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Interest on debt securities

Reflections on the debtor and creditor approach

De Nederlandsche Bank
Background paper prepared by the Balance of Payments and Financial Accounts Department

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1. Introduction

1. The Advisory Expert Group on National Accounts concluded in its February 2004 meeting that in the System of National Accounts (SNA) interest income on tradable debt securities should be recorded following the so-called 'debtor approach'. At the June 2004 BOPTEG meeting the issue was discussed of reopening the debate among the national accounts community. The views of the BOP experts with regard to this issue were widely diverging. A majority expressed preference for accruing interest income on tradable debt securities on the basis of the current market rates of interest, irrespective of the originally agreed interest rate at the time the securities were issued. This approach is known as the 'creditor approach'. A minority, to which the Dutch Central Bank (DNB) belonged, expressed preference for the so-called debtor approach, in which interest income is accrued on the basis of the implicit effective interest rate (yield to maturity) at issue of the security (based on both the coupon and the premium/discount margin at issue). DNB was asked to provide a background paper in support of its position not to reopen this debate.

2. Many of the arguments with regard to this issue have been summarized in documents that were discussed at the BOPTEG meeting in June. A repetition of all these arguments of either approach seems therefore not very useful. However, we would like to shed some light on a number of aspects that seems to have acquired less attention so far. Our focus will mainly be directed to the question "What do we want to measure in the National Accounts/BOP and what are the analytical needs". Most of our considerations are related to the treatment of the dimension of time in the System, as the creditor and debtor approach seem to be based on different views there.

3. We will restrict ourselves to the debtor and creditor approach only. The so-called 'acquisition approach' is neglected, as it is to be regarded as conceptually inferior. The acquisition approach will result in an asymmetrical treatment of income between the issuer and the holder of the security as soon as the debt is traded in the market at an interest rate different from the rate at issue.

4. No exegesis of the Compilation Guide and BOP Textbook, External Debt Manual will be given with the aim to 'proof' views. Apparently, a number of differences in the wording used (or even alleged inconsistencies) between all these sources and the SNA/BOP can be found, as a reflection that the debate on this issue was already going on for a number of years. Further elaboration on the exegesis would merely add to the semantic part of the discussion. We will restrict ourselves mainly to the SNA/BOP as the conceptual framework.

2. The debtor and the creditor approach compared

5. In order to highlight the essential differences between the two approaches we will use the same example as presented in Table 3 of the Joice/Wright paper prepared for the October 2000 BOPCOM meeting (page 15-16). The example concerns a five-year bond with a face value of \$ 1000, issued at par value and paying a coupon of \$ 50 each year (implicit effective interest rate, or yield to maturity: 5%). At the end of year 3 the price of the bond suddenly drops to \$964, which implies a current (= market) yield to maturity (CYTM) of 7% from that moment on. The recording of all transactions involved in buying and holding this bond over the entire lifetime is presented in a BOP/IIP format in **annex 1**.

6. Both the creditor and the debtor approach fully agree on the end of period (IIP) value of the bond in each of the five years. It is the current market price in each year, which is equal to the fair value of the bond. Also the treatment of the change in the value of the bond at the end of year 3 due to the rise in the market rate of interest is the same in both approaches. This change should be recorded in the Revaluation Account as a nominal holding loss. Both approaches would record the same transactions in the BOP during the first 3 years.

7. The difference between the two approaches is related to the period after the change in the market rate of interest. The subsequent maturing of the bond to its redemption value is treated as revaluation changes under the debtor approach. Under the creditor approach these revaluation changes are not needed, as the application of the current market rate of interest for the calculation of the accrued interest income (minus the coupon payments, or 'coupon redemptions') exactly equals the changes in the market value of the bond (see annex 1). The justification for this result given by the creditor approach seems to run as follows: Revaluation changes under the debtor approach are unjustified because neither market conditions (i.e. the market rate of interest) nor perceptions about the creditworthiness of the issuer did change during the last two years. Therefore, there is no rationale for recording revaluation changes in the remaining years to maturity (years 4 and 5). Moreover, consistent application of the principles of market price valuation and accrual accounting for income demands the calculation of accrued interest income that results in a yield that differs from the implicit effective interest rate at issue.

