Government Bond Data Report

European market data update

Q4: 2017

Association for Financial Markets in Europe
www.afme.eu

Table of Contents

Highlights and Market Environment

This report provides a comprehensive data source with updated statistics of the Government bond[2] primary and secondary markets in Europe (EU28).

"The full year EU government bond trading volume[1] in 2017 was similar to 2016, with a small decrease of 0.3%"

Among the main findings of this report are:

- **Average daily trading volumes** of European government bonds increased in the majority of jurisdictions in our data set between 4Q16 and 4Q17. However, it fell 20% on aggregate, primarily due to a fall in German government bond turnover. The quarter on quarter turnover comparison showed a very small increase of 1% on aggregate; however, there was a large quarterly increase in Ireland and Italy. The notable quarterly and annual increase in Italy was likely driven by a combination of the run up to the Italian general election in March 2018 and a credit rating upgrade in October 2017.

- **European Government bond gross issuance** totalled €579.4 bn in 4Q17, a decrease of 2% from the volume issued in 3Q17 (€591.3 bn).

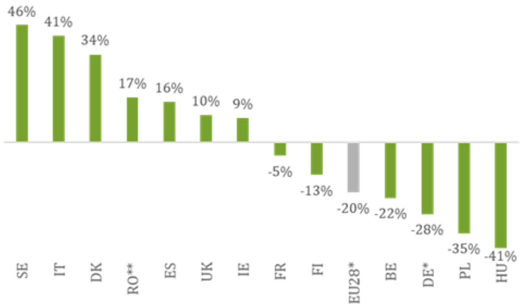
- **The average bid-cover ratio** (demand/amount allocated)[3] was 2.14 in 4Q17, reflecting a significant decrease in the bid/cover ratio for the UK. As illustrated in Chart 2.7, the fall in bid/cover ratio for the UK in the last two quarters appears to show a return to the long-term trend, after a significant increase in bid/cover ratio since 3Q 2016.

- 2017 saw **15 long-term credit rating upgrades for EU countries** compared to 2 downgrades. This reflects a strong year for the credit quality of European sovereign issuers. A comparison of the upgrade/downgrade ratio with European securitisation and high yield bonds is undertaken below.

	2014	2015	2016	2017
Gross Issuance (€ bn)	2727.9	2601.3	2556.1	2485.4
Bonds (€bn)	1268.1	1215.7	1187.0	1235.3
Bills (€bn)	1459.8	1385.6	1369.1	1250.1
Outstandings (€ tn)	9.3	9.7	9.6	9.8
Bid-cover ratio	2.29	2.22	2.16	2.13
Average daily turnover (% YoY change)	-	-8.4%	-7.2%	-0.3%

Annual change in Government Bond average trading volumes

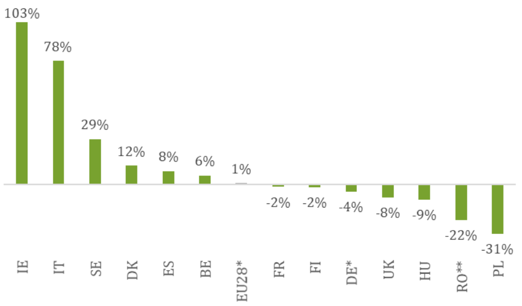
(4Q17 vs 4Q16) Selected European jurisdictions



*Source: AFME with information from European DMOs and other agency sources and Trax, a MarketAxess subsidiary. See section 5 for details on aggregation basis and sources. *Europe total and German turnover is sourced from TRAX Facts as the quarterly variation of average daily volumes of government and sovereign bonds. **Romanian turnover volume calculated using outstanding volumes in Section 3.*

Quarterly change in Government Bond average trading volumes

(4Q17 vs 3Q17) Selected European jurisdictions



*Source: AFME with information from European DMOs and other agency sources and Trax, a MarketAxess subsidiary. See section 5 for details on aggregation basis and sources. *Europe total and German turnover is sourced from TRAX Facts as the quarterly variation of average daily volumes of government and sovereign bonds. **Romanian turnover volume calculated using outstanding volumes in Section 3.*

[1] Total EU government bond trading volume data is sourced from Trax

[2] Fixed income securities issued by central governments. The report includes Bonds and Treasury Bills and excludes agencies and Central Bank origination.
[3] Weighted average (by issuance volume) of bid-cover ratios in the United Kingdom, Spain, France, Italy, Germany, Belgium, Sweden, Netherlands, Denmark and Austria.

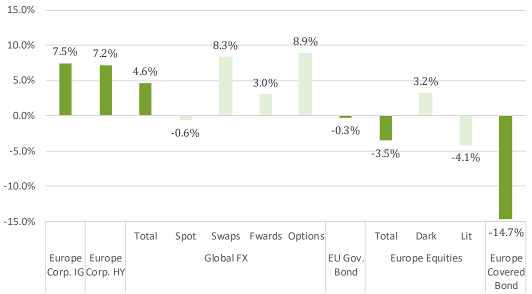
Highlights

2017 EU Government Bond trading volume consistent with 2016 level

The full year 2017 EU government bond trading volume[4] remained very similar to the level seen in 2016, with a slight decrease of 0.3%. This is consistent with the findings on a national level, as of the countries where trading volume data for full year 2017 is available, 6 countries experienced an increase[5] in trading volumes and 6 experienced a decrease[6].

A comparison of the annual change in trading volumes for government bonds with other asset classes is set out in the left chart. European corporate bonds, both investment grade and high yield, experienced a notable increase in trading volumes whereas covered bonds saw a significant decrease. The increase in FX trading was driven by derivatives as opposed to spot markets, and the decrease in equities trading was a consequence of lower trading on lit venues.

Annual change in European Bond, European Equities and Global FX trading (2017-16, %)

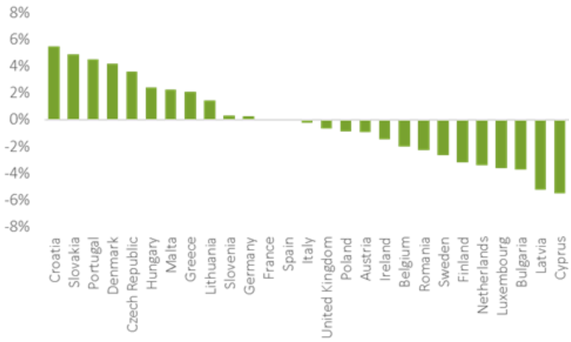


Source: *Trax, a MarketAxess subsidiary (corporate bond, government bond, and covered bonds); CBOE Global Markets (Equity); Global FX (FX committees from Tokyo, NY, UK, Singapore, Canada, and Australia)*

Increasing average years to maturity for CEE countries

Nine countries saw a quarterly increase (3Q17 to 4Q17) in weighted average years to maturity of outstanding government bonds of greater than 1% (see chart on the left), with 5 of these countries from Central and Eastern Europe. Outstanding bonds from CEE countries tend to have lower time to maturity than the EU average, as a result increases for CEE countries will help with EU convergence in this respect. However, not all CEE countries saw an increase, as of the 10 EU countries in the CEE grouping[7], 6 countries experienced increased time to maturity and 4 experienced a decrease.

Quarterly change in weighted average years to maturity for outstanding government bonds 3Q17 to 4Q17



Source: *Thomson Reuters Eikon*

EU government bond issuer credit rating upgrades outweigh downgrades by 7.5 to 1 in 2017

There were 15 upgrades to the credit ratings of EU countries in 2017 compared to 2 downgrades, resulting in an upgrade/downgrade ratio of 7.5. This ratio is significantly higher than the equivalent value of 1.4 in 2016. The chart on the left also illustrates that the 2017 upgrade/downgrade ratio for government bond issuers was higher than for securitisations and high yield bonds (instrument rather than issuer rating was used for these categories). The increase in the ratio from 2016 to 2017 was also significantly higher for government bond issuers as compared to securitisations and high yield bonds.

The increases to EU sovereign credit ratings in 2017 were driven by southern and eastern European countries, as Cyprus, Greece, Slovenia, Portugal and Bulgaria have all received multiple upgrades.

Credit rating upgrades/downgrades of selected European issuers and securities

	2017		2016		2017	2016
	Upgrades	Downgrades	Upgrades	Downgrades	Up/down ratio	
Securitisation*	2,219	497	1,913	424	4.5	4.5
Government bonds**	15	2	11	8	7.5	1.4
HY Bonds***	151	109	115	170	1.4	0.7

Source: *AFME and SIFMA with Moody's, Fitch, and S&P data. *By instrument. ** By issuer (long-term foreign currency). ***By instrument*

[4] Total EU government bond trading volume data is sourced from Trax
[5] UK, Sweden, France, Denmark, Greece and Poland.
[6] Italy, Spain, Finland, Belgium, Ireland and Hungary.

[7] The EU countries in the CEE grouping as defined by the OECD are Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia, Estonia, Latvia and Lithuania. Due to lack of available data for Estonia, only 10 countries are included in the analysis.

The improving credit quality in the region was reflected by further falls of the CDS spreads 4Q17, most notably in Chart 6.6 for Portugal and Spain.

Major upcoming regulatory, legislative and policy initiatives

There several regulatory initiatives that are currently being considered at the European and national level with expected impact on the government bond markets. Some of the key initiatives recently implemented or currently being developed are:

- MiFID II/R
- Fundamental Review of the Trading Book (FRTB)
- Basel III
- CSDR
- Prospectus Regulation

AFME and its members are actively contributing on all of these and other initiatives.

BOX: Uncertain future of floating rate European government bonds referencing IBORs

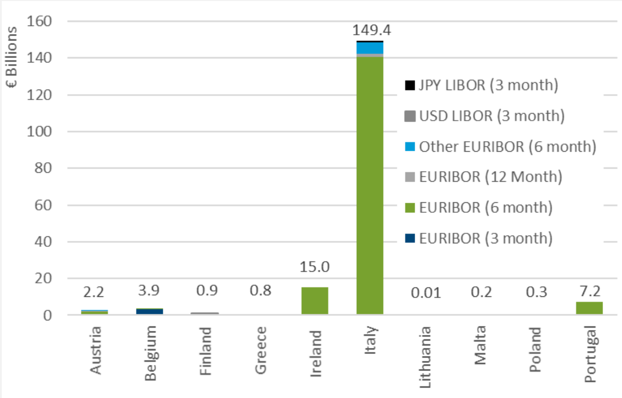
The development and selection of alternative reference rates as an alternative to LIBOR in the US and UK (as well as equivalent work in Switzerland and Japan) has been progressing for a number of years but focus on the future of IBOR rates was heightened since the CEO of the FCA, Andrew Bailey, gave a speech in June 2017. In this speech he questioned the sustainability of LIBOR benchmarks in the absence of an active underlying market and stated that panel banks have only committed to supporting the rate until the end of 2021. Transition to alternative reference rates has now begun in earnest, but particular uncertainty remains about the outcome for legacy contracts referencing LIBOR if it ceases to be published after 2021.

