

**Thirteen Meeting of the  
IMF Committee on Balance of Payments Statistics  
Washington, D.C., October 23–27, 2000**

**Calculating the Accrual of Interest on Tradable Debt Securities**

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# CALCULATING THE ACCRUAL OF INTEREST ON TRADABLE DEBT SECURITIES<sup>1</sup>

## Section 1: Introduction and Summary

1. When new international statistical standards were published in 1993, one of the major changes to the recommended presentation of the System of National Accounts and the Balance of Payments was the adoption of accruals recording for income and expenditure. However, as countries have begun to implement these standards, questions have been raised about their exact interpretation in respect of interest flows associated with tradable debt. A number of authors have explored this issue during the past five years and the topic has been addressed by statisticians working in National Accounts, Monetary and Financial Statistics, Government Finance Statistics, and Balance of Payments Statistics. Notwithstanding the active involvement of the international standard setting bodies, a clear consensus has yet to emerge. The Inter-Secretariat Working Group on National Accounts (ISWGNA) discussed the issue in 1999 and established a website and electronic discussion group as means of exchanging ideas.<sup>2</sup> The IMF Committee on Balance of Payments Statistics (the Committee) considered papers by Fund staff at its meetings in October 1998 and October 1999. The present text results from a commission from this latter meeting to undertake a further review, with the aim of developing a clear recommendation in respect of the international standards. The commission included a request to seek inputs from interested parties, and to summarize the competing arguments, as a step towards developing the recommendation.

2. In essence, the issue is how to measure the property income from a fixed term debt security on which the cash flows are fixed but whose market value is free to vary. Two methodologies in particular are under scrutiny: the first views the accruing interest income as fixed over the life of the security, once the issue price and conditions of future cash flows are known; the second takes the view that there is no a priori way of determining what proportion of the future payments stream represent interest and what proportion principal. Under this view the income stream is fixed for only so long as market conditions are constant after issue: when there is a change in market conditions that result in a change in the value of the security a new future income profile is established.

3. Choosing between these alternatives raises some profound conceptual and practical questions. Among these are issues about the boundary between income and holding gains; the interpretation of a “historical cost” view of interest under fair value accounting (see further below); the potential complications for the analysis caused by the use of financial derivative products to alter the cash flows associated with securities

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<sup>2</sup> See <http://www.imf.org/external/np/sta/na/interest/>

issuance; and the extent to which the alternative methodologies are consistent with the wider definitions and accounting concepts of the System of National Accounts.

4. The practical issues raised by this debate have thus far tended to focus on problems of data collection. However, a number of other issues seem to be at least as important in determining user and compiler preferences. These include: consistency with commercial accounting practice and tax law; the targeting of indicators such as the general government deficit which could be sensitive to the chosen method; the impact on, and hence interpretation of, sectoral and national saving; and aspects of market practice, for example the extent to which government debt managers operate strategies which encourage forward looking cost minimization strategies through the active use of buy-backs and similar techniques.

5. Drawing from the papers placed on the Fund's website and responses to the questionnaire sent to the Fund's membership, among other sources, the authors of this paper have examined the case for each of the competing methodologies through an exploration of the issues. So far as is practical this is done by returning to first principles.

6. Section 2 examines some basic principles of the accruals process. It shows how interest may be delivered through capital uplift on a security issued at a discount and how current historical cost and mixed value accounting systems result in a subjective assessment of the boundary between interest income and capital gains/losses. The development of new commercial accounting standards for fair value accounting are explored and their implications for the income/capital gains boundary tested.

7. While Section 2 is substantially rooted in commercial accounting practice, Section 3 is more concerned with its application to the System of National Accounts and, by extension, the balance of payments. The requirement for the symmetrical recording of income flows between sectors within the System is used to derive three competing accruals methodologies—the so-called “debtor,” “acquisition” and “creditor” approaches. The application of these approaches is illustrated through a set of arithmetic examples. The conceptual basis of the models is then examined in the context of the wider *SNA* and BoP framework: specifically, the consistency of the models with the market value world of the *SNA*; the wider definition of “interest” within the System; and the relationship between interest, as the return on financial capital, and rental income, as the return on fixed capital. Finally, the implication of the “creditor” model that the so-called fixed rate debt instrument delivers a variable rate of interest is considered in the specific context of the use made of derivative products, by some issuers, to effect the same “transformation”—does this introduce an inconsistency into the system?

8. Section 4 brings together and analyses the various legal, institutional and practical issues which might provide legitimate grounds for adopting a different treatment from that based on conceptual arguments alone. We begin here by returning to the relationship between commercial and statistical accounting practice and the extent to which the statistician may be dependent upon data derived from firms' own management accounting systems. The paper shows how these in turn may be shaped by tax or other regulatory

requirements and how users/providers of data may also be influenced by their own policy goals or those of others.

9. Section 5 draws the debate to a conclusion. It summarizes the competing arguments in support of the “debtor,” “acquisition” and “creditor” approaches as described in detail in sections 3 and 4. This leads to a recommendation for adoption within the *SNA* and equivalent standards. Standard setters will wish to debate this recommendation, which is presented together with a summary listing of the supporting arguments.

10. An annex summarizes the results from the questionnaire, prepared by the Statistics Department of the IMF and sent to the IMF’s correspondents in all the macroeconomic statistics subject matter areas: national accounts, balance of payments, government finance statistics and monetary and finance statistics.