8. It is important to note that the creditor approach records more income over the entire life of the bond (\$286) than the debtor approach (\$250) does (see annex 1). This corresponds with the higher rate of interest in the market during the last two years of the life of the bond. However, if the accrued interest income plus all revaluation changes are taken together as a measure for the total return on investment (the 'full fair value income'), both approaches fully agree with each other (\$250). This is even true for each of the individual years during the lifetime of the bond. By implication, either the debtor approach treats part of the income as revaluation changes, or the creditor approach treats part of the revaluation changes as income. In this respect it is important to note that the debtor approach results in a total income over the entire life of the bond that exactly equals to the 'full fair valuation income' (\$250), while the creditor approach does not (\$286).

9. As a consequence of accruing income on the basis of the current market rate of interest, the creditor approach records net financial transactions over the years in which the bond matures to its redemption value after the change in the rate of interest. Or more precisely, the holder (issuer) constantly provides additional financing (redemptions) to the issuer (holder) as long as the current market rate of interest stays above (beneath) the coupon rate. The same phenomenon can occur under the debtor approach, but here only for the premium or discount (redemption margin) that was realized at issue of the bond (and thus also for zero-bonds), not for premiums and discounts that developed after the issue of the bond.

3. The creditor approach further considered

10. The arguments used in favor of the creditor approach seem to be based on three main considerations:

- No need to treat the maturing of bonds as revaluation changes;
- Consistent application of the principle of market price valuation;
- Consistent application of the principle of accrual accounting;

We will deal with these considerations one by one.

3.1 *The need for revaluation changes*

11. According to the creditor approach the maturing of a bond to its redemption value, after the occurrence of a change in the market rate of interest, cannot be regarded as price changes of the asset, because wider market conditions are supposed to be unchanged as long as the market rate of interest remains the same. This view is based on a misperception of the nature of the rate of interest. The interest rate is not the price of a bond or of any asset or liability. The interest rate is not a price like the price of goods and services. The interest rate is a conversion factor that relates current prices (for goods, services, assets and liabilities) to all future prices at different periods of time. As assets live, by definition, for more than one accounting period, time is a crucial factor for the determination of their prices. By implication, the price of an asset may change as time elapses, because there is a change within the dimension of time. Therefore, the price of an asset may change as the remaining lifetime of the asset changes, although the rate of interest remains stable in the market. As long as the current market conditions differ from those at the time of issue (or inception) of the asset, the price of the asset will have to change as time elapses, in order to equilibrate inter-temporal supply and demand.

12. The validity of the recording of revaluation changes under the debtor approach is also questioned in the following way: ‘If the losses were already expected (for the years 4 and 5 in the example of annex 1), should there not have been an impairment write down offsetting the gain?’¹ This suggestion is hard to understand. First of all, there is no disagreement on the value of the stocks between the debtor, the creditor and the full fair value approach. Secondly, the question exemplifies a neglect of the importance of the dimension of time in the valuation of assets. We can think of no single impairment test that would result in a value of the bond that deviates from its current market value, *only because of the fact that in the foreseeable future the value of the asset is known to change*. In fact, it is just the other way around. Because the market participants have taken into account the future (redemption) value of the bond, the current value is arrived at in the market. This is precisely what one would expect in efficient markets! All relevant information, including the path to the redemption value, is absorbed in the current market prices of the assets.

3.2 *Consistent market price valuation*

13. Market price valuation is indeed to be regarded as a general principle underlying the whole SNA/BOP framework. The perception of those who are in favor of the creditor approach with regard to the valuation issue is best expressed in the following way: “Once the

¹ Chris Wright, Income from Bonds: The 1993 SNA Treatment – A response, Bank of England.

designers of the System chose to adopt market prices as the underlying basis for all aspects of the system, not just transactions but balances as well, the creditor approach for the calculation of interest flows became the only method consistent with the System's overall integrity"². It should be noted that this quote does not use the wording '*current*' market prices as the basis for all aspects of the system. But the use of '*current*' prices is the real issue of the debate, more specifically; there is only disagreement with regard to the choice of the market rate of interest.

14. The valuation of balances in the System is not disputed by anybody: "The appropriate valuation basis for assets and liabilities is the price at which they might be bought in the markets at the time the valuation is required." (SNA 2.69).

15. For transactions the issue is much more subtle. "Transactions are valued at the price actually agreed upon by the transactors. Market prices are thus the basic reference for valuation in the System. In the absence of market transactions, valuation is made according to costs incurred or by reference to market prices for analogous goods and services." (SNA 2.68). Two observations can be made with regard to this paragraph. First of all, although market prices are the basic reference for the valuation of transactions in the System, no clear statement is made that transactions should be valued at current market prices in all cases. For goods and services this seems not to be a real issue. But for interest it does matter, because the aspect of time is involved. Secondly, in paragraph 2.68, in which the general principles for valuing transactions are defined, only reference is made to goods and services. Nothing is said about the market price of income transactions.

