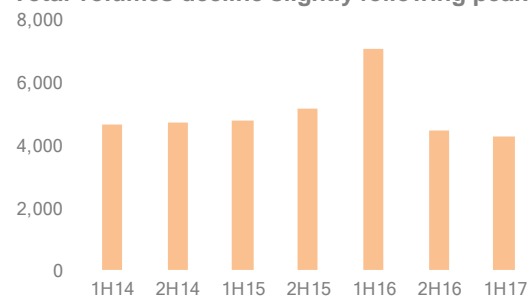
The incidence of detrimental outcomes as measured by the overall volume of **consumer complaints** made directly to NCAs fell slightly in 1H17 compared with the previous six months, marking a three-year low (T.40). 1H16 had seen a spike in aggregate complaints, attributable to underlying issues in relation to contracts for difference (CFDs) in 2015 – complaints being a

lagging indicator – and issues around bank resolutions.

T.40

Consumer complaints filed directly with NCAs

### Total volumes decline slightly following peak



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

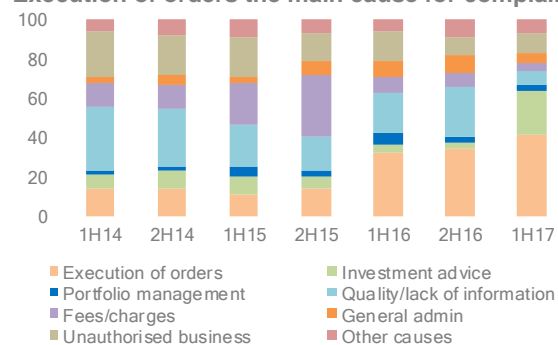
Sources: ESMA complaints database.

The two leading **causes for complaint** filed with NCAs in 2H16 were the execution of orders (41%) and investment advice (22%) (T.41). The former has been a leading cause for complaint since 1H16 and reflects varying definitions used by different countries in their data collection and categorisation systems. Likewise, investment advice may be broadly defined in some countries, and in a significant number of cases complaints appear to have been made notably after receipt of advice, e.g. in the context of debt securities following credit events.

T.41

Complaints filed directly with NCAs, by cause

### Execution of orders the main cause for complaint

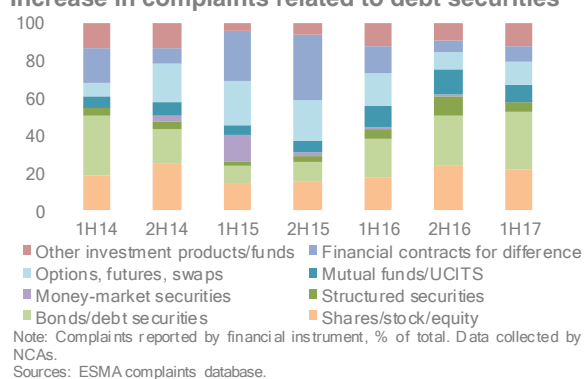


Note: Complaints reported directly to NCAs by financial instrument, % of total. Data collected by NCAs.

Sources: ESMA complaints database.

Regarding the **type of financial instrument** cited in complaints filed in 1H17, the proportion of complaints referring to debt securities continued its steady rise, to a new high of 30% (T.42). This share compared with just 8% in 1H15. The uptrend was driven by firm credit events and, in particular, bank resolutions in more than one country.

T.42  
Complaints filed directly with NCAs, by instrument  
**Increase in complaints related to debt securities**



Finally, alongside monitoring trends in established retail markets, ESMA also monitors markets for financial innovation and assesses the risks and benefits of different innovations. A recent development is the growth in Initial Coin Offerings (ICOs), prompting attention from the perspective of investor protection in particular. ESMA has issued an alert to investors, highlighting the risks associated with investing in Initial Coin Offerings (ICOs). Box T.43 below provides further details.

T.43  
Initial Coin Offerings (ICOs)  
**ICO investments are highly risky**

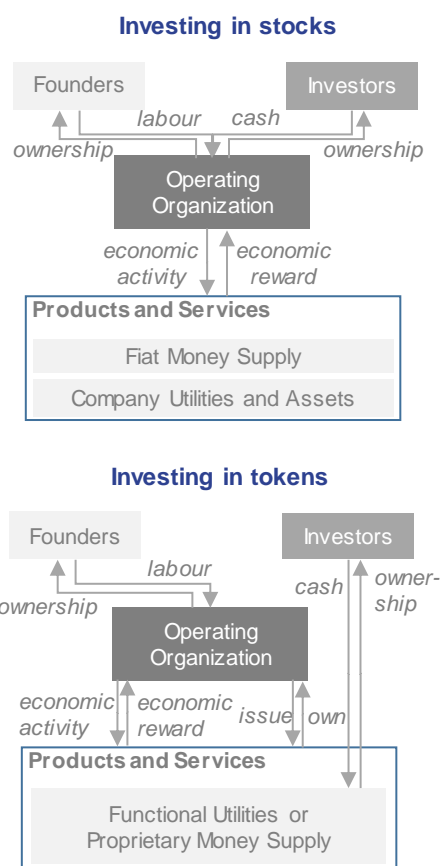
On 13 November 2017, ESMA issued two Statements to alert investors to the high risks of ICOs and to remind firms involved in ICOs of their obligations under EU regulation.<sup>20</sup> ESMA is actively analysing the market to assess how the sector evolves and whether some adjustments to the existing rules may be needed to address some of the specific aspects of ICOs. Many ICOs are launched overseas but more recently the phenomenon has gathered momentum in the EU.

The ESMA Statements highlighted the need for investors to realise that ICOs are extremely speculative investments, vulnerable to the risk of fraud and illicit activities. The risk to investors of losing all the money that they have invested is very high. Meanwhile, firms involved in ICOs should give careful consideration as to whether their operations constitute regulated activities. In particular, depending on their business models and the features of the tokens being issued, firms involved in ICOs may need to comply with the requirements laid down in the Prospectus Directive, the Markets in Financial Instruments Directive, the Alternative Investment Funds Managers Directive and the Anti-Money Laundering Directive.

An ICO is a new means of raising money from the public, using so-called “coins” or “tokens”. The terms “initial token offering” or “token sale” are sometimes used as well. In an ICO, a business or individual issues proprietary coins or tokens and puts them for sale in exchange of fiat or virtual currencies, e.g. Bitcoin or Ether. While their name may suggest similarities, it is important to distinguish between ICOs and Initial Public Offerings (IPOs). In the case of ICOs, investors receive a digital coin or token instead of a share (T.44). The features and purpose of the coins or tokens vary across ICOs. Many serve to access or purchase a service or product to be developed by the issuer using the proceeds of the ICO. Others confer voting rights or a stake in future revenues of the issuing venture. In contrast to shares, coins

or tokens do not usually provide ownership rights in the enterprise. Some have no tangible value.

T.44  
Investing in tokens versus investing in shares  
**ICO – comparative overview**



Source: Autonomous NEXT, ESMA.

ICO campaigns are conducted online, using the Internet and social media. The coins or tokens are created and disseminated using distributed ledger or blockchain technology (DLT). ICOs are used to raise funds for a variety of projects, including but not limited to businesses building on DLT. Recent examples include projects to develop digital banking and payment services, on-line gambling or new IT infrastructures. Practically anyone with Internet access can participate in an ICO. The coins or tokens are typically traded or may be exchanged into fiat or virtual currencies at specialised coin exchanges after issuance.

There has been a rapid surge in ICOs over the last few months. Publicly available information suggests that amounts in excess of USD 3bn were raised globally through ICOs in 2017, marking a 17-fold increase compared to 2016. Even this is likely to be an underestimation, as many ICOs may go unnoticed.

Some observers attribute this growing interest in ICOs to the rocketing prices of virtual currencies (see Box T.37). Many investors are enticed by the prospect that the new coins or tokens being issued might follow the same path. Some recent ICOs have attracted the equivalent of several million euros in just a few days.

ICOs could provide an alternative source of funding for small or innovative businesses. However, ESMA is concerned that investors may not realise the high risks they incur when investing in ICOs. Depending on how they are structured, ICOs may fall outside of the regulated space. Because of their

<sup>20</sup> <https://www.esma.europa.eu/press-news/esma-news/esma-highlights-ico-risks-investors-and-firms>

anonymity and the capacity to raise large amounts of money in a short timeframe, they are vulnerable to the risk of fraud or money laundering.

Several regulators have recently published investor warnings and/or position papers on the rules likely to apply to ICOs. Regulators in China and Korea have banned ICOs.

---

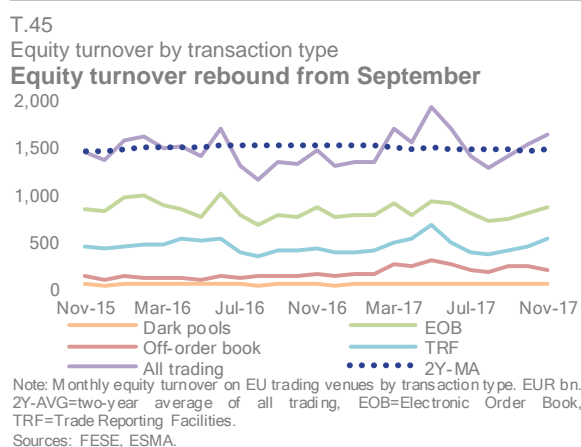
# Infrastructures and services

In 2H17 equity trading activity contracted. The composition of trading remained broadly stable, with the majority of transactions occurring via electronic order books. Despite reportedly higher volumes during the episode of high equity-market volatility at the beginning of February 2018, markets did not suffer major disruptions. With respect to CCPs, the rate of centrally cleared products increased for both IRS and CDS. In 2H17 ESMA added three CCPs to the list of third-country central counterparties recognised to offer services and activities in the EU. In addition, the second delegated regulation requiring mandatory clearing of certain index CDS and IRS took effect for financial counterparties and AIFs above the EUR 8bn threshold of gross amounts outstanding. In the CRA industry, securitised products registered a peak in the size of downgrades in 2H17. With regard to financial benchmarks, the number of Euribor panel contributors remained stable at 20 banks and the dispersion of Euribor quotes submitted decreased overall.

## Trading venues: lower turnover

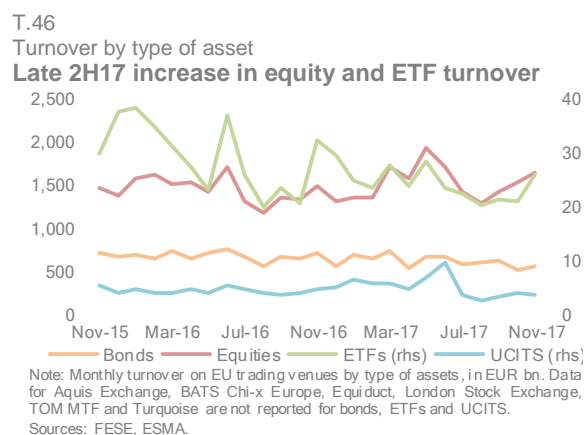
In 2H17, monthly equity turnover on EU trading venues decreased by 9% from the previous six months, and now stands close to its long-term average. The share of turnover conducted via electronic order books increased slightly (54%) at the expense of trade reporting facilities (29%). Meanwhile, the share of off-order book trading continued to grow, reaching 14% of equity trading compared to 7% in 1H16 (T.45).

While electronic order books remain the standard, a number of transactions are conducted via dark pools. Dark pools offer benefits to institutional investors willing to buy and sell large blocks of instruments while avoiding significant market impact. However, some market participants may be disadvantaged by the lack of transparency and availability of information. ESMA continues to monitor these dynamics in the context of MiFID II/MiFIR, also with a view to guaranteeing transparency and market efficiency.



Meanwhile, the proportion of trading on multilateral trading facilities (MTF) remained at its

end-1H17 level of 6%. Most of the trading continued to take place on regulated markets (A.175). Trading **turnover** on exchanges remained dominated by equity trading, which accounted for 71% of the total turnover in November 2017. Around 28% of transactions involved bond trading, while ETFs and UCITS accounted for 1% and 0.2% respectively (T.46).



The number of **circuit breaker** occurrences was low in 2H17, with about 38 occurrences per week triggered on 14 EU trading venues (A.179).<sup>21</sup> Circuit breakers are trading-venue-based mechanisms designed to manage periods of high volatility by halting trading whenever the price of a security falls out of a predetermined price range; trading resumes after the securities affected are put into auction.

According to the ESMA register on **suspensions and removals**, in 2H17 67 financial instruments were suspended from trading on EEA trading venues (A.171). Most of the ongoing suspensions in 4Q17 originated from one EU Member State, without being attributed to a specific reason.

<sup>21</sup> The figures on CB occurrences on EU trading venues do not cover XETRA, Euronext or the Irish Stock Exchange.

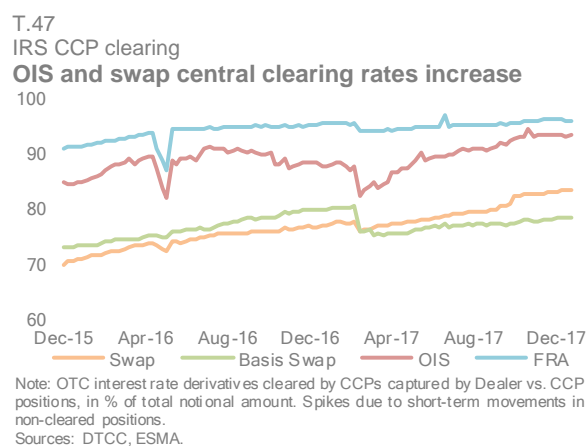
During the same period, 107 financial instruments were removed from trading (A.172).

### CCPs: increased CDS clearing

In 2H17, three Indian CCPs were added to the list of third-country central counterparties recognised to offer services and activities in the EU. This brings the number of third-country **CCPs recognised** in the EU to 32 entities. In July and August 2017, the second delegated regulations requiring mandatory clearing of certain interest rate derivatives<sup>22</sup> and index CDS took effect for financial counterparties and AIFs with gross notional amounts outstanding above the EUR 8bn threshold.<sup>23</sup> These counterparties are now required to clear fixed-to-float swaps and forward rate agreements (FRA) denominated in NOK, PLN and SEK currencies, as well as two CDS indices (five-year untranchéd iTraxx Main Index CDS and five-year untranchéd iTraxx Crossover Index CDS).

**Central clearing** remained on its long-term upward trend in 2H17. OIS clearing rose from 90% at the end of 1H17 to 93% in December, while the share of cleared basis swaps and FRAs remained broadly stable at a high level (78% and 96%, respectively). The proportion of centrally cleared regular swaps climbed from 79% in June to 83% at the end of 2017 (T.47). Clearing rates recovered for all instruments (except basis swaps) from their mid-February slump, possibly reflecting concerns over participants' capacity to meet the 1 March 2017 deadline for mandatory variation margining on non-cleared derivatives.

As the second phase of the clearing obligation for certain CDS indices entered into force, CDS central clearing rates consistently increased. Based on daily trading volumes, the share of centrally cleared CDS contracts climbed to 86% at the end of September 2017, up from 80% at the end of June, and well above the five-year moving average (A.188).



### CSDs: higher rate of corporate bond settlement fails

Continuing its regulatory effort, in 2H17 ESMA published guidelines<sup>24</sup> on cooperation between authorities under the **Central Securities Depositories Regulation (CSDR)**. The purpose of these guidelines is to ensure consistent, efficient and effective supervisory practices within the EU in respect of cooperation arrangements between supervisory authorities. More specifically, the guidelines refer to the consultation of authorities involved in the procedure for authorising CSDs and communication between the home and host authorities in relation to a CSD wishing to provide cross-border services.

On 18 September 2017, the final migration wave to T2S was completed, with four additional markets connecting to it: Estonia, Latvia, Lithuania and Spain. The number of CSDs currently connected to T2S reached 20, covering 20 European markets. T2S, the European platform for securities settlement, provides harmonised settlement across Europe and treats cross-border and domestic settlement identically, thus enhancing the integration of post-trade processes in the Union. While the total value of settled transactions in the EU has increased since the beginning of migration to T2S in June-August 2015, the share of **settlement fails** decreased across markets during the summer. Settlement fails subsequently remained relatively low for equities but increased for corporate bonds. Across markets, the percentage of

<sup>22</sup> Commission Delegated Regulation (EU) 2016/1178 of 10 June 2016 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on the clearing obligation (Text with EEA relevance)

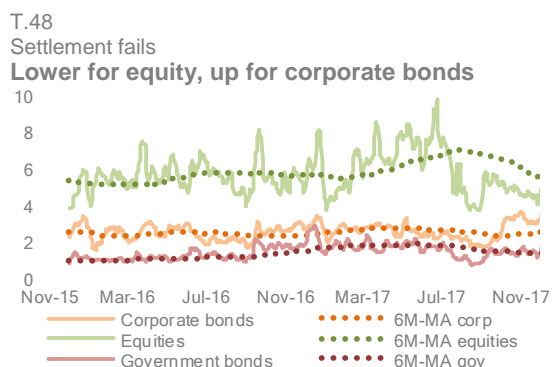
<sup>23</sup> Commission Delegated Regulation (EU) 2016/592 of 1 March 2016 supplementing Regulation (EU) No 648/2012

of the European Parliament and of the Council with regard to regulatory technical standards on the clearing obligation.

<sup>24</sup> See: [https://www.esma.europa.eu/sites/default/files/library/esma70-151-435\\_csd\\_guidelines\\_on\\_cooperation\\_between\\_authorities.pdf](https://www.esma.europa.eu/sites/default/files/library/esma70-151-435_csd_guidelines_on_cooperation_between_authorities.pdf)



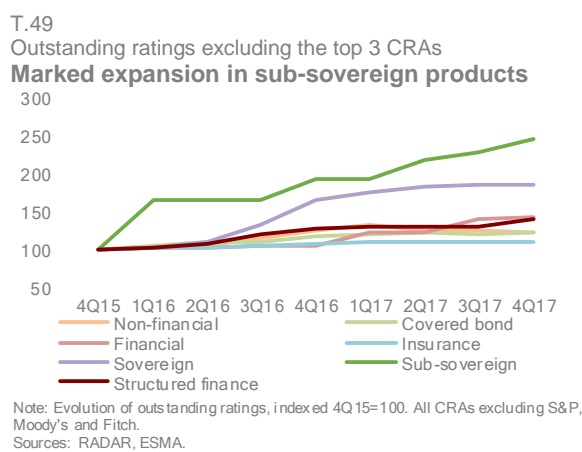
settlement fails was, as usual, higher for equities (T.48).



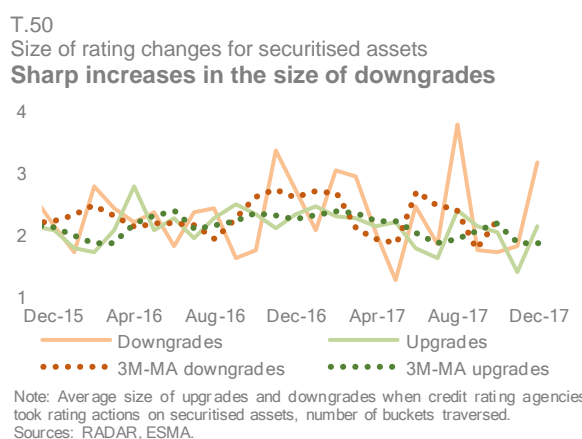
### CRAs: increase in downgrade size for securitised products

The **CRA industry** in the EU remains concentrated around three large players (S&P's, Moody's and Fitch Ratings), which issue 80% of all outstanding ratings, while smaller CRAs are expanding their businesses. Indeed, the number of outstanding ratings issued by smaller CRAs is steadily growing: It has increased by 25% since 4Q15, while the ratings issued by the three largest CRAs decreased by 5% (T.49 and A.194). This trend is particularly pronounced in the financial and sub-sovereign sectors.

In April 2017, ESMA promoted a common approach to rules supporting the use of smaller CRAs by issuing a Supervisory Briefing<sup>25</sup> to nationally-appointed Sectoral Competent Authorities. In particular, ESMA provides clarity with regard to the application of Article 8 of the CRA Regulation, which requires issuers or related third parties to consider appointing a smaller CRA when they intend to appoint two or more CRAs for an issuance or entity rating.



In terms of **geographical coverage**, of all the EU-registered CRAs only the three largest have full EU-wide coverage, issuing ratings for entities located and/or instruments traded in all 28 EU Member States. As of December 2017 there were eight CRAs that operated within national borders only.



In 2H17, rating actions on **securitised products** continued to be characterised by more upgrades than downgrades (A.55). However, the average size of downgrades far exceeded that of upgrades. Particularly evident are the peaks observed in August and December, when securitised products were on average downgraded by four notches (T.50). During that period, there were 602 new SFI ratings issued, as opposed to 900 withdrawals, reflecting the long-term decline in the amount of securitised products outstanding (A.78).

### Financial benchmarks: lower dispersion of Euribor quotes

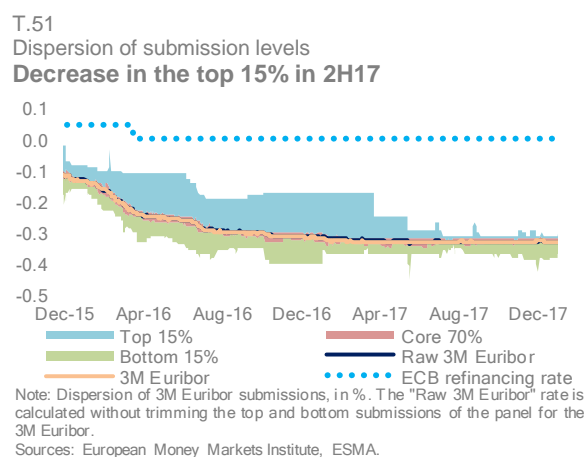
On 30 June 2016 the **Benchmarks Regulation** (BMR) entered into force to be fully applicable as

<sup>25</sup> "Supervisory Briefing: A Common Approach to the CRA Regulation's Provisions for Encouraging the use of Smaller CRAs", April 2017.

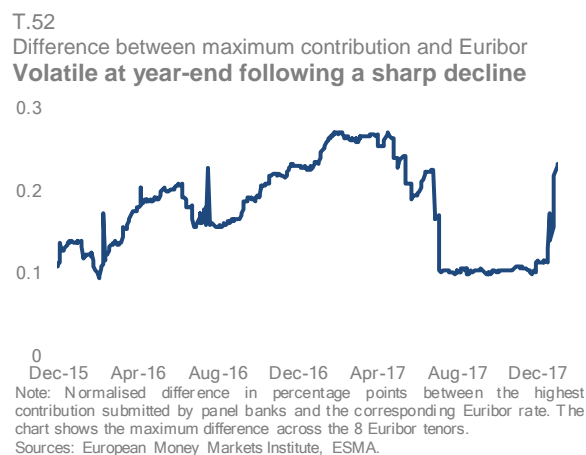
of January 2018.<sup>26</sup> ESMA began publishing the list of benchmark administrators and third country benchmarks at the beginning of the year. EURIBOR, EONIA and LIBOR were designated as critical benchmarks (i.e. referenced by at least EUR 500bn contracts). For **critical benchmarks**, the BMR provides for the formation of a college of national supervisors and for ESMA to take a coordinating and mediating role.

The BMR stipulates that input data for the benchmark calculation should be transaction data, where available and appropriate. Strengthening the transaction base of major interbank offered rates in the EU has proved more difficult than anticipated, raising important questions as to the long-term strategy in this market. Some steps have already been taken. On 21 September, the ECB announced that it would start providing an overnight unsecured index before 2020, based entirely on transactions. On the same date, the Belgian Financial Services and Markets Authority (FSMA), ESMA, the ECB and the EC announced the launch of a new working group tasked with the identification and adoption of a risk-free overnight rate to serve as a basis for an alternative to current benchmarks denominated in euro.

In terms of **panel composition**, the Euribor panel composition remained stable in 2H17 at 20 banks, while 28 banks continued to constitute the EONIA panel (A.195). Our risk indicators do not identify any significant irregularity in Euribor submission and calculation during the reporting period.<sup>27</sup> The dispersion of Euribor submission quotes narrowed further at the beginning of 2H17 and remained low and stable during most of the period (T.51).



The lower dispersion was also reflected in the sharp drop in the maximum difference between the quotes submitted and the actual Euribor in early 2H17, as the submission by one panel bank converged to the other quotes in the six-month tenor rate. Alongside this, the **gap** between the actual Euribor<sup>28</sup> and the non-trimmed average for the three-month tenor narrowed in 2H17. A sharp increase in the difference between the maximum contribution and the actual Euribor rate at the end of the year (T.52) may be related to volatile money market conditions, reflected in volatile repo rates and higher sovereign bid-ask spreads.



The **three-month Euribor rate** was broadly stable at negative levels during the second half of the year, with 3% of banks lowering the previous-day submission, 2.9% raising their quotes and 94% keeping them unchanged (A.198). Finally, in 2017 the three-month Euribor remained below the ECB interest rate for the main refinancing operations.

<sup>26</sup> Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016.

<sup>27</sup> ESMA's risk indicators are based on the data publicly available on the EMMI website.

<sup>28</sup> The current Euribor calculation builds on a quote-based methodology, where the highest and lowest 15% of

submitted quotes are eliminated in order to prevent any individual contributors from influencing the rate. The remaining quotes are then averaged.

At the global level, in a recent progress report on **benchmark reform**<sup>29</sup> the Financial Stability Board (FSB) concluded that whilst regulators have developed powers to require mandatory contributions to benchmarks, ensuring the integrity and robustness of benchmarks remains challenging and it is uncertain whether submitting banks will continue to make submissions to unsecured interest rate benchmarks over the medium to long-term. The FSB acknowledges that only limited progress has been made to date on migration from the major interbank benchmarks to alternative risk-free reference rates even where these are already available.

---

<sup>29</sup> FSB, "Reforming major interest rate benchmarks, Progress report on implementation of July 2014 FSB recommendations", October 2017.

# Risks

# ESMA Risk Dashboard

R.1

## Main risks

Risk segments	Risk categories		Risk sources				
	Risk	Outlook	Risk	Outlook	Outlook		
Overall ESMA remit	Orange circle	Blue arrow	Liquidity	Orange circle	Blue arrow	Macroeconomic environment	Downward arrow
Systemic stress	Yellow circle	Blue arrow	Market	Red circle	Blue arrow	Low interest rate environment	Blue arrow
Securities markets	Red circle	Blue arrow	Contagion	Orange circle	Blue arrow	EU sovereign debt markets	Blue arrow
Investors	Yellow circle	Blue arrow	Credit	Orange circle	Blue arrow	Infrastructure disruptions, incl. cyber risks	Upward arrow
Infrastructures and services	Yellow circle	Blue arrow	Operational	Yellow circle	Upward arrow	Political and event risks	Upward arrow

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 4Q17 overall risk assessment is unchanged from 3Q17. EU financial markets remained calm during the quarter, with limited reactivity to global geopolitical events. While benign market conditions prevailed during the reporting period, February 2018 saw severe market corrections and the return of equity market volatility, confirming our prevailing valuation concerns. ESMA's market risk assessment remains very high. However, our assessment for credit risk has improved from very high to high. The outlook for market, liquidity and contagion risks is stable. Operational risk continues to be elevated, with a deteriorating outlook, due to Brexit-related risk to business operations and the mounting risk of cyber-attacks. The main sources of risk remain a potential repricing of risk premia and geopolitical developments whose effects may spill over to global financial markets. On the perimeter of global securities markets, the latter months saw extreme volatility in the prices of virtual currencies and strong growth in Initial Coin Offerings.

## Risk summary

Risks in the markets under ESMA's remit remained at high levels, reflecting very high risk in securities markets and elevated risk for investors, infrastructures and services. ESMA's market risk assessment was again very high. While benign market conditions prevailed during the reporting period, the beginning of February 2018 saw severe market corrections and the return of equity market volatility, confirming our prevailing valuation concerns. On the other hand, the level of credit risk eased from very high to high, reflecting a strengthening macroeconomic environment and higher credit ratings in several EU member states, although the deterioration in outstanding corporate ratings persisted. Liquidity risk in 4Q17 remained high despite improvements in securities markets. Operational risk was elevated, but with a deteriorating risk outlook as concerns mount over potential cyber-attacks. The risk outlook was stable across the other risk categories. On the perimeter of global securities markets, the latter months saw an extraordinary rise and subsequent fall in prices of virtual currencies, as well as growing issuance of

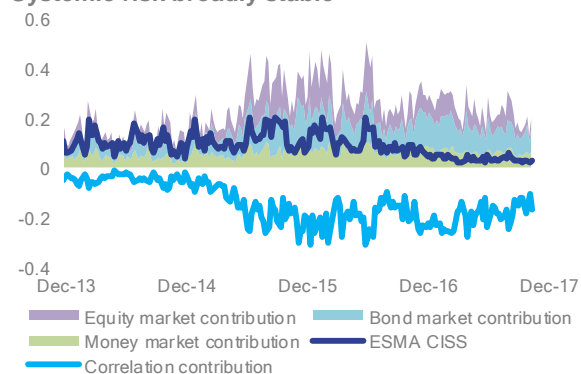
Initial Coin Offerings (ICOs). ESMA has warned against the substantial risks associated with investments in virtual currencies and ICOs.

**Systemic stress** remained at very low levels in 4Q17, based on the composite systemic stress indicator (R.2). Within securities markets, bond markets again registered the highest contribution to the systemic stress measure.

R.2

ESMA composite systemic stress indicator

### Systemic risk broadly stable



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

## Risk sources

**Macroeconomic environment:** The EU's economic recovery continued in 4Q17. Household spending remains an important driver of the ongoing expansion, while fixed capital investment is gaining momentum. Business survey data point to the strongest economic activity in several years and are still trending up. Economic sentiment in the EU reached its highest level since 2000, supported by a broad-based increase in business and consumer confidence. According to the European Commission's Autumn forecast, the EU economy performed significantly better than expected in 2017, in line with stronger growth around the world. EU GDP is now expected to have grown by 2.3% in 2017 and to gradually slow over the next two years to 2.1% in 2018 and 1.9% in 2019. Downside risks to the growth outlook remain – linked to global geopolitical events, a potential slowdown in China, stronger appreciation of the euro, and risks related to the outcome of the Brexit negotiations.

**Low interest-rate environment:** In 4Q17, ECB monetary policy remained highly accommodative to ensure supportive financing conditions, while BoE rates remained low despite an increase in November. EA government bond yields declined slightly in the reporting period, while corporate bond spreads tightened again. The low-yield environment thus persists, reinforcing risks related to search-for-yield strategies. The high-yield fund segment experienced some volatility in 4Q17, with a sharp decline in US high-yield corporate bonds and net redemptions from EU-domiciled funds of EUR 8bn. Another source of concern stems from funds investing in emerging market bonds, which registered net cumulative inflows of EUR 71bn (R.25) and may be particularly vulnerable to a sudden reversal in global risk premia due to the lower liquidity of their investment portfolio. Excessive risk-taking and potential capital misallocation thus remain relevant risk sources in the medium-term. In the context of a persistently low interest yield environment, abruptly increasing yields could lead to losses for investment positions and generate volatility spikes in asset prices.

**EU sovereign debt markets:** Ten-year EU sovereign risk premia generally edged down in 4Q17 amid low interest rates and supportive monetary policy. Sovereign yields seem to have somewhat bottomed out for now following an increase at the beginning of 2017, reflecting the gradual improvement in the macroeconomic context. In the medium to long-term, rising yields

could represent a source of risk in countries with high levels of public and private debt. Sovereign bond market liquidity remained ample in 4Q17, although it decreased slightly towards the end of the year (R.11).

**Market functioning:** No significant disruptions to the functioning of EU markets were observed in 4Q17. During this period, the number of circuit breaker occurrences remained low with a weekly average of 38, compared to 121 in 1H17 (R.39). The number of ongoing trading suspensions increased, but these were concentrated mainly in one EU Member State. Central clearing continued to increase as implementation of the clearing obligation for derivatives continues. In August, the second delegated regulation requiring mandatory clearing of certain index CDS took effect for financial counterparties and AIFs above the EUR 8bn threshold of gross amounts outstanding. On 18 September, the final migration wave to T2S was completed, with four additional markets connecting to it: Estonia, Latvia, Lithuania and Spain. T2S contributes to the integration of post-trade processes across participating markets. The total value of settled transactions in the EU has increased since the beginning of migration to T2S in June-August 2015. In 4Q17, the share of settlement fails increased for corporate bonds, while declining for equities (R.42). Cyber risk is increasingly becoming a concern for financial market institutions, especially with respect to their business continuity and the integrity of proprietary data, as illustrated by recent global ransomware attacks.

**Political and event risk:** In the EU, Brexit is among the most important political risks. The ongoing negotiations between the EU27 and the UK on the withdrawal terms represent a high source of uncertainty for financial markets, despite the absence of any visible reaction in EU markets – foreign exchange markets aside. News flow and announcements may further intensify political and event risk, increase uncertainty and lead to greater asset price volatility in EU markets. In particular, a scenario in which negotiations remain inconclusive or end in a disorderly fashion could result in negative cliff effects in financial markets. ESMA is calling on market participants to thoroughly review any potential exposure to Brexit cliff effect risks and address these as part of their risk management.

## Risk categories

**Market risk – very high, outlook stable:** In 4Q17 financial markets exhibited limited reaction to geopolitical risks. Short-term expectations of equity price volatility ticked up from 11% to 13%, partly reflecting renewed concerns over political developments in the EU; historically, however, they remained at low levels overall (R.7). In contrast, exchange rate volatilities continued to decline (R.8). EU financial equity prices were mixed, with banks underperforming other sectors (-2.4%), while insurance companies and other financials gained 1.2%. In the medium to long term, sources of concern stem from political uncertainty in the Brexit negotiations and from valuation risk. Elevated prices in the context of a low yield environment could be exposed to severe reversals due to swift repricing of risk premia, should a phasing out of expansionary monetary policy materialise.

**Liquidity risk – high, outlook stable:** Liquidity in equity markets remained stable in 4Q17, with the ESMA composite equity illiquidity indicator oscillating close to its long-term average (R.4). Liquidity in sovereign bond markets deteriorated slightly towards the end of the year, reflected mainly in higher bid-ask spreads (R.10, R.11). In contrast, bid-ask spreads on corporate bonds continued to narrow in 4Q17 to levels below their long-term average (R.16). The trading volume of centrally cleared repos continued to grow strongly (R.13) while collateral scarcity premia (i.e. the difference between general collateral and special collateral repo rates), increased again in late 2017 (R.14) reflecting possible shortages of high-quality collateral. This may increase liquidity risk and volatility in funding costs and reduce overall market confidence.

**Contagion risk – high, stable outlook:** In sovereign bond markets, the median correlation between Germany and other EU countries' bond yields decreased temporarily at the beginning of 4Q17 but remained generally high. Dispersion levels gradually fell, with most countries now registering positive correlation with German bonds (R.19). In the medium to long term, contagion risks may derive from swift repricing in bond markets leading to high bond fund redemptions and triggering fire sales of illiquid assets. Intra-sectoral fund interconnectedness increased in 4Q17 for both hedge funds and MMFs (R.29 and R.31). MMFs' higher interconnectedness potentially reflects the build-up of risk buffers against the ongoing trend of asset price inflation (R.32).

**Credit risk – high, outlook stable:** In 4Q17 non-financial corporate bond spreads remained very low across rating categories in the range of 68 bps for BBB-rated securities to 7 bps for the AAA class (R.15). Covered bond spreads recorded similar developments. The gradual introduction of mandatory clearing for certain derivative asset classes should also help reduce counterparty credit risk. On the other hand, the credit quality of corporate bonds continued to deteriorate, though at a slower pace compared to 1H17 (R.17), and substantial inflows for bond funds investing in emerging markets revealed the persistence of search for yield strategies (R.25). Overall, our credit risk assessment improves from very high to high, reflecting the increasingly robust macroeconomic environment, improvements in EA sovereign and corporate creditworthiness and low credit spreads. A potential future revision of the monetary policy stance may adversely impact our credit risk assessment, given the high-level of indebtedness in several EU countries.

**Operational risk – elevated, outlook deteriorating:** Conduct and systems risks remained a key concern both within and outside the EU. On conduct risk, the number of complaints regarding financial instruments reported directly to NCAs in our sample saw an uptick in 3Q17 to around 1,500, following a steady downward trend from 2Q16 onwards. One driver of this trend was the continuing reduction in complaints regarding contracts for difference and options, futures and swaps, following actions taken by NCAs in relation to some firms providing these products. Complaints relating to bonds and other debt securities exhibited the greatest increase in 3Q17, although more than a quarter of the complaints still related to equity instruments (R.37). The dispersion of Euribor submission quotes increased anew in late 4Q17 (R.45), possibly reflecting year-end money market volatility. As regards systems risk, in 4Q17 no major trading disruptions were observed on EU trading venues, with trading volumes at around a third of the two-year peak observed following the UK referendum (R.40). In post-trading activities, corporate bond settlement fails rose from 2% to 3% in 4Q17 (R.42). Regarding cyber risks, concerns are expected to intensify in the medium to long term; as a result, the risk outlook for operational risk is deteriorating. In 1H17 there were 107 instances of data breaches in the financial services sector, mostly related to identity thefts (R.47).

# Securities markets

R.3

## Risk summary

Risk level

Risk change from 3Q17

Outlook for 1Q18



## Risk drivers

- Asset re-valuation and risk re-assessment
- Low interest rate environment and excessive risk taking
- Geopolitical and event risks
- Potential scarcity of collateral

Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for forthcoming quarter. Systemic risk assessment based on categorisation of the 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

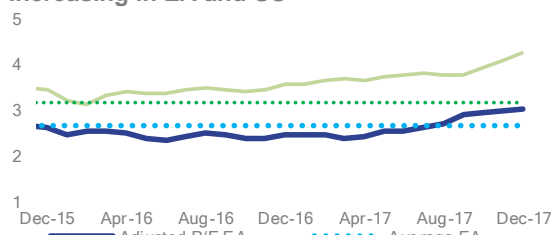
## ESMA composite liquidity index Lower equity liquidity in 4Q17



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

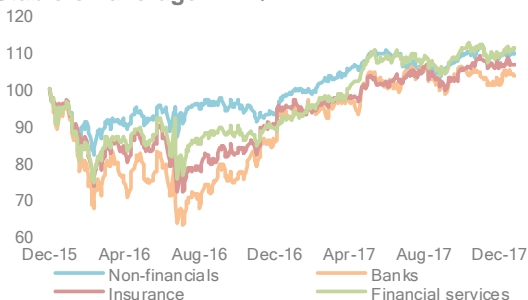
## Equity valuation Increasing in EA and US



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.  
Sources: Thomson Reuters Datastream, ESMA.

R.6

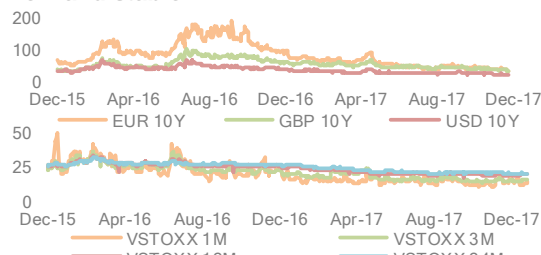
## Equity prices Stable on average in 4Q17



Note: STOXX Europe 600 equity total return indices. 01/12/2015=100.  
Sources: Thomson Reuters Datastream, ESMA.

R.7

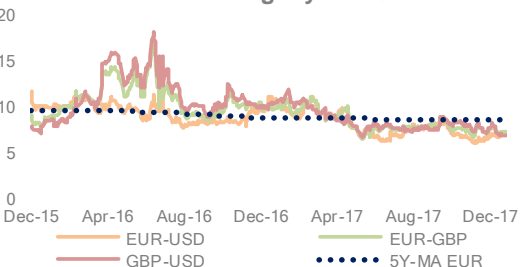
## Financial instrument volatilities Low and stable



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

R.8

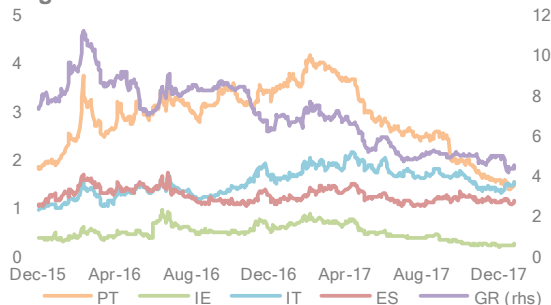
## Exchange rate volatilities EUR-USD decreases slightly in 4Q17



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: Thomson Reuters EIKON, ESMA.

