NEW AND TIMELY STATISTICAL INDICATORS ON GOVERNMENT DEBT SECURITIES

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Abstract

New monthly statistical indicators on government debt securities for euro area countries have now been developed on the basis of the information contained in the Centralised Securities Database (CSDB). The CSDB is jointly operated by the European System of Central Banks (ESCB) and contains timely and high-quality security-by-security reference data on debt securities, equities and investment funds. The new indicators on government debt securities provide an indication of the expected disbursements made for the servicing of issued debt securities together with the associated interest rate (nominal yield), broken down by original and remaining maturity, currency and type of coupon rate.

This paper describes in detail the newly compiled statistical information and thus contributes to further describing the euro area government bond markets. The new indicators are also highly relevant for policy-making. On the one hand, they may be used to relate the nominal yields and government bond market yields, which play an important role in the monetary transmission mechanism. On the other hand, these indicators are essential for fiscal policy as a means of analysing the relationship between the sustainability, financing needs and servicing of government debt and possible feedback loops into the government deficit that, ultimately, may have an impact on the tax burden for corporations and households.

Keywords
Government debt, euro area, debt securities

JEL codes
E62 Fiscal Policy, H63 Debt • Debt Management • Sovereign Debt, H68 Forecasts of Budgets, Deficits, and Debt

Contents

1. Introduction

New monthly statistical indicators on government debt securities for euro area countries have now been developed on the basis of the information contained in the Centralised Securities Database (CSDB). Live since 2009, the CSDB aims to hold complete and up-to-date reference information on all individual securities relevant for the statistical and non-statistical (e.g. monetary and fiscal analysis) purposes of the European System of Central Banks (ESCB). The security-by-security flexible approach of the CSDB, as opposed to the traditional aggregated reporting approach that offers only predetermined data breakdowns, allows the computation of new indicators on government debt securities without increasing the reporting burden on debt issuers.

This statistical paper describes in detail the newly compiled statistical information and thus contributes to further describing the euro area government debt securities markets. The indicators under review provide an indication of the expected disbursements made for the servicing of issued government debt securities (debt service) together with the associated interest rate (nominal yield), broken down by original and remaining maturity, currency and type of coupon rate. The European Central Bank (ECB) plans to start disseminating these statistics later this year.

The main findings are that these very timely statistics contain information that is highly relevant for policy-making. On the one hand, they may be used to relate nominal yields and government bond market yields to maturity, which play an important role in the monetary transmission mechanism. On the other hand, these indicators are fundamental to an analysis of the relationship between the sustainability, financing needs and servicing of government debt and the possible fiscal impact in the economy for corporations and households of alternative fiscal policy choices, such as the impact on interest rates, on the tax burden and even on prices.

This paper begins by describing the CSDB and its relevance for statistical outputs and policy-making. The next section describes in detail how statistics on euro area government debt service and average nominal yields are compiled and also presents the main statistical findings. Section 3 shows the place of debt service statistics in the analysis of government financing needs and the developments of nominal yield compared to market yield to maturity. Section 4 gives an overview of how the CSDB data are aligned with the European System of Accounts and government debt. Section 5 discusses specific issues of which a user needs to be aware when analysing debt service and average nominal yields statistics. The final section draws a conclusion.

2. The Centralised Securities Database (CSDB)

In May 2014 the outstanding amounts of debt securities issued by euro area residents amounted to approximately €16.5 trillion. This figure shows the relevance of the euro area debt securities market and the importance of having more detailed information on debt securities. The Centralised Securities Database (CSDB) was created as a multi-purpose system jointly operated by the European System of Central Banks (ESCB) and contains detailed reference information on the issuance of securities, making it a valuable source of information for statistical compilation as well as for increasing non-statistical needs. A brief description of the CSDB and its relevance for policy-making is presented in this section.

2.1.   A brief description

The CSDB is a security-by-security database that went live in 2009 with the aim of holding complete, accurate, consistent and up-to-date information on all individual securities relevant for the statistical (e.g. financial accounts, balance of payments, investment funds and securities holdings statistics) and, increasingly, non-statistical (e.g. monetary policy, fiscal analysis, market operations and risk management) purposes of the ESCB. The CSDB covers securities issued by EU residents; securities

likely to be held and transacted in by EU residents; and securities denominated in euro, regardless of the residency of the issuer and holders. The CSDB currently contains information on over seven million non-matured or alive debt securities, equities and mutual fund shares/units plus approximately nine million matured or non-alive[2] securities.

The CSDB is an ESCB common data platform containing reference data on securities (e.g. outstanding amounts, issue and maturity dates, coupon and dividend information, statistical classifications, etc.), issuers and prices (market, estimated or defaulted) as well as more recently introduced information on ratings (of the security, issuer, guarantor or issuance programmes)[3].

The CSDB is a single information technology infrastructure which is operated jointly by the members of the ESCB and promotes consistent results and efficient data reporting and compilation. Developed by the ECB, the system is accessible by the ESCB and uses data from commercial data providers and other existing sources (via ESCB members); the most reliable value for each attribute is selected and gaps (in particular for prices and income) filled with reliable estimates. It makes use of expertise within the ESCB to enhance data quality in accordance with the Guideline of the European Central Bank of 26 September 2012 on the data quality management framework for the Centralised Securities Database (ECB/2012/21).

2.2. Relevance of CSDB data for government finance statistics and policy-making

The financial crisis that hit Europe in recent years increased the relevance of granular security-by-security data as a means of ensuring better microeconomic analysis of financial markets, focusing on specific instruments and markets. The changing financial environment and developing needs call for flexible statistical reporting. Additionally, interest in the risks associated with different types of instruments/issuers has added new requirements that have made the CSDB platform a relevant tool for monetary and fiscal policies. Statistics on financial stocks and flows broken down by institutional sector and a broad class of financial instruments are essential for the conduct of monetary and fiscal policies. Therefore, the item-by-item data included in the CSDB gives policy-makers a much broader spectrum of opportunities to analyse specific aspects of the financial markets.

In addition to the availability of granular data, the timeliness of the CSDB information enables policy-makers to react more quickly to the evolution of and trends in the financial markets. The system processes information on a daily basis and provides end-of-month data with a delay of approximately one to two weeks, which means that users have access to data far more quickly than to other aggregated statistics as well as the possibility of many more data breakdowns.

Particularly on government finance statistics (GFS), given that debt securities account for by far the largest share of government debt in the euro area (around 80% of government debt), the CSDB provides timely, granular data on government debt securities, producing information on debt service, average nominal yields and financing needs of euro area governments.

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[2] An example of a "non-alive" security would be equity of a bankrupt company which is kept in the CSDB for reference

[3] Rating information in the CSDB has to date been used by the ECB only.

3. Government debt service and nominal yields

The issuance of government debt securities is naturally associated with its servicing (debt service) and interest rates (average nominal yield). Statistics on debt service and average nominal yields for euro area governments have shown interesting developments in recent years, which have presented a number of challenges for euro area sovereign debt. This section explains in detail how those statistics, which the ECB plans to start disseminating later this year, are compiled using the CSDB.

3.1. Debt service

The issuance of debt securities requires a set of disbursements, including principal amounts and/or interest, to be made throughout the lifetime of the debt. This set of payments is referred to as debt service. As indicated by past observations, redemptions of debt securities in debt markets can occur in one of the following situations[4]:

- The maturity date has been reached;

- Redemption took place at an early date, i.e. before the maturity date, and can be:

    o Partial – reduction of the outstanding amounts;

    o Total – the debt security is repaid in full.

