

# TRV

#### ESMA Report on Trends, Risks and Vulnerabilities

No. 1, 2016



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## **Executive summary**

#### **Trends and risks**

#### **ESMA risk assessment**

Risk segments		Risk categories	;			Risk sources	
	Risk		Risk	Change	Outlook		Change
Overall ESMA remit		Liquidity		→	•	Macroeconomic environment	7
Systemic stress		Market		-	-	Low interest rate environment	→
Securities markets		Contagion		-	•	EU sovereign debt markets	→
Investors		Credit		-	•	Funding patterns	→
Infrastructures and services		Operational		-	-	Market functioning	→

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 categoristion 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: Risk levels in the markets under ESMA remit remained high, reflecting elevated risks for investors, infrastructures and services, and the financial system at large, as well as very high risks in securities markets. We continue to consider market risk very high, following materialisation of the valuation risk. Our credit risk assessment remains unchanged at very high levels. While still at a lower level, liquidity risk is under scrutiny due to ongoing concerns about the reduction of liquidity provision on bond markets, while contagion and operational risk remain unchanged at high and elevated, respectively. Key risk sources remain uncertainty with respect to emerging market developments, in particular China; continued downward pressure on commodity prices, especially oil; and sustained pressure on commodity-export-oriented emerging economies, reinforced by potential weaknesses in market functioning. Subsequent price movements and volatility on EU or US equity markets reflected this anxiety.

Market environment: The market environment in 2H15 confirmed ESMA financial stability concerns. EU markets were characterised by the materialisation of valuation risk in equity markets together with a resurgence of volatility. This was accompanied by the expectation of diverging monetary policy and growing uncertainties surrounding economic growth, especially in EMs, which weighed on foreign exchange and commodity markets. Market turmoil was fostered by reassessment of the situation for oil-exporting countries and companies from the energy sector, with the potential for second-round effects. In early 2016 an agreement between oil producers helped to stabilize commodity prices, although it may not fully address excess supply issues. On bond markets, there were ongoing concerns regarding potentially lower liquidity and increased credit risk premia, which may increase the potential for a market correction. Overall, market sentiment declined close to its five-year average. Finally, issuance activity was sustained, with capital market financing still exceeding bank loans.

Securities markets: Search for yield combined with concerns around equity overvaluations, emerging market vulnerabilities and divergent monetary policy prospects produced a volatile market environment amplified by potentially lower liquidity in some market segments. While contagion from earlier developments in Greece had remained limited, risks materialised during the summer, when equity prices experienced a sharp drop and volatility soared, driven by a large sell-off in Asian equity markets. Tensions temporarily abated but resurfaced at the end of the year, highlighting the persistence of some of the underlying issues, especially the slowdown in China and the drop in oil prices. Equity markets remained volatile since then, and sensitive to adverse news. Conditions in other markets remained benign, with low interest rates prevailing in bond and money markets. Wider spreads on low-grade fixed income securities, such as corporate bonds and asset-backed securities, suggest an increase in credit risk premia, following several years of yield compression. Volumes declined somewhat, with lower issuance in the sovereign and non-financial corporate segments, and declining turnover in sovereign repo and money markets. The volume of structured products sold to retail investors continued to decline despite an increase in the variety of products.

Investors: Investment funds faced a combination of multi-year high volatility and declining flows. Commodity funds continued to figure prominently here, reporting further negative performance in the wake of declining commodity prices. These developments were passed on to retail investors, whose portfolio generated lower returns yet with a higher level of risk. Against this background, concerns over liquidity deepened. Unease is growing about a potential liquidity mismatch for funds that offer daily liquidity while invested in less liquid assets, notably fixed-income instruments issued by corporates, in emerging markets or exposed to the energy sector. Although the EU fund sector has proved resilient so far, recent examples from the US market have also shown that risks were not purely theoretical, with some funds temporarily failing to meet redemption requests or experiencing a liquidity discount.

Infrastructures and services: In the second half of 2015, the share of trading via electronic order books on trading venues increased. For securities depositories, important regulatory reforms are under way, while three CCPs extended their activities to clear new classes of assets. This increasing importance and centrality of infrastructures and services makes their operational resilience and continuity crucial. Further improvements in financial market governance have been observed, especially with regard to financial benchmarks and more accurate credit ratings.

#### **Vulnerabilities**

MREL/TLAC requirements: This article analyses the Minimum Requirement for Own Funds and Eligible Liabilities (MREL) and the Total Loss-Absorbing Capital (TLAC) requirements for banks. These bail-in tools will complement the prudential requirements and contribute to absorb losses in case of failure. They may also pose issues in terms of the consistency of rules within and across jurisdictions and transparency around the securities that will be considered eligible, the trigger levels for conversion or write-off and the setting of the Point of Non-Viability (PONV). Investors should thus undertake a careful investment analysis that considers the liability profile of the banks, the MREL/TLAC requirements and the local Resolution Authority's discretionary powers. For their part, regulators should strive to provide investors with as much transparency as is possible without undermining the Resolution Authority. Similarly, consistency in approaches to the 'what' and 'when' across jurisdictions will make the investment analysis more robust.

Financial innovation: Risk and benefit assessment: This is the first of a two-part analysis of financial innovation. We provide the reader with an overview of ESMA analytical process. This will be followed in an upcoming TRV with a detailed analysis of our Financial Innovation scoreboard. ESMA has put in place a monitoring framework designed to ensure that innovation does not undermine the core objectives of investor protection, financial stability and orderly markets. In this article we outline the scope of our work, the sources of information we employ and how we prioritize the work. We also outline some of the key challenges of monitoring financial innovation across the EU. Finally, we outline how this monitoring process will support ESMA's product intervention powers which become effective with the new MIFID legislation.

The central clearing landscape in the EU: This article gives an overview of the central clearing landscape in the EU within the EMIR framework. In 2009, G20 leaders agreed that OTC derivative contracts should be cleared by Central Counterparties (CCPs). The EMIR Regulation was subsequently adopted to implement this commitment in the EU. Since the entry into force of EMIR on 16 August 2012, the process of CCP authorisation has progressed, with sixteen CCPs having been authorised to operate in the EU. The mandatory clearing requirement for several classes of OTC interest rate swaps and credit default swaps should become applicable in 2016, and several interoperability arrangements are in place.

Collateral scarcity premia in EU repo markets: This analysis focuses on the drivers of the cost of obtaining high-quality collateral in seven EU countries over the last two years. This period covered two important changes in ECB monetary policy: The introduction of a negative deposit rate in June 2014 and the launch of quantitative easing in January 2015. The analysis is based on a dataset matching information on European repo markets with securities lending markets and bond-specific characteristics. Empirical results show that the cost of obtaining high-quality collateral, proxied by specialness of government bond repos, increases with demand in the cash market from short selling activities, even in calm financial conditions. In bear market conditions – when good collateral is most needed – this may lead to tensions in some asset market segments. Collateral reuse may alleviate these tensions, but requires transparency and monitoring of risks from collateral chains. Understanding the drivers of specialness can help to identify factors and practices liable to increase procyclicality in the financial system.

## Trends

#### 7

## **Market environment**

The market environment in 2H15 confirmed ESMA financial stability concerns. EU markets were characterised by the materialisation of valuation risk in equity markets together with a resurgence of volatility. This was accompanied by the expectation of diverging monetary policy and growing uncertainties surrounding economic growth, especially in EMs, which weighed on foreign exchange and commodity markets. Market turmoil was fostered by reassessment of the situation for oil-exporting countries and companies from the energy sector, with the potential for second-round effects. In early 2016 an agreement between oil producers helped to stabilize commodity prices, although it may not fully address excess supply issues. On bond markets, there were ongoing concerns regarding potentially lower liquidity and increased credit risk premia, which may increase the potential for a market correction. Overall, market sentiment declined close to its five-year average. Finally, issuance activity was sustained, with capital market financing still exceeding bank loans.

Market performance was impacted by the materialisation of market valuation concerns in equity markets (-6.1%), while commodities continued their downward trend (-33.6%). Corporate and sovereign bond markets were more stable despite the global uncertainty (T.1), but an increase in credit risk premia at the end of the reporting period may signal the potential for a market correction. A succession of news reports and events in emerging markets triggered market sell-offs in an already volatile trading environment due to concerns about possible overvaluations and uncertainty around the path of US monetary policy. Especially towards the end of the reporting period, market unease was heightened by the steep decline in oil prices in conjunction with China's slowdown and the potential prospect of lower global growth (T.21). On the other hand, the political agreements in the euro area on the Greek financial situation reduced the likelihood of a Eurozone crisis.

The slide in equity prices and general concerns over high asset valuations temporarily drove **volatility** (T.2) to a multi-year high in 2H15 across asset classes. Equity and commodity markets were the most severely impacted, with volatility passed on to investment funds and ultimately to retail investors. Corporate and sovereign bond volatilities increased, but not on the same scale, highlighting ongoing concerns over potentially lower liquidity levels in bond markets.

Market **liquidity** issues remained a concern, especially amid reports of the banks' retreat from market making activities as they refocused on their core businesses. In contrast to the high volatility, indicators suggest that overall liquidity on equity markets remained ample. Conversely, the development in bid-ask spreads seemed to indicate temporary tensions on bond markets (T.8). Issues in EM countries were reflected in **exchange rate** developments, with the EUR partially recovering from its significant decline during the first half of the year. The rebound was particularly strong against EM currencies following the devaluation of the CNY. However, the EUR depreciated further against USD. Net capital flows also show a strong domicile preference, with non-residents withdrawing money from the EU area during 3Q15 (T.3) and EU residents temporarily reducing their outflows during the same period (T.4). This home bias reflects the prevailing risk aversion stemming from recent FX movements and uncertain macroeconomic prospects.

Overall, market sentiment in financial services receded in 2H15 close to its 5Y MA. Negative developments in confidence levels were evenly distributed within the financial sector, although confidence in the insurance and pension fund sector remained particularly subdued (T.6).

Capital market financing declined to EUR 543bn in 2Q15 and 3Q15, following the record issuance volume observed in 1Q15. Equity still represents the bulk of capital market financing, while net financial sector debt issuance remained negative. From the investor side, the contribution by insurers shrank, although remaining predominant, while bond funds experienced outflows. The volume of capital market issuance remains constantly higher than net new lending, but overall it still plays a limited role in financing the real economy. Especially for SMEs, market-based sources of financing are hardly relevant, with less than 5% of the firms issuing debt securities. This highlights the need to strengthen capital markets financing with a view to a more diversified financing base for the EU economy, which is a main element in the Capital Markets Union work plan published by the European Commission in September 2015.







Capital markets issuance

Capital market financing continued to exceed loans



Financial sector debt Securitised assets 1Y-MA loans Note: Net issuance of debt securities, equities and securitised assets in the EA, by type of instrument and sector, in EUR bn. Securitised assets include ABS, MBS and covered bonds. Due to different netting and consolidation methodologies, the data may not be fully reconciliable. 1Y-MA markets plots the 1Y-MA of the aggregate of all assets displayed in columns. 1Y-MA loans plots 1Y MA of loan-based financing. Sources: ECB, Dealogic, ESMA.



#### Institutional financing

Contribution of insurance declined



Note: EA institutional investment flows by type of investor, EUR bn. Other= financial vehicle corporations, mixed funds, other funds. EUR bn. 1Y-MA=1Y moving average of all investment flows. 1Y-MA not shown for 10Q2 and 10Q3 as not all series are available for 2009. Sources: ECB, ESMA.



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





Auxiliary activities Overall financial sector SV-MA Overall Note: European Commission survey of EU financial services sector and subsectors (NACE Rev. 2 64, 65, 66). Confidence indicators are averages of 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.



Dec-13 Apr-14 Aug-14 Dec-14 Apr-15 Aug-15 Dec-15 Liquidity indicator 40D-MA •••••• 5Y-MA

Note: Liquidity measured as median across countries of the difference in bid-ask yields for 10Y sovereign bonds, in basis points. 24 EU countries are included. Sources: Bloomberg, ESMA.

## **Securities markets**

Search for yield combined with concerns around equity overvaluations, emerging market vulnerabilities and divergent monetary policy prospects produced a volatile market environment amplified by potentially lower liquidity in some market segments. While contagion from earlier developments in Greece had remained limited, risks materialised during the summer, when equity prices experienced a sharp drop and volatility soared, driven by a large sell-off in Asian equity markets. Tensions temporarily abated but resurfaced at the end of the year, highlighting the persistence of some of the underlying issues, especially the slowdown in China and the drop in oil prices. Equity markets remained volatile since then, and sensitive to adverse news. Conditions in other markets remained benign, with low interest rates prevailing in bond and money markets. Wider spreads on low-grade fixed income securities, such as corporate bonds and asset-backed securities, suggest an increase in credit risk premia, following several years of yield compression. Volumes declined somewhat, with lower issuance in the sovereign and non-financial corporate segments, and declining turnover in sovereign repo and money markets. The volume of structured products sold to retail investors continued to decline despite an increase in the variety of products.

#### Equities: Volatility on the rise

EU equity markets were characterized by much stronger volatility across EU countries than has been seen over the last few years. During the summer, a succession of news reports and events in emerging markets triggered market sell-offs in an already volatile trading environment due to concerns about possible overvaluations and uncertainty around the path of US monetary policy. Although EU equity prices subsequently recovered, they fell by around 6% in 2H15, with comparable losses in US and JP equity prices (both decreasing by around 5%). EM stocks dropped 15%, and by the end of the year they stood more than 20% below their 2015 high in April (T.9).



Since these developments were driven primarily by external events, EU equity markets were affected relatively evenly. As a result, **price dispersion** remained limited since June, with no major unilateral movement to highlight since the political tensions around the Greek financial situation earlier in the year (A.18).

Equity market movements may have been amplified by lower market **liquidity**, with the 40day average bid-ask spreads on large European caps slightly higher at 6.3 basis points at the end of 2015, compared to 5.7 basis points end-2014. However, bid-ask spreads remained below their long-term average, and ESMA's illiquidity indicator suggests that overall liquidity on equity markets remains ample (A.20 and A.21).

The steepest drop in equity prices was registered on 24 August with EU equities falling 5% in just one day. Concerns over growth prospects in several large emerging markets crystallized around China as local authorities intervened to stem a prolonged sell-off in equities. Due to negative market reactions spilling over to other parts of the world and reinforced by expectations of lower EM growth, short-term realised **volatility** in EU equity markets spiked to a multi-year high of 40% towards the end of August, before falling back to an average of 23% in the fourth quarter (T.11).

Tensions resurfaced at the end of the year, with EM equity prices experiencing another sharp drop, led by China, and volatility in EU markets rising anew, against the backdrop of changes in monetary policy stances in the US and EU.

Market movements were driven to some extent by intensified short-selling activity, as reflected in **securities lending** data. The utilisation rates of European and especially Asian equities, which are proxies for short-selling borrowing demands, inched up after 24 August (T.10). More broadly, securities lending activity in the



lendable value, in %. The seasonal peaks in equity loans reflect tax arbitrage related to dividends payment. The dashed line indicates 24/08/2015. Sources: Markit Securities Finance, ESMA.

Possibly as a result of lower valuations and volatile markets, **equity issuance** in the EU declined during the third quarter to EUR 26.8bn, down from EUR 36.6bn in 3Q14. However, issuance recovered during the fourth quarter, leading to a 15% increase in 2H15 from the same period last year, driven by an increase in IPOs from EUR 12.7bn to EUR 27.4bn (A.15).

Regarding **derivatives**, global growth in the market value of exchange-traded equity indices continued, although they still represent a relatively small fraction of total derivatives. Turnover, meanwhile, peaked to an all-time high of more than USD 100tn in notional value, mainly as a result of the 36% quarterly increase in equity futures. The growing role of derivatives may have played a part in the 24 August market crash by amplifying market movements due to various options strategies and volatility hedging (T.12).

#### **Debt instruments: Yields remain low**

Following a period of instability at the end of 1H15 amid mounting uncertainties over developments in Greece, yields on ten-year **sovereign bonds** decreased in both core and peripheral countries as from end July (A.26). The impact on EU sovereign bond markets of uncertainty around the Greek financial situation has been relatively limited, as shown by spreads of ten-year sovereign bond yields in peripheral countries relative to the corresponding German yields, which widened only slightly and then quickly returned to their previous levels (A.27). This was also reflected by stable trends in

securities lending markets collateralised by government bonds. The utilisation rates of European government bonds, a proxy for short-selling-related demand, have remained broadly stable around 30% (A.61).



#### T.12

#### Equity prices and volatility

The impact of Gamma hedging on equity markets On 24 August 2015, concerns over Chinese growth triggered a global sell-off in equity markets, with the Euro Stoxx 50 losing up to 5% intraday from its previous close. The large drop in some Asian equity markets (the Shanghai CSI 300 Composite index lost around 8%, with futures down 13%) had led to a steep overnight drop in index futures in Europe between Sunday and Monday.

Market intelligence suggests that part of the sell-off was driven by a combination of options strategies and a low-liquidity environment. Such strategies include for example index options (e.g. puts and collars), but also volatility-targeting portfolios and hedging of VIX-based products, acting as "stop-loss" orders executed beyond certain price or volatility thresholds. Analysts from JPMorgan estimated that the derivatives Gamma – the amount of equity sales triggered by such strategies for every 1% of market decline – in S&P 500 and ETF options had reached a record USD 25bn at the end of the previous week.

Such Gamma-hedging is sensible from a risk management perspective to limit losses and reduce exposures, but it also amplifies intraday market movements. A large share of the increase in pre-market trading volumes (where liquidity is typically scarce) was due to hedging flows, driving most of the price movements in futures indices. This in turn caused sharp increases in volatility measures, creating a self-reinforcing trend in equity markets.

There are several implications for financial stability. The first is that Gamma-hedging can be problematic from a macro-prudential perspective due to the losses it might impose on investors that are not fully hedged. The second is the amplification of stock price movements, with multiple trading halts on US stocks and exchange-traded funds resulting in numerous market dislocations (ETFs mispriced compared to their underlying index). The last is the cyclical impact on market liquidity, which is already becoming increasingly event-driven due to the structural move towards algorithmic trading.

Overall, yields remained at low levels in line with the moderate perception of sovereign risk reflected by the developments in sovereign CDS spreads (A.31), despite the lower average credit EU sovereign bond issuance totalled EUR 477bn in 2H15, on a par with 2H14 (EUR 472bn; A.23). On the other hand, sovereign EUR repo volumes fell to a daily average of EUR 155bn in 2H15, around 7% below 1H15 (A.65).

**Corporate bond issuance** by banks was around EUR 191bn in 2H15, increasing by 40.8% compared to 2H14 but decreasing with respect to 1H15 (-26.9%). However, since non-financial corporation issuance contracted in the same period to about EUR 133bn (versus EUR 211bn in 1H15 and EUR 147bn in 2H14), total corporate bond issuance declined by 31.2% in 2H15, to EUR 356bn (A.36). Looking at the type of instruments (T.13), the ABS and MBS segment was stable versus 2H14, at EUR 36bn, while the issuance of covered bonds increased to EUR 68bn, higher than in both 1H15 (EUR 64bn) and 2H14 (EUR 42bn).



Corporate bond yields fell slightly across risk categories, apart from BBB-rated securities (+7 bps), but remained at a low level. The difference between higherand lower-rated bonds widened, with the differential between AAA-rated bonds and BBB-rated bonds increasing from 47bps in June 2015 to 90bps in December 2015, the highest level since September 2013 (T.14). EA BBB-rated non-financial corporate bond spreads to the risk-free rate reached a two-year high of 194bps in September, possibly reflecting repricing following a deterioration in the average credit quality of both financial and non-financial EU corporate issuers during the

first half of the year. It remains to be seen whether this break in the long-term yield compression trend will mark a decisive reversal with broader consequences for European securities markets and financial institutions.



Looking into securitised products, EUR 45bn were placed in 1H15, representing 55% of issuance, compared to EUR 48bn in 2H14 (50% of issuance) and EUR 35bn in 1H14 (29% of issuance; A.45). At the end of 1H15, EUR 1.3tn of securitised products were outstanding, of which more than half (EUR 729bn) were retained, presumably for repos or securities lending. Several initiatives have been taken to revive securitisation in the EU. In particular, the Commission Securitisation initiative adopted on 30 September 2015 is a package of two legislative proposals: A Securitisation Regulation and a proposal to amend the Capital Requirements Regulation.