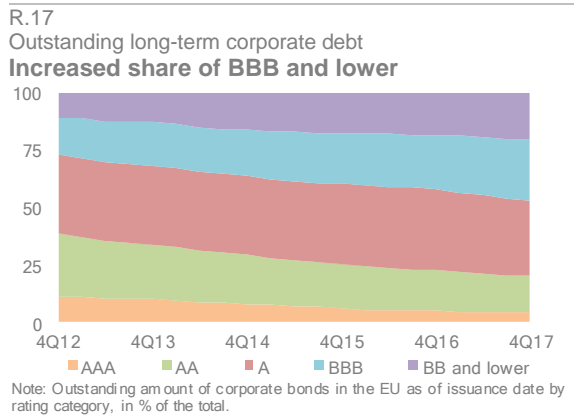
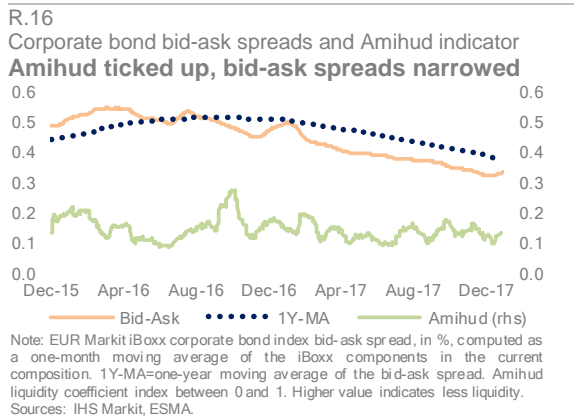
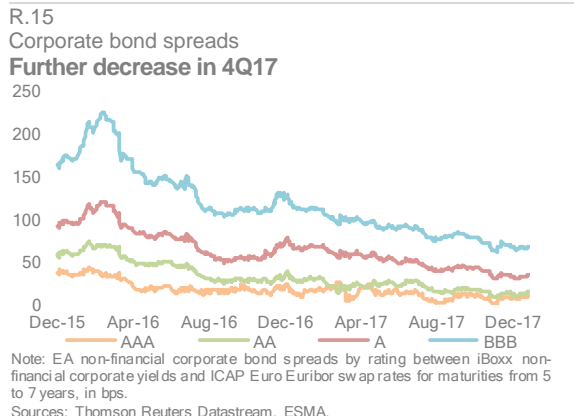
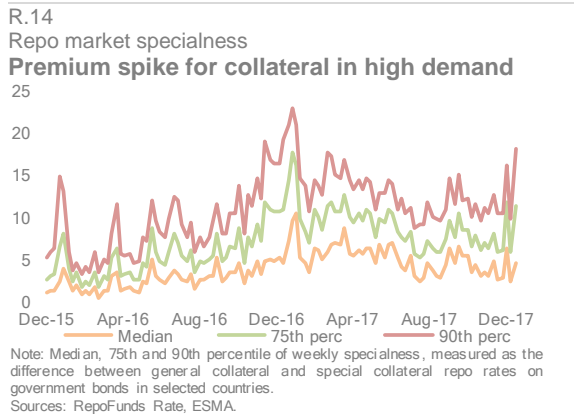
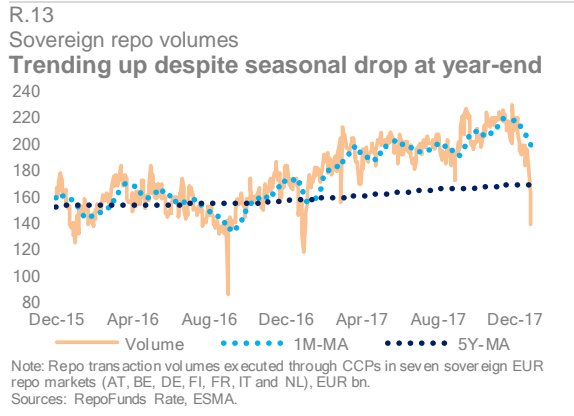
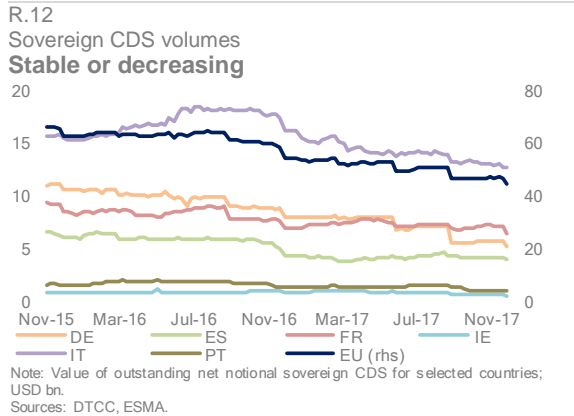
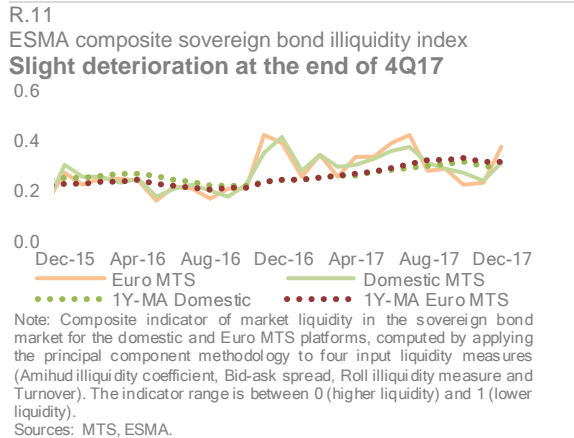
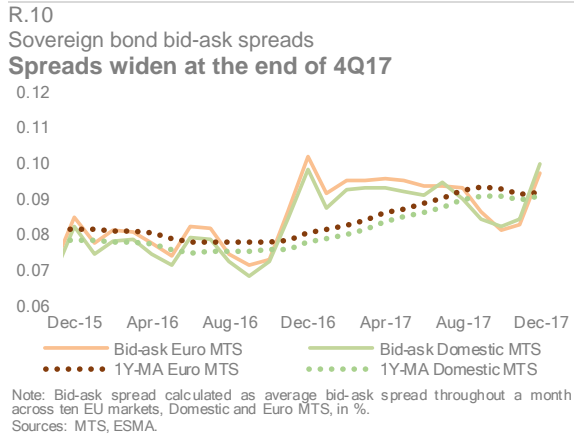
R.9

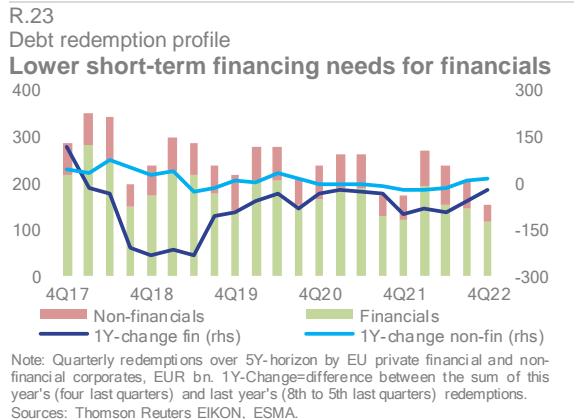
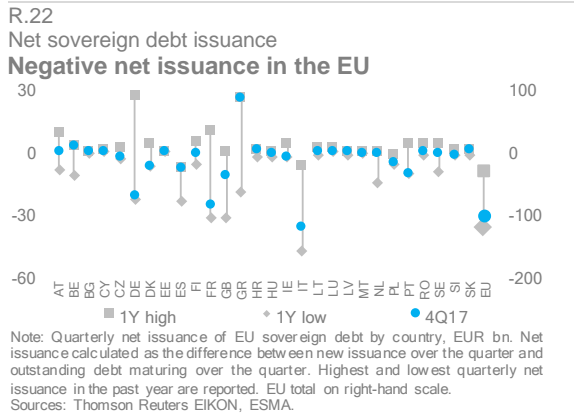
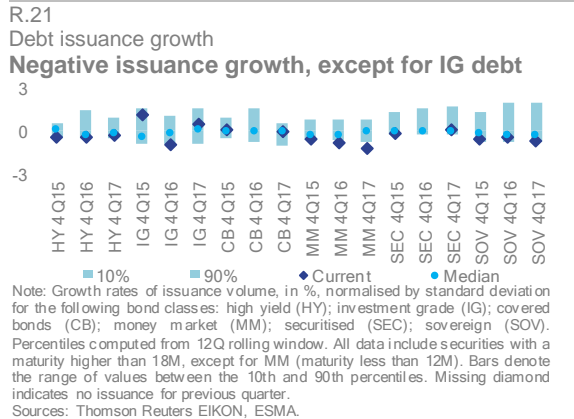
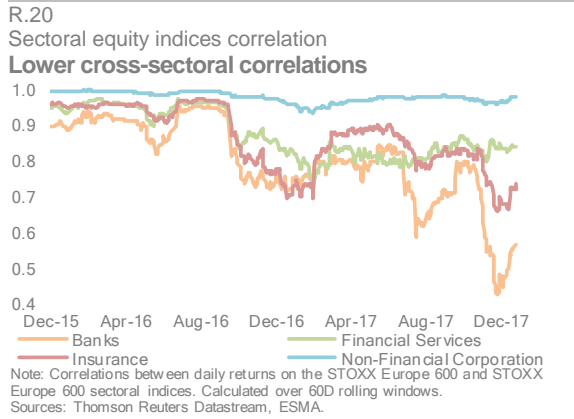
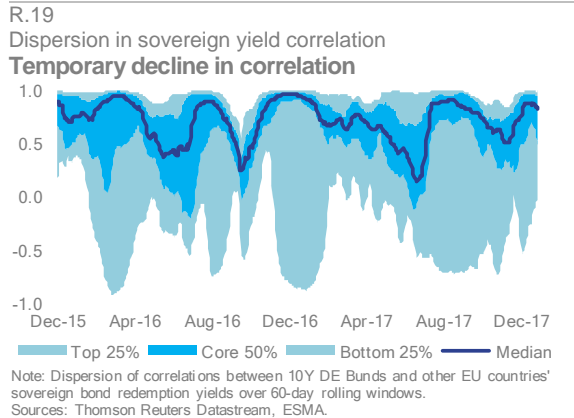
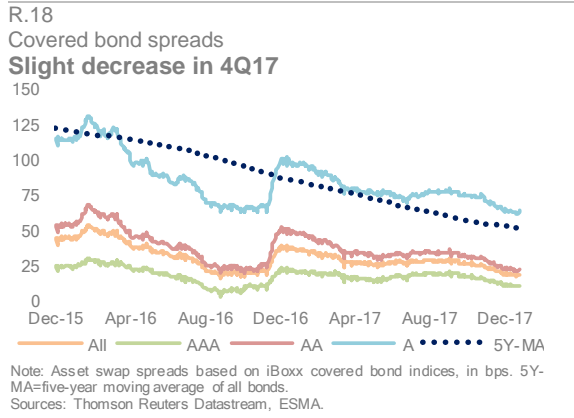
## Sovereign risk premia Slight decline across countries



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







# Investors

R.24

## Risk summary

Risk level

Risk change from 3Q17

Outlook for 1Q18



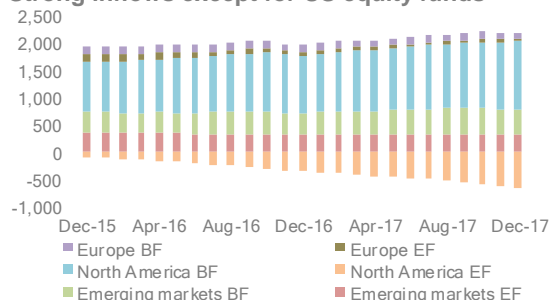
## Risk drivers

- Sustained search-for-yield
- Asset re-valuation and risk re-assessment
- Correlation in asset prices
- Continued inflows into riskier EU investment funds

Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for forthcoming quarter. Systemic risk assessment based on categorisation of the 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

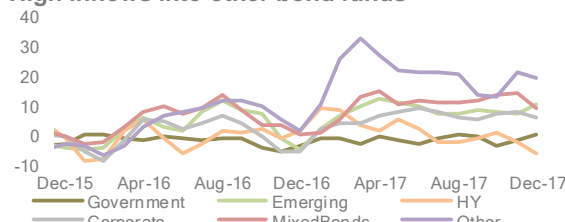
## Cumulative global investment fund Strong inflows except for US equity funds



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

R.26

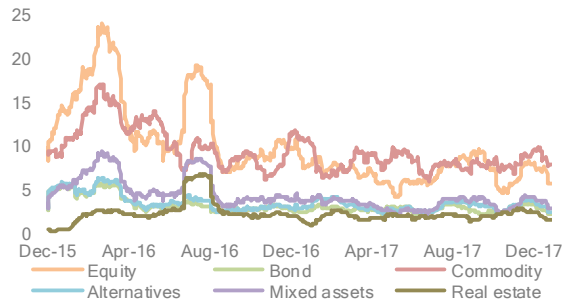
## EU bond fund net flows High inflows into other bond funds



Note: Two-month cumulative net flows for bond funds, EUR bn. Funds investing in corporate and government bonds that qualify for another category are only reported once (e.g. funds investing in emerging government bonds reported as emerging; funds investing in high-yield corporate bonds reported as HY). Other comprises the remaining funds, e.g. absolute return, hedged, short term or inflation-protected funds.  
Sources: Thomson Reuters Lipper, ESMA.

R.27

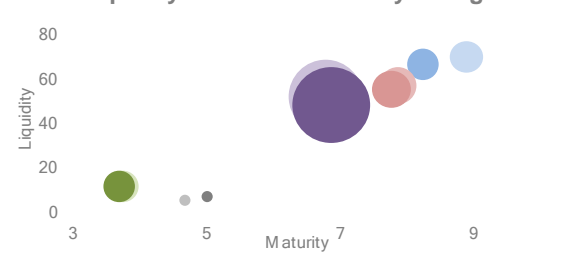
## RoR volatilities by fund type Stable across asset classes



Note: Annualised 40-day historical return volatility of EU-domiciled investment funds, in %.  
Sources: Thomson Reuters Lipper, ESMA.

R.28

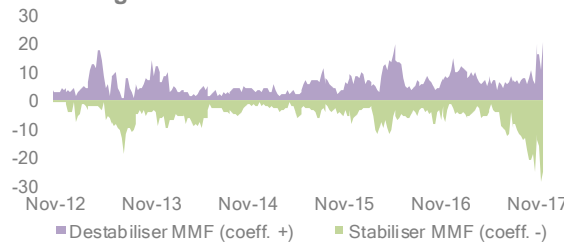
## Liquidity risk profile of EU bond funds Stable liquidity and mixed maturity changes



Note: Fund type is reported according to their average liquidity ratio, as a percentage (Y-axis), the effective average maturity of their assets (X-axis) and their size. Each series is reported for 2 years, i.e. 2016 (bright colours) and 2017 (dark colours).  
Sources: Thomson Reuters Lipper, ESMA.

R.29

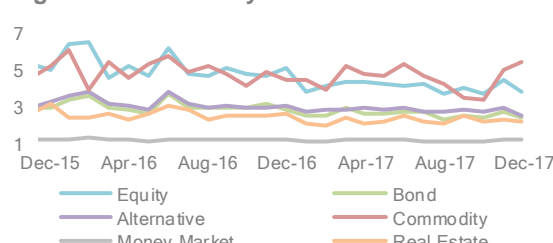
## Money market fund interconnectedness Increasing interconnectedness end-2017



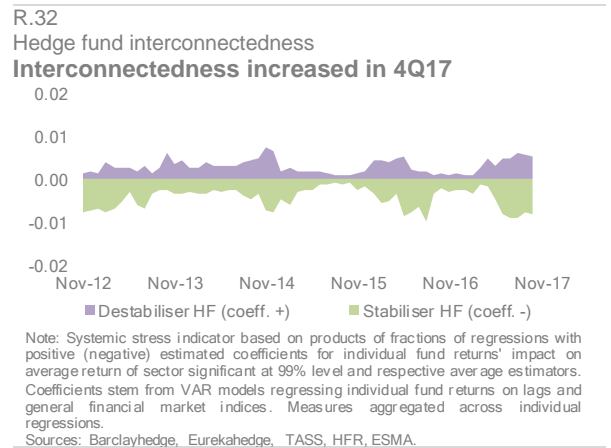
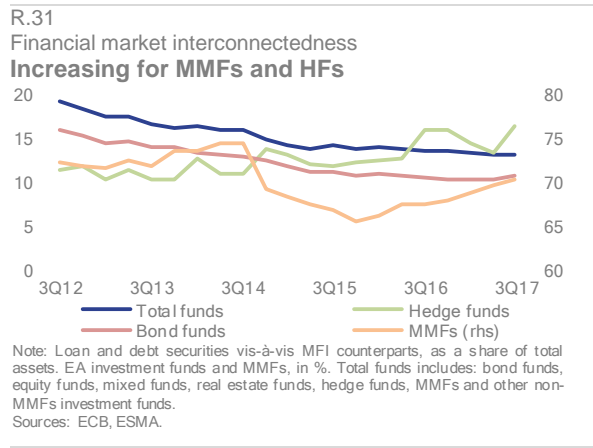
Note: Systemic stress indicator based on products of fractions of regressions with positive (negative) estimated coefficients for individual fund returns' impact on the mean sector return and respective estimators. Coefficients stem from VEC models regressing individual fund returns and moments of the entire industry's return distribution on lags and general financial market indices. Measures aggregated across individual regressions.  
Sources: Thomson Reuters Lipper, Thomson Reuters Datastream, ECB, ESMA.

R.30

## Retail fund synthetic risk and reward indicator Higher for commodity funds



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



# Infrastructures and services

R.33

## Risk summary

Risk level

Risk change from 3Q17

Outlook for 1Q18

## Risk drivers



– Operational risks, incl. cyber risks



– Conduct risk, incl. intentional or accidental behaviour by individuals, market abuse



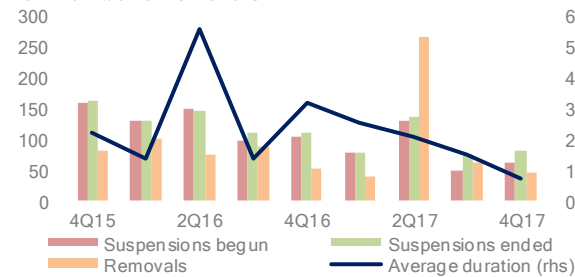
– Systemic relevance, interconnectedness between infrastructures or financial activities, system substitutability

Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for forthcoming quarter. Systemic 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

## Trading suspensions – lifecycle and removals

### Low number of removals

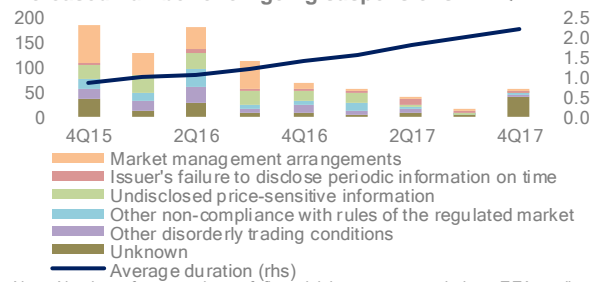


Note: Number of dead suspensions, split by the quarter during which they started and ended, and removals of financial instruments traded in EEA trading venues. Average duration of dead suspensions, in days, computed as the mean of the difference between the end-of-quarter date and the issuance date. Sources: ESMA Registers.

R.35

## On-going trading suspensions by rationale

### Increased number of on-going suspensions in 4Q17

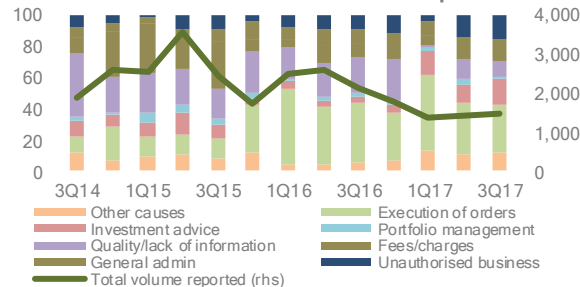


Note: Number of suspensions of financial instruments traded on EEA trading venues ongoing at the end of the reporting period, grouped by quarter during which they started and by rationale. Average duration, in years, computed as the mean of the difference between the end-of-quarter date and the start date. Sources: ESMA Registers.

R.36

## Complaints indicator by rationale

### Execution of orders is main cause for complaint

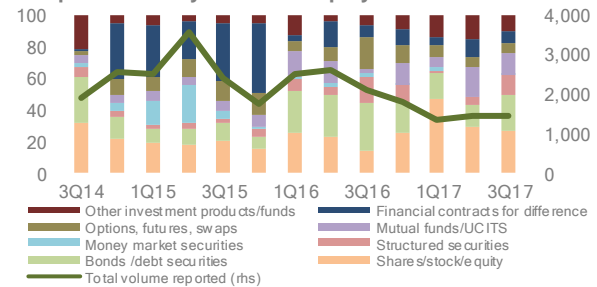


Note: Complaints reported directly to 18 NCAs (AT, BG, CY, CZ, DE, DK, EE, ES, FI, HR, HU, IT, LT, LU, MT, PT, RO, SI), in % of total volume by cause. The line shows the total volume of complaints reported (rhs). Sources: ESMA complaints database.

R.37

## Complaints indicator by instrument

### Complaints mostly related to equity and bond instruments

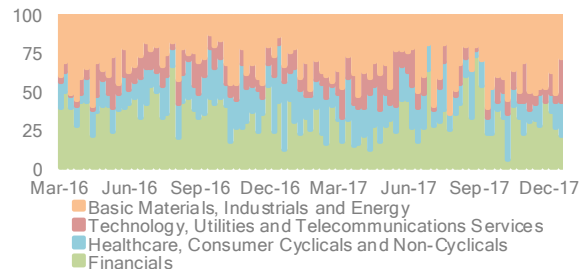


Note: Complaints reported directly to 18 NCAs (AT, BG, CY, CZ, DE, DK, EE, ES, FI, HR, HU, IT, LT, LU, MT, PT, RO, SI), in % of total volume by type of financial instrument. The line shows the total number of complaints reported (rhs). Source: ESMA complaints database.

R.38

## Circuit breaker trigger events by sector

### Lower share for financials

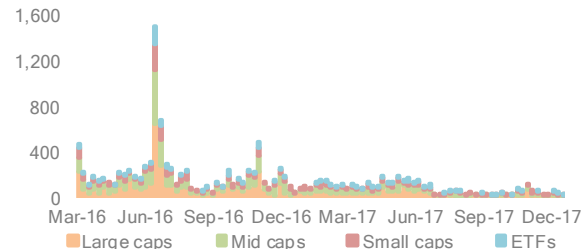


Note: Percentage of circuit breaker trigger events by economic sector. Results displayed as weekly aggregates. The analysis is based on a sample of 10,000 securities, including all constituents of the STOXX Europe 200 Large/Mid/Small caps and a large sample of ETFs tracking the STOXX index or sub-index. Sources: Morningstar Real-Time Data, ESMA.

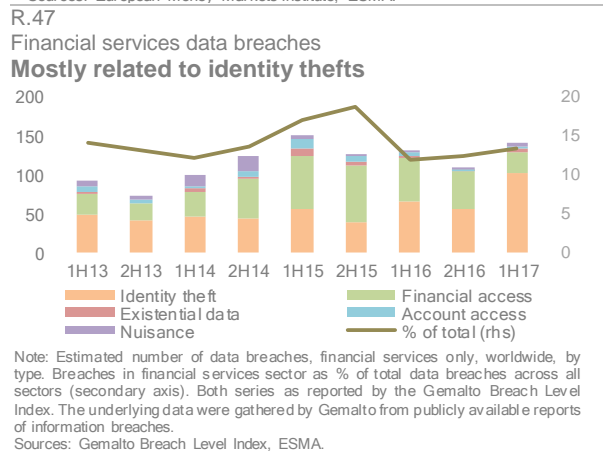
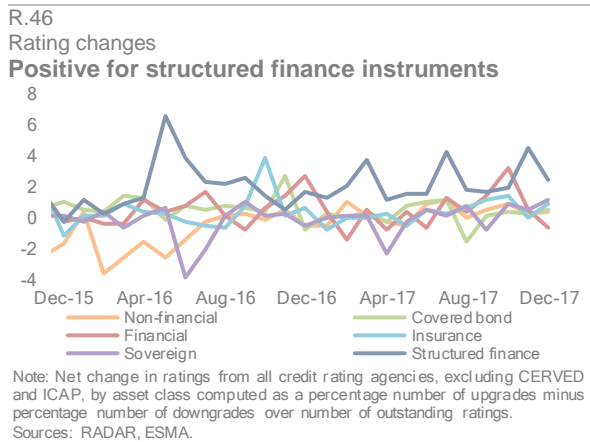
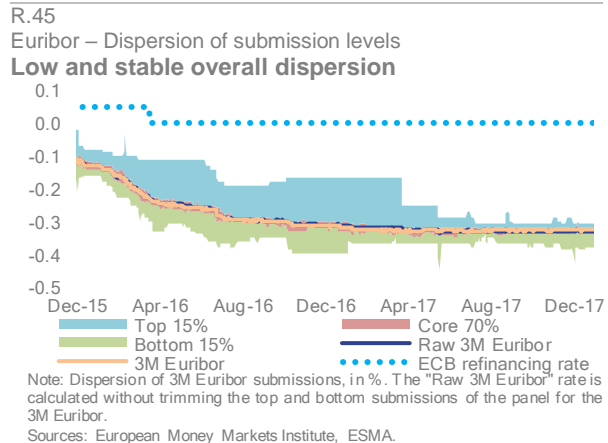
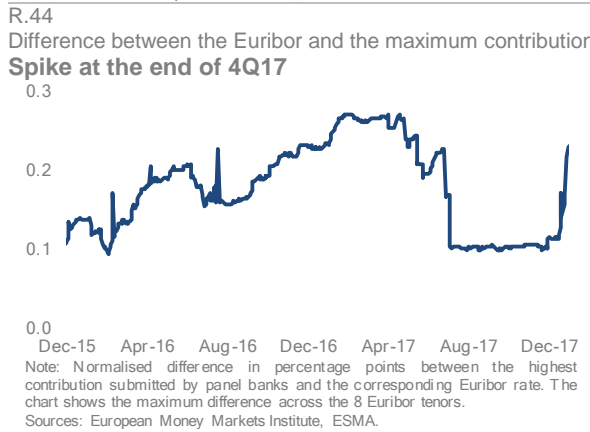
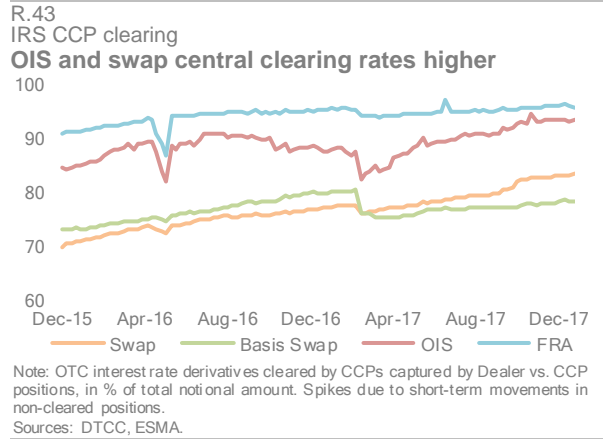
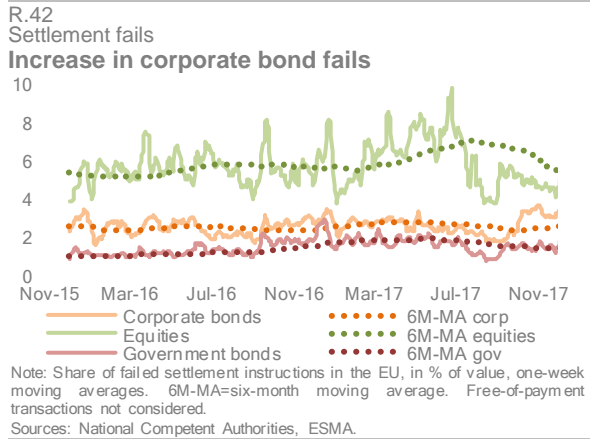
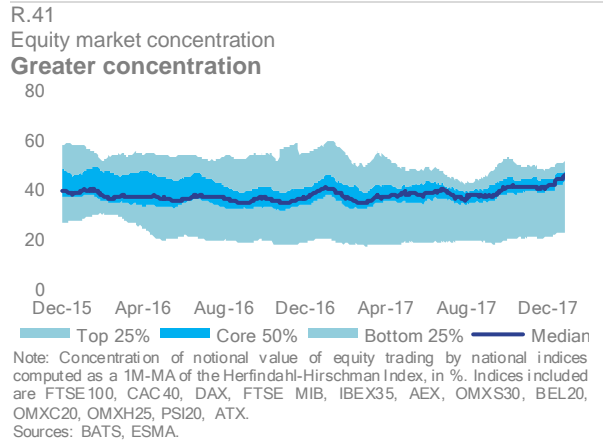
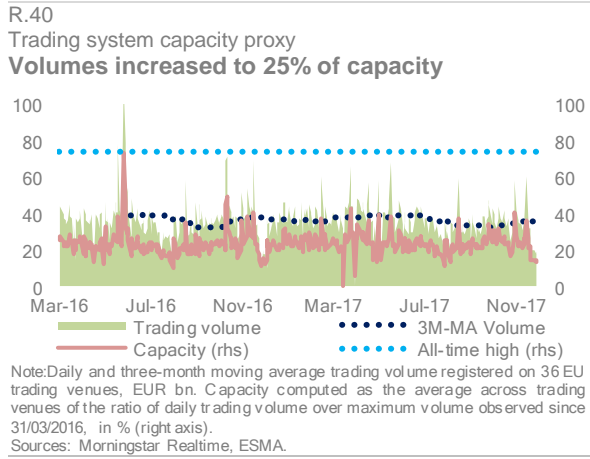
R.39

## Circuit breaker occurrences by market capitalisation

### Limited number of occurrences



Note: Number of daily circuit breaker trigger events by type of financial instrument and by market cap. 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.



# Vulnerabilities

## Investor protection

# AIFMD – a framework for risk monitoring

Contact: [massimo.ferrari@esma.europa.eu](mailto:massimo.ferrari@esma.europa.eu)<sup>30</sup>

In the aftermath of the financial crisis, the regulation of Alternative Investment Funds (AIFs) has been a European regulatory priority due to their perceived risks to financial stability, orderly markets and investor protection. The Alternative Investment Fund Managers' Directive (AIFMD) establishes an EU-wide harmonised framework for the supervision of Alternative Investment Fund Managers (AIFMs), with the objectives of enhancing investor protection, strengthening the single market and monitoring systemic risk. This article discusses the distinctive features of the AIFMD in the light of their role in enhancing market integrity and their impact on financial stability. The extensive reporting obligations introduced by the AIFMD for AIFs and their managers allow National Competent Authorities (NCAs) to oversee whether AIFMs are properly addressing micro-prudential risks, and to assess the potential systemic consequences of the individual or collective AIFM activities. By providing a first EU-wide analysis of the structure and main risks stemming from the AIFs market, this article helps to build an operational framework for monitoring risks in the AIFM sector.

## Introduction

In the aftermath of the global financial crisis the G20 international forum stressed in its 2008 summit in Washington, and at subsequent meetings,<sup>31</sup> the necessity of consistent international regulation and oversight with respect to every financial market participant and financial product, reflecting the global consensus for tighter regulation of the alternative investment fund sector.

In response to this, the Financial Stability Board (FSB) advanced a programme of financial reforms to build a more resilient and less procyclical financial system. The work of the FSB in this regard emphasised the need to create global monitoring capabilities to capture the scale and trends in non-bank financial intermediation (FSB, 2011).

In this context, the European Commission proposal for a Directive on Alternative Investment Fund Managers (AIFMD) issued in 2009 aimed to lay the regulatory foundations for a secure financial system to support and stimulate the real

economy. This represented the first attempt to regulate the alternative investment fund industry at EU level. The European Parliament and the Council finally adopted the Directive<sup>32</sup> in June 2011.<sup>33</sup>

The remainder of this article is structured as follows: Section 2 outlines the status of the regulatory framework prior to the adoption of AIFMD, as well as the objectives and distinctive features of the Directive. Section 3 discusses the reporting framework laid down by the Directive and the Level II Regulation. Section 4 presents an overview of the structure of and risks in the EU alternative investment fund market. The latter is based on AIFMD data collected at the end of 2016, covering around 60% of the AIFs managed and/or marketed by EU asset managers. The figures included in this article only cover reporting items that show an adequate level of quality according to our data quality analysis. However, there may be revisions in the future as ESMA and NCAs continue to work on improving data completeness and quality.

<sup>30</sup> This article was authored by Massimo Ferrari.

<sup>31</sup> In November 2008, the Washington Summit Declaration called for the extension of regulation to all sectors of the financial industry. In April 2009, the London Summit Declaration provided for all systemically important financial institutions, markets, and instruments to be subject to the appropriate degree of regulation and oversight, suggesting mandatory registration of asset managers and oversight over their activities to ensure adequate risk management. The Pittsburgh and Toronto

Summit Declarations of September 2009 and June 2010 confirmed support for the global regulation of financial services and agreed on the implementation of strong measures to improve transparency and regulatory supervision of the alternative investment fund industry.

<sup>32</sup> Directive 2011/61/EU.

<sup>33</sup> The AIFM Directive was published in the Official Journal of the European Union on July 1, 2011 and entered into force on July 21, 2011.



## Overview of the regulation

### The status prior to AIFMD

Before the adoption of AIFMD, managers of alternative investment funds, unlike UCITS, were not subject to EU-level legislation. Even so, many asset managers were authorised to perform portfolio management and investment advisory activities under MiFID. Moreover, several regulatory initiatives were implemented at national jurisdiction level across the EU.

The fragmented pre-crisis regulatory and supervisory landscape created a disincentivising environment for cross-border activity and distribution of alternative investment products. In a 2005 Green Paper the European Commission had already highlighted the negative impact on EU growth of the inefficiencies in the market for non-UCITS investment funds.<sup>34</sup>

### The objectives of AIFMD

The objective of the AIFMD is to provide an internal market and a harmonised regulatory and supervisory framework for the activities within the EU of all AIFMs, regardless of whether they have their registered office in a Member State (EU AIFMs) or a third country (non-EU AIFMs).<sup>35</sup>

As a post-crisis regulatory initiative, the AIFMD clearly exhibits some crisis-related features aimed at strengthening investor protection and financial market stability. These features include:

- the enhancement of intermediary specific oversight and the integrity of the internal market to provide legal certainty for its participants, e.g. professional investors, competent authorities and other stakeholders;
- an incentive structure aiming to avoid excessive risk taking by imposing cross-sector rules on remuneration schemes and governance;

- a focus on systemic risk and consistent requirements regarding risk management procedures and processes;
- extensive reporting obligations;
- close cooperation between all National Competent Authorities (NCAs) and ESMA.

In broad terms, the AIFMD lays down rules for the authorisation, ongoing operation and transparency of AIFMs<sup>36</sup>.

#### V.1

### Background of AIFMD

The regulation of AIFs, including hedge funds, has its roots in events that took place long before the financial crisis. The failure of Long-term Capital Management (LTCM) in 1998 already acted as a prime, albeit isolated, example of the risks associated with position concentration and a lack of regulatory oversight, bringing to regulatory attention the systemic risks posed by highly leveraged funds. While some of these issues also became apparent during the financial crisis,<sup>37</sup> it has been argued that hedge funds contributed to reducing volatility by selling overvalued assets and buying undervalued ones (BIS, 2010). Even so, the investment fund use of leverage, speculative short selling and fire sales to meet demand for redemptions may have had a role in the amplifying phase of the crisis in particular (IOSCO (2009)).

In its report to the European Commission, the High-Level Group on supervision chaired by De Larosière,<sup>38</sup> recommended “extending appropriate regulation, in a proportionate manner, to all entities conducting financial activities of a potentially systemic nature, even if they have no direct dealings with the public at large”.<sup>39</sup>

The work of the Group emphasised the role of the fund managers, rather than the funds themselves, and advocated equipping European national supervisors with a consistent set of rules aimed at avoiding regulatory arbitrage through the introduction of compulsory EU-wide standards and thus reducing the risk of moral hazard. In particular, the report suggested registration measures to be adopted for alternative investment fund managers at the EU level.

The AIFMD extends appropriate regulation and oversight to all actors and activities that might entail significant risks by introducing a coherent European framework for regulating AIFMs and increasing their accountability, with the ultimate goal of protecting investors, depositors and financial markets while strengthening and deepening the European single market. The

<sup>34</sup> See EC, Green Paper on the Enhancement of the EU Framework for Investment Funds, 12 July 2005:

<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52005DC0314>

<sup>35</sup> See Comment 4 of the AIFM Directive.

<sup>36</sup> Operating conditions include conduct-of-business rules, an advanced risk and liquidity management organisation, and rules on valuation, delegation and the appointment of a depositary, as well as limits on leverage set in the AIF’s offering documents. See Art.21 of the AIFMD and Art.95 of the Level II Regulation.

<sup>37</sup> In July 2007, two Bear Stearns hedge funds, mainly invested in the US subprime mortgage market, filed

for bankruptcy. This event reignited the debate on leveraged funds and the consequences of their failures for stability of the financial system.

<sup>38</sup> See Report of the High-level Group on Financial Supervision in the EU, February 2009:

[http://ec.europa.eu/internal\\_market/finances/docs/de\\_larosiere\\_report\\_en.pdf](http://ec.europa.eu/internal_market/finances/docs/de_larosiere_report_en.pdf)

<sup>39</sup> In the UK, the Turner review reached the same conclusions, indicating that hedge funds merited more attention from a financial stability perspective as they could, in aggregate, have an important procyclical systemic impact.

Directive does not address the funds themselves, but rather the fund managers and their current business activities, independently of the specific strategy or business model.<sup>40</sup> As mentioned, its scope is wide and applies not only to EU AIFMs managing one or more AIFs, whether these are domiciled inside or outside the EU, but also to all non-EU AIFMs that manage one or more EU AIFs or market one or more AIFs in the Union.<sup>41</sup>

The definition of AIF provided in the AIFMD includes a very wide range of collective investment undertakings and excludes funds authorised under the UCITS Directive.<sup>42</sup> By doing so, it covers not only hedge funds, but also other types of funds, such as private equity funds, real estate funds, and some funds of funds.<sup>43</sup>

### Centrality of the authorisation framework

The explicit prohibition for any AIFM to manage or promote a fund unless authorisation has been granted by the NCA of the Member State in which the manager is domiciled lies at the core of the Directive itself. The definition of the common authorisation framework allows supervisors to identify managers and conduct effective oversight relying on the reporting obligations introduced by the Directive.

With the authorisation, AIFMs obtain access to an EU passport which may relate to the cross-border management of AIFs or the cross-border sale of AIF units to professional investors.<sup>44</sup>

The authorisation framework provides for some exemptions to increase the efficiency of the regulation and respond to the needs of smaller or

specialised funds. Small AIFMs, i.e. managers with less than EUR 100mn in assets under management (AuM) or EUR 500mn if investors are locked-in for five years and in the absence of leverage, are partially exempted from complying with some provisions of the AIFMD<sup>45</sup> since their impact on financial stability is limited. AIFMs invoking this *de minimis* rule must register in their home Member State, provide NCAs with simplified reporting only, and can place their products only in their jurisdiction. These AIFMs can, however, still opt-in in order to obtain passporting rights in return for full compliance.

To address procyclicality, managers are required to implement liquidity and risk management processes, including monitoring and stress testing, and to report the results to national supervisors. Moreover, the investment strategy, the liquidity profile and the redemption policy both in normal and exceptional market circumstances must be disclosed to investors. All these provisions point to ensuring the consistency and prudence of processes and fund characteristics in order to both enhance the management of micro-prudential risks in AIFs by AIFMs and to mitigate the risk of liquidity and maturity mismatches both from an investor protection and financial stability perspective.

### Reporting obligations under AIFMD

One of the major features of the AIFMD is the introduction of extensive reporting obligations<sup>46</sup> on a regular basis, to enable NCAs and ESMA to

<sup>40</sup> Consideration 10 of the AIFMD clearly states that the AIFMD does not regulate AIFs. AIFs will therefore continue to be regulated and supervised at national level as it would be disproportionate to regulate the structure or composition of the portfolios of AIFs managed by AIFMs at Union level and it would be difficult to provide for such extensive harmonisation due to the very diverse types of AIFs managed by AIFMs. The AIFM Directive does not therefore prevent Member States from adopting or continuing to apply national requirements in respect of AIFs established in their territory.

<sup>41</sup> This holds independently of whether the AIF is an EU AIF or a non-EU AIF. See Art.1(a)-(c) of AIFMD.

<sup>42</sup> See Art.4 and 5 of the UCITS Directive.

<sup>43</sup> In contrast to the UCITS Directive, the AIFMD is not a voluntary regime. Investment funds managed or marketed in the Union, either open- or closed-ended, which do not need to be authorised under the UCITS Directive must be managed by an entity authorised or registered at national level as an AIFM. A limitation of the scope is that the Directive regulates only the marketing of AIFs to professional investors as defined in MiFID. The marketing of AIFs to retail investors and the sale of units or shares on the initiative of the investor are not covered by the Directive, and it is left to NCAs to decide on regulation of the marketing of AIFs to retail investors. A second crucial difference between the two regulatory

regimes is that the AIFMD does not regulate the products, i.e. the funds, but focuses on the managers by setting minimum operating requirements, mandatory registration and conduct of business rules. In so doing, it applies horizontally to all asset managers. In other words, the AIFMD does not specify eligible assets, limit exposure or issuer concentration, leverage or risks. UCITS on the other hand contains detailed provisions with regard to what UCITS are allowed to do or not. This covers issues such as diversification requirements, limitations on the types of assets the fund might invest in, or the obligation to redeem units upon request at short notice. Such limitations do not apply under the AIFM Directive, as they are not deemed appropriate for professional investors.

<sup>44</sup> The idea of the passport is modelled on the UCITS Directive, with the notable difference that the products subject to the UCITS Directive require authorisation themselves, while the AIF must be managed in accordance with the AIFMD. In contrast to the UCITS Directive, but like MiFID II, the AIFMD provides for third-country rules.

<sup>45</sup> See Art.3(2) of the AIFMD.

<sup>46</sup> This reporting obligation is laid down by Art.3(3)(d) and 24(1), (2) and (4) of the AIFM Directive.

assess trends in the alternative fund industry and monitor financial stability.<sup>47</sup>

Prior to the 2007 financial crisis, the most important concern related to AIFs' opacity was that it could result in heightened counterparty risk in highly interconnected financial markets. In contrast, transparency can enhance financial stability (Acharya et al., 2009). Researchers have shown that while public disclosure (to markets) can harness market discipline, private disclosure (to regulators) provides authorities with the necessary information to monitor the stability of the financial institution (Daníelsson et al., 2005). Disclosure requirements are thus one of the key aspects of macro-prudential regulation in the context of the AIF industry.

### Harmonised data collection

This EU-wide harmonised data collection in the alternative investment fund industry is unprecedented and constitutes a significant step in the direction of supervisory convergence. Standardisation of the reporting obligation content implies uniform implementation of the rules established by the AIFMD. In line with the principle of regulating the manager and not the product, an AIFM must provide the required information on behalf of the AIFs it manages<sup>48</sup> to its home NCA. The AIFM Directive also requires NCAs to cooperate and exchange information on the AIFMs under their supervision.<sup>49</sup>

To comply with the reporting requirements set out in the AIFMD, the Level II Regulation<sup>50</sup> specifies the frequency of reporting, which may be required on a quarterly, semi-annual or annual basis<sup>51</sup> depending on various characteristics of the AIFM and the complexity of the AIF under management (V.2):

- the status of the manager, i.e. whether it has a passport to market its product in the EU;
- the value of AuM in portfolios of AIFs managed by a given AIFM;<sup>52</sup>
- whether an AIF employs leverage on a substantial basis;<sup>53</sup>
- the type of assets in which an AIF invests.

Annex IV to the Level II Regulation contains the detail on the information to be reported.<sup>54</sup> Overall, most Level II measures focus on the objectives to address micro-prudential risks and to ensure or improve investor protection. Given that the reporting frequencies vary for different funds, full-scale data covering the entire EU AIF market is available only on a yearly basis, i.e. at the end of the year. The ESMA Guidelines on reporting obligations complement Annex IV of the Level II Regulation by providing technical definition and concrete filing instructions.<sup>55</sup>

Under Art.24(1) of the AIFMD, for each EU AIF managed or marketed in the Union, managers are required to report on the breakdown of investment strategies, the concentration of investors, the main categories of assets held by the AIF, including principal exposures and concentration, and the regional investment focus.

In addition, under Art.24(2) managers with an EU passport are subject to more extensive disclosure of instruments traded, exposures, AIFs' market risks and liquidity profiles, use of leverage and the results of the stress test. Using the information reported, NCAs are in a position to oversee whether AIFMs properly address micro-prudential risks.

<sup>47</sup> The US Dodd-Frank Act follows a similar approach in this respect, by mandating registration and reporting for systemic risk oversight.

<sup>48</sup> This reporting requirement should nevertheless apply to non-EU AIFMs that manage AIFs marketed in the Union.

<sup>49</sup> See Art.53 of the AIFM Directive. ESMA and the ESRB should also be informed.

<sup>50</sup> European Commission Delegated Regulation (EU) No. 231/2013.

<sup>51</sup> According to article 110 Level II Regulation, AIFM reporting information shall be provided to the home NCA as soon as possible and no later than one month after the end of the reporting period. Where the AIF is a fund of funds this period may be extended by 15 days.