This paper presents the past debt service, i.e. the set of disbursements actually made to satisfy debt obligations in a given past period, and the scheduled (future) disbursements. The focus of the paper will be the scheduled debt service of government debt securities in the coming year, which, for the sake of simplicity, we will refer to as "debt service".

A security-by-security database such as the CSDB makes it possible to calculate scheduled (future) redemptions in addition to past redemptions, a concept that is central to this paper. Scheduled redemptions only take into consideration the maturity date of current debt securities. Naturally, that does not include any possible early redemption of debt securities and/or redemptions of debt securities that will be issued in the future (i.e. that do not yet exist).

The second component of debt service is the interest that is to accrue in a given future period. For coupon-bearing debt securities, this is calculated by multiplying the observed coupon rate by the current outstanding amounts. This calculation assumes that there are no future changes in the coupon rate (see Box A), independently of the type of coupon. The issuance of debt securities at discount/premium is reflected in the face value of the debt securities (see Section 6.2).

The scheduled debt service is then the sum of the scheduled redemptions and interest to accrue, usually broken down by future periods (e.g. the next three months, the next year). In this paper the debt service for debt securities denominated in foreign currency assumes that there is no change in the exchange rate vis-à-vis the euro (see Box A).

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4   The issuance of government debt securities also covers the new debt securities issued and the increase in the outstanding amounts for any existing debt security.

Variable interest rates, exchange rates and debt service for debt securities

Debt service is a forward-looking statistical concept. It gauges future disbursements, of principal and interest, in respect of the servicing of the current outstanding debt. The calculation of debt service is therefore affected by market prices that will be set in the future and are not yet know with certainty. The most important market prices for debt contracts are the exchange rates (for debt denominated in foreign currency) and the market reference variable interest rates (e.g. Euribor, for debt issued with a variable interest rate).

For any coupon-bearing security, the part relating to interest in the scheduled debt service is calculated by applying the last observed coupon rate to the current outstanding amount. This means that any future changes to the coupon rate of floating-rate debt securities, index-linked rate debt securities and changes to the coupon rate for fixed rate debt securities contractually agreed (e.g. step-up coupons) are not taken into account in the calculation of the scheduled debt. Only the last observed coupon rate is considered.

In the euro area, the debt service scheduled for the next 12 months (from June 2014 to May 2015) amounts to 16.8% of GDP, comprising €1,474 billion of principal (face value) and €211 billion of interest to accrue (see Table A). The current breakdown of government debt securities outstanding in the euro area shows that around 80% of the outstanding amounts were issued with a fixed interest rate, while only 12% were issued with a variable interest rate (floating or index-linked interest rate). Only Italy (€360 billion), Germany (€222 billion) and France (€180 billion) show some relevant issuance with variable interest rates.

Outstanding amounts , average nominal yields and debt service

(as scheduled at May 2014, € billion for outstanding amounts and debt service, as a percentage per annum for yields)

Table A

Country	Outstanding amounts (selected type of rates)			Average nominal yields (selected type of rates)			Debt service (in the coming year)	
	Fixed rate	Zero coupon	Variable rate	Fixed rate	Zero coupon	Variable rate	Principal	Interest
Belgium	320	12	35	3.9	0.2	1.1	69	12.0
Germany	1,337	167	83	2.6	0.2	0.4	345	33.0
Estonia	-	-	-	-	-	-	-	-
Ireland	88	25	1	4.9	-	2.9	4	4.9
Greece	68	3	15	3.7	3.1	2.1	30	2.9
Spain	738	23	79	4.3	0.8	4.3	186	31.0
France	1,289	185	216	3.4	0.2	2.1	351	43.9
Italy	1,253	137	211	4.5	1.1	1.4	349	57.3
Cyprus	5	-	3	4.6	1.9	-	2	0.2
Latvia	5	0	0	3.7	0.3	6.3	0	0.3
Luxembourg	6	-	-	2.6	-	-	0	0.2
Malta	5	0	0	4.7	0.6	1.3	1	0.3
Netherlands	315	3	42	3.1	0.2	2.3	62	9.6
Austria	193	8	7	3.8	0.6	2.0	28	6.7
Portugal	102	0	18	4.5	1.5	3.4	30	4.3
Slovenia	22	0	2	4.5	3.1	1.0	3	1.4
Slovakia	32	3	1	3.9	-	1.6	5	1.3
Finland	89	4	4	2.8	-	0.6	9	2.4

| Euro area | 5,867 | 572 | 718 | 3.6 | 0.7 | 1.5 | 1,474 | 211.6 |

Source: CSDB, authors' calculations.

Similarly, any future change in the exchange rates will not be taken into account in the calculation of the scheduled debt service, as this would involve forecasting exchange rates. Any future disbursement in foreign currency will be converted into the national currency on the basis of the representative market exchange rate prevailing on the last working day of each month. The vast majority of the government debt securities issued by the euro area governments are denominated in euro. Therefore, future changes to the exchange rates are not expected to create a significant statistical impact on the indicators.

3.2. Nominal yields

A central variable in bond markets is the market yield to maturity of a debt security. The market yield to maturity is an estimate of what an investor (creditor) will earn if the bond is held until its maturity date. The market yield to maturity is a focal variable for the creditor. However, for the debtor there is another yield that is extremely important for its financial decisions, the nominal yield.

The nominal yield (percentage per annum) is the interest rate that the debtor promises to pay debt holders per unit of time. The nominal yield comprises the coupon rate (i.e. the interest rate stated on a bond when issued) and any difference between the stated redemption price at maturity and the issue price (i.e. discount or premium). The discount or premium is linearly spread (accrued) as interest over the full lifetime of the debt security (original maturity in days).

$$nominal.yield = coupon.rate + 365 \times \frac{(redemption.price - issue.price)}{original.maturity}$$

(1)

For every individual debt security that is still outstanding, the nominal yield is calculated using equation (1). The average nominal yield for N securities (e.g. for a country) is calculated using the face value as the weighting factor (see equation (2)). Average nominal yields may be calculated for different types of breakdowns, such as remaining maturity.

$$average.nominal.yield = \sum_{i=1}^{N} \frac{nominal.yield_i \times face.value_i}{\sum_{r=1}^{N} face.value_r}$$

(2)

A security-by-security database, such as the CSDB, allows the calculation of the average nominal yields for transactions (issuances and redemptions). It is of particularly interest for gauging the current average nominal yields for the issuance of government debt securities and the average nominal yields of redeemed debt securities in the preceding 12-month period.

3.3. Main results

The statistics compiled for debt service and average nominal yields using the CSDB span the period from December 2009 to May 2014. The main results for the euro area governments are presented below.
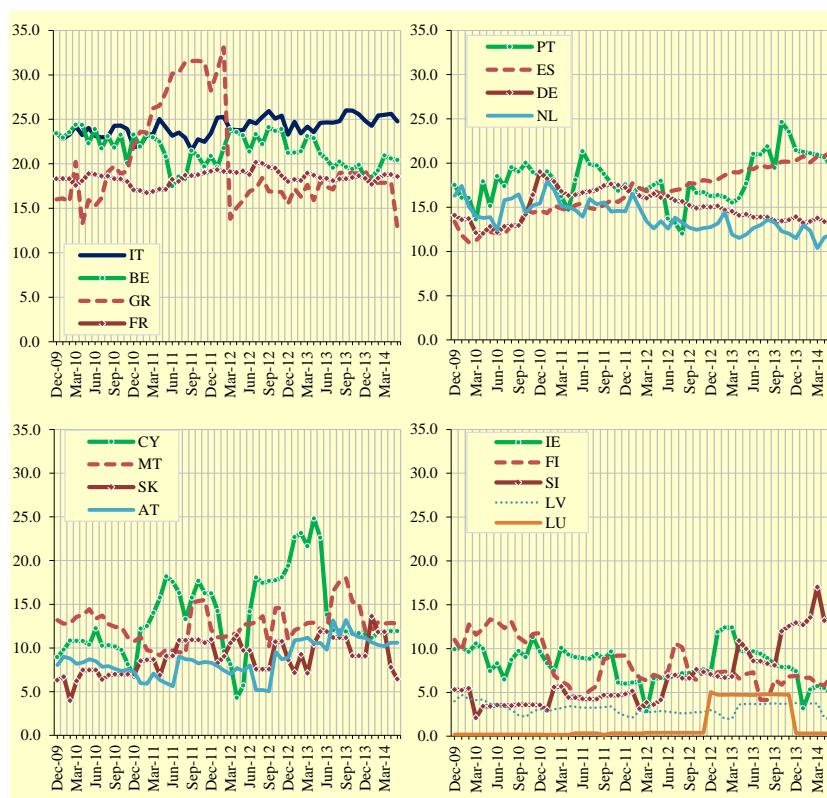
3.3.1. Debt service ratio