Spreads of EA AAA-rated securitised products remained at low levels, but increased nonetheless on average from 7 basis points in 1H15 to 15 basis points in 2H15. Spreads in the US also widened from 80 to 100 basis points (A.47).

The **credit quality** of securitised assets improved in 1H15. This was driven by several factors, including one rating agency updating its methodology and the improvement in the credit rating of various EU sovereigns, leading to an increase in the share of AA-rated securities finance instruments from 18.4% in 2H14 to 23.2% (T.15). The percentage of AAA-rated securitised assets also edged up, to 23%, while the share of securitised assets rated subinvestment grade remained below 30% (A.51). Overall, the number of rated securitised assets continued to decline, due to a general decrease across asset classes, particularly relevant for ABCP (14%) and ABS (6%). At the same time, the accuracy of ratings measured over the previous twelve months fell for ABS and RMBS, though remaining at high levels (A.52).

#### T.15

#### Credit ratings

Focus on developments in structured finance ratings

The latest data from ESMA's ratings central repository (CEREP) show a substantial improvement in the average quality of both structured finance instruments (SFIs) and covered bonds, as reflected in a strongly positive (notch-weighted) drift for these rating categories (A.57). This was driven by several factors, including the announcement by one rating agency in March that it was updating its rating methodology, and the improvement in the credit rating of some EU sovereigns. These factors led to a wave of upgrades that were not directly related to the credit quality of the outstanding instruments.

Changes in methodology have a short-term impact on outstanding ratings (stock effect), which is immediately visible in the data, as well as a longer term impact on the new ratings assigned (flow effect) in subsequent years. The latter will be gradually reflected in the distribution of ratings within that category. Changes in sovereign ratings may influence the rating of financial corporate issuers in particular, reflecting the ability of the sovereign to provide an additional backstop. These developments may eventually be reflected in the ratings assigned to SFIs, even if the payment of cash flows does not always depend directly on the issuer's solvency.

The detailed breakdown of rating changes available in CEREP offers valuable information for understanding underlying dynamics. In the case of SFIs, for example, the factors highlighted above led to a sizeable increase in the number of double-A ratings and a corresponding reduction in single-A ratings (T.16). These numbers include all CRAs registered in the EU, as well as new ratings, withdrawals (including SFIs that have matured) and defaults. The net change in outstanding SFI ratings has been in negative territory since 2H09 as the number of new ratings has not been able to compensate for the number of instruments maturing, reflecting a broader contraction in securitisation markets. The calculation of net change in SFI ratings also includes the number of defaults, which has recently been increasing, although it remains low: The percentage of SFI defaults in 1H15 reached 1%, up from 0.5% in the previous period (T.17).

The wave of SFI upgrades was particularly concentrated in certain EU countries, namely Greece, Ireland, Italy, Portugal and Spain. The notch-weighted drift in these countries for Moody's rose to 2.6% in 1H15, up from 1.6% in 2H14 (T.18). This followed an earlier wave of downgrades, with Moody's displaying a larger negative SFI rating drift than its competitors in 2H12 and 1H13.



In 2H15 the total of **covered bonds** outstanding in the EU shrank further by EUR 7bn to EUR 1,202bn. This was despite a rebound in gross issuance volumes, which amounted to EUR 156bn in 2015, up 36.2% on 2014 (EUR 115bn) and 44% in comparison to 2013 (EUR 109bn). In a context of low interest rates, average covered bond spreads (across all rating categories) increased in the second half of the year, though remaining at low levels (around 40bps for AAArated securities). The increase was particularly noteworthy for A-rated covered bonds, for which spreads almost tripled from 42bps at the end of June to 118bps at the end of December (A.54).





#### EUR up against EM currencies

In foreign exchange markets, the EUR partially recovered from its significant decline during the first half of the year. The rebound was particularly strong against a basket of EM currencies including CNY, IDR, MXN, RUB and TRY, with the single currency gaining around 10% in 2H15 (T.19). This development was partly driven by two successive interventions by CN monetary authorities to devaluate the CNY in order to stimulate growth. Market intelligence suggests that the EUR benefitted from a renewed safe-haven status, signalling stronger single currency confidence in the and outweighing perceived dovish comments from the ECB regarding the path of future monetary policy.

T.19 Foreign exchange rates <b>EUR appreciated against other currencies</b>
120
110
100
90
80
70  Dec-13  Apr-14  Aug-14  Dec-14  Apr-15  Aug-15  Dec-15    USD
Note: Spot exchange rates to Euro. Emerging is a weighted average (2013 GDP) of spot exchange rates for CNY, BRL, RUB, INR, MXN, IDR and TRY. 01/10/2013=100. Increases in value represent an appreciation of EUR. 5Y-MA of the USD exchange rate. Sources: ECB. IMF. ESMA.

The EUR remained relatively stable against GBP, as expectations regarding the ECB asset purchase programme counterbalanced the pricing in of a later-than-previously-expected interest rate hike in the UK: Markets are now pricing in an initial BoE rate increase in January 2017, about a year later than had been expected at the end of June. The EUR also remained almost flat against USD following its 8% decline in the first half of the year. The implied USD-EUR exchange rate volatility

subsided somewhat from its earlier levels, but with periodic peaks from broader market risks.

The outstanding volume of exchange-traded **currency derivatives** notionals increased slightly to USD 295bn at the end of 1H15, up 3% from 2H14 (A.81). Quarterly turnover stood at USD 16.4tn year-to-date, up 12% from the same period last year (A.82).



Commodity prices continued to trend down, mainly due to developments in energy markets. The overall commodity price index stood 30% below its end-June level, with energy prices down 43%. Here again, the main driver was lower growth expectations in emerging markets, combined in the case of oil with excess supply capacity reflected in high inventories and crude oil production forecasts for the years ahead. As a result, volatility was on the rise, with 40-day average volatility in energy prices up to 48% in September, the highest since 1H09, before subsequently subsiding. The implied volatility of options on light crude oil prices rose in line. A recent BIS report estimated global oil and gas debt at USD 2.5tn in 2014, up from USD 1tn in 2006. The decline in asset values backing this debt is likely to have caused financial strains, with leverage amplifying the dynamics of energy price decline (T.20).

Drop in oil prices adds to market concerns

Since July 2014 crude oil prices have fallen by almost 75%, from USD 105 per barrel to around USD 27 on 21 January 2016, hitting a twelve-year low (T.22). Supply factors seem to have played a somewhat more prominent role than demand factors in driving down the price of oil. Overall, the economic impact of low oil prices is generally assumed to be positive. Cheaper oil is expected to stimulate global economic growth: The benefits to oil importers are generally estimated to outweigh the loss to producers. However, lower oil prices may coincide with tensions in global financial markets.

T.21 Commodities

The confluence of factors re-confirms our strong negative market risk assessment.

Most immediately, the collapse in oil prices has a direct impact on the valuation of oil companies worldwide. This is true not only of companies that extract crude oil and face lower profit margins, but also of companies specialised in petrochemicals and refined petroleum products that are perceived to be negatively affected in the long run by low and volatile oil prices. The price of bonds from issuers in this sector is similarly impacted.

Through second-round effects, lower oil prices and growth slowdowns in oil-exporting countries are likely to strain corporates' balance sheets and, by amplifying nonperforming loans, also those of banks.

At the broader economic level, declining oil pricing impacts markets in which oil production plays a key role. Slacker GDP growth from lower oil prices may cause budgetary problems. The sovereign and corporate sectors of some oilexporting countries also rely on global markets for funding. A reassessment of growth prospects by investors has already triggered capital outflows, reserve losses, sharp currency depreciations, and rising sovereign CDS spreads. Most of the increase in emerging market non-financial corporate (and US high-yield) debt in the last few years has been in oil and commodity industries. Although it may seem likely that the negative effects from lower oil prices highlighted above would remain concentrated in the economies directly involved and in the energy sector, there are several transmission channels through which oil price developments can have additional destabilising effects on global financial markets.

First, investors exposed to the energy sector, or to companies based in oil-producing countries, can face losses either through their direct portfolio holdings of securities (stocks and bonds), or through the exposure of funds in which they are invested. These funds may either hold securities themselves or track indices that are sensitive to changes in oil prices (e.g. S&P Oil and Gas index, emerging market bond indices, or key equity benchmarks in oil exporting countries). For example, EU equity prices in the oil and gas sector declined by 19% in 2H15 (T.23). In turn, this can trigger large fund outflows and redemptions that may have a destabilising effect, particularly in illiquid markets, and impose losses on other investors. The prospect of large funds, including public investors from oil producing countries, offloading assets to increase their cash buffers can weigh additionally on global asset prices.

Furthermore, given the possibility of substituting cheap oil for other energy sources, developments in the oil sector are likely to spill over into correlated industries such as gas, other conventional energy markets, or alternative energies and impact securities valuations there, too, although the direction and size of that impact is likely to vary.

An additional transmission channel is greater risk aversion. The turmoil in some market segments, combined with lower growth in China and lingering uncertainties around US monetary policy, has resulted in stronger volatility and lower global risk appetite. In the EU, this is in part reflected in significantly higher spreads of EU high-yield corporate bonds, with the difference between AAA-rated bonds and BBB-rated bonds widening by around 40bps in 2H15 to its highest level since September 2013. Increased volatility and tighter financing conditions are in turn expected to feed through to lower GDP growth, also in the EU, weighing on investor sentiment.

Overall, the recent rout in global markets from lower oil prices highlights the heightened market risk and prevailing volatility, particularly in riskier market segments; investors should bear this in mind when making their investment decisions and allocations. These developments also underscore our assessment that market risk remains very high.



Sources: Bloomberg, Thomson Reuters Datastream, ESMA

T.23 EU equity prices EU oil and gas sectors underperformed 120 110 90 80 70 60 Jan-14 May-14 Sep-14 Jan-15 May-15 Sep-15 Jan-16 EU all sectors EU equity indices, rebased 1/1/2014=100. Sources: Datastream, ESMA.

#### **Other markets**

Conditions in short-term **money markets** were mixed. In the EA, the EONIA remained in negative territory, drifting down slightly from -6bps to -23bps, while the 3M Euribor declined 12bps to -13bps (A.71).



However, these relatively favourable developments contrasted with a decline in EONIA lending volumes, from EUR 1.3tn in 2Q15 to EUR 1.1tn in 3Q15 and to around EUR 700bn in 4Q15, reflecting reduced interbank activity (T.24). The LIBOR-OIS spread edged up

Implied interest rate volatility, as measured by onemonth forward Euro-Euribor swaptions, fluctuated close to the levels observed earlier in the year, at around 100%, up from around 50% on average last year, although the five-year tenor volatility increased somewhat (A.74). Higher historical and implied volatilities in the context of interest rates are partly related to their current levels, since they are close to zero.

With regard to market-based credit intermediation, the two main developments were the increase in EU MMF liabilities and securities lending activity, up 5% and 11% respectively as of the mid-year from their year-end level (T.25). However, these two types of market-based credit intermediation combined to around EUR 1.5tn, while European repo market activity has remained relatively stable at around EUR 5.5tn over the past two years.



Meanwhile, interconnectedness between EA investment funds and MFIs through loans and debt securities holdings continued to decline, to 14% of total assets, down from more than 17% in 2013. This development was driven mainly by

reduced MMF, bond funds and hedge funds' onbalance sheet exposures to MFIs (A.86).

The liquidity level of Prime EU MMFs remained stable, with the share of liquid assets available at one-day and one-week notice standing at 26% and 39% of AuM respectively (A.88). On the other hand, the weighted-average maturity and life of these funds shortened slightly, from 44 and 65 days respectively as at the end of 2Q15 to 42 and 62 days as of October, close to their long-term average (A.87).

The volume of **structured products** sold to retail investors in 2015 fell versus 2014 despite a continuous increase in the number and variety of products. Retail investors in search of yield had access to more complex and structured investment strategies with risk-return characteristics that match specific needs and investor demand. For example, 58% of the structured products were sold without any capital protection, which may signal greater risk appetite.



Products with equity instruments as their underlying continued to constitute the bulk of sales volumes and numbers but they encompass a wide variety of products, including convertible bonds which offer a debt-like payoff.

## Investors

Investment funds faced a combination of multi-year high volatility and declining flows. Commodity funds continued to figure prominently here, reporting further negative performance in the wake of declining commodity prices. These developments were passed on to retail investors, whose portfolio generated lower returns yet with a higher level of risk. Against this background, concerns over liquidity deepened. Unease is growing about a potential liquidity mismatch for funds that offer daily liquidity while invested in less liquid assets, notably fixed-income instruments issued by corporates, in emerging markets or exposed to the energy sector. Although the EU fund sector has proved resilient so far, recent examples from the US market have also shown that risks were not purely theoretical, with some funds temporarily failing to meet redemption requests or experiencing a liquidity discount.

#### Investment funds: Surge in volatility amid constant liquidity concerns

In 2H15 heightened concerns across markets negatively impacted the EU investment fund industry. Compared to 1H15, performance declined for all types of funds, and dispersion between the different investment policies narrowed. Equity funds in particular suffered from the stock market correction over the reporting period before temporarily recovering, as their average monthly returns dropped to 0.96% (-0.40pp). They continued to outperform other funds, with fund returns ranging from 0.05% for bond funds to 0.26% for alternatives. Commodity funds continued to figure prominently, reporting negative performance (-1.82%) in the wake of declining commodity prices.



Market developments in August led to the highest level of volatility in years for equity and commodity funds (T.28). While still high, bond funds' return volatility was lower than for equity funds, reflecting the ongoing concerns regarding the bond market's potentially lower liquidity.



Assets under management for the entire EA investment fund industry followed market performance with a decline in 3Q15, before rebounding in October at EUR 10.5tn, with bonds, equity and mixed funds representing the bulk of the industry (A.95). Leverage was broadly stable across fund categories (A.98). Alternative investment funds increased their market share a little to 36% of EU investment fund volume, with UCITS representing 64% of the industry (A.96).

Fund flows decreased versus 1H15, falling to EUR 112bn in 2H15 (-51%). In a context of greater macroeconomic uncertainty, all funds investing in the US or in emerging markets experienced substantial outflows. Moreover, asset allocation between bond funds (EUR -10.9bn) market funds and money (EUR 30.3bn) was rebalanced. Flows into money market funds were nevertheless volatile, driving development of the sector during the reporting period (T.29).



EU bond funds saw outflows in all asset categories, with corporate and emerging bond funds picking up the bulk of the decline (T.30).



Sources: Thomson Reuters Lipper, ESMA,

EU Most strategies in the alternative investment funds sector recorded negative performance in 2H15. Although alternative investment strategies claim low correlation with standard asset classes, they were also affected by equity markets and fears of a global economic slowdown. The industry recorded a loss of 2.1% over the reporting period, with distressed debt (-4.6%), event driven (-5.8%) and relative value (-3.4%) strategies turning in the worst performances (A.112). Within the subcategory of alternative mutual funds, flow patterns were similar to other investment funds, with outflows from US funds and better resistance from EU funds (A.113). For all EA assets under management hedge funds, increased to EUR 306bn in 2H15 but remained markedly below their temporary spike of early 2015. This was probably related to changes in derivative positions in one member state. Accordingly balance sheet leverage was stable, around 1.37, but still noticeably below its early 2015 level (A.113).

Half of the EU money market fund industry is delivering returns close to zero or negative, as market rates have continued to decline. The average monthly rate of return (RoR) dwindled to 0.33% in 2H15 but was still above the 5Y average. This performance was driven by funds not denominated in EUR: US dollardenominated EU MMFs were among the best performing funds although their yields declined markedly to 0.9%, down from 1.7% in 1H15 (A.107). These particular developments were related chiefly to foreign exchange dynamics across economic regions, with the EUR stabilizing against major currencies after depreciating in 1H15, as expectations of monetary policy divergence were factored in. The weighted average maturity of MMF portfolios declined for most funds, even though some lengthened the overall maturity of their portfolio to maintain positive returns.

Compared to 1H15, MMFs recorded higher inflows (A.108). Flows were also concentrated, with nineteen funds attracting 50% of the positive flows. Assets under management stood at EUR 1.0tn at the end of 2015, of which half were invested in constant net asset value (CNAV) funds<sup>1</sup>.

On the regulatory side, IOSCO published its review of the regulation of MMFs<sup>2</sup>. This showed that the EU framework was compliant with IOSCO recommendations, taking into account both the 2010 CESR Guidelines and the 2013 EC Proposal for Regulation currently under discussion. EU jurisdictions in particular have in force requirements on the types of assets MMFs may invest in and the risks they may take, such as liquidity, maturity or credit risk. The CNAV feature of MMFs was also a key issue: where this feature is permitted, IOSCO acknowledged progress in addressing issues and risks associated with CNAV. However, pending the finalisation of EU regulation, it also asked for further measures to reinforce their resilience and their ability to face significant redemptions.

In 2H15, the performance of EU exchangetraded funds declined to 0.7%, driven primarily by the decline in equity markets but also by other asset classes, notably commodities. Performance distribution for the sector shifted with the mean and ranged from -2.7% to 2.0% (A.117). Like investment funds. ETFs

Fitch, "European MMF Quarterly", 16 November 2015.

<sup>2</sup> IOSCO, "Peer Review of Regulation of Money Market Funds: Final Report", September 2015.

experienced a dramatic surge in volatility in 3Q15, which reached its highest level in 3 years. The NAV of EU ETFs progressed by 4%, to EUR 425bn (A.119).

Considering their higher risk and reward profile, the best and the worst performing ETFs were leveraged funds investing in equity or commodities. To achieve their leverage ratio, these leveraged ETFs typically use total return swaps or futures. Their swap counterparties will in turn hedge these contracts, transmitting the rebalancing flows into markets. As a result, leveraged ETFs are not only exposed to higher liquidity risk by placing orders during a narrow window at the end of the trading day, but also to higher counterparty risk.

Increased volatilities fuelled ongoing financial stability concerns around fund liquidity. The combination of potentially lower market liquidity, unprecedentedly high volatility (T.28) and outflows challenges the EU fund industry's capacity to meet redemption needs at short notice. This is giving rise to concerns about a potential liquidity mismatch for funds that offer daily liquidity while invested in less liquid assets, notably fixed-income instruments. In the event that a run were to materialise, the resulting fire sales would spread risks through contagion across asset classes and other financial intermediaries. The IMF recently also indicated that larger holdings by mutual funds, in particular open-end mutual funds, are associated with more severe liquidity declines during stress periods.<sup>3</sup>

In this environment EU funds were nonetheless able to maintain their portfolio liquidity (T.31). In recent years they have tended to reduce the liquidity of their assets while increasing their maturity, presumably driven by search for yield incentives. However in 2015 most bond funds kept their liquidity risk profile stable by compensating for less liquid exposure with shorter maturity, and vice-versa. On the whole non-sovereign bond funds held the maturity of their holdings and the liquidity of their assets almost stable. In contrast corporate bond funds held less liquid assets but with shorter maturities. HY funds continue to be hallmarked by the low liquidity of their portfolios. Finally, loan funds' risk profile improved with a reduction in the maturity of their holdings, although in

relative terms they remained the most exposed to liquidity risk.



Despite the resilience of EU bond funds, the issue of fund liquidity still needs to be closely monitored. We observed a slight dip below its four-year average in the relative proportion of cash and cash-equivalent derivatives in corporate bond fund portfolios in 2H15, to 3.1% of their holdings (T.32). These cash holdings can be used in particular to supplement portfolio diversificaton when relatively illiquid assets are held. If this declining trend is confirmed it could potentially reduce the funds' capacity to meet redemption needs, especially if the underlying corporate bond market becomes less liquid.



Similarly, bond funds recently captured attention in the US. In December 2015, one large US high-yield bond fund announced that it would liquidate its portfolio and suspend redemptions. The fund manager considered that he could not meet redemption requests without selling assets at a discounted price and disadvantaging the remaining shareholders. This was the consequence of the intrinsic illiquidity of the fund holdings, such as corporate bonds rated below CCC or unrated, coupled with a low level of cash and other liquid assets.