16. BPM5 provides some additional information in paragraph 92: 'A market price is to be clearly distinguished from a price quoted in the market, a world market price, a going price, a fair market price, or any price that is intended to express the generality of prices for a class of supposedly identical exchanges rather than a price actually applying to a specific exchange.' Apparently, the application of some sort of an average value of the rate of interest for the calculation of a class of income transactions is clearly not regarded as a market price suitable for the valuation of the transactions.

17. Throughout the whole SNA no single statement or even clear indication can be found which rate of interest should be used for the calculation of income. The actual flows of income are traditionally understood to be the historically agreed obligations for all components of income, such as the compensation of employees and the income on debt. Employees will get compensation according to their contract, irrespective of the current wage rate in the labor market, although they could hypothetically renegotiate their contract every (minute of the) day. The same applies to interest income.

18. This traditional understanding is now challenged by the creditor approach by the view that, due to the tradability of the securities, both the issuer and the holder are constantly evaluating and accepting the new conditions in the market as if they were concluding new arrangements at the '*current*' market conditions on a '*permanent*' basis. Put in another way, the creditor approach is based on the perception that the income on tradable debt has, effectively, no history. In fact the approach is based on the implicit hypothesis that all tradable debt could constantly be refinanced at the current (or holding period average) market conditions between the holders and the issuers. We believe this is the crux of the matter.

² Chris Wright, Measuring interest accruals on tradable debt securities in economic and financial statistics, Bank of England Quarterly Bulletin, Spring 2001.

19. The creditor approach is based on the implicit assumption that both the issuer and the holder of the securities are *not* locked into the financial conditions of the security at the time it was issued. Indeed, for the individual *holder* this is true. Each holder has the opportunity to sell the security whenever he wants to do so. Therefore, the individual holder is indeed not locked into the conditions of the contract. This is essentially the reason for existence of tradable debt. But on a macro-economic level this argument does not hold. As long as the debt is not redeemed some holder has to accept the specific characteristics of the asset (in terms of the specific payment scheme and the foreseeable valuation pattern). The price of the bond will equilibrate the characteristics of the instrument (such as the interest component) with those of other investment opportunities, including foreseeable changes in its value due to the maturing of the bond. This is the way how participants in the bond market perceive it.

20. The *issuer* would not be locked in the conditions of the contract if he could buy back all bonds instantaneously. For that to be true certain rather strict conditions need to be met. The market for each and every individual bond would have to be:

- totally liquid (i.e. all debt is constantly available in the market at the current market price);
- without any transaction costs and;
- without any legal constraints for repurchasing tradable debt.

These conditions are far from being met in reality. All debt is not instantaneously available in the market, transaction costs are sometimes quite substantial and most bonds are issued with the explicit condition that early redemption is not possible in order to protect the investor and secure his right on the investment income over the entire original term to maturity.

21. Some bonds are indeed early redeemable, but this is a specific financial instrument, known as a ‘callable bond’. For bonds issued at par, the callable bond will require a higher coupon than the non-callable bond. In any case, the callable bond has a higher yield to compensate the buyer for the possibility of the bond being redeemed before maturity³. Therefore, it seems fully unjustified to accrue interest based on the hypothesis that all bonds are instantaneously redeemable and as if refinancing could take place without economic costs only because of the tradability of bonds. In fact the creditor approach uses the words ‘tradable’ and ‘callable’ as synonyms⁴. So, the economic actors have to drag on the historical conditions into their current economic transactions, including income transactions. Therefore, the economy as a whole is locked into the financial conditions of the securities that were issued before.

³ The transaction costs (in terms of income) for having the right of early redemption of a bond are not negligible and can be assessed by comparing the yield of a callable bond and an otherwise identical bond that is not callable. A callable bond gives the issuer the option to buy back debt at a specified price before maturity. The call provision gives the company flexibility in its financing: if interest rates should decline significantly, it can call the bonds and refinance the issue at lower interest costs. This privilege comes at a price, the price of a call option.