The scheduled debt service in the coming year records all debt securities that will mature in the next 12-month period. The values are compiled every month, taking into account the redemption and issuances of government debt securities.

Typically, euro area governments show debt service for the coming year (debt service ratio) that is lower than one-quarter of GDP (Chart 1). For Greece the debt service increased considerably between December 2010 and March 2012 and then dropped abruptly when the private sector involvement (PSI) in a Greek government debt exchange was successfully finalised. In that move, nearly 97% of private sector bondholders participated in the exchange of their Greek government bonds for short-term European Financial Stability Facility (EFSF) notes and new long-term Greek government bonds, which equated to a reduction of some 53.5% in nominal terms (around €100 billion). The longer maturities of the new Greek government bonds helped to reduce the debt service from 33% of GDP to around 14%.

Chart 1

Debt service in the coming year for euro area government debt securities, by country
(as a percentage of GDP)

Source: CSDB, authors' calculations.

The debt service ratio for Italy increased slightly in the past four years and remains close to 25% of GDP. The debt service ratios for Portugal and Spain rose in the past four years to around 20% of GDP at the end of May 2014. For Spain the debt service ratio has been rising progressively. For Portugal the ratio reached 25% in October 2013 but then shrank back to 20%, partly as a result of a debt exchange in December 2013 (of some €6.64 billion) and a bond buyback in March 2014 (of some €1.37 billion).
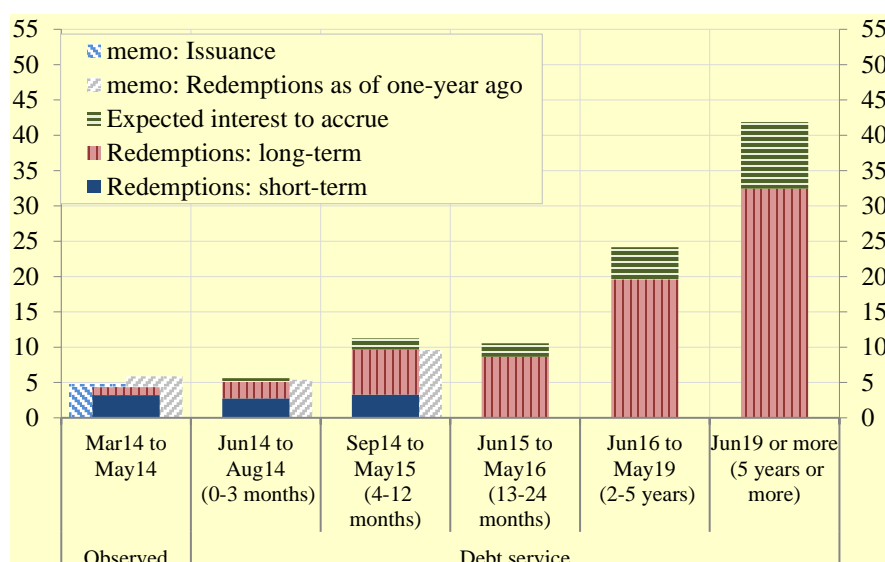
The debt ratio for Cyprus increased by 20 percentage points of GDP between the country's request in June 2012 for financial aid from the other euro area countries in order to shore up its banks, which incurred heavy losses on Greek debt exchange, and the finalisation of the bailout agreement in March 2013. The debt service ratio then reduced quickly from 25% of GDP to around 12.0% of GDP and now remains at that level.

More recently, the debt service ratio for Slovenia increased rapidly (doubled in just one year). This is related to the government financial assistance for its financial sector in the form of far-reaching banking recapitalisation.

For the euro area as a whole, the debt service scheduled for the next 12 months is approximately 16.8% of GDP (€1.7 trillion), compared to 17.2% one year ago; the value comprises 14.7% of principal (face value) and 2.1% of interest to accrue (see Chart 2). The amounts of principal of both short and long-term debt securities scheduled to be redeemed in three months is 5% of GDP (down from 5.4% one year ago). On the other hand, debt securities with payment due over 3 and up to 12 months increase to 9.7% of GDP (from 9.6% one year ago).

Chart 2

Debt service for euro area government debt securities, by disbursement periods
(as a percentage of GDP)

Legend:
- memo: Issuance
- memo: Redemptions as of one-year ago
- Expected interest to accrue
- Redemptions: long-term
- Redemptions: short-term

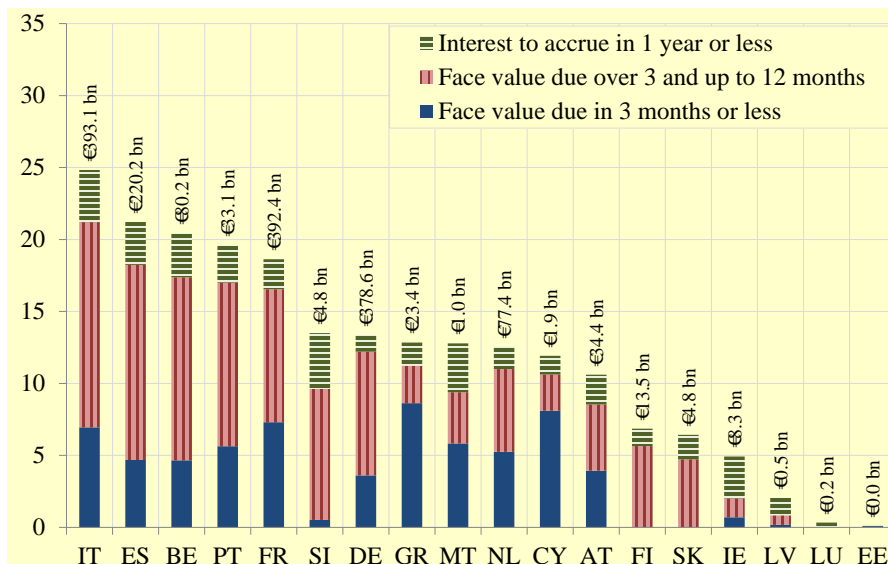|	Observed	Debt service				
	Mar14 to May14	Jun14 to Aug14 (0-3 months)	Sep14 to May15 (4-12 months)	Jun15 to May16 (13-24 months)	Jun16 to May19 (2-5 years)	Jun19 or more (5 years or more)

Source: CSDB, authors' calculations.

The debt service for five euro area countries (Belgium, France, Italy, Portugal and Spain) expected in the coming 12 months is more than 15% of GDP (see Chart 3), as compared to seven countries one year ago (the aforementioned countries

plus Greece and Cyprus). Moreover, six euro area countries (Cyprus, France, Greece, Italy, Malta and Portugal) expect principal (face value) repayments of debt securities larger than 5% of GDP, which are due in three months or less.