<sup>3</sup> International Monetary Fund, "Global Financial Stability Report", October 2015.

US ETFs also attracted attention for similar reasons. On 24 August in particular, there was a breakdown between ETFs and their corresponding intraday NAV. Unlike other funds, ETF shares are traded like stocks on secondary markets. On primary markets, only "Authorized Participants" (AP) ensure that the value of the share traded on secondary markets does not vary significantly from its net asset value. This arbitrage mechanism allows ETF shares to be traded close to their NAV price. But ultimately the liquidity of ETFs still depends on the liquidity of their underlying assets, which can evaporate during market stress<sup>4</sup>, as happened on 24 August due to the stock market correction. Moreover, there is evidence that some US ETFs were still traded below their NAV several days after the event, thus incorporating a discount due to lower liquidity.

From a regulatory perspective, the first point to note in this context is that both UCITS and AIFMD are subject to various requirements in relation to liquidity management which are designed to avoid liquidity risks. The UCITS Directive requires liquidity to be ensured for all their investments and sets out specific rules for the eligibility of transferable securities, money market instruments and financial derivative instruments. At the management company level, rules on both risk and liquidity management must be observed. With respect to the AIFMD, the AIFM are obligated to put in place liquidity management requirements if they manage open-ended or leveraged closed-ended AIFs. This includes alignment of the fund's investment strategy, liquidity profile and redemption policy, as well as setting appropriate liquidity management limits and stress tests.

In the light of the above it is necessary to ensure that these regulatory standards are properly and consistently implemented and to develop more detailed guidance where needed. In addition the  $IMF^5$  considers that liquidity mismatches in the asset management industry should be mitigated, especially for funds that invest in relatively illiquid and infrequently traded assets but allow investors to redeem their shares easily. It recommends considering the use of tools that adequately price in the cost of liquidity, including minimum redemption fees, improvements in illiquid asset valuation, and mutual fund sharepricing rules. In that respect, international bodies such as the FSB and IOSCO are currently evaluating the role that existing or additional policy measures could play in mitigating potential risks and will make policy recommendations necessary. Such as recommendations would then provide the basis for common standards across jurisdictions, in particular in the EU.

## Retail investors: Sentiment affected by adverse market conditions



After a promising start to the year for retail investors, returns on their representative portfolios declined sharply during 2H15, eventually returning to their five-year moving average. This is due primarily to EU equity markets, whose decline was felt by retail investors either directly or indirectly through collective investment schemes. Additionally, retail investors were adversely impacted by other financial events, such as the bursting of the EM stock market bubble.

Reduced expectations for economic growth, if realized, may eventually affect retail investors' **gross disposable income**. Nonetheless, after the consistent drop in income witnessed since 2011 the trend has turned mildly positive, as the five-year moving average indicates.

<sup>&</sup>lt;sup>4</sup> ESMA, "Performance and risks of Exchange-Traded Funds", TRV 2 2014.

<sup>&</sup>lt;sup>5</sup> International Monetary Fund, "Global Financial Stability Report", April 2015.



Global macroeconomic events adversely affected **investor sentiment** and dampened expectations of an economic recovery in the EA by the end of 2015 – as can be seen from the downward trend in the EA future indicators.

T.35

Investor sentiment Sentiment moderately affected by markets



As for retail investors' **portfolio allocation**, they further increased their holdings of investment fund shares in 1H15. This can be explained by the funds' performance over the period compared to other assets, and also by their use as a vehicle for retirement savings. It is particularly true of funds characterized by longterm investment choices. In comparison the rate of growth in direct investment into equity decelerated compared to 1H14.



Retail investor **complaints** about the low quality or even lack of information provided to investors when they purchase financial instruments have declined in relative terms since 2H13, when they represented 61% of the total, a situation mainly due at that time to the default of banking institutions in two EU countries. However, complaints in this category still represent the first cause of complaints. Other important reasons for complaint are unauthorized business and incorrect or inappropriate execution of financial orders. On the positive side, these complaints can also be explained by investors' deeper knowledge and understanding of their own rights vis-à-vis the financial instrument provider.



Note: Complaints data by cause of complaint in % over the total. Data collected from NCAs, firms and Ombudsman of 27 EU countries (excluding CZ). Sources: ESMA complaints data collection by EU NCAs.



As far as the type of financial instrument is concerned, complaints focused chiefly on bonds and equities. More recently the share of complaints about derivative instruments has increased, reflecting the growing importance of more complex products in retail investor portfolios.



Note: Annualised growth rates of EA-18 households' real and financial assets, %. 5Y-MA: 5 years moving average of the growth rate. Sources: ECB, ESMA.

The value of both **household real and financial assets** is growing at a rate slightly above the five-year moving average, with financial assets growing at 6.3% during 1Q15 and real assets at 1.3%. This reflects positive developments on financial markets in 1H15 but does not reflect the reversal that occurred in 2H15.



EU households held EUR 32.9tn in financial assets and EUR 9.9tn in financial liabilities in 1Q15. The amount of financial assets continued to increase while that of financial liabilities was stable. As a result, the liabilities-to-assets ratio continued to head down, with a drop of more than 3.6 percentage points in the last two years, falling to 30% in the first quarter of 2015. Reasons behind the fall include a tight credit environment and the consequent low percentage of loans that banks grant to households.

## Infrastructures and services

In the second half of 2015, the share of trading via electronic order books on trading venues increased. For securities depositories, important regulatory reforms are under way, while three CCPs extended their activities to clear new classes of assets. This increasing importance and centrality of infrastructures and services makes their operational resilience and continuity crucial. Further improvements in financial markets governance have been observed, especially with regard to financial benchmarks and more accurate credit ratings.

### Trading venues: Increased share of electronic order books

Trading volumes continued their upward trend, notwithstanding the correction from the five-year high recorded in April 2015; much of this peak and subsequent correction was related to activity recorded in trade reporting facilities<sup>6</sup>. The share of equity transactions conducted via electronic order books stood at over 63% in November 2015. While this represents a rebound from less than 60% in June, it is on a par with the two-year average, which is significantly below the average of the five preceding years. On the other hand, just above 28% was reported to trade reporting facilities, which is 1.5 percentage points below the twoyear average. Having fallen to a low of 6.2% (down from 10% in March), the share of offorder book transactions climbed back to 7%. Dark pools retained a small share of 2.3%, above the two-year average (T.41).



#### T.42

#### **Circuit breakers**

Circuit Breakers (CBs) are market-based trading halts triggered by a potential price disruption and intended to avoid discontinuity in price movements. CBs can thus facilitate investor protection and help assure fairness in, and integrity of, markets. CBs can be split into two types: marketwide and stock-specific, depending on whether trading is suspended across an entire trading venue, or for a single, or several single securities. Regulation and market practices on CBs differ significantly between the EU and US.

In the EU, several trading venues implement stock-specific CBs; however, trading rules differ significantly from exchange to exchange, and the variety of CB calibrations makes it difficult to generalise standard market practices. On the regulatory side, MiFID II art. 48(5) requires "regulated markets to be able to temporarily halt or constrain trading if there is a significant price movement in a financial instrument on that market or a related market". As of today there is no mandatory reporting from trading venues on the parameters of CBs. Reporting will start in January 2017, when MiFID II enters into force. In this regard, ESMA is mandated to draft Guidelines on the appropriate calibration of CBs.

In the US, in 2012 the Securities and Exchange Commission (SEC) revised the market-wide CBs that halt the broad market at times of severe stress. CBs apply to stocks and to a list of exchange-traded products, including those that track broad-based stock indexes. Under these rules, cross-market trading halts occur when the S&P 500 falls 7% (Level 1), 13% (Level 2), and 20% (Level 3) from its previous closing price. The SEC has also introduced uniform CBs for individual stocks – limit up-down mechanism – that, depending on the stock price and when declines occur, halt the market for 5 or 15 minutes.

On 24 August 2015, market turmoil partly related to concerns about an economic slowdown in China caused stocks and ETFs traded on US trading venues to be halted more than 1,200 times. These trading halts may have helped avoid a flash crash. A total of 1,067 circuit breakers were triggered at NYSE while there were 165 at Nasdaq and three at BATS. Notwithstanding the presence of circuit breakers, ETFs showed "flash-crash"-style drops with the price falling up to 50% from the previous closing price, as investors sold their ETF shares at a deep discount to their NAV. ETF prices registered wider swings because of their unique structure. Like mutual funds, ETFs own a basket of investments. But they have the advantage of actively trading throughout the day. As stocks in the ETF basket were halted it became impossible to price the ETF itself. This pressured market makers, such as broker-dealers that facilitate trades. to sell ETFs at market orders (orders to sell without any restrictions as to price or timeframe such as market and stop-loss sell orders), thus fuelling price decline and triggering CBs.

<sup>&</sup>lt;sup>6</sup> FESE Statistics Methodology, September 2015: "Reporting transactions refer to trades reported through a Trade Reporting Facility (TRF) when only one counterparty provides information on the trade and offers dissemination services at the request of the reporting trader. The other counterparty could use this facility if reporting is mandatory."

In China, the China Securities Regulator Commission (CSRC) recently introduced a market-wide CB system which halts trading on the Shanghai and Shenzhen stock exchanges for 15 minutes whenever the CSI 300 Index moves up or down by 5% compared to the previous closing price and for the entire trading session if it moves by 7%. The CB rules entered into force on 1 January 2016. On the first day of trading after implementation (4 January 2016) market-wide CBs were triggered: Trading on the Shanghai and Shenzhen exchanges was halted for 15 minutes when the CSI300 index fell by 5% from the previous closing price and then for the rest of the day as the CSI300 index subsequently fell by 7%. On Thursday, 7 January 2016, CBs were triggered again and stock markets closed only 30 minutes after they had opened. In the evening of that day the CSRC suspended the CB rules, and the CSI 300 recovered 2% on the following day. This case highlights the complex dynamics and interaction between markets and trading rules in stress situations.

#### CCPs: Increasing coverage

Over the reporting period, three CCPs were granted an extension of authorisation by their competent authorities. Eurex Clearing AG, first authorised in April 2014, was re-authorised to also clear OTC Inflation Swaps. BME Clearing, originally authorised in July 2015, now extends its activities and services to clear OTC interest rate derivatives and some cash equities both on OTC and Regulated Markets. Finally, CME Clearing Europe has been authorised to extend its activities and services to clear short-term interest rate futures (STIRs) and deliverable swap futures (DSFs). Globally, the share of OTC interest rate derivatives cleared increased for all asset classes except FRAs and in November for OIS where important non-cleared positions were taken (T.43). Global IRS volumes reported to the Depository Trust and Clearing Corporation decreased by USD 46tn over the reporting period.



#### **CSDs: Volatile activity**

ESMA approved the last set of Technical Standards related to the Regulation of Central Securities Depositories (CSDR) in January 2016. These Technical Standards, which aim at harmonising CSD requirements in the EU, cover the cooperation requirements among authorities, requirements concerning recognition of thirdcountry CSDs, requirements on risk monitoring tools, record keeping, investment policy or reconciliation measures, and requirements regarding non-discriminatory access to CSDs by market participants, including issuers, CCPs, trading venues or other CSDs. Finally, the TS include requirements on how to report internalised settlements (for securities transactions settled outside securities а settlement system) as well as on settlement discipline.

Settlement activity, as measured by the total value of settled transactions, remained dominated by government bond transactions in the EU. The activity for this asset class was more volatile over the reporting period. This followed a spike at the end of June 2015, a period corresponding to the highest point reached by EU sovereign yields, notably Greek government debt, during the summer (A.27). Since then, there has been a gradual reduction in bond activity (T.44). In the longer run, settlement activity was stable, with the annual value of settlement instructions processed by EU CSDs in 2014 quite similar to the amount settled in 2013 (A.144).



The share of transactions for which settlement failed was lower for government bonds than for equities and corporate bonds, with the former still under 2% (T.45). Nevertheless, the share of failed settlements was more volatile for all categories of assets from end-1H15.



## Credit rating agencies: Stable ratings accuracy

In an environment of low interest rates and mixed liquidity conditions on bond markets, credit rating agencies fared relatively well during 1H15 in terms of the discriminatory power of their credit ratings (as measured by Accuracy Ratios). In the short term (one year), Accuracy Ratios depicted the overall solid performance of ratings across asset classes. The ratio for financial corporates (90.8%) was the highest in the last period, followed by non-financials (90.1%) and structured finance (82.5%) (T.46). This reflects the fact that structured finance instruments have a relatively higher tendency to experience defaults in higher rating classes, but also that the overall default frequency is higher. In contrast, defaults of financials and nonfinancials have been scarce.



Note: Cumulative accuracy profile (CAP) coefficients measure the accurancy of ratings. The coefficient is derived from average defaulter position (AP), then computed as follows: CAP = 2\*AP-1. The closer the coefficient is to 1, the higher the accuracy of the ratings (i.e. defaults occur among low credit ratings). Sources: CEREP, ESMA.

The longer the time horizon, the lower the AR typically is. This is well reflected by the five-year cumulative accuracy profile (CAP)<sup>7</sup> for the same

asset classes (T.47). The corresponding five year AR for non-financial corporates, financials and structured finance is 65.4%, 53.5% and 70.4% respectively. The shape of CAP and low value of AR for financials is driven by the high incidence of defaults in the highest rating classes over the time horizon. Similarly, the overall solid performance of non-financial corporate ratings is negatively impacted by a small number of highly rated defaults recorded by one rating agency.

T.47 Rating accuracy Driven by low default frequency



Note: Cumulative accuracy profile (CAP) curves for the 3 largest credit rating agencies. 2H10-1H15. The CAP curve plots the cumulative proportion of issuers by rating grade (starting with the lowest grade on the left) against the cumulative proportion of defaulters by rating grade. Sources: CEREP, ESMA.

## Financial benchmarks: Enhanced governance

The continuity of financial benchmarks in the EU remained a key concern in 2H15. Administrators of key reference rates made significant progress in enhancing governance, quality, methodology and accountability of their benchmarks. The legislative process on an EU legal framework for benchmarks is ongoing (T.51). In 2H15, the European Parliament and Council were negotiating a draft EU law aimed at improving administrator governance and methodologies, which will introduce for the first time EU-wide direct supervision of administrators of benchmarks such as interbank reference rates and other indices. The European Money Market Institute (EMMI), i.e. the international association providing Euribor and Eonia, has enhanced the Euribor control framework, as described in the revised Code of Conduct

<sup>&</sup>lt;sup>7</sup> Cumulative Accuracy Profile (CAP) is a measure of a rating scale's rank-ordering capability. Each CAP has a corresponding Accuracy Ratio (AR) which measures the area between the CAP and a "random" curve (a 45)

degree line). For the purpose of gauging credit rating agencies' (CRAs) operational efficiency, 5-year CAP and 1-year AR for three asset classes (non-financial corporates, financials and structured finance) are presented. Importantly, the reliability of both measures is highly dependent on default occurrence. For small default samples the measures may be statistically insignificant. By extension, it is not possible to estimate CAP and corresponding AR for asset classes with no default history.

published in October 2015. The EMMI launched a consultative position paper on the evolution of Euribor with the objective of developing and evaluating a transaction-based benchmark determination methodology, to be introduced in July 2016.

Meanwhile, in the EU and elsewhere, investigations into potential manipulations of interbank interest reference rates, derivatives prices, oil price benchmarks and exchange rates are ongoing. Authorities also monitor submission patterns to address data quality concerns. As regards the contributors to the Euribor panel, one contributor ceased to act as a submitter in the reporting period. The panel is now composed of 23 banks (T.48).



The **dispersion** of quotes submitted for the calculation of Euribor remained broadly stable in 2H15. In the reporting period the maximum difference was observed in the three-month and six-month tenor (T.49).



contribution submitted by panel banks and the corresponding Euribor rate. The chart shows the maximum difference across the 8 Euribor tenors. The increase since 2013 is linked to technical factors such as low Euribor rates. The spike in August 2014 reflects the fact that two panel banks submitted respectively a quote for the two-week tenor which was 7 times higher than Euribor and a quote for the 1M tenor which was 10 times higher than Euribor. Sources: Euribor-EBF, ESMA.

Enhanced governance and submission rules at administrator and panel bank level may offer some assurance that the quality and reliability of contributions has nevertheless improved. For the calculation of Euribor, the calculation agent eliminates the top and bottom 15% of submitted rates in order to reduce the impact of an outlier submission. The gap between the actual Euribor and the non-trimmed average rate for the threemonth tenor increased slightly at the beginning of 2H15 before decreasing in December. However, no spikes were observed in the reporting period (T.50).



On average in 2H15, 81% of banks decided to keep to their previous-day submission, while 5% decided to raise their quote and 14% chose to lower it. Overall, the reporting of lower rates from day to day in 2015 translated into a marked decrease in the levels of the three-month Euribor. Finally, in 2H15 the three-month Euribor continued lower than the ECB interest rate for main refinancing operations (A.150).

T.51

Reform under-way

EU legal framework for benchmarks

The development of an EU legal framework for benchmarks is in progress. The September 2013 EU Commission "Proposal for a Regulation on indices used as benchmarks in financial instruments and financial contracts" states that:

- benchmark administrators should be regulated, and supervised by national competent authorities, and, for critical benchmarks, by colleges of national supervisors;
- all entities calculating benchmarks or contributing information used in their calculation should be required to tighten up their governance and scrutiny procedures, in particular to prevent conflicts of interest;
- data for the calculation of benchmarks would have to be publicly available, as well as information on the intended purposes of each benchmark measure;
- banks would have to assess the suitability of the benchmarks they use before entering into any financial contract, such as a mortgage.

The European Parliament and the Council engaged in trilogue negotiations in 2H15 towards a final agreement and adoption of the Regulation. Preliminary political agreement between the European Parliament and the Council was reached on 24 November 2015. Publication in the Official Journal of the EU is expected in 2Q16

**Risks** 

## **ESMA Risk Dashboard**



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 is based on quantitative indicators and analyst judgement.

Our 4Q15 risk assessment remains materially unchanged from the previous quarters. Systemic stress remained high, driven by the materialisation of key risks in emerging markets, in particular China. A low interest rate environment still prevails in the EU, with low December EA inflation numbers and the continued downward trend in commodity market prices. The increased difference in yields across rating classes indicating a higher credit risk premium could also signal an end to yield compression. This, in an environment of still-high return volatility and increased interconnectedness in the fund sector, together with potentially thin liquidity on some more vulnerable markets, could amplify the risk of a reversal in global risk premia.

#### **Risk summary**

Risk levels in the markets under ESMA remit remained high, reflecting elevated risks for investors, infrastructures and services, and the financial system at large, as well as very high risks in securities markets. We continue to consider market risk very high, following materialisation of the valuation risk. Our credit risk assessment remains unchanged at very high levels. While still at a lower level, liquidity risk is under scrutiny due to ongoing concerns about the reduction of liquidity provision on bond markets, while contagion and operational risk remain unchanged at high and elevated, respectively. Key risk sources remain uncertainty with respect to emerging market developments, in particular China; continued on commodity downward pressure prices, especially oil; and sustained pressure on commodity-export-oriented emerging economies, reinforced by potential weaknesses in market functioning. Subsequent price movements and volatility on EU or US equity markets reflected this anxiety.

**Systemic stress** decreased at the beginning of 4Q15, following the elevated sovereign debt and equity market tensions in 3Q15, to return to 2Q15 levels.



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**

The

environment: Macroeconomic macroeconomic environment in the EU was mixed in 4Q15 with, for example, low industrial production in some core Member States and lower-than-expected inflation in December. On the other hand, the European Commission's Sentiment Indicator Economic improved markedly in the EU at the end of the reporting period and growth seemed to be back on a positive trend in some peripheral countries. Internationally, employment figures in the US were good at the end of the reporting period; despite disappointing news from the manufacturing sector, this increases the probability of a gradual rise in interest rates following the Federal Reserve's December decision to increase rates for the first time in nearly a decade. Uncertainty around emerging market developments persisted, notably with equity price swings, low growth prospects in China and spillovers to other markets. Low commodity prices also heavily impacted global financial markets, due chiefly the to on energy corporates repercussions and commodity-exporting emerging market countries. The EUR exchange rate held stable in 4Q15 versus the USD, GBP, and CHF, but slightly less so against a basket of emerging market currencies including CNY, IDR, MXN, RUB and TRY, against which the EUR gained around 10%.