## **Section 2: Accruals Accounting: Some Conceptual Issues**

### **2.1: What is Accruals Accounting?**

11. One of the more important changes made to macro-economic statistics in recent years has been the adoption of accruals recording for income and expenditure. Prior to the publication of the *1993 System of National Accounts (SNA93)* and the fifth edition of the IMF’s *Balance of Payments Manual (BPM5)*, income flows were recorded on a “due for payment” basis, i.e., at the point where cash payments were scheduled to occur. For many economic transactions, this practice meant that the statistical recording of events through the flow of income did not map well to the timing of the economic events or processes generating these flows. Thus economic activity taking place in a given period would frequently not be recorded in the statistics until some later period.

12. For many transactions, these timing discrepancies were small. However, for some activities, the due date for settlement could be a considerable time after the economic activity which the National Accounts were seeking to record. This was particularly true for interest income where the practice of annual or semi-annual interest crediting has been widespread. The advent of zero coupon bonds, where interest is settled at redemption, made these timing discrepancies even greater, potentially running to many years.

13. Accruals accounting records economic events as they occur rather than when payment falls due. In so doing, it changes the focus of income from what an economic agent receives in settlement, to what the agent provides, for example in the form of goods and services, factor inputs, transfers or through the provision of capital. Thus, income earned through the provision of labor input this month, but not due for settlement until next month, will now be recorded in this month’s account.

14. This change in treatment does not, of course, alter the fact that payment does not occur until the following month. But it does mean that a claim for payment must now be

recorded as a financial asset on the employee's balance sheet (and a payable on the balance sheet of the employer). This claim will be extinguished by the actual cash payment, when it is received. Thus, the cash receipt is no longer viewed as the counterpart financial account transaction to the flow of income; but is rather the settlement of a financial claim subsequent to the occurrence of an income generating event.

15. For funds intermediated through the banking system, principally deposits and loans, the concept of interest accrual is generally clear. The actual flows, as recorded under the old standards, represent the contractually agreed rates—fixed or variable—applied to the outstanding balances and settled at the due date. The application of the accruals standards in these cases is generally straightforward: the income accounts record the flow of interest continuously throughout the period(s) that funds are provided/used; the balance sheet simultaneously records the interest as accruing within the asset/liability position of the lender/borrower of the capital sum; and the actual settlement of the interest receivable/payable at the due date is recorded not as interest income, but as a financial transaction which, in the case of a cash payment, may be viewed as extinguishing the accumulated accruals within the balance sheet. For example, a deposit of \$1,000 on which interest is credited half yearly, may receive credits of \$30 at the end of the second and fourth quarters, but would record interest as accruing continuously, i.e., \$15 per quarter with the accrual reinvested within the balance sheet so that a deposit of \$1,015 would be recorded at the end of the first quarter.<sup>3</sup> If the half yearly payment of \$30 were received as a separate cash payment, then the second quarter balance sheet would record a simultaneous payment of \$15 in interest, thereby increasing, momentarily, the deposit balance to \$1030, a reduction in deposits from \$1,030 to \$1,000, and an equal increase in cash holding of the depositor. Viewed from the perspective of the depositor, the \$30 settlement payment represents no more than a compositional change within the asset side of his balance sheet (from deposits of \$1030 to deposits of \$1000 and cash of \$30). Viewed from the bank's perspective, the settlement means that cash assets and deposit liabilities both fall, i.e., the balance sheet is \$30 smaller.

16. The recording of interest may be less intuitive for some other instruments. For example, where an instrument can be issued or acquired at a price different from its face value, the total return—the yield to maturity—will comprise two elements: any contractual payments between the issuer and the holder; and the effects of the reversal of any discount or premium at the time of issue/acquisition. Current statistical standards are not entirely clear about the treatment of this second element. Specifically, the circumstances under which the yield is to be regarded as synonymous with the interest stream is at best ambiguous and, at worst, contradictory.

## **2.2: The Boundary Between Interest Income and Capital Gains**

17. The principle that interest can sometimes be delivered through capital uplift in the value of a security is well established. The issuance of short-term money market

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<sup>3</sup> Banks' accounting practices may record unsettled accruals elsewhere on the balance sheet; however, the principle demonstrated here is unaffected.

instruments at a discount from its face value has long provided an administratively convenient and flexible tool of financial management which would not have been possible if interest had to be individually settled with registered holders. The same principle has subsequently been applied to a range of other debt securities, including deep discount and zero coupon bonds.<sup>4</sup>

18. Commercial historical cost and mixed value accounting practice has long regarded the accrual of discount within the acquisition cost of securities as reflecting the accrual of interest.<sup>5</sup> This confirms two important principles: first, that interest can be delivered through a change in the value of a security as well as by means of an explicit payment; and second, that the interest deliverable by a tradable security can be viewed differently by different holders, because the acquisition cost for new holders will be determined by market conditions at the time of acquisition rather than at the time of issue.

19. These two principles demonstrate that no clear delineation exists between interest income and the yield to maturity, and that, as a consequence, the historical cost standards permit two agents to report the same economic event in two different ways. This is best illustrated through an arithmetic example.

20. For example, a five year zero coupon bond, issued for \$747 but with a redemption value of \$1000, has a yield to maturity of 6 percent and would be shown by both the issuer and acquirer as generating an accrual of interest of \$45 ( $\$747 \times 6$  percent) during the first year of its life. If there were no change in market conditions, then a new acquirer, purchasing this security in the secondary market at the end of the first year would pay \$792 and would amortize this smaller discount over the remaining four years to maturity. Under this scenario, both the issuer and the new acquirer of the security would record an accrual of interest of \$48 ( $\$792 \times 6$  percent) in the bond's second year. This result satisfies the requirements of the national accounts that flows of income should be reported symmetrically by counterparties, and, if the accrual of interest is treated as a re-investment within the parent instrument, this result would also mean that the respective liability and asset positions of the two parties are reported identically.