<sup>52</sup> The rules for computation of the asset under management are set out in Art.2 of the Level II Regulation.

<sup>53</sup> According to Art.111 of the Level II Regulation, leverage shall be considered to be employed on a substantial basis when the exposure of an AIF calculated according to the

Commitment Method exceeds three times the fund's net asset value. The calculation methodology is detailed in Art.8 Level II Regulation.

<sup>54</sup> Annex IV of the Implementing Regulation provides a whole pro-forma reporting template consisting of more than 40 detailed questions and 300 data fields.

<sup>55</sup> The purpose of the ESMA Guidelines is to ensure common, uniform and consistent application of the reporting obligations to national competent authorities (NCAs) stemming from Art.3(3)(d) and 24(1), (2) and (4) of the AIFMD. They provide clarification on the information that AIFMs must report to NCAs, the timing of the reports and the procedures to be followed when AIFMs move from one reporting obligation to another. The Guidelines have applied since 8 October 2014.

V.2

AIFM reporting thresholds

**Higher reporting frequency for larger AIFMs**

	Yearly	Semi-annual	Quarterly
<b>AIFM reporting</b>	≤EUR 100mn (leveraged AIF)	≥EUR 100mn (leveraged AIF)	>EUR 1bn
	≤EUR 500mn (unleveraged AIF)	≥EUR 500mn (unleveraged AIF)	
	All unleveraged AIFs (above the thresholds) ≤ EUR 1bn investing in non-listed companies to acquire control		

Note: Reporting frequencies indicated by Level II Regulation for authorised AIFMs based on the characteristics of the manager and the AIFs managed. The complete tree diagrams on the reporting frequencies are available in the ESMA guidelines on reporting obligations.

Source: ESMA.

**A first analysis of AIFMD data**

As previously mentioned, the reporting obligations established by the AIFMD and the Implementing Regulation provide a standard data collection framework and ultimately improve transparency to NCAs. These obligations ultimately enable NCAs and ESMA to acquire a complete overview of the structure of the AIF market and better monitor the risks in the EU financial system as they relate to alternative investments.

At present, data collected for the end of 2016<sup>56</sup> cover around 60% of the AIFs managed or marketed in the EU by authorised asset managers.<sup>57</sup> Not all of the data currently reported show an adequate level of quality. Together with the high degree of diversity and complexity in the AIF industry, the quality of relevant information poses challenges from an analytical perspective.<sup>58</sup> ESMA together with NCAs is continuously working on improving the coverage and quality of AIFMD data. Still, this initial analysis of the EU AIF market, which is based on reporting items considered of sufficient data quality, permits a first large-scale assessment and comparison of risks and characteristics across fund types.<sup>59</sup>

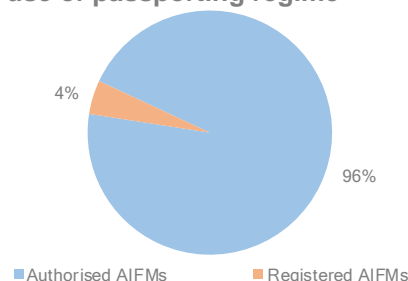
More than 80% of the AIFs reported are managed by AIFMs with passporting rights. In terms of NAV

this proportion is even higher, i.e. 96% of the total NAV is managed by European authorised AIFMs (V.3).

V.3

AIFMD passport by NAV of AIFs

**Strong use of passporting regime**



Note: NAV of AIFs by AIFM status at the end of 2016 reported under the AIFM Directive. AIFs managed by authorised and registered AIFMs, all reporting frequencies (quarterly, semi-annually, yearly), in %.

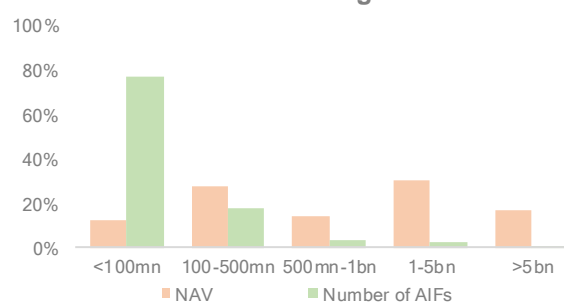
Sources: National Competent Authorities, ESMA.

As expected, with an average NAV of EUR 50mn, registered AIFs, i.e. those managed by AIFMs that can market their products only in the jurisdiction in which they are registered, appear somehow structurally smaller than AIFs managed by authorised AIFMs, which have an average NAV of EUR 160mn. The influence of large funds becomes evident when considering the median<sup>60</sup> NAV, which equals EUR 30mn for AIFs managed by authorised AIFMs and EUR 10mn for AIFs managed by registered AIFMs.

V.4

AIF distribution by size

**NAV concentrated in few large funds**



Note: AIFs' distribution by NAV at the end of 2016 reported under the AIFM Directive at the end of 2016. AIFs managed by authorised and registered AIFMs. All reporting frequencies (quarterly, semi-annually, yearly), in %.

Sources: National Competent Authorities, ESMA.

The AIF industry seems to be dominated by a few large participants, and a large proportion of

<sup>56</sup> This is the case in terms of number of AIFs, but also by net assets based on available industry estimates. The present analysis is based on the full information set made available in the ESMA central database. Information transmission is still ongoing and delays are due to technical issues. All reporting frequencies, quarterly, semi-annually and yearly, are considered.

<sup>57</sup> The lists of authorised AIFMs and the AIFs they manage or market in the EU are published on the ESMA Public

Registers, which are compiled on the basis of the information provided by NCAs.

<sup>58</sup> ESMA is conducting a systematic data quality analysis of reported information.

<sup>59</sup> For the scope of this analysis, only AIFs managed by EU AIFMs are considered.

<sup>60</sup> The median is the value separating the higher half of a population from the lower half.

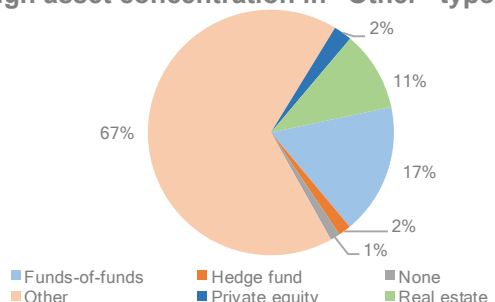
assets is heavily concentrated among a small pool of large funds.

In the sample analyse Chart V.4 shows that 2% of the funds are above EUR 1bn in size. Yet they hold around 46% of total NAV. On the other hand, around 95% of the AIFs are sized below EUR 500mn and hold 40% of total NAV.

AIFs are classified alternatively as hedge funds, real estate, funds-of-funds, private equity, other and, as a residual category, “none”<sup>61</sup> of the previous types.<sup>62</sup>

Portfolios of AIFs classified under the type “other” represent two-thirds of the total assets managed by AIFMs (V.5). The AIF type “Other” includes the following investment strategies: fixed income fund, equity fund, infrastructure fund, commodity fund, other fund<sup>63</sup>.

V.5  
AIF type by NAV  
**High asset concentration in “Other” type**



Note: NAV of AIF types at the end of 2016 reported under the AIFM Directive. AIFs managed by authorised and registered managers, all frequencies (quarterly, semi-annually, yearly), in %.  
Sources: National Competent Authorities, ESMA.

AIFMs must also indicate the breakdown of investment strategies pursued by the fund. This classification by type and strategy reflects the fact that AIFs can invest in a variety of assets, including property and commodities, often using a high degree of flexibility around how they invest. The broadest set of investment strategies is indicated under the hedge funds type, as hedge funds are able to fully exploit this flexibility in managing different asset classes and complex portfolios, possibly employing a high level of leverage and elaborated trading strategies.

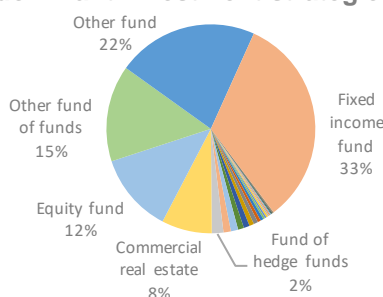
There are 35 possible investment strategies admitted by the Level II Regulation, however the

<sup>61</sup> According to the ESMA Guidelines, AIFMs should select “None” as predominant AIF type where the investment strategy of the AIF does not permit the identification of a predominant AIF type.

<sup>62</sup> Together with the investment policy and the objectives, the investment strategy of the AIF is part of the information to be disclosed by the AIFM to investors before they invest.

top six alone account for more than 90% of total assets (V.6).

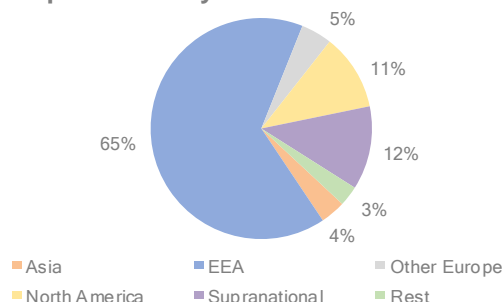
V.6  
AIF strategy by NAV  
**Five dominant investment strategies**



Note: NAV by AIFs' investment strategies at the end of 2016 reported under the AIFM Directive. AIFs managed by authorised and registered AIFMs, all reporting frequencies (quarterly, semi-annually, yearly), in %.  
Sources: National Competent Authorities, ESMA.

Fixed income AIFs<sup>64</sup> hold the largest share in terms of NAV. This feature of the market structure gives some indication of the segments in which the materialisation of macro- and micro-prudential risk should be carefully monitored. The prevalence of the commercial real estate (CRE) strategy among real estate funds is a clear example of this, as CRE markets are linked to general economic and supply conditions (ESRB, 2015),<sup>65</sup> and represents one of the areas in which data collected by national supervisors under the AIFMD could help close a significant information gap.

V.7  
NAV by regional investment focus  
**Europe as the key investment area**



Note: NAV of AIFs by regional investment focus at the end of 2016 reported under the AIFM Directive. AIFs managed by authorised and registered AIFMs, all reporting frequencies (quarterly, semi-annually, yearly), in %.  
Sources: National Competent Authorities, ESMA.

According to the data reported by EU-domiciled AIFMs on behalf of their funds, Europe is the

<sup>63</sup> Annex IV to the Level II Regulation.

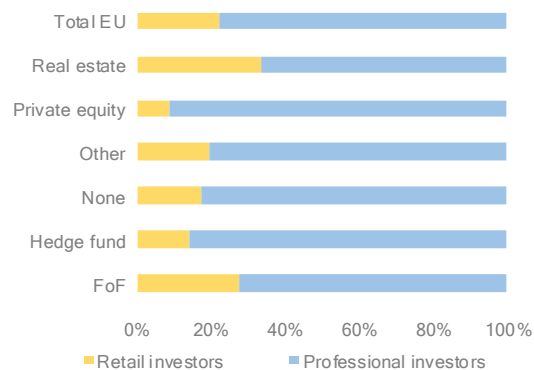
<sup>64</sup> MMFs operating under the AIFM Directive have to report the fixed income strategy.

<sup>65</sup> Notably, the report also highlights the fact that there is no strong agreement on a definition of CRE.

dominant investment region, with 65% of assets domiciled in the European Economic Area (EEA). This simple and stylised fact underscores the importance of the sector to the financing of the European economy (V.7).

V.8  
NAV by type of client

**Clients mainly professional**

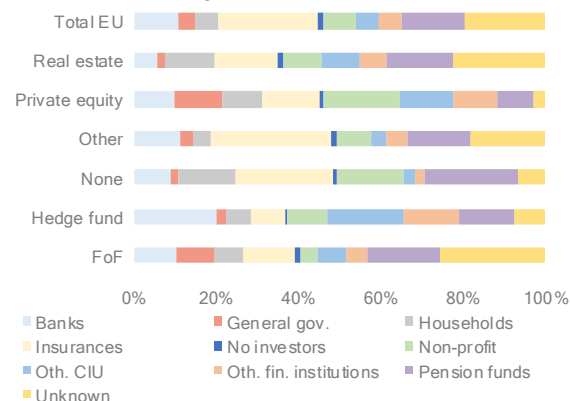


Note: NAV of AIFs by type of client reported at the end of 2016 under the AIFMD. AIFs managed by authorised and registered AIFMs, all reporting frequencies, (quarterly, semi-annually, yearly), in %. FoF=Fund of Funds. Sources: National Competent Authorities, ESMA.

As would be expected for alternative funds under AIFMD, AIF clients are mainly professional (V.8). Indeed, the Directive itself regulates marketing only to professional investors. The financial crisis has demonstrated that even this category of investors requires reliable investor protection measures and can benefit from comprehensive information. Notably, as individual Member States may also permit the marketing of AIFs to retail investors within their own jurisdiction, retail clients' participation in the alternative investment market appears significant, especially in segments such as real estate and funds of funds where retail investors account for 35% and 27% of the net assets respectively.

V.9  
Breakdown of the ownership

**Investors mainly institutional**



Note: NAV of AIFs by fund investor at the end of 2016 reported under AIFM Directive. AIFs managed by authorised and registered AIFMs, all reporting frequencies (quarterly, semi-annually, yearly), in %. FoF=Fund of Funds; CIU=Collective Investment Undertaking. Sources: National Competent Authorities, ESMA.

Insurances and pension funds combined hold 40% of the assets managed by EU AIFMs. The exposure towards real estate and private equity, which amounts in both cases to 30% of their NAV, indicates that these institutional investors demand products not traditionally offered by hedge funds or fixed income AIFs (V.9).

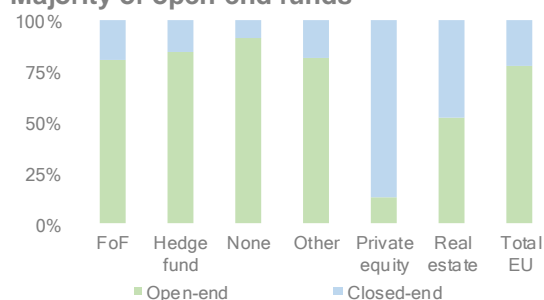
Liquidity risk in the asset management sector has recently received significant attention from regulators and international bodies, as liquidity transformation is a structural characteristic of investment funds (FSB, 2015; IOSCO, 2017). In this context, liquidity affects a fund's ability to meet cash requirements resulting from investor redemptions without causing substantial market impact. Relative asset liquidity is subject to variation over time and its assessment for different assets and asset classes is a complex exercise. On the other hand, liquidity management to meet redemption requests should not affect the pursuit of investment objectives, strategies and obligations to remaining shareholders.

For investment funds, liquidity risk thus relates to both the ability to sell portfolio assets, considering timeliness and related costs, and to the liquidity offered to investors who want to redeem shares in a fund. Potential mismatches between these two liquidity profiles constitute a key structural vulnerability of asset management activity, particularly with regard to open-ended vehicles.

V.10

Redemption rights to investors

**Majority of open-end funds**



Note: NAV of AIFs by redemption rights offered to investors at the end of 2016 under the AIFMD. AIFs managed by authorised and registered AIFMs, all reporting frequencies, (quarterly, semi-annually, yearly), in %.

FoF=Fund of Funds. Sources: National Competent Authorities, ESMA.

Open-ended AIFs offering redemption rights to their investors in the ordinary course of business represent 70% of the analysed sample and hold 80% of total NAV. Only in the case of private equity strategies do closed-end AIFs dominate in both number and size (V.10).

While the AIFMD stipulates specific liquidity risk management requirements for all open-ended AIFs, the general obligation to report on the estimated time to liquidate the portfolio gives AIFMs the incentive to examine the adequacy of the portfolio assets' liquidity and its evolution over time. Further, the Directive requires the AIFM to disclose to investors a description of the AIF's liquidity risk management, including the redemption rights in both normal and exceptional circumstances, and the existing redemption arrangements with investors.

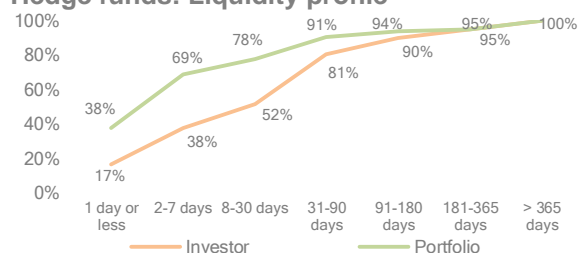
In this respect, it is interesting to note that half of the open-ended AIFs analysed disclose that they restrict investors' redemption scope by requiring advance notice of redemption. On the other hand, the adoption of a lockup period appears rather limited.

Material liquidity mismatch and concerns over a fund's ability to meet redemption demands resulting in the sale of assets can potentially spread to other funds with similar profiles and characteristics and ultimately amplify market stress as funds sell across asset classes to meet unanticipated redemptions (FSB, 2017; Manconi et al, 2012; Lehecka and Ubl, 2015) (V.11).

V.11

Aggregate portfolio and investor liquidity

**Hedge funds: Liquidity profile**



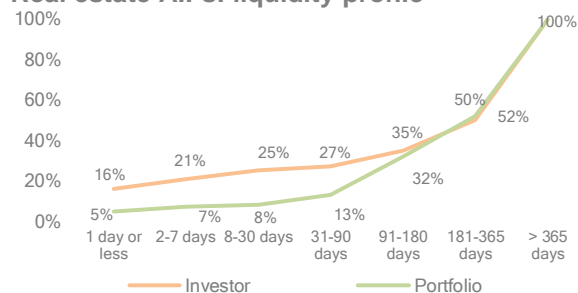
Note: Portfolio and investor liquidity profiles of hedge funds. The portfolio liquidity profile is determined by the percentage of the funds' portfolios that can be liquidated within the period specified on the horizontal axis. The investor liquidity profile reflects the shortest period within the specified period that the fund could be withdrawn or investors could receive redemption payments, as applicable. Sources: National Competent Authorities, ESMA.

The evaluation of potential liquidity mismatches at market level needs to consider structural characteristics and differences in investment strategies across AIF types. The aggregated portfolio liquidity can then be compared over different time intervals with the total NAV share that can be redeemed.<sup>66</sup> For example, real estate AIFs specialise in less liquid assets and as such present a different liquidity risk profile from other AIFs (V.12). A similar risk of liquidity mismatch characterises funds of funds, as the liquidity they offer to investors may not be aligned with the redemption periods of the funds they invest in.

V.12

Aggregate portfolio and investor liquidity

**Real estate AIFs: liquidity profile**



Note: Portfolio and investor liquidity profiles of real estate funds. The portfolio liquidity profile is determined by the percentage of the funds' portfolios that can be liquidated within the period specified on the horizontal axis. The investor liquidity profile reflects the shortest period within the specified period that the fund could be withdrawn or investors could receive redemption payments, as applicable. Sources: National Competent Authorities, ESMA.

At the aggregated level, hedge funds, on the other hand, show no signs of liquidity mismatch. This likely reflects their preference to respond and try to adapt quickly to market conditions, thus resulting in investments in more liquid instruments.

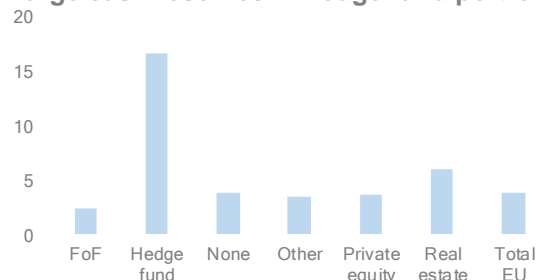
Additionally, hedge funds hold a high share of unencumbered cash, which could be broadly defined as outright cash or cash-like securities,

<sup>66</sup> AIFMs should assume that they would impose gates where they have the power to do so but that they would

not suspend withdrawals/redemptions and that there would be no redemption fees.

including G10 government bonds, which usually feature low credit risk and high trading volumes and are relatively easy to liquidate. These cash reserves are not used to enter into transactions (e.g. swaps and other derivatives) or as collateral, and their size gives an indication of a fund’s ability to respond to margin calls and absorb losses on positions, especially in the case of derivatives-based strategies. Overall, 16% of hedge funds’ total NAV is allocated to this purpose (V.13).

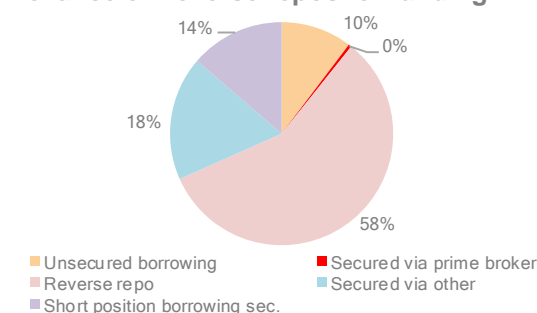
V.13  
Unencumbered cash  
**Large cash reserves in hedge fund portfolios**



Note: Unencumbered cash held by AIFs at the end of 2016 reported under the AIFM Directive. AIFs managed by authorised and registered AIFMs, all reporting frequencies (quarterly, semi-annually, yearly), in % of NAV. FoF=Fund of Funds. Sources: National Competent Authorities, ESMA.

Among the other possibilities to increase their market exposure, AIFs can obtain leverage by borrowing cash or securities directly from counterparties. This financial leverage represents the fund’s balance sheet leverage. Under the AIFMD reporting obligations, it is apparent from the aggregation of unsecured cash, collateralised cash and securities, and the borrowing of securities to cover for short positions (V.14).

V.14  
Leverage through borrowing  
**Reliance on reverse repos for funding**

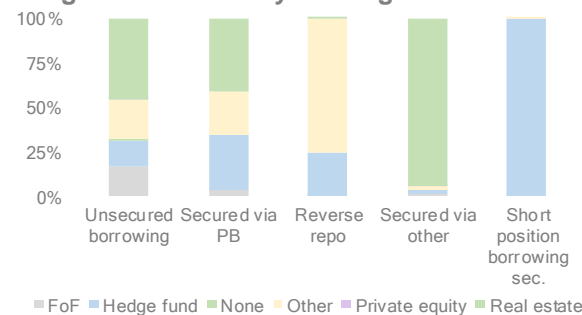


Note: Cash and securities borrowed by AIFs at the end of 2016 reported under the AIFM Directive. AIFs managed by authorised and registered AIFMs, all reporting frequencies (quarterly, semi-annually, yearly), in %. Sources: National Competent Authorities, ESMA.

Data reported for the end of 2016 show that AIFs rely strongly for their funding on reverse repurchase agreements, which account for almost 60% of the total borrowings. Unsecured borrowing plays only a minor part (V.14). Hedge funds and AIFs classified as “Other” make

considerable use of reverse repurchase agreements. Moreover, hedge funds rely on various funding sources, reflecting their aim to maintain a high share of their balance sheet in cash (V.15).

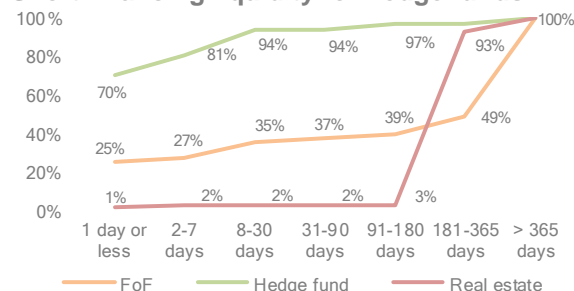
V.15  
AIFs’ borrowing sources  
**Hedge funds diversify funding sources.**



Note: Cash and securities borrowing by AIF type at the end of 2016 reported under the AIFM Directive. AIFs managed by authorised and registered AIFMs, all reporting frequencies (quarterly, semi-annually, yearly), in %. FoF=Fund of Funds. Sources: National Competent Authorities, ESMA.

Reverse repo borrowing, especially if it is short term, involves liquidity transformation and roll over risk, which stems from the interaction between debt market liquidity and credit risk. Roll over risk is high when debt rolling is frequent and can occur several times before the underlying assets mature, i.e. before their true value is revealed.

V.16  
Liquidity financing  
**Short financing liquidity for hedge funds**



Note: Liquidity financing of selected AIF types. The aggregate amount of borrowing and cash financing is divided depending on the longest period for which the creditor is contractually committed to provide such financing. Sources: National Competent Authorities, ESMA.

Financing liquidity, often referred to as funding liquidity, is an important risk factor for AIFs and their managers. Brunnermeier and Pedersen (2009) show that funding liquidity is closely linked to market liquidity, and this can act as an accelerator in case of financial distress. Hedge funds’ financing liquidity is short, at 70% of their borrowings, when considering that all lines of credit and term financing, are not committed beyond one day. This share increases to 94% within the 30-day horizon (V.16).



## Conclusion

The AIFMD forms a key part of the European regulatory response to the vulnerabilities in the financial system exposed by the recent financial crisis. While strengthening and deepening the Single Market through the introduction of an authorisation framework for AIFMs, the Directive increases the transparency of managers for investors and introduces a common robust approach to investor protection. One major innovation is the introduction of reporting obligations to allow NCAs, ESMA and the ESRB to conduct harmonised and effective supervision, oversee micro-prudential risk, and monitor the build-up of systemic risk.

This article, using supervisory information transmitted by NCAs to ESMA, aims to provide a first comprehensive description of the EU AIF market and to contribute to the discussion on definition of a framework for monitoring trends and risks in the alternative investment fund industry.

In particular, by presenting some key characteristics of AIFs and proposing a first set of indicators, the present work highlights the strong heterogeneity across AIF types, suggesting that their distinctive features should be taken into account when identifying and assessing potential risks related to alternative investments.

Due to the novelty and complexity of the reporting framework introduced by AIFMD, concerns over the quality of some relevant information currently available remain. At present, ESMA and NCAs are working together on AIFMD data to both improve the coverage of the AIF industry and address a number of measurement issues observed across jurisdictions. However, the AIFMD database already provides ESMA and NCAs with significant information for supervisory and analytical purposes, offering an opportunity to better understand the role and activities of AIFs.

Going forward, ESMA will continue to develop descriptive market statistics, trend indicators and risk metrics on an EU-wide basis to support NCAs supervisory activities and inform policy-making processes relating to AIFMD.

## References

Admati, A.R., Pfleiderer, P. (2000) "Forcing firms to talk: Financial disclosure regulation and externalities", *The Review of financial studies*.

Allen, W. A., & Wood, G. (2006) "Defining and achieving financial stability", *Journal of Financial Stability*.

Acharya, V., Gale, D., Yorulmazer, T. (2011), "Rollover risk and market freezes", *The Journal of Finance*.

Acharya, V., Wachtel, P., Walter, I. (2009) "International Alignment of Financial Sector Regulation", in *Restoring Financial Stability: How to Repair a Failed System*, Wiley & Sons.

BIS (2010), "Review of the Differentiated Nature and Scope of Financial Regulation"

Brunnermeier, M.K., Pedersen, L.H. (2009), *Funding liquidity and market liquidity. Review of Financial Studies*.

De Larosière, J., Balcerowicz, L., Issing, O., Masera, R., Mc Carthy, C., Nyberg, L., Pérez, J. and Ruding, O. (2009), "The de Larosière Group", *Report of the High-Level Group on Financial Supervision in the EU*.

Danielsson, J., Taylor, A., Zigrand, J.P. (2005), "Highwaymen or Heroes: Should Hedge Funds be Regulated? A Survey", *Journal of Financial Stability*.

Elliott, D.J. (2014), "Systemic risk and the asset management industry", *Economic Studies at Brookings*.

ESRB (2015), "Report on commercial real estate and financial stability in the EU".

Financial Services Authority (2009), "The Turner review: A regulatory response to the global banking crisis".

FSB (2011), "Progress in the Implementation of the G20 Recommendations for Strengthening Financial Stability: Report to G20 Finance Ministers and Central Bank Governors".

FSB (2015), "Assessment Methodologies for Identifying Non-Bank Non-Insurer Global Systemically Important Financial Institutions".

Financial Stability Board (2017), "Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities"

IOSCO (2009), "Hedge Funds Oversight; Final Report".

IOSCO (2017), "Open-ended Fund Liquidity and Risk Management – Good Practices and Issues for Consideration. Consultation report".

Lehecka, G., Ubl, E. (2015), "Analyzing the systemic risks of alternative investment funds"

based on AIFMD reporting: a primer”, OENB Financial Stability Report.

Manconi, A., Massa, M., Yasuda, A. (2012), “The role of institutional investors in propagating the crisis of 2007–2008”. *Journal of Financial Economics*.

Teo, M., (2011), “The liquidity risk of liquid hedge funds”, *Journal of Financial Economics*.

## Orderly markets

# Exchange-traded derivatives in the EU – an overview

Contact: [tania.derenzis@esma.europa.eu](mailto:tania.derenzis@esma.europa.eu)<sup>67</sup>

This article provides an overview of the EU exchange-traded derivatives (ETD)<sup>68</sup> market on the basis of data collected before the implementation of MiFID II/MiFIR. The forthcoming regulatory framework will have a profound impact on the structure of EU financial markets. Therefore, a comparison between pre- and post-MiFID II ETD market structures will improve our understanding of structural changes, and this article is laying the foundations for such a comparison. Our main findings show that, as of 2H16, the EEA ETD market size was around EUR 200tn in terms of trading volumes, and products were more standardised than in the Over-The-Counter (OTC) market.

## Introduction

Since 2008, as part of the G-20 objectives, the effective regulation of global financial markets has formed an essential element of building a stronger financial system, supporting economic growth and safeguarding financial stability.<sup>69</sup> This is linked to the increased regulatory and supervisory focus on potential financial market disruptions stemming from defective corporate risk management practices and negative effects due to uncoordinated domestic regulatory actions.

In the EU, the Markets in Financial Instruments Directive (MiFID)<sup>70</sup> implemented in 2007 fostered increased competition and brought significant benefits to investors, such as lower fees, higher market liquidity and lower market entry barriers. However, in light of market developments during the last ten years, the need for a revision of the MiFID core principles had become clear.

MiFID II/MiFIR<sup>71</sup> not only aim to complement MiFID by overcoming drawbacks related to market changes such as increased fragmentation

and market complexity, but also to improve transparency and trade execution.

In line with the G20 objectives, the new MiFID II/MiFIR framework ensures that organised trading takes place on regulated platforms and introduces rules on algorithmic and high-frequency trading. As such, the framework increases transparency in the OTC derivatives market and addresses issues that have contributed to the creation of new trading platforms and practices falling outside the scope of MiFID.

Against this background, MiFID II/MiFIR include requirements on data disclosure, mandatory trading requirements for certain derivatives on organised trading venues (TVs), and specific supervisory actions regarding financial instruments and positions in derivatives.

This article provides an overview of the EU exchange-traded derivatives (ETD) market in 2H16, ahead of MiFID II/MiFIR implementation. It describes the EU ETD market, based on semi-annual reference and transaction data for non-equity instruments. These data were provided by Trading Venues to ESMA<sup>72</sup> to perform the

<sup>67</sup> This article was authored by Marnix Dek, Tania De Renzis and Laura Ionita. The report and the figures displayed have been computed with utmost care. The authors are aware that the data used may have some limitations. In that respect, the figures are provided for analytical purposes only and are not deemed to determine any regulatory obligation by market participants.

<sup>68</sup> For the purpose of this article ETD refers to derivatives traded on both Regulated Markets and Multilateral Trading Facilities.

<sup>69</sup> G20 Germany 2017, July 2017, "G20 Leaders' Declaration: Shaping an interconnected world".

<sup>70</sup> MiFID (Directive 2004/39/EC), in force since November 2007, governs the provision of investment services in financial instruments by banks and investment firms and

the operation of traditional stock exchanges and alternative trading venues. For more information, see:

[https://ec.europa.eu/info/law/markets-financial-instruments-mifid-directive-2004-39-ec\\_en](https://ec.europa.eu/info/law/markets-financial-instruments-mifid-directive-2004-39-ec_en)

<sup>71</sup> The application date of MiFID II/MiFIR was extended from 3 January 2017 to 3 January 2018. Directive 2014/65/EU, see:

[https://ec.europa.eu/info/law/markets-financial-instruments-mifid-ii-directive-2014-65-eu\\_en](https://ec.europa.eu/info/law/markets-financial-instruments-mifid-ii-directive-2014-65-eu_en)

<sup>72</sup> On 23 March 2016 the Delegated Project Board for MiFID II, which is composed of delegating NCAs and ESMA, approved the way forward on the transitional calculations for the implementation of MiFID/R II, and proposed that

transitional transparency calculations (TTC) for the implementation of MiFID II/MiFIR.<sup>73</sup>

This analysis describes the EU market in 2H16, relying on a detailed set of data available for EU countries.<sup>74</sup> It gives an overview of the EU ETD market, with detailed information on several major asset classes, as a complement to the analysis of EU derivatives markets already published by ESMA. In the “EU derivative market – a first-time overview” article, from ESMA’s TRV No.2, 2017, volumes were calculated as open interest on derivatives contracts, based on weekly EMIR data from trade repositories (ESMA, 2017). Open interest is a stock measure, whereas the estimates provided here are based on traded volumes, which is a flow measure. Therefore, the numbers are not directly comparable to the analysis in the previous ESMA article but provide complementary information on trading activity in EU derivative markets.

Furthermore, this analysis can serve as a reference point to assess the impact of MiFID II/MiFIR on the EU ETD market structure. This will enable supervisors and regulators to identify significant changes, including benefits and drawbacks of the new regulatory structure, and follow-up with potential actions if necessary.

The main findings show that, in the current EU ETD market structure, derivatives contracts are characterised by a narrow range of exchange-traded products on standardised markets, as opposed to the increasing diversity of OTC-traded derivatives instruments. The analysis focuses only on regulated markets (RM) and multilateral trading facilities (MTF), as these are the only types of TVs recognised and regulated under MiFID.<sup>75</sup> MiFID II/MiFIR will imply a change in market structure and will also create availability of new data.

The remainder of the paper is structured as follows: a general description of EU exchange-traded and, more specifically, ETD markets; an

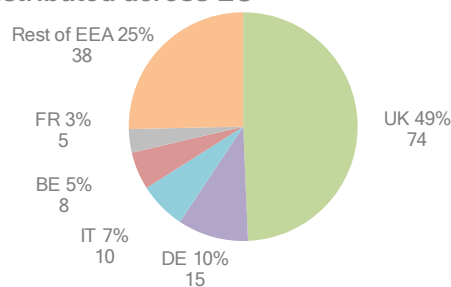
analysis of the EU ETD market including the main findings per type of derivatives; and conclusions.

## Exchange-traded markets

Financial market structures play a crucial role in determining the efficiency and stability of financial markets. The two main structures in which financial markets are organised are exchange trading and OTC trading (IMF, 2017).

As of mid-September 2017, according to ESMA registers<sup>76</sup> there were 106 RMs and 152 MTFs in the EU. Almost half the MTFs were registered in the UK, while the remainder were distributed across the rest of the EU: DE (10%), IT (7%) and FR (3%) (V.17). In terms of RMs in the EU, 17% were located in DE, 12% in ES and GB and 8% in IT.

V.17  
Multilateral trading facilities in EU  
Distributed across EU



Note: MTFs by country as of 20 September 2017, as number of MTFs and in % of total EEA MTFs.  
Sources: ESMA registers.

ETD markets are markets for derivatives contracts traded on regulated trading venues. ETDs have become more popular following the financial crisis and regulatory actions thereafter, such as the standardisation of contracts, liquidity, reduction of default risk and transparency, have become determining factors in investment strategies.

ESMA carries out and publishes the transitional calculations for the purpose of the equity and non-equity transparency regime.

<sup>73</sup> For more details, see ESMA (2017b) and:

<https://www.esma.europa.eu/policy-activities/mifid-ii-and-mifir/mifid-ii-transitional-transparency-calculation>.

<sup>74</sup> Besides EU countries, Norway is included only for commodities (including C10) and equity derivatives. The share is, however, very small compared to the overall volume.

<sup>75</sup> In contrast, MiFID II/MiFIR classifies three types of trading venues operating on ETD markets: regulated market (RM), multilateral trading facility (MTF) and organised trading facility (OTF). OTF is a new category that allows trading of non-equity instruments i.e. bonds, structured

finance products, emission allowances or derivatives. There are several new characteristics in terms of operating on OTFs, i.e. use of proprietary capital, and trading only physically settled commodity derivatives in order to avoid regulatory arbitrage.

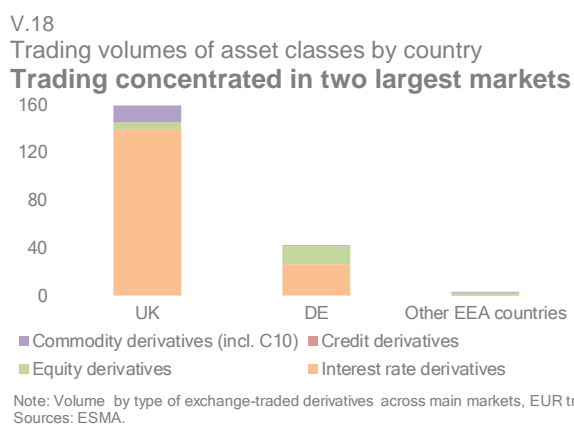
<sup>76</sup> The information included is reported only for MTF as part of the information extracted from ESMA Registers falling under the MiFID implementing Regulation 1287/2006. The Registers have been set up by ESMA based on information provided by Member States. Queries regarding the content of this database should be addressed directly to the competent authority of the relevant RM or MTF.

## The EU ETD market

### Sample description

The current analysis is based on ETD market transaction data gathered from 44 reporting TVs from 30 EU countries. Data refer only to RM and MTF from 3 July 2016 to 2 January 2017. For this analysis, the transaction data received are semi-annual, aggregated by instrument. The level of granularity of the reference data is high and covers all segments.<sup>77</sup> Information on the following derivative asset classes is included: equity, credit, interest rate (IR), and commodity (including C10<sup>78</sup>).<sup>79</sup>

The ETD dataset used in this article compares well to the ETD statistics from the Bank for International Settlements (BIS), which provide information on the size and structure of organised futures and options markets.<sup>80</sup> For example, ESMA's dataset for IR derivatives (options and futures) shows a daily average turnover of EUR 1.3tn for 2H16 for the EU compared with EUR 1.4tn based on BIS data for Europe.<sup>81</sup>

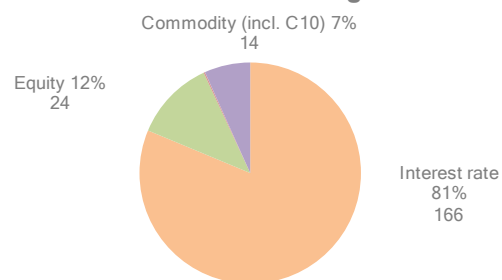


According to the data received from TVs, the EU derivatives market size in 2H16 was worth approximately EUR 200tn, based on traded

volumes. UK is the largest market in the EU followed by DE (V.18).

Exchange-traded IR derivative volumes are significantly higher than other asset classes. IR derivatives represent more than EUR 166tn in notional volume, i.e. more than 80% of the total ETD market (V.19), followed by equity derivatives (EUR 24tn) and commodity derivatives (EUR 13tn).

V.19  
Derivatives market by asset class  
**Interest rate derivatives — highest volume**



Note: ETD volume per asset class, in % of total volume and EUR tn. Credit (not visible in the chart) accounts for 0.2% or 0.4 EUR tn.  
Sources: ESMA.

The number of transactions is higher for commodity derivatives than for IR derivatives. According to the data, commodity derivatives recorded 82 million transactions, or 62% of the total (V.20). In terms of notional volumes and volumes per transaction, however, the situation is reversed. Commodity derivatives account for just 7% of total volumes (V.19).<sup>82</sup>

When analysing equity derivatives, the figures can be compared with those reported at a global level by the World Federation of Exchanges (WFE). These show a growing importance of equity index derivatives. Volumes in listed equity index futures and options spiked in 2H16, even as the global amount of listed equity instruments declined.<sup>83</sup> Similarly, our data for 2H16 show a high concentration of volumes in EU equity derivatives with an index as the underlying.

<sup>77</sup> Official Journal of the European Union, Commission Delegated Regulation 2017/583 supplementing Regulation No 600/2014 of the European Parliament and of the Council on market in financial instruments with regard to regulatory technical standards on transparency requirements for trading venues and investment firms in respect of bonds, structure finance products, emission allowances and derivatives.

<sup>78</sup> According to Section C(10) of Annex I of Directive 2014/65/EU this type of derivatives is defined as options, futures, swaps, forward rate agreements and any other derivative contracts relating to climatic variables, freight rates, inflation rates or other official economic statistics.

<sup>79</sup> The data reported include also contracts for difference that are, however, not considered in this analysis.

<sup>80</sup> These statistics are compiled by the BIS from commercial data sources, and capture the turnover and open interest of interest rate and foreign exchange derivatives traded on derivatives exchanges. Europe includes EEA plus Switzerland, Russia and Turkey. See: <http://www.bis.org/statistics/extderiv.htm>.

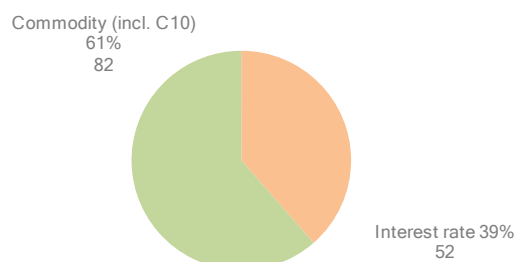
<sup>81</sup> BIS data are based on aggregated yearly data converted from USD to EUR using the European Central Bank's (ECB) USD/EUR exchange rate per 30 December 2016.

<sup>82</sup> The data collected from TVs did not include the number of equity derivative transactions, which are not therefore included in the total count.

<sup>83</sup> WFE (December 2016), "Trends in equity derivatives: January to November 2016".

V.20

### Number of ETD derivatives transactions Commodity higher than IR derivatives



Note: Number of ETD transactions per asset class, in % of total transactions and thousands. Credit (not visible in the chart) accounts for 0.02% or 24,000 transactions.

Sources: ESMA.

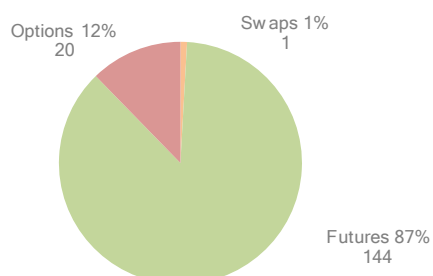
## Trading activity by asset class

### Interest-rate derivatives

IR derivatives are the most-traded asset class in notional terms in both exchange-traded and OTC derivatives markets (ESMA, 2017).<sup>84</sup> Investors in these instruments often aim to hedge interest rate risk, manage asset-liability duration mismatches, or take positions on future price changes.

V.21

### IR derivatives market Highest volume share for futures



Note: Exchange-traded interest rate derivatives volume by type of contract, in % of total volume and EUR tn.

Sources: ESMA.

Chart V.21 shows the IR derivatives market volumes broken down by futures, swaps and options contracts. Futures contracts on bonds and interest rates account for 87% of the total exchange-traded IR derivatives market, and options for 12%. Short-term futures contracts on interbank interest rates (e.g., Euribor and Libor) have comparable characteristics to OTC forward contracts, and are the most actively traded products. In terms of the total number of transactions, they amounted to 14.5 million.