Low-interest rate environment: In December the Federal Reserve raised its Federal Funds Rate to 0.5%, ending -a long-lasting near-zero costof-borrowing policy. Good employment figures are driving expectations that US interest rates will gradually be increased in 2016. In the EA, low inflation in December, coupled with the continued EUR 1.1tn bond buying programme, confirmed expectations of a prolonged low interest rate environment. This was illustrated by low sovereign risk premia and price earnings ratios in the EA close to their long-term average. In this environment of continued search for yield, potentially low secondary-market liquidity could still harbour the risk of a sudden reversal in global risk premia.

EU sovereign debt markets: Following the tensions fuelled by uncertainties around EU sovereign debt developments in 3Q15, the situation improved from August after agreement was reached with Greece on an overall EUR 85bn bailout package and the successful release of the first tranches. Most of the emergency capital market measures were totally

or partially lifted towards the end of 4Q15. But tensions around public debt were still present on EU markets amid low growth prospects in some core countries and persistently low inflation in an environment of still-high EU sovereign debt levels.

Funding patterns: Issuance was stable, if not indeed higher, over the reporting period compared to 4Q14. HY issuance remained the same as in 3Q15, at EUR 12bn, although it was still up on the EUR 8bn issued in 4Q14. IG issuance also remained unchanged and issuance of sovereign debt in the EU amounted to EUR 240bn, somewhat lower than the EUR 273bn in 3Q14 but similar to issuance in the same year-earlier period (EUR 242bn in 4Q14). Covered bond issuance was sustained at EUR 37bn, slightly below the EUR 43bn issued in 3Q15 when a large number of deals in the covered bond primary market led to an increase in the issuance of covered bonds, but still well above the EUR 26bn issued in 4Q14 (R.14). Investment funds increased their leverage ratios for bond funds and held them stable for other fund types, while volatilities in returns within almost all segments fell from the 3Q15 peak (R.22) related to the spillovers from equity market price swings in China.

Market functioning: Resilience in systems remained a key concern following market disturbances in the US after the Chinese market crash, notably the mispricing of several ETFs. More recently, newly established trading halt facilities for Chinese securities markets were suspended by local authorities amid volatile trading and high uncertainty. Market circuit breakers were called into question in China as analysts and investors argued that they might have amplified losses during market turmoil. In a different context, the lifting of the emergency capital market measures adopted by Greece in 3Q15 was implemented without any relevant effects on EU markets outside Greece. However, due to ongoing recapitalisation processes the short selling ban was still partially in place until the end of 4Q15 on shares of at least one credit institution admitted to trading on the Athens Exchange and the Multilateral Trading Facility of "EN.A" (Alternative Market of the Athens Exchange). This also affected all depository receipts (ADRs, GDRs) representing those shares.

#### **Risk categories**

Market risk – very high: After a market correction in 3Q15, notably in the EU in the wake of the Chinese stock market crash, volatility held the high levels reached in 3Q15. Price-earnings ratios remained around their historical average in the EA despite the equity market price correction and were well above these averages in the US (R.5). In EU sovereign bond markets risk premia decreased from the two previous quarters (R.8). Implied bond market volatilities increased further in 4Q15, after having fluctuated around already high levels in 3Q15 (R.6). Although the increase is amplified by the fact that short term interest rates are very low, this is nevertheless a sign of expected uncertainty over future price developments. These movements were also related to concerns over low secondary market liquidity. Commodity markets were very volatile, reaching historical lows as Brent Crude fell below USD 40 per barrel and copper and aluminium traded at a sixyear low. Sliding oil prices eventually translated onto global financial markets through their direct impact on energy corporates and energydependent countries, and also due to the fear of negative second-round effects and their impact on growth. Finally, USD-EUR exchange rate volatility peaked around the Fed's December committee meeting, when rates were raised for the first time in nearly a decade (R.7).

Liquidity risk - high: Liquidity pressures were still high in 4Q15 although the equity illiquidity index remained around its long term average (R.4). Sovereign bid-ask spreads decreased slightly for most reported countries and returned to end-2014 levels (R.9). Corporate bond spreads, having peaked towards the end of 3Q15, were also stable, although at a relatively high level. Nevertheless, the difference in yields across rating classes indicates a higher credit risk premium than during the first half of the year (R.11). Various market participants are reporting a structural reduction in liquidity provision on corporate bond markets, rendering them more vulnerable to liquidity shocks than other markets, but unequivocal evidence is scarce. Finally, with the exception of real-estate funds return volatility for funds was still high (R. 22), which could exacerbate market liquidity tensions.

Contagion risk – high: Sovereign market clustering increased at the beginning of 4Q15

only to decrease towards the end of the reporting period without having reached the highs of the previous quarters, while the dispersion in yield correlations also decreased, potentially reflecting a change in the coreperiphery structure of the EU sovereign market (R.12). The intra-country correlation between sovereign and corporate bonds entered negative territory at the beginning of 4Q15, returning to positive levels towards the end of the reporting possibly signalling period, improved diversification potential in securities markets (R.13). In the hedge fund sector, intra-sector contagion between hedge funds remained low, both for funds balancing the sector's performance trend and for those reinforcing it (R.26).

Credit risk - very high: Gross sovereign debt issuance contracted in 4Q15. In non-sovereign markets, issuance decreased for MBS, covered bonds and hybrid capital, held broadly stable for high-yield and investment grades and increased only for ABS. However, net sovereign debt issuance started to accelerate again at the beginning of 4Q15 to end up positive over the reporting period (net calculated as the difference between new issuance and outstanding debt maturing over the same period). Fund sector volatilities, having peaked at the end of 3Q15, returned to lower levels, while leverage remained high for the fund industry. This gave rise to unease, especially in an environment of continued search for yield. Finally, concerns were raised that declining oil prices might increase the probability of default for all corporates in to the energy sector.

Operational risk – elevated: Operational risk, including technology and conduct risks, remained a key concern both within and outside the EU, as several events reignited disquiet over potential technology fragilities in the financial system during the previous quarters. The level of dispersion in 3M Euribor submissions fell slightly in 4Q15 while investigations into financial benchmark manipulations, including interbank interest reference rates, derivatives prices, oil price benchmarks and exchange rates, continue both in the EU and elsewhere.

Sources: Thomson Reuters Datastream, ESMA

## **Securities markets**



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



Sources: Bloomberg, ESMA



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

#### R.12







■ 10% ■ 90% ◆ Current ● Median Note: Growth rates in issuance volume in per cent normalised by standard deviation for the following bond classes: sovereign (Sov); money market (MM); covered bonds (CB); investment grade (IG); high-yield (HY); asset backed securities (ABS); mortgage backed securities (MBS). Percentiles computed from 110 rolling window. All data include securities with a maturity higher than 12M. Bees deate the recent functione batware the 10th end 00th appreciation 18M. Bars denote the range of values between the 10th and 90th percentiles Sources: Dealogic, ESMA





AAA AA - A BBB Note: EA non-financial corporate bond spreads by rating between IBoxx non-financial corporate yields and ICAP euro euribor swap rates for different maturities, basis points. Sources: Thomson Reuters Datastream, ESMA.

#### R.13

Dispersion in sovereign-corporate yield correlation. Lower correlation



Positive net issuance



200

160

120

80

40

-40 0 ■1Y high 1Y low • 15Q4 Note: Quartely net issuance of EU sovereign debt by country, EUR bn. Net issuance calculated as the difference between new issuance over the quarter

and outstanding debt maturing over the quarter. Highest and lowest quarterly net issuance in the past year are reported. EU total on right-hand scale. Sources: Dealogic, ESMA. R.17

Hybrid capital issuance and outstanding Lower issuance



Note: Outstanding amount computed as the cumulated sum of previously issued debt minus the cumulated matured debt prior to reference date. EUR bn Sources: Dealogic, ESMA.

R.19





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



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

## Investors



Note: Assessment of main risk categories for markets under ESMA remit since past quarter, and outlook for current 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.24

Retail fund synthetic risk and reward indicator Highest risks in the commodity and equity fund segments



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.

#### R.26

Hedge fund interconnectedness Low levels of interconnectedness



Note: Systemic stress indicator based on products of fractions of regressions with positive (negative) estimated coefficient individual fund return's impact on average return of sector significant at 99% level and respective average estimators. Coefficients stem from VAR models regressing individual fund returns on lags and council foregoing and the individual fund returns on lags and council foregoing and the individual fund returns on lags and council foregoing and the individual fund returns on lags and council foregoing and the individual fund returns on lags and council foregoing and the individual fund returns on lags and council foregoing and the individual fund returns on lags and council foregoing and the individual fund returns on lags and foregoing and the individual fund returns on lags and foregoing and the individual fund returns on lags and foregoing and the individual fund returns on lags and foregoing and the individual fund returns on lags and foregoing and the individual fund returns on lags and foregoing and the individual fund returns on lags and foregoing and the individual fund returns on lags and foregoing and foregoing and for foregoing and forego general financial markets indices. Measures aggregated across individual regressions. Data until November 2015. Sources: Barclayhedge, Eurekahedge, TASS, HFR, ESMA.

## **Infrastructures and services**

R.27

**Risk** level

#### **Risk summary**

Risk change from 3Q15

Outlook for 1Q16



#### **Risk drivers**

- Operational risks, incl. insufficient technology management, cyber-attacks.
- Conduct risk, incl. intentional or accidental behaviour by individuals, market abuse.
- Systemic relevance of individual operations, including size, market share, complexity of operations, interconnectedness with other infrastructures or financial activities and entities, substitutability of systems.

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



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. The increase since 2013 is linked to technical factors such as low Euribor rates. The spike in August 2014 reflects the fact that two panel banks submitted respectively a quote for the two-week tenor which was 7 times higher than Euribor and a quote for the 1M tenor which was 10 times higher than Euribor. Sources: Euribor-EBF, ESMA.

#### R.32

Euribor - Dispersion of submission levels Decreased dispersion towards end-4Q15





Note: Share of failed settlement instructions in EU; % of value, 5D-MA. Free-ofpayment transactions not considered. Sources: National Competent Authorities, ESMA.

#### R.31

#### Euribor – Variation in daily changes Peak in rate reductions



Note: Number of banks changing their three-month Euribor submission from day to day, %. Sources: Euribor-EBF, ESMA.

#### Rating changes

R 33



## Vulnerabilities

## Investor protection MREL/TLAC requirements

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This article analyses the Minimum Requirement for Own Funds and Eligible Liabilities (MREL) and the Total Loss-Absorbing Capital (TLAC) requirements for banks. These bail-in tools will complement the prudential requirements and contribute to absorb losses in case of failure. They may also pose issues in terms of the consistency of rules within and across jurisdictions and transparency around the securities that will be considered eligible, the trigger levels for conversion or write-off and the setting of the Point of Non-Viability (PONV). Investors should thus undertake a careful investment analysis that considers the liability profile of the banks, the MREL/TLAC requirements and the local Resolution Authority's discretionary powers. For their part, regulators should strive to provide investors with as much transparency as is possible without undermining the Resolution Authority. Similarly, consistency in approaches to the 'what' and 'when' across jurisdictions will make the investment analysis more robust.

#### Background

In the aftermath of the financial crisis, global financial regulators determined to adopt a more robust position on financial institutions' capital. A key pillar of the approach is the Basel III Accord, which was approved in 2011 and is to be implemented between 2013 and 2019. The Accord's aim is to ensure that banks have sufficient resources to withstand times of financial distress through strengthening bank capital requirements by increasing bank liquidity and decreasing bank leverage. The renewed capital requirements are further articulated through required common equity Tier 1 and capital buffers, while complementary liquidity and leverage ratios have been introduced. Within the EU, the Accord is implemented through CRD IV<sup>2</sup> and CRR<sup>3</sup>, which transpose the capital requirements into EU law.

Additionally, the EU approved in 2014 the Banking Recovery and Resolution Directive (BRRD)<sup>4</sup>, which entered into force on 1 January 2016. It contains policy on how Resolution Authorities are to resolve a bank once it is threatened with failure and establishes a set of common tools available to European authorities to deal with failing institutions. The tools designed are fourfold: the sale of business, the bridge institution, the asset separation and the bail-in tool. The focus of this article is the bail-in tool.

The criteria for determining the Minimum Requirement for Own Funds and Eligible Liabilities for bail-in are called MREL. With the MREL, European authorities seek to ensure that banks have enough liabilities to absorb losses in case of failure, and therefore shareholders and creditors will shoulder much of the recapitalisation burden instead of tax-payers, as was the case with earlier bail-outs.

Additionally, the Financial Stability Board (FSB) has finalised<sup>5</sup> its Total Loss-Absorbing Capacity (TLAC) requirement for 30 (16 of which are European) Globally Systemically Important Banks (G-SIBs). The TLAC requirement needs to be viewed in complement to the MREL. The intent of TLAC is to limit the probability and impact of the failure of a large globally systemically important financial institution on financial stability, i.e. to put an end to the "too-big-to-fail" phenomenon.

There are a number of reasons for analysing MREL and TLAC together. First, MREL and TLAC have a similar objective, namely to ensure that banks have sufficient capital to continue functioning in times of financial distress. Second, the TLAC requirement applies to a subset of banks subject to MREL and can be viewed as a still tighter version of MREL requirements. Third, as banks prepare for MREL requirements, that

<sup>&</sup>lt;sup>1</sup> This article was co-authored by Patrick Armstrong and Livia Polo Friz.

<sup>&</sup>lt;sup>2</sup> Directive 2013/36/EU.

<sup>&</sup>lt;sup>3</sup> Regulation (EU) No 575/2013.

<sup>&</sup>lt;sup>4</sup> Directive 2014/59/EU.

<sup>&</sup>lt;sup>5</sup> <u>http://www.financialstabilityboard.org/2015/11/tlac-press-release/</u>
subset of banks must at the same time prepare for TLAC, which is effective as from 2019. As a result, when determining their financing needs G-SIB banks need to take both MREL and TLAC requirements into consideration, as they issue securities which comply with both requirements.

ESMA is interested in the topic from the investor's standpoint. We recognize that bail-in tools are a necessary departure from tax-payerbased bank bail-outs and will help to ensure that the banks have enough liabilities to absorb losses in case of failure. However, these new instruments also have implications that investors should be aware of. They may pose issues in terms of consistency of implementation across jurisdictions and transparency around the securities which will be considered eligible for bail-in. Investors must be cautioned to undertake a careful investment analysis that considers both the liability profile of the institution and also relevant MREL/TLAC requirements, localized jurisdictional requirements and discretionary powers. For their part, regulators should strive to provide investors with as much transparency as to what will be eligible collateral and when it will be called upon, as is possible without undermining the Resolution Authority.

# Banking Recovery and Resolution Directive: The bail-in tool

In order to prevent the circumvention of bail-in rules and to avoid contagion effects, the BRRD defines some minimum funds<sup>6</sup>, i.e. the MREL, which each bank will need to hold and which will be deemed eligible for bail-in if necessary. They will be set on a case-by-case basis. The rationale is that banks need always to have sufficient loss-absorbing capacity, i.e. bail-in-able capital.

The bail-in tool applies to failing or likely-to-fail EU institutions. As outlined above, according to the Directive such firms must cover losses to their required capital levels with at least 8% of the total liabilities (debt and equity). The Directive calls for the establishment of a resolution fund to act as a back-stop to bail-in. The resolution fund will be set up in each country so that by 2025 it reaches 1% of all covered deposits of all the credit institutions authorized in that country. In order to reach the target level, banks will have to make annual

contributions based on their liabilities (excluding own funds and covered deposits) adjusted for risk<sup>7</sup>. Banks may request resolution financing from the resolution funds during the bail-in phase only after 8% of total liabilities including own funds has been bailed in. As an additional safeguard to contain losses, the resolution fund contribution may not exceed 5% of the total liabilities. Bail-in potentially applies to any liabilities not backed by assets or collateral, unless explicitly excluded in the BRRD<sup>8</sup>. Resolution Authorities may, under exceptional circumstances, decide to exclude other liabilities based on a case-by-case analysis<sup>9</sup>.

The introduction of the resolution tools envisaged in the BRRD provides national authorities with common powers and instruments to anticipate bank crises and resolve financial institutions in an orderly manner if a failure occurs, while at the same time ensuring the continuity of essential bank operations and minimising taxpayers' exposure to losses<sup>10</sup>.

BRRD aims to ensure that banks will be safer, as they will have committed resources available to restore eventual losses. For investors, however, the possibility of being bailed in raises some issues with regard to transparency of the actual risk, the probability of being subject to bail-in, and the consistency of rules within and across jurisdictions.

### Features of MREL and TLAC

For the 16 European G-SIBs, the MREL requirements will have to be evaluated together with the TLAC regulations. MREL and TLAC have been set up to pursue a similar objective, that is to ensure that banks are endowed with sufficient internal resources to compensate potential losses and to continue functioning in case of distress, without resorting to public funds (as was the case with bail-out). However, MREL and TLAC also differ in a number of ways.

- <sup>8</sup> See Article 44(2) of Directive 2014/59/EU.
- <sup>9</sup> See Article 44(3) of Directive 2014/59/EU.
- <sup>10</sup> European Council PR 9510/14.

<sup>&</sup>lt;sup>6</sup> See Article 45 of Directive 2014/59/EU.

<sup>&</sup>lt;sup>7</sup> <u>http://www.consilium.europa.eu/uedocs/cms\_data/docs/p</u> ressdata/en/ecofin/142492.pdf

- MREL is an EU legal requirement, while TLAC rules are proposed by the Financial Stability Board<sup>11</sup>.
- TLAC regulates a subset of the institutions regulated by MREL, that is, the G-SIBs.
- MREL does not impose any public disclosure requirements, while TLAC does so at the legal entity level.
- Whereas the level of MREL is bank-specific, banks defined as G-SIBs under TLAC will be required to have bail-in-able debt in the order of at least 16% of Risk-Weighted Assets (RWAs) in 2019 and at least 18% of RWAs in 2022<sup>12</sup>. In practice, as evident in Charts V.1 and V.2, the two metrics are similar, since the level of RWAs is a fraction of total assets.
- MREL does not impose additional leverage requirements, whereas TLAC requires G-SIBs to hold at least twice the Basel III Tier 1 leverage ratio requirement, that is, at least 6% by 2019 and at least 6.75% by 2022.
- Finally, MREL potentially applies to all instruments which satisfy the following conditions: "the instrument is issued and fully paid up, the liability is not owed to, secured or guaranteed by the institution itself, the purchase of the instrument was not funded directly or indirectly by the institution, the liability has a remaining maturity of at least one year" and "the liability does not arise from a derivative or (...) a deposit which is preferred in the national insolvency law"13. On the other hand, liabilities eligible for TLAC must: "be paid in, be unsecured, not be subject to set off or netting rights that would undermine their loss-absorbing capacity in resolution, have a minimum remaining contractual maturity of at least one year or be perpetual, not be redeemable by the holder (i.e. not contain an exercisable put) prior to maturity<sup>14</sup>.

<sup>13</sup> See article 45(4) of Directive 2014/50/EU.



Bail-in requirements Minimum 8% of total assets



Note: Percentages of Risk-Weighted Assets (RWAs). The combined buffer is given by the sum of the capital conservation buffer (2.5%), the countercyclical capital buffer (0-2.5%) and the higher of systemic risk, G-SII and O-SII buffers (0-5%) for a total between 2.5% and 10%. Pillar 2 can be above 2%. Sources: BIS, ESMA.

V.2 TLAC requirements 16% of RWA in 2019



Note: Percentages of Risk-Weighted Assets (RWAs). The FSB has established that TLAC capital will have to be at least 16% by 2019 and 18% by 2022. As to the leverage ratio, it will have to be at least 6% by 2019 and at least 6.75% by 2022. Source: ESMA.