Chart 3

Debt service of euro area government debt securities for the coming year, by country
(as a percentage of GDP and € billion, June 2014 to May 2015)

Source: CSDB, authors' calculations.

3.3.2. Average nominal yields

The average nominal yields of euro area government debt securities showed a fairly stable pattern after the onset of the euro area sovereign debt crisis in late 2009. With a very few country exceptions, the average nominal yields have since decreased (see Chart 4). For instance, Germany reduced its average nominal yields by almost a full 140 basis points to 2.3%, from the peak of 3.7% in January 2010.
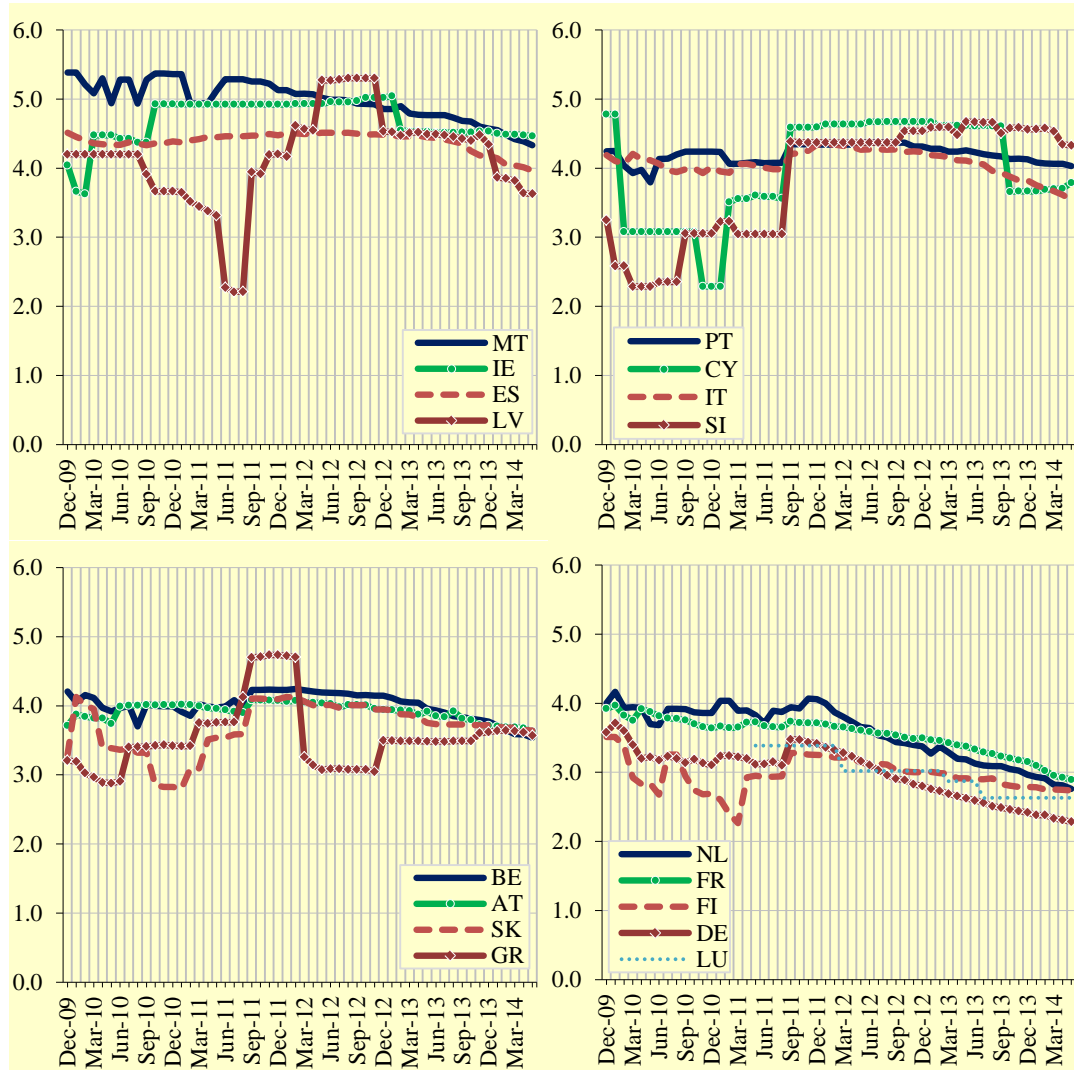
In Ireland, the aggravation of the euro area sovereign debt crisis led to a rapid increase to around 5% in average nominal yields, which remained high until May 2014. For Greece, average nominal yields increased markedly until March 2012 when there was a sudden drop associated with the PSI. Since then the average nominal yields for Greece have increased steadily. Other countries that were distinctly affected by the crisis, such as Italy, Latvia Portugal and Spain, witnessed their government average nominal yields increasing from 2010 to 2012. It was not until 2013 that yields started to drop to levels seen prior to the sovereign debt crisis. Finally, the average nominal government yields of Slovenia and Cyprus increased considerably in 2013 in connection with the financial measures (e.g. bank nationalisation and recapitalisation) taken by their governments in order to stabilise the financial sector.

In contrast, declining developments of average nominal yields have been observed in Finland, France, Germany and the Netherlands since late 2011. A significant drop in government average nominal yields is observed for France and

the Netherlands, where levels below 3% have been reached for the first time in several years.

Chart 4

Average nominal yields for euro area government debt securities, by country
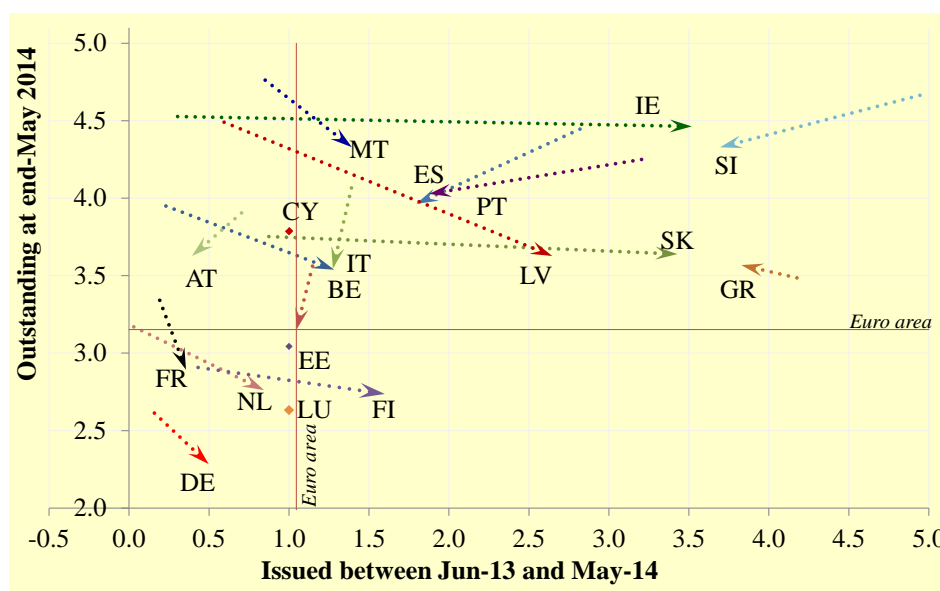(as a percentage per annum)

Source: CSDB, authors' calculations.

The average nominal yield on outstanding government debt securities for the euro area as a whole fell to 3.2% at the end of May 2014, from 3.6% one year ago (see Chart 5). Compared to one year ago, only Estonia and Greece recorded an increase in average nominal yield. Currently, the maximum difference in average nominal yield is between Germany (lowest, 2.3%) and Ireland (highest, 4.5%).