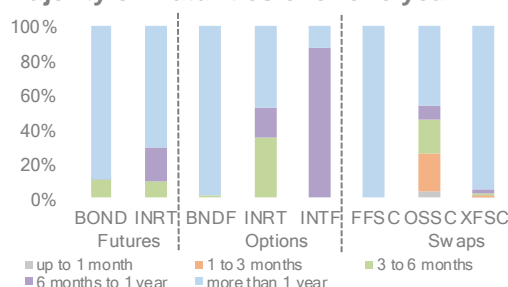
<sup>84</sup> Volumes in this article refer to traded volumes and not open-interest on derivatives contracts as in the article published in the TRV No.2, 2017.

Futures contracts on bonds mostly refer to products with long-term exposures to government debt instruments.<sup>85</sup>

Chart V.22 reports the IR derivatives market by contract type (i.e. futures, options and swaps) and underlying type (bonds, interest rates and currencies), and by time to maturity. The majority of the traded volume (72%) of IR derivatives has a maturity greater than one year, with the exception of interest rate options and OIS single currency swaps, of which half of the volume is reported with maturities from one to twelve months.

V.22

### IR derivatives market according to maturity buckets Majority of maturities over one year



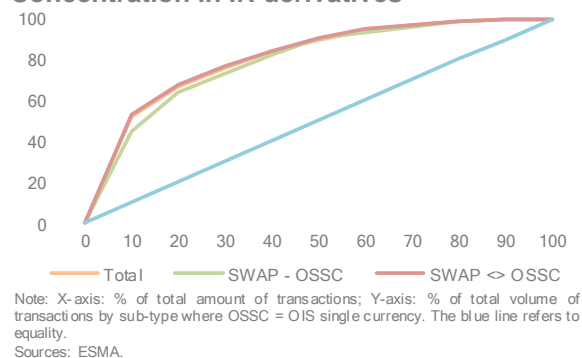
Note: Percentage of total volume by maturity bucket for futures on bonds (BOND) and interest rates (INRT); options on bond futures (BONDF), on interest rates (INRT), on interest rate futures (INTF); and float-to-float single currency swap (FFSC), OIS single-currency swap (OSSC), fixed-to-float single-currency swap (XFSC).

Sources: ESMA.

The Lorenz curve in Chart V.23 shows the concentration in the number of transactions with respect to volume traded. For swaps, the top 10% of transactions accounts for more than 50% of the traded volume. However, this concentration tends to be higher for options and futures, with the top 10% of transactions accounting for more than 80% of the traded volume. Overall, it can be noted that the volume of options, and most particularly that of futures, is much larger than for swaps (V.21). This is presumably because options and futures are generally exchange-traded contracts, while swaps are mostly traded OTC. Continued analysis of the distribution of the different contracts and the potential movements within ETD and between OTC and ETD markets will be important once MiFID II/MiFIR are fully implemented.

<sup>85</sup> More specifically, according to the available data, German government bonds account for the largest share (EUR 20tn).

V.23  
IR derivatives: Lorenz curve  
**Concentration in IR derivatives**

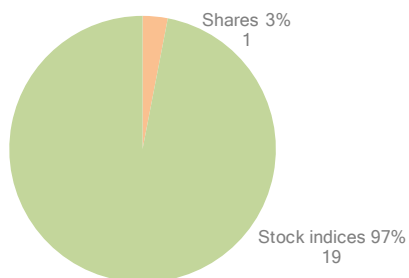


### Equity derivatives

Equity managers often use equity derivatives<sup>86</sup> in investment strategies to increase or reduce their exposure to certain equity instruments without trading the actual security.

Besides shares, equity derivatives are based on a wide range of other underlyings. Data in this analysis also includes the following: stock indices, baskets of shares resulting from a corporate action, dividend indices, stock dividends, ETFs and volatility indices.

V.24  
Exchange-traded equity derivatives  
**Stock indices as the most-traded underlying**



Note: Exchange-traded equity derivative volume by type of underlying, in % of total volume and EUR bn.  
Sources: ESMA.

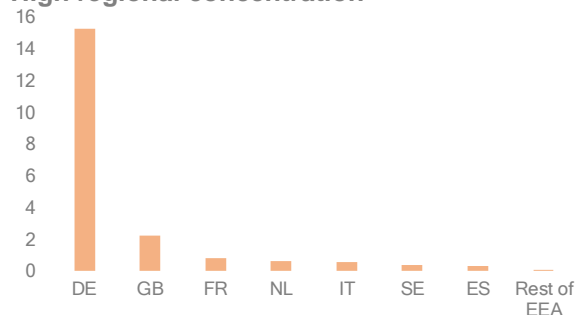
Chart V.24 shows that stock indices are the most-traded underlying in exchange-traded equity derivatives markets, covering almost 97% of total volume. Index derivatives enable market participants to gain exposure to the price movements of an entire index through a single futures or options contract. Shares account for only 3% of the market. The remaining underlyings are negligible, comprising in total less than 0.3% of the market. In terms of contract types, stock

index derivatives are mostly traded in the form of futures (65%) and options (35%).

These products are highly standardised in terms of strike price, size and expiry date, which contributes to their high liquidity. Regarding equity swaps, the information received from TVs shows that stock index swaps account for 0.1% of exchange-traded stock index derivatives. This is in line with what was already observed for the IR derivatives markets, since swap contracts are mostly traded OTC.

In terms of geographical concentration, chart V.25 depicts the equity derivatives market by country. DE accounts for 76%, with volumes of more than EUR 15tn, followed by UK (11%) and FR (4%).

V.25  
Exchange-traded equity derivatives  
**High regional concentration**



Note: Exchange-traded equity derivatives volume by country, EUR tn.  
Sources: ESMA.

### Credit derivatives

Credit default swaps (CDS) are of major importance because they allow market participants to hedge and redistribute credit risk. However, these features also contributed to the build-up of vulnerabilities before the financial crisis, affecting the pricing of credit risk and intensifying contagion risk due to greater interconnectedness.

Credit derivatives are widely traded OTC. According to the previous TRV article (ESMA, 2017), in terms of gross notional outstanding value the credit derivative markets totalled EUR 13.8tn outstanding as of February 2017. The BIS reports USD 9.9tn of CDS contracts outstanding globally between dealers as at end-2016.

This article, however, focuses on CDS traded on RM and MTF. In the recent financial crisis, CDS contracts exposed sellers to systemic risk contagion. This highlighted the need for greater

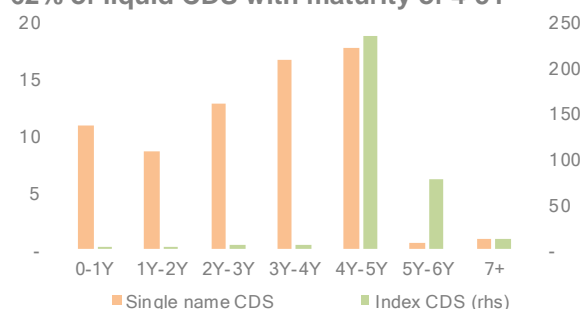
<sup>86</sup> Norway is included.

regulation and transparency. MiFID II/MiFIR aim to make markets more transparent and potentially shift trading in some customised instruments from OTC to ETD markets. Looking at the US market, according to the ISDA the notional amount of swap execution facilities (SEF) grew by 10% in 2Q17 compared with the same year-earlier period, with SEF-traded swaps representing 54% of notional IR volume on- and off-SEF.<sup>87</sup>

Data on EEA single name and index CDS volumes were received from four MTFs. In total, they account for only 0.2% of the total volume of the ETD market. Index CDS make up more than 83% of the total volume of the credit derivatives market, while single-name CDS account for 17%. The most liquid-single name and index CDS, based on trading volumes, are in the four- to five-year maturity bucket, while those at longer-term maturities are less liquid (V.26).

V.26

Volumes of exchange-traded CDS

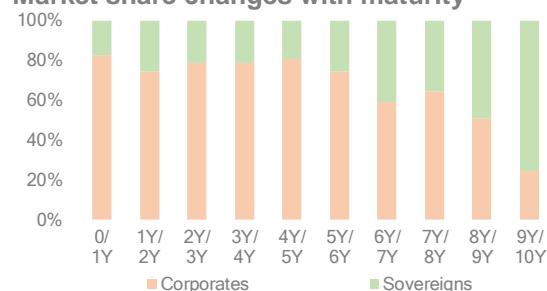
**62% of liquid CDS with maturity of 4-5Y**

Note: Exchange-traded volume of single-name CDS and Index CDS at different maturities, EUR bn.  
Sources: ESMA.

Broken down by type of issuer, the share of traded volume for corporate issuers is significantly higher than that of sovereigns at short-term maturities. This pattern gradually reverses as the maturity increases (V.27).

V.27

Exchange-traded single name CDS

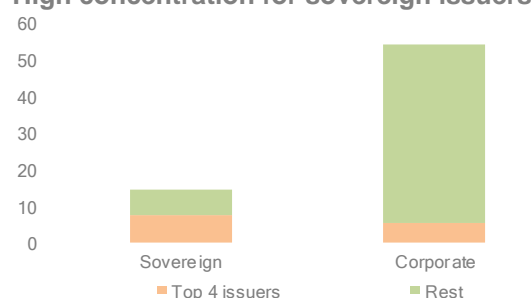
**Market share changes with maturity**

Note: Share of exchange-traded single-name CDS volume by type of issuer, in % of total volume.  
Sources: ESMA.

The top four sovereign and public issuers account for more than 10% of total exchange-traded single-name CDS (EUR 7bn), and 50% of the aggregated single-name CDS for sovereign issuers (V.28). In contrast, the top four corporate issuers account for 10% of the total single-name exchange-traded CDS corporate issuers (EUR 5bn).

V.28

Volumes of exchange-traded single-name CDS

**High concentration for sovereign issuers**

Note: Volume of exchange-traded single-name CDS by underlying issuer sector, EUR bn.  
Sources: ESMA.

In the sample, sovereign CDS are denominated in USD. This could be explained by the fact that investors wish to mitigate the risk of a severe depreciation in the bond's original denomination (EUR) in case of a credit event.<sup>88</sup>

Focusing on CDS indices, the five-year iTraxx Europe index with maturities falling into the four-five and five-six year buckets is the most traded, both in terms of traded volume and number of trades (V.29).

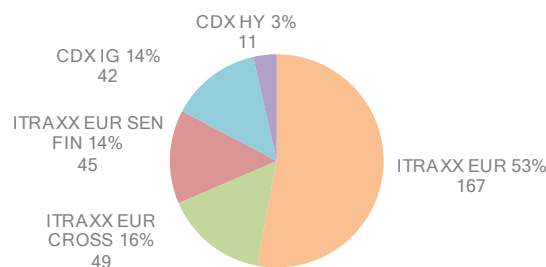
<sup>87</sup> ISDA, August 2017, "SwapsInfo Second Quarter 2017 Review".

<sup>88</sup> Fontana, A. and Scheicher, M., (2010), "An analysis of euro area sovereign CDS and their relation with government bonds", ECB Working Paper Series.



V.29

### Volumes of exchange-traded index CDS ITRAXX Europe – high volume



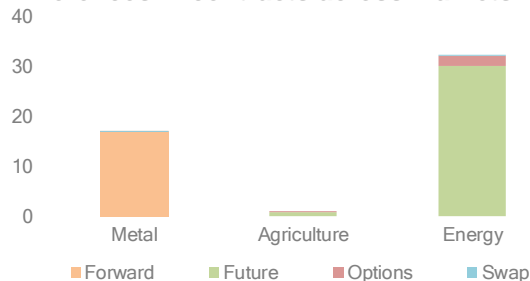
Note: Exchange-traded volumes for Markit ITRAXX Indices (Europe, Europe crossover and Europe senior financial) and Markit CDX North America Indices (IG and HY) at 5Y maturity, share of the total in % and volumes in EUR bn.  
Sources: ESMA.

## Commodity derivatives

Commodity derivatives,<sup>89</sup> one of the oldest derivative classes, are an important element in investment strategies for portfolio diversification due to their low correlation with other asset classes, notably equities, over the long run (Gorton and Rouwenhorst, 2006).<sup>90</sup> Moreover, the interdependence with inflation makes commodities a sought-after investment for risk-mitigation strategies when other traditional assets may perform poorly in times of rising inflation.

V.30

### Commodities derivatives by contract and underlying Differences in contracts across markets



Note: Share of exchange-traded commodity derivative volume, per commodity and contract types, in % of total volume.  
Sources: ESMA.

In 2H16, a total of EUR 13.7tn was traded in commodity derivatives contracts on EU ETD markets. The most actively traded contracts with commodities as underlyings were futures, followed by forwards, options and swaps (V.30).

Futures contracts have a total volume traded of almost EUR 8.5tn. Historically, commodities were the first underlying to be traded as futures contracts until the creation of currency futures contracts.

It is important to note that the presence of forward contracts in the sample refers to the London Metal Exchange (LME) contracts on metal.<sup>91</sup> These types of contract are based on physical settlements, by transfer of the claim on the metal, and have short-term maturities. LME represents a significant proportion of traded metal, mostly on copper, zinc and aluminium, together making up 75% of the entire metal trading activity (V.31).

V.31

Commodities derivatives, by underlying sub-type

### Oil is by far the most-traded commodity

	No. of trades	% of total	Volume	% of total
<b>Metal</b>	<b>11,197</b>		<b>4,614</b>	
Aluminium	2,418	22	1,020	22
Copper	3,609	32	2,078	45
Nickel	1,635	15	597	13
Zinc	2,452	22	796	17
<b>Energy</b>	<b>66,734</b>		<b>8,802</b>	
Oil	65,672	98	8,508	97
<b>Agriculture</b>	<b>3,971</b>		<b>278</b>	
Cocoa	1,548	39	137	49
Milling wheat	508	13	33	12
Robusta coffee	685	17	46	17
Rapeseed	386	10	28	10
White sugar	766	19	31	11

Note: Number of trades in thousands, volumes in EUR bn, and % of total underlying commodity type. Only the largest sub-types are included, measured by number of transactions and volumes.  
Sources: ESMA.

Energy is the most traded underlying in the commodities derivatives market. Oil represents more than 95% of the market in terms of volume and number of transactions. Crude oil is one of the most actively traded commodities and provides various opportunities for investors, including hedging exposures to companies sensitive to changes in oil prices (i.e. in the transportation or petrochemical industries).<sup>92</sup>

Chart V.32 shows the breakdown in number of transactions and volume of freight derivatives for forward freight agreements (FFAs), options and other C10 derivatives<sup>93</sup>. FFAs dominate the data set both in number of transactions and total traded volumes.

<sup>89</sup> Norway is included.

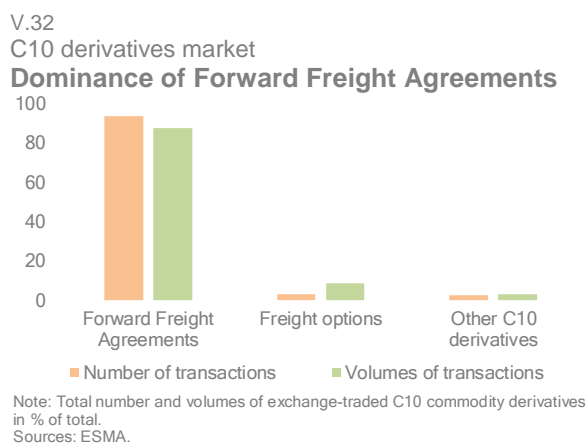
<sup>90</sup> For a more complete review of the literature on this topic, see Lombardi, M., J. and Ravazzolo, F. (2013), "On the correlation between commodity and equity returns: implications for portfolio allocation".

<sup>91</sup> For more information, see:

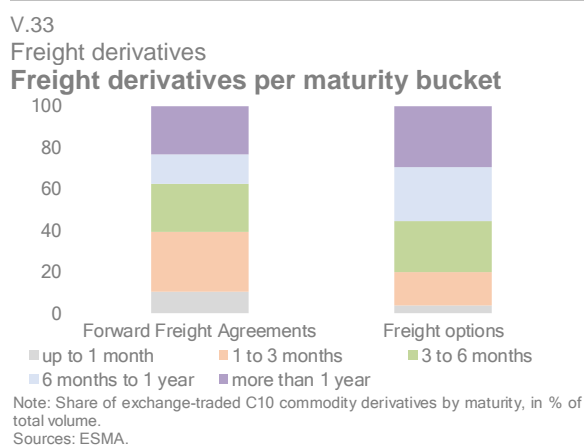
[http://ec.europa.eu/competition/consultations/2011\\_questionnaire\\_emissions\\_trading/eurometaux\\_annex\\_en.pdf](http://ec.europa.eu/competition/consultations/2011_questionnaire_emissions_trading/eurometaux_annex_en.pdf)

<sup>92</sup> Lotay J., S., Nossa, D. and Vrana P., E., (2015), "Hedging oil and gas production".

<sup>93</sup> For more details on C10 derivatives see the "Sample Description" section and related footnote.



Finally, chart V.33 breaks down FFAs and options by maturity, showing that the majority of contracts are short maturities.



## Conclusion

This article provides an overview of the EU ETD market, looking at the overall market structure but also at derivative class and sub-class levels (equity, credit, IR, and commodity including C10).

The data puts the size of the EU ETD market in 2H16 at around EUR 200tn in total traded volumes. In line with expectations, the ETD market is more standardised in terms of products than the OTC market. The data covered RM and MTF only, as these were the only TVs regulated under MiFID.

The analysis is based on a detailed and granular dataset that ESMA collected from TVs across EU member states in respect of its delegated assignment to perform the TTC ahead of the

upcoming MiFID II/MiFIR supervisory and regulatory framework. Data reporting requirements under the new MiFID II/MiFIR framework are successfully filling the gaps in data availability on trading activity, market agents and infrastructures.

This article is a first-time study ahead of follow-up analyses after MiFID II/MiFIR implementation. Based on the more complete database of instrument reference and transaction data created by the new regulatory requirements,<sup>94</sup> ESMA will be able to document developments in EU financial market structures from pre- to post-MiFID II/MiFIR, at instrument and market infrastructure level.

In general, the implementation of MiFID II/MiFIR will enhance data availability and quality, which will allow for in-depth and complete analyses of EU financial markets, including trading activity and infrastructures. The new regulatory framework will thus allow a more comprehensive evaluation of EU market efficiency.

## References

- ESMA (2017) “EU derivative market – a first-time overview”, Report on Trends, Risks and Vulnerabilities No.2, 2017.
- ESMA (2017b) “MiFID II Transition Transparency Calculations”, Latest update 11 September 2017.
- Fontana, A. and Scheicher, M., (2010), “An analysis of euro area sovereign CDS and their relation with government bonds”, Working Paper No.1271, ECB Working Paper Series.
- Gorton, G. and Rouwenhorst, K., G. (2006) “Facts and fantasies about commodity futures”, Financial Analysts Journal, 2006.
- IMF (2017) “Exchange or over-the counter”, Finance and Development, July 2017.
- Lombardi, M., J. and Ravazzolo, F. (2013) “On the correlation between commodity and equity returns: implications for portfolio allocation”.
- Lotay J., S., Nossa, D. and Vrana P., E., (2015), “Hedging oil and gas production”.
- Rummer S. and Pauletto, C. (2012) “The History of Derivatives: A Few Milestones”, EFTA Seminar on Regulation of Derivatives Markets.

<sup>94</sup> For more details, see: ESMA, MiFIR Reporting Instructions, see:

<https://www.esma.europa.eu/policy-rules/mifid-ii-and-mifir/mifir-reporting-instructions>

World Federation of Exchanges (2016) "Trends in commodity derivatives: January to November 2016", December 2016.

## Financial stability

# The public disclosure of net short positions

Contact: [julien.mazzacurati@esma.europa.eu](mailto:julien.mazzacurati@esma.europa.eu)<sup>95</sup>

As part of the latest Review of the EU Short Selling Regulation, ESMA conducted an analysis of net short positions in EU shares and the impact of public disclosure on investor behaviour. Short-selling activities in EU equities are highly concentrated, with short sellers (excluding market makers and primary dealers) mainly located in the US and UK, and a few investors active on a large number of EU shares. The public disclosure threshold influences the market outcome of net short positions, which seems driven by investors seeking to avoid crossing the threshold in order to keep their strategy secret. These investors are less likely to increase their short position, and tend to hold it for a longer period of time, when they are right below the public disclosure threshold. The article also investigates herd behaviour in short selling activities, in the context of public disclosure.

## Background

On 1 November 2012, the EU Regulation on short selling and certain aspects of credit default swaps (SSR)<sup>96</sup> entered into force. The SSR aimed to increase the transparency of short positions in EU shares and sovereign debt, to reduce settlement risk from uncovered short sales, to restrict short selling of sovereign debt instruments, and to give authorities powers of intervention (including temporary short-selling restrictions).

In early 2017, the European Commission requested Technical Advice from ESMA on evaluation of the Regulation.<sup>97</sup> One of the areas ESMA was asked to focus on was net short positions, including “*whether public disclosure of net short positions in shares are efficient, effective and relevant (...)*.”

To inform its response to the Commission, ESMA conducted a quantitative analysis of net short positions in EU shares and the impact of public disclosure on investor behaviour. The next section provides conceptual definitions and a description of the net short positions data

collected for this purpose. The final section presents the results of the analysis published as part of ESMA’s Technical Advice.<sup>98</sup>

## Net short positions in EU shares

### Description and calculation

Investors use short sales for directional trading or hedging long positions. A short position describes the sale by an investor of shares borrowed from a third party. The investor buys the shares again at a later point in time and returns them to the lender. The potential profit or loss stems from the share price movement between the sale and the purchase, minus the borrowing fees.

Alternatively, investors can buy put options to build synthetic short positions in derivatives markets.<sup>99</sup> If the share price declines below the option’s strike price, investors may buy the share and exercise the option to make a profit from the difference between spot and strike price, minus the purchase price of the option.

SSR net short positions are calculated as the difference between short and long positions, both

<sup>95</sup> This article was authored by Julien Mazzacurati, with technical support from Sylvain Canto. The article is based on ESMA’s Technical Advice to the European Commission on certain aspects of the Short-Selling Regulation (Annex 5).

<sup>96</sup> Regulation (EU) No. 236/2012.

<sup>97</sup> [https://ec.europa.eu/info/files/formal-request-esma-technical-advice-evaluation-regulation-eu-ndeg-236-2012-short-selling-and-certain-aspects-credit-default-swaps\\_en](https://ec.europa.eu/info/files/formal-request-esma-technical-advice-evaluation-regulation-eu-ndeg-236-2012-short-selling-and-certain-aspects-credit-default-swaps_en).

<sup>98</sup> The full Technical Advice, which includes an analysis of temporary short-selling bans and thresholds for significant price falls, is available on ESMA’s website:

<https://www.esma.europa.eu/press-news/esma-news/esma-advises-commission-specific-elements-short-selling-regulation>

<sup>99</sup> Other synthetic strategies involving options include, for example, selling call options, combining options and long positions, combining put and call options (with or without different strike prices), etc.

in cash markets and derivatives markets. The notional value of derivatives positions must be delta-adjusted to reflect the sensitivity of the derivatives value to the underlying share price.

Market participants must report net short positions in EU shares to the relevant national authorities when the position is equal to at least 0.2% of a company's issued share capital, and again at each 0.1% increment above that. In addition, net short positions above 0.5% are publicly disclosed on the competent authority's website.<sup>100</sup> Market makers and authorised primary dealers are exempted from the reporting regime. In practice, this implies that the majority of investors reporting net short positions to national authorities are hedge funds and other asset managers (ESMA, 2013).

## Overview of SSR data

National authorities use the SSR net short positions data reported to them to monitor short-selling activities in their domestic market. In addition, authorities send to ESMA on a quarterly basis net short position data aggregated at ISIN level.<sup>101</sup> ESMA uses the aggregated data for financial stability risk monitoring at EU level (see for example A.81 to A.86), and other internal purposes.

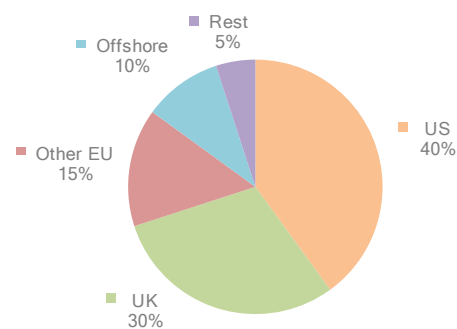
For the Technical Advice, ESMA collected all net short positions reported to authorities between 1 January 2013 and 31 December 2016. This amounts to a total 210,341 positions across 19 EU Member States. These short position notifications referred to 2,321 different shares, the majority with primary listing in the UK (755), Germany (359), Sweden (266), France (223) and Italy (199).

There are around 1,000 different net short position holders active in EU shares, i.e. investors that have reported at least one net short position during the sample period. A large majority of these (around 70%) are domiciled in the US and UK, with 15% based in other EU countries and 10% offshore (V.34).<sup>102</sup> The average number of position holders by share is 11.5 and the median is five.

<sup>100</sup> For the links to national websites where net short positions in EU shares are publicly disclosed, see: [https://www.esma.europa.eu/sites/default/files/library/ssr\\_websites\\_ss\\_positions.pdf](https://www.esma.europa.eu/sites/default/files/library/ssr_websites_ss_positions.pdf).

V.34

Geographic distribution of net short position holders  
**Short sellers mainly US and UK based**



Note: Distribution of net short position holders, by domicile. Offshore includes BM, GG, IM, KY, JE and VG.  
Sources: National Competent Authorities, ESMA.

Investors reported net short positions in 26.6 different shares on average, with a median of five. The large difference between the mean and the median indicates that a small number of position holders short a large number of shares. Moreover, around 150 position holders account for more than 80% of net short position notifications received, covering three quarters of the ISINs in the dataset. Taken together, this suggests that short-selling activities in EU shares are highly concentrated.

## Public disclosure of short positions

### Recent literature

The literature on the public disclosure of short positions is sparse, owing mainly to the recent adoption of such measures in a relatively limited set of countries. Public disclosure is generally considered as an alternative policy tool to short-selling bans, with the similar aim of introducing a constraint on short-selling activity. However, where bans can be a blunt instrument intended for emergency situations, public disclosure rules differ in at least two regards:

- The disclosure rule is permanent and therefore intended to durably influence the behaviour of investors;
- The threshold does not constitute a hard ceiling on short-selling activities and its effects are more nuanced, so it may not have a symmetric impact on all investors.

The second point is a fundamental one, in that an asymmetric impact on investors could have

<sup>101</sup> For example, NCAs would report to ESMA two net short positions of 0.2% and 0.3% in a particular ISIN on any given day as an aggregate position of 0.5% in that ISIN.

<sup>102</sup> Offshore includes here Bermuda, Cayman Islands, Isle of Man, Guernsey, Jersey, and the British Virgin Islands.

different implications for trading activity and financial stability.

In Europe, Jones, Reed and Waller (2016) investigated the public disclosure of short positions by focusing on the regimes adopted in the UK, France and Spain that pre-dated the SSR. Noting that the literature generally argues that short sellers improve market efficiency and help to stabilise share prices, they analyse the effects of disclosure on share prices and on the behaviour of short sellers, based on public data from these three countries. They find that public disclosure has a limited overall impact on share prices, outside of rights issues. They also conclude that public disclosure discourages informed trading, and that share prices become less informative as a result. Lastly, the authors document the existence of herding behaviour, with the presence of a short position disclosure significantly increasing the probability of another disclosure, but find no evidence that disclosure is used for share price manipulation.

Using SSR data on German shares, Jank, Roling and Smajlbegovic (2016) investigate the behaviour of investors around the public disclosure threshold. They find that a considerable fraction of position holders is reluctant to cross the threshold. The decision to cross appears to be persistent, as some investors follow a policy not to disclose their positions. The authors also find stronger negative returns for the shares shorted by secretive investors, suggesting that these investors possess superior information. As a result, secretive investors are prevented by the threshold from fully acting on their information and beliefs due to the constraint imposed on short selling, resulting in less informational efficiency.

To investigate the impact of public disclosure on investor behaviour *below* the threshold, we reproduced the methodology used by Jank et al. (2016), applied to the ESMA EU-wide sample described in the previous section. We also looked into the impact of public disclosure *above* the threshold, confirming the existence of herding behaviour documented in Jones et al. (2016).

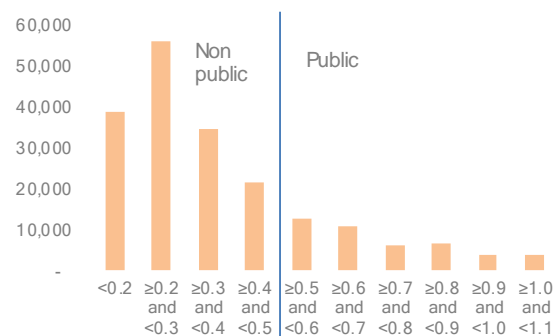
### Distribution of net short positions

Given the notification thresholds (every 0.1% starting at 0.2% of issued share capital), net short positions are grouped into bins of ten basis-point increments, as in Jank et al. (2016). For example,

the  $\geq 0.2$  and  $< 0.3$  bin includes positions greater than or equal to 0.2% of issued share capital but smaller than 0.3%; the  $\geq 0.3$  and  $< 0.4$  bin includes net positions greater than or equal to 0.3% but smaller than 0.4%; and so on.

Most net short positions are below the public disclosure threshold of 0.5% (71% of the sample). The number of short positions in each bin gradually decreases from 0.2% (the reporting threshold) as the size of short positions increases, with no obvious clustering around the public disclosure threshold of 0.5% (V.35).<sup>103</sup> This also holds with higher data granularity, e.g. when splitting the sample into bins of five basis points or smaller.

V.35  
Distribution of net short positions in EU shares  
**No clustering below the public threshold**



Note: Number of net short positions in EU shares from 01/01/2013 to 31/12/2016 regrouped in 0.1% increments (in % of issued share capital). The blue line marks the public disclosure threshold.

Sources: National Competent Authorities, ESMA.

### Public disclosure threshold

To determine the impact of the public disclosure threshold on investor behaviour, we investigate the frequency of net short position increases and the duration of positions, as in Jank et al. (2016). Each unique combination of position holder and ISIN is considered as a distinct short position which may increase and decrease over time.

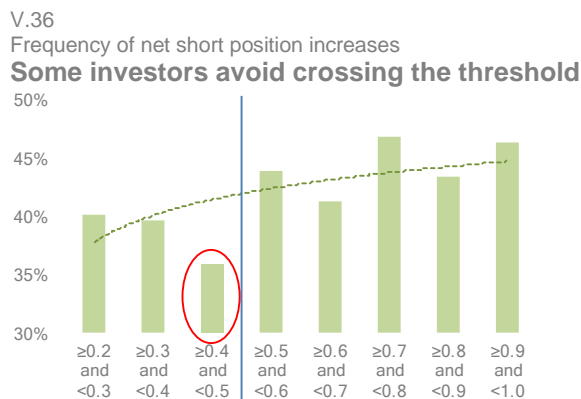
To investigate the frequency of short position increases, net short positions are split within each bin based on whether the next notification is in a higher or lower bin, i.e. whether the short position increases or decreases. We look in particular at the  $\geq 0.4$  and  $< 0.5$  bin, which is just below the public disclosure threshold and where positions are the most likely to be influenced by the constraint.

Around 36% of net short positions in the  $\geq 0.4$  and  $< 0.5$  bin show an increase, the smallest

<sup>103</sup> In the graph, net short positions data are truncated at 1.0 (i.e. positions above 1.0% are not displayed) for

readability. Net short positions below 1.0% represent more than 90% of the sample.

percentage of all reporting bins (V.36). This contrasts with a 40% increase of positions in the bin just below and a 44% increase of positions in the bin just above. Moreover, the trend suggests that the frequency of net short position increases tends to grow with the size of net short positions, whereas the  $\geq 0.4$  and  $< 0.5$  bin marks a drop in frequency of increases relative to smaller positions. The differences in frequencies relative to the  $\geq 0.4$  and  $< 0.5$  bin are all statistically significant at the 1% level.<sup>104</sup>



Note: Frequency of net short position increases in EU shares from 01/01/2013 to 31/12/2016 regrouped in 0.1% increments (in % of issued share capital), based on the previous reporting bin. The blue line indicates the public disclosure threshold. The dotted line is a logarithmic trend.  
Sources: National Competent Authorities, ESMA.

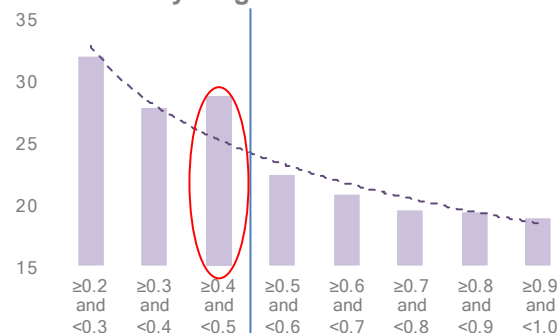
The abnormality observed highlights that the public disclosure threshold has a material impact on the market outcome of net short positions. This outcome is likely driven by the behaviour of some position holders who avoid crossing the public disclosure threshold.

Next, we investigate the duration of net short positions by observing the number of days spent in each bin (i.e. between two short position notifications). Stale positions with a duration greater than 300 days are excluded to avoid introducing a bias.<sup>105</sup> Again, we focus on positions in the  $\geq 0.4$  and  $< 0.5$  bin, which are the most likely to be influenced by the public disclosure threshold.

The duration of short positions in the  $\geq 0.4$  and  $< 0.5$  bin is the second highest, with an average of 29 days (V.37). Differences between positions in bins with a lower duration (i.e. all bins except the lowest reporting bin) relative to the  $\geq 0.4$  and  $< 0.5$  bin are all statistically significant at the 1%

level. Moreover, the decreasing trend suggests that the duration of positions in the  $\geq 0.4$  and  $< 0.5$  bin is an outlier.<sup>106</sup>

V.37  
Average duration of net short positions  
**Investors stay longer below the threshold**



Note: Average duration of net short positions in EU shares from 01/01/2013 to 31/12/2016, in days, regrouped in 0.1% increments (in % of issued share capital). The blue line marks the public disclosure threshold. The dotted line is a logarithmic trend.  
Sources: National Competent Authorities, ESMA.

This abnormality reinforces the view that the public disclosure threshold seems to influence the market outcome of net short positions, likely driven by the behaviour of some investors who avoid crossing the public threshold and tend to “overstay” in the reporting bin just below the threshold.

### Public disclosure avoidance

To identify the type of investors influenced by the disclosure threshold, the sample is further divided between net short positions at their record high and positions below their record high, as in Jank et al. (2016). The objective is to determine whether the public disclosure threshold impacts investors asymmetrically.

In each bin, a net short position is at its record high if, for each unique pair of position holder and ISIN, the position has never been in a higher bin in the past. For example, a position of 0.2% reported for the first time will be in the record-high sample of the  $\geq 0.2$  and  $< 0.3$  bin. If this position increases to 0.3%, it is then part of the record-high sample of the  $\geq 0.3$  and  $< 0.4$  bin. If the position decreases to 0.2% again, it will now be part of the non-record high sample of positions in the  $\geq 0.2$  and  $< 0.3$  bin. Net short positions below 0.5% that are at their record high have never

<sup>104</sup> As a robustness check, the analysis was also performed using a logit regression to account for the non-normality of the net short positions distribution. The odds-ratios obtained for each bin showed a virtually identical picture.

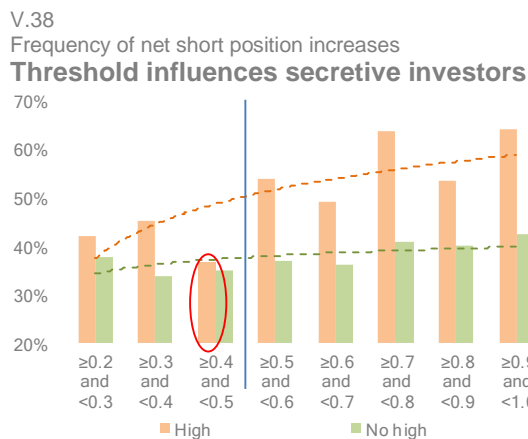
<sup>105</sup> Indeed, after the first notification, positions that fall below the 0.2% reporting threshold should be notified to the relevant authority one last time until the threshold is crossed again. However, it appears that position holders

frequently omit to notify the regulator, leaving a large number of stale positions between 0.2% and 0.3%.

<sup>106</sup> When using median instead of mean, the duration in the 0.4% bin is still the second highest, equal to the duration in the 0.3% bin (12 days), but the gap with the 0.5% bin is much larger in relative terms (8 days). See ESMA (2017) for the full details.

been made public, allowing us to focus on the behaviour of investors who avoid public disclosure and aim to keep their strategy secret from other investors.

We observe in the data that the impact of the public disclosure threshold is concentrated on net short positions that are at their record high in the bin immediately below the threshold. This is visible from both the difference in frequency with the adjacent bins, and the break compared with the overall trend (V.38).



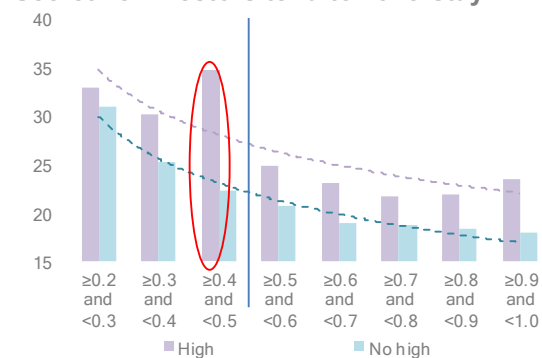
Note: Frequency of net short position increases in EU shares from 01/01/2013 to 31/12/2016, regrouped in 0.1% increments (in % of issued share capital), based on the previous reporting bin. The blue line marks the public disclosure threshold. The dotted lines are logarithmic trends. The sample is split between positions at their record high ("High") and below their record high ("No high").  
Sources: National Competent Authorities, ESMA.

For the non-record high sample, the frequency of increases for positions in the bin just below the 0.5% threshold is in line with the overall trend, and comparable to the adjacent bins. This suggests that the behaviour of investors that have already publicised a short position in a specific share (i.e. investors that have publicly expressed a bear view on an issuer in the past) is not influenced by the public disclosure threshold. Jank et al. (2016) show that the decision to cross or not to cross the disclosure threshold appears to be persistent, with investors adhering to their behaviour over time. This may reflect concerns about protecting private information, or proprietary investment strategies.

The average duration of net short positions confirms that the public disclosure threshold only impacts record-high positions that are in the bin just below the threshold (V.39). Investors that hold record-high short positions in the  $\geq 0.4$  and  $< 0.5$  bin stay on average for 35 days in this reporting bin, compared to 30 and 25 days in the

adjacent bins. Moreover, the average duration of net short positions tends to decrease as the size of the positions increases, but the duration of record-high positions in the bin just below the threshold marks a clear break from the overall trend.<sup>107</sup>

V.39  
Average duration of net short positions  
**Secretive investors tend to "overstay"**



Note: Average duration of net short positions in EU shares from 01/01/2013 to 31/12/2016, in days, regrouped in 0.1% increments (in % of issued share capital), based on the previous reporting bin. The blue line marks the public disclosure threshold. The dotted lines are logarithmic trends. The sample is split between positions at their record high ("High") and below their record high ("No high").  
Sources: National Competent Authorities, ESMA.

In contrast, the average duration of net short positions in the  $\geq 0.4$  and  $< 0.5$  bin that are below their record high is 22 days, i.e. 13 days shorter than record-high positions in the same reporting bin. This is comparable to the duration of short positions in the adjacent bins and in line with the overall decreasing trend.

These observations confirm the view that the public disclosure threshold seems to influence the behaviour of investors, who avoid crossing the threshold and are reluctant to disclose their strategy. Investors that have disclosed their position in the past no longer seem to be influenced by the threshold.

## Herd behaviour

We rely on the definition of herd behaviour first developed by Banerjee (1992), applied in this context: Investors follow the actions of other investors even when their private information suggests doing something different, which inflicts a negative externality on the rest of the market. To assess herding, we concentrate on instances where multiple investors short the same share over a limited period of time, or where short position holders contemporaneously change the size of their position.

<sup>107</sup> These findings are confirmed when using median instead of mean duration: the median duration of net short positions in the  $\geq 0.4$  and  $< 0.5$  bin is 15 days, the longest of all reporting bins.



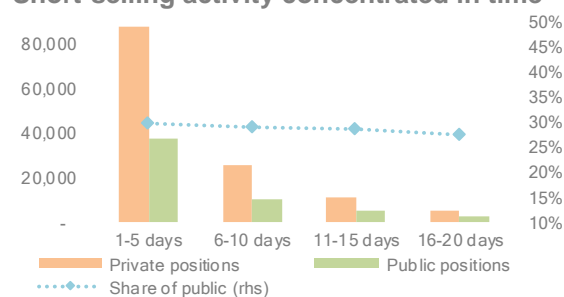
To do so, we investigate the time between net short position notifications and measure the time concentration of net short positions. More specifically, we calculate the number of days between each notification on the same share and across investors, provided that the notifications are at least one day apart.<sup>108</sup> Net short positions are then regrouped into buckets, based on the number of days that have passed in the four weeks following the most recent notification.

First, we focus on net short position notifications received after a private notification (i.e. a net short position below 0.5%). Since private notifications are by definition not publicly available, they should not influence the behaviour of other investors.

Time concentration appears to be very high, with 60% of all notifications received within five days of another private notification on the same share, including 27% within one day (V.40). This degree of concentration suggests the existence of herd behaviour amongst short sellers, reflecting group reaction to public information (e.g. company news, market developments), and individual investors likely anticipating the reaction of other investors.

The share of publicly disclosed positions (i.e. net short positions above 0.5%) is broadly stable and in line with the full-sample average of 29%. This confirms that private notifications do not influence the decision by other investors to go public.<sup>109</sup>

V.40  
Net short position changes following a private notification  
**Short-selling activity concentrated in time**



Note: Number of private and public net short position notifications received in the days following a private position notification on the same ISIN, and share of public positions (right axis) in % of total. Private positions are net short below the public disclosure threshold.  
Sources: National Competent Authorities, ESMA.

Next, we compare these results with the number of net short position notifications received after a public disclosure.<sup>110</sup> Unlike private notifications, publicly disclosed positions in a security can be expected to influence the behaviour of other investors vis-à-vis that security for two reasons. First, investors may assume that those who go public are likely to be better informed, and decide to replicate their competitor's strategy. Second, investors may be less concerned with keeping their strategy secret once another investor has gone public, and decide to take a larger position.