21. In practice, the above example is not realistic. Market conditions would normally change over the life of such a bond so that a new acquirer, purchasing in the secondary market, will typically view the return differently from the issuer. If, in our example, market conditions had changed at the end of the first year of the bond, immediately prior to the new acquirer's purchase, so that the new acquisition price was \$823, rather than \$792 previously, then the new acquirer will face a yield to maturity of 5 percent and will amortize the new discount to redemption over the four years to maturity. This gives an accrual of interest of just \$41 ( $\$823 \times 5$  percent) in the second year of the bond as against

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<sup>4</sup> The motives here have also been influenced by different preferences amongst investors, in part a function of differential tax treatments applying to coupon payments and capital uplift in some markets, as well as to the scope they offer for the exact matching of cash flows to investors' needs.

<sup>5</sup> The opposite applies to an instrument issued at a premium: the amortization of the premium has been considered a repayment of capital by the accounting profession for a long time.

the \$48 (\$792\*6 percent), which will be reported by the issuer. Both estimates of accruing interest are meaningful, in the context of each counterparty’s reported accounts, but they now fail to satisfy the National Accounts requirement for symmetry. The amortized present value calculations and associated accruing interest estimates by the two parties are set out in the table below.

**Table 1**

| Year             | Issuer          |                  | New Acquirer    |                  |
|------------------|-----------------|------------------|-----------------|------------------|
|                  | Year opening pv | Interest accrual | Year opening pv | Interest accrual |
| 1                | \$747           | \$45             | -               | -                |
| 2                | \$792           | \$48             | \$823           | \$41             |
| 3                | \$840           | \$50             | \$864           | \$43             |
| 4                | \$890           | \$53             | \$907           | \$45             |
| 5                | \$943           | \$57             | \$952           | \$48             |
| Redemption Value | \$1000          | -                | \$1000          | -                |

22. The application of “fair value” accounting principles introduces a further potential complication. The International Accounting Standards Committee defines fair value as:

*“the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm’s length transaction.”<sup>6</sup>*

23. Under “fair value” accounting, both the issuer and the holder of tradable securities will record the revalued price of the instrument following any change in market conditions—in the example this means a reported value, by both parties, of \$823 outstanding at the end of year 1. The question for the issuer is then how to record the subsequent flow of accruing interest. If he continues to record his original estimate of the flow in the second year of the bond—\$48—then the implied effective interest cost is 5.8 percent as against 6 percent at the time of issue. Put another way, the internal coherence between the reported stocks and flows in the accounts is impaired: \$48 of accruing interest has apparently been re-invested in the bond, yet its fair value increases by only \$41 during the second year (from \$823 to \$864). Market conditions were unchanged throughout this period so that the “missing” \$7 (\$48-\$41) cannot be attributed to a price change. The position for the holder of the security has also become less clear. If, for example, market conditions were to change for a second time, then the projected accruing interest stream of the new acquirer in our example would also cease to be consistent with the new market value of the bond.

<sup>6</sup> Paragraph 8, *International Accounting Standard: Financial Instruments: Recognition and Measurement* IAS 39 International Accounting Standards Committee London 1998.

24. The issues raised here take us to the crux of the methodological debate. In a system built on the principle of market prices—the present value of future payment streams—can it be meaningful to base the associated future income stream on a historical interest rate? Based on the arithmetical example, the answer would appear to be no.

25. Nevertheless, it must be recognized that the interpretation of the interest accruing on tradable debt securities might still be viewed differently by the issuer and a new acquirer following a change in market conditions. This is possible because the revaluation of the security associated with the change in market conditions can be perceived differently by the two parties: the issuer may view the revaluation as a purely temporary disturbance which is reversed over the remaining life of the security; while the new acquirer accepts the revaluation as a once and for all change which establishes a completely new future income stream. The former may choose to make no change to his books; the latter would accept the changed situation and record it, accordingly.<sup>7</sup>

26. Understanding these differences of perception is crucial. In principle, changes in the capital value of a bond occur either as an unplanned “windfall” gain or loss, or as an incremental change in value which is “expected” in the sense that it is implicit in the yield to maturity. The distinction between these two is conceptually unambiguous. The former occurs as the consequence of some external event—for example through a change in market conditions or because of a change in the credit rating of the issuer. The effect of such a change may only be viewed with hindsight, i.e., it is backward looking. By contrast, the latter type is wholly forward looking, a new future stream: the accrual of value associated with the yield to maturity which the holder can rely upon subject to the non-default of the issuer. In a world where securities are recorded at amortized cost, agents record their “expected” valuation changes based on the cost at issue/acquisition. In this situation, differences in the reported income stream follow directly from differences in the reported value of the security. By contrast, where both agents report a security at the same market value, there can only be a single interpretation of “expected” and “unexpected” valuation changes: in the example above, the change in value from \$792 to \$823 at the end of year 1 was “unexpected”—a windfall gain (loss) to any agent holding (issuing) the security; but thereafter, the new present value profile of the bond represents the yield faced by both agents.<sup>8</sup>

27. Why then might perceptions be thought to differ? The key to unlocking this question is the issuer’s perception of the bond itself. An explicit feature of the above example was the ability of the bond holder to sell the security and for a new acquirer to assume ownership. However, an implicit, and erroneous, assumption is that the security

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<sup>7</sup> The acquirer may be able to do nothing else as he may be unaware of the issue price and could not record it on that basis even if he so chose.