In the Eurozone, work to develop an alternative reference rate to EURIBOR and EONIA was initiated in September 2017 when the Commission, FSMA, ESMA and ECB launched a new Working Group tasked with the identification and adoption of a risk-free overnight rate which can serve as a basis for an alternative to current benchmarks in the euro area. In a parallel development, the ECB announced that it will start providing a euro unsecured overnight index before 2020, which will be based entirely on transactions in Euros that are reported by banks in accordance with the ECB's money market statistical reporting (MMSR).

The ECB's work to develop a euro unsecured overnight interest rate has taken on greater significance since the European Money Markets Institute (EMMI), the administrator of EONIA and EURIBOR, stated last month that they would not continue with their work to make EONIA compliant with the EU Benchmarks Regulation (BMR). As a result, it will not be possible to reference EONIA in new contracts after 1st January 2020. The relevant national competent authority, which for EONIA and EURIBOR is Belgium's Financial Services and Markets Authority, would thus need to utilise the grandfathering provisions in the BMR to enable the continued use of EONIA in legacy contracts outstanding after that date.

The reference rate of greatest significance to the European Government bonds market is EURIBOR (no Government bonds indexed to EONIA were found). As Chart 1 illustrates, over €178 billion of outstanding bonds are indexed to EURIBOR, with the Italian Government accounting for over €148 billion.

Chart 1: Outstanding European Government Bonds Indexed to EURIBOR or LIBOR Q4 2017[8]



€ million	EURIBOR (3 month)	EURIBOR (6 month)	Other EURIBOR (6 month)	EURIBOR (12 Month)	USD LIBOR (3 month)	JPY LIBOR (3 month)	Total
Austria	-	2,125	40	75	-	-	2,240
Belgium	3,495	376	-	-	-	-	3,871
Finland	100	-	-	-	812	-	912
Greece	-	756	-	-	-	-	756
Ireland	-	15,034	-	-	-	-	15,034
Italy	-	140,660	6,065	1,850	-	845	149,419
Lithuania	7	-	-	-	-	-	7
Malta	-	223	-	-	-	-	223
Poland	300	-	-	-	-	-	300
Portugal	50	7,100	-	-	-	-	7,150
Total	3,952	166,274	6,105	1,925	812	845	179,913

Source: *Thomson Reuters Eikon.*

EMMI are seeking to ensure that EURIBOR is compliant with the BMR by introducing a revised hybrid methodology for EURIBOR by Q4 2019 which uses additional data on interbank lending volumes. It is not clear, however, that it will be possible to ensure that this calculation methodology is sufficiently reliant on transactions data rather than panel bank submissions, and it is expected that clarity on the issue will only be available towards the end of 2018. In the event that EURIBOR is not deemed compliant with BMR, then as with EONIA, new contracts (for example EURIBOR based swaps) will not be able to reference EURIBOR after 1st January 2020.

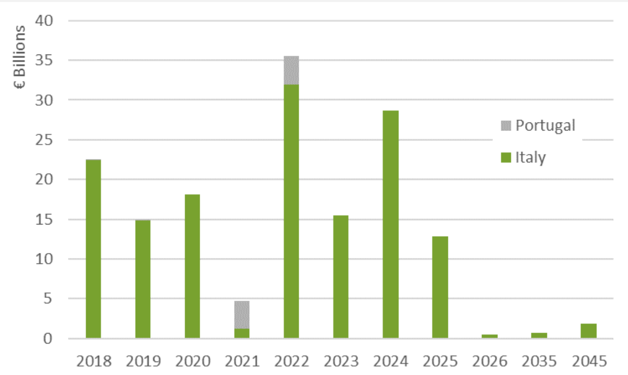
If EURIBOR is deemed non-compliant with the BMR, then Belgium's Financial Services and Markets Authority would again need to use the grandfathering provisions in the BMR to enable legacy contracts to continue referencing EURIBOR

[8] 'Other EURIBOR (6 months)' includes 6 month EURIBOR swap rates of various tenors.

after 1st January 2020. It is not guaranteed that current EURIBOR panel banks will continue submitting quotes to EMMI, given the legal and operational risks involved in providing such quotes, especially if the rate is not BMR compliant. The number of EURIBOR panel banks has already fallen from 44 in 2012 to 20 today. However, Article 23 of the BMR could be used by regulators to compel panel banks to submit to EURIBOR for 2 years (as it has been deemed a 'critical' benchmark under the BMR).

The issues mentioned above result in considerable uncertainty around the future of EURIBOR and instruments that reference it. An important factor to analyse when considering this uncertainty is the maturity profile of relevant bonds. Chart 2 sets out the maturity profile for Italian and Portuguese government bonds indexed to EURIBOR (chosen due to relatively large outstanding amounts and the Irish bonds have not been included due to their exchange option discussed below), illustrating that a significant volume of legacy contracts are exposed to EURIBOR uncertainty until 2025 and that some bonds will continue to reference EURIBOR until 2045 unless amendments to bond documentation are made.

Chart 2: Maturity Profile of Outstanding Italian and Portuguese Government Bonds Indexed to EURIBOR Q4 2017



Source: *Thomson Reuters Eikon.*

The EURIBOR-indexed government bond that has the greatest outstanding amount is the Italian floating rate bond linked to 6-month EURIBOR, called CCT-eu. CCT-eus were introduced in 2010 to replace the existing CCTs which indexed to the six-month BOT (Treasury Bill) rate. A description of the Italian CCTeu bonds can be found here, and the initial aim for replacing CCTs with CCTs-eu was to "appeal a greater number of national and international investors who will be keener to have it in their portfolios", it was also felt that the instrument "offers a suitable protection or hedge to those investors, corporate as well as retail, whose liabilities are EURIBOR linked" and would improve secondary market liquidity compared to CCTs. These bonds continue to be issued on a regular basis.

If EURIBOR ceases to be published after 2020, the procedure set out in the CCT-eu bond documentation[9] states that "the 6 month EURIBOR of the first business day for which it is available, going backwards in time, will be used", thus effectively the bond will be fixed rate, with the rate equal to the last available EURIBOR fixing plus the relevant additional spread for the bond.

The Irish Government also has exposure to EURIBOR through €15 bn of outstanding long tenor bonds referencing 6-month EURIBOR (maturing between 2047 and 2053). These bonds were a one-off issue in 2013, exchanged for Promissory Notes held by the Central Bank of Ireland and a feature of these transactions is an Exchange Option Deed, allowing the floating rate bonds to be exchanged for fixed rate bonds issued by the Irish National Treasury Management Agency.

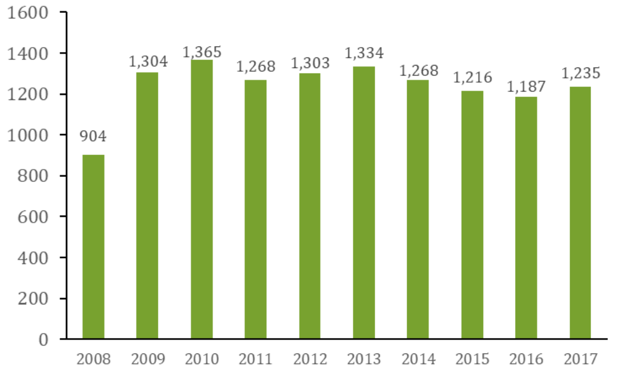
The Portuguese government bonds referencing 6 month EURIBOR are the OTRV bonds with maturities up to 10 years. The latest issue of these bonds was on 5th December 2017, for an amount of €1.3 billion and a maturity of 5 years.

AFME is actively involved in a number of initiatives working to preparing the market for the transition to risk free reference rates. It is an issue of significant complexity which will require global coordination to find solutions and implement them effectively, so raising awareness of the potentially impacts and ongoing work is crucial.

[9] Information available on the Tresoro website

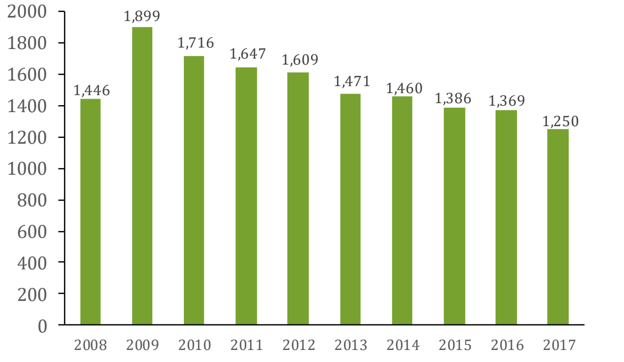
1. Issuance

1.1 EU Government Bond issuance (EUR bn)



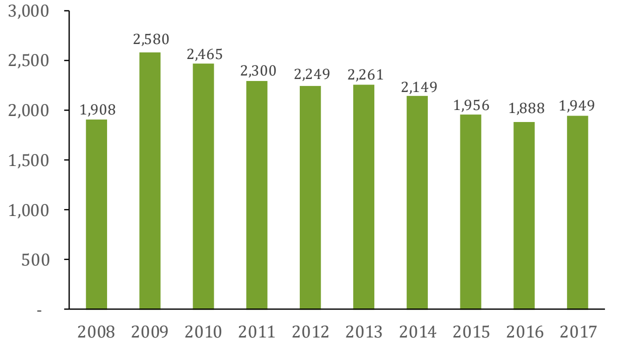
Source: *ECB and National Debt Management Offices*

1.2 EU Treasury Bills issuance (EUR bn)



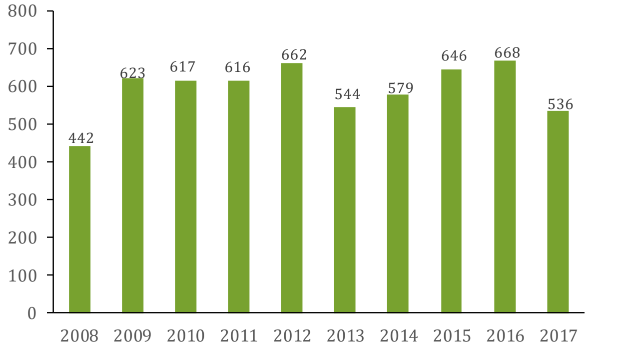
Source: *ECB and National Debt Management Offices*