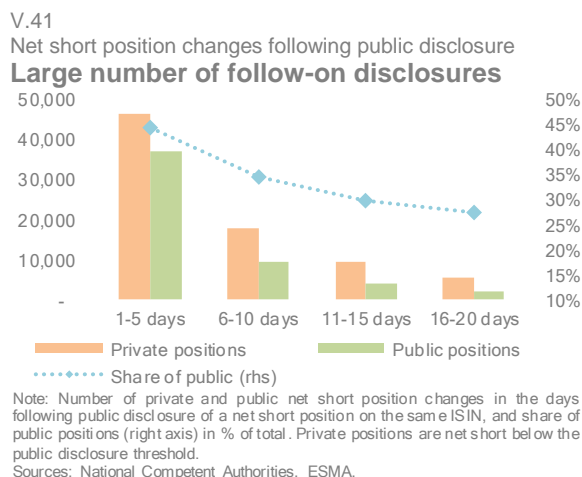
Again, time concentration appears to be very high after public disclosure (V.41). This is particularly the case for publicly disclosed positions in the five days that follow another public disclosure on the same ISIN. Indeed, the share of public notifications received within one week is much higher after another public disclosure has taken place (44%), and converges over time towards the full-sample average of 29%.

<sup>108</sup> This one-day difference is necessary given that public disclosure occurs one day after the short position notification. As a result, the time between net short position changes is possibly biased upward when multiple notifications are received on the same day.

<sup>109</sup> To confirm that public disclosure does not influence these findings, we followed the same procedure excluding all notifications received within ten and twenty days of a public disclosure. The share of publicly disclosed positions remains stable as in the main results (albeit lower due to the large number of public positions

removed) and time concentration remains very high with most position changes received within five days of the previous notification.

<sup>110</sup> The total number of net short position notifications received in the weeks that follow public disclosures is smaller than the number of notifications received in the weeks that follow private notifications. This is by construction, since publicly disclosed notifications constitute less than one third of the sample.



The higher share of publicly disclosed notifications is confirmed using a logit regression inspired by Jones et al. (2016).<sup>111</sup> We define the dummy variable *Public* as a dependent variable and use lagged dummy variables indicating recent short position disclosures as explanatory variables. The estimation results show that the odds of a net short position notification being public (i.e. above 0.5%) are six times higher when another disclosure has taken place in the past week on the same share (V.42).

V.42  
Odds ratio of a public disclosure  
**Recent disclosures increase the odds**

Time since the previous disclosure	Odds ratio*	Standard error
1 week	6.3	0.8
2 weeks	4.2	0.7
3 weeks	3.3	0.7
4 weeks	3.0	0.8

Note: Odds ratio and standard errors from a logit regression, where the dependent variable is a dummy variable indicating whether a position is public or not, and the explanatory variables are lagged dummy variables indicating whether a short position disclosure has taken place in the last one, two, three or four weeks.  
\* All estimates statistically significant at the 1% level.  
Sources: ESMA.

The larger share of publicly disclosed notifications reflects a combination of follow-on disclosures by other investors and subsequent changes to a position already disclosed (e.g. from 0.5% to 0.6%): Around half of the public notifications received within four weeks of a previous disclosure came from a different investor.<sup>112</sup>

To inform the analysis further, we look at the number of different investors that reported a

position within five days of another notification. The average number of investors per share who reported a position after a private notification is very similar to the average following a public disclosure (around 12 investors), while the median is the same (six investors). This suggests that herding from new investors “piling in” immediately after a public disclosure, i.e. investors who previously did not hold a short position in a share and just seek to replicate other investors’ strategies, is limited.

As highlighted in Jones et al. (2016), it is possible that follow-on disclosures simply reflect independent investor reactions to exogenous public information. Indeed, the higher share of public notifications might reflect different investor behaviour above the disclosure threshold unrelated to previous public disclosures. However, the elements presented above strongly suggest that investors react to public disclosure by increasing the size of their position, thereby reinforcing herd behaviour. However, this hypothesis was not specifically tested.

## Conclusion

The analysis of net short positions in EU shares shows that public disclosure influences the market outcome of short positions below and above the 0.5% disclosure threshold.

First, the threshold imposes a constraint on short selling that is binding for investors who avoid publicly disclosing a net short position in a particular share, i.e. investors who aim to keep their strategy secret from other investors. Jank et al. (2016) documented stronger negative returns for German stocks shorted by these secretive investors, suggesting that the concealment of a short position is associated with superior information.

Public disclosure can increase pricing efficiency by bringing transparency when positions are disclosed by informed investors. However, it also seems to reinforce herd behaviour, with disclosure leading to follow-on disclosures by other investors. One question raised in the literature but not addressed here is whether short sellers might use public disclosure to manipulate share prices by influencing others and profit from large price declines (so-called “bear raids”).

<sup>111</sup> The setup is different here given the nature of the data: the logit calculates the odds that a net short position notification is public rather than private, while Jones et al. (2016) estimate the probability of a public disclosure (compared to no disclosure) on any given day.

<sup>112</sup> The methodology used possibly overestimates the share of public disclosures from new investors.

Using public SSR data from three countries, Jones et al. (2016) find no evidence of this.

The current notification and public disclosure thresholds provide meaningful information both to regulators for supervisory purposes and to the market for transparency purposes. Nonetheless, further research on the potential externalities of the public disclosure threshold would be needed to increase public understanding of the impact of the threshold.

## References

Banerjee, A. V. (1992), "A simple model of herd behavior", *The Quarterly Journal of Economics*, Vol. 103, No. 3, pp. 797-817.

ESMA (2013), "Technical advice on the evaluation of the Regulation (EU) 236/2012 on short selling and certain aspects of credit default swaps."

ESMA (2017), "Technical advice on the evaluation of certain elements of the Short Selling Regulation."

Jank, S., C. Roling and E. Smajlbegovic (2016), "Flying under the radar: the effects of short-sale disclosure rules on investor behaviour and stock prices", Deutsche Bundesbank, Discussion Paper No. 25/2016.

Jones, C.M., A.V. Reed and W. Waller (2016), "Revealing shorts: an examination of large short position disclosures", *The Review of Financial Studies*, Vol. 29, No. 12, pp.3278-3320.

## Methods

# Operational risk assessment – the ESMA approach

Contact: [steffen.kern@esma.europa.eu](mailto:steffen.kern@esma.europa.eu)<sup>113</sup>

Operational challenges for financial market participants have intensified in recent years. Consequently, regulatory and supervisory attention to operational risk monitoring has increased. So far, ESMA operational risk assessments have been based mainly on qualitative evaluations of newswflows, complemented by evidence from quantitative indicators whenever possible. This article introduces our new systematic, comprehensive, analytical approach to operational risk monitoring in EU markets. Going forward, in line with our general risk assessment methodology we will take a wide range of quantitative indicators into consideration, complemented by in-depth market intelligence. In doing so, we focus on three priority risk areas of specific relevance to ESMA and the markets in our remit: market misconduct, infrastructure disruptions, and cyber attacks.

## Introduction

Operational risks in securities markets are receiving increasing attention. Developments such as the recent surges in cyber-attacks on financial firms, or technical glitches leading to flash crashes on trading venues, have heightened the sensitivity of market participants and regulators to potential disruptions in financial services providers' operations.<sup>114</sup>

This article is concerned with the assessment – i.e. the identification, monitoring and analysis – of operational risk from a regulatory and supervisory perspective. For ESMA, risk assessments inform the Authority's regulatory work, support daily supervisory practices, contribute to supervisory convergence initiatives, and help identify any market-wide or systemic problems at an early stage.

We introduced operational risk as a risk category to the quarterly ESMA risk reporting as early as 2015 and have since monitored our remit for existing and emerging risks, based mainly on qualitative analysis. With this edition of the

Trends, Risks and Vulnerabilities report (TRV), we are introducing a more systematic, comprehensive and analytical approach to operational risk assessment.

## Definition and delineation

The reference definition of operational risk has been provided by the Basel Committee on Banking Supervision, stating that "[o]perational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk".<sup>115</sup>

In line with this approach, similar formulations have been included in legal documents governing the operation of entities in markets within the remit of ESMA, such as Central Counterparties (CCPs),<sup>116</sup> Central Securities Depositories

<sup>113</sup> This article was authored by Steffen Kern and Giuseppe Loiacono.

<sup>114</sup> In 2003, a Capco White Paper estimated that operational issues accounted for 50% of hedge fund failures (Capco, 2003). For an analysis of the importance of operational risk to financial firms see, e.g., Allen (2003), De Fontnouvelle (2003), Cummins (2005). On the importance of operational risk modelling at entity level, see Basak (2016), and De Fontnouvelle (2004) for the impact of using different valuation models at entity level. For an overview and assessment of entity-level measurement approaches see Galloppo (2011).

<sup>115</sup> BCBS, 2011, p. 3. The definition is also widely used in the EU, e.g. <https://www.esa.europa.eu/regulation-and-policy/operational-risk>. For the EU banking sector, operational risk provisions are specified in CRD IV

(Directive 2013/36/EU), Art. 85, and CRR (Regulation 575/2013), esp. Arts. 20, 95, 312-324. For an overview see Allen & Overy, 2014.

<sup>116</sup> CCP prudential operational risk requirements are governed by the approaches required for credit institutions (Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on capital requirements for central counterparties, Art. 3.1) for which operational risk is defined as "the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events, and includes legal risk" (Regulation No 575/2013, Art. 4.1 (52)).

(CSDs),<sup>117</sup> Credit Rating Agencies (CRAs)<sup>118</sup> and Trading Venues (TVs).<sup>119</sup> More specifically, the Advanced Measurement Approach to operational risk also applicable to CCPs differentiates between operational event types in areas such as fraud, business best practices, and physical assets (Table V.43 below).

V.43

### Operational event types in relevant EU law

Event-type category	Definition
Internal fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent regulations, the law or company policy, excluding diversity/discrimination events, which involve at least one internal party
External fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent the law by a third party
Employment practices and workplace safety	Losses arising from acts inconsistent with employment, health or safety laws or agreements, from payment of personal injury claims, or from diversity/discrimination events
Clients, products, business practices	Losses arising from an unintentional or negligent failure to meet a professional obligation to specific clients (including fiduciary and suitability requirements), or from the nature or design of a product
Damage to physical assets	Losses arising from loss or damage to physical assets from natural disaster or other events
Business disruption and system failures	Losses arising from disruption of business or system failures
Execution, delivery, process management	Losses from failed transaction processing or process management, from relations with trade counterparties and vendors

Sources: Regulation No 575/2013, Art. 324.

From its definition and the legislative typology of events, it is evident that operational risk is a broad concept covering a wide range of potential incidences and, with this, an even wider range of potential sources from which such risks can hypothetically and practically emanate. It also follows that the measurement of risks in this context can be a very complex endeavour, for the

individual entity as well as for the measurement of operational risk at a market-wide level.

For securities regulators and supervisors, such operational disruptions are a central concern.

- Securities market infrastructures, incl. TVs, CCPs, CSDs, CRAs or benchmark providers are essential for day-to-day financial market activity around the world. Interruptions to their operations can have severe repercussions for investors and the wider financial system.<sup>120</sup>
- Financial innovation has led to unprecedented complexity and speed in trading systems, so that operational irregularities may have unpredictable effects in timing and scale.<sup>121</sup>
- Disruptions to the services of investment funds and firms can incur costs on retail clients and damage market confidence.<sup>122</sup>
- The variety of market participants in securities markets makes the oversight of operational risks particularly difficult. Retail and institutional investors, trading venues, central counterparties, credit rating agencies, benchmark providers and others differ widely in their business models, risk susceptibility and risk management, and their operations evolve over time, sometimes relatively fast.

From a wider risk perspective, operational risk analysis is an indispensable complement to the core financial market risk categories regulators and supervisors are concerned with, including market, liquidity, credit and contagion risks.

Importantly, all of these risk categories are interrelated, and this particularly applies to operational risks.<sup>123</sup> Thus, a significant business disruption or system failure in a CCP can affect the market and credit risks to which the CCP itself

<sup>117</sup> Operational risk for Central Securities Depositories (CSD) is referred to as "[...] the risks caused by deficiencies in information systems, internal processes, and personnel performance or disruptions caused by external events which result in the reduction, deterioration or breakdown of services provided by a CSD [...]" (Regulation (EU) No 909/2014 (45)).

<sup>118</sup> Operational risk for Credit Rating Agencies (CRA) is referred to as "[...] any inadequate report of its credit rating activities and any actual or potential conflicts of interest that may influence the analyses and judgments of its rating analysts, employees, or any other natural person whose services are placed at the disposal or under the control of the credit rating agency and who are directly involved in the issuing of credit rating and persons approving credit ratings [...]" (Regulation (EU) No 1060/2009 (Annex 1)).

<sup>119</sup> Trading venues' prudential operational risk requirements are governed by the approaches required for regulated markets, organized trading facilities (OTF) and multilateral

trading facilities (MTF) (Directive (EU) No 2014/65/EU Arts. 18, 47) for which operational risk is defined as "the risk of loss resulting from inadequate or failed arrangements for the management of the technical operations of the facility, including the establishment of effective contingency arrangements to cope with risks of systems disruption" (Regulation No 575/2013, Art. 4.1 (52)).

<sup>120</sup> Operational risks in financial market infrastructures have been covered in BIS (2012).

<sup>121</sup> E.g. Walch (2015). Accenture (2016) explore the interaction between cyber risks and operational risks.

<sup>122</sup> E.g. Brown (2008) and Brown (2012) explore operational risks in hedge funds and their measurement.

<sup>123</sup> For a detailed discussion of the relationship between operational risk and other risk categories see Young, Coleman (2009), pp. 45ff.

as well as its clearing members are exposed. In the same vein, a significant fraud event at an institutional investor may hypothetically lead to a loss of confidence among its clients and to a run situation, potentially resulting in high market or even contagion risks.

Upon closer consideration, the number of risk sources and scenarios of escalation is effectively infinite. As a result, the work on identifying and managing operational risks at the level of individual market participants has intensified, especially over the last decade. Regulators have required supervised entities to establish and strengthen their operational risk management – ranging from internationally agreed principles,<sup>124</sup> to legal requirements in individual jurisdictions<sup>125</sup> to detailed guidance by supervisory authorities.<sup>126</sup> To further support these risk management activities, industry associations have enhanced their coverage of the topic.<sup>127</sup>

As operational risk management by market participants grows more sophisticated, regulators and supervisors have an interest in monitoring the occurrence of operational risk events, their probability and their impact. From the risk analytical perspective of ESMA, it is therefore important to conceptualise an analytical framework that suits the diverse remit and objectives of the Authority and to operationalise it in a practicable and meaningful manner.

## Conceptualising operational risk for ESMA's market risk analysis

Since early 2015, we have included an explicit measure for operational risk in ESMA's remit in our quarterly risk assessment (Risk Dashboards) as well as our semi-annual reporting (TRVs). So far, our operational risk assessments have been based mainly on qualitative evaluations of news flow from the market areas under ESMA's remit, complemented whenever possible by evidence from quantitative indicators.

### Refining the approach: Analytical priorities

Going forward, we will provide a more systematic approach that is more deeply rooted in quantitative indicators and risk metrics. To render our methods more systematic, we follow a two-step approach: First, we identify risk areas of particular relevance and define priority fields for

monitoring and analysis. Second, we select existing risk indicators that serve as quantitative monitoring components and inform our final risk assessment.

Our identification of priority areas for risk monitoring builds on the categorisation provided by the BCBS as discussed above. We consider operational risk as a risk category that exists in its own right – its close interlinkages with other risk types notwithstanding. In line with its definition, we distinguish between four main sub-categories of operational risk, according to different risk sources.

As a first risk source, operational risk can occur in relation to the **internal organisation** of entities and processes in securities markets. In this area, risks can, for example, emerge as a result of inadequate corporate governance or business processes, corporate security and business continuity provisions, as well as communications and losses in reputation and credibility.

Second, **systems** are considered a key area of potential operational weaknesses. This risk source includes first and foremost Information Technology (IT) applied by market participants, covering software and hardware, system governance and processes as well as system security. Within ESMA's remit this category is particularly sensitive, considering the high degree of digitisation of financial services providers in general, and the central role of IT and other systems specifically for financial infrastructure and other services providers, such as TVs, CCPs and CSDs.

A third important source of operational risk is the **behaviour** of individuals or entities in the markets. Risk sources in this area encompass fraud, including market manipulation and abuse, conflicts of interest, breach of contract and negligence. Behavioural risks, too, are of particular relevance for ESMA. Promoting good conduct in financial services is a core objective of practically all legislative and regulatory rules in the Authority's remit. Thus, conduct-of-business requirements make up the largest part of key legal frameworks, such as EMIR, MiFID/MiFIR, CSDR, CRAR, UCITS, AIFMD, the Benchmarks Regulation, and others. With the Market Abuse Regulation, an entire legal framework is

<sup>124</sup> Key international standards include IOSCO (1994), BIS (2012), and BCBS (2011).

<sup>125</sup> Especially in the wake of the financial crisis of 2007, practically all major legislative measures in the EU have

included extensive requirements for operational risk management in market participants.

<sup>126</sup> E.g. AMF (2016).

<sup>127</sup> E.g. SIFMA (2015).

dedicated to preventing and sanctioning manipulative behaviour in securities markets.

Finally, **external** risk factors need to be taken into account. Physical externalities such as natural catastrophes, terrorism and cyber attacks have caused substantive damage to financial operations in the past, and their impact is attracting increasing attention as a risk management issue. In addition, litigation claims from third parties are closely linked to behavioural risks inside a financial services provider and can result in high financial burdens. More generally, behavioural and system failures in third parties can pose direct or indirect risks to an otherwise uninvolved market participant.

These four sub-categories and potential risk sources are an important step in devising an analytical framework. To make our risk assessment method more tangible, we identify severe but plausible risk events for the three market areas in ESMA's remit. In **securities markets**, these hypothetical events include market manipulation and abuse or a potential impairment of reference market information.

For **market infrastructures**, we include instances of trading disruptions and irregularities, settlement disruption and cyber attacks, while for **investors**, scenarios of client data impairment, fraud and violations of investor best interests play a particular role. For each hypothetical event in the three ESMA market areas, we apply a structural risk assessment for the loss-event probability and loss impact and derive a measure for the gross loss risk exposure of each event.<sup>128</sup>

As a result of this structural risk assessment, we identify three priority areas for our risk monitoring going forward:

#### — **Priority 1: Market misconduct**

**Main risk sources:** Market abuse and manipulation, fraud, violation of investor best interests, and impairment of market reference information.

**Key markets:** Trading venues, institutional investors, CRAs.

**Main ESMA objectives:** Investor protection, orderly markets.

#### — **Priority 2: Infrastructure disruptions**

**Main risk sources:** Non-availability of systems, esp. infrastructures, dis-continuity

in financial system operations, impairment of market reference information.

**Key markets:** Central clearing, securities depositories, trading venues, investment firms, benchmarks.

**Main ESMA objectives:** Investor protection, financial stability, orderly markets.

#### — **Priority 3: Cyber attacks**

**Main risk sources:** Non-availability of systems, esp. infrastructures, discontinuity in financial system operations, impaired integrity of client data.

**Key markets:** Central clearing, securities depositories, trading venues, investment firms, CRAs.

**Main ESMA objectives:** Investor protection, financial stability.

#### Operational-risk indicators and metrics

In light of the three priority areas of risk monitoring identified above, ESMA extends its quantitative analysis to underpin the operational risk assessment and outlook with stronger empirical evidence (Table V.44).

Regarding market **misconduct risks**, we are in the process of collecting aggregated statistics on administrative sanctions and criminal investigations from NCAs under MAR. With a view to monitoring violations of investor best interests, we already evaluate statistics on the number and details of complaints filed to NCAs by retail investors, the gross and net performance of investment funds and any fees and charges, tracking errors by passive investment funds, and we are working on indicators pointing to the risk of closet-indexing practices by investment funds. Finally, we review statistics on the accuracy of credit ratings and interbank reference rates to assess potential impairments of reference market information.

<sup>128</sup> For the structural assessment, we multiply the probability (P) of the event risk materialising (ranging in four steps from "low" to "significant", "high" and "very high") with the expected size of impact (I) in case of materialisation of the risk, incl. breadth and intensity of impact (ranging in four

steps from "small" to "significant", "strong" and "very strong"), yielding the expected gross loss risk (R), ranging from "small" to "significant", "high" and "very high".

V.44

**ESMA-RAE operational risk indicators****Market misconduct**

Indicator	Source	Status
MAR administrative measures	P	D
MAR criminal sanctions	P	D
ESMA complaints	P	O
ESMA fund fees and charges indicators	C	O
Closet indexing share in fund industry	C	D
ETF tracking error	C	O
Fund net real relative performance	C	O
Qualitative coverage	MI	O

**Infrastructure disruption**

Indicator	Source	Status
MiFID2 trading halts	P	O
MiFID2 trading suspensions	P	O
Trading volumes and capacity	C	O
ESMA settlement activity	P	O
ESMA settlement fails	P	O
Value of settled transactions	C	O
Securities in CSD accounts	C	O
CCP value cleared	C	O
IRS CCP clearing	C	O
Share of transactions cleared	C	O
Share of TOTV/ETD	P	D
Qualitative coverage	MI	O

**Cyber attack**

Indicator	Source	Status
Number of cyber attacks	C	O
Types of cyber attacks	C	O
Qualitative coverage	MI	O

Note: Indicative list of risk indicators and metrics used for ESMA operational risk assessment. O=in operation; D=under development; C=commercial data; P=ESMA proprietary data; MI=ESMA market intelligence. List may be subject to change.  
Sources: ESMA.

Risks of **infrastructure disruptions**, in particular from trading irregularities, are covered by our evaluation of MiFID II proprietary statistics on trading suspensions, and our monitoring of trading volumes and capacities. Similarly, we review risks of settlement disruptions on the basis of, for example, proprietary statistics on settlement activity, settlement fails, and CCP clearing. Finally, using commercial database we monitor the occurrence of trading halts in the EU trading venues.

Finally, with regard to **cyber attacks**, we continue to review the number, nature and intensity of incidences in the financial industry through our market intelligence activities and are working on the inclusion of third-party statistics on cyber attacks.

**Limitations of the proposed approach**

It is important to note that our refined approach to operational risk monitoring is – and necessarily so – subject to a number of caveats.

First, conceptually as well as in practice it is difficult to separate the three priority areas in clear terms. For example, infrastructure disruptions and cyber attacks are closely related, in particular inasmuch as a significant cyber attack on an

infrastructure provider may lead to disruption of its services. Other overlaps, such as cyber attacks aiming to manipulate a market, are conceivable. This makes comprehensive monitoring of these priority areas all the more warranted.

Second, catastrophe and terrorism risks as well as other risk sources, if not specifically covered in our quantitative analysis, remain part of our qualitative monitoring of the operational risk landscape, and evidence will be included if and when changes in the related risk levels occur.

Third, the landscape of risks changes over time, and with it the focus of our work. With this in mind, we will review our structural assessment and prioritisation annually to ensure our analytical focus remains relevant.

Finally, at the outset of our analysis the quantitative analytical framework does not systematically encompass corporate, regulatory and supervisory risk mitigation. Assessment of existing risk mitigation efforts is covered as an important part of the qualitative risk assessment at ESMA.



V.45  
**ESMA-RAE risk monitoring – coverage**

**Risk segments**

Risk segment	Definition
Overall ESMA remit	Risk level and outlook for all markets under ESMA remit in aggregate, incl. securities markets, investors, infrastructures and services, as well as systemic stress.
Systemic stress	Risk level and outlook for systemic risks and measures of interlinkages in securities market activities under ESMA remit.
Securities markets	Risk level and outlook for securities market activities.
Investors	Risk level and outlook for institutional and retail investor activities.
Infrastructures, services	Risk level and outlook for infrastructures and services operations

**Risk categories**

Risk category	Definition
Market risk	Risk level and outlook for risk of losses owing to adverse movements in financial market prices or to excessive volatility
Liquidity risk	Risk level and outlook for risks related to the ability to trade an asset at short notice, at low cost and with little impact on its price (market liquidity) and to the ability for financial institutions to settle obligations when due (funding liquidity)
Credit risk	Risk level and outlook for risk of losses owing to the inability of counterparties to fulfil their contractual obligations. It also monitors factors which might increase credit risk at a systemic level
Contagion risk	Risk level and outlook for risks to others related to the propagation of stress in a particular economy or segment or sector of the financial market
Operational risk	Risk level and outlook for risks of direct or indirect loss resulting from inadequate or failed internal procedures, people, and systems or from external events

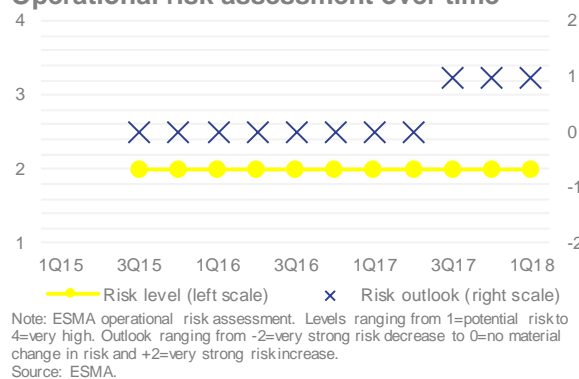
**Risk sources**

Definition
Risk outlook for a list of the most important potential origins of disruptions or structural imbalances for markets under ESMA remit, in order of indicative severity.
Sources: ESMA.

**Operational risk in ESMA risk monitoring**

Operational risk was introduced as a risk category in our overall risk assessment, alongside market, liquidity, contagion and credit risk. We assess operational risk with respect to its current risk level, ranging in four steps from "potential risk" to "very high risk", as well as to the risk outlook, differentiating between improving, deteriorating or unchanged risk levels in the forward reporting period. The track record of our assessment is presented in Chart V.46 below.

V.46  
 ESMA risk level and outlook assessment  
**Operational risk assessment over time**



By further developing our analytical approach to operational risk, we complement and strengthen the regular risk monitoring that we submit to the EU Institutions and subsequently make available to the public.

Most importantly, the new approach helps us deepen the coverage of our risk assessment. In our semi-annual TRV reports and the quarterly Risk Dashboards (RDs), we provide separate risk assessments for the risk segments in the ESMA remit, covering a composite risk level and outlook indicator for the overall ESMA remit as well as separately for securities markets, infrastructures and services, and investors, respectively (Table V.45 above). Operational risks, even if not directly addressed in the risk segment analysis, can have an indirect impact on the segment perspective if e.g. an event affects the risk levels in one or more market segments.

Operational risk explicitly enters the picture when evaluating risk along the second dimension of monitoring, namely by risk categories, where it complements the financial market risk categories of market, liquidity, credit and contagion risk.

In addition, operational risk may feature among the key risk sources that we highlight as a third dimension of our monitoring, where we list the most important potential origins of disruptions or structural imbalances for markets under ESMA remit, in order of indicative severity.

V.47

### ESMA-RAE risk monitoring – risk indicators

#### Risk level assessment

Risk level	Symbol	Definition
Very high risk	●	Very high risk of materialisation
High risk	●	High risk of materialisation
Elevated risk	●	Elevated risk of materialisation
Potential risk	●	Low risk of materialisation

Note: Risk level assessments provide qualitative indicators of the level of risk of a significant market impact at the time of issue of the risk assessment.

#### Risk outlook assessment

Risk outlook	Symbol	Definition
Very strong increase	↑	Very strong increase in risk
Strong increase	↗	Strong increase in risk
No material change	→	No material change in risk
Strong decrease	↘	Strong decrease in risk
Very strong drop	↓	Very strong decrease in risk

Note: Risk outlook assessments provide directional indicators of possible changes in the level of risk in subsequent reporting periods at the time of issue of the risk assessment.

Sources: ESMA.

For both the risk segments and categories ESMA specifies an assessment of risk levels by means of qualitative indicators of the level of risk at the time of issuance of the risk assessment. In these cases, and for the risk sources, ESMA also provides a risk outlook, shown as a directional indicator of possible changes in the level of risk in subsequent reporting periods (Table V.47 above).

As discussed in the concrete case of operational risk in this article, the risk assessment methodology applied by ESMA (Table V.48) combines quantitative analysis (drawing on ESMA risk indicators and metrics) with qualitative analysis (bringing ESMA market intelligence as well as any risk assessments undertaken by National Competent Authorities into the picture) as the key sources of information. The quantitative and qualitative evidence forms the basis for the final ESMA analyst assessment. The risk assessments are disseminated through the TRV and RD reports,<sup>129</sup> by means of which ESMA reports to the EU Institutions and which are subsequently made available to the wider public on the ESMA webpage.

<sup>129</sup> In addition to TRV and RD reporting, ESMA risk assessments are also shared with other bodies to whose risk analytical activities ESMA contributes, such as the ESRB, IOSCO and the ESA Joint Committee. TRV and

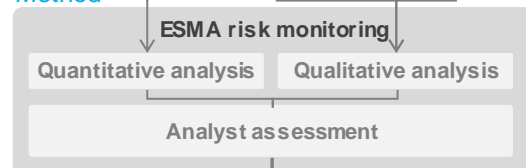
V.48

### ESMA-RAE risk monitoring – approach

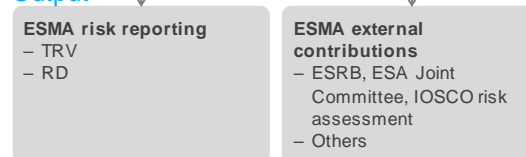
#### Sources



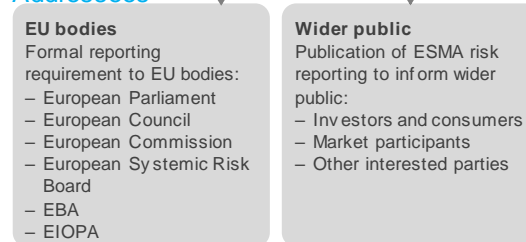
#### Method



#### Output



#### Addressees



Note: TRV=ESMA semi-annual Report on Trends, Risks and Vulnerabilities; RD=ESMA quarterly Risk Dashboard; NCA=National Competent Authority; RAE=ESMA Risk Analysis and Economics Department; EBA=European Banking Authority; EIOPA=European Insurance and Occupational Pensions Authority; ESRB=European Systemic Risk Board; IOSCO=International Organization of Securities Commissions. Sources: ESMA.

### Conclusion

With its enhanced approach to monitoring operational risks, ESMA is widening and deepening its analytical work on this increasingly important discipline. Operational challenges for financial market participants have multiplied and intensified in recent years. Digitisation, product complexity or cyber attacks are but the most important of a wide range of issues to be addressed. These diverse issues at entity level translate into a maze of risk categories and risk sources, let alone potential risk events and triggers, when viewed from the perspective of

RD reports are subject to internal ESMA sign-off procedures and final approval by the ESMA Board of Supervisors.

regulators and supervisors trying to map and measure the risk landscape in their remit.

With the prioritisation of three risk areas, namely market misconduct, infrastructure disruptions and cyber attacks, we give focus to our monitoring of risks in the EU single market and provide a flexible framework for adjustment in case of structural changes in the operational risk landscape.

All the same, we are still at a very early stage in developing this discipline for our remit. Numerous potential risk sources exist for which risk indicators and metrics need to be evolved, and we are working continuously to enhance our monitoring tools. At the same time, new data sources, such as MiFID II market data reporting data and others, are becoming available which allow for more sophisticated methods of risk monitoring. In close cooperation with the National Competent Authorities, we will continue to enhance and refine our operational risk monitoring and improve the risk assessment as provided in our TRV and RD reports.

## References

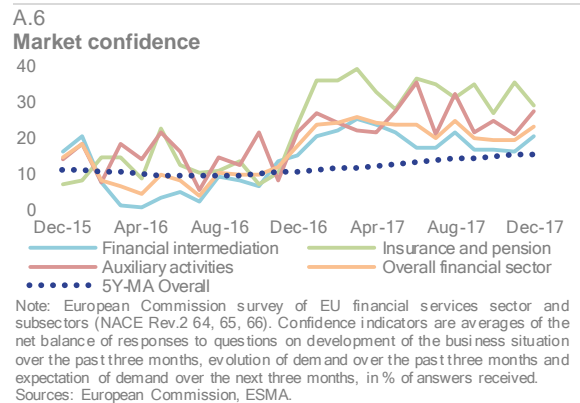
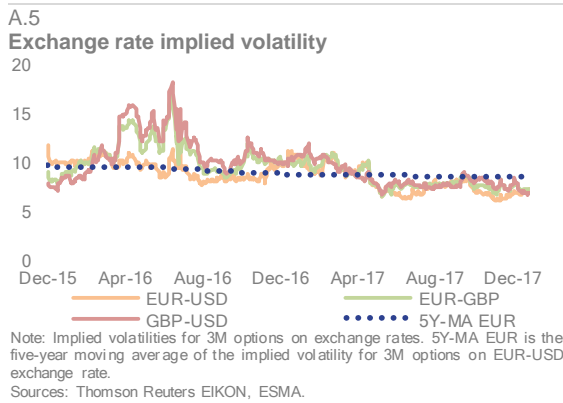
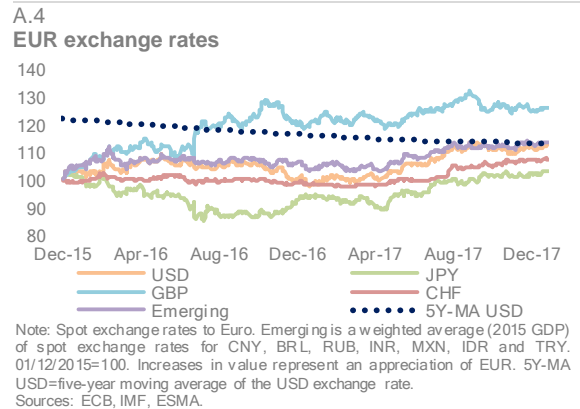
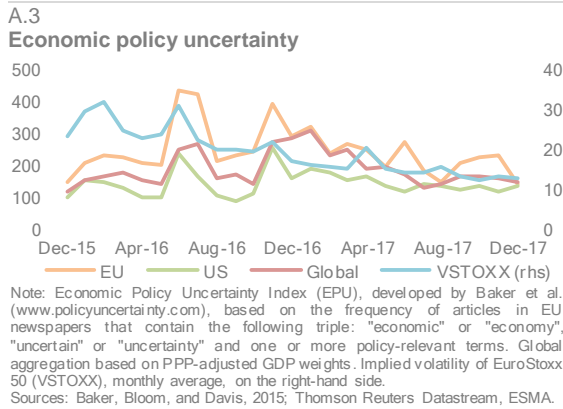
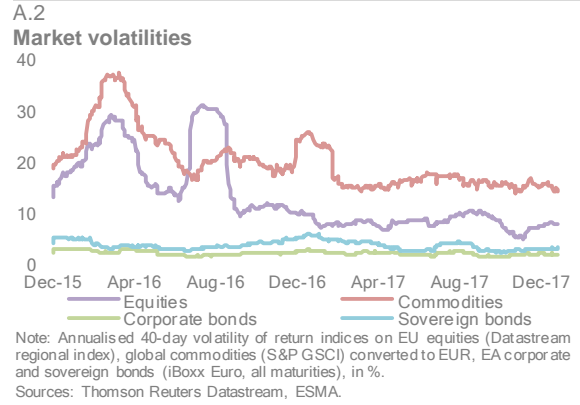
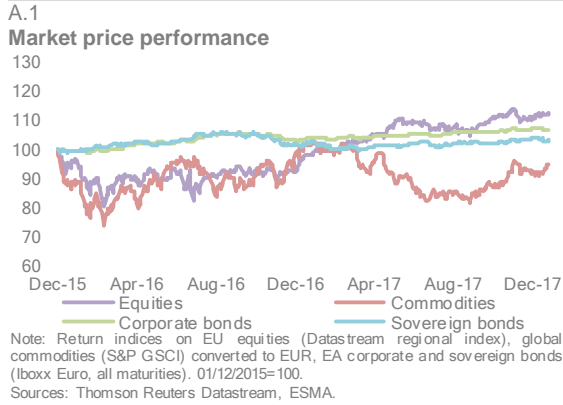
- Accenture (2016), "The convergence of operational risk and cyber security".
- Allen, L. (2003), "Cyclicality in Catastrophic and Operational Risk Measurements", NYU Working Paper No. S-FI-03-13.
- Allen & Overy (2014), "Capital Requirements Directive IV Framework – Operational Risk".
- Autorité des Marchés Financiers (2016), "Operational risk management guideline", Paris.
- Basak, S., et al. (2016), "A Theory of Operational Risk".
- BCBS (2011), "Principles for the Sound Management of Operational Risk", June 2011.
- BIS, IOSCO (2012), "Principles for financial market infrastructures".
- Brendon Young, et al. (2009), "Operational Risk Assessment", Wiley Finance Series.
- Brown, S. J. et al. (2008), "Estimating Operational Risk for Hedge Funds: The  $\omega$ -Score", Yale ICF Working Paper No. 08-08.
- Brown, S. J. (2012), "Quantitative Measures of Operational Risk: An Application to Funds Management".
- Capco (2003), "Understanding and Mitigating Operational Risk in Hedge Fund Investments", White Paper.
- Cummins, D. et al. (2004), "The Market Value Impact of Operational Risk Events for U.S. Banks and Insurers".
- De Fontnouvelle, P. et al. (2003), "Using Loss Data to Quantify Operational Risk".
- De Fontnouvelle, P., et al. (2004), "Implications of Alternative Operational Risk Modelling Techniques".
- Galloppo, G. et al. (2003), "What Has Worked in Operational Risk?", Global Journal of Business Research, Vol. 5, No. 3, pp. 1-17.
- IOSCO (1994), "Operational and Financial Risk Management Control Mechanisms for OTC Derivatives Activities of Regulated Securities Firms".
- SIFMA (2015), "Operational risk – Tailoring the right model for asset management firms".
- Walch, A. (2015) "The Bitcoin Blockchain as Financial Market Infrastructure: A Consideration of Operational Risk", NYU Journal of Legislation and Public Policy 837.