<sup>8</sup> This point might be more apparent where the security is sold immediately the price change occurs. In this instance, the seller has realized the gain: the new holder will not be involved in any such holding change—so why should the future stream of income from that point be considered to be partly a holding gain, and be constantly adjusted? The new holder will not record the income stream in the “old” basis. The event that caused the price of the security has occurred and, as a result, a new income stream commences.



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 as the issuer would, in effect, be locked into a loan with no right of early repayment. Under such circumstances, the issuer would rightly pay more regard to the historical cost measure of accruing interest liabilities. In practice, of course, the issuer is free to buy back the bond so that the interest cost should reflect the prevailing rather than the historical cost of finance. Tradability is the primary distinguishing feature of securities from other financial instruments and is the central element of this debate.

28. To anchor this point, suppose that, in the earlier example, the issuer redeemed the bond at the end of the first year, immediately following the change in market conditions. However, no sooner has he redeemed the bond than he decides to re-issue it at the same price (\$823) at which he re-bought it. What are the consequences of this action? Abstracting from any transfer costs, one would hope that the issuer's position is unaffected—his balance sheet has been restored to its position prior to the dual transaction. However, if the issuer had thought that his recorded stream of accruing interest liabilities would also return to its previous historical cost path, then he is mistaken. By his own amortized cost calculation he will now record an interest stream of \$41 in year 2, in line with the new yield to maturity. While the specific example may appear implausible, the general principle here is sound: the issuer is free to re-finance his borrowings at any time so that the relevant cost of his current liability is that given by the current yield.<sup>9 10</sup> ,

29. A comparable situation arises when an issuer has two bonds on issue, with different coupon rates, but with all other features being the same (term to maturity, periodicity of coupon payment, currency) so that while their current market prices are different their yield to maturity is the same. In this instance, why should the purchaser/holder of the first (with the higher coupon rate) be considered to be lending at a higher rate than the second purchaser/holder of the second bond (with the lower coupon rate) even though each purchased the security in the secondary market at the same time with the same yield to maturity. Moreover, if the two bonds were held by the same party, why should that party be considered to be earning more interest on one bond than on the other when they have the same yield to maturity, the same opportunity cost—the basis under which investors choose where to place their funds to maximize their returns, and may have been acquired at the same time. Moreover, how would the purchaser even know how to separate these holdings? The holder is probably indifferent to how much he

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<sup>9</sup> Liability management is important—not only does it offer means for the issuer to capitalize on changes in market prices (for example, when interest rates rise) but also may be an essential ingredient for any organization that receives an inflow of cash (such as from the sale of an asset) which could be used to reduce leverage. For more discussion on this point see Section 4.4.

<sup>10</sup> An additional point regarding the debtor approach is that not only is there inconsistency between the flows and the position data but that, from an analytical point of view, if a fall in interest rate occurs so that the debt security's value rises, under the debtor approach, the debtor has the worst of both worlds: his liabilities increase and his interest payment stream remains at the higher, historic level.

holds of one versus the other as they are earning the same return and are, to all intents and purposes, interchangeable.

### **2.3: The Application of Fair Value Accounting**

30. While strict adherence to historical cost accounting rules is fast disappearing from commercial accounting practice, the development and application of full fair value accounting remains embryonic. Current practice generally follows a mixed value approach with long-term investments recorded at cost while items held for trading purposes are shown at fair value. For financial companies, especially banks, this has given rise to a distinction between “banking book” and “trading book” business.

31. The pressure for the development of full fair value accounting derives from the rapid growth in the use of risk management strategies over the past decade. Initial moves to ensure the fair value recording of derivative instruments held for trading, have given way to pressures for the widening of fair value rules to reflect the growing use of risk management techniques in which banking book portfolios are effectively hedged through the trading book. In this sense, the division of the balance sheet, based on different valuation principles, is now seen to be unhelpful for prudential monitoring as well as general disclosure standards.

32. The International Accounting Standards Committee (IASC) has been working to develop a comprehensive standard for fair value recording. The publication, in 1998, of IAS 39, on the reporting of financial assets and liabilities, was an important step in this process, in that it established interim disclosure standards for accounting years beginning after January 1, 2001, yet further work is still needed to develop a fully comprehensive framework. The next step in this process will be the release of a draft of this broader standard around October 2000.

33. Many of the issues under debate carry implications for the collection of data for the national accounts, the balance of payments, government finance statistics and monetary and financial statistics. Of particular relevance are:

- the treatment of loans and deposits where standard setters, but not the banking industry, favor their inclusion within the scope of the rules on fair value recording;
- the valuation of liabilities, where the options are either to take the market assessment (either directly or through an appropriate choice of discount rate) or to take the present value based on a “risk free” discount rate so as to avoid the under-recording of liabilities, and hence the over-recording of net worth; and, in the present context,
- the associated treatment of income.

34. The IASC and the Canadian Institute of Chartered Accountants (CICA) have made clear, since the earliest outputs in 1997, that full fair value accounting would carry implications for the recording of income. In essence, fair value accounting draws

unrealized, as well as realised, holding gains and losses within the scope of income recognition for public disclosure. Clearly this could carry wide-ranging implications, e.g., for tax legislation. **However, in principle, those elements which National Accounts statisticians have regarded as falling outside the SNA definitions of income could continue to be excluded, as will be seen below.** The key question is whether it is meaningful, in the context of the *SNA*'s move to a market value framework, to continue to partition valuation changes for debt securities in a way which artificially leaves income recognition unaffected, or whether there are genuine consequences from the move from historical cost to a market value system which require a reassessment of this view.