Chart 5

Average nominal yields for euro area government debt securities, euro area total and by country
(May 2014; as a percentage per annum; connecting dotted line shows situation one year-ago)

Source: CSDB, authors' calculations.

The average nominal yield on debt securities issued by euro area governments as a whole in the past 12 months is 1.0%, some 11 bps lower than one year ago. The issuance of new debt securities in Belgium, France, Germany, Ireland, Latvia, the Netherlands, Malta and Slovakia resulted in an increase in the nominal yields, as compared to one year ago.

4. Government debt service and nominal yields: selected analysis

In this section, two selected analyses are presented using the debt service and average nominal yields statistics. First, the government financing needs for the euro area countries is explored and linked to the debt service statistics compiled from the CSDB. Second, the average nominal yields and market yield to maturity are put together to show some noteworthy developments experienced by euro area governments in recent years.

4.1.   Gross government financing needs and debt service

Fiscal analysis examines the financing needs for the coming months/years in relation to the government debt outstanding. The gross government financing needs provide an overall measure of government financial obligations for the coming year. In its simpler form, the gross government financing needs for the coming year are calculated by adding together the projection for government
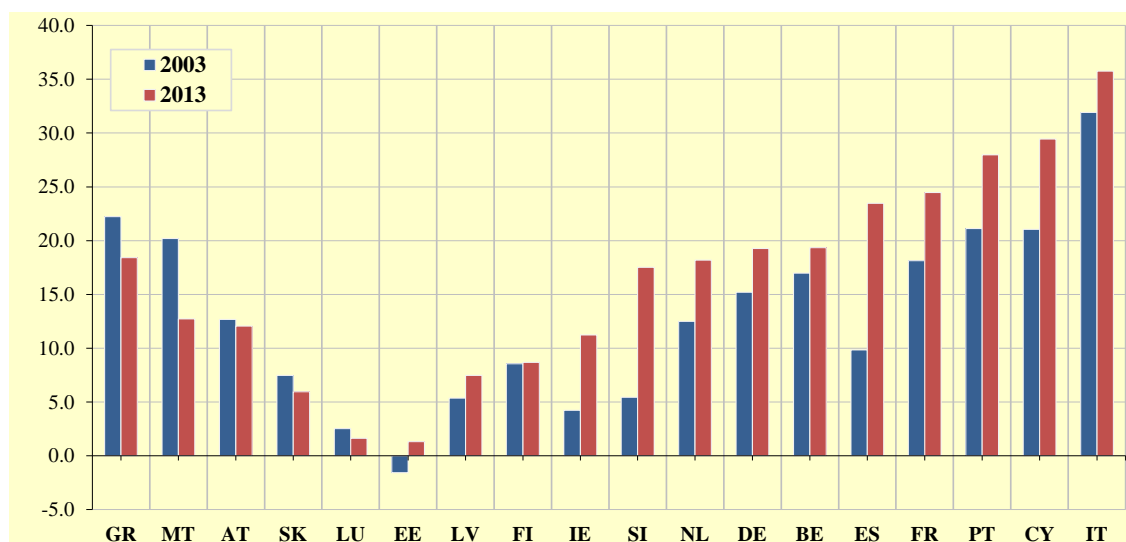
deficit/surplus (net lending/net borrowing) and government debt that matures in the course of the year (i.e. debt with a remaining maturity of one year or less). The results help to understand what a government would need to do to fulfil its financial obligations, the alternatives being a) raise more debt, b) sell financial assets, c) increase revenue (e.g. increase taxes, sell non-financial assets) and/or d) reduce expenditure (e.g. capital expenditure, compensation of employees, subsidies). These choices will have different fiscal impacts in the economy, such as on interest rates, the tax burden and even on prices. Depending on the government choice, a) and c) may have an impact on the tax burden, interest rates, costs and prices for corporations and households, while d) may reduce the net operating profits of corporations and household disposable income.

During the past decade – 2003 to 2013 – government financing needs for the euro area governments changed noticeably (see Chart 6). Only five countries managed to reduce financing needs for the next year. The increases relate mainly to higher amounts of government debt outstanding, in combination with shorter debt maturities on some sovereign crisis borrowing (see Section 6.1), which was only partly offset by reductions in government deficit/surplus (except for Belgium, Estonia, Finland, Ireland, Slovenia and Spain).

Chart 6

Gross government financing needs, by country
(as a percentage of GDP; 2013 includes the deficit/surplus projection for 2014, while 2003 uses the observed deficit/surplus for 2004)

Source: ECB, European Commission (2014 projections), authors' calculations.

The debt service calculated using data from the CSDB (see Chart 1) may serve as a unique indicator for government financing needs, given that the largest share of the government debt (about 80%) takes the form of debt securities. The debt service may be used to proxy the financing needs relating to government debt with a remaining maturity of one year or less. Thus, debt service may be used to closely monitor any strains on forthcoming government financial obligations, further detailing future periods during which the financial obligations will actually occur. In

that regard, fiscal analysis requires complementary information on the interest rate cost for government debt, the current (and possible expected) market interest rates and the foregoing interest rates on maturing debt, so that the impact on government interest expenditure from refinancing debt may be calculated (see next Section).

4.2. Nominal yields and market yields

The average nominal yield provides a measure of the interest cost associated with the debt issued by an entity, in this paper by government. Typically, the average nominal yield remains fairly stable and only changes markedly when considerable amounts of debt are redeemed and/or issued. The average nominal yield can be used to assess, from the debtor perspective, the amounts of interest expenditure that will need to be serviced with the current debt outstanding. The average nominal yield is calculated for all debt securities outstanding.[5] The average nominal yield changes with the primary (issuance) market trades but does not change with trades in the secondary market, except if the issuer buys back its own debt securities in the market to proceed with an early redemption.
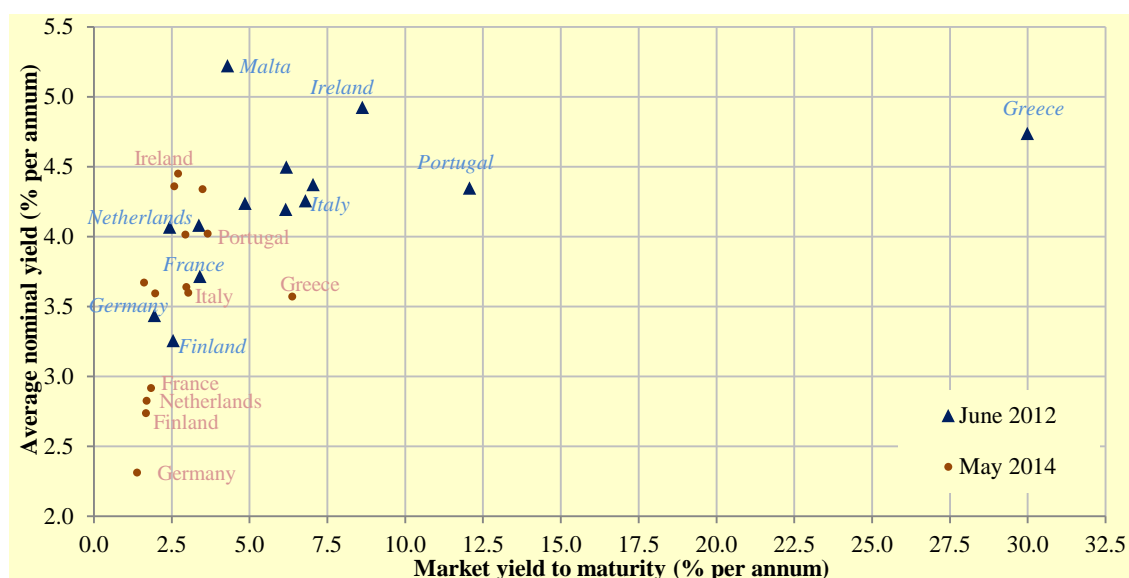
On the other hand, the yield to maturity quoted in sovereign bond markets reflects the interest revenue that a creditor would obtain from buying a debt security and holding it until maturity. This market rate is affected by several characteristics of the debt security, such as coupon rate, maturity, risk creditworthiness of the issuer and volume issued, but also by market supply and demand. The market yield to maturity is calculated only for a few selected government debt securities, usually called benchmark debt securities, and is calculated for several remaining maturities, such as 5 years and 10 years. The market yield to maturity may vary very quickly depending on economic events and news. It is also affected by both primary (issuance) and secondary market trades. The market yield can be used to gather information on the possible interest cost with the issuance of new debt securities.