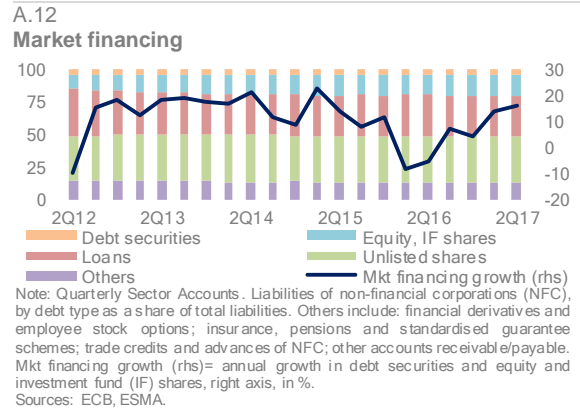
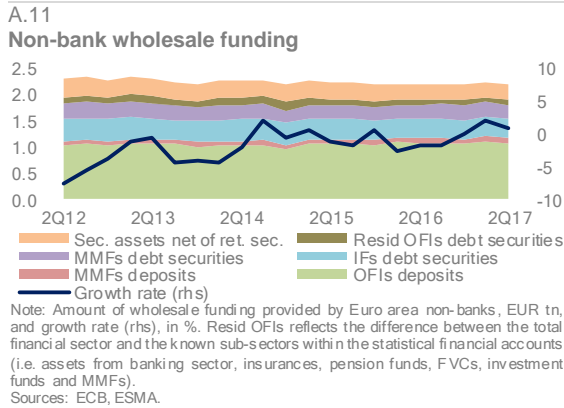
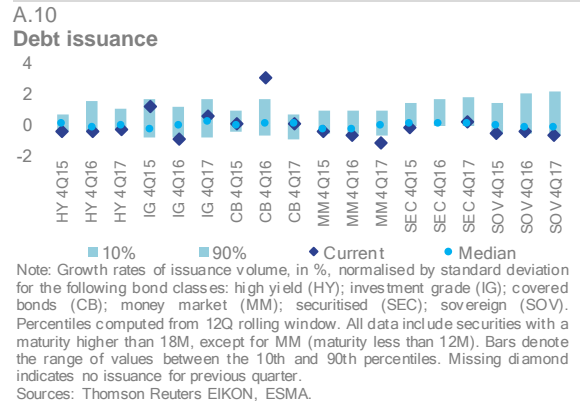
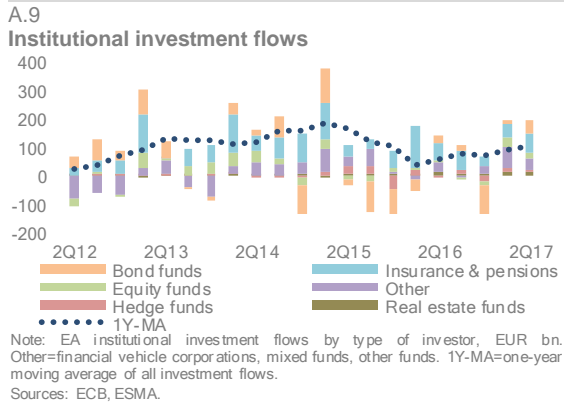
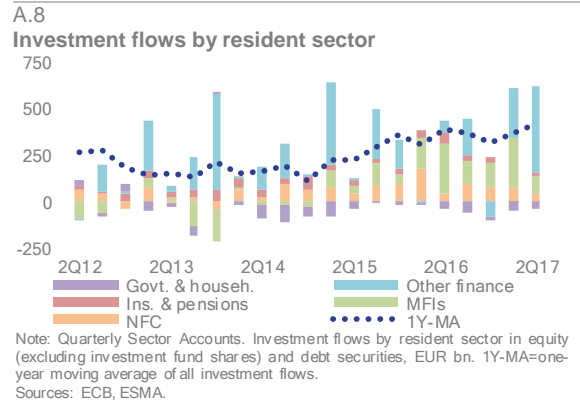
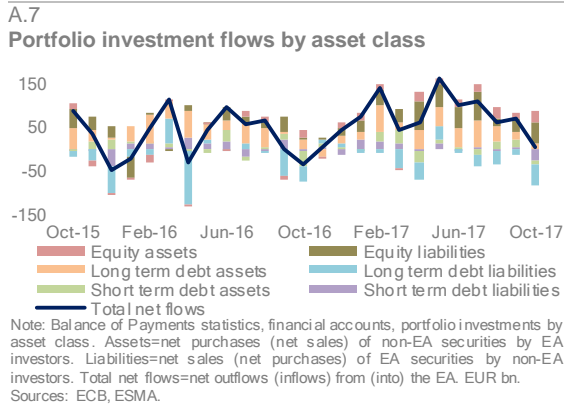
# Annexes

# Statistics

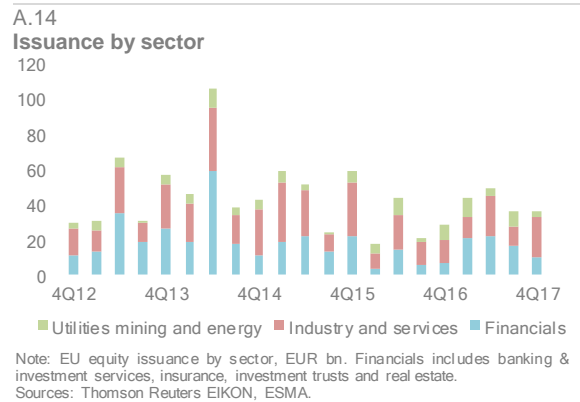
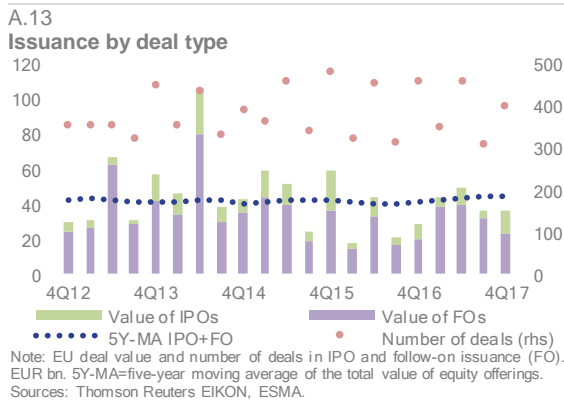
## Securities markets

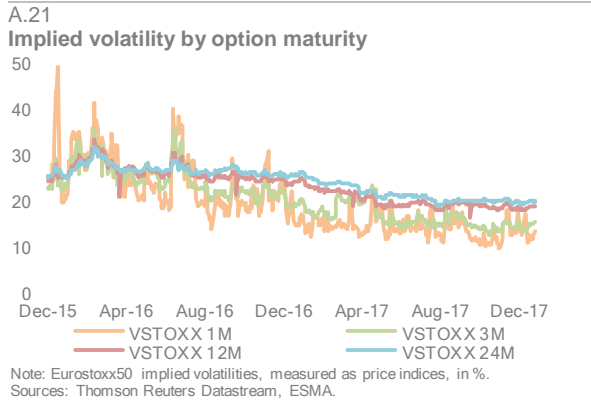
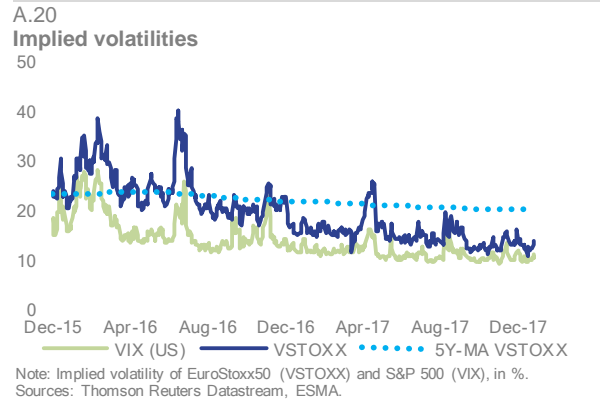
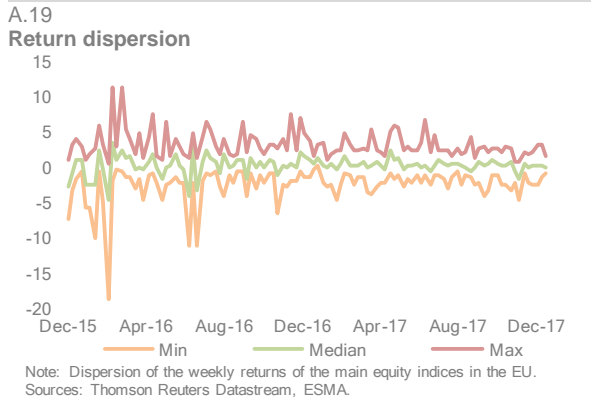
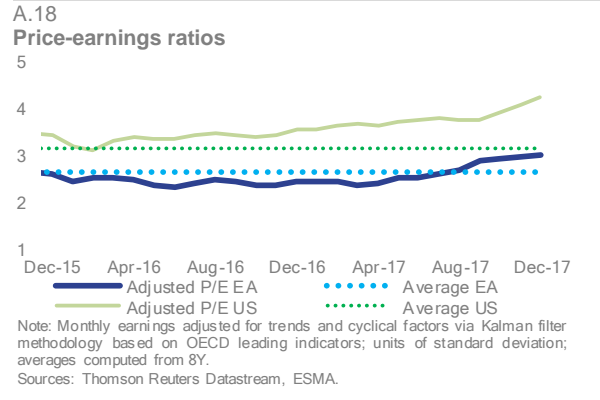
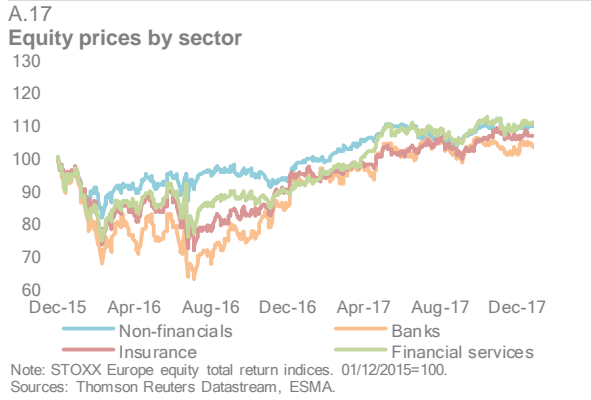
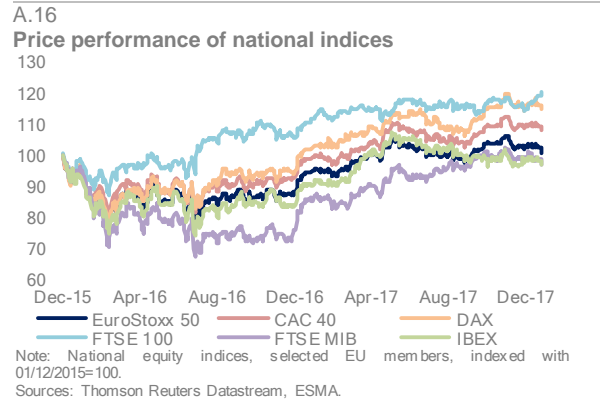
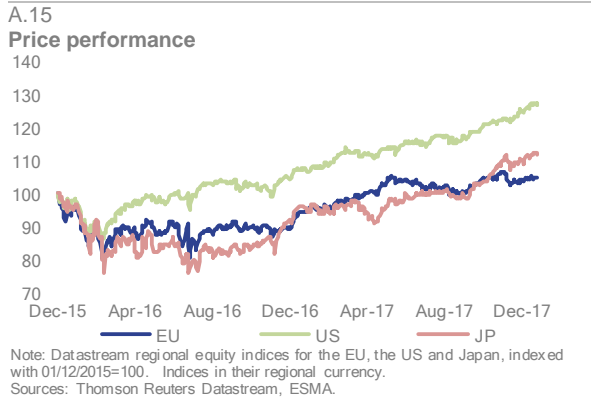
### Market environment

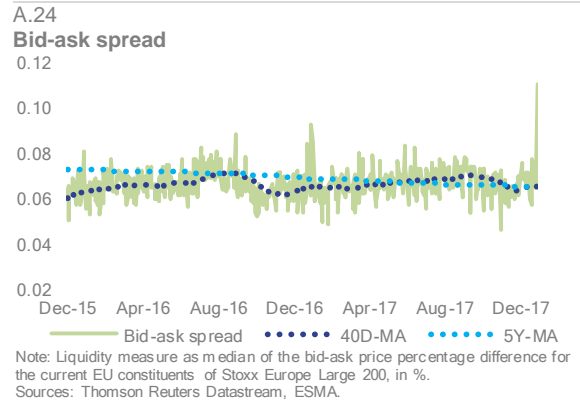
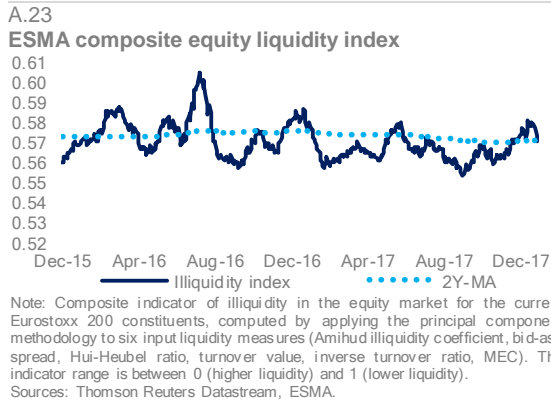




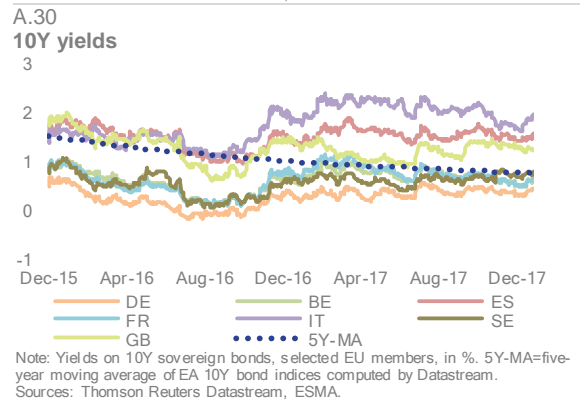
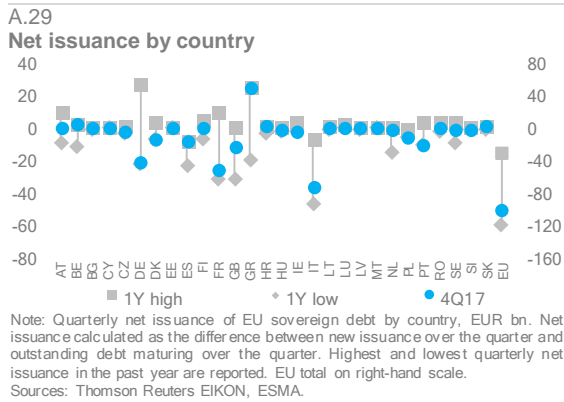
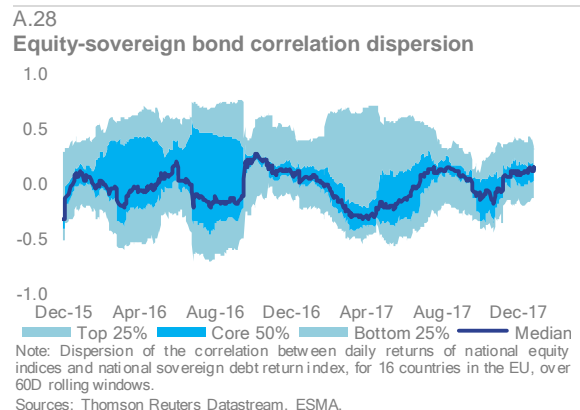
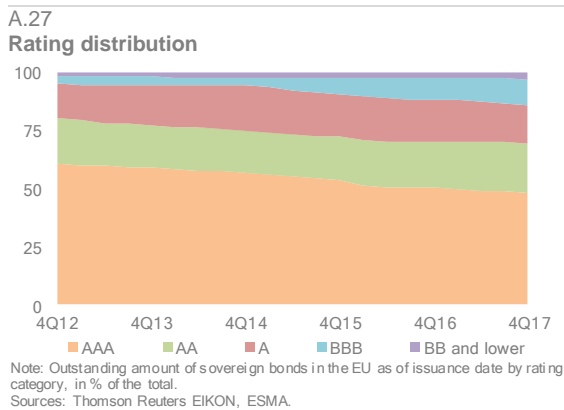
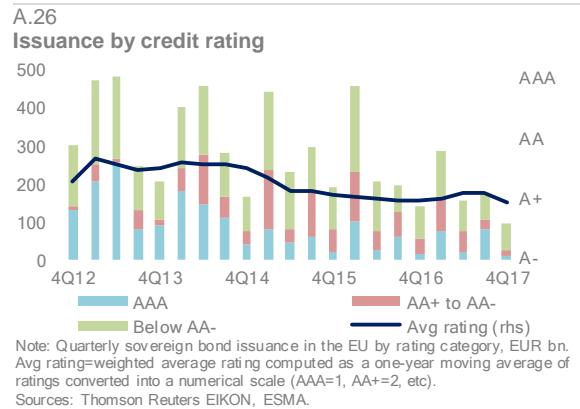
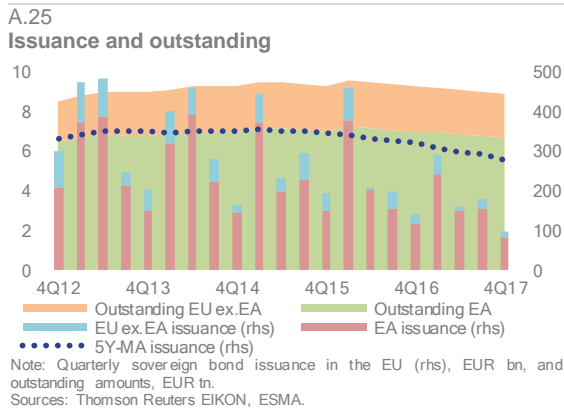
**Equity markets**



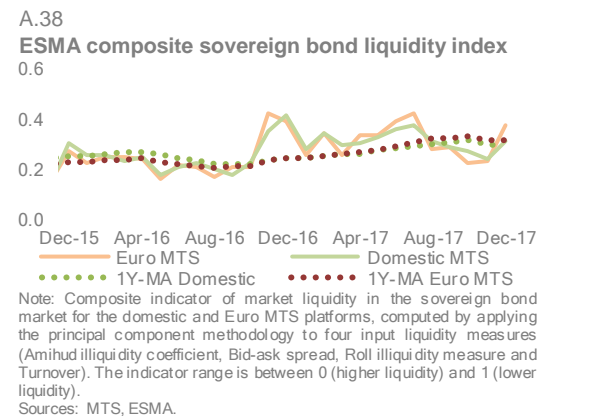
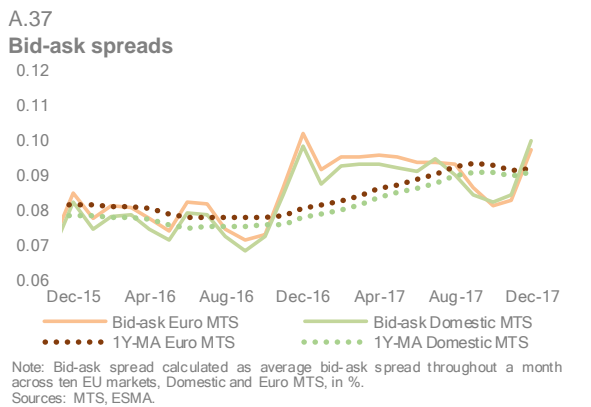
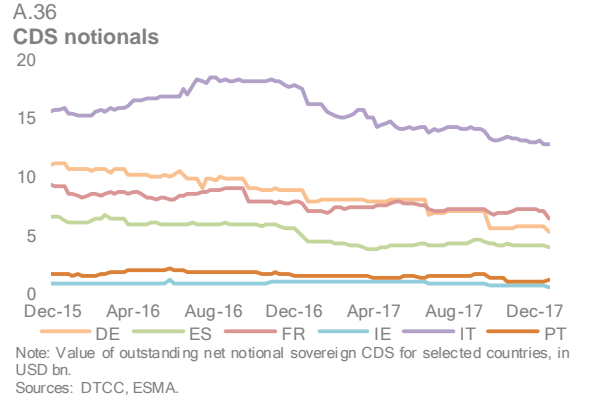
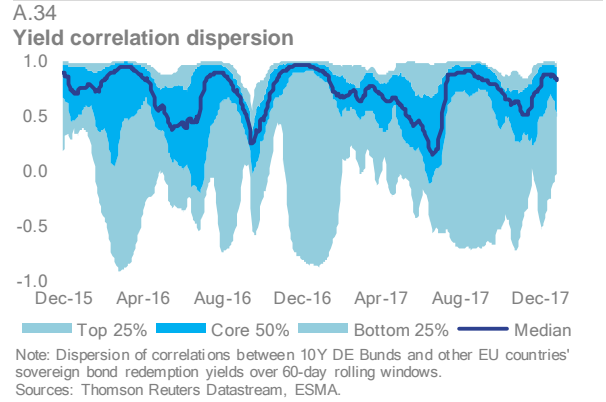
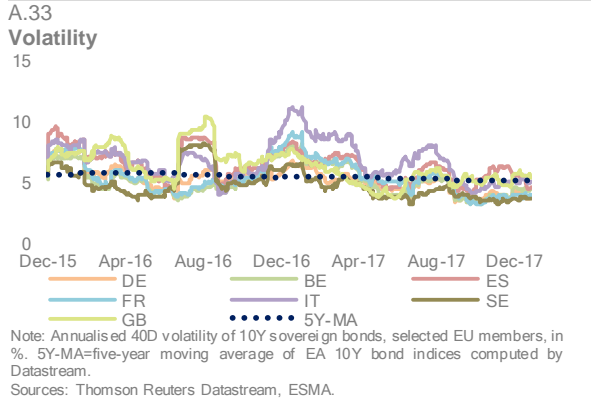
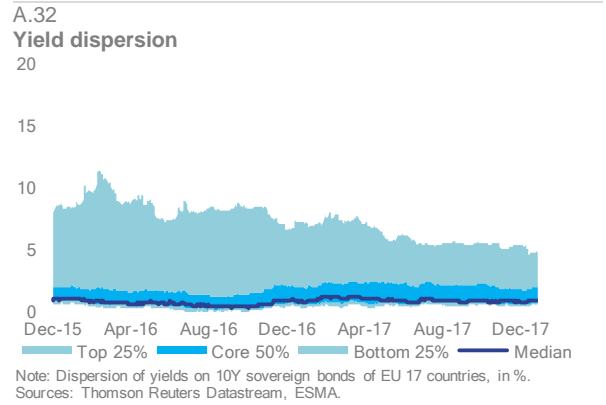
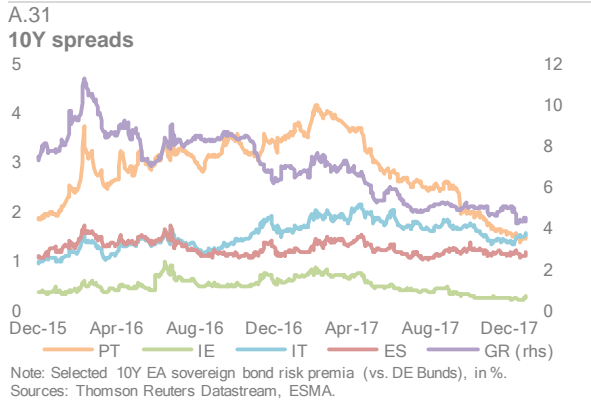


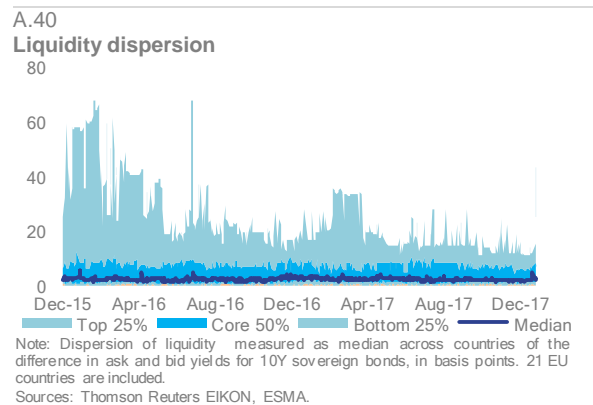
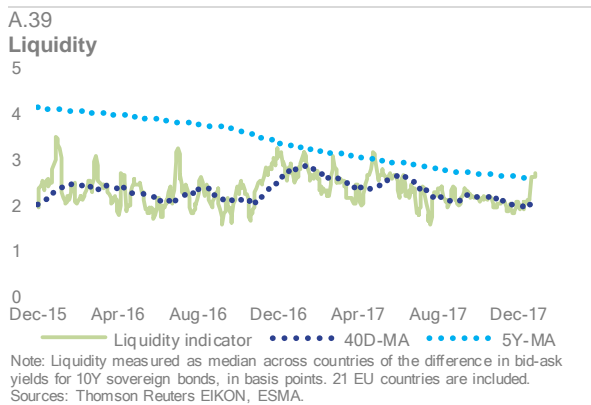


## Sovereign-bond markets

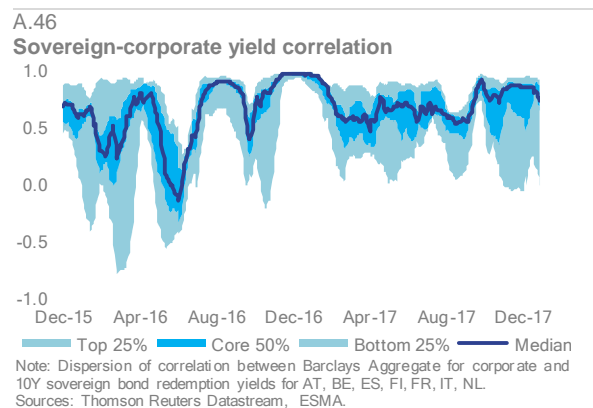
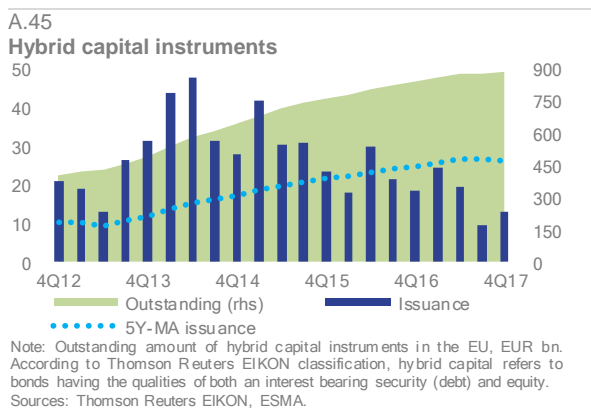
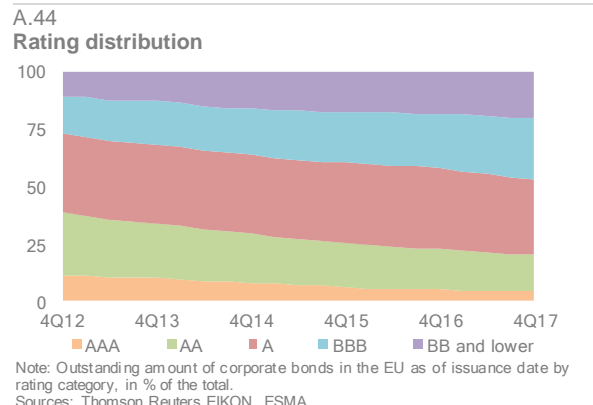
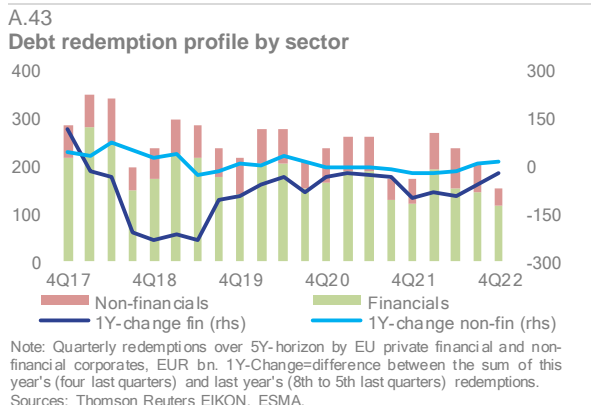
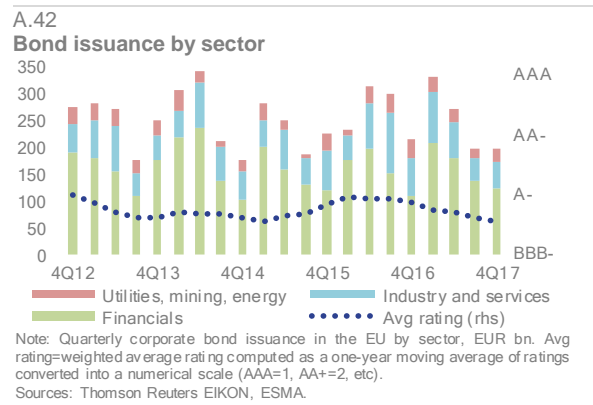
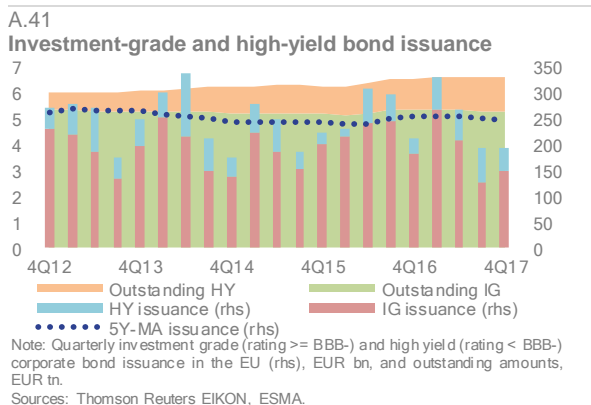


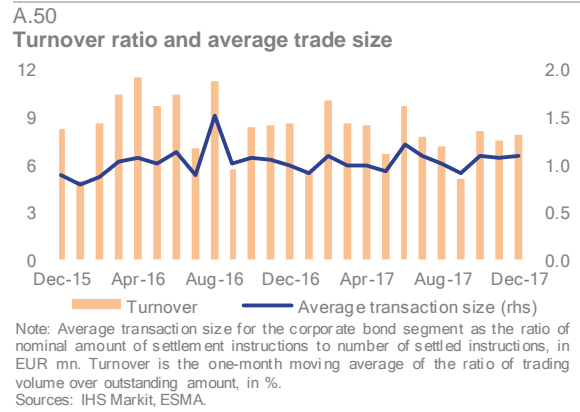
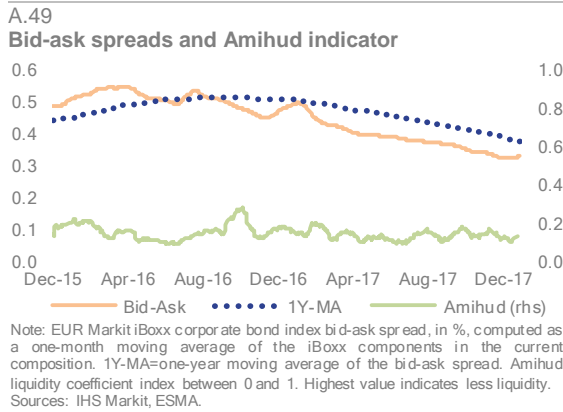
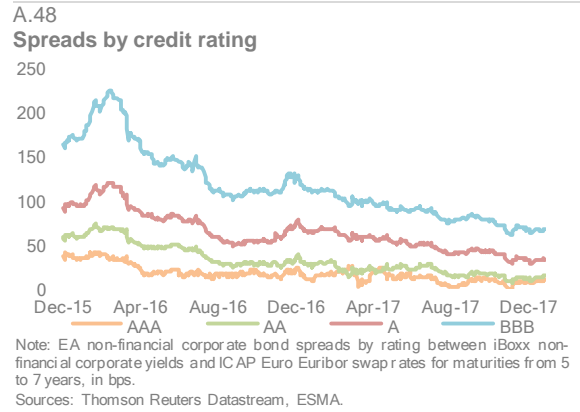
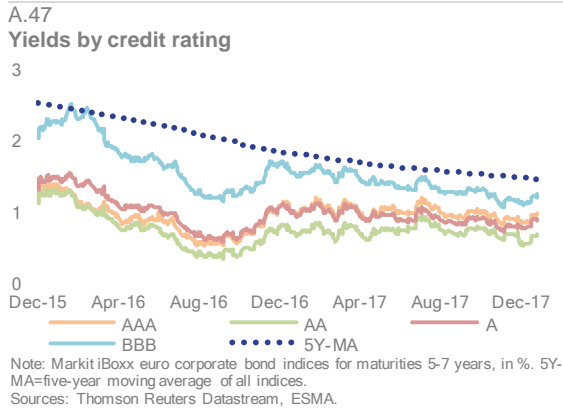




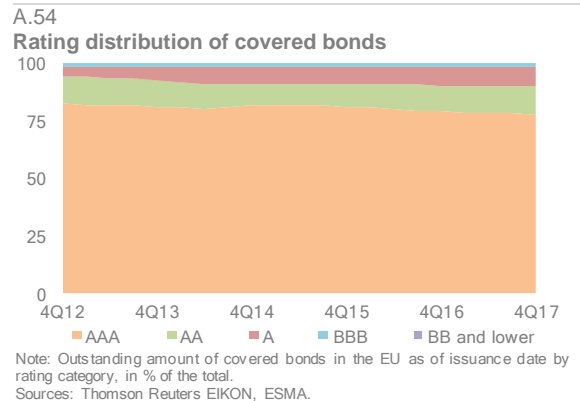
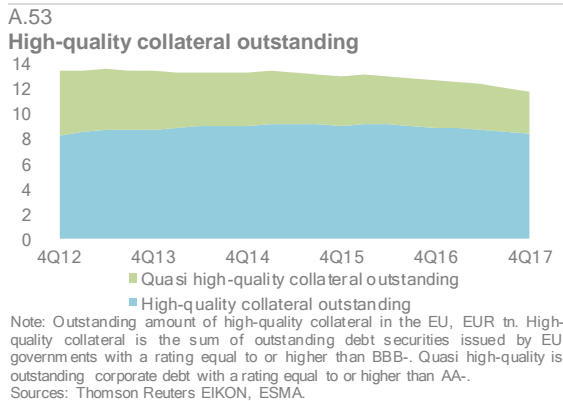
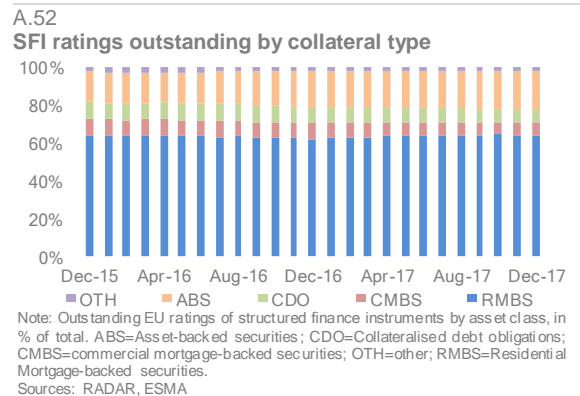
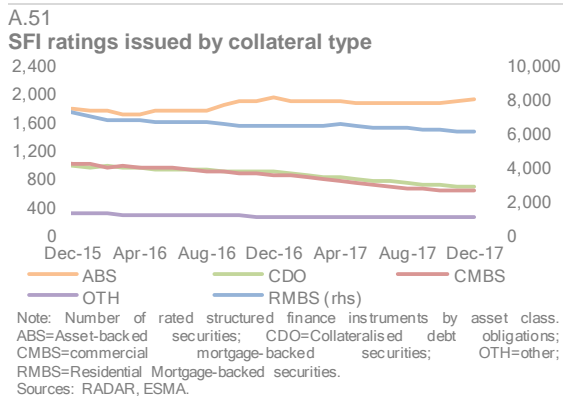


**Corporate-bond markets**

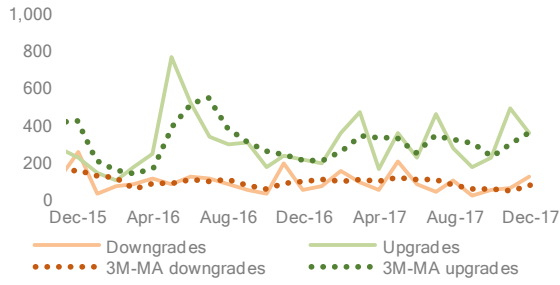




**Credit quality**

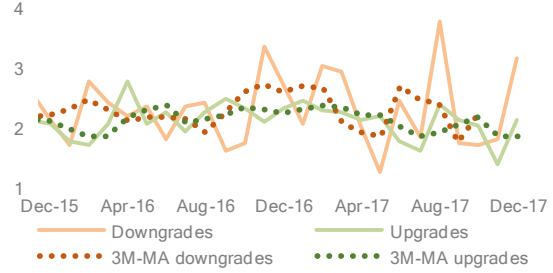


A.55  
SFI rating changes



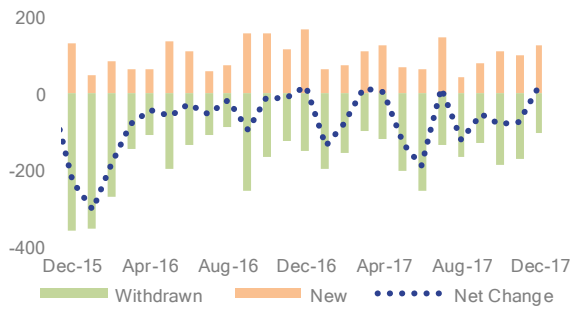
Note: Number of rating changes on securitised assets.  
Sources: RADAR, ESMA.

A.56  
Size of SFI rating changes



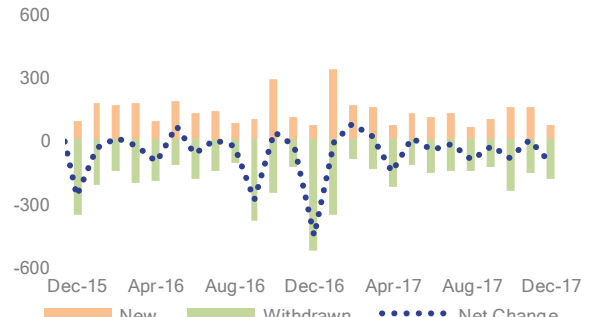
Note: Average size of upgrades and downgrades when credit rating agencies took rating actions on securitised assets, number of buckets traversed.  
Sources: RADAR, ESMA.

A.57  
Change in outstanding SFI ratings



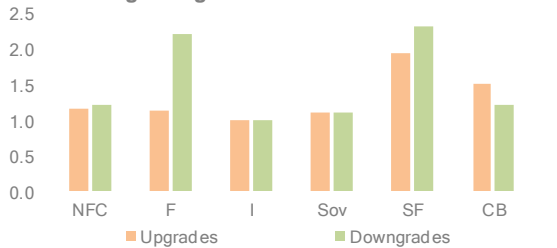
Note: Number of withdrawn and new ratings for structured finance instruments.  
Sources: RADAR, ESMA.

A.58  
Change in outstanding covered bond ratings



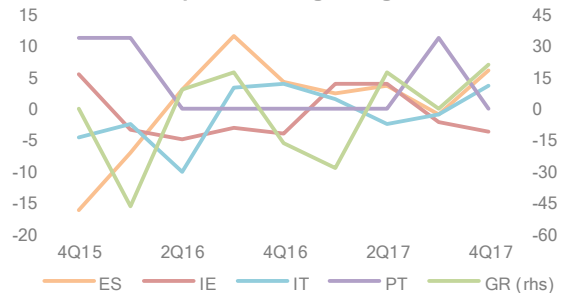
Note: Number of withdrawn and new ratings for covered bonds.  
Sources: RADAR, ESMA.

A.59  
Size of rating changes



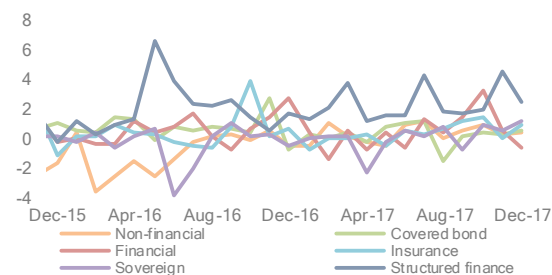
Note: Average size of upgrades and downgrades, excluding CERVED and ICAP, by asset class for 3Q17, in number of notches. NFC=Non Financials, F=Financials, I=Insurance, Sov=Sovereign, SF=Structured Finance, CB=Covered Bonds.  
Sources: RADAR, ESMA.

A.60  
Non-financial corporates rating changes



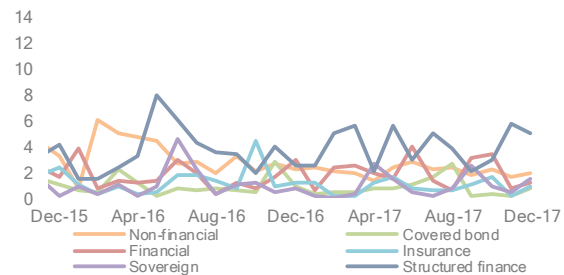
Note: Number of upgrades minus downgrades for ES, GR, IE, IT and PT, in % of outstanding ratings. Data from Fitch Ratings, Moody's, S&P's.  
Sources: RADAR, ESMA.

A.61  
Rating drift



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

A.62  
Rating volatility

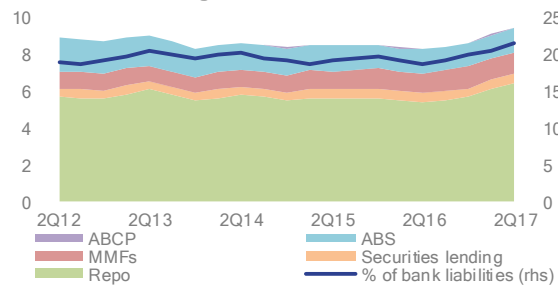


Note: Volatility of ratings by all credit rating agencies, excluding CERVED and ICAP, by asset class computed as number of rating changes over number of outstanding ratings.  
Sources: RADAR, ESMA.

## Market-based credit intermediation

A.63

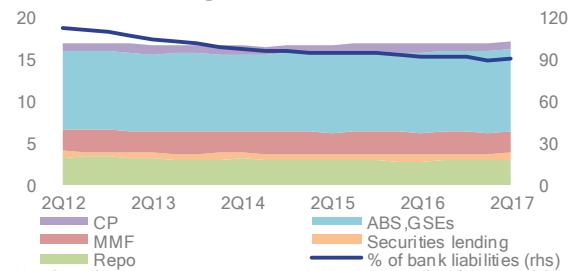
### EU shadow banking liabilities



Note: Size of shadow banking system proxied by amounts of ABS and ABCP outstanding, size of the EU repo market and EU securities on loan (collateralised with cash), and liabilities of MMF, in EUR tn. In % of bank liabilities on rhs. Sources: ECB, AFME, ICMA, Markit Securities Finance, ESMA.

A.64

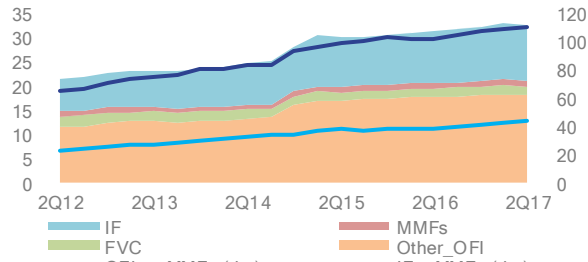
### US shadow banking liabilities



Note: Size of shadow banking system proxied by liabilities of ABS issuers, GSEs and pool securities, open commercial paper (CP), size of the US repo and securities lending (collateralised with cash) markets, and liabilities of Money Market Funds, in USD tn. In % of bank liabilities on rhs. Sources: Federal Reserve Flow of Funds, Thomson Reuters Datastream, ESMA.

A.65

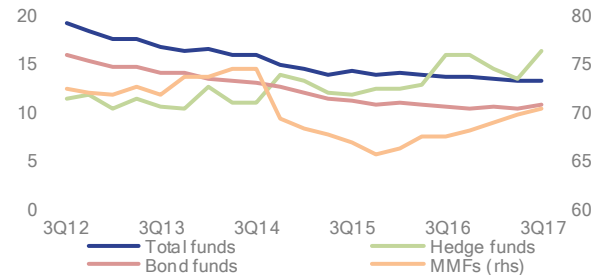
### MMFs and other financial institutions



Note: Total assets for EA Money Market Funds (MMFs) and other financial institutions (OFI): investment funds (IF), financial vehicle corporations (FVC), other OFI estimated with ECB Quarterly Sector Accounts, in EUR tn. In % of bank assets on right axis. Sources: ECB, ESMA.