1.3 Eurozone bonds and bills issuance (EUR bn)



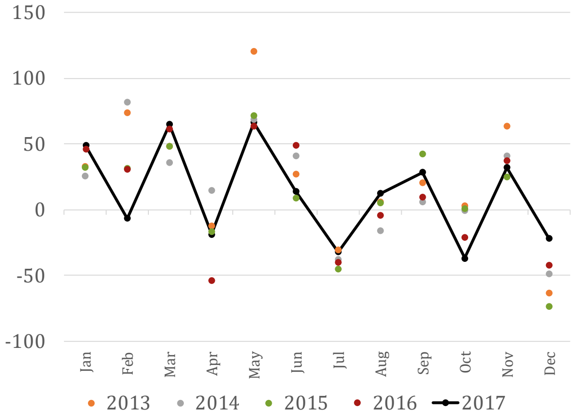
Source: *ECB and National Debt Management Offices*

1.4 Non-Eurozone bonds and bills issuance by (EUR bn)



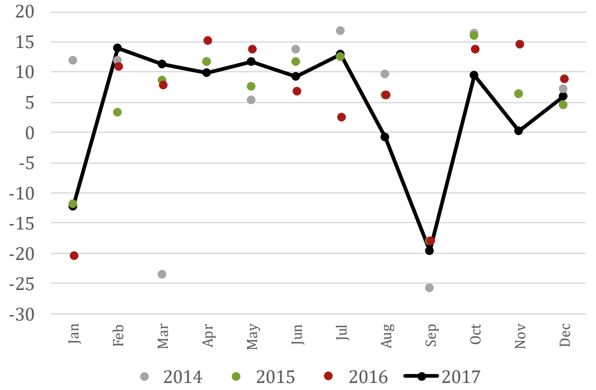
Source: *ECB and National Debt Management Offices*

1.5 Euro area net sovereign debt issuance (EUR bn)



Source: *ECB*

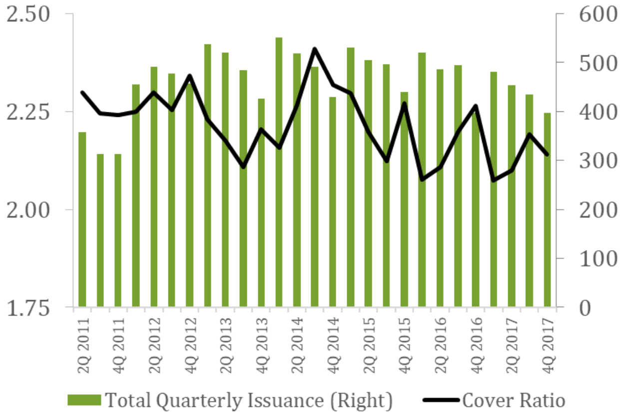
1.6 UK Gilts net issuance (GBP bn)



Source: *UK Debt Management Office*

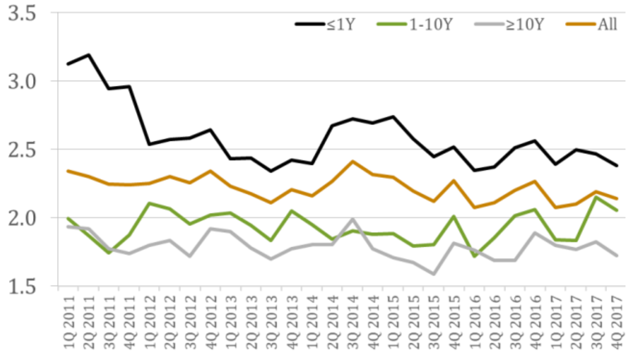
2. Recent auctions and primary dealers

2.1 Average bid-cover ratios and issued volumes in selected jurisdictions (EUR bn)



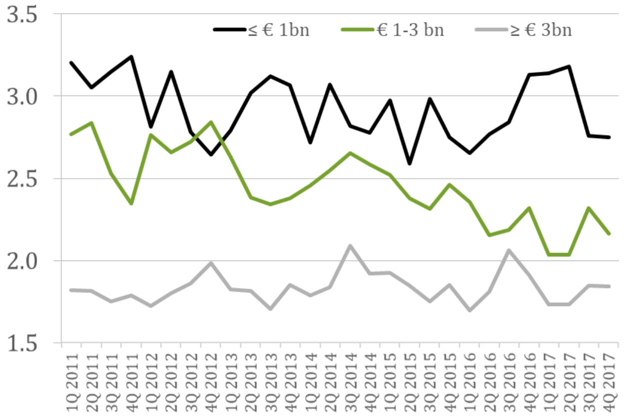
***Source:** Thomson Reuters Eikon. Weighted average of UK, DE, FR, ES, IT, BE, SE, NL, DK, and AT bonds and bills*

2.2 Average bid-cover ratios by tenor (years) of issued instrument



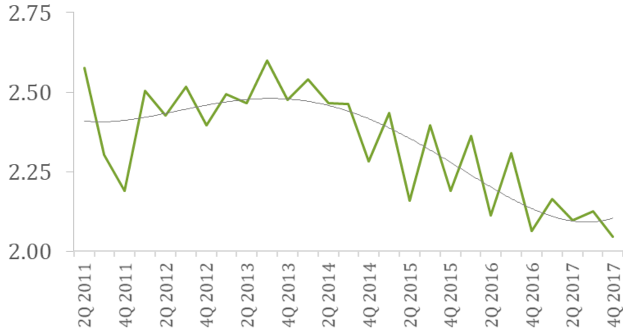
***Source:** Thomson Reuters Eikon. Weighted average of UK, DE, FR, ES, IT, BE, SE, NL, DK, and AT bonds and bills*

2.3 Average bid-cover ratios by size of issued instruments



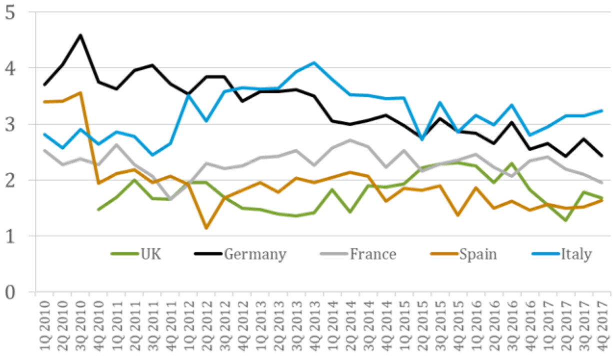
***Source:** Thomson Reuters Eikon. Weighted average of UK, DE, FR, ES, IT, BE, SE, NL, DK, and AT bonds and bills*

2.4 Average auction size in selected European jurisdictions (EUR bn)



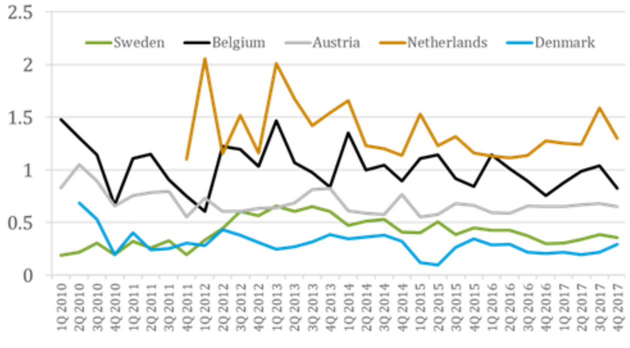
***Source:** Thomson Reuters Eikon. Weighted average of UK, DE, FR, ES, IT, BE, SE, NL, DK, and AT bonds and bills. Polynomial trendline in grey.*