# National initiatives for MREL/TLAC eligibility

Even though they formally involve the globally largest banks, the new prescriptions are expected to have a wide reach in terms of the set of banks which can potentially be required to improve on their capital. Several national initiatives to adapt to the new rules on MREL/TLAC requirements have already taken place in EU countries and others are ongoing. National authorities must choose a strategy to determine which instruments will be considered eligible for bail-in and the order of loss absorption in case of insolvency or failure. However, they do have a certain degree of discretion in terms of the possible approaches.

One key feature to be determined is the ranking of senior unsecured debt in national insolvency law. Standard capital prioritization views

<sup>&</sup>lt;sup>11</sup> The FSB is an international body established by the G-20 in 2009 which monitors and makes recommendations on the global financial system.

<sup>&</sup>lt;sup>12</sup> <u>http://www.financialstabilityboard.org/2015/11/tlac-press-release/</u>

<sup>&</sup>lt;sup>14</sup> <u>http://www.financialstabilityboard.org/2015/11/tlac-press-release/</u>

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subordinated debt as junior to senior debt, which means that, in the case of a bail-in, it would have to be written-down earlier than senior debt. However, for TLAC purposes, part of the senior liabilities will have to be made TLAC-eligible. In addition, the general principle is that if a liability ranks pari passu with non-eligible TLAC liabilities, then it cannot also be TLAC-eligible (No Creditor Worse-Off principle).

At a general level, debt can be subordinated in three different ways: structurally, contractually and statutorily.

- First, the structural approach envisages the issuance of MREL/TLAC eligible debt through a holding company ('HoldCo'), either already in existence or newly created. The downside to this approach is that it increases the firm's structural complexity.
- Second, contractual subordination refers to the issuance of Tier 2 capital. In this approach, compliance with MREL/TLAC would be ensured by simply increasing total capital. The main advantage is that Tier 2 has regulatory capital recognition and the instruments are already present and known in the market. However, Tier 2 issuance is the most expensive option for banks and can affect spreads across asset classes for relative pricing reasons. An alternative contractual approach is for the bank to issue Tier subordinated debt (potential 3 instruments) ranking between traditional Tier 2 and senior debt. This would be cheaper than traditional Tier 2, but would add complexity to the capital structure.
- The third and final approach would be the one, whereby the statutory national insolvency law would allow senior debt to be MREL/TLAC-eligible. This would be the least expensive option, since TLAC-eligibility could apply retroactively if the national law allows it and banks may potentially use existing stocks of debt. Criteria for the bail-in-ability of senior debt will depend on national regimes. The main risk associated with this scenario is lack of clarity, since senior debt would be statutory but not contractually subordinated. Moreover, certain bank treasuries would not be able to purchase bail-in-able senior debt, since G-SIBs' claims on other G-SIBs' TLAC must be deducted from their own TLAC or regulatory capital.

At the European level, two of the approaches described above are predominant, namely the

structural and the statutory one. The structural approach is that adopted by the United Kingdom and Switzerland, where G-SIBs have started issuing senior debt through HoldCos, which can be bailed-in before the OpCo in the case of failure. The statutory approach is the one being adopted by France, Germany, Italy and Spain, where changes in national laws are allowing senior debt to be bail-in-able. The estimated capital shortfall for European banks varies widely. In 2015, for a sample of 64 banks (14 of which are G-SIBs) the EBA estimated that if all senior unsecured debt (with maturity above one year) and uncovered deposits were feasibly and credibly loss-absorbing, with an MREL threshold at 8% of total liabilities and equity seven banks would have a shortfall of EUR 13bn. If, on the other hand, only equity and subordinated debt are deemed eligible, the MREL shortfall is estimated to reach around EUR 510bn across 47 banks<sup>15</sup>.

To date, the European market remains heterogeneous in terms of issuance. We observe issuance of Tier 1 instruments coming to market with different trigger levels, write-down mechanisms, notional size, credit ratings and listing venues. As shown in Chart V.3, Tier 1 issuance totalled EUR 72.2bn between October 2013 and October 2015, while Tier 2 issuance reached EUR 117.8bn in the same period. The so-called Tier 3 instruments have not yet been issued.



<sup>15</sup> http://www.eba.europa.eu/documents/10180/1132900/E BA-RTS-2015-05+RTS+on+MREL+Criteria.pdf

#### Impact on investors

Lack of transparency with regard to the known Point of Non-Viability or trigger point. The Resolution Authority cannot know in advance the exact circumstances in which an institution approaches non-viability. There may be a wide variety of circumstances or events, both exogenous and endogenous, which bring about failure. For that reason, forecasting in advance the exact terms under which the Resolution Authority will take action is difficult at best. This creates uncertainty for investors as to the precise conditions within which the Resolution Authority will declare non-viability and bail in the instrument. Investors must appreciate this risk before undertaking such investments.

Lack of consistency with regard to to the terms of the MREL within a jurisdiction. The Resolution Authority will determine eligible capital for the MREL on a case-by-case basis depending on the characteristics of a given institution. Consequently, there is no set required common minimum MREL. From an investment standpoint, this may make comparison of the risks across a given jurisdiction challenging.

Lack of consistency with regard to the terms of MREL across jurisdictions. As explained above, bail-in potentially applies to any of an institution's liabilities not backed by assets or collateral, unless explicitly excluded in the BRRD. The Resolution Authority has the discretion, in the interest of financial stability, to exclude certain additional liabilities from the list of bail-in-able securities. For example, the approach taken by France, Germany, Italy and Spain differs from that adopted by the UK and Switzerland. In the former, legislation has been drafted to allow existing debt instruments to be made bail-in-able. In the latter, there has been a greater push to issue new explicitly bail-in-able instruments. This creates potential divergences across jurisdictions and makes a comparative investment analysis of institutions operating in different jurisdictions challenging.

**Differences between MREL and TLAC.** MREL is set as a ratio of eligible capital relative to Total Assets while TLAC is expressed as eligible capital as a percentage of RWAs and as a leverage ratio, which may be another source of confusion. Moreover, TLAC defines eligible capital contractually, whereas under MREL the Resolution Authority sets the amount of eligible capital on a case-by-case basis. TLAC eligibility and bail-in eligibility may not necessarily coincide. Hence, a liability may be bail-in-eligible but not TLAC-eligible. Investors need to be able to assess the overall amount of liabilities as well as the exact waterfall of write-down in order to correctly price the risk and evaluate whether it suits their risk-return profile. Unless the two methods achieve convergence, investors may struggle to reconcile the two approaches.

#### **Risk mitigants**

As for the lack of transparency risk, there are existing obligations on the issuer in relation to the public offers and/or admission to trading on a regulated market; these would be determined by the Prospectus Directive and relevant national law in areas which fall within certain exemptions or under certain thresholds set out in that Directive. Where the financial instrument is marketed, distributed or sold by a MiFID firm (investment firm or credit institution), the usual obligations in relation to pre-sale disclosure, including disclosure of the relevant risks, assessment of appropriateness, and, where investment advice is provided, suitability would apply<sup>16</sup>. Moreover, there is some question as to whether certain information in the possession of the issuer is sufficiently material to require disclosure consistent with the Market Abuse Regulation.

In addition, with regard to the information for investors on the likelihood of their being bailed in, firms have to provide information to the client about the financial instrument. includina "warnings of the risks associated with investments in those instruments or in respect of particular investment strategies"<sup>17</sup>, both in cases where investment advice is provided and where it is not. The fact that the security is bail-in-able, and the consequences for investors if it is bailed in, are expected to be included in these disclosures. Where investment advice is provided, the adviser is obliged to ensure that the instrument is suitable for the client. It should be mentioned that ESMA has recently published Guidelines on complex debt instruments under MiFID II; in this context all bail-in-able debt instruments are deemed complex and the

<sup>&</sup>lt;sup>16</sup> See Article 19 of MiFID 1, Articles 24-25 of MiFID 2.

<sup>&</sup>lt;sup>17</sup> See Article 19(3) of MiFID 1.

provision of "execution-only" services will never be possible for these instruments<sup>18</sup>.

In terms of the lack of harmonization risk within and across jurisdictions it is important that Resolution Authorities work together to try and develop a harmonized set of rules that would allow investors to evaluate with a greater degree of confidence the risks associated with each security. Harmonization could improve the standardization of new instruments in the event of their issue, further increasing understanding for investors.

#### Conclusion

The MREL and TLAC requirements are expected to strengthen banks' position and prevent situations of financial distress and financial contagion. Banks will at all times need to hold a minimum amount of securities which satisfy eligibility conditions and can be either converted or written-down in case of a shortfall of capital. At the same time, it is possible that the bail-in-ability of some securities will pose new risks to investors due to the lack of transparency and lack of harmonization within and across jurisdictions.

As a consequence of the two factors mentioned above, investors face uncertainty which may prevent them from correctly assessing and pricing risk and from understanding the concrete probability of being bailed-in. Investors active in more than one country will have to deal with possible different approaches to recognition of the subordination of debt. Different calculations for MREL and TLAC further add to the complexity. Such features may entail risks in the area of consumer protection, since they make it more difficult for investors to thoroughly assess the suitability of the security to their own risk profile. Bail-in gives Resolution Authorities an innovative tool to deal with failing institutions, and regulation should help reduce uncertainty and improve comprehension for investors. While these rules are aimed at ensuring protection and safety, more transparency and consistency is needed to enable investors better to analyse risks and to avoid excessive divergence of approaches across the EU.

<sup>18</sup> See Article 19(3) of MiFID 1. See ESMA Guidelines on instruments and structured debt deposits (ESMA/2015/1783), published in November 2015, aimed at identifying certain categories of complex debt instruments for the purpose of Article 25(4) of MiFID II (so-called "execution-only" regime). The qualification as complex instruments implies that, when investment advice is not provided, investment firms will be required to ask clients or potential clients to provide information regarding their knowledge and experience in order to assess the appropriateness of these instruments for them. These guidelines will be applicable from the application date of MiFID 2 (3 January 2017) and are intended to enhance investor protection and reduce potential detriment associated with those instruments being sold to investors unable to understand the risks involved in such an investment.

# **Financial innovation: Risk** and benefit assessment

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This is the first of a two-part analysis of financial innovation. We provide the reader with an overview of ESMA analytical process. This will be followed in an upcoming TRV with a detailed analysis of our Financial Innovation scoreboard. ESMA has put in place a monitoring framework designed to ensure that innovation does not undermine the core objectives of investor protection, financial stability and orderly markets. In this article we outline the scope of our work, the sources of information we employ and how we prioritize the work. We also outline some of the key challenges of monitoring financial innovation across the EU. Finally, we outline how this monitoring process will support ESMA's product intervention powers which become effective with the new MIFID legislation.

#### Introduction

ESMA is charged with ensuring that the EU national supervisory authorities achieve a harmonised approach to the supervision and regulation of innovative financial activities and provide the EU institutions with relevant advice. ESMA has appointed the Financial Innovation Standing Committee ('FISC')<sup>2</sup> to undertake this work.

We employ the following definition for financial ('...the act of creating and innovation, distributing new financial instruments, processes, business models and markets, including the new application of existing ideas in a different market context.')<sup>3</sup> Over the past three years, ESMA has put in place a framework within which the analysis of financial innovation can best take place. The principles-based framework provides а approach to the work both in terms of the range of innovation we track as well as the tools we employ. In designing the framework, we have been guided by the three core objectives of ESMA --- investor protection, financial stability and orderly markets.

The ESMA objectives serve to ground the analysis of financial innovation for a number of reasons.

- First, while innovation in finance can contribute to economic growth, some financial innovation has been identified as a factor that gave rise to financial instability during the recent crisis. Analysing financial innovation can assist supervisors, policy makers and market participants to be more aware of the types of innovations that may give rise to financial instability and those which support growth and prosperity.
- Second, innovations that lead to deliberate misinformation or fraudulent behaviour among market participants threaten orderly markets. This in turn can lead to a loss of confidence among investors and participant withdrawal. Financial innovation analysis can alert regulators to potential threats to market integrity.
- Third, investor confidence is critical to the robust functioning of markets. In the monitoring of innovation the analysis guard against information serves to asymmetry. Investors should have sufficient information as to the risk/return profile of a product to make investment decisions appropriate to their circumstances and needs.

Importantly, we realize that financial innovation has also beneficially contributed to the key economic pillars through which finance operates – providing a system of payments, a means to pool funds for savings, mechanisms to transfer savings for productive investments, and ways in which to manage and optimize the allocation of risk. In turn, innovation has brought investors and consumers material benefits, whether through the widespread use

<sup>&</sup>lt;sup>1</sup> This article was authored by Patrick Armstrong.

<sup>&</sup>lt;sup>2</sup> Regulation (EU) No 1095/2010, Article 9.4.

<sup>&</sup>lt;sup>3</sup> Lerner, Josh; Tufano, Peter (2011): The Consequences of Financial Innovation: A Counterfactual Research Agenda. In NBER Working Paper (w16780). page 5. Available online at http://www.nber.org/papers/w16780.

of credit cards, the growth in index mutual funds or access to futures and swaps to manage risk. However, we have also observed that those positive benefits originating from financial innovation are sometimes overlooked when the topic is discussed in favour of adverse innovations tied to the financial crisis. We bring to the subject a balanced approach, both protective and supportive.

#### Challenges

The design of a framework to analyse financial innovation across the EU is subject to certain challenges.

- First is the heterogeneity of the financial markets across the 28 Member States. They differ in breadth, depth, volume, and sophistication of market participants.
- Second is the concept of 'innovation spiral'.
  What may have been designed and targeted to a given segment of sophisticated market participants may over time migrate to a market segment home to less informed investors for whom the product introduces unexpected risks.
- Third, our task is complicated by the fact that when an innovation is newly introduced its user base is typically narrow and in turn its scope for creating systemic harm is limited. Our challenge lies in recognizing and inhibiting the growth in flawed products before they become widely distributed.
- Fourth, we observe that the perceived utilities of innovations are often situation/time-dependent. Weaknesses in certain innovations may only become apparent during periods of extreme illiquidity or economic crisis, e.g. U.S. subprime securities.
- Fifth, our ability to monitor innovative products using classical risk management tools is limited. One of the primary obstacles to understanding the risk profile of newly introduced products is the lack of time series information with which to measure volatility and tail risk.
- Finally, we recognize the existence of the 'regulatory dialectic'.<sup>4</sup> The private sector

has incentives and resources to respond frequently to regulatory measures with innovative tools, techniques and products that seek to circumvent the intended regulation.

#### Scope

In terms of innovation breadth, as market regulators we focus most closely on the securities markets; yet we remain aware of the need to follow other markets, knowing that innovations found in one sector, i.e. banking, may migrate to the securities markets. In defining innovation, we have included financial innovations both in terms of products and processes. By products we refer to an innovative instrument or class of instruments, such as an exchange traded fund. An innovative process is an inventive way or technique in which to produce and distribute products or services to targeted participants in financial or commodities markets.

Crowdfunding is an example of an innovative process that leverages technology to attract investors. However, we realize that the differences between innovative products and processes may at times be blurred, and for that reason we will define innovation using a functional approach so as not to overlook innovations doing much the same thing, but employing a different name. We employ a variation on the Merton framework used to define the core functions performed by financial products or processes.<sup>5</sup> In analysing innovations we monitor those that may cause potential detriment while also observing those that may introduce potential benefits.

As to market participants, we track the life cycle of innovation with the aim of monitoring product originators, distributors and intermediaries as well as the end investor, in both institutional and retail markets. It is important that we follow the growth and development of products across market

<sup>&</sup>lt;sup>4</sup> Kane, Edward J., 1981. "Accelerating Inflation, Technological Innovation, and the Decreasing Effectiveness of Banking Regulation," Journal of Finance, 36 (May), 355-367.

<sup>&</sup>lt;sup>5</sup> 'Financial Innovation is the act of creating and then popularizing new financial instruments, as well as new financial technologies, institutions, and markets. The innovations are sometimes divided into product or process variants, with product innovations exemplified by new derivative contracts, new corporate securities, or new forms of pooled investment products, and process improvements typified by new means of distributing securities, processing transactions, or pricing transactions.' Lerner, Josh and Peter Tufano, February 2011, "The consequences of financial innovation: a counterfactual research agenda, national bureau of economic research".

sectors from origination to end investors for a variety of reasons.

- First, products may be segregated to a corner of the market but remain in need of monitoring, such as products oriented and limited to niche institutional investors. We think most recently of synthetic CDOs, which while not widely diffused, were material contributors to the financial crisis. On the other hand, we must also recognize that there are complex products that are targeted specifically towards retail investors for which the institutional space has no appetite, and structured retail products are a ready example.
- Second, we recognize that over time products evolve and those that may have been designed for one segment may find their way into other market segments. The classic model of product innovation suggests it is the sophisticated, less riskaverse consumers that adopt a given innovation in its early stages. Later, as the product matures, it becomes more widely diffused, accepted and employed. This is true in finance, with exchange traded funds, particularly in the US, providing an example of a product that successfully diffused from a small set of sophisticated institutional investors to the retail market.
- Third, as the innovative product passes from originator to distributor to end investor, it is critical to ensure that information disclosure and transparency remains in place or is further targeted and enhanced.
- Finally with the realization that innovation does not stop at the European waters' edge, despite a primary EU focus our horizon in following innovation is a global one. Securities markets, more than most economic functions. other operate worldwide. In a complementary fashion, we monitor localized Member State market developments with an eye to determining developments whether those are reproduced elsewhere.

# Regulation, support and consistency

As outlined in our core objectives, our first duty is to ensure investor protection. However, in the pursuit of investor protection we may find innovations that call for a higher level of regulatory protection while at the same time demanding a greater degree of support through regulatory transparency or regulatory convergence in order to grow. Crowdfunding provides a good example of where, on the one hand, there may be a need for greater regulatory presence to protect investors given the relatively unique characteristics of crowdfunding that existing regulations had not anticipated. On the other hand, in the absence of an EU-wide directive on the topic of crowdfunding, Member States have treated the matter with differing levels of regulatory intensity, and the absence of a more harmonized approach to crowdfunding may serve to stultify its development within the EU. In this sense, we may seek to provide proportionate and consistent regulatory responses to allow for the growth of crowdfunding consistent with our regulatory aims.

#### Sources of information

The ways in which we source knowledge of financial innovation is both a challenge and an opportunity. There is no 'cookbook' to this process dictating the steps we need to take to track innovation. On the other hand, the absence of a known accepted process gives us an opportunity to build what we consider to be the most effective framework. We look for market intelligence from both qualitative and quantitative sources.

- First, from the standpoint of product providers, we have developed and continue to nurture relationships with large globally active financial institutions both on the buy side and the sell side. These entities are all closely involved in the development and dispersion of financial products. As well we have established productive relationships with the major credit rating agencies that see a wide breadth of innovative products across the global markets.
- Second, as to users, we maintain close contact with investors both retail and institutional.
- Third, we have a broad dialogue with the financial service consultant community, whose work frequently provides objective insights into market developments.
- Fourth, we have developed a working relationship designed to share relevant information with other global public organisations interested in the topic of financial innovation. Those organisations

include the OECD, IOSCO, the Financial Stability Board as well as non-EU regulators notably the US SEC, US Fed, CFPB, FINRA, ASIC and the Hong Kong Monetary Authority.

- Fifth and by no mean least, we look to our 28 Member States to report to us what they are seeing in their markets. They are best positioned and resourced to appreciate local developments. It is then our work to identify any patterns across the Member States.
- Sixth, we closely follow developments originating from the European Commission. Along with the European Investment Bank and the European Investment Fund it has been actively involved in reviewing innovative ways in which to revive economic growth across the EU.
- Seventh, as to research we follow academic publications and have access to a number of market-based information providers and data bases.
- Finally, our Consultative Working Group is well-placed to contribute to our work. Coming from the industry, academia and consulting, the members bring to the topic complementary insight, knowledge and constructive criticism which we have found most valuable.

### Monitoring and filtering metrics: Financial Innovation scoreboard

Innovations come to the market at a pace that is impossible to track on an individual basis. Moreover, the vast majority of these innovations will fail and not survive to be widely diffused. We nonetheless need to determine how best to allocate our limited resources to monitor innovations with the potential to be both detrimental and beneficial. In turn, we have developed what we view as a structured methodology for evaluating innovations in securities markets. The methodology results in a scoring system that better enables us to focus our attention.

The scoreboard methodology follows a stepwise process.

