



ECB-UNRESTRICTED  
20 July 2016

## WORKING GROUP ON SECURITIES DATABASES

### RECOMMENDATION 7 OF THE G-20 DATA GAPS INITIATIVE PHASE 2 (DGI-2)

#### COMPLEMENTARY NOTE NO 1 (CN 1) ON THE REPORTING TEMPLATES

## ACCRUED INTEREST FOR FIXED INTEREST RATE DEBT SECURITIES

Recommendation 7 on Securities Statistics of the G-20 Data Gaps Initiative Phase 2 (DGI-2) is based on the methodology explained in the Handbook on Securities Statistics (HSS). In particular Annex 1 of the HSS “Comparing Market Value and Nominal Value for Debt Securities” illustrates the calculation of nominal value and accrued interest as well as the relationship between accrued interest and coupon payments for several types of debt securities.

The **Complementary Note No 1 (CN 1)** to the HSS provides further explanations on the calculation of **accrued interest for the debtor principle in the case of fixed interest rate debt securities**.

The HSS is aligned to the System of National Accounts 2008 (SNA2008) and the Balance of Payments and International Investment Position Manual, Sixth Edition (BPM6). The calculation of accrued interest for fixed interest rate debt securities are part of Annex 1 to the HSS and are in line with the examples contained in the External Debt Statistics - Guide for Compilers and Users, 2013 (EDS Guide), Appendix to Chapter 2 (para. 2.62 ff.), and with the Monetary and Financial Statistics Manual and Compilation Guide 2016 (pre-publication draft), Box 5.2 and Annex 5.2.

### *Calculation of accrued interest – General considerations*

**Accrued interest on debt securities** is the remuneration, accruing continuously over time, for an intertemporal exchange of funds between the holder(s) and the issuer of a debt security.

Accrued interest can be compiled for the **debtor principle** as well as for the **creditor principle**. In the first case, accrued interest depends on the market conditions at issuance of a debt security. In the second case, it depends on the market conditions at the time a debt security is purchased. By convention, the HSS and the international statistical standards in general apply the debtor principle. Therefore, the explanations in the CN 1 are based on the debtor principle.

In the predominant case for debt securities, a principal is channelled at issuance from the first holder to the issuer and redeemed by the issuer to the last holder at maturity. In this typical

case, accrued interest for the debtor principle is composed of the coupon payments and the difference between the redemption and the issue price.

Accrued interest is part of positions and transactions in debt securities. It is to be included in positions both at market value and at nominal value. The counterpart transactions to accrued interest are financial transactions in the respective debt securities.

### **Calculation of accrued interest – Fixed interest rate debt securities**

#### **Fixed interest rate debt securities issued at par (HSS Table A.1.1)**

In this case, accrued interest for the debtor principle is generated only by the coupon payments; accrued interest due to discount is zero. The **nominal yield to maturity calculated at issuance** of a debt security **equals the fixed interest rate**. The accrued interest for the debtor principle is calculated by multiplying the nominal yield to maturity at issuance and the nominal value at the beginning of the reference period.

In the example of HSS Table A.1.1, the nominal yield is 10% and the nominal value at the beginning of each reference period is 1,000 currency units (CU), i.e. the accrued interest for the debtor principle is 100 CU. The calculations of accrued interest do not depend on changes in the market value of the debt security.

<b>HSS Table A.1.1 – A fixed Interest Rate Bond Issued at Par – Accrued interest</b>						
Issue price: 1,000 CU; annual coupon payments: 100 CU; original maturity: 5 years; redemption price: 1,000 CU; calculated nominal yield to maturity at issuance: 10%						
	Start year 1	End year 1	End year 2	End year 3	End year 4	End year 5
Nominal value						
before coupon payment	1,000.0	1,100.0	1,100.0	1,100.0	1,100.0	1,100.0
after coupon payment		1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
Accrued interest		100.0	100.0	100.0	100.0	100.0
due to coupon		100.0	100.0	100.0	100.0	100.0
due to discount		0.0	0.0	0.0	0.0	0.0
Coupon payment		-100.0	-100.0	-100.0	-100.0	-100.0

#### **Fixed interest rate debt securities issued at a discount (HSS Table A.1.2)**

In this case, accrued interest for the debtor principle is generated by the coupon payments and the difference between the nominal value at maturity and the issue price.