2.5 Average auction size in selected jurisdictions (EUR bn)



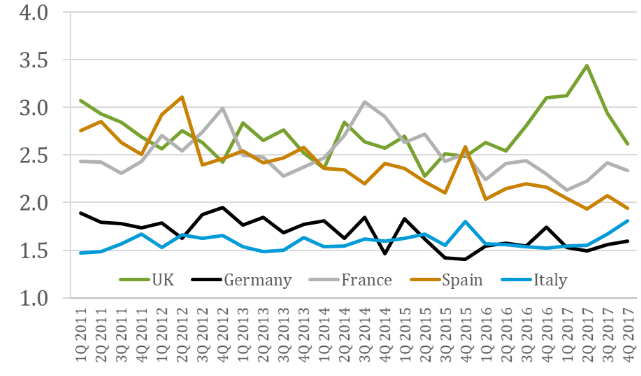
***Source:** Thomson Reuters Eikon*

2.6 Average auction size in selected jurisdictions (EUR bn)



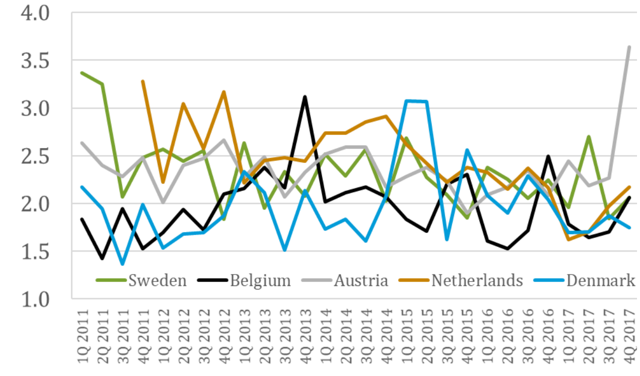
***Source:** Thomson Reuters Eikon*

2.7 Average bid-cover ratios by jurisdictions



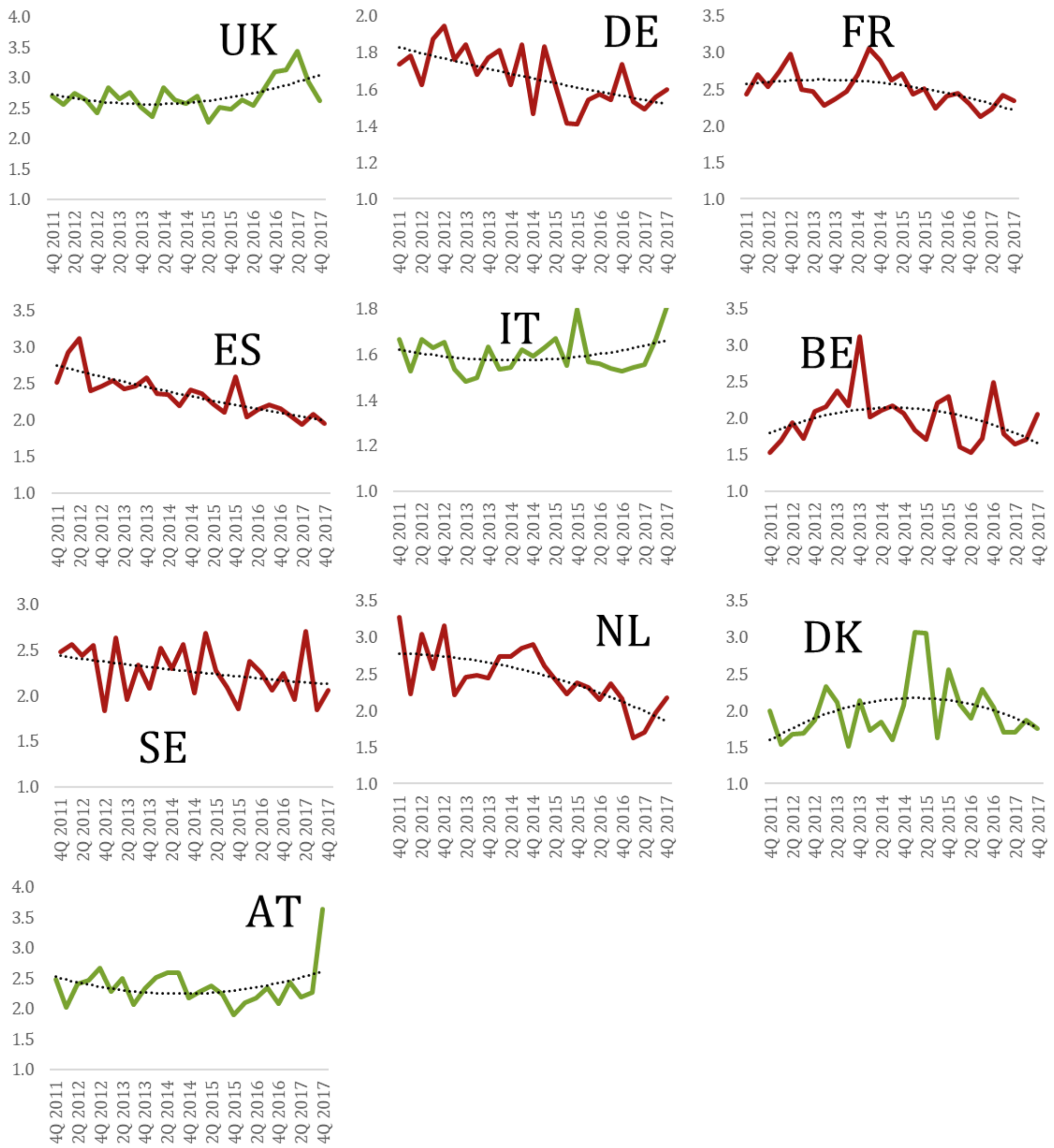
Source: *Thomson Reuters Eikon*

2.8 Average bid-cover ratios by jurisdictions



Source: *Thomson Reuters Eikon*

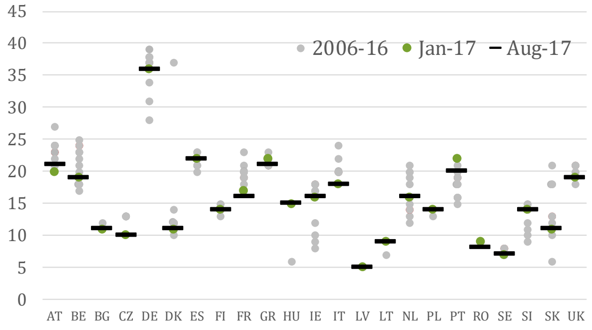
2.9 Average bid-cover ratios in selected jurisdictions: 2011-17[10]



Source: *Thomson Reuters Eikon*

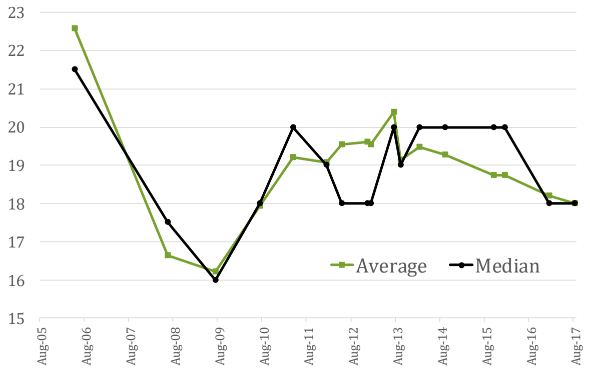
[10] Chart colour indicates slope of trendline. Green indicates end value of trendline above starting value and red indicates end value of trendline below starting value.

2.10 Number of primary dealers relative to historic number



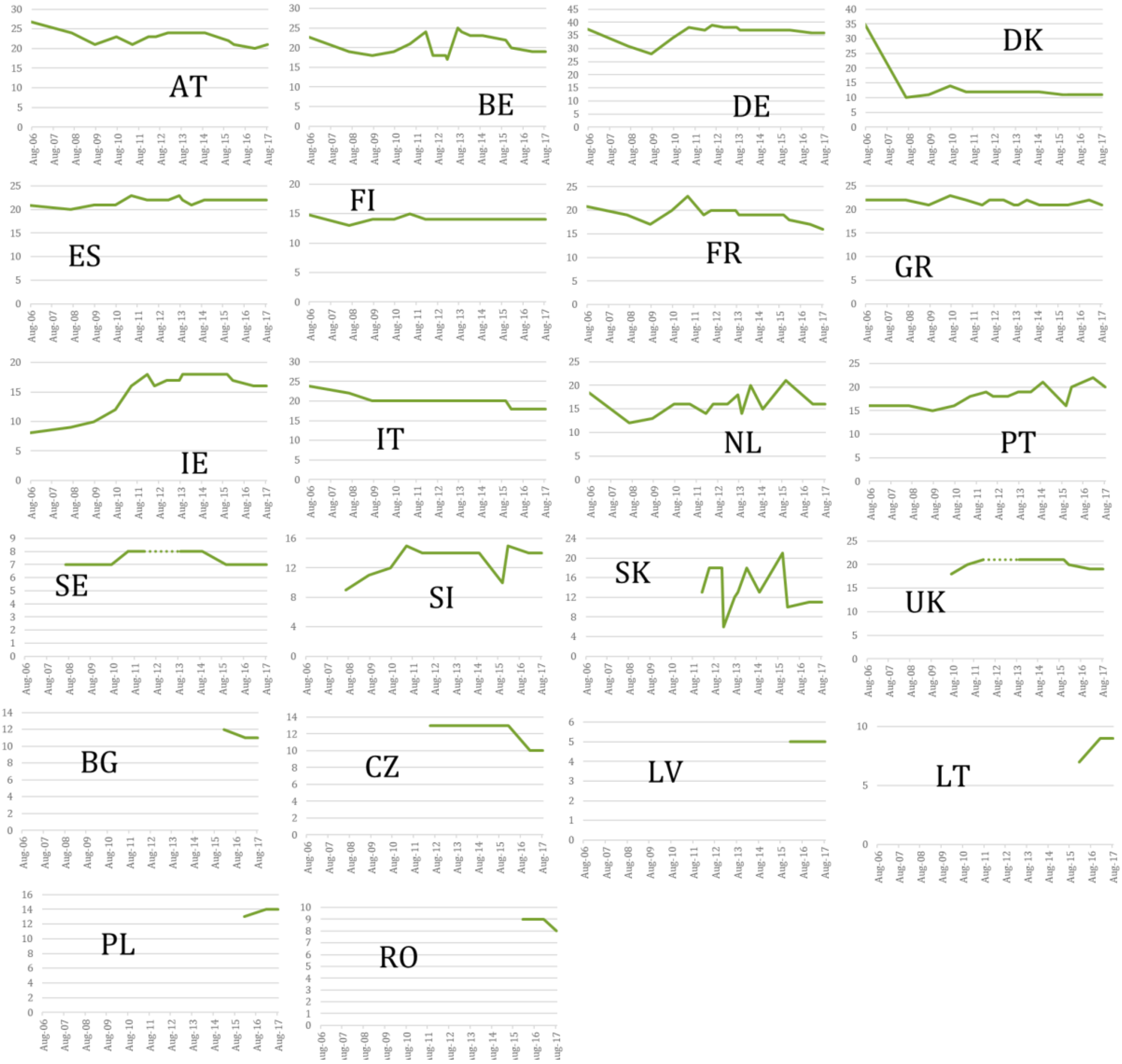
Source: *AFME Primary Dealers Handbooks and national DMOs*

2.11 Average and median number of primary dealers in selected EU countries



Source: *AFME Primary Dealers Handbooks and national DMOs. Average and medians of AT, BE, DE, DK, ES, FI, FR, GR, IE, IT, NL, PT, SE, SI and UK*

2.12 Number of primary dealers in Europe by jurisdiction: 2006-17[11]

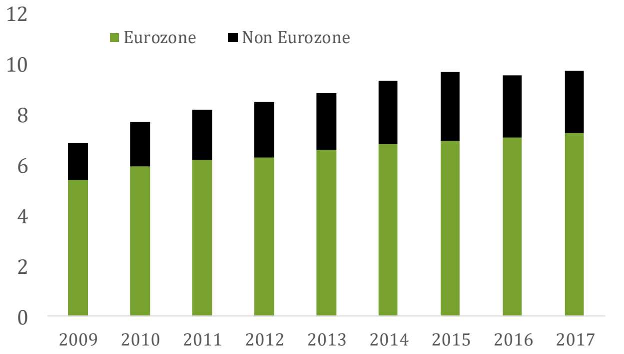


Source: *AFME Primary Dealers Handbooks and national DMOs*

[11] Dotted line for UK and Sweden indicates data not recorded in the relevant period.