 First, we seek to identify innovations. For this process we rely heavily on the sources of information described above, which combine to provide us with the necessary market intelligence.

- Second, we categorize the innovation by type: is it a product, process or some other form of innovation such as a marketing method or inventive organizational method? Additionally, we do not want to be misled by the labelling of a given innovation, so we further divide the innovation by functional type as described by Merton, i.e., is it a payment service, pooling of funds, transferring resources over time, managing risks, providing price information, or addressing asymmetric information/incentives problems?
- Third, we prioritize financial innovation relative to the objectives of investor protection, financial stability and market integrity. The filtering is done by assigning scores on criteria that are relevant to the objective in question. Each of the objectives has a set of risk factors that we believe best reflects its unique characteristics. The resulting scores rank the innovation according to deemed threat to the objectives.
- Fourth is the analytical stage of the process where we try to better understand such questions as the drivers of the innovation, e.g., regulation, technology, competition. We also analyse the market context in which the innovation operates, the market participants involved and the distribution channels employed.
- Finally, based on the results of our analysis we determine how to respond. Based on its founding regulations ESMA may employ a number of different legal instruments in response. Before doing so, we ask a number of fundamental questions as to the innovation to better guide our action, such as understanding the primary issue of problem and urgency, and what outcome are we hoping to achieve and what impact would it have on the market. Our response may come in the form of an Opinion, Advice, Statement, Warning or ultimately product intervention.

#### **Product Intervention**

With the upcoming implementation of MiFID, ESMA may '....temporarily prohibit or restrict the marketing, distribution or sale of certain financial instruments...' that address significant investor protection concerns, that threaten the orderly functioning and integrity of financial markets or the stability of the whole or part of the financial system. The Member State NCAs will be granted a similar set of powers. Among the conditions that must be met before the powers can be employed is that the response is proportionate and justified, nondiscriminatory, and not sufficiently addressed by existing Union law or better supervision. The preparatory work for this forthcoming responsibility has involved two phases, with Phase 1, largely conducted in 2015, assessing the scope of the powers, understanding NCA preparedness, developing the market monitoring process and an assessment framework to better understand whether the conditions for acting are met. The preparatory work in 2016 will include better understanding of NCA market monitoring, assessing product interventions already in place within NCAs on which ESMA must opine, articulating a detailed implementation process, raising awareness across relevant ESMA standing committees, and building a pipeline of issues.

By exercising its informal and formal powers, ESMA will seek to meet its Investor Protection. Financial Stability and Orderly Markets objectives, while allowing appropriate freedom to innovate. In short, only when the benefit of mitigating detriment to investors and markets outweighs limiting choice to a segment of investors, can this material decision be considered. What are some of the conditions or circumstances that will give rise to such a scenario? We can consider various instances of material market failure, such as inadequate level of competition or information asymmetry that allows a product provider to act in ways that are detrimental to investors. However, given the enormity of any such action, it can only be taken after thorough market analysis confirms the source and severity of risk to investors. We further recognize that the absence of intervention cannot and should not be viewed as implicit endorsements of products. We must also recognize that at times it is appropriate for a regulatory body to intervene to stimulate innovations that will serve society, businesses, and households.

#### Conclusion

We outlined at the beginning of this paper that the framework for our financial innovation work is a principles-based approach. In using this approach we recognize that the topic of innovation differs in magnitude from the vast majority of work ESMA does in the policy space. There is no Level I legal provision to follow within the sphere of financial innovation. The types of innovation and need for innovation differ greatly across Member States. In turn, our framework needs to remain flexible and adaptive to market events. It also needs the subtlety to know when to respond in a supportive as opposed to a protective manner. We intend to revisit the framework on a regular basis to ensure it remains effective and relevant.

### **Orderly markets**

# The central clearing landscape in the EU

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This article gives an overview of the central clearing landscape in the EU within the EMIR framework. In 2009, G20 leaders agreed that OTC derivative contracts should be cleared by Central Counterparties (CCPs). The EMIR Regulation was adopted subsequently to implement this commitment in the EU. Since the entry into force of EMIR on 16 August 2012, the process of CCP authorisation has progressed, with sixteen CCPs having been authorised to operate in the EU. The mandatory clearing requirement for several classes of OTC interest rate swaps and credit default swaps should become applicable in 2016, and several interoperability arrangements are in place.

#### Introduction

During the financial crisis, events like the default of Lehman Brothers or the bail-out of AIG exposed several problems with the functioning markets. of OTC derivative Excessive exposures, under-collateralisation of operations, deficient risk modelling, high interconnectedness of market participants, and a lack of transparency were contributors to the financial crisis. As a consequence, in 2009, G20 leaders agreed that OTC derivative contracts should be traded on exchanges or electronic trading platforms, that these operations should be cleared in central counterparties and that all OTC derivative transactions should be reported to trade repositories. The European Market Infrastructure Regulation (EMIR) was one of the measures adopted in the European Union (EU) to implement the G20 commitments together with MiFIDII/MiFIR trading obligation for derivatives.

Since entry into force of the EMIR Regulation sixteen CCPs have been authorised to operate in the EU, and some interest rate swaps as well as the main index CDS have been proposed for the clearing obligation. Central clearing and the associated benefits, such as those related to netting, for example a reduction in exposures and liquidity demand during stressed market conditions or the mutualisation and orderly distribution of losses, are now at a more mature stage in the EU.

The first part of this article gives an overview of the CCPs that have been authorised to operate in the EU, the second part is focused on the clearing obligation procedures, and the last part

## describes the different interoperability arrangements in place.

V.1

Selected EMIR definitions (REG (EU) No 648/2012 Article 2)

'CCP' means a legal person that interposes itself between the counterparties to the contracts traded on one or more financial markets, becoming the buyer to every seller and the seller to every buyer.

'Clearing' means the process of establishing positions, including the calculation of net obligations, and ensuring that financial instruments, cash, or both, are available to secure the exposures arising from those positions.

'OTC derivative' or 'OTC derivative contract' means a derivative contract the execution of which does not take place on a regulated market as within the meaning of Article 4(1)(14) of Directive 2004/39/EC or on a third- country market considered as equivalent to a regulated market in accordance with Article 19(6) of Directive 2004/39/EC.

'Interoperability arrangement' means an arrangement between two or more CCPs that involves cross-system execution of transactions.

#### **Authorisation**

Under EMIR, each EU CCP wishing to offer services in the EU must be granted an **authorisation** by the competent authority of the Member State in which it is established. In accordance with EMIR, the competent authority in charge establishes a college of relevant European competent authorities which gives an opinion on the CCP authorisation, and on extensions of authorisations, reviews of margin setting models or the setting of interoperability arrangements.

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#### V.2

Composition of colleges of supervisors for CCPs (REG (EU) No 648/2012 Article 18(2))

The college shall consist of:

(a) ESMA;

- (b) the CCP's competent authority (Chair);
- (c) the competent authorities responsible for the supervision of the clearing members of the CCP that are established in the three Member States with the largest contributions to the default fund of the CCP referred to in Article 42 on an aggregate basis over a one-year period;
- (d) the competent authorities responsible for the supervision of trading venues served by the CCP;
- (e) the competent authorities supervising CCPs with which interoperability arrangements have been established;
- (f) the competent authorities supervising central securities depositories to which the CCP is linked;
- (g) the relevant members of the ESCB responsible for the oversight of the CCP and the relevant members of the ESCB responsible for the oversight of the CCPs with which interoperability arrangements have been established;
- (h) the central banks of issue of the most relevant Union currencies of the financial instruments cleared.

CCPs established in third countries (outside the EU) and willing to provide clearing services to EU clearing members or trading venues may do so only when they are **recognised** by ESMA. ESMA can recognise a CCP from a third country under certain conditions including:

- the fact that the European Commission has adopted so called "equivalence decisions" in respect of the third-country in which they are established, ensuring that CCPs authorised in that third country are subject to regulatory and supervisory legal requirements equivalent to those of EMIR;
- the fact that the CCP is duly authorised in its home country.

Before granting recognition, ESMA must consult certain EU competent authorities (e.g. competent authorities of EU clearing members of the CCP, central banks of issue of Union currencies cleared by the CCP).

To date, ESMA has recognised sixteen thirdcountry CCPs established in Australia, Canada, Japan, Hong Kong, Mexico, Singapore and South Africa.

#### **Prudential requirements**

When authorised to operate in the EU, a CCP is then subject, *inter alia*, to a set of **prudential requirements**. In order to be able to measure and assess its liquidity and credit exposures with respect to each of its clearing members or another CCP with which it has concluded an interoperability arrangement, a CCP should also have timely access to all the relevant pricing sources on a near to real-time basis.

Further to general requirements on business conduct, proper capitalisation and operational risk management procedures, **margins** are called and collected by CCPs to limit credit exposures with respect to clearing members. For OTC derivatives, margins should cover, at least, losses over a potential five-day liquidation period of the asset, with a confidence interval of 99.5%.

In addition to margins, CCPs have to maintain a pre-funded **default fund** to cover any losses that exceed those already covered by margins. The contribution to this default fund is proportional to each clearing member's exposure. The default fund should cover, under extreme market conditions, the default of the clearing member to which it has the largest exposure or of the second and third-largest clearing members if the sum of their exposures is greater.

A CCP should also maintain enough "skin-in-thegame" in the form of **pre-funded available financial resources** to cover potential losses not covered by the margins and the pre-funded default fund. These additional available financial resources should be available to the CCP and should come on top of the CCP's initial capital, including retained earnings and reserves. The overall financial resources of the CCP should be large enough to withstand the default of at least the two clearing members to which it has the largest exposure, including under extreme but plausible market conditions.

Finally, CCPs may require non-defaulting clearing members to provide **additional funds** in the event of a default of another clearing member. More generally the exhaustion of financial resources in case of default will occur following a given default waterfall established by the Regulation (V.3).

V.3 Default waterfall							
	Order	Resources					
1	Margins posted by a defaulting clearing member	Defaulting clearing					
2	Default fund contribution of the defaulting clearing member	member's resources					
3	CCP's own dedicated resources or "skin-in-the-game"	CCP own resources					
4	Contributions to the default fund of the non-defaulting clearing members	Other clearing members' resources					
Sou	Source: ESMA.						

## So far the list of EU CCPs authorised in the union includes:

V.4

List of authorised CCPs in the EU

	Securities		Derivatives					Other
	EQ	FI	IR	CD	FX	EQ	Cdt	
Nasdaq OMX Clearing (SE) European Central			Y	Y	Y	Y	Y	
Counterparty (NL)	Y							
(PL)	Y	Υ	Y	Y	Υ	Y		Y
Eurex Clearing (DE)	Y	Υ	Y	Υ	Y	Y	Y	Y
CCG (IT)	Y	Y				Υ	Υ	Y
LCH. Clearnet SA (FR)	Y	Y		Y	Y	Y	Y	Y
Commodity Clearing (DE)							Y	Y
LCH. Clearnet Ltd (UK)	Y	Y	Y	Υ	Y	Y	Y	Y
Keler CCP (HU)	Y	Y	Y	Y	Y	Y	Y	Y
CME Clearing Europe (UK)			Y		Y		Y	Y
<b>CCP.A</b> (AT)	Y	Y						
LME Clear (UK)							Y	
BME Clearing (ES)	Y	Y	Υ	Y		Y	Y	Y
OMIClear-C.C. (PT)							Y	
ICE Clear Netherlands (NL)						Y		
Athex Clear (GR)	Y	Y			Y	Y	Y	Y
Note: Securities: Equity (	EQ), Deb	t (FI).	Deriva	atives:	Inter	rest ra	ate (IF	R), credi

Note: Securities: Equity (EQ), Debt (FI). Derivatives: Interest rate (IR), credit (CD), foreign exchange (FX), equity (EQ), Commodity (Cdt). Source: ESMA.

#### **Clearing obligation**

EMIR, with the overarching objective of reducing systemic risk, states that certain classes of OTC derivatives should be subject to a clearing obligation. Although the clearing obligation refers to OTC derivatives, CCPs do clear other products such as derivatives traded on regulated markets as well as cash equities or bonds, and EMIR provisions on CCPs also apply to these products.

In terms of **procedure** and in accordance with EMIR, ESMA, after having consulted the relevant stakeholders, has to develop and submit to the European Commission draft technical standards defining the classes of OTC

derivatives that should be subject to the clearing obligation.

EMIR foresees two possible procedures for the identification of classes of OTC derivatives to be subject to the clearing obligation:

- the "bottom-up approach" in which the determination of classes is based on classes of assets already cleared by authorised or recognised CCPs;
- the "top-down" approach according to which ESMA on its own initiative identifies classes that should be subject to the clearing obligation but for which there is not yet a clearing offer.

The different classes proposed for the clearing obligation so far have resulted from the bottomup approach only.

In that context, ESMA consulted stakeholders with a discussion paper<sup>2</sup> and four consultation papers. The first covered interest rate derivatives denominated in EUR, GBP, JPY and USD<sup>3</sup>, the second credit default swaps<sup>4</sup>, the third foreign exchange non-deliverable forwards<sup>5</sup> and the fourth interest rate derivative classes denominated in CZK, DKK, HUF, NOK, PLN and SEK<sup>6</sup>.

Having taken into account, in accordance with EMIR, the degree of standardisation of the relevant classes of OTC derivatives, their volume and liquidity as well as the availability of fair, reliable and generally accepted pricing information on the given class of OTC derivatives, ESMA proposed a clearing obligation for some assets in the interest rate and credit categories.

For interest rates, ESMA first proposed four instruments: basis swaps, fixed-to-float interest rate swaps, forward rate agreements and overnight index swaps settled in four currencies (EUR, USD, GBP, JPY). The RTS for this set of instruments entered into force on 21 December 2015. In a draft RTS submitted to the European

- <sup>4</sup> <u>2014/ESMA/800 Consultation Paper, Clearing Obligation</u> <u>under EMIR No. 2 published on 11 July 2014</u>
- <sup>5</sup> <u>2014/ESMA/1185</u> <u>Consultation Paper</u>, <u>Clearing</u> <u>Obligation under EMIR No. 3 published on 1 October</u> <u>2014</u>

<sup>&</sup>lt;sup>2</sup> <u>2013/ESMA/925 Discussion Paper on the Clearing</u> <u>Obligation published on 12 July 2013</u>

<sup>&</sup>lt;sup>3</sup> <u>2014/ESMA/799 Consultation Paper, Clearing Obligation</u> <u>under EMIR No. 1 published on 11 July 2014</u>

<sup>&</sup>lt;sup>6</sup> 2015/ESMA/807 Consultation Paper, Clearing Obligation under EMIR No. 4 published on 11 May 2015

Commission ESMA recently proposed extension of the clearing obligation to fixed-to-float interest rates and forward rate agreements settled in three additional currencies (NOK, PLN, SEK).

For credit derivatives, in an RTS submitted to the European Commission ESMA proposed that the following CDS classes be subject to the clearing obligation: untranched indices with the iTraxx Europe Main and the iTraxx Europe Crossover (five-year tenor) as the underlying, these two series being by far the most liquid of the CDS index market (around 50% of total index volume in trade count as of 2Q14). In comparison, CDS single names. while accounting for a large part of the credit OTC derivative market, have a relatively more moderate amount of activity on a reference-byreference basis. As a result, ESMA will continue to monitor their activity but has not yet proposed single names to the clearing subjecting obligation.

For **equity derivatives**, taking into account the feedback received during the consultation, notably the fact that a clearing obligation would require more time and consultation on the relevant characteristics of products to be cleared, the fact that the equity derivative market is predominantly exchange based, and the need for further international convergence, ESMA has not proposed any class of equity derivatives for the clearing obligation.

In the case of **foreign-exchange** nondeliverable forwards (NDFs), given in particular the limited experience of counterparties with NDF clearing and the importance of international consistency in the implementation schedule of the clearing obligation, ESMA has not proposed a clearing obligation on the NDF classes at this stage.

Counterparties subject to these clearing obligations are all financial counterparties and non-financial counterparties (NFCs) for which the non-hedging OTC derivative activity crosses certain thresholds.

#### V.5 Non-financial counterparties' activity<sup>7</sup>

In February 2015, ESMA published as part of the EMIR review an analysis on the use of OTC derivatives by nonfinancial counterparties. On OTC derivative markets 27% of the counterparties are financials and 73% NFCs. But in terms of notional amounts, 98% is realized by financials and only 2% by NFCs. Among those NFCs, only less than 1% of counterparties have non-hedging exposure above the threshold, representing 16% of the amounts of all NFCs.

Nevertheless, a class by class analysis focusing on systemic risks reveals that among the different classes of OTC derivatives traded by NFCs only commodity and foreign exchange derivative classes can be considered systematically relevant when compared to derivative classes traded by financial counterparties.

Finally, ESMA found that particularly in the commodity asset classes, among the main market participants many groups of NFCs do not exceed the thresholds. ESMA therefore suggests that the European Commission may wish to revisit the way in which NFC+ (i.e. those that exceed the threshold and are thus subject to mandatory clearing) are identified, to ensure that the entities that qualify as NFC+ are in effect the ones that pose the most significant risks to the system, for example by aggregating the positions of NFC in OTC derivatives per asset class irrespective of their hedging or non-hedging nature.

Equivalent financial and non-financial counterparties established in a third country might also have to clear if they enter a transaction that would have to be cleared with an EU counterparty subject to clearing, or if the transaction has a direct, substantial and foreseeable effect within the EU.

Non-financial counterparties with non-hedging exposure below the aforementioned thresholds are exempt from clearing. Pension funds are also exempt from clearing until 2017, and transactions between companies belonging to the same group are likewise exempt subject to an approval or non-objection by their competent authorities.

Finally, if a class of OTC derivatives no longer has an authorised or recognised CCP in order to clear its contracts, it ceases to be subject to the clearing obligation.

<sup>&</sup>lt;sup>7</sup> <u>ESMA EMIR Review Report No. 1, "Review on the use</u> of OTC derivatives by non-financial counterparties".

V.6

#### Status of clearing obligations

Asset class	Classes	Status of RTS				
Interest Rate	Basis, Fixed-to- float, FRA and IOS in EUR, GBP, JPY and USD	RTS published in the Official Journal on 1 Dec 2015				
Credit		RTS delivered to				
	Index Credit Default	the European				
	Swaps	Commission on				
had a set Data		1 Oct 2015				
Interest Rate	FRA and Fixed-to-	RIS delivered to				
	float swaps in NOK,	the European				
	PLN, SEK	10 Nov 2015				
Equity	Lookalike/Flexible	No RTS proposed				
	equity derivatives and CFD	at this stage				
Foreign	Non-deliverable	No RTS proposed				
Exchange	Forward (NDF)	at this stage				
Source: ESMA.						

#### Interoperability arrangements<sup>8</sup>

EMIR defines an interoperability arrangement as an arrangement between two or more CCPs that involves a cross-system execution of transactions, or in other words a reciprocal link between the CCPs.

Given the complexities involved in an interoperability arrangement on the clearing of derivatives, the scope of EMIR provisions on interoperability was restricted to transferable securities and money market instruments. This does not mean that arrangements on derivative clearing are forbidden. They are indeed authorised, but the framework described in EMIR does not apply to the corresponding arrangements. Nevertheless, the guidelines and recommendations published by ESMA<sup>9</sup> are intended to be applied as a basis for national competent authorities' risk assessment to all interoperability arrangements, including those on derivatives. These guidelines are related to open and fair access, risk identification and monitoring, the deposit of collateral and cooperation between national competent authorities. Most EMIR items on interoperability focus on risks and ensure that any extra or different risks arising from interoperability arrangements that would not arise for a standalone CCP are taken into account. Furthermore, according to EMIR, risk is the only relevant basis on which the implementation of an interoperability arrangement can be refused.