It is interesting to compare the two rates, particularly those at the peak of the euro area sovereign debt crisis (June 2012) and the latest data available (May 2014) (see Chart 7). A noteworthy development, despite the extreme market yields for some countries during the crisis, is that the average nominal yield remained below 5%. This is naturally related to the efforts that euro area countries and EU institutions took to contain the euro area sovereign debt crisis. For instance, the ECB's non-standard monetary policy measures (such as the Securities Markets Programme, covered bond purchase, the outright monetary transactions programme, emergency liquidity assistance and long-term refinancing operations)[6] have contributed to lowering the market yields considerably, to the point where, in May 2014, the dispersion between countries had been considerably reduced as compared to June 2012.

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[5] It is also possible to calculate a breakdown of average nominal yield by remaining maturity. Although available, this breakdown is not shown in this paper.

[6] See http://www.ecb.europa.eu/mopo/html/index.en.html for further information.

Chart 7

Average nominal yields and 10-year market yield to maturity for euro area government debt securities, by selected countries
(May 2014 and June 2012; as a percentage per annum)

Source: CSDB, Reuters, authors' calculations.

Another interesting observation is that while the reduction of the market yields was more visible in the countries that were financially stressed (e.g. Greece, Ireland, Italy and Portugal), the reduction of the average nominal yields is more visible for countries that had higher credit creditworthiness (e.g. Finland, France, Germany and the Netherlands).

5. The CSDB, the statistical European standards and Government debt

In this section the CSDB data are compared to the statistical concept of government debt used in Europe in terms of sector coverage, valuation and calculation method, followed by an actual comparison of the figures computed by these two sources.

On the one hand, the CSDB provides all the information needed to compile high-quality statistics on the issuance of government debt securities in accordance with the European statistical standards (European System of Accounts – ESA), in terms of sector classification and coverage, instrument breakdown (short and long-term) and valuation. On the other hand, in Europe a relevant indicator for general government statistics is government debt, also referred to as "EDP debt" or "Maastricht Debt", as defined in Protocol No 12 on the Excessive Deficit Procedure (EDP) annexed to the Maastricht Treaty and in the Council Regulation (EC) No 479/2009 (as amended) on the EDP. Total general government gross debt is defined as "total gross debt at nominal value outstanding at the end of the year and consolidated between and within the sectors of general government" and has the following characteristics:

- Sector delineation: total government debt comprises the consolidated liabilities of the general government sector (i.e. central government, state government, local government and social security funds). Publicly owned units engaged in commercial operations, such as public corporations, are excluded from the measurement of government debt.

- Breakdown by instrument: total government debt is constituted by the liabilities of general government in the form of (i) currency and deposits, (ii) debt securities, and (iii) loans, as defined in the European System of Accounts (ESA 2010).

- Valuation: total government debt is measured as the "face value" of the debt. It equals the amount contractually agreed that the government will have to refund to creditors at maturity. This means, in particular, that government debt is not affected by changes in market yields or by accrued interest.

- Consolidation: total government debt is consolidated across the general government sector, which implies that government debt instruments held as assets by general government units are not included in the calculation of the debt.

Bearing those aspects in mind, the data compiled from the CSDB on the basis of ESA may deviate in several aspects from government debt based on EDP. However, the indicators presented in this paper are complementary, relevant and useful to produce. The main differences between the CSDB data and government debt are as follows:

- The CSDB comprises only debt securities (which cover about 80% of euro area government debt);

- There is no information in the CSDB that allows the consolidation of government debt. Data on government debt securities held by other government units, on a security-by-security basis, are available in the ESCB Securities Holding Statistics Database, which is not yet operational;

- The CSDB can provide data on debt securities at face value (as well as at market value). Debt securities denominated in foreign currency in the CSDB are converted into the national currency on the basis of the representative market exchange rate prevailing on the last working day of each month. However, for government debt, debts that are denominated in foreign currency and are exchanged into the national currency through contractual agreements, such as swaps and forward rate agreements, are converted into the national currency at the rate agreed in those contracts and not at the prevailing market rate;

- Finally, the sector delineation in the CSDB is essentially in line with the sector delineation in the government debt. Nevertheless, there may be some cases where an entity is not classified along those lines: a) when certain operations of a specific unit are rerouted to government accounts (e.g. government special purpose units located abroad with the objective of issuing debt); b) temporary misclassification due to the CSDB data flow process. The sector classification of issuers in the CSDB is first prepared by commercial data providers, which are instructed to adhere to the description of the institutional units in the ESA. However,
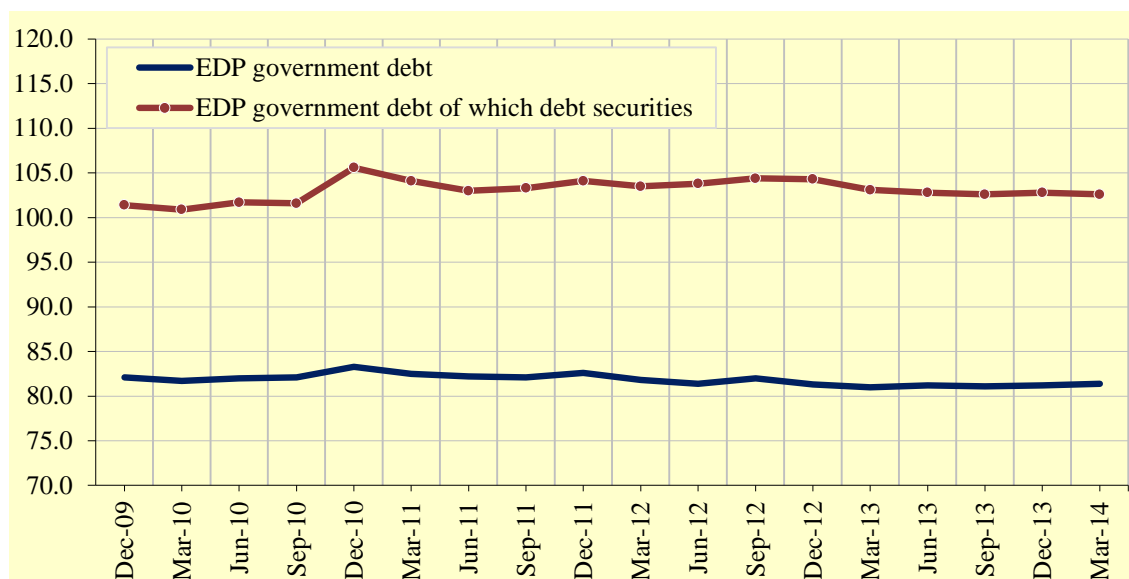
the statistical classification sometimes obeys very detailed rules that data commercial data providers are not able to implement. In such situations, the national central banks perform an analysis of the sector classification and correct any incorrectly classified entity. The sector classification is then harmonised with the different statistical domains, including the statistics compiled by the national statistical institutes.