A.66

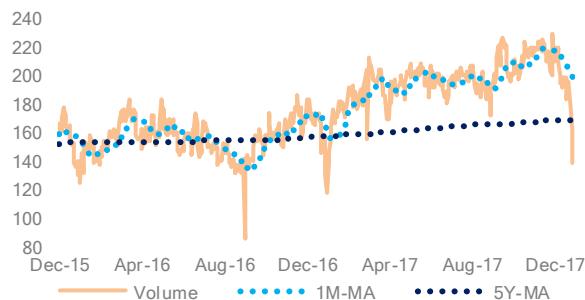
### Financial market interconnectedness



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

A.67

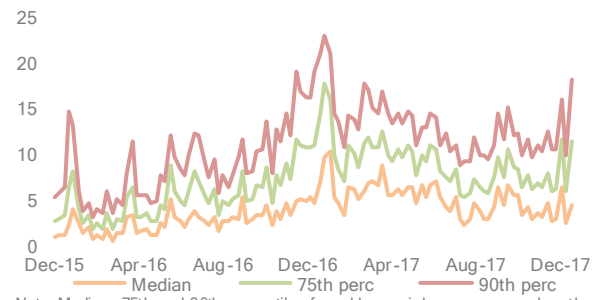
### Sovereign repo volumes



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

A.68

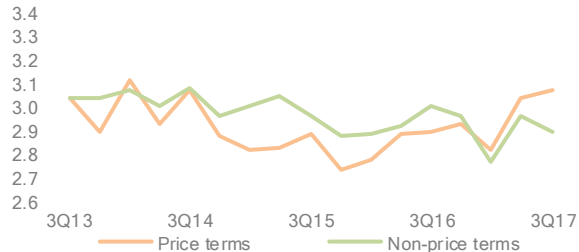
### Sovereign repo market specialness



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

A.69

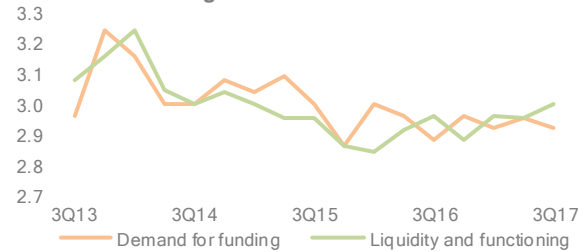
### Credit terms in SFT and OTC derivatives



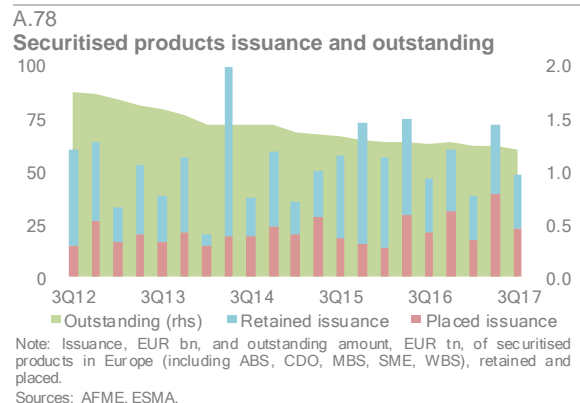
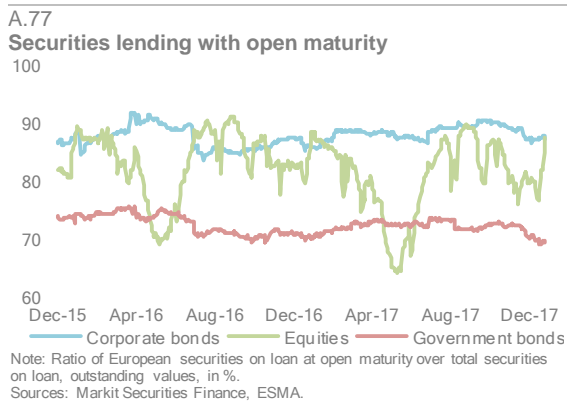
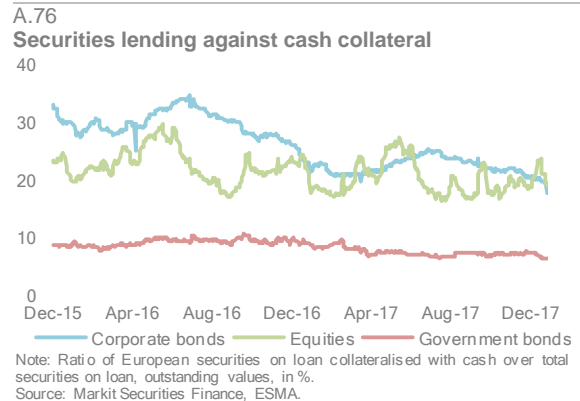
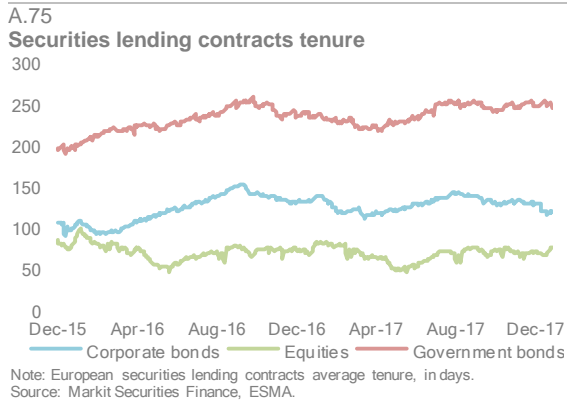
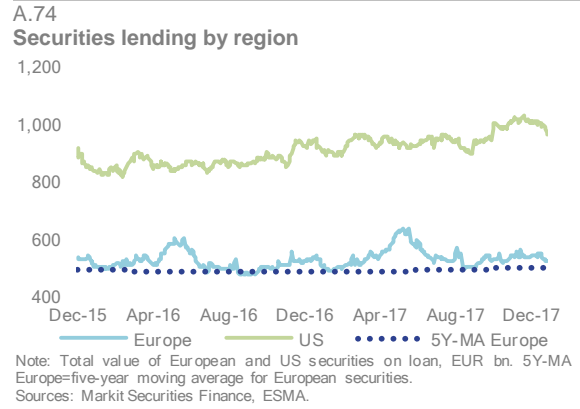
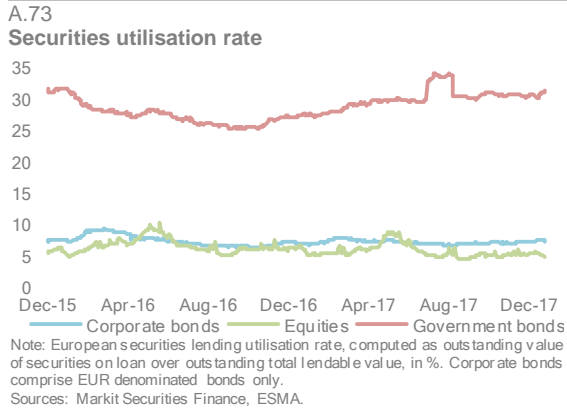
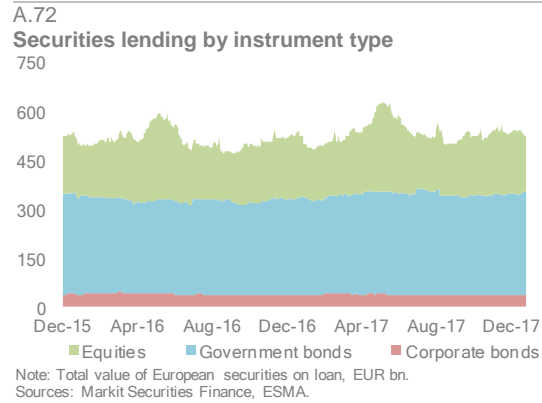
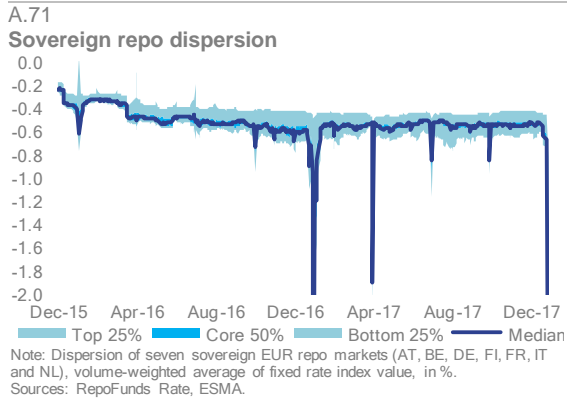
Note: Weighted average of responses to the question: "Over the past three months, how have terms offered as reflected across the entire spectrum of securities financing and OTC derivatives transaction types changed?" 1=tightened considerably, 2=tightened somewhat, 3=remained basically unchanged, 4=eased somewhat, and 5=eased considerably. Sources: ECB, ESMA.

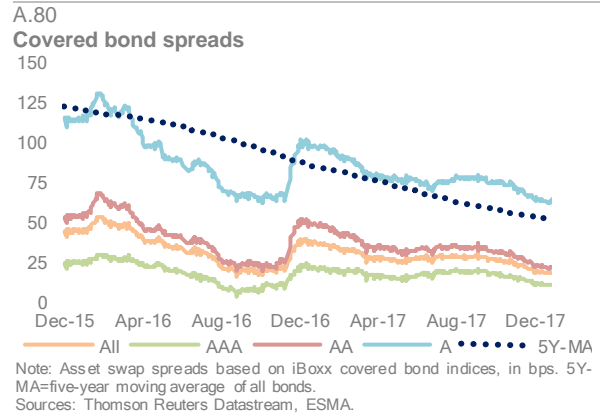
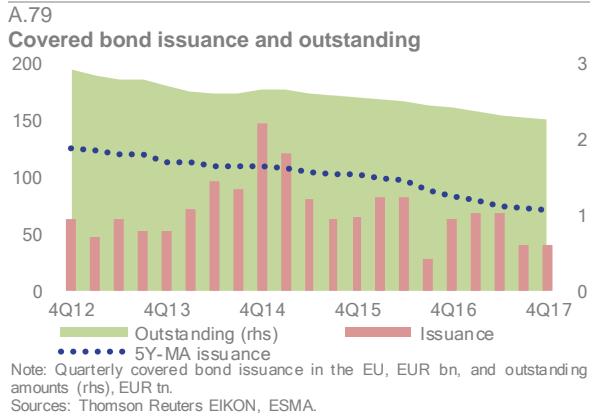
A.70

### Securities financing conditions

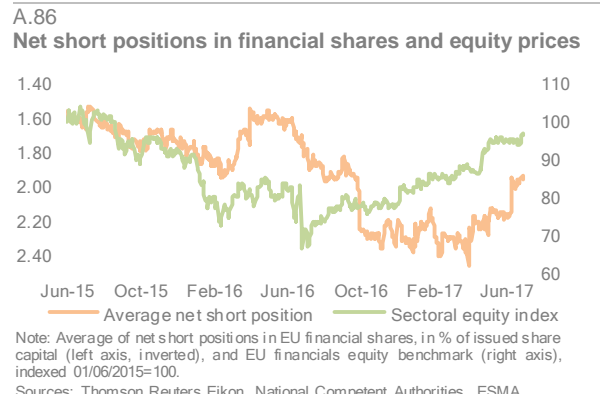
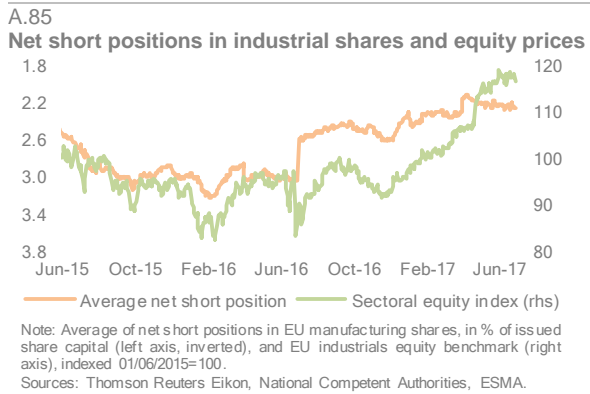
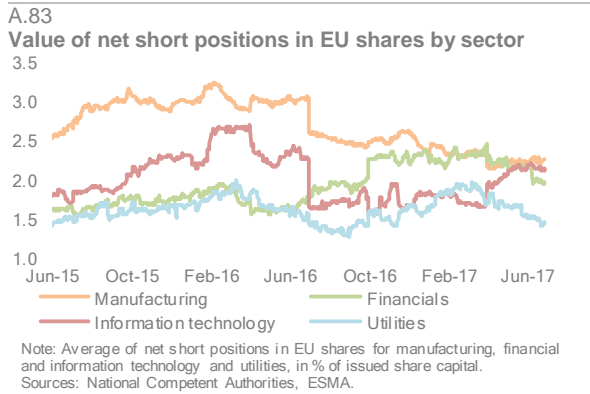
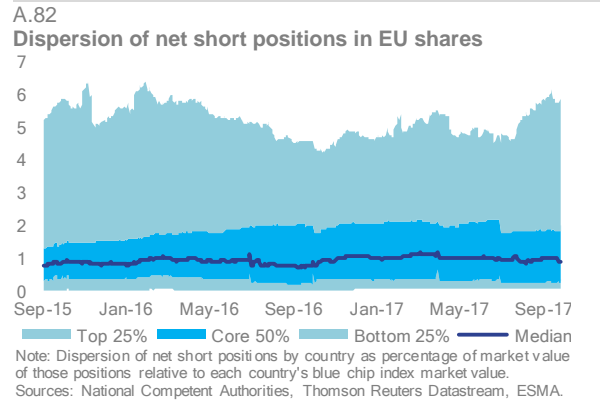
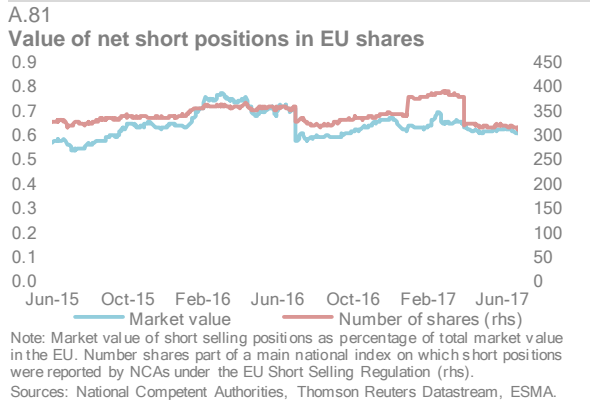


Note: Weighted average of responses to the questions "Over the past three months, how has demand for funding / how have liquidity and functioning for all collateral types changed?" 1=decreased / deteriorated considerably, 2=decreased / deteriorated somewhat, 3=remained basically unchanged, 4=increased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

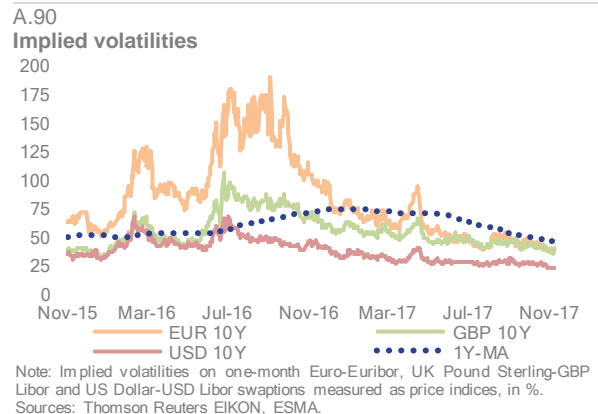
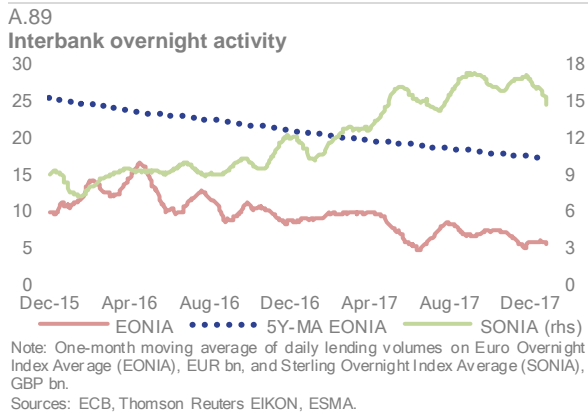
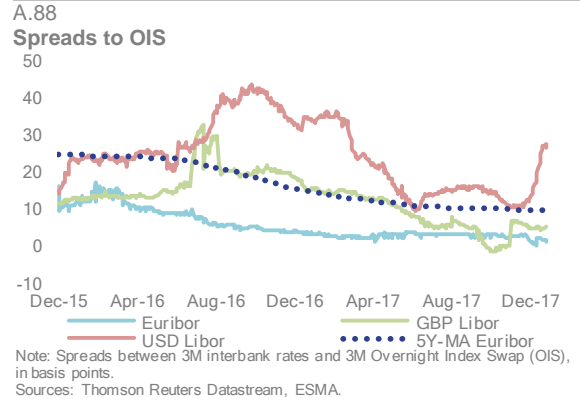
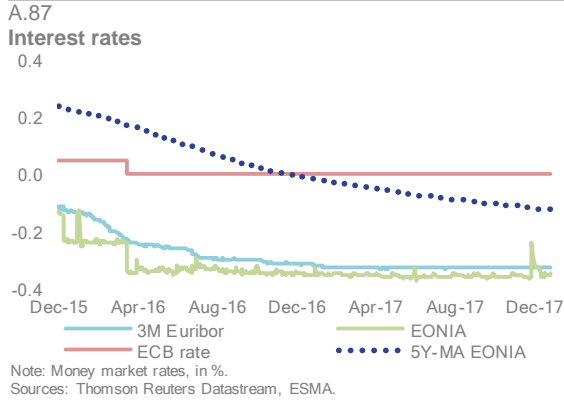




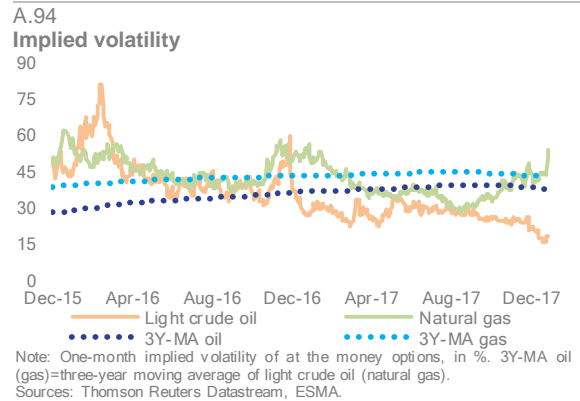
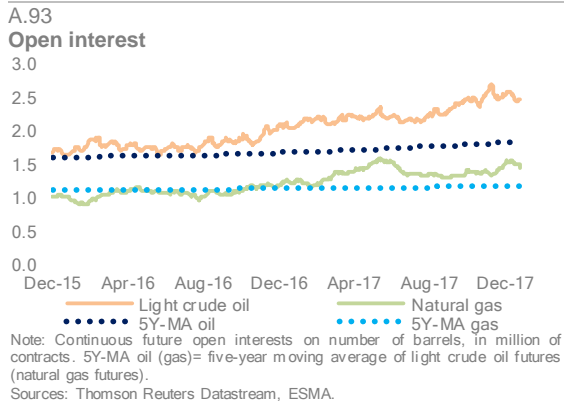
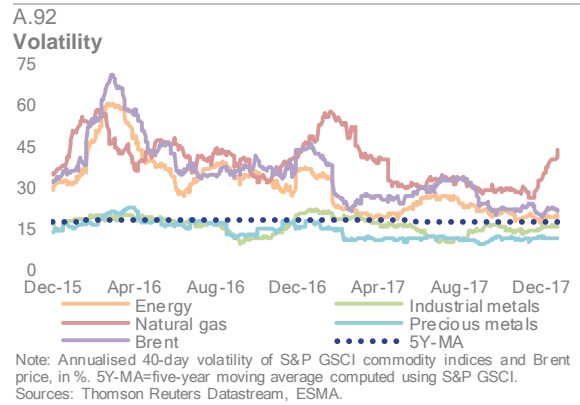
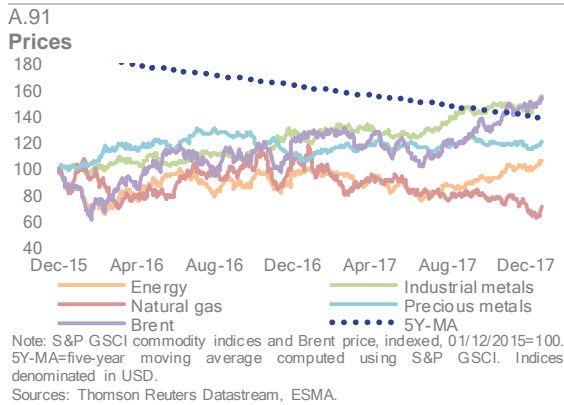
**Short selling**



## Money markets



## Commodity markets

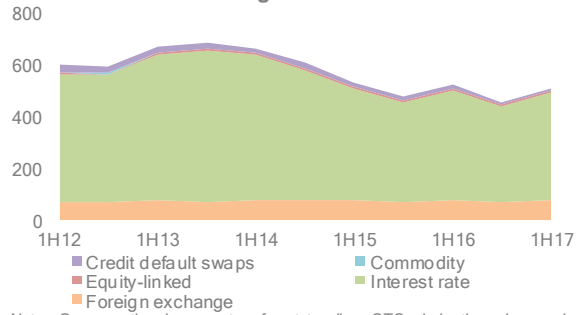




## Derivatives markets

A.95

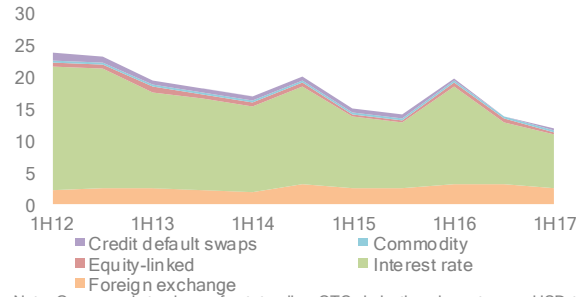
### OTC notional outstanding



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

A.96

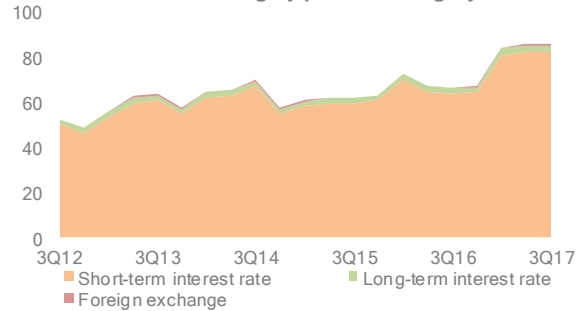
### OTC market value



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.97

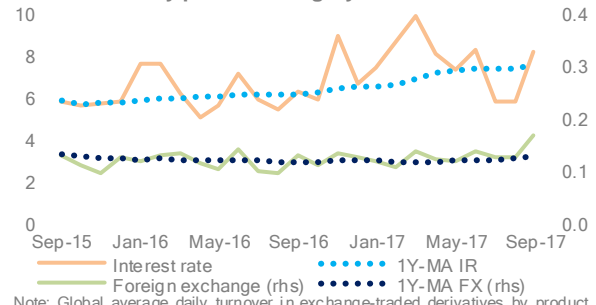
### ETD notional outstanding by product category



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

A.98

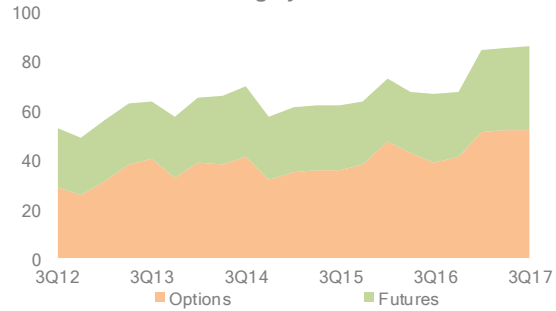
### ETD turnover by product category



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

A.99

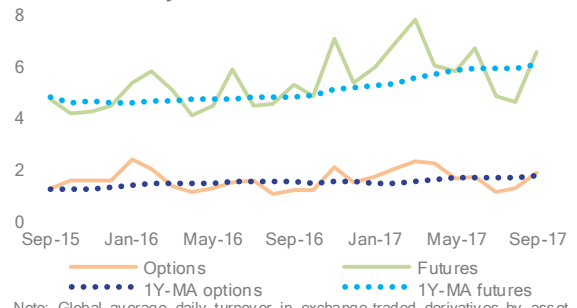
### ETD notional outstanding by asset class



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

A.100

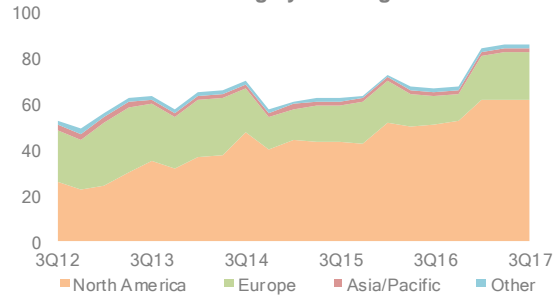
### ETD turnover by asset class



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

A.101

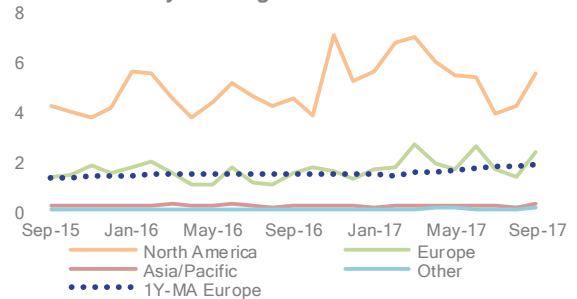
### ETD notional outstanding by exchange location



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

A.102

### ETD turnover by exchange location



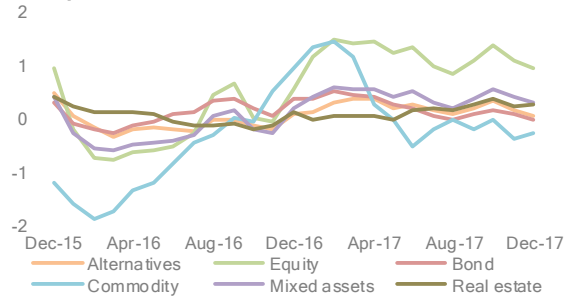
Note: Global average daily turnover in exchange-traded derivatives by exchange location, in USD tn. "Europe" as defined by BIS.  
Sources: Bank for International Settlements, ESMA.

# Investors

## Fund industry

A.103

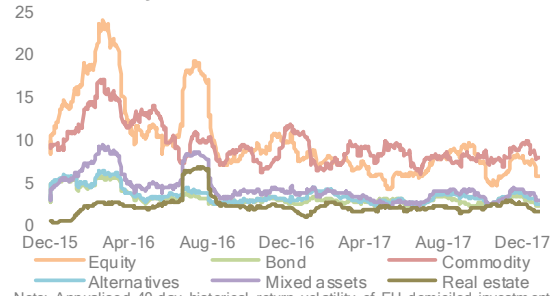
### Fund performance



Note: EU-domiciled investment funds' annual average monthly returns, asset-weighted, in %.  
Sources: Thomson Reuters Lipper, ESMA.

A.104

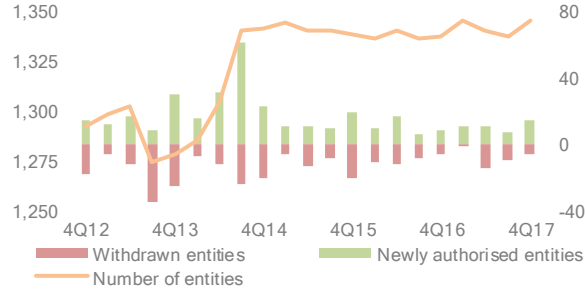
### Fund volatility



Note: Annualised 40-day historical return volatility of EU-domiciled investment funds, in %.  
Sources: Thomson Reuters Lipper, ESMA.

A.105

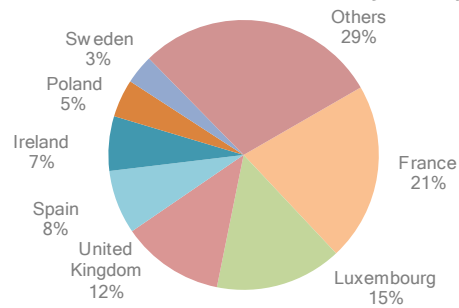
### Entities authorised under UCITS



Note: Number of entities authorised under the UCITS Directive by national competent authorities of the Member States and notified to ESMA. Newly authorised entities and withdrawn entities on the right axis.  
Sources: ESMA Registers.

A.106

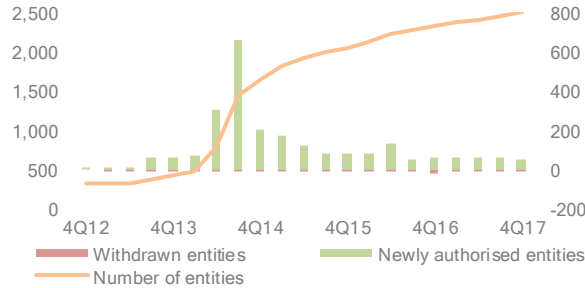
### Share of entities authorised under UCITS by country



Note: Number of entities authorised under the UCITS Directive by national competent authorities and notified to ESMA, in %.  
Sources: ESMA Registers.

A.107

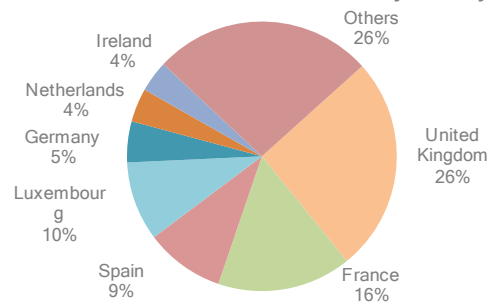
### Entities authorised under AIFMD



Note: Number of entities authorised under AIFMD by national competent authorities of the Member States and notified to ESMA. Newly authorised entities and withdrawn entities on the right axis.  
Sources: ESMA Registers.

A.108

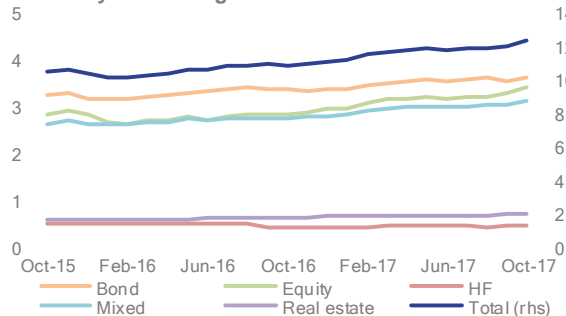
### Share of entities authorised under AIFMD by country



Note: Number of entities authorised under AIFMD by national competent authorities and notified to ESMA, in %.  
Sources: ESMA Registers.

A.109

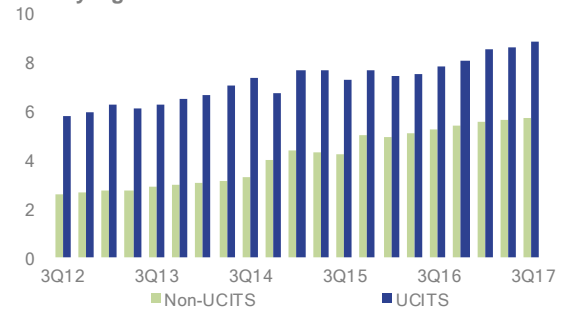
### Assets by market segment



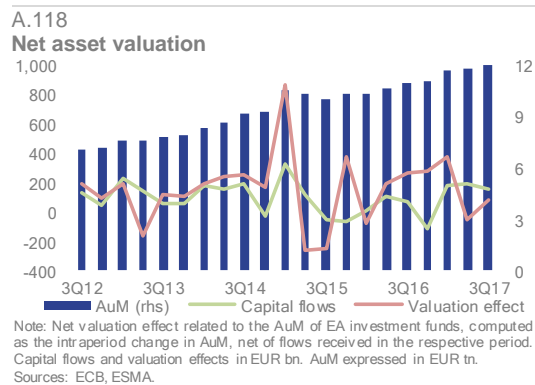
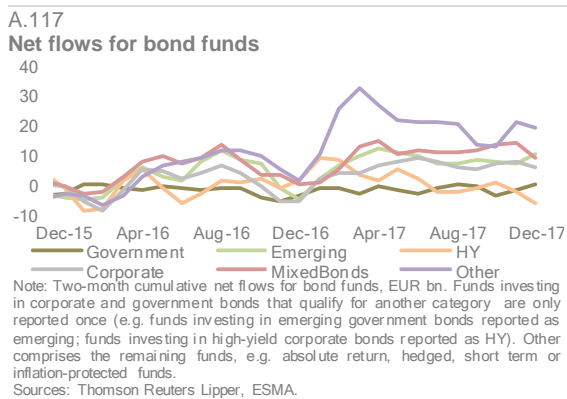
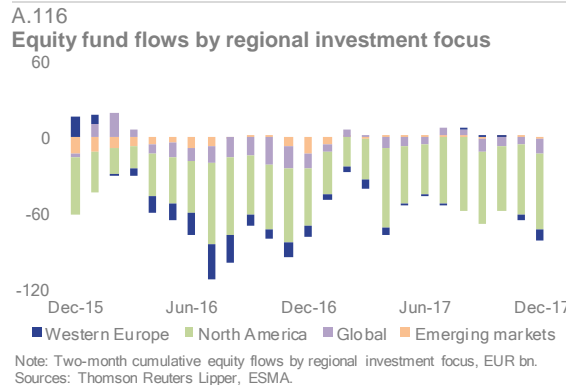
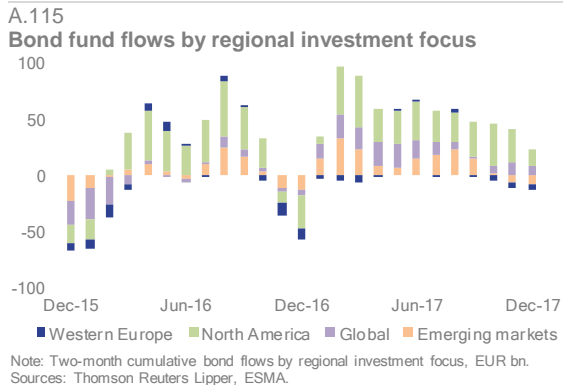
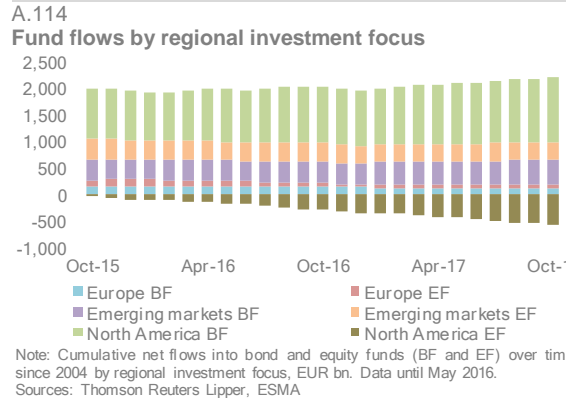
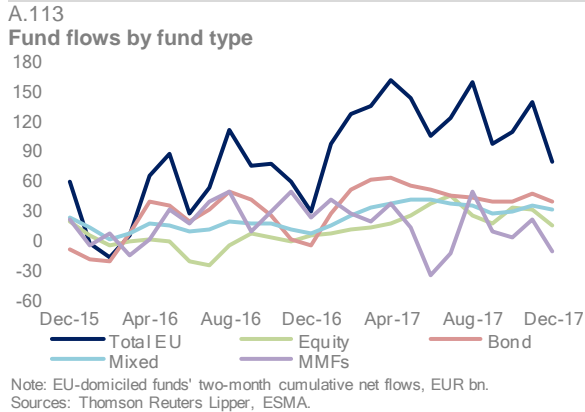
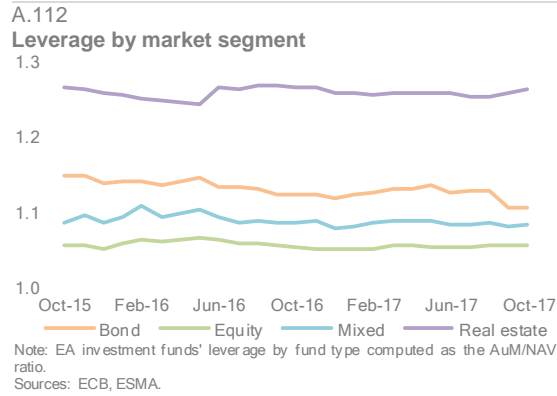
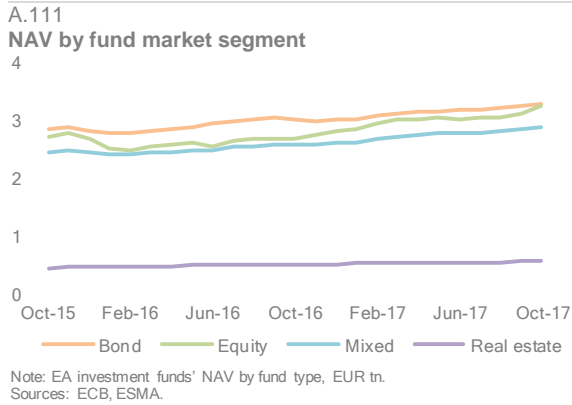
Note: AuM of EA funds by fund type, EUR tn. HF=Hedge funds.  
Sources: ECB, ESMA.

A.110

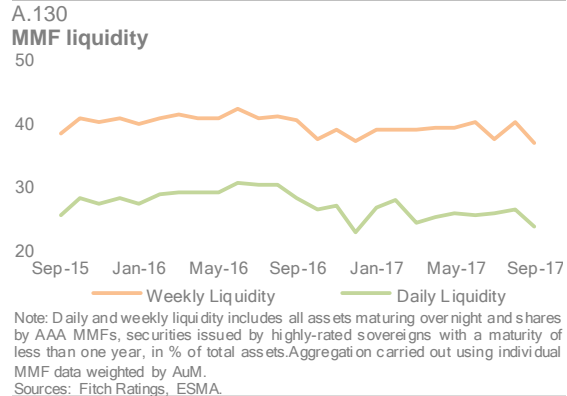
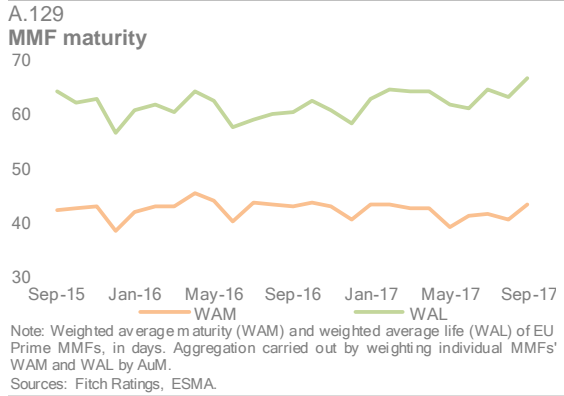
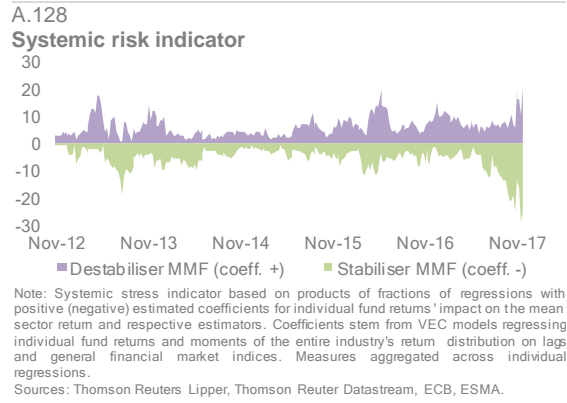
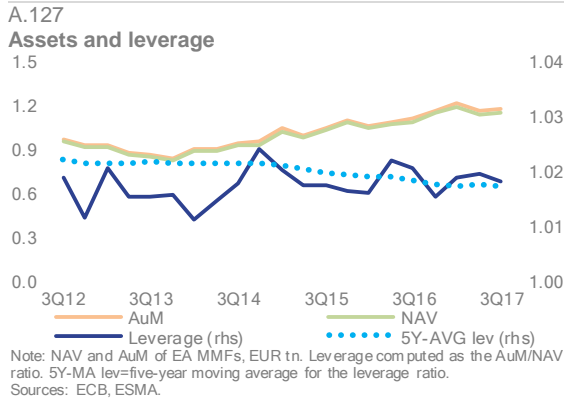
### NAV by legal form



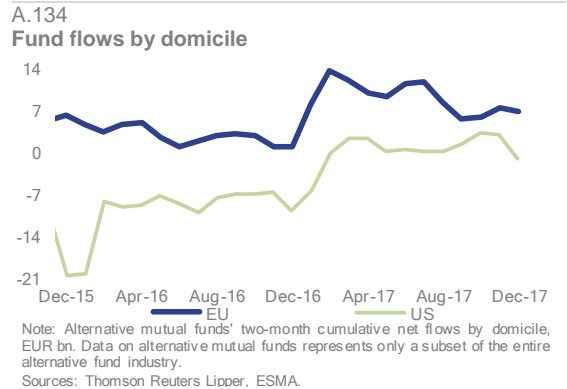
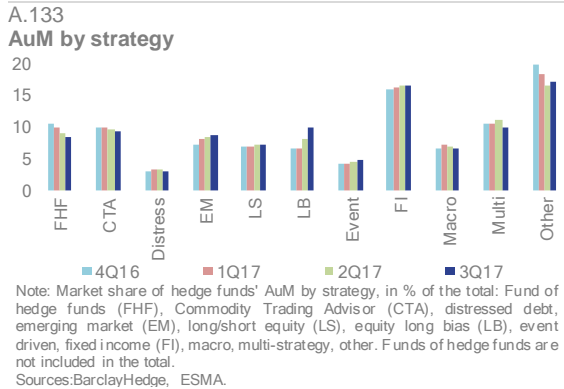
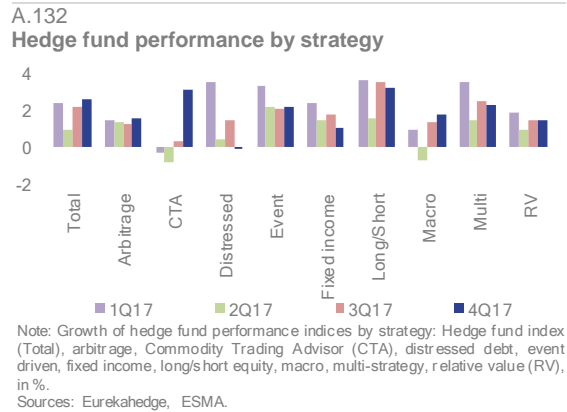
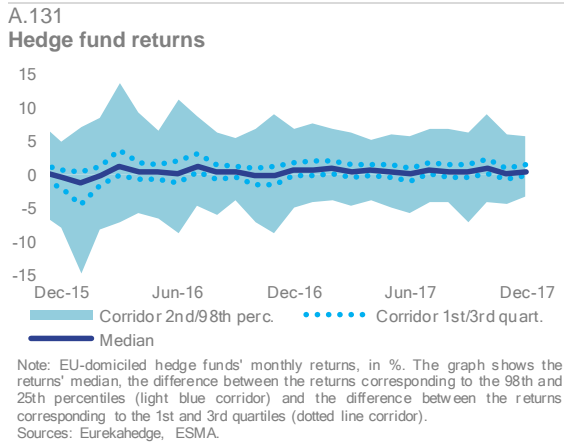
Note: NAV of EU fund industry, EUR tn. Quarterly data.  
Sources: EFAMA, ESMA.