35. The treatment of interest income is a case in point. Whilst the Joint Working Group (JWG)<sup>11</sup> has not yet released its draft comprehensive standards for public scrutiny, all available indications suggest that fair value disclosure will carry implications for the calculation of accrued interest flows. Specifically, the interest on fixed or zero coupon debt securities would cease to be based upon the amortized cost, and would move to a fair value basis, that is reflecting current prevailing rates. This preserves the principle of partitioning valuation changes according to whether they are “expected” or “unexpected” in the sense described in Section 2.2 above.

36. There remain some conceptual and practical questions as to how best to determine interest on a fair value basis. The conceptual issues relate largely to interpreting the effects of the yield curve. The JWG will probably recommend a Current Yield To Maturity (CYTM) basis, but allow enterprises to use the market expectations basis that is evident in current interest forward rates if interest risk is being managed on that basis.

**Table 2**

| Year | Opening fair value (= pv of future payments stream) | CYTM        | Interest Income | Other net Change in Value | Cash receipt of Coupon | Closing Fair Value (= pv of future payments stream) |
|------|---|-------------|-----------------|---------------------------|------------------------|---|
| 1    | 957.9   | 6.0 percent | 57.5            | 0                         | -50                    | 965.4   |
| 2    | 965.4   | 6.0 percent | 57.9            | 0                         | -50                    | 973.3   |
| 3    | 973.3   | 6.0 percent | 58.4            | -17.9                     | -50                    | 963.8   |
| 4    | 963.8   | 7.0 percent | 67.5            | 4.6                       | -50                    | 985.9   |
| 5    | 985.9   | 6.5 percent | 64.1            | 0                         | -50                    | 1000  |

37. To see how this might work, consider the case of a five-year bond with a face value of \$1,000 and carrying a fixed annual coupon of \$50. The bond is acquired at a fair value of \$958, giving a CYTM of 6 percent. Market conditions remain unchanged over

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<sup>11</sup> The JWG set up by the accounting bodies of a number of major countries to review a number of important accounting issues.

the first three years of the bond's life, with the fair value rising in line with the amortized historical cost measure towards \$982 at the end of the third year. But conditions then change, immediately following payment of the annual coupon, and the fair value falls back to \$964 to give a CYTM of 7 percent. Market conditions change again a year later, causing the CYTM at the start of the bond's final year to fall to 6.5 percent. The fair value positions and associated fair value income disclosures are set out in the table.

38. The key point to note here is that, while the comprehensive standards recognise the full change in the fair value of the bond during the accounting period within income disclosure, only that element arrived at by applying the CYTM to the outstanding principal is recognized as interest. In other words, there is a clear separation of interest from holding gains/losses.<sup>12</sup> The draft standards for income recognition will require fair value interest income and other net changes in the fair value of the instrument to be separately recorded.<sup>13</sup>

39. The conclusions drawn by the JWG in respect of interest income are of particular significance. If, as seems likely, the draft standards confirm the case for moving to the prevailing market rate—"creditor"—approach, then the retention of the amortized historical cost model for the National Accounts and other economic statistics will require a persuasive conceptual or practical justification. Given that the broad direction of international accounting standards in this area has been known for more than three years, it is surprising that these issues are only now starting to be widely debated by statisticians.<sup>14</sup>

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<sup>12</sup> Thus, in this example, in Year 1 interest equals 57.5, comprising 50 (coupon) and the increase in market value between opening and closing balances (i.e., amortization) of 7.5; in Year 2, interest equals 57.9, being the coupon (50) plus 7.9 amortization; in Year 3, interest equals 58.4 (the 50 coupon plus 8.4 in amortization); in Year 4, interest equals 67.5 (the 50 coupon plus 17.5 amortization); and Year 5, interest equals 64.1, (50 coupon plus 14.1 amortization).

<sup>13</sup> An interesting aspect of the work of the IASC and the CICA in their discussion document is that they offer two solutions to handling a change in yield that results from a change in market prices: one is to recognize immediately the change in asset value on the balance sheet, and record the new in yield on the income statement; the other solution (which was not recommended) was to leave the asset at acquisition price and the yield that was implicit in that price should continue to be recognized in the income statement for as long as the asset was held. In other words, the discussion document provided one alternative which would be consistent with the creditor approach and the other would be consistent with historic price approach. The option favored by the supporters of the debtor approach, that is, market price for the financial instrument but historic price for the income was not considered to be an option.

<sup>14</sup> However, it should be noted that the issue was first raised in 1995 by Peter Harper (1995).

### Section 3: Interest Accrual within the National Accounts' Family of Macroeconomic Statistics

#### 3.1: Accrual Accounting

40. Accrual accounting is a central element to the international statistical framework.

The 1993 SNA states:

*“Accrual accounting records flows at the time economic value is created, transformed, exchanged or extinguished. This means that flows which imply a change of ownership are entered when ownership passes, services are recorded when provided, output at the time products are created and intermediate consumption when materials and supplies are being used. The System favours accrual accounting because:*

*(a) The timing of accrual accounting is in full agreement with the way economic activities and other flows are defined by the System. This agreement allows one, for instance, to evaluate the profitability of productive activities correctly (i.e., without the disturbing influence of leads and lags in cash flows) and to calculate a sector's net worth correctly at any point in time;*

*(b) Accrual accounting can be applied to non-monetary flows.” (SNA 3.94)*

41. By the same token, for balance of payments, for example, *BPM5* indicates the same principle. For exports and imports are recorded when change of ownership occurs, not when the good leaves or enters an economy or when it is paid for. The same applies to income:

*“Under investment income, interest is recorded on an accrual basis, which is the continuous method of recording that matches the cost of capital with the provision of capital. If the interest is not actually paid, an entry is required, together with an offsetting credit entry in the **financial account** for the claim associated with the nonpayment (i.e., an increase in liabilities) The two entries are particularly important for zero coupon and other deep discounted bonds. The difference between the issue price and the value at maturity is treated, on an accrual basis, as interest over the life of the bond” (*BPM5* para. 121).*

#### 3.2: Establishing the Options

42. While full fair value accounting remains some way off for companies' public disclosure, market value recording is already a reality for the National Accounts and its associated families of economic statistics. Care needs to be taken, however, when reading across from the “market value” principles used within the National Accounts, to the

potentially broader and less prescriptive interpretation of “fair value” envisaged for published company accounts, for example, how to record liabilities (see below). In part this probably reflects the statisticians’ dependence on existing firm level data sources, but it also results more directly from the core requirements of the System of National Accounts which derive from its integrated “flow-of-funds” matrix structure.

43. As indicated in section 2.3 above, the ground-rules for the comprehensive disclosure of fair values on the balance sheet are not yet confirmed. Specifically, there remain outstanding questions over the most appropriate way of valuing financial liabilities—using a pure market valuation which reflects changes in the credit rating of the issuer would tend to depress reported liabilities at the precise moment that a company was getting into difficulty. Thus the new disclosure standards might opt for valuation rules which permit the same instrument to be valued in two different ways for the respective balance sheets of the debtor and the creditor.

44. Such an outcome would be inconsistent with the *SNA*’s requirement for the symmetrical recording of balance sheet positions by counterparties.<sup>15</sup> By adopting the market as an independent arbiter of value, the *SNA* may be imposing some limitations on the analytical use to which the accounts can be put, but it ensures the considerable advantage of coherence of the analytical framework as a whole. Broadly similar concerns lie behind the *SNA*’s recommendation that loans and deposits be recorded at their face value. In this case, however, the guidance additionally reflects the absence of any externally determined valuation that could be applied equally to debtor and creditor positions.

45. Turning to income, it should be clear from the earlier examples that the use of the standard amortized cost calculation for accruing interest fails to satisfy this same principle of the national accounts—the symmetrical recording of flows by counterparties. Two alternative solutions have been proposed: imposing symmetry by the overlaying of the flows, as viewed by one counterparty (typically the issuer), on to the accounts of both parties; and the recalculation of interest flows based on the new yield to maturity, subsequent to any change in market conditions.

46. The current *SNA/ESA* guidance is generally understood to recommend the first of these approaches.

47. Under this treatment, the future flow of interest is determined at the point of issue—i.e., it is not affected by any subsequent changes in market conditions. Supporters of the approach argue that it best represents the cost of capital associated with the security, it reflects the market price principle—as this was the market price at the time of issue—and that this cost remains the most relevant flow for financial analysis, even though it may not be recognized by a purchaser in the secondary market, who, even if

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<sup>15</sup> Symmetry is essential in the national accounts and the balance of payments so that the value of all transactions (expressed as debits and credits) equal, either at the national level (national accounts) or the global level (the balance of payments). This point is more evident in the national accounts which is a closed system at the national level but the balance of payments is a closed system at the global level.

aware of the original issue price, is probably indifferent to it. This treatment is widely referred to as the “debtor approach” because it records the accrual of interest from the perspective of the issuer.

48. Many national accountants and government finance statisticians favor the “debtor approach” on practical data collection grounds. The quality and availability of data from issuers of securities has tended to be higher than from holders so that practical considerations have commonly made it acceptable to impose the data provided by issuers. These arguments will be considered further in Section 4 below.

49. The main alternative to the “debtor approach” is to recalculate the accruing interest flows for both counterparties, following each change in market conditions, using the principles for fair value recognition of income described in Section 2.3 above. This method, sometimes referred to by statisticians as the “creditor approach,” has thus far received less widespread support but is favored by balance of payments statisticians in the countries of the European Union and has been successfully implemented in all macroeconomic statistics in Australia.

50. This approach is described in the Balance of Payments Compilation Guide (BPCG).

*“For securities (portfolio investment), accrued interest for a particular period should be calculated by applying the prevailing interest rate to the average market rate of the security. The result may differ from coupon interest payments made during the period.” (BPCG para. 620)*

51. Some sources, including the *BPM5*, refer to a third method—the so-called “acquisition approach.” This approach is recommended in *BPM5* when a zero or deep discount security is traded in the secondary market.

*“If, prior to maturity, a zero coupon or deep discounted bond is traded in the secondary market, the transaction price may include a realized capital gain or loss in addition to accrued interest. ... Prevailing interest rates reflecting the difference between the new owner’s cost and the value of the bond at maturity should be used for the subsequent recording of interest on the bond.” (BPM5 para. 396)<sup>16</sup>*

52. Like the “debtor approach,” this relies on an amortized cost measure of interest income—in this case viewed from the perspective of the acquirer. While this does, in practice, represent the way in which source data for asset positions are still frequently available, the authors of the current paper do not regard this third approach to be

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<sup>16</sup> It should be noted that while *BPM5* recommends the application of the acquisition approach for zero and deep discount instruments only, the principle of different rates applying during the life of a tradable security with a fixed payment stream applies to all such instruments, especially when there has been a marked shift in the interest yield curve, either upward or downward (usually associated with a similar shift in [anticipated] inflation).

materially different in principle from the “debtor” model.<sup>17</sup> Most of the conceptual criticisms of the “debtor approach” made in this paper apply equally to the “acquisition approach” so that references to the former can, unless explicitly excluded, be also taken to apply to the latter. The remainder of this section will accordingly focus on the conceptual coherence of the “debtor” and “creditor” models within the context of the wider accounting framework of the *SNA*.