The actual comparison of the outstanding amounts of government debt securities issued by euro area countries computed from the CSDB and the EDP euro area government debt shows a very stable relation, between 80% and 83% since the end of 2009 (see Chart 8). A direct comparison of the EDP government debt in the form of debt securities and the CSDB figures reveals a ratio that has been floating at around 101% and 106% since the end of 2009. These facts inspire confidence with regard to using the timely CSDB data as an early indicator of EDP government debt.

Chart 8

Government debt securities computed from the CSDB compared to EDP government debt
(as of July 2014; CSDB data as a percentage of EDP government debt data)

Source: CSDB, Eurostat, authors' calculations.

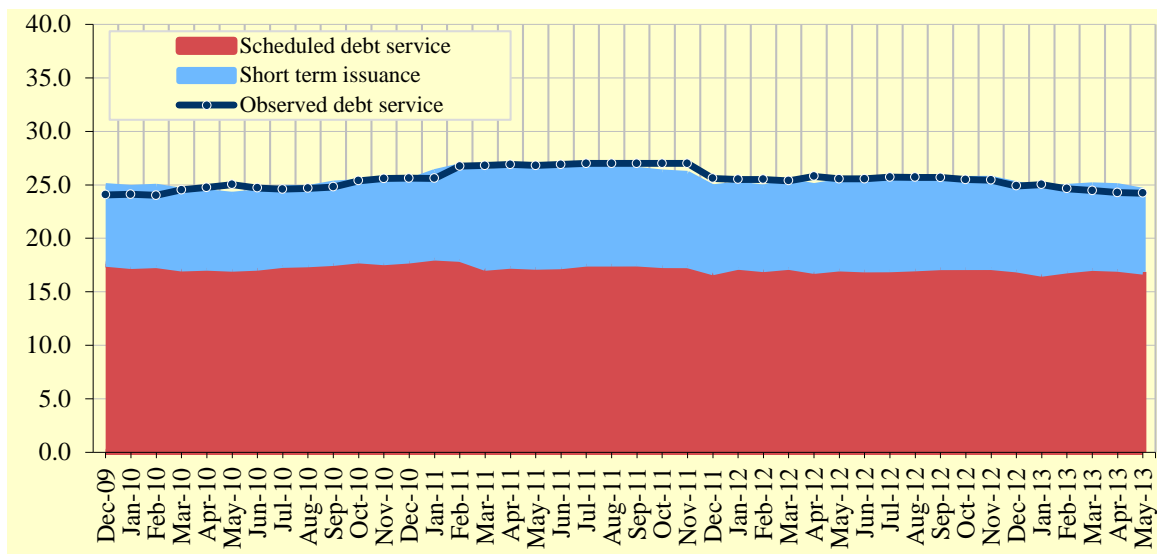## 6. Selected issues using the CSDB data

This section discusses some issues that a data user needs to consider when analysing debt service and average nominal yields. More specifically, it describes a) the impact of issuance of short-term debt and earlier debt redemptions in the calculation of debt service, and b) the effect of issuance at discount/premium in the breakdown of debt service between principal (face value) and interest. It also examines a current limitation in using the CSDB for the calculation of average nominal yields when additional debt is issued under the same debt security (tranche issuance).

6.1.   Short-term issuance of debt securities and debt service

The scheduled debt service for the coming year records all debt securities outstanding that will mature in the coming 12-month period. For instance, in May 2013 the scheduled debt service in the euro area shows that government debt securities maturing in the coming year (i.e. between June 2013 and May 2014) amounted to 17.2% of GDP (see Chart 9). However, the actual debt service after that year had passed was considerably higher (25.5% of GDP). The gap between the scheduled and the observed debt service can be explained by the issuances of short-term debt securities and, to a lesser extent, by earlier redemption (partial or total) of debt securities. It should be noted that to measure the gap, not all short-term debt securities are to be considered but only those that were issued and matured between June 2013 and May 2014 (e.g. all three-month debt securities issued between June 2013 and February 2014).

Chart 9

Debt service in euro area governments (in the coming year) – scheduled and observed
(as of May 2014, as a percentage of GDP)

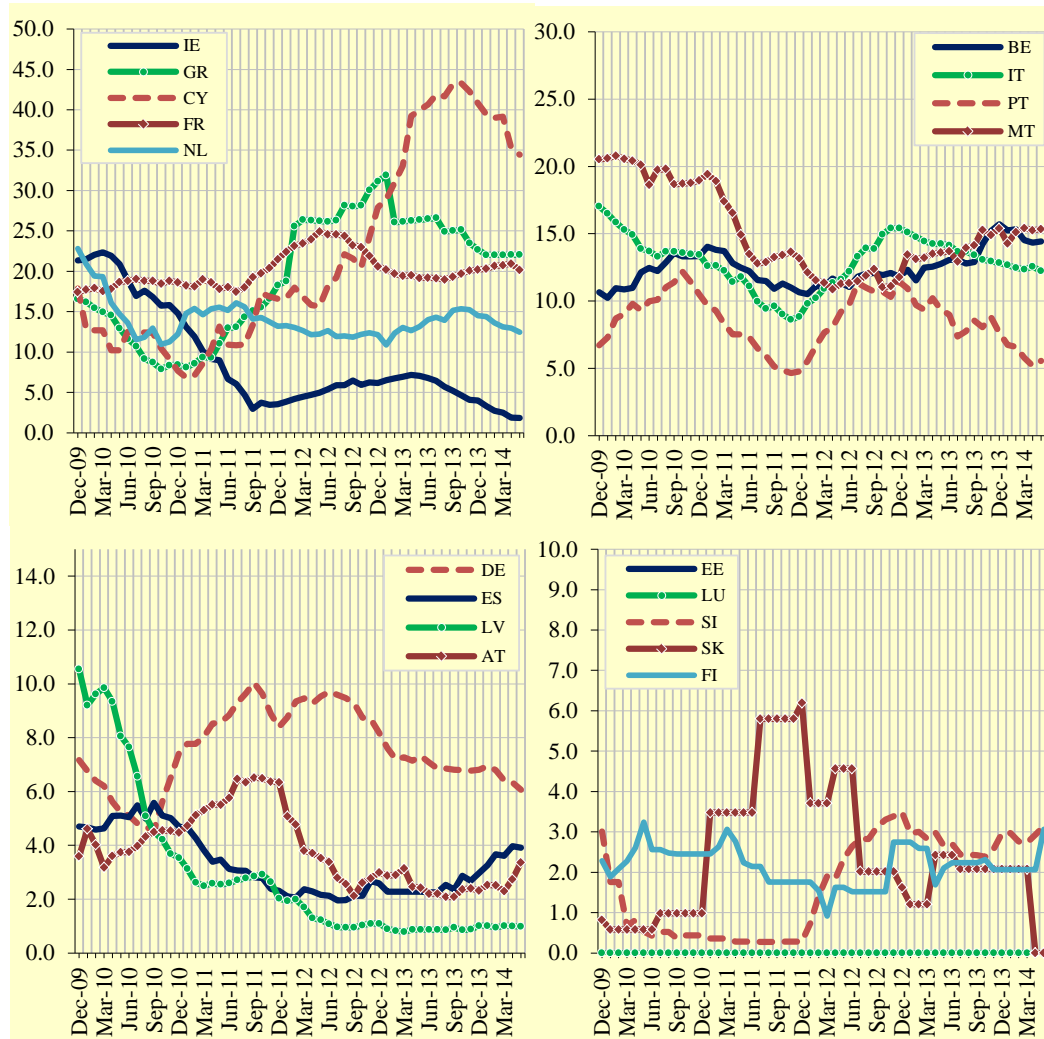Source: CSDB, Eurostat, authors' calculations.