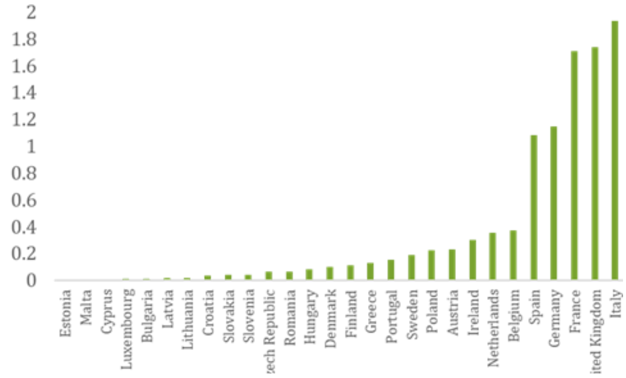
3. Outstanding

3.1 Outstanding debt securities issued by Central Governments (Nominal, EUR tn)



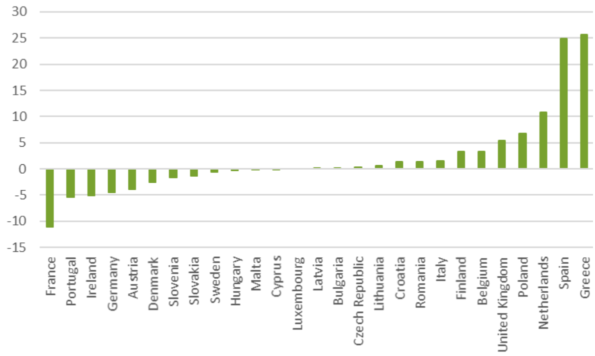
Source: *ECB and Thomson Reuters Eikon*

3.2 European government bonds outstanding by country (EUR tn)



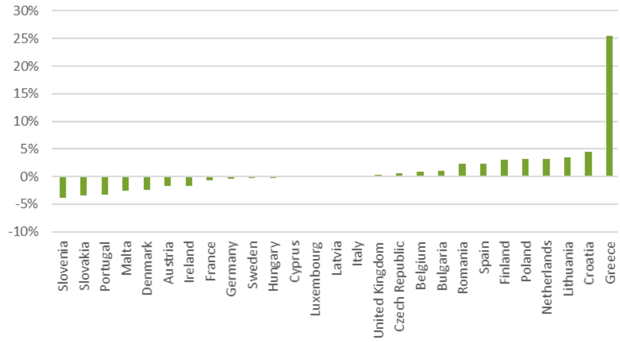
Source: *Thomson Reuters Eikon*

3.3 Change in outstandings 3Q17 to 4Q17 (EUR bn)[12]



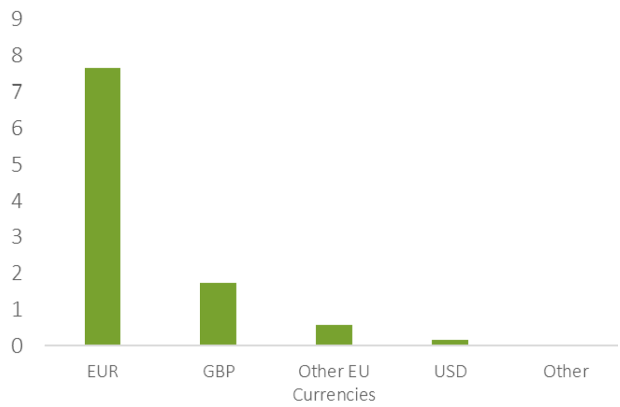
Source: *Thomson Reuters Eikon*

3.4 % Change in outstandings from 3Q17 to 4Q17



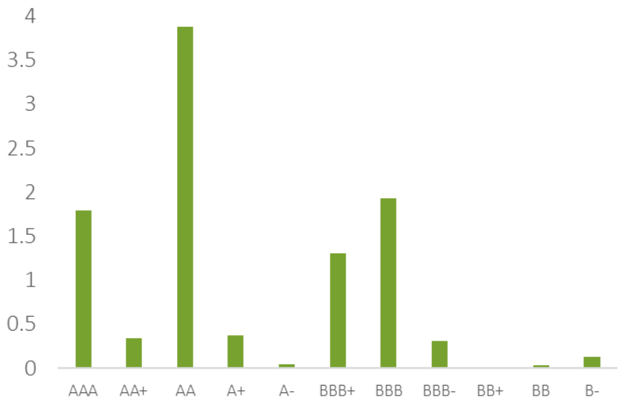
Source: *Thomson Reuters Eikon and Standard and Poor's*

3.5 European government bonds outstanding by currency (EUR tn)



Source: *Thomson Reuters Eikon*

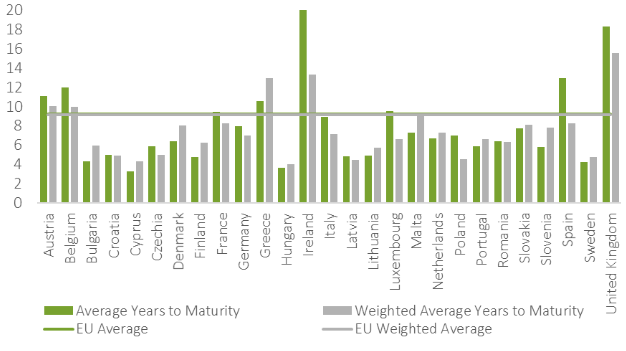
3.6 European government bonds outstanding by current rating of issuer (EUR tn)



Source: *Thomson Reuters Eikon and Standard and Poor's*

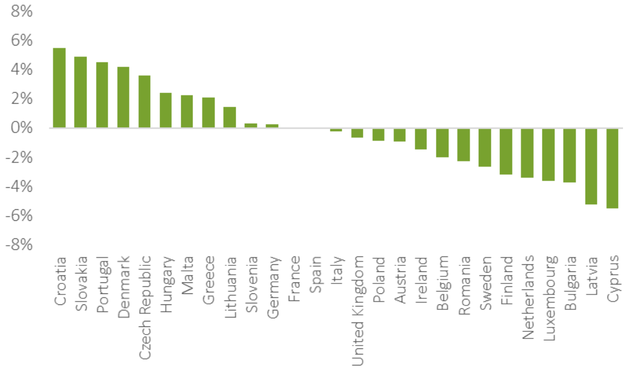
[12] The significant increase in Greek outstanding bonds was due to a debt swap on 5th December 2017, which resulted in an addition of bonds to the data set used.

3.7 Average years to maturity for outstanding government bonds in EU countries[13]



Source: *Thomson Reuters Eikon*

3.8 Quarterly change in weighted average years to maturity for outstanding government bonds 3Q17 to 4Q17 [14]

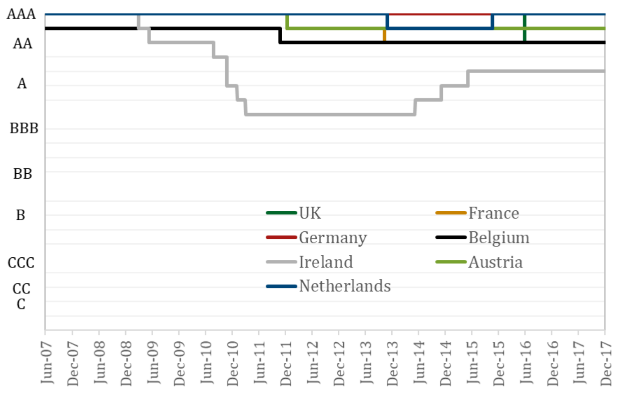


Source: *Thomson Reuters Eikon*

[13] Weighted average by issuance volume
[14] Weighted average by issuance volume

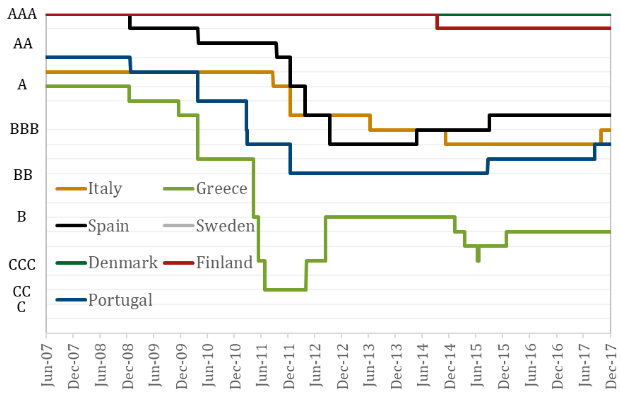
4. Credit quality

4.1 Long-term foreign currency credit rating (Central and Northern Europe)



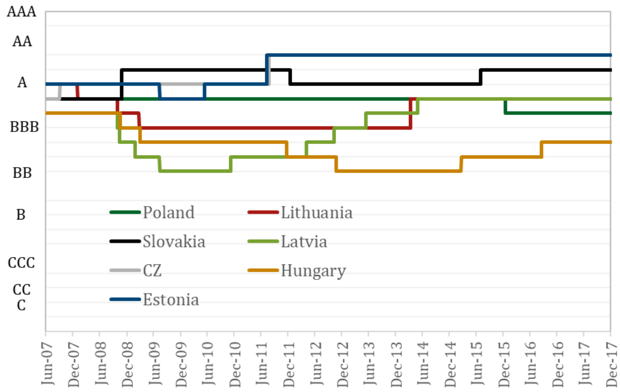
Source: *Thomson Reuters Eikon with data of Standard and Poor's*

4.2 Long-term foreign currency credit rating (Nordics and Southern Europe)



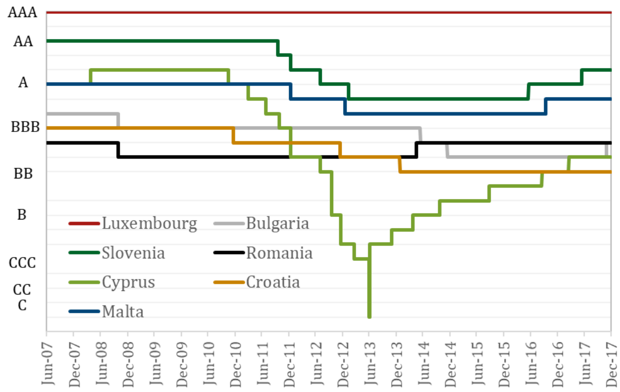
Source: *Thomson Reuters Eikon with data of Standard and Poor's*

4.3 Long-term foreign currency credit rating (Visegrad 4 and Baltic states)



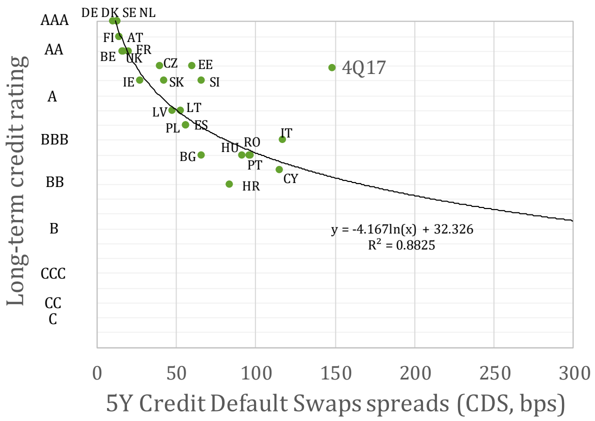
Source: *Thomson Reuters Eikon with data of Standard and Poor's*