⁴ ‘However, an implicit, and erroneous, assumption is that the security will remain in the market until it matures – i.e. that the issuer either cannot or will not **redeem** the liability early. If this assumption were true, then the issuer’s liability cannot be strictly viewed as **tradable**...’ John Joice and Chris Wright, Calculating the Accrual of Interest on Tradable Debt Securities, Thirteenth Meeting of the IMF Committee on Balance of Payments Statistics, Washington, D.C., October 23-27, 2000, p. 7-8.

4.3 *Consistent accrual accounting*

22. Accrual accounting is a method of recording that matches the cost of capital with the provision of capital. Both the creditor and the debtor approach accrue continuously interest over the holding periods of the assets/liabilities. The only difference between the two approaches concerns the right measure of the 'cost of capital'. The assertion made by the creditor approach of being the more consistent approach in accepting the consequences of accrual accounting is therefore hard to understand as an argument in its own right. The creditor approach may give the impression of being the more consistent in accepting the principle of accrual accounting, because of a constant provision of additional financing (or additional redemptions). However, this outcome is solely the consequence of the application of the current market interest rate instead of the yield to maturity at issue. It has nothing to do with the principle of accrual accounting as such.

23. Accrual accounting implies that the economic subjects are constantly (every minute of the day) 'transacting' the flow of interest income. Under the debtor approach this flow is fully defined by the characteristics of the financial instrument and the conditions in the financial market at the time of issue. Under the creditor approach this flow of income seems to be defined by the 'current' market value of the bond and the 'current' market rate of interest (or, more precisely, the 'current' yield to remaining maturity of that bond). However, the word 'current' indicates that neither is ever fixed over the holding period. Every minute (or second?) of a holding period there will be a different 'current' market value of the bond and there will be a different 'current' yield to maturity of that bond. As a consequence, the calculation of total income over the holding period will have to be the aggregation of an endless number of infinitesimal flows. Moreover, without the bond actually being traded one cannot observe the actual new yield and has to use some representative market rate, a going rate, a fair market rate, or any rate that is intended to express the generality of rates.

24. As it is not feasible to apply the creditor approach in its pure form an approximation of the concept of accrual accounting according to the creditor approach is therefore necessary. In practice these problems with the creditor approach are overcome by fixing both the market value of the bond and by choosing a yield to remaining maturity for a particular period of time. This may be either the values at the beginning of the holding period or some holding period average. If the creditor approach is made operational in this way, some characteristics of the instruments are frozen over the compiling period.

25. One of the consequences of accruing income on the basis of the current market rate of interest compared to the yield to maturity at issue will be a change in the sectoral and national savings surpluses. Under the creditor approach a drop in the market rate of interest (e.g. due to a drop in inflationary expectations or monetary conditions) will instantaneously raise the profitability of the debtor sectors/nations for a number of subsequent years. This result is accomplished without any economic transaction being undertaken by the debtor self. It has nothing to do with the nature of financial markets. It is merely a bookkeeping result. The economic actors themselves, however, will not experience this change as an improvement of their economic conditions, because their obligations will remain unchanged. The only difference compared to the debtor approach will be that part of the coupon payments that the debtors have to make are now classified as redemptions⁵. Nevertheless the debtors are still

⁵ In case of a sudden rise in the rate of interest the coupon payments fall short of the accrued interest. The reduced profitability of the debtor sectors/nations has no real meaning for financial behaviour, because the need for additional financing is automatically taken care of by the existent creditors.

weighed down by the same 'coupon' payment obligations, that they have to finance somehow, irrespective whether these are treated as income payments or as redemptions. The interplay between the economic structure, as it is fixed in the stocks of financial assets and liabilities and the economic process of financing will no longer have a clear link with the process of production and income distribution and financing.

Annex 1

BOP/IIP recordings of a bond according to the debtor's accounts (BOP sign)

	Year	Creditor approach				Debtor approach			
		1 and 2	3	4	5	1 and 2	3	4	5
Income Account									
Accrued interest		-50	-50	-67	-69	-50	-50	-50	-50
Financial account									
Portfolio Investment – Bonds									
<i>Accrued interest</i>		50	50	67	69	50	50	50	50
<i>Coupon/redemption payments</i>		-50	-50	-50	-50	-50	-50	-50	-50
Net transactions		0	0	17	19	0	0	0	0
Revaluations		0	-36	0	0	0	-36	17	19
End of period market value		1000	964	981	1000	1000	964	981	1000
Currency & Deposits									
Net transactions		50	50	50	50	50	50	50	50
Errors and Omissions		0	0	0	0	0	0	0	0
Memorandum item									
<i>Full fair value income</i>		50	14	67	69	50	14	67	69