First, the **nominal yield to maturity at issuance** of the debt security is calculated based on the **issue price**. It is the discount rate at which the net present value of the future cash flows generated by the debt security is equal to its issue price as observed on the market.

Second, the **accrued interest** for the debtor principle in any reference period is calculated by multiplying the nominal yield to maturity at issuance and the nominal value at the beginning of the reference period. The latter can be calculated as the net present value of the future cash flows generated by the debt security when applying the nominal yield to maturity at issuance. By construction, the nominal value at issuance is equal to the issue price. The nominal value of a debt security issued at a discount increases with the accrued interest due to discount that is not yet paid. Accrued interest for the debtor principle depends only on the issue price, but not on later changes in the market price (e.g. due to changes in market interest rates in general or perceptions of the credit risk).

Third, **accrued interest due to discount** for the debtor principle is the difference between the accrued interest and the coupon payments. It is the accrued interest not paid and increases the nominal value of the debt security from one reference period to the next. The accumulated accrued interest due to discount between the time of issuance and maturity is equal to the discount.

In the example of the HSS Table A.1.2 the issue price is 900 CU. Therefore, the nominal yield to maturity at issuance is calculated as 10%. Accrued interest for the first reference period is equal to the nominal value at issuance, the issue price, multiplied by the nominal yield:  $900 \text{ CU} \times 10\% = 90 \text{ CU}$ . 73.6 CU will be paid by the issuer to the holder of the debt security at the end of year 1 as coupon payment. The difference between the accrued interest and the coupon payment is accrued interest due to discount of 16.4 CU. The latter increases the nominal value at the beginning of the second reference period to 916.4 CU. Accrued interest for the second reference period of 91.6 CU is calculated by multiplying the nominal value at the beginning of the second reference period of 916.4 CU by the nominal yield to maturity at issuance of 10%. These calculations are applicable until maturity. They do not depend on changes in the market value of the debt security.

<b>HSS Table A.1.2 – A fixed Interest Rate Bond Issued below Par – Accrued interest</b>						
Issue price: 900 CU; annual coupon payments: 73.6 CU; original maturity: 5 years; redemption price: 1,000 CU; calculated nominal yield to maturity at issuance: 10%						
	Start year 1	End year 1	End year 2	End year 3	End year 4	End year 5
Nominal value						
before coupon payment	900.0	990.0	1,008.0	1,027.8	1,049.6	1,073.6
after coupon payment		916.4	934.4	954.2	976.0	1,000.0
due to accrued interest		16.4	34.4	54.2	76.0	100.0
Accrued interest		90.0	91.6	93.4	95.4	97.6
due to coupon		73.6	73.6	73.6	73.6	73.6
due to discount		16.4	18.0	19.8	21.8	24.0
Coupon payment		-73.6	-73.6	-73.6	-73.6	-73.6

### **Zero-coupon debt securities (HSS Table A.1.3)**

Zero-coupon debt securities are fixed interest rate debt securities issued at a discount, whereby the coupon payment is zero. Accrued interest for the debtor principle is therefore equal to accrued interest due to discount.

In the example of the HSS Table A.1.3 the issue price is 620.9 CU. Therefore, the nominal yield to maturity at issuance is calculated as 10%. Accrued interest for the first reference period is equal to the nominal value at issuance, the issue price, multiplied with the nominal yield:  $620.9 \text{ CU} \times 10\% = 62.1 \text{ CU}$ . As the coupon payment is zero, accrued interest is equal to accrued interest due to discount. The latter increases the nominal value at the beginning of the second reference period to 683.0 CU. The same calculations are applicable until maturity. They do not depend on changes in the market value of the debt security.

<b>HSS Table A.1.3 – A Zero-coupon Bond – Accrued interest</b>						
Issue price: 620.9 CU; annual coupon payments: 0.0 CU; original maturity: 5 years; redemption price: 1,000 CU; calculated nominal yield to maturity at issuance: 10%						
	Start year 1	End year 1	End year 2	End year 3	End year 4	End year 5
Nominal value	620.9	683.0	751.3	826.4	909.1	1,000.0
due to accrued interest		62.1	130.4	205.5	288.2	379.1
Accrued interest		62.1	68.3	75.1	82.6	90.9
due to coupon		0.0	0.0	0.0	0.0	0.0
due to discount		62.1	68.3	75.1	82.6	90.9
Coupon payment		0.0	0.0	0.0	0.0	0.0