4.4 Long-term foreign currency credit rating (Balkans, CY, MT and LU)



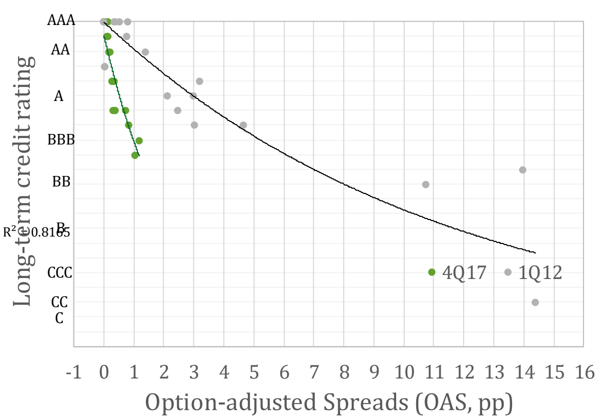
Source: *Thomson Reuters Eikon with data of Standard and Poor's*

4.5 Long-term foreign currency credit rating and 5Y Credit Default Swaps (CDS)



Source: *Thomson Reuters and Standard and Poor's*

4.6 Long-term foreign currency credit rating and option-adjusted spreads (OAS)



Source: *Barclays and Standard and Poor's*

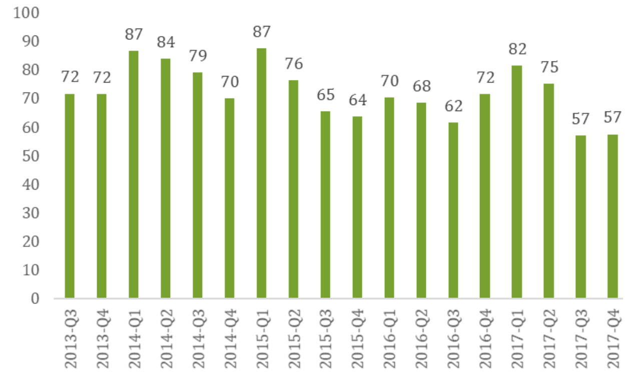
4.7 European rating actions on long-term foreign currency ratings (2017FY and 2018YtD)

Issuer	Rating action	Date	Rated by	Rationale
Cyprus	Upgrade to BB+ (stable) from BB	Mar-17	S&P	Stronger-than-expected economic growth and fiscal progress
Italy	Downgrade to BBB (stable) from BBB+	Apr-17	Fitch	Track record of fiscal slippage, weak growth, and failure to bring down gov. debt. Political risk and banking sector weakness
Slovenia	Upgrade to A+ (stable) from A	Jun-17	S&P	Improving debt dynamics on the back of economic expansion and recovery of its financial sector
Greece	Upgrade to Caa2 (positive) from Caa3	Jun-17	Moody's	Successful conclusion of the 2nd review adjustment programme, improved fiscal prospects, and signs of the economy stabilizing
Cyprus	Upgrade to Ba3 (positive) from B1	Jul-17	Moody's	Improvements in economic resilience, consistent fiscal outperformance and favourable fiscal outlook
Greece	Upgrade to B- (positive) from CCC	Aug-17	Fitch	Expectation that debt sustainability will steadily improve, reduced political risk and sustained GDP growth
Malta	Upgrade to A+ (stable) from A	Aug-17	Fitch	Public debt dynamics are improving with strong nominal GDP growth and recurrent primary surpluses
Portugal	Upgrade to BBB- (stable) from BB+	Sep-17	S&P	Strong economic and budgetary performance as well as receding external financing risks
Slovenia	Upgrade to Baa1 (stable) from Baa3	Sep-17	Moody's	Favourable debt trend, driven by fiscal consolidation and robust economic growth. Progress in some important structural reforms
Ireland	Upgrade to A2 (stable) from A3	Sep-17	Moody's	Faster-than-expected growth and improvement in fiscal metrics
UK	Downgrade to Aa2 (stable) from Aa1	Sep-17	Moody's	Significant weakening of public finances and erosion of economic strength due to departure from EU
Cyprus	Upgrade to BB (positive) from BB-	Oct-17	Fitch	Strong improvement in the performance of and outlook for public finances
Italy	Upgrade to BBB (stable) from BBB-	Oct-17	S&P	Strengthening economic outlook, growing investment and a steady increase in employment
Bulgaria	Upgrade to BBB- (stable) from BB+	Dec-17	S&P	Improving external metrics, underpinned by a multiyear expansion of exports, amid a rise in domestic savings
Bulgaria	Upgrade to BBB (stable) from BBB-	Dec-17	Fitch	Prolonged decline in external debt ratios and strong budget outturns with strengthening economic growth
Ireland	Upgrade to A+ (stable) from A	Dec-17	Fitch	Improving health of the banking sector, declining government debt-to-GDP, and reducing debt servicing costs
Portugal	Upgrade to BBB (stable) from BB+	Dec-17	Fitch	Debt trajectory on a firm downward trend, significant improvement in the budget balance and strong cyclical recovery
Spain	Upgrade to A- (stable) from BBB+	Jan-18	Fitch	Reduction in macro imbalances, strong econ. recovery, and limited econ. impact caused by Catalonia's declaration of independence
Croatia	Upgrade to BB+ (stable) from BB	Jan-18	Fitch	Strengthening tourism revenues, a current account surplus, and stronger consumption and investment
Greece	Upgrade to B (positive) from B-	Jan-18	S&P	Steadily improving general government finances and its gradually recovering economic prospects
Greece	Upgrade to B (positive) from B-	Jan-18	Fitch	Improved outlook of debt sustainability underpinned by sustained GDP growth, reduced political risks
Greece	Upgrade to B3 (positive) from Caa2	Feb-18	Moody's	Material fiscal and institutional improvements under its current adjustment programme

Source: *Fitch, Moody's, S&P*

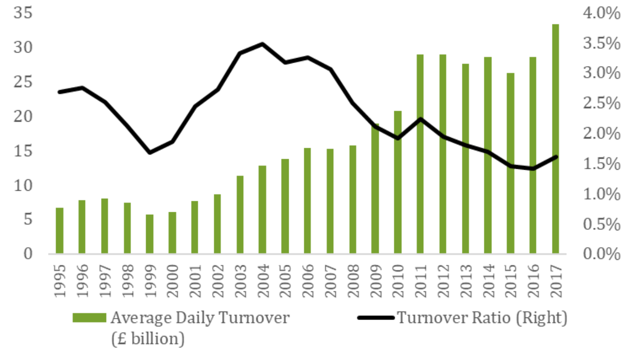
5. Secondary market trading volumes and turnover ratios[15]

5.1 EU28: Average daily trading volumes on MarketAxess (Gov. & sovereign bonds, EURbn)[16]



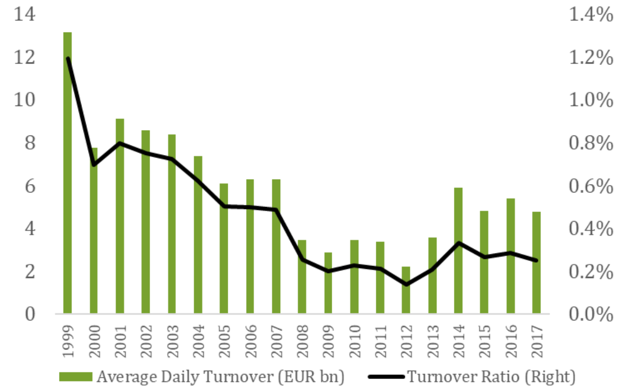
Source: *Trax, a MarketAxess subsidiary*

5.2 United Kingdom: Average daily trading volume (bonds only) and turnover ratio[17]



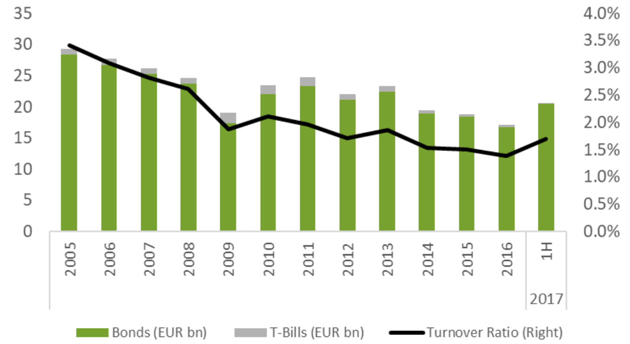
Source: *UK Debt Management Office*

5.3 Italy: Average daily trading volume (bonds and bills) and turnover ratio. Electronic trading[18]



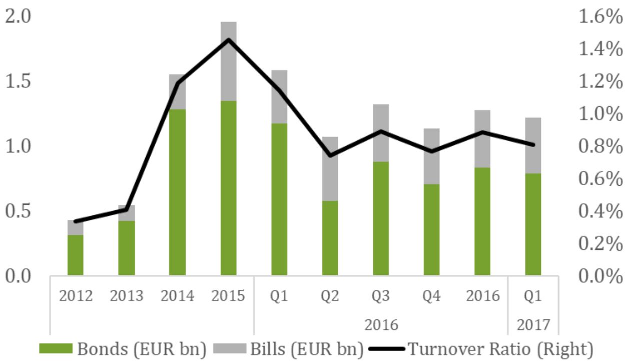
Source: *Italian Dipartimento del Tesoro*

5.4 Germany: Average daily trading volume (aggregated bonds and bills) and turnover ratio[19]



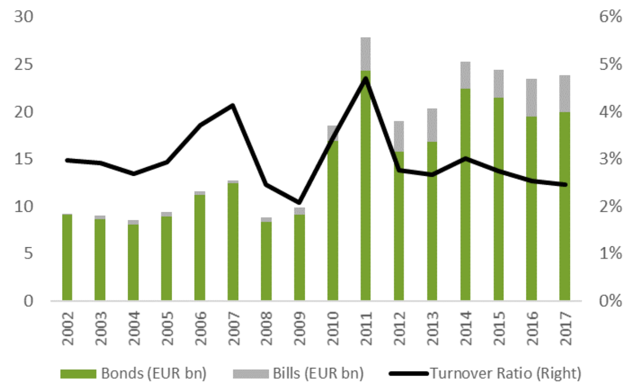
Source: *Deutsche Finanzagentur and ECB*