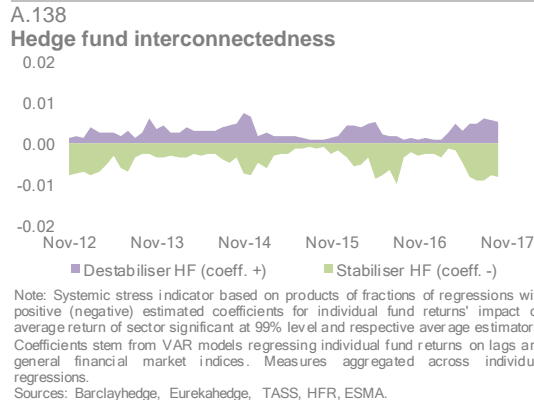
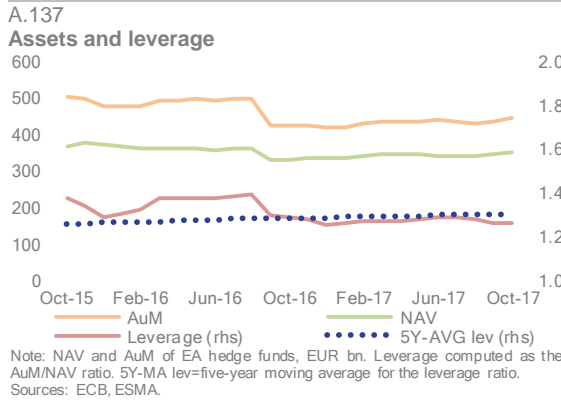
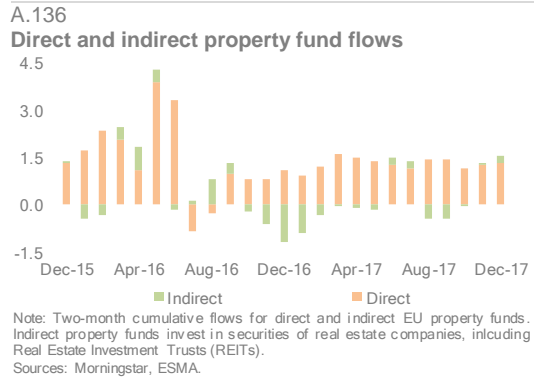
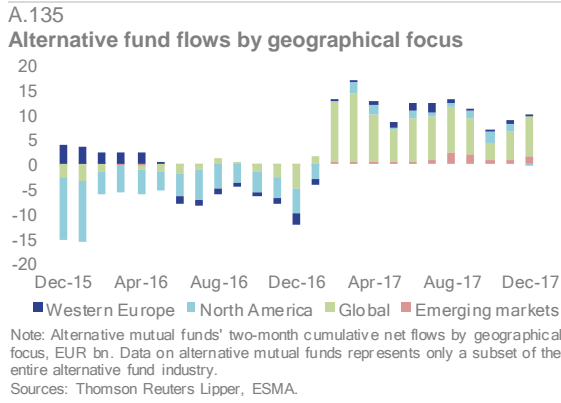




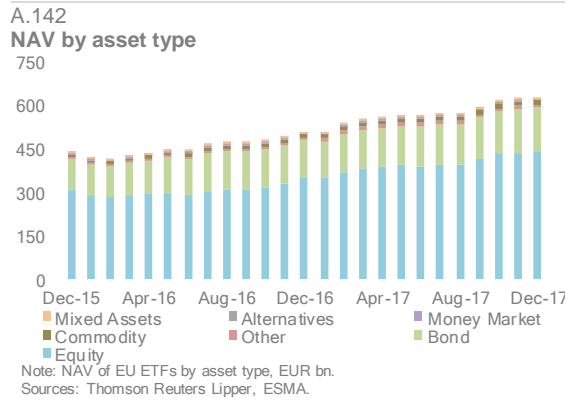
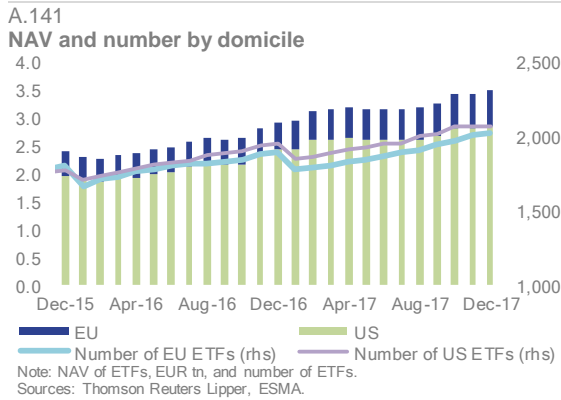
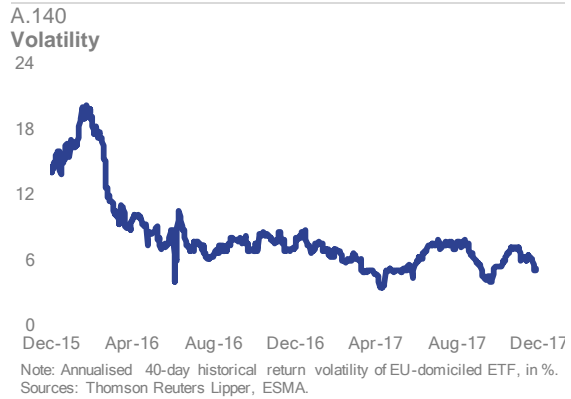
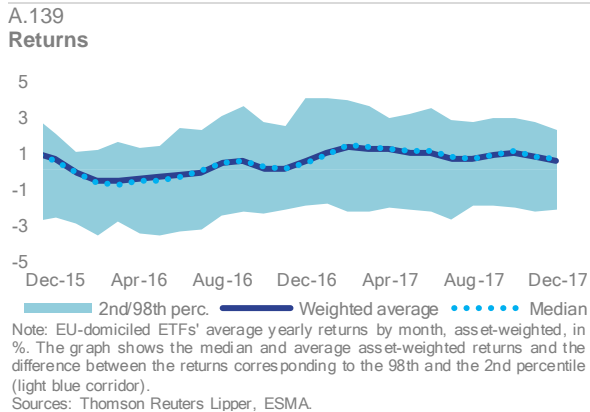


**Alternative funds**



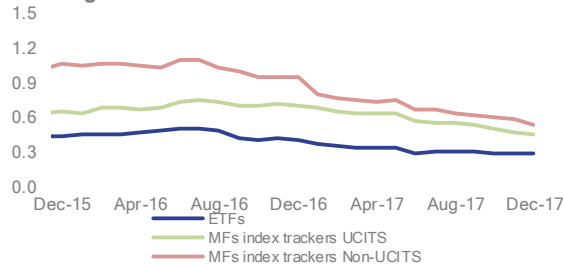


**Exchange-traded funds**



A.143

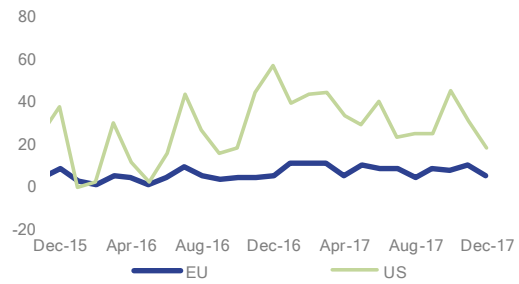
**Tracking error**



Note: Tracking error defined as standard deviation of mutual fund (MF) excess returns compared to benchmark. The graph shows the tracking error for ETF and mutual funds both UCITS and non-UCITS. Yearly standard deviation reported on monthly frequency. End-of-month data, in %.  
Sources: Thomson Reuters Lipper, ESMA.

A.144

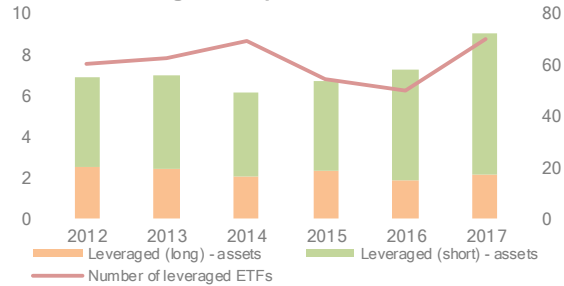
**Flows by domicile**



Note: ETF net flows by domicile, EUR bn.  
Sources: Thomson Reuters Lipper, ESMA.

A.145

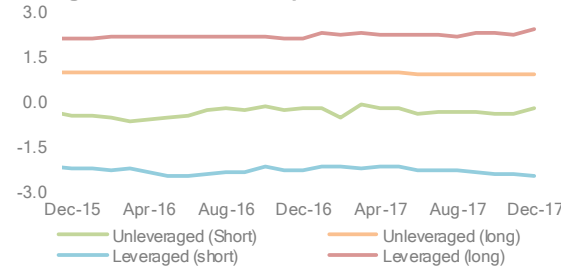
**Assets of leveraged European ETFs**



Note: Total assets of leveraged long and leveraged short ETFs with primary listings in Europe, in EUR bn and total number of products (rhs), in thousand.  
Sources: ETFGI, ESMA

A.146

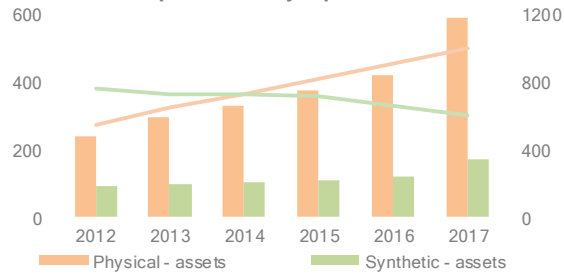
**Average beta values for European ETFs**



Note: Leveraged ETFs are self reported. The annual average monthly beta is measured as the volatility of a fund return in comparison to its benchmark. An unleveraged ETF replicating its benchmark will typically have a beta close to 1.  
Sources: Thomson Reuters Lipper, ESMA.

A.147

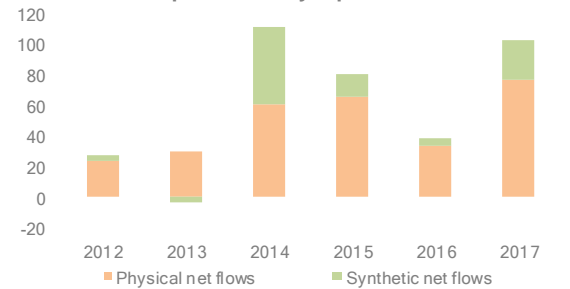
**Assets of European ETFs by replication method**



Note: Total assets of physical and synthetic ETFs with primary listings in Europe, in EUR bn and total number of products (rhs).  
Sources: ETFGI, ESMA

A.148

**Flows into European ETFs by replication method**

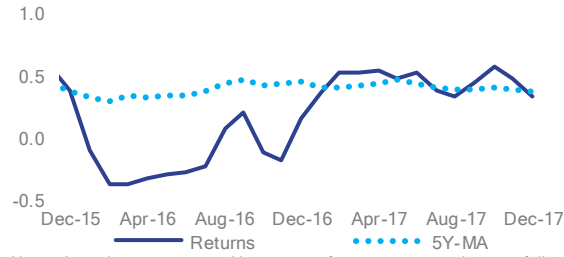


Note: Net flows of physical and synthetic ETFs with primary listings in Europe, in EUR bn.  
Sources: ETFGI, ESMA

## Retail investors

A.149

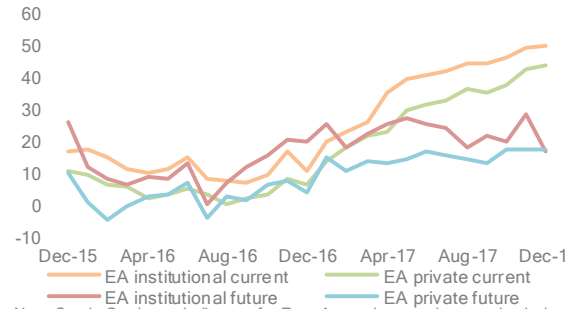
### Portfolio returns



Note: Annual average monthly returns for a representative portfolio for households, in %. Asset weights, computed using ECB Financial Accounts by Institutional Sectors, are 37% for collective investment schemes (of which 12% mutual funds and 25% insurance and pension funds), 31% for deposits, 22% for equity, 7% debt securities and 3% for other assets.  
Sources: Thomson Reuters Datastream, Thomson Reuters Lipper, ECB, ESMA.

A.150

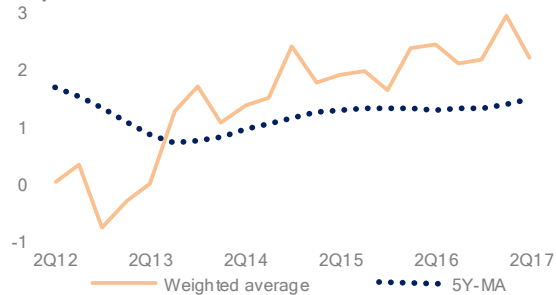
### Investor sentiment



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

A.151

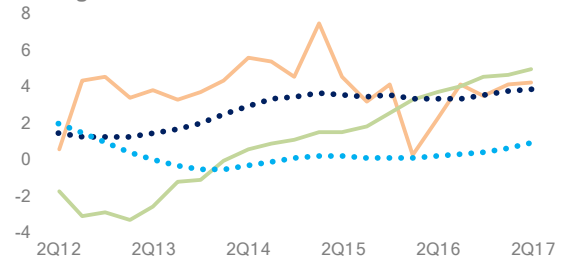
### Disposable income



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

A.152

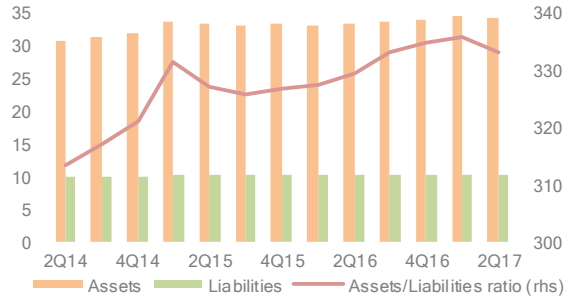
### Asset growth



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

A.153

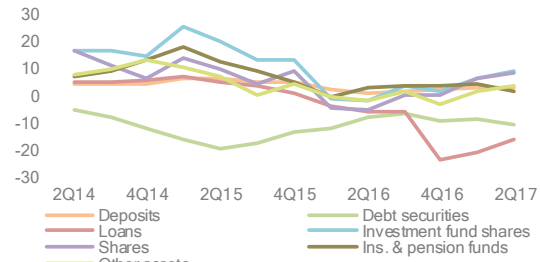
### Household assets to liabilities ratio



Note: EU households' financial assets and liabilities, EUR tn. Assets/Liabilities ratio in %.  
Sources: ECB, ESMA.

A.154

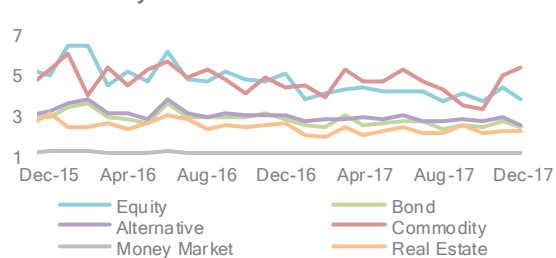
### Growth rates in financial assets



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

A.155

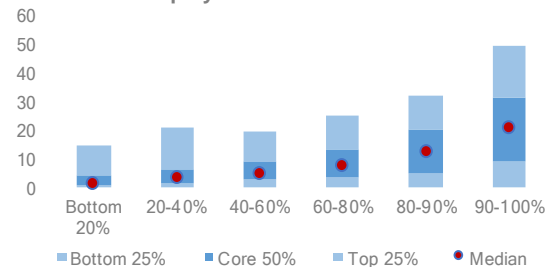
### Retail fund synthetic risk and reward indicator



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

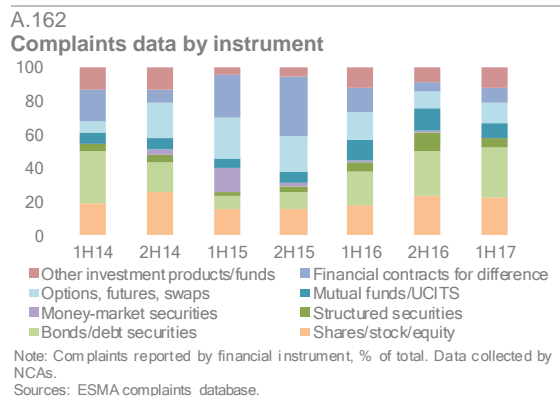
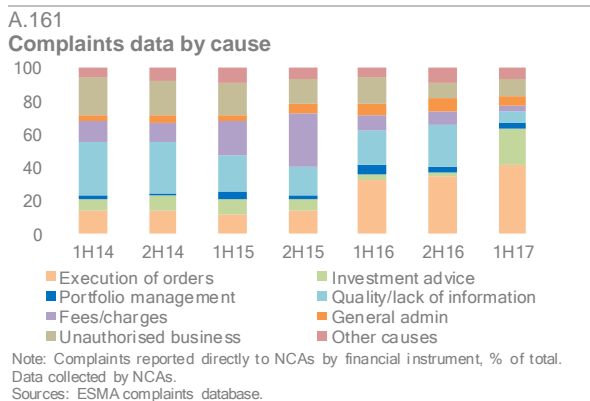
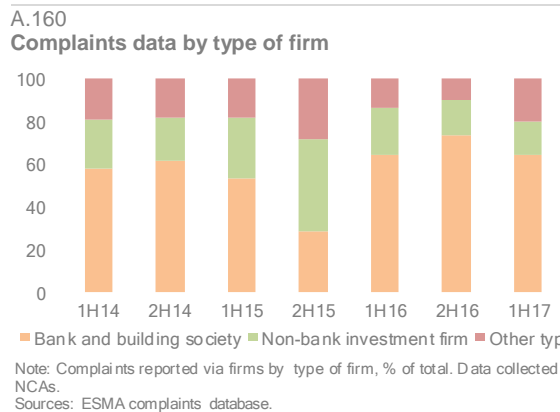
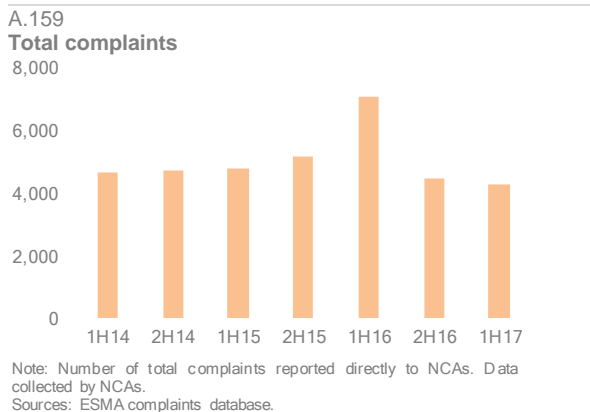
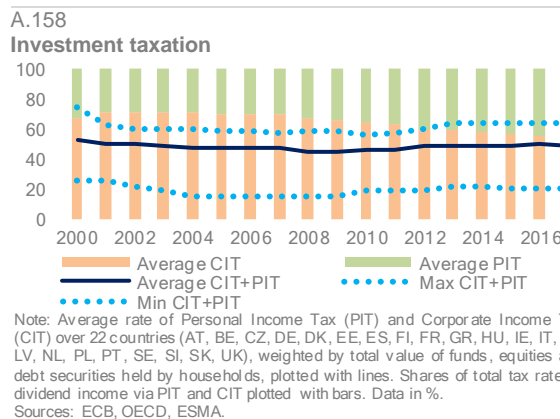
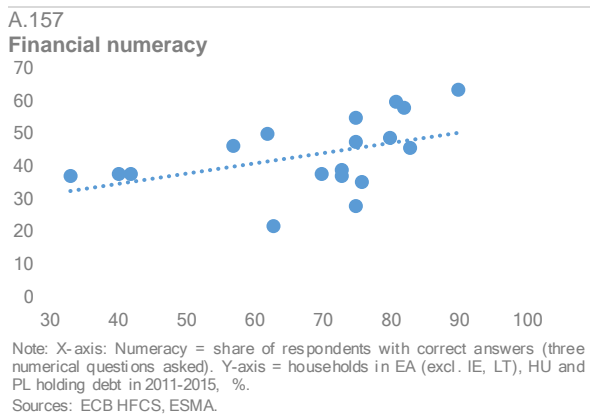
A.156

### Share ownership by income

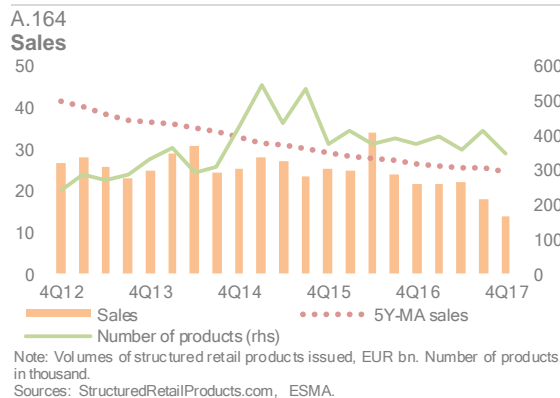
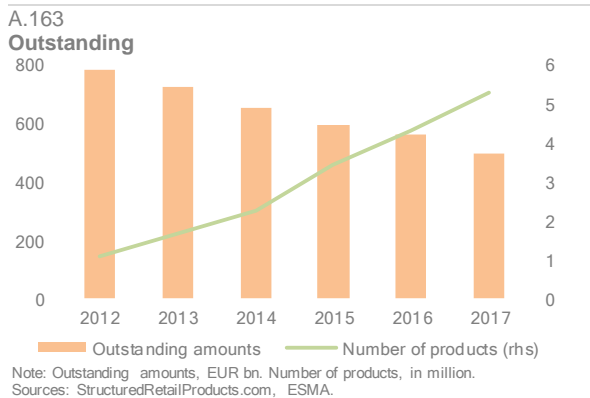


Note: Dispersion of the national percentages of households owning shares, by their income group. Data for EA countries (excl. LT), HU and PL for 2011-2015, %. 'Bottom 25%' represents the range of values from minimum to 1st quartile, 'Core 50%' interquartile range, and 'Top 25%' from 3rd quartile to maximum.  
Sources: ECB HFCS, ESMA.



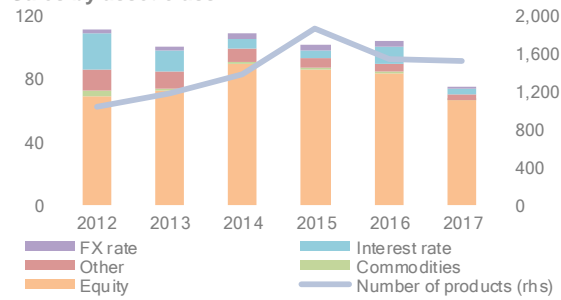


## Structured retail products



A.165

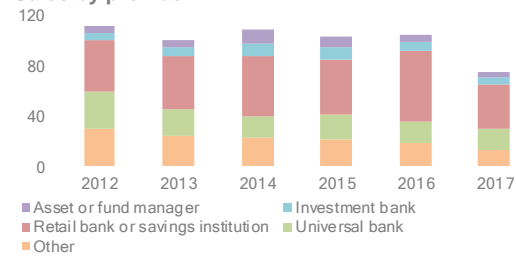
Sales by asset class



Note: Volumes of structured products sold to retail investors by asset class, EUR bn. Number of products sold, in thousand.  
Sources: StructuredRetailProducts.com, ESMA.

A.166

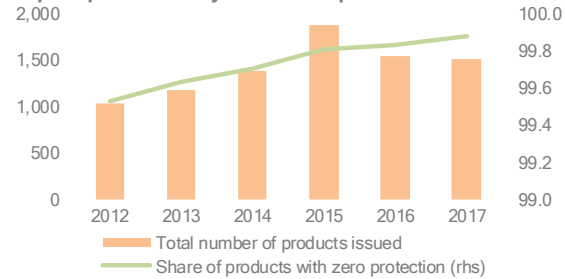
Sales by provider



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

A.167

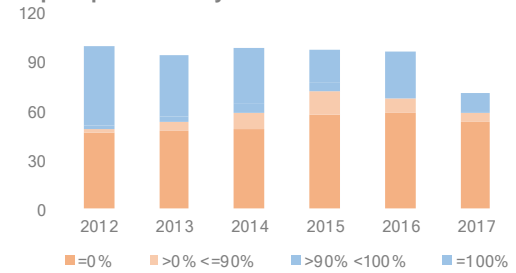
Capital protection by number of products sold



Note: Number of structured products sold to retail investors, thousands. Share of products with zero capital protection, in %.  
Sources: StructuredRetailProducts.com, ESMA.

A.168

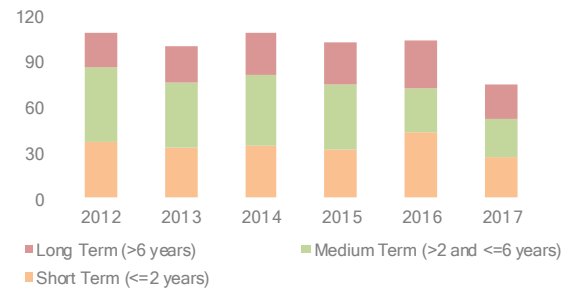
Capital protection by volume sold



Note: Volumes of structured products sold to retail investors by level of capital protection, EUR bn.  
Sources: StructuredRetailProducts.com, ESMA.

A.169

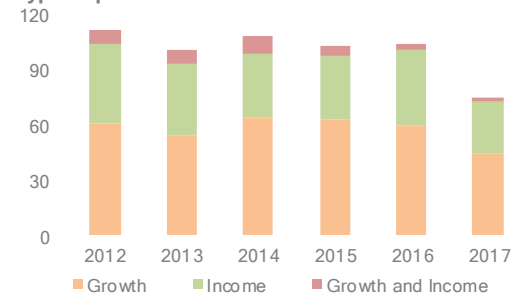
Investment term



Note: Annual volumes of structured products sold to retail investors by investment term, EUR bn.  
Sources: StructuredRetailProducts.com, ESMA.

A.170

Type of product



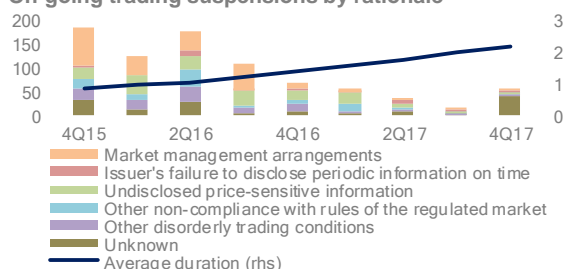
Note: Volumes of structured products sold to retail investors by type, EUR bn.  
Sources: StructuredRetailProducts.com, ESMA.

# Infrastructures and services

## Trading venues and MiFID entities

A.171

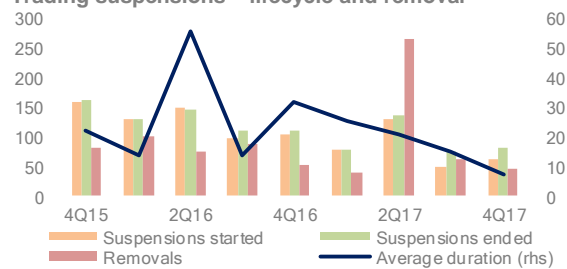
### On-going trading suspensions by rationale



Note: Number of suspensions of financial instruments traded on EEA trading venues on-going at the end of the reporting period, grouped by quarter during which they started and by rationale. Average duration, in years, computed as the mean of the difference between the end-of-quarter date and the start date.  
Sources: ESMA Registers.

A.172

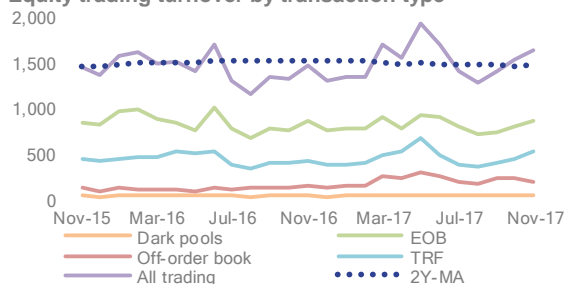
### Trading suspensions – lifecycle and removal



Note: Number of former suspensions, split by quarter in which they started and ended, and removals of financial instruments traded on EEA trading venues. Average duration of former suspensions, in days, computed as the mean of the difference between the end-of-quarter date and the start date.  
Sources: ESMA Registers.

A.173

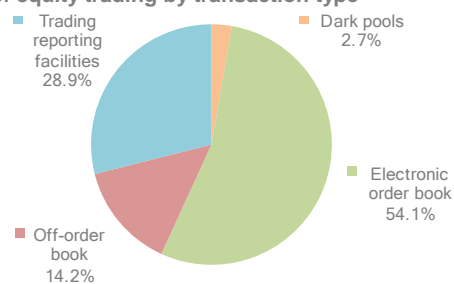
### Equity trading turnover by transaction type



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

A.174

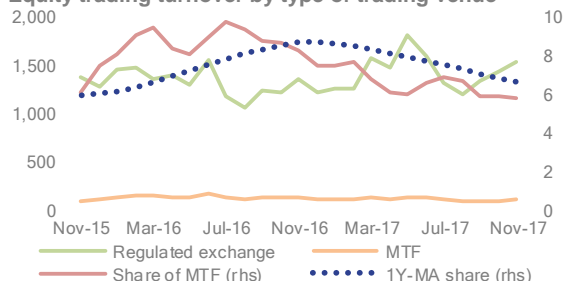
### Share of equity trading by transaction type



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

A.175

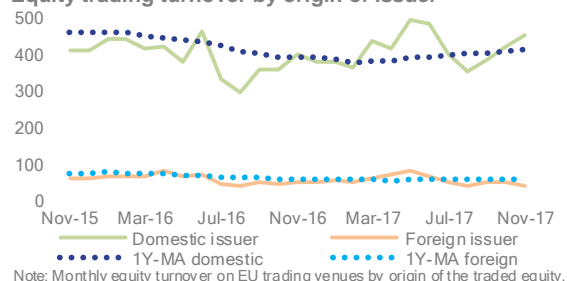
### Equity trading turnover by type of trading venue



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.176

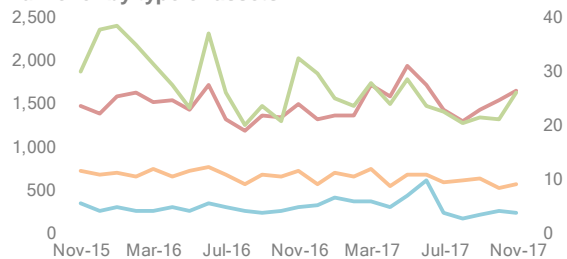
### Equity trading turnover by origin of issuer



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.177

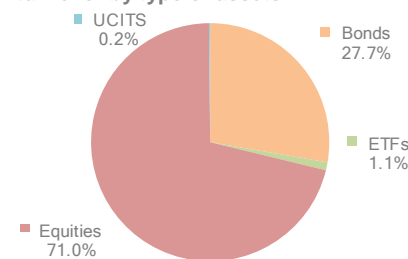
### Turnover by type of assets



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.

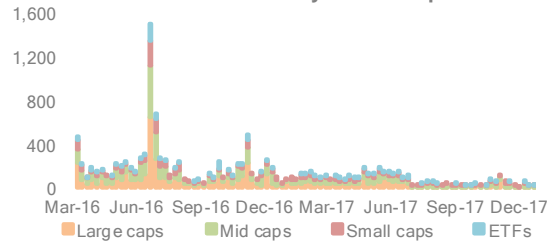
A.178

### Share of turnover by type of assets



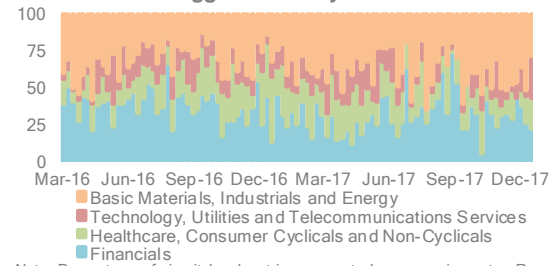
Note: Share of turnover by asset class, in % of total turnover over the reporting period. Data for Aquis Exchange, BATS Chi-x Europe, Equiduct, London Stock Exchange, TOM MTF and Turquoise are not reported for bonds, ETFs and UCITS.  
Sources: FESE, ESMA.

**A.179**  
Circuit breaker occurrences by market capitalisation



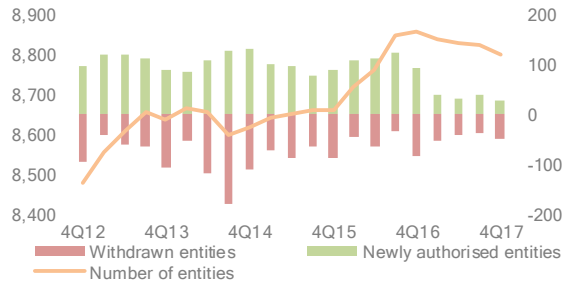
Note: Number of daily circuit breaker trigger events by type of financial instrument and by market cap. Results displayed as weekly aggregates. The analysis is based on a sample of 10,000 securities, including all constituents of the STOXX Europe 200 Large/Mid/Small caps and a large sample of ETFs tracking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

**A.180**  
Circuit breaker trigger events by sector



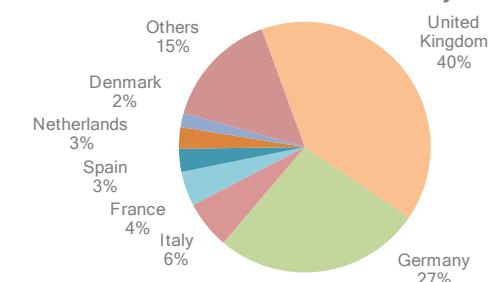
Note: Percentage of circuit breaker trigger events by economic sector. Results displayed as weekly aggregates. The analysis is based on a sample of 10,000 securities, including all constituents of the STOXX Europe 200 Large/Mid/Small caps and a large sample of ETFs tracking the STOXX index or sub-index.  
Sources: Morningstar Real-Time Data, ESMA.

**A.181**  
Number of entities authorised under MiFID



Note: Number of entities authorised under MiFID by national competent authorities of the Member States and notified to ESMA. Newly authorised entities and withdrawn entities on the right axis. No data for the UK starting from 1Q17.  
Sources: ESMA Registers.

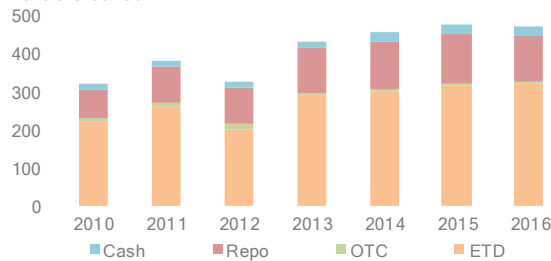
**A.182**  
Share of entities authorised under MiFID by country



Note: Share of entities authorised under MiFID by national competent authorities and notified to ESMA, in % of total.  
Sources: ESMA Registers.

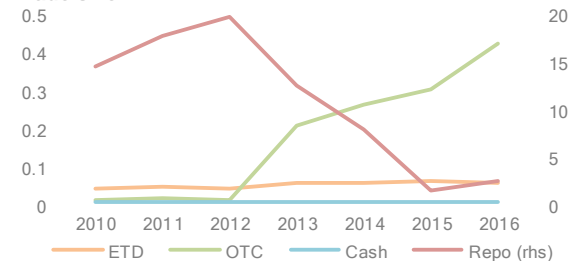
**Central counterparties**

**A.183**  
Value cleared



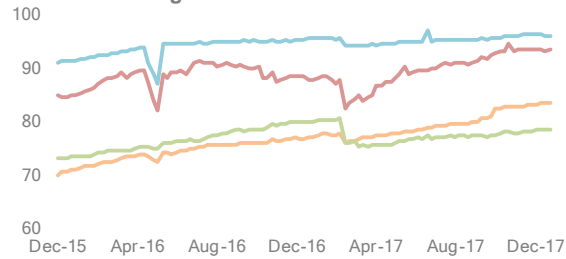
Note: Volume of transactions cleared by reporting CCPs. Annual data, EUR tn, for Cash, Repos, non-OTC and OTC derivatives. LCH Ltd, although the largest CCP in terms of volume in the OTC segment, is not reported due to uneven reporting during the period.  
Sources: ECB, ESMA.

**A.184**  
Trade size



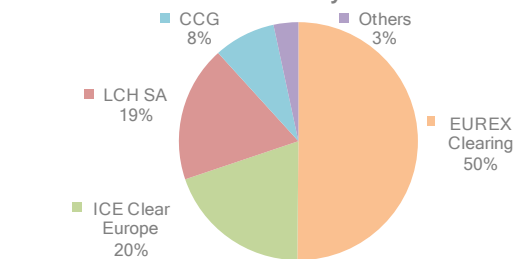
Note: Average size of transactions cleared by reporting CCPs, for Cash, Repos, non-OTC and OTC derivatives. Annual data, EUR mn. LCH Ltd, although the largest CCP in terms of volume in the OTC segment, is not reported due to uneven reporting during the period.  
Sources: ECB, ESMA.

**A.185**  
IRS CCP clearing

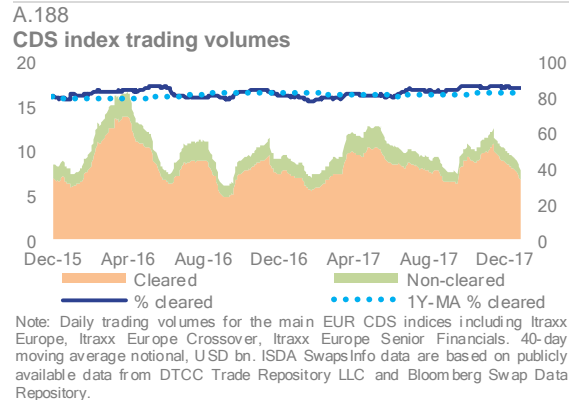
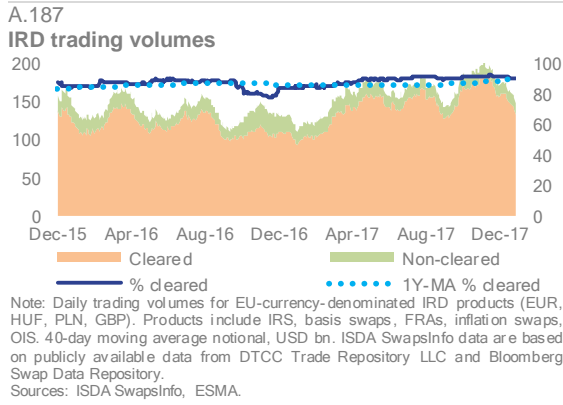


Note: OTC interest rate derivatives cleared by CCPs captured by Dealer vs. CCP positions, in % of total notional amount. Spikes due to short-term movements in non-cleared positions.  
Sources: DTCC, ESMA.

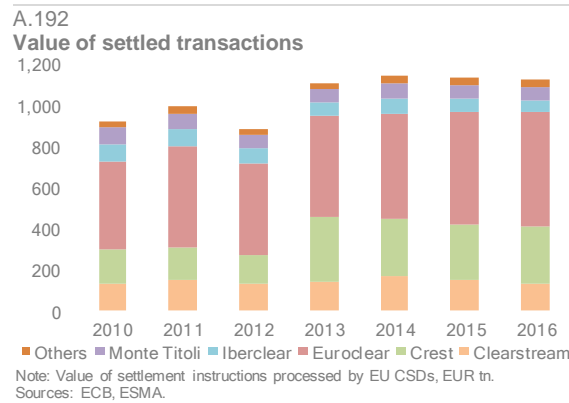
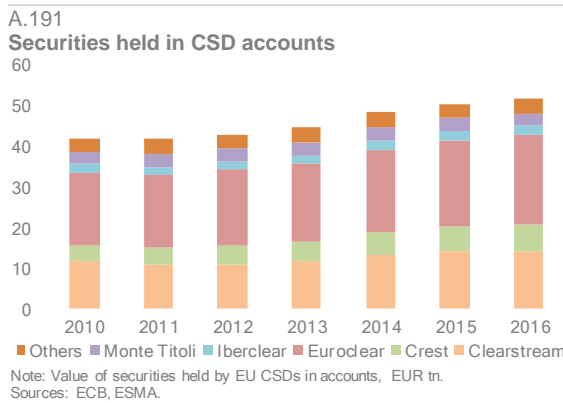
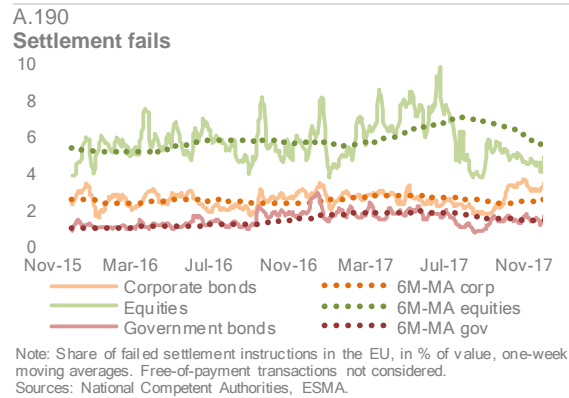
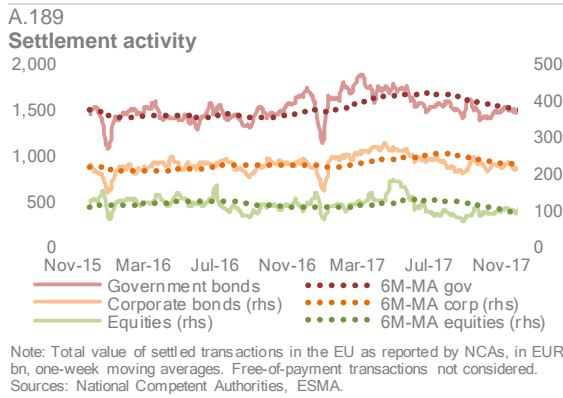
**A.186**  
Share of transactions cleared by CCPs



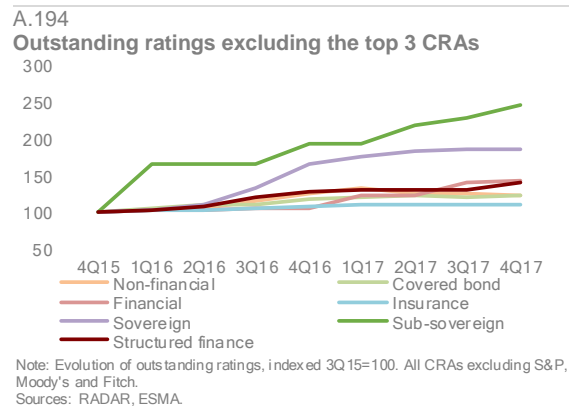
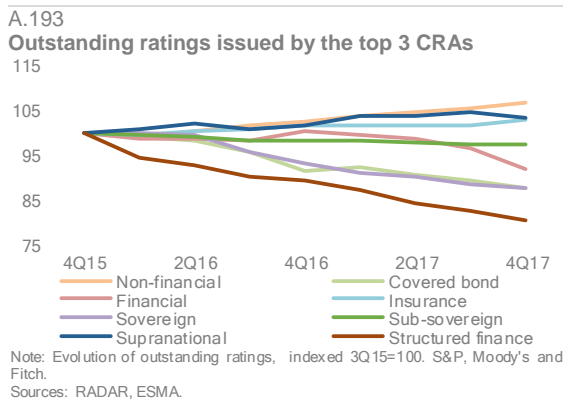
Note: Share of volume of transactions cleared by reporting CCPs for Cash, Repos, non-OTC and OTC derivatives, 2016. LCH Ltd, although the largest CCP in terms of volume in the OTC segment, is not included due to uneven reporting during the period.  
Sources: ECB, ESMA.



## Central securities depositories



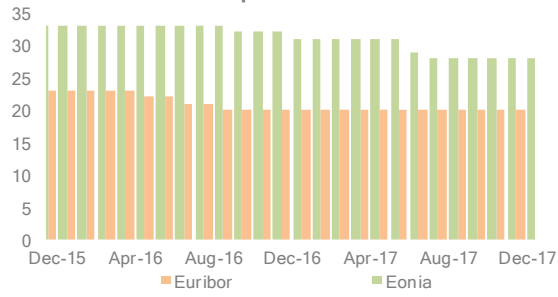
## Credit rating agencies



## Financial benchmarks

A.195

### Number of benchmark panel banks



Note: Number banks contributing to the Euribor and Eonia panels.  
Sources: European Money Markets Institute, ESMA.

A.196

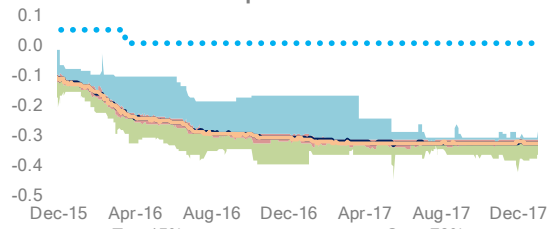
### Dispersion in Euribor contributions



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.

A.197

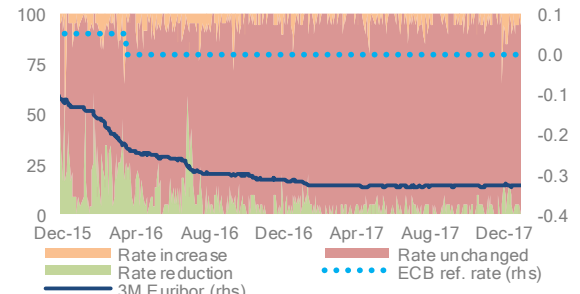
### Euribor submission dispersion



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.

A.198

### Euribor submission variation



Note: Number of banks changing their 3M Euribor submission from day to day, in %.  
Sources: European Money Markets Institute, ESMA.

# 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
NFC	Non Financial Corporation
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