### **3.3: Reconciling Changes in Positions with Flows**

53. The accounting framework of the System of National Accounts provides a number of crucial tests of methodological integrity. We have already examined, in Section 3.1 above and earlier, the requirement for the symmetrical recording of positions and flows. This test concerns the consistency of data provided by counterparties. Of equal importance to the coherence of the System is the reconciliation between the opening and closing balance sheet positions of an individual agent or sector. Specifically, the System requires that the change in balance sheet positions during an accounting period can be “explained” by a defined set of transactions, other flows and adjustments and revaluations.

54. The arguments ranged against the “debtor approach” typically focus on the conceptual rather than the practical. However, even on practical grounds, the debtor approach presents problems. One of the major ones is that, while the accounting requirement for symmetry is met (by constraining the flows of the holder), the historical cost flows fail to reconcile the changes in the market value of the security subsequent to a change in market conditions. This is best illustrated through a further simplified example. Consider a five-year bond with a face value of \$1000 and paying an annual coupon of \$50. The bond is issued at \$1000 and so delivers a yield of 5 percent with the issuer recording an annual accruing interest liability of \$50 which is exactly extinguished at the year-end by the annual coupon. At the end of the third year, market conditions change and the value of the bond drops to \$964, i.e., a current yield to maturity of 7 percent. During the fourth year of the bond, under the “debtor” approach, the accounts will continue to record an annual interest accrual of \$50 but the market price of the bond has now increased to \$981. In the final year the bond returns to its face value of \$1000 at redemption. The reconciliation between opening and closing balance sheet positions is set out in the table.

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<sup>17</sup> While similar in principle, the problems associated with the debtor approach may be worse from a conceptual point of view. Under the acquisition approach, not only is symmetry very unlikely between the debtor and the creditor, but it is also very unlikely to be similar even among holders, whose acquisitions may be made at different times, in different periods, with very different market conditions and prices.



**Table 3**

| Year | Opening market value | Interest accrual | Coupon payment | Revaluation                           |       | Closing market value |
|------|----------------------|------------------|----------------|---------------------------------------|-------|----------------------|
|      |                      |                  |                | Market Revaluations<br>"Revaluations" | Other |                      |
| 1    | 1000                 | 50               | -50            | 0                                     | 0     | 1000                 |
| 2    | 1000                 | 50               | -50            | 0                                     | 0     | 1000                 |
| 3    | 1000                 | 50               | -50            | -36                                   | 0     | 964                  |
| 4    | 964                  | 50               | -50            | 0                                     | 17    | 981                  |
| 5    | 981                  | 50               | -50            | 0                                     | 19    | 1000                 |

55. The main point to note here is that following the “debtor approach” requires the addition of revaluation adjustments in each period after the initial change in market conditions in order to reconcile movements between the opening and closing balance sheet positions. Put another way, the receipt of the annual coupon is not sufficient to prevent the value of the outstanding principal from increasing. Critics of the “debtor approach” argue that only the first revaluation adjustment—a fall of 36 in year three—is analytically meaningful, being linked to a change in market conditions. The recorded revaluations in years 4 and 5 cannot be explained either as a consequence of wider market conditions or as the result of changing perceptions about the credit worthiness of the issuer. They may only be interpreted as a balancing entry and thus constitute evidence of mis-measurement somewhere in the other changes of assets account. As noted by Peter Hill (1999) the Other Changes in Assets Account is **not a reconciliation** account, to accommodate residuals that cannot otherwise be accounted for. The entries in the account have analytical meaning in their own right and the account can be derived independently of the other accounts in the system.<sup>18</sup>

56. Adopting the fair value, “creditor approach,” to income recognition, eliminates the need for these additional balancing entries. The equivalent flows for the last example are set out for comparison below.

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<sup>18</sup> While it may be possible (although not desirable) to make these arbitrary changes in the Other Changes In Asset Account of the debtor, it would be very much more difficult to attribute them to the creditor sectors without information on a security-by-security basis of all holdings by all sectors at all times.

**Table 4**

| Year | Opening market value | Interest Accrual | Coupon payment | Revaluation                        |       | Closing market value |
|------|----------------------|------------------|----------------|------------------------------------|-------|----------------------|
|      |                      |                  |                | Market Revaluations "Revaluations" | Other |                      |
| 1    | 1000                 | 50               | -50            | 0                                  | 0     | 1000                 |
| 2    | 1000                 | 50               | -50            | 0                                  | 0     | 1000                 |
| 3    | 1000                 | 50               | -50            | -36                                | 0     | 964                  |
| 4    | 964                  | 67               | -50            | 0                                  | 0     | 981                  |
| 5    | 981                  | 69               | -50            | 0                                  | 0     | 1000                 |

57. The final payment in the financial account is 1050, representing the coupon due and the final bullet payment. All the interest payable over the year (69) that has been "reinvested" in the bond during the course of the year.

### 3.4: Consistency with the Wider 1993 SNA Definition of Interest

58. In addition to meeting the strict accounting rules of the *SNA*, the selected method for the recognition of interest flows must also satisfy the descriptive definition of interest within the System. Paragraph 7.93 in the *1993 SNA* states that interest is a form of property income receivable by the owners of certain kinds of financial assets, namely, Deposits, Securities other than Shares, Loans, and Other accounts receivable. It is worth repeating here the *1993 SNA* definition of interest:

*"Under the terms of the financial instrument agreed between them[,] interest is the amount that the debtor becomes liable to pay to the creditor over a given period of time without reducing the amount of principal outstanding."*

59. The simplified reconciliation accounts for the "debtor" and "creditor" models, set out in Section 3.2 above, provide a convenient test for this definition.