5.5. Portugal: Average daily trading volume and turnover ratio[20]



Source: *Agência de Gestão da Tesouraria e da Dívida Pública – IGCP and ECB*

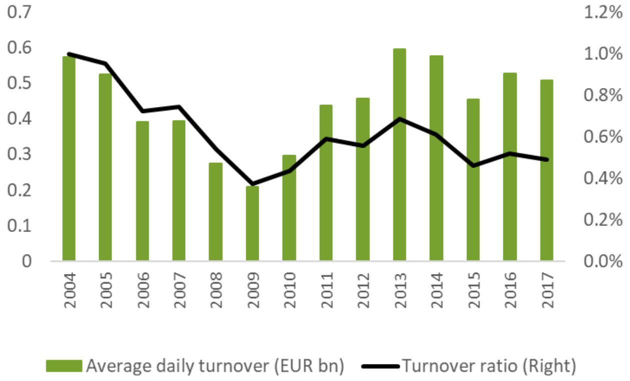
5.6 Spain: Average daily trading volume and turnover ratio[21]



Source: *Banco de España and Tesoro Público de España*

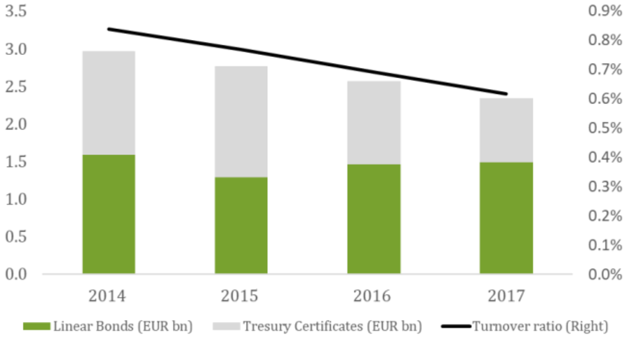
[15] Turnover ratios are calculated as the average daily trading volume relative to total outstandings. Cash trading only (excludes repo and derivatives transactions). Given the differences in the aggregation basis across jurisdictions, the data is not fully comparable between countries.
[16] Secondary Market Volumes (please note this is restricted to 2013-Q3 onwards as split not available prior to this date. Volumes are calculated by converting the individual traded securities to EUR using the prevailing exchange rate on the date of each trade. ADV calculated by dividing the total converted volume by the number of UK trading days for quarter. Government & Sovereign bond volumes for EU28 member states as per the AFME methodology.
[17] Turnover data reported to the DMO by the Gilt-edged Market Makers (primary dealers).
[18] Turnover on electronic interdealer regulated market.
[19] Turnover of both electronic and OTC trading. The traded volume is aggregated for a representative part of the members of the Bund Issues Auction Group with trades with all counterparties. Bubills, Schaetze, Bobls, Bunds and inflation-linked securities. Capital and coupon strips as well as US-dollar bonds are excluded. Data not currently available for 2H17.
[20] Turnover of electronic and OTC trading reported on MTS-Portugal, BrokerTec and eSpeed. Data not currently available after 1Q17.
[21] Turnover is total outright transactions (excluding Repo operations). Includes Treasury Bills, non-stripped Government Bonds and stripped Government Bonds, both in electronic platforms and OTC (second tier and transactions between market members and clients).

5.7 Finland: Average daily trading volume (aggregated bonds and bills) and turnover ratio[22]



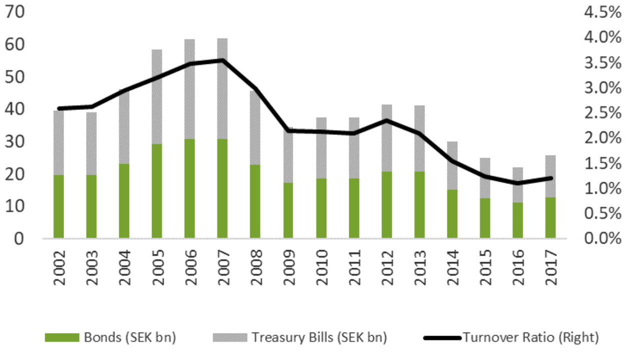
Source: *Finland Valtiokonttor and ECBi*

5.8 Belgium: Average daily trading volume and turnover ratio[23]



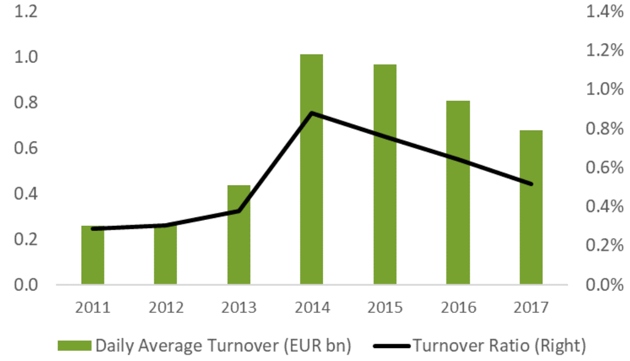
Source: *Belgian Debt Agency and ECB*

5.9 Sweden: Average daily trading volume and turnover ratio[24]



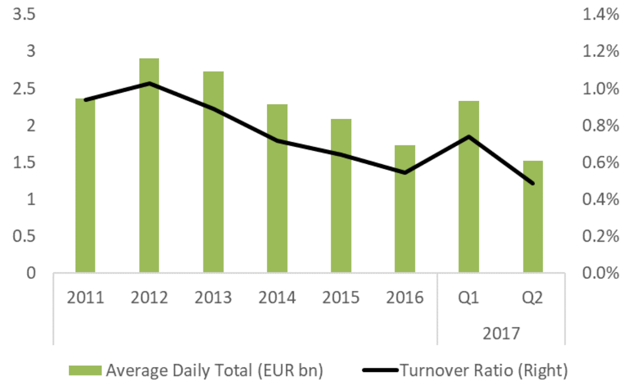
Source: *Swedish National Debt Office (Riksgälden) and ECB*

5.10 Ireland: Average daily trading volume (aggregated bonds and bills) and turnover ratio[25]



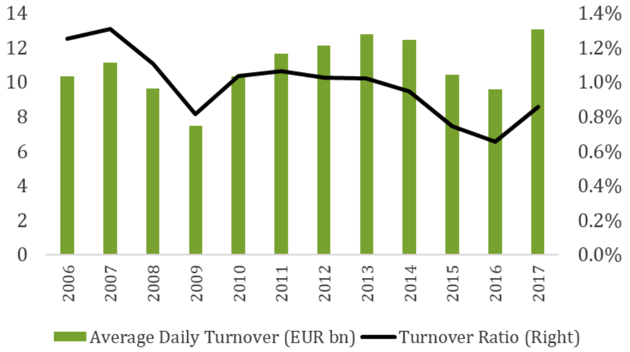
Source: *Irish Stock Exchange and ECB*

5.11 Netherlands: Average daily trading volume (bonds only) and turnover ratio[26]



Source: *Ministerie van Financiën*

5.12 France: Average daily trading volume (bonds only) and turnover ratio[27]



Source: *Agence France Trésor and ECB*

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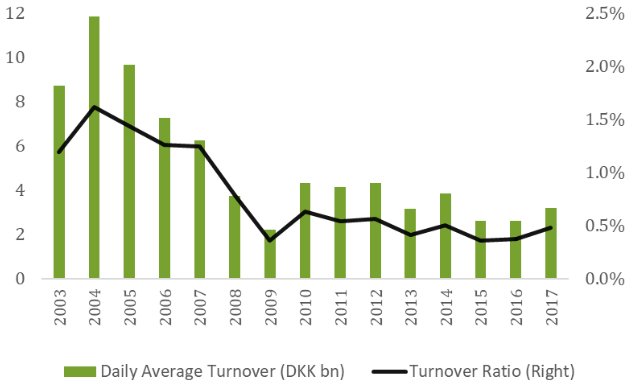
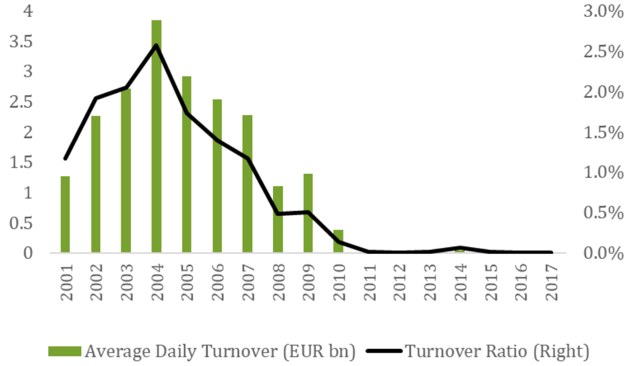
[22] Turnover of customer trades, MTS Finland and Euro MTS.
[23] Turnover is total outright transactions.
[24] Turnover is total outright transactions.
[25] Turnover on Irish Stock Exchange.
[26] Turnover is customer and interdealer trading. Total outright transactions, including electronic and OTC trading. Data available only as of 2Q17
[27] Turnover of voice and electronic trading (not including PSPP transactions or trading without an SVT).