For most euro area governments, the issuances of short-term securities in the past 12-month period were stable and below 15% of GDP (Chart 10). At the time of the financial crisis and the euro area sovereign debt crisis, when several governments experienced difficulties when endeavouring to issue long-term government bonds, short-term issuances became noticeably important. In Cyprus, short-term issuances (in the preceding 12 months) gradually increased after December 2012 and reached a peak of 43.3% of GDP in October 2013. In Greece, short-term issuances were high, above 20% of GDP from January 2012 onwards, after reaching a maximum of 31.9% of GDP in January 2013. In the Netherlands, short-term issuances were pronounced until February 2010 but thereafter they gradually decreased to 12.4% in May 2014. An interesting development can be observed for Ireland, where short-term issuance during the crisis reached 22.4% of

GDP (in February 2010) and later significantly decreased to 1.8% of GDP in May 2014. Germany also shows an increase to almost 10% of GDP (in August 2011), reducing afterwards to the levels (6% of GDP in May 2014) prior to the crisis. Since November 2011, high short-term issuances (above 20% of GDP) have also been observed in France.

Chart 10

Short-term issuances of debt securities
(as of May 2014, 12-month cumulated sum as a percentage of GDP)

Source: CSDB, authors' calculations.

6.2.   Issuance at discount/premium and debt service

The European statistical standards (ESA 2010) for the compilation of national accounts data recommend that for debt securities issued at discount/premium (e.g. zero coupon bonds) the difference between the issue price and the redemption price be treated as interest to be accrued over the lifetime of the security. The calculation of nominal yields (see Equation (1)) takes into account the existence of discount/premium.

As discussed in Section 5, the data on government debt securities compiled from the CSDB show the face value of the debt securities (which is closer to the concept of government debt). The face value (redemption value) for securities issued at discount/premium includes an interest component. By computing the face value of debt securities, the breakdown between principal and interest in the debt service cannot be properly separated for securities issued at discount/premium, as otherwise the interest part would be counted twice. For the debt service only the coupon part of the debt security is recorded as interest.

For example, the interest accrued on a four-year zero coupon bond issued with a discount of 20% (issue price of 80, redemption value of 100) is equal to 5% per annum. In accordance with the international statistical standards, the scheduled payments (debt service) would record 5% in the first year, 5% in the second year, 5% in the third year and finally 85% (80% related to the principal amount – issue price – and 5% related to the interest component) in the fourth year. However, the debt service for a zero coupon bond calculated using the CSDB will show only a scheduled payment in the fourth year amounting to 100% (redemption price).

6.3.   Nominal yield calculation and bond taps

It is common practice among issuers of debt securities to resort to issuance of additional debt from past issues under the same instrument, referred to as "bond taps" or "tap issues". This method allows the issuer to elude certain transaction or legal costs as well as to speed up the raising of funds. In addition, many of the formalities needed to issue a bond, such as the prospectus, are bypassed by the issuer, which proceeds directly to the auction of new securities. This practice is very common for euro area government debt securities.

The special characteristics of these types of issuances have implications when considering the interest component in the CSDB. The new tranche will be issued with the same maturity date as the original issuance; however, it might have a different issue price or even coupon rate. This implies that the total nominal yield to be paid should be calculated as a weighted average of the nominal yield for each tranche and the initial issuance (i.e. the coupon rate of the tranche when issued and any difference between the stated redemption price at maturity and the issue price for each tranche).

The security-by-security information derived from the CSDB makes it possible to calculate the nominal yield for each security (see Section 3.2). However, for tap issues, the specific issue price and/or coupon are known only for the initial issuance and are not recorded for any subsequent new tranche (only the amounts outstanding are tracked) in the CSDB. The main consequence is that the nominal yield calculation has a bias towards the initial issuance as only the initial issue price and coupon rate will be considered. For the computations, the two main components affected will be: a) different coupon rate (a higher coupon of the initial issuance compared to the coupon of the tranches will result in a higher total nominal yield and vice versa); and b) different issue price (a higher issue price of the initial issuance compared to the issue of the tranches will result in a lower total nominal yield and vice versa).

An example of the bias introduced into the average nominal yield is provided in Table 1, which shows the data extracted from the CSDB supplemented with additional information for each tranche issued. In this example there are several

tranches that are issued at different prices but keep the same redemption price and coupon rate. The results show that using the weighted average of the nominal yields of each tranche, the total average nominal yield is 3.97% (Method 1). If only the initial issue price of the first tranche is used for the total amounts issued, the average nominal yield is 3.86% (Method 2), i.e. equal to the average nominal yield on the first tranche. The total difference is 11 basis points lower. From a statistical perspective, this difference does not affect the general results. However, possible improvements to the CSDB are being considered in order to reduce this bias.

Example of average nominal yield calculation methods for tap issues

(data as of May 2014)

Table 1

Method 1: Calculation of nominal yield considering different issue prices for each tranche								
Tranches	Issue date	Maturity date	Issue price	Redemption price	Amounts issued (€ bn)	Share (% of total)	Coupon (fixed, annual) rate (% per annum)	Nominal yield per tranche (% per annum)
Initial	23/02/2005	15/04/2021	99.8	100	3,000	39.9	3.85	3.86
Second	18/04/2005	15/04/2021	99.0	100	1,108	14.8	3.85	3.91
Third	16/05/2005	15/04/2021	100.8	100	1,079	14.4	3.85	3.80
Fourth	15/08/2005	15/04/2021	100.9	100	900	12.0	3.85	3.79
Fifth	15/03/2010	15/04/2021	97.1	100	990	13.2	3.85	4.11
Last	13/09/2010	15/04/2021	83.6	100	434	5.8	3.85	5.40
					Average nominal yield (% per annum)			3.97

Method 2: Calculation of nominal yield assuming the same issue price for all tranches (currently adopted)								
Tranches	Issue date	Maturity date	Issue price	Redemption price	Amounts issued (€ bn)	Share (% of total)	Coupon (fixed, annual) rate (% per annum)	Nominal yield per tranche (% per annum)
Total	23/02/2005	15/04/2021	99.8	100	7.510	100	3.85	3.86
					Average nominal yield (% per annum)			3.86
					Difference between Method 1 and Method 2 (basis points)			11

Source: CSDB, authors' calculations.

7. Conclusion

This statistical paper introduces two monthly statistical indicators related to debt securities issued by the euro area governments – the debt service, defined as the scheduled payments of principal and interest by the debtor in the coming year, and the average nominal yield, i.e. the interest rate that the debtor promises to pay creditors per unit of time. These statistics, compiled from the Centralised Securities Database (CSDB), afford interesting insights into the euro area government debt securities markets. These very timely monthly indicators, which the European Central Bank (ECB) plans to start disseminating later this year, may be used to monitor possible strains in servicing government debt, including debt sustainability, which may be useful information to be taken into account in determining monetary and fiscal policies.

The paper describes in detail the statistical compilation of the debt service and average nominal yields statistics for euro area government debt securities, forging a link to the all-encompassing government debt statistics (around 80% of government debt takes the form of debt securities). The main findings are that these statistics complement the available statistical information on government finance. Furthermore, the new statistics are available with a short time lag, providing users with data far more quickly and with many more data breakdowns than other aggregated government finance statistics.

This paper also presents the recent developments in debt service and average nominal yields statistics for the euro area governments, by country, in an extremely challenging period for the euro area sovereign debt markets.

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