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Existing interoperability arrangements

	Markets	Interoperable CCPs				
	BATS Chi-X	EuroCCp NV	SIX x-Clear	LCH.Clearnet Ltd		
	Burgundy	EuroCCp NV	SIX x-Clear			
	Aquis Exchange	EuroCCp NV	SIX x-Clear	LCH.Clearnet Ltd		
EQ	LSE	EuroCCp NV	SIX x-Clear	LCH.Clearnet Ltd		
	Turquoise	EuroCCp NV	SIX x-Clear	LCH.Clearnet Ltd		
	UBS MTF	EuroCCp NV	SIX x-Clear			
	Equiduct	EuroCCp NV	SIX x-Clear	LCH.Clearnet Ltd		
	Oslo Børs/ Oslo Axess	LCH.Clearnet Ltd	Oslo Clearing	Į		
FI		LCH.Clearnet SA	CCG			
ETDs		LCH.Clearnet Ltd	Oslo Clearing	I		

#### Source: ESMA

Most of the interoperability arrangements in place in the EU are set for equity clearing. The majority of these equity arrangements were already in place before the entry into force of EMIR, the exception being the arrangement operating on the Oslo Børs/Oslo Axess market, even though a Memorandum of Understanding had been signed between the two CCPs back in 2009.

For government bonds, only one arrangement is in place in the EU, between LCH.Clearnet SA and Cassa di Compensazione e Garanzia (CC&G). This arrangement, activated in 2004 and since then authorised and thus deemed compliant with EMIR, covers the clearing of outright transactions and repos on Italian government bonds.

Finally, one (ETD) derivative interoperability arrangement is in place between LCH.Clearnet Ltd and Oslo Clearing, covering index and single Norwegian stock futures and options listed on Oslo Børs and Turquoise.

In its report on the extension of the scope of interoperability arrangements published in July 2015, ESMA recommended extension of the EMIR provision relating to interoperability arrangements to ETD derivatives, while mentioning that a further extension to OTC derivatives should be assessed at a later stage.

<sup>&</sup>lt;sup>8</sup> <u>See ESMA's final report on "The extension of the scope of interoperability arrangements"</u>.

<sup>&</sup>lt;sup>9</sup> ESMA "Guidelines and Recommendations for establishing consistent, efficient and effective assessments of interoperability arrangements".

Central clearing varies across Europe, both geographically and in terms of assets cleared. Its structure might still evolve in the coming years, but the central clearing landscape in the EU has already come a long way since the entry into force of EMIR in 2012. Almost all EU CCPs have now been re-authorised under EMIR, and so have most of the related interoperability arrangements. ESMA has analysed a large number of OTC derivative classes to determine whether they should be subject to the clearing obligation and has proposed a clearing obligation in the interest rate and credit asset classes. Finally, in recent reports on how the EMIR framework has been functioning, ESMA has provided input and recommendations to the European Commission, including recommendations on amending EMIR in relation to the clearing obligation and on recognition of third country CCPs.

# Financial stability Collateral scarcity premia in EU repo markets

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This analysis focuses on the drivers of the cost of obtaining high-quality collateral in seven EU countries over the last two years, covering two important changes in ECB monetary policy: The introduction of a negative deposit rate in June 2014 and the launch of quantitative easing in January 2015. The analysis is based on a dataset matching information on European repo markets with securities lending markets and bond-specific characteristics. Empirical results show that the cost of obtaining high-quality collateral, proxied by specialness of government bond repos, increases with demand in the cash market from short selling activities, even in calm financial conditions. In bear market segments. Collateral reuse may alleviate these tensions, but requires transparency and monitoring of risks from collateral chains. Understanding the drivers of specialness can help to identify factors and practices liable to increase procyclicality in the financial system.

#### Introduction

Collateral plays a very important and growing role in financial markets, enabling, for instance, dealers to finance their market-making activities and market participants to enter into derivative contracts<sup>2</sup>. This role has become increasingly significant since the crisis, due partly to regulatory reforms, but also to generally greater reliance on secured funding. Without good access to high-quality collateral, dealers and market participants would find it more costly to trade, with a negative impact on financial stability through reduced market liquidity and on the real economy through increased frictions in bond market financing for non-financial corporations.

Securities Financing Transactions (SFTs) play a key role in supporting collateral fluidity – i.e. collateral being in the right place, at the right time, for the right entity – by ensuring collateral flows to counterparties that need them for regulatory and business purposes (Singh, 2013).

The principal types of SFTs are repos and securities lending. A repo is the sale of securities together with an agreement for the seller to repurchase equivalent securities at a later date. The repo rate is an annualized interest rate capturing the difference between the spot and forward prices. Securities lending is an agreement whereby one party lends a security to another party against a fee for a limited period of time in exchange for either other securities or cash. The two types of instrument have many similarities and can sometimes be used as substitutes for each other, although the main categories of users are typically different. The instruments are used mainly to obtain funding or to source collateral for a broad range of activities, including hedging, liquidity management, trading, etc.

The objective of this article is to analyse the drivers of the cost of obtaining high-quality collateral, proxied by specialness of government bond repos.

Specialness is defined as the difference between the General Collateral (GC) repo rate and the special collateral rate for a specific instrument. GC assets are homogeneous liquid securities used indiscriminately by market participants for a certain rate (the GC rate) driven by the usual supply and demand dynamics. In GC repos, the choice of bond to be delivered as collateral is made after the trade, typically from a collateral pool (i.e. a basket of securities meeting certain eligibility criteria). Specific collateral repos, on the other hand, are repos in which the collateral is known before the trade is executed and has specific characteristics. When these characteristics are

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<sup>&</sup>lt;sup>2</sup> See Singh, M. (2014) "Collateral and Financial Plumbing", Risk publications; Duffie, D., M. Scheicher and G. Vuillemey (2015) "Central Clearing and Collateral Demand"), Journal of Financial Economics, Vol. 116, pp. 237-256.

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in high demand, such trades are known as *specials*. Thus, special collateral (SC) rates tend to be lower than GC rates<sup>3</sup>. Specialness can be used as a proxy for the scarcity premium to be paid for procuring a specific security (Duffie, 1996). Indeed, if a specific security becomes more limited relative to existing demand, the corresponding repo rate falls (the specialness of the specific security increases). This may happen in response to a reduction in the amount of that security available or following an increase in demand for that security on the cash market.

Securities Financing Transactions<sup>4</sup>: At the core of financial markets

Securities financing is an activity that consists in the temporary transfer of a security to a counterparty against collateral of equal or greater value, either in the form of cash or another security. SFTs are versatile instruments employed for various purposes by a wide variety of market participants. The various types of SFTs (repos, sell-buy backs, securities loans, etc.) have similar economic effects. Main uses include: funding, including from central banks; liquidity and collateral management; yield-enhancement strategies; short sales; and dividend tax arbitrage.

There are two types of repos: General Collateral (GC) transactions and specific collateral transactions. GC assets are liquid securities considered as being homogeneous and used indiscriminately by market participants for a certain rate (the GC rate) driven by the usual supply and demand dynamics. Specific collateral transactions, on the other hand, are repos in which the collateral is known before the trade is executed and has specific characteristics. When these characteristics are in high demand, the trades are known as specials. Buyers thus bid competitively for special collateral (SC), implying that SC rates are lower than GC rates. SC transactions are therefore security-driven transactions in which the collateral is specifically sought after, while GC deals are mainly cash-driven, implying different incentives for market participants. As a result, repo trading is based on different GC and SC rates.

The results of our empirical analysis show that the cost of obtaining high-quality collateral increases with demand in the cash market from short selling activities, even in calm financial conditions. In bear market conditions – when good collateral is needed the most – this may lead to tensions in some asset market segments. Collateral reuse, by reducing the collateral scarcity premium, may alleviate these tensions but requires transparency and monitoring of associated financial stability risks. Both the negative deposit rate and central bank asset purchases seem to affect regular repo market dynamics. In particular, public sector asset purchases as part of the ECB's Quantitative Easing (QE) may reduce the available supply of high-quality collateral. However, this is likely to be offset by the central bank's securities lending programmes.

#### **Policy context**

In the aftermath of the global financial crisis, global regulators set out several policy recommendations to address risks specific to securities financing markets which were perceived to have played a role in the crisis (FSB, 2013). These risks included interconnectedness between financial institutions, increased system leverage, and facilitated maturity and liquidity transformation within shadow banks (FSB, 2012). The FSB policy recommendations were followed in the EU by a Regulation to increase the transparency of SFTs adopted in December 2015.

The SFT Regulation aims to improve the transparency of SFTs – mainly in the following two ways: The Regulation requires all transactions to be reported to Trade Repositories and the data to be made available to EU and national authorities.

The Regulation also improves the transparency of reuse (any use of collateral by the collateral taker for their own purposes) of financial instruments by setting minimum conditions to be met by the parties involved, including written agreement and prior consent.

Most of the recent regulatory initiatives focus on the risks that collateral may pose to financial stability arising from the opacity of collateral reuse, collateral management practices and collateral valuation. For example, valuation is thought to increase system procyclicality, as easier (tighter) conditions on securities financing transactions, e.g. changes in haircuts, tend to increase (decrease) leverage when market conditions are benign (deteriorating) (BIS, 2010).

Within this analytical framework, specialness, which is the focus of this article, is of particular interest. Specialness is a measure of the price of the underlying collateral (Duffie, 1996). Therefore, understanding what the drivers of specialness are can help to single out individual factors and practices liable to increase procyclicality in the financial system.

V.1

<sup>&</sup>lt;sup>3</sup> While specific collateral is not always special, in the case of sovereign repos it should be a reliable proxy. Indeed, the underlying sovereign bonds in our dataset are eligible for ECB refinancing (and therefore also for the Eurex GC Pooling ECB basket), implying that collateral providers should be able to borrow cash at the GC rate.

<sup>&</sup>lt;sup>4</sup> See ESMA TRV 2-2014, "The systemic relevance of securities financing markets in the EU" for additional details.

#### The dataset

Our dataset covers the period between 7 March 2013 and 21 September 2015. The period analysed includes two important changes in ECB monetary policy: the introduction of a negative rate on the deposit facility in June 2014 and the launch of quantitative easing in January 2015.

For repo variables, we rely on data from RepoFundsRate (RFR), which include information on repo transactions executed on BrokerTec or MTS, two CCP-based electronic trading platforms for euro repos. The data we use are aggregated in two different ways: at ISIN level and at country level. In both cases, the data contain daily observations of CCPcleared repo transactions collateralized with government bonds issued by seven EU countries (Austria, Belgium, Finland, France, Germany, Italy and the Netherlands).

At ISIN level, we define specialness as the difference between the GC repo rate for country i at time t and volume-weighted average repo rate (VWAR) for ISIN i at time t:

Specialness<sub>i,j,t</sub>= GC<sub>i,t</sub>-VWAR<sub>i,j,t</sub>

Both the GC rate and SC rate decreased during the period analysed, following changes in monetary policy. In particular, both rates have turned negative on average since June 2014 after the ECB introduced a negative interest rate on its deposit facility (V.2).



During crisis periods more bonds tend to become special and investors may pay larger premia to acquire some specific securities. At the same time, very special bonds – the upper tail of the distribution – are particularly susceptible to changes in market demand, especially in periods of market stress (Corradin et al, 2015). Therefore, in crisis periods specialness distribution tends to become more dispersed. In Chart V.3, which provides a graphical illustration of the distribution of specialness in our data, this particular feature is hardly predominant since we analyse a time period mainly characterised by very low interest rates and reduced volatility.



For each day and ISIN we are able to match the data on the repo market with data on the securities lending market.

The traditional securities lending channel is captured in our data by lender quantity on loan, i.e. the quantity of securities on loan from lenders (mainly agency lending on behalf of institutional investors, or proprietary lending from investment funds, for example). However, lender quantity on loan, which is relatively stable in time, is not equal to the total amount of securities on loan (quantity on loan). The difference between the two quantities is a proxy for broker-to-broker activity, which we use as a proxy for collateral reuse<sup>5</sup>. When broker-tobroker activity increases, this reflects strong demand in cash bond markets that cannot be satisfied by the classic securities lending chain (V.4).

Utilisation rate is defined as the ratio between lender quantity on loan and lendable quantity (the quantity of securities in lending programmes, i.e. a proxy of the supply of collateral in the market). Utilisation rates are recognised proxies for short-selling activity in the cash market. Indeed, securities lending allows short sellers to cover their bet against a security.

<sup>&</sup>lt;sup>5</sup> There are several reasons why broker-to-broker activity can be used as a proxy for collateral reuse. First, lenders do not reuse non-cash collateral. Second, brokers almost exclusively use non-cash collateral, and peaks in broker-to-broker activity reflect either high demand for securities, limited availability, or a combination of both. Given that the lendable quantities of securities are relatively stable over time, the most likely adjustment variable is collateral reuse by brokers.



#### **Empirical approach**

We employ panel data analysis to study how the degree of specialness of a specific bond in the repo market is affected by broker-to-broker activity, short selling, bond-specific characteristics and market dynamics. Our baseline model is the following:

Specialness<sub>it</sub> =  $\alpha_i$  +  $\beta$ (broker-to-broker activity)<sub>it</sub> +  $\gamma$ (short selling)<sub>it</sub> +  $\delta$ (bond specific controls)<sub>it</sub> +  $\zeta t_t + \varepsilon_{it}$ 

where  $\alpha_i$  is a bond-specific fixed effect and  $t_t$  is a time trend. Specialness measures the cost of obtaining high quality collateral. We use broker-to-broker activity as a proxy for the reuse of collateral in the market. In normal times, we expect a negative relation between broker-to-broker activity and specialness: Greater reuse of collateral increases the supply of securities. This decreases the probability that these securities are on special and reduces the scarcity premium.

Short selling is proxied by the utilisation rate (V.5). In line with previous literature we expect a positive relation between short selling and specialness. Indeed, if a trader sells short a bond in the cash market, he or she is likely to borrow this bond from securities lending markets to cover the short position (see Duffie, 1996).

We include four dummy variables equal to one when the bond is respectively "on the run" with one-year maturity, with five-year maturity, with seven-year maturity, or with ten-year maturity, and zero otherwise ("off the run")<sup>6</sup>. We use the

above dummies to investigate whether certain maturities among the on-the-run bonds tend to have a higher degree of specialness than others. Moreover, we add a dummy variable equal to one the first day a bond is off the run and zero otherwise: We expect a negative relation between this variable and specialness, in line with previous literature showing that onthe-run bonds are typically more special due to their liquidity premium (Duffie, 1996; Krishnamurthy, 2002).



We analyse three different sub periods: between 7 March 2013 and 11 June 2014 (date of the introduction of negative interest rates on deposits); between 11 June 2014 and 22 January 2015 (the launch of quantitative easing); between 22 January 2015 and 21 September 2015. Our regressions are run separately on the three periods since we expect our variables of interest to respond differently before and after the changes in monetary policy.

#### Results

Table V.6 shows the results for the whole sample.

In the first period, before the introduction of the negative interest rate on deposits, and in the third period, after the launch of ECB QE<sup>7</sup>, we find that collateral reuse is negatively related to specialness. However, in the second period, after the introduction of negative interest rates on deposits, the relation between broker-to-broker activity and specialness turns positive. A

<sup>&</sup>lt;sup>6</sup> "On-the-run" bonds are the most recently issued government debt securities within a maturity basket. They are typically more liquid than "off-the-run" bonds,

which are older government debt securities within the same maturity basket.

<sup>&</sup>lt;sup>7</sup> The ECB QE focuses on bonds that are usually liquid with a high degree of interdealer activity, and therefore such bonds tend to go on special more frequently, as in Duffie (1996).

possible interpretation is that although a negative deposit rate lowers both GC and SC rates, the low interest rate environment and prudential regulatory requirements caused banks to scale back their GC repo business in bonds, as a result of which inter-dealer activity declined. Lower activity in this repo market segment would translate into higher GC rates, and therefore a larger scarcity premium.

As expected and consistent with the existing literature, short-selling activity has a positive and significant relation with specialness across different periods. Indeed, short sales increase demand and the relative scarcity of a bond, and therefore the scarcity premium. The average size of repo transactions is negatively and generally significantly related to specialness, meaning that larger transaction volumes tend to reduce scarcity premia. This result is in line with collateral borrower concentration, which also has a negative effect on specialness – a lower number of borrowers trading larger volumes corresponds to lower premia.

V.6

Baseline model results

Impact across sub-periods at ISIN level

	Bet	fore	Between		Af	ter
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
btb	- *	- *	+ **	+ **	- **	- ***
utilis	+ ***	+ ***	+ ***	+ ***	+ ***	+ *
size	- ***	- ***	- *	- *	- ***	- ***
5Yon	+ *	+ *	+	+	-	-
1D off	- ***	- ***	+	+	+	+
conc		- ***		-		- **

Note: Before: 7 March 2013-10 June 2014; Between: 11 June 2014-21 January 2015; After: 22 January 2015-21 September 2015. btb: broker to broker activity; utilis: utilisation rate; size: average size of repo transaction; 5Yon: 5Y on the run; 1D off: first day off the run; Conc: collateral borrower concentration. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.

#### **Country level analysis**

Next, we look at country-level data using the country indices made available by RepoFundsRate.

The baseline model remains the same as in the ISIN-level regression, with some small differences. We run pooled OLS estimations with robust standard errors using countries as the cross-sectional dimension:

Specialness<sub>it</sub> =  $\alpha$ +  $\beta$ (broker-to-broker activity)<sub>it</sub> +  $\gamma$ (short selling)<sub>it</sub> +  $\zeta$  (controls)<sub>t</sub> + Neg<sub>t</sub>+ QE<sub>t</sub>+  $\epsilon_{it}$ 

Table V.7 shows the results for the country-level regressions. The coefficient signs of the shortselling and broker-to-broker activity variables are consistent with the repo market framework introduced above, and the results of the ISINlevel regressions. Almost all the coefficients are significant at the 1% level, and results are robust under various specifications.

The utilisation rate coefficient is consistently positive and the collateral reuse coefficient negative. As in the ISIN-level regression, a negative coefficient reflects an increase in the supply of collateral from reuse and results in a lower premium.

√.7 Baseline model results I <b>mpact at country level</b>									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
btb	- ***								
utilis	+ ***								
Neg	+ ***	+ ***		+ ***	+ ***	+ ***	+ ***		
QE	+ ***		+ ***	+ *	+ **	-	+		
Neg-Util				+ *					
Neg-btb					+ ***				
QE-util						+ ***			
QE-btb							+ ***		
country	No	Yes	Yes	No	No	No	No		

Note: btb: broker-to-broker activity; utilis: utilisation rate; Neg: dummy for negative deposit rates introduction; QE: dummy for the launch of ECB QE; Neg-Util and Neg-btb: variables interacting negative deposit rate dummy with utilisation rate and broker-to-broker activity; QE-util and QE-btb: variables interacting QE dummy with utilization rate and broker-to-broker activity. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.

The negative deposit rate and QE dummies coefficients are positive and strongly significant, reflecting the positive impact of these policy developments on the collateral scarcity premium. A negative deposit rate makes ECB refinancing relatively cheaper and therefore reduces liquidity-driven demand on repo markets. Although ECB rates impact both GC and SC rates, the asymmetric impact on repo demand leads to relatively higher GC rates, i.e. a larger scarcity premium. Interacting these two dummy variables with the short-selling and broker-to-broker variables, we observe three things. First, the original QE dummy variable becomes non-significant while the negative deposit dummy variable remains statistically significant, suggesting that the negative deposit rate has a broader market impact while the impact of QE on collateral scarcity premium only feeds through short-selling and collateral reuse. Second, both the negative deposit rate and QE have a larger coefficient through collateral reuse than through short selling. Taken together, these three different elements highlight the magnitude of changes introduced by the negative deposit rate as well as the crucial role of reuse in collateral markets.

#### V.8

Collateral reuse: Need for transparency

Most SFTs in Europe are title-of-transfer agreements that give full right of reuse to the collateral receiver, which has become a widespread practice in financial markets over the last decade.

Reuse of collateral provides liquidity and enables counterparties to reduce funding costs. However, it tends to create complex collateral chains between market participants, giving rise to financial stability risks. The lack of transparency on the extent to which collateral is reused can amplify risks to financial stability.

The new Regulation<sup>8</sup> on the transparency of securities financing transactions and of reuse recently adopted by the EU sets out minimum conditions to be met by the parties involved in SFTs, including disclosure and written agreement. This would ensure that clients or counterparties have to give their consent before reuse takes place and that they make decisions based on clear information on the risks that it might entail.