5.13 Denmark: Average daily trading volume (bonds and bills) and turnover ratio[28]



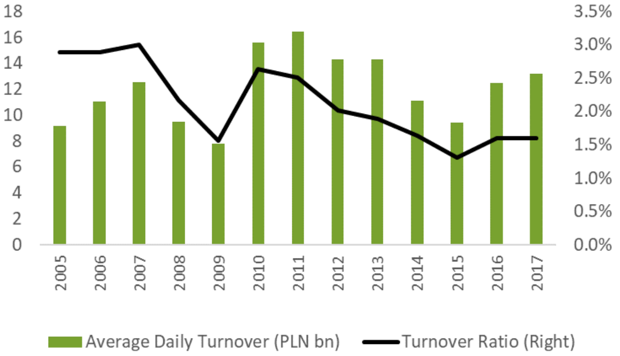
Source: *Danmarks Nationalbank*

5.14 Greece: Average daily trading volume (bonds only) and turnover ratio[29]



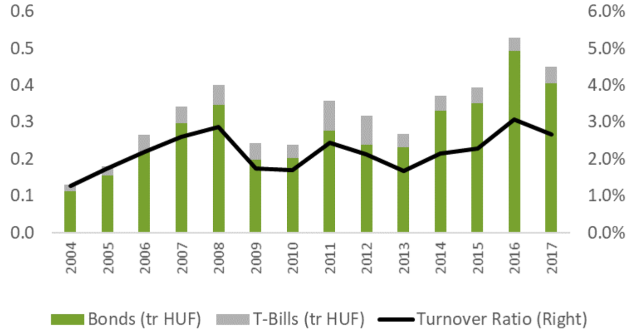
Source: *Bank of Greece and ECB*

5.15 Poland: Average daily trading volume (bonds only) and turnover ratio[30]



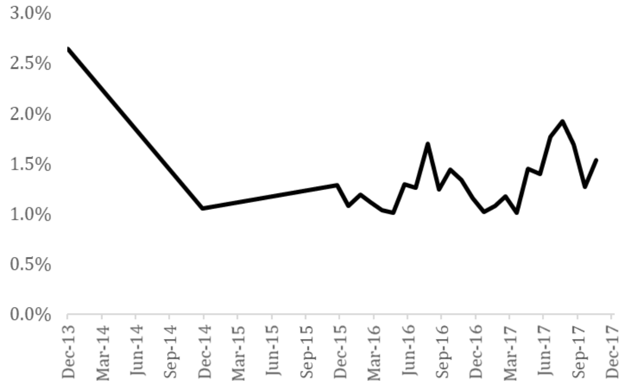
Source: *National Depository for Securities (KDPW), WSE*

5.16 Hungary: Average daily trading volume and turnover ratio[31]



Source: *ÁKK*

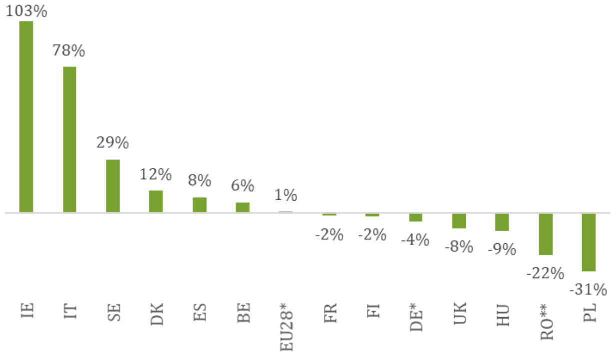
5.17 Romania: Average daily turnover ratio[32]



Source: *Ministerul Finantelor*

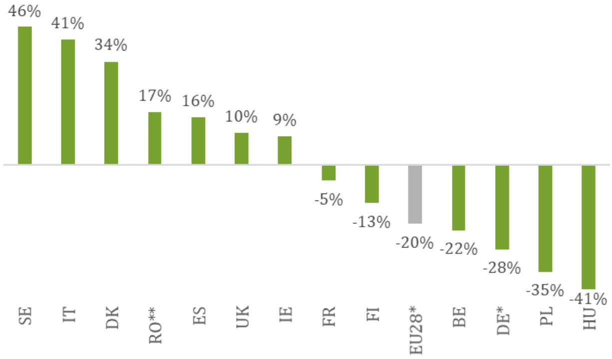
[28] Turnover of MTS, TradeWeb, Bondvision and trades reported to Nasdaq OMX (including voice trading).
[29] Turnover on Electronic Secondary Securities Market (HDAT).
[30] Turnover is total outright transactions. Data from KDPW are presented according to the date of the settlement, while data from WSE are presented according to the date of conclusion of a transaction.
[31] Turnover on MTS Hungary and Keler OTC.
[32] Turnover ratio of the government securities issued on domestic market. Official values reported as average monthly turnover ratios, which have been converted assuming 20 business days per month. Turnover volume not available.

5.18 Quarterly change in average daily turnover volumes of EU government bonds: 3Q17 to 4Q17



*__Source:__ AFME with information from European DMOs and other agency sources. See section 5 for details on aggregation basis and sources. *Europe total and Germany is sourced from TRAX Facts as the quarterly variation of average daily volumes of government and sovereign bonds. **Romanian turnover volume calculated using outstanding volumes in Section 3.*

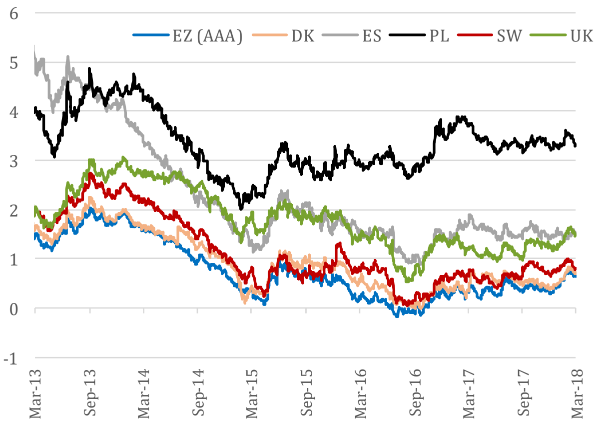
5.19 Annual change in average daily turnover volumes of EU government bonds: 4Q16 to 4Q17



*__Source:__ AFME with information from European DMOs and other agency sources. See section 5 for details on aggregation basis and sources. *Europe total and Germany is sourced from TRAX Facts as the quarterly variation of average daily volumes of government and sovereign bonds. **Romanian turnover volume calculated using outstanding volumes in Section 3.*

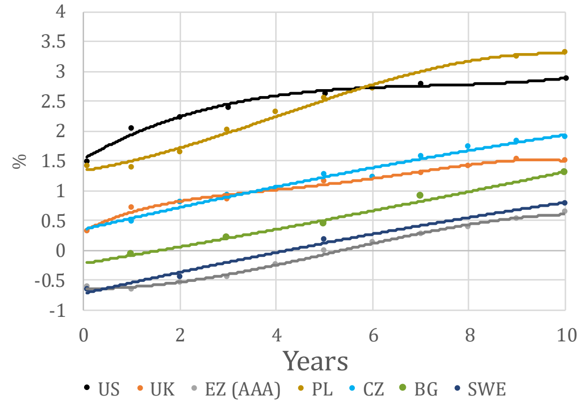
6. Valuations

6.1 Selected European 10Y spot yields



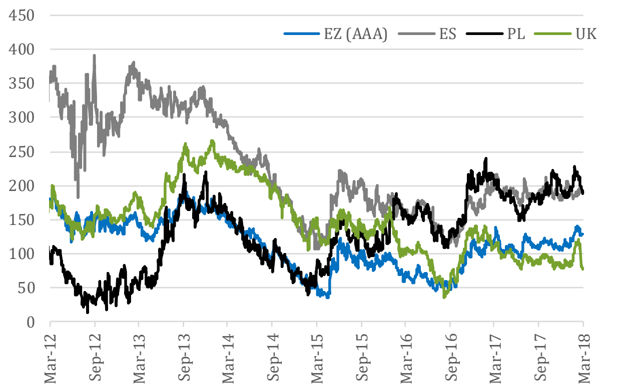
Source: *ECB and Thomson Reuters Eikon*

6.2 Sovereign spot yield curve of selected jurisdictions: 6 Mar 2018



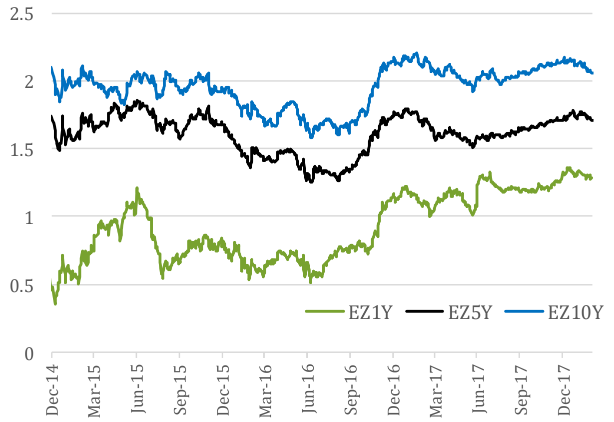
Source: *Thomson Reuters Eikon*

6.3 Slope: 1Y10Y spread (bps)



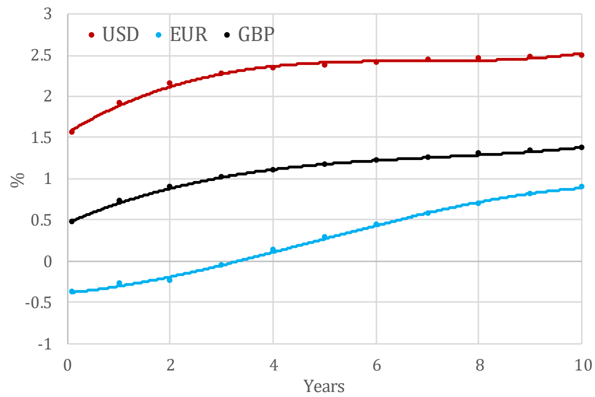
Source: *ECB and Thomson Reuters Eikon*

6.4 Market-implied inflation expectations (EuroZone)



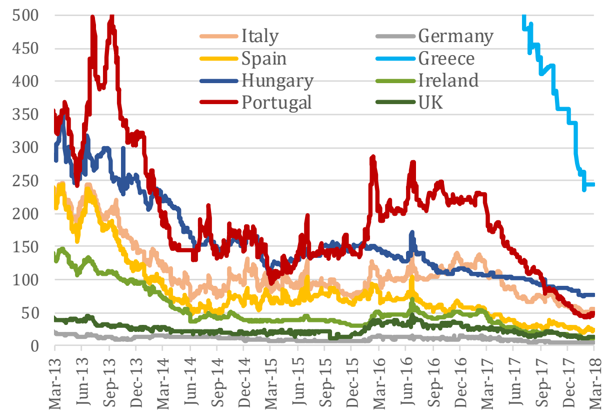
Source: *Thomson Reuters Eikon*

6.5 Overnight index swap (OIS) yield curve: 6 Mar 2018



Source: *Thomson Reuters Eikon*

6.6 5Y Sovereign Credit Default Swap (CDS, bps)



Source: *Thomson Reuters Eikon*

Annex

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Methodologies

A summary of the methodologies adopted for this report is available at https://www.afme.eu/en/reports/Statistics/Methodologies

London Office
39th Floor
25 Canada Square
London E14 5LQ
United Kingdom

Switchboard:
+44 (0)20 3828 2700

Brussels Office
Rue de la Loi, 82
1040 Brussels
Belgium

Switchboard:
+32 (0) 2 788 3971

Frankfurt Office
Skyper Villa
Taunusanlage 1
60329 Frankfurt am Main
Germany

Switchboard:
+49 (0) 69 5050 60 590

AFME
Julio Suarez – Associate Director, Research
Alex Hunt –Quantitative Analyst
Victoria Webster – Director, Primary Dealers
Charles Deslandes – Manager, Primary Dealers

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