#### Conclusion

This article summarises our findings on the drivers of the cost of obtaining high-quality collateral, proxied by specialness of government bond repos, in seven European countries over the last two years. Without good access to highquality collateral, market participants would find it more costly to trade, with a negative impact on financial stability through reduced market liquidity and on the real economy through increased frictions in bond market financing for non-financial corporations.

Empirical results show that the cost of obtaining high-quality collateral increases with pressures in the cash market (short selling activities), even in calm financial conditions. In bear market conditions – when good collateral is most needed – this may lead to tensions in some asset market segments. Collateral reuse may alleviate these tensions, but requires transparency and monitoring due to the risk entailed in collateral chains.

The period analysed covers two important changes in ECB monetary policy: the introduction of negative deposit rates in June 2014 and the launch of quantitative easing in January 2015. We observe a significant, albeit marginal, impact of these two policy changes on the scarcity premium. In the case of QE, this is likely alleviated by the ECB and NCB securities lending programmes, which would address potential collateral shortages.

The availability of new data on SFTs coming from the new EU Regulation will significantly improve transparency in this market. For the time being, the distribution of specialness (V.2) will be used as an additional risk indicator in ESMA TRV and Risk Dashboards to detect stress in repo markets, for example arising from short sales, or reduced collateral availability.

#### References

BIS (2010) "The role of margin requirements and haircuts in procyclicality", CGFS Publications No 36.

Corradin, S. and A. Maddaloni (2015) "The Importance of Being Special: Repo Markets during the Crisis," working paper.

Duffie, D. (1996) "Special repo rates" Journal of Finance 51, 493-526.

Duffie, D., M. Scheicher and G. Vuillemey (2015) "Central Clearing and Collateral Demand"), Journal of Financial Economics, Vol. 116, pp. 237-256.

FSB (2012) "FSB Report on Securities Lending and Repos: Market Overview and Financial Stability Issues".

FSB (2013) "Strengthening Oversight and Regulation of Shadow Banking. Policy Framework for addressing Shadow Banking Risks in Securities Lending and Repos".

Singh, M. (2013) "Collateral and monetary policy", IMF Working Paper, WP/13/186.

Singh, M. (2014) "Collateral and Financial Plumbing", Risk Publications.

<sup>&</sup>lt;sup>8</sup> Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012

Annexes

# **Statistics**

### Securities markets

### Market environment





10



70 Dec-13 Apr-14 Aug-14 Dec-14 Apr-15 Aug-15 Dec-15 GBP - USD JPY \_ ------ Emerging ••••• 5Y-MA USD - CHF

Note: Spot exchange rates to Euro. Emerging is a weighted average (2013 GDP) of spot exchange rates for CNY, BRL, RUB, INR, MXN, IDR and TRY. 02/12/2013=100. Increases in value represent an appreciation of EUR. 5Y-MA of the USD exchange rate. Sources: ECB, IMF, ESMA.



••••••• 5Y-MA Overall

Note: European Commission survey of EU financial services sector and subsectors (NACE Rev.2 64, 65, 66). Confidence indicators are averages of 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 sources: European Commission, ESMA.





Note: Net issuance of debt securities, equities and securitised assets in the EA, by type of instrument and sector, in EUR bn. Securitised assets include ABS, MBS and covered bonds. Due to different netting and consolidation methodologies, the data may not be fully reconcilable. 1Y-MA markets plots the 1Y-MA of the aggregate of all assets displayed in columns. 1Y-MA loans plots 1Y MA of Ioan-based financing. Sources: ECB, Dealogic, ESMA.

A.11 Equity issuance by sector



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





Note: Net outflows=BoP and international investment position. Portfolio investment assets of EA 19 (fixed composition) residents. Net transactions over the period, EUR bn. Sources: ECB, ESMA.



Note: Growth rates of issuance volume in per cent normalised by standard deviation for the following bond classes: sovereign (Sov); money market (MM); covered bonds (CB); investment grade (IG); high-yield (HY); asset backed securities (ABS); mortgage backed securities (MBS). Percentiles computed from 110 rolling window. All data include securities with a maturity higher than 18M. Bars denote the range of values between the 10th and 90th percentiles. Sources: Dealogic, ESMA.



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



Note: EA institutional investment flows by type of investor, EUR bn. Other= financial vehicle corporations, mixed funds, other funds. EUR bn. 1Y-MA=1Y moving average of all investment flows. 1Y-MA not shown for 10Q2 and 10Q3 as not all series are available for 2009. Sources: ECB, ESMA.

#### Equity markets





Price-earnings ratios



0.00 Dec-11 Jun-12 Dec-12 Jun-13 Dec-13 Jun-14 Dec-14 Jun-15 Dec-15 Adjusted P/E EA Adjusted P/E US Average 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. Data available until the end of October 2015. Sources: Thomson Reuters Datastream, ESMA.







Note: Datastream regional equity indices for the EU, the US and Japan, indexed with 02/12/2013=100. Indices in their regional currency. Sources: Thomson Reuters Datastream, ESMA.



Illiquidity indicator 0.62



Note: Composite indicator of liquidity in the equity market for the current Eurostoxx 200 constituents, computed by applying the principal component methodology to six input liquidity measures (Amihud iliquidity coefficient, bidask 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.



percentage difference for the current EU constituents of the main national indices, %. Truncated at 4% for clarity purposes. No data for HR, CY, EE, LV, LT, MT and SK. Sources: Thomson Reuters Datastream, ESMA.

#### Sovereign-bond markets



Note: Quarterly issuance (rhs), EUR bn, and outstanding debt (lhs), EUR tn. Amounts outstanding after 15Q2 forecasted. Sources: Dealogic, Eurostat, AMECO, ESMA.

A.25



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



A.29 Volatility







Note: Quarterly issuance in the EU ranked by S&P ratings at launch, EUR bn. Weighted average rating computed by converting ratings into a numeric scale (AAA=21, AA+=20, etc). Sources: Dealogic, ESMA.

A.26 10Y yields



A.28 Yield dispersion 20 16 12 , alles 8 4 Dec-13 Aug-15 Dec-15 Apr-14 Aug-14 Dec-14 Apr-15 Top 25% Core 50% Bottom 25% Median

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

A.30

Yield correlation dispersion





Note: Datastream CDS sovereign indices (5 years, mid-spread). Sources: Thomson Reuters Datastream, ESMA



Dec-13 Apr-14 Aug-14 Dec-14 Apr-15 Aug-15 Dec-15 Liquidity indicator • 40D-MA • • • • • • 5Y-MA Note: Liquidity measured as median across countries of the difference in bid-ask yields for 10Y sovereign bonds, in basis points. 24 EU countries are included. Sources: Bloomberg, ESMA.



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Note: Dispersion of liquidity measured as median across countries of the difference in ask and bid yields for 10Y sovereign bonds, in basis points. 24 EU countries are included. Sources: Bloomberg, ESMA.











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

#### Corporate-bond markets

A.39

40

20

0

-20

A.45

200

150

100

50

0

10Q2

Issuance and outstanding

11Q2



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A.42

2500

2000

1500

1000

500

0

15Q2



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





Note: Outstanding amount computed as the cumulated sum of previously issued debt minus the cumulated matured debt prior to reference date. EUR bn. Sources: Dealogic, ESMA.



A.44 Spread by credit rating 200 150 100 50 Aug-14 Dec-14 Apr-15 Aug-15 Dec-15 Dec-13 Apr-14

AAA AA - A BBB Note: EA non-financial corporate bond spreads by rating between iBoxx non-financial corporate yields and ICAP euro euribor swap rates for different maturities, basis points. Sources: Thomson Reuters Datastream, ESMA



#### Securitised assets and covered bonds

Outstanding (rhs) Retained issuance Placed issuance Note: Issuance and oustanding amount, EUR bn, of securitised products in Europe (including ABS, CDO, MBS, SME, WBS), retained and placed. Sources: AFME, ESMA.

13Q2

14Q2

12Q2



basis points. Sources: Thomson Reuters Datastream, ESMA.

A.49



Note: Securitised products in the EU rated by Moody's. Number of rating changes per quarter. Sources: AFME, Moody's, ESMA.



of total pool. Sources: CEREP, ESMA.

A.53 Covered bond outstanding 150 2000 1500 100 1000 50 500 0 0 10Q4 11Q4 12Q4 13Q4 14Q4 15Q4 Outstanding (rhs) Issuance •••••5Y-MA Issuance

Note: Outstanding amount computed as the historical cumulated sum of the difference between issuance and maturity of covered bonds, EUR bn. 5Y-MA is five-year moving average for issuance. Sources: Dealogic, ESMA.



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Note: Securitised products in the EU rated by Moody's. Rating classes in % of total amount outstanding. Sources: AFME, Moody's, ESMA.

A.50

Size of rating changes







Note: Asset swap spreads based on iBox covered bond indices, basis points. bY-MA=five year moving average of all bonds. Sources: Thomson Reuters Datastream, ESMA.

### Credit quality



Note: Average size of upgrades and downgrades from all credit rating agencies by asset class for 1H15, average number of notches. SF=structured finance, CB=covered bonds, Sovereign includes public finance. Sources: CEREP, ESMA.









### A.61 Securities utilisation rate 40 30 20 10 0 Dec-13 Apr-14 Aug-14 Dec-14 Apr-15 Aug-15 Dec-15 Corporate bonds Government bonds Equities Note: European securities lending utilisation rate, computed as outstanding value of securities on loan over outstanding total lendable value, %. Corporate bonds comprise euro denominated bonds only.

Sources:Markit Securities Finance, ESMA



Securities lending against cash collateral 40



Note: Ratio of European securities on loan collateralised with cash over total securities on loan, outstanding values, %. Source: Markit Securities Finance, ESMA.



Dec-13 Apr-14 Aug-14 Dec-14 Apr-15 Aug-15 Dec-15 Equities —— Government bonds —— Corporate bonds

Note: Ratio of European securities on loan at open maturity over total securities on loan, outstanding values, %. Sources: Markit Securities Finance, ESMA



Hous, Lob min Sponie dynamic general genera

### Short selling



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





and NL), volume -weighted average of fixed rates index val Sources: RepoFunds Rate (BrokerTec,MTS,ICAP), ESMA. value, %



is the sum of outstanding debt securities issued by EU governments with a rating equal or higher than BBE-.Quasi high-quality is outstanding corporate debt with rating equal or higher than AA-. Sources: Dealogic, Eurostat, AMECO, Standard & Poor's, ESMA.



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



Sources: National Competent Authorities, Datastream, ESMA

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A.64

A.70

#### Money markets







#### basis points. 5Y-MA Euribor, 5 years moving average for Euribor spread. Sources: Thomson Reuters Datastream, ESMA. A.74 Euribor volatility 700



#### Commodity markets



Note: S&P GSCI Commodity indices and Brent price, indexed, 01/01/2014=100. 5Y-AVG=five-year average computed using S&P GSCI. Indices denominated in USD. Sources: Thomson Reuters Datastream, ESMA.





Note: Annualised 40D volatility of S&P GSCI Commodity indices and Brent price. %. 5Y-MA=five-year moving average computed using S&P GSCI. Sources: Thomson Reuters Datastream, ESMA.



Sources: Thomson Reuters Datastream, ESMA.

#### **Derivatives markets**



category, USD tn. Sources: Bank for International Settlements, ESMA.









#### Shadow banking and market based credit intermediation

100

80

60

40

20

0



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. % of bank liabilities on rhs. Sources: ECB, AFME, ICMA, Markit Securities Finance, ESMA.

A.85 MMF and other financial institutions 30 25 20 15 10 5 0 10Q3 11Q3 12Q3 13Q3 14Q3 15Q3 IF MMFs FVC Other OFI

OFIs + MMFs % of MFI (rhs) IF+MMFs % of MFI (rhs) 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 MFUA. EUR tn, in % of banks' assets on rhs. Sources: ECB, ESMA.



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, USD tn. % of bank liabilities on rhs. Sources: Federal Reserve Flow of Funds, Thomson Reuters Datastream, ESMA







#### Structured retail products



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





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



Universal bank
 Other
 Note: Volumes of structured products sold to retail investors by provider per year EUR bn. Others include: academic institutions; asset or fund managers; brokerage; commercial banks; independent financial advisers; insurance and pension companies; private banks or wealth managers; securities companies; SPV.

Sources: StructuredRetailProducts.com, ESMA.










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





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

#### A.103

Net flows for bond funds



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

A.105



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. 2014 (mid tones) and 2015 (hue). Sources: Thomson Reuter Lipper, ESMA.







A.104 Net asset valuation

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



Sources. monison neuters Lipper, LSivi





### Alternative funds



Note: EU domiciled hedge funds' monthly returns, %. The graph shows the returns' median, the difference between the returns corresponding to the 98th and 25th percentiles (light blue corridor) and the difference between the returns corresponding to the 1st and 3rd quartiles (dotted line corridor). Sources: TASS Lipper, Eurekahedge, BarclayHedge, HFR, ESMA.



Note: Alternative mutual funds' 2M cumulative net flows by domicile, EUR bn. Data on alternative mutual funds represents only a subset of the entire alternative fund industry. Sources: Thomson Reuters Lipper, ESMA.

20

A.115 Assets and leverage 400



Leverage (rhs) •••••• 5Y-AVG lev (rhs) Note: NAV and AuM of EA hedge funds, EUR bn. Leverage computed as the AuM/NAV ratio. 5Y-MA leverfive-year moving average for the leverage ratio. Sources: ECB, ESMA.





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



Note: Market share of hedge funds' AuM by strategy: Fund of hedge funds, Commodity Trading Advisor, distressed debt, emerging market, long/short equity, equity long bias, event driven, fixed income, macro, multi-strategy, other. Funds of hedge funds are not included in the total. % of total. Sources:BarclavHedge. ESMA.



Note: Systemic stress indicator based on products of fractions of regressions with positive (negative) estimated coefficient individual fund return's impact on average return of sector significant at 99% level and respective average estimators. Coefficients stem from VAR models regressing individual fund returns on lags and general financial market indices. Measures aggregated across individual regressions. Data until September 2015. Sources: Barclayhedge, Eurekahedge, TASS, HFR, ESMA.

### Exchange-traded funds



Note: EU domiciled ETFs' average yearly returns by month, asset weighted, %. The graph shows the median and average asset weighted returns and the difference between the returns corresponding to the 98th and the 2nd percentile (light blue corridor). Sources: Thomson Reuters Lipper, ESMA.

A.119



0.0 Dec-13 Apr-14 Aug-14 Dec-14 Apr-15 Aug-15 Dec-15 ETFs - MFs index trackers UCITS - MFs index trackers Non-UCITS

Note: Tracking error defined as standard deviation of fund 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. Sources: Thomson Reuters Lipper, ESMA.



Note: Annualised 40D historical return volatility (%) of EU domiciled ETF. Sources: Thomson Reuters Lipper, ESMA.

A.120

NAV by asset type



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



Note: ETF not cumulative net flows by domicile, EUR bn. Sources: Thomson Reuters Lipper, ESMA



### Retail investors







Note: Annualised growth rates of average gross disposable income in 16 EU countries (BE, CZ, DK, DE, IE, ES, FR, IT, NL, AT, PL, PT, SI, FI, SE, UK), %. Sources: Eurostat, ESMA.

A.127



Assets Liabilities Liabilities/Assets ratio Note: EU households' financial assets and liabilities, excl. BG, CY; EUR tn (lhs). Assets/Liabilities ratio, % (rhs). Sources: ECB, ESMA.



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 bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated into categories 1-7 (with 7 representing bit is the translated bit is the translated into categories 1-7 (with 7 representing bit is the translated bi higher levels of volatility). Sources:Thomson Reuters Lipper, ESMA.



Note: X-axis: Numeracy = share of respondents with correct answers (three numerical questions asked). Y-axis = EA households (excl. IE, EE) holding debt in 2008-2011. % Sources: Special Eurobarometer 342 2011, ECB HFCS, ESMA



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Note: Annualised growth rates of EA-18 households' real and financial assets, % 5Y-MA: five-year moving average of the growth rate. Sources: ECB, ESMA.



Note: Unweighted average annualised growth (%) in EU households' financial assets. Data from 25 EU countries excl. BG, CY, AT. Excluding DK, FI, GB, GR, HR, IE from loans; IE from investment funds; CZ, DK, FR, GR, LU, RO from other assets (derivatives and other accounts receivable/payable) Sources: ECB, ESMA.



Note: Dispersion of the national percentages of households owning shares by their income group. Data for EA member states (excl. IE, EE) for 2008-2011, %. Bottom 25% represents the range of values from minimum to 1st percentile, Core 50% from 1st percentile to 3rd percentile, and Top 25% from 3rd percentile to maximum. Sources:ECB HFCS, ESMA



Note: Unweighted average of personal income and corporate income taxes over 21 countries (AT, BE, CZ, DE, DK, EE, ES, FI, FR, GR, HU, IE, IT, LU, NL, PL, PT, SE, SI, SK, UK) plotted through the line chart (%). Composition of the average in personal income vs. corporate income taxes plotted on the column chart (%). Sources: OECD.





Note: Complaints data by financial instrument in % over the total. Data collected from NCAs, firms and Ombudsman of 27 EU countries (excluding CZ). Sources: ESMA complaints data collection by EU NCAs.

## Infrastructures and services





Note: Turnover in EUR as % of total. Data as of September 2015. Sources: FESE, ESMA.



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





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



Note: Share of volume of transactions cleared by reporting CCPs for Cash, Repos, non-OTC and OTC derivatives, 2014. LCH.Clearnet Ltd not included due to uneven reporting during the period. Sources: ECB, ESMA.

### Central counterparties



Jan-14 May-14 Sep-14 Jan-15 May-15 Sep-15 Corporate bonds Equities Government bonds Note: Total value of settled transactions in the EU as reported by NCAs; daily values in EUR bn. Free-of-payment transactions not considered. Sources: National Competent Authorities, ESMA.

A.143



Others ■ Iberclear ■ Monte Titoli ■ Crest ■ Clearstream ■ Euroclear Note: Value of securities held by EU CSDs in accounts; annual data in EUR tn. Sources: ECB, ESMA.



Note: Share of failed settlement instructions in EU; % of value, 5D-MA. Free-ofpayment transactions not considered.

Sources: National Competent Authorities, ESMA.

### A.144

Value of settled transactions



Others Monte Titoli Iberclear Euroclear Crest Clearstream Note: Value of settlement instructions processed by EU CSDs; EUR tn. Sources: ECB, ESMA.

### Credit rating agencies



Note: Cumulative accuracy profile (CAP) coefficients measure the accurancy of ratings. The coefficient is derived from average defaulter position (AP), then computed as follows: CAP = 2\*AP-1. The closer the coefficient is to 1, the higher the accuracy of the ratings (i.e. defaults occur among low credit ratings). Sources: CEREP, ESMA.



Note: Number of banks contributing to the Euribor panel; non-viability is assumed at 12 contributing banks Sources: Euribor-EBF, ESMA.



Note: Cumulative accuracy profile (CAP) curves for the 3 largest credit rating agencies. 2H10-1H15. The CAP curve plots the cumulative proportion of issuers by rating grade (starting with the lowest grade on the left) against the cumulative proportion of defaulters by rating grade. Sources: CEREP, ESMA.



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. The increase since 2013 is linked to technical factors such as low Euribor rates. The spike in August 2014 reflects the fact that two panel banks submitted respectively a quote for the two-week tenor which was 7 times higher than Euribor and a quote for the 1M tenor which was 10 times higher than Euribor. Sources: Euribor-EBF, 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
DTCC	Depository Trust & 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
IRS	Interest Rate Swap
LTRO	Long-Term Refinancing Operation
MA	Moving Average
MBS	Mortgage-Backed Securities
MMF	Money Market Funds
MTN	Medium Term Note
NAV	Net Asset Value
NCA	National Competent Authority
OIS	Overnight Index Swap
OMT	Outright Monetary Transactions
отс	Over the Counter
RMBS	Residential Mortgage-Backed Securities
SCDS	Sovereign Credit Default Swap
SF	Structured Finance
UCITS	Undertaking for Collective Investment in Transferable Securities
YTD	Year to Date
Countries abbreviated according to ISO standards	

Currencies abbreviated according to ISO standards