60. In the first three years of the bond's life, it should be apparent that the definition holds under either method. Up to this point, any within-year changes in market price represent the accrual of interest (and are hence, volume changes, not valuation changes), are exactly reversed by the payment of the cash coupon, so that the value of the instrument returns to its face value of \$1,000. The situation changes, however, following the change in market conditions at the end of the third year. From this point onwards, the two models provide very different accounts of the accruing interest stream, only one of which can be consistent with the *1993 SNA* definition.

61. To understand what is occurring here, it is first necessary to recognise that the change in market conditions has caused the value of the issuer's liability to fall. Put another way, the value of the outstanding principal at the beginning of year 4 is \$964 rather than \$1,000. "Principal" may be taken to mean the value of the financial instrument at market prices. It is not (necessarily) equal to the face value or the original

amount lent/borrowed or some amortized value based on the rate of interest at the time of issue. It is the present value of the future stream of payments (both the redemption amount and all coupons, if any), using the current appropriate market rate of discount. Because the debt is tradable, the issuer is free to settle his liability by purchasing the bond in the secondary market, so that the *principal* he would be required to provide is the bond's market price.

62. The two alternative views of accruing interest in year 4 may then be examined. Under the “debtor” model, the recorded accrual of interest of \$50 is extinguished by the cash coupon payment, yet the value of the issuer’s liability increases. By contrast, applying the “creditor” approach, the accrual of interest exceeds the cash coupon by the exact amount of the change in the principal outstanding. In other words, the reconciliation problems in the “debtor” model identified in Section 3.2 above, appear to follow from the methods implicit use of an interest definition different from that of the *SNA*. This is not surprising as the market price is equal to the present value of the future stream of payments using the current rate of discount.

63. This result is more intuitive in the case of a security issued at a premium. Consider, for example, a 3-year bond carrying an annual coupon of \$60. The bond has a face value of \$1,000 but is issued at \$1,027.2, a current yield to maturity of 5 percent. Exactly two years later, market conditions change and the value of the bond falls to its face value of \$1,000, i.e., a CYTM of 6 percent. The amortized cost and market value positions and flows are shown below.

**Table 5**

| Year | Opening Amortized Cost | Opening Market Value | Interest (Debtor Approach) | Interest (Creditor Approach) | Coupon Payment | Closing Market Value | Closing Amortized Cost |
|------|------------------------|----------------------|----------------------------|------------------------------|----------------|----------------------|------------------------|
| 1    | 1027.2                 | 1027.2               | 51.4                       | 51.4                         | -60            | 1018.6               | 1018.6                 |
| 2    | 1018.6                 | 1018.6               | 50.9                       | 50.9                         | -60            | 1000.0               | 1009.5                 |
| 3    | 1009.5                 | 1000.0               | 50.5                       | 60                           | -60            | 1000.0 <sup>19</sup> | 1000.0                 |

64. In the bond’s first year, the holder receives more through the annual coupon than is earned as interest using either measure. Market conditions are unchanged so that the market value is equal to the amortized cost, and the fall in the principal outstanding on either measure exactly equals the extent to which the coupon receipt exceeded the accruing interest, thereby representing a repayment of principal. Market conditions change at the very end of the second year. As a result, the market value of the bond falls by \$9.5 from where it would otherwise have been. However, interest for the period was earned prior to the change, and was again exceeded by the annual coupon payment by an

<sup>19</sup> For exposition purposes, this represent the value of the bond immediately after the payment of the coupon and immediately before the retirement of the bond. In fact, these transactions are simultaneous.

amount equal to the fall in the outstanding principal before allowing for the windfall loss associated with the change in conditions. In the bond's final year, market conditions are stable. However, the earlier change has caused the "debtor" and "creditor" measures of accruing interest to diverge. Using the "debtor" calculation, the holder of the bond again receives an annual payment in excess of the interest earned, yet the market value of the bond is now seen to be unchanged. By contrast, under the "creditor" approach, the accrual of interest is exactly equal to "the amount that the debtor becomes liable to pay to the creditor ... without reducing the amount of principal outstanding."

### **3.5: Interest and Income Streams from the Use of Fixed Capital Compared**

65. The assessment of the competing accruals methodologies has, so far, highlighted the compatibility of the resulting estimates with the accounting rules and definitions of the *SNA*. Some commentators have additionally drawn attention to the important parallels between interest, as the return on financial capital, and rental income, as the return on fixed capital. These parallels are important because they provide an alternative perspective on the implications of the move to fair or market value reporting for the measurement and interpretation of income.

66. The issue here is whether, under a market value framework, a rental agreement in which cash flows are fixed for the duration of a contract means that accruing rental income is correspondingly constrained. If it is, then rental income may provide the basis for a conceptual counter-argument in support of the "debtor" principle for interest accrual.

67. Testing this hypothesis is again best done through an arithmetical example. Suppose, for example, that A owns a warehouse which has a market value of \$100,000. Suppose also that the market rental value is \$6,000 per annum, i.e., 6 percent of the capital value. A now enters a lease agreement with X, giving full use of the warehouse for two years in return for annual rental payments of \$6,000, payable at the end of each year. Immediately following the start of the agreement, an external event takes place which causes the market value of identical warehouses to rise to \$120,000 and, by extension, the market value of new rental agreements to rise to \$7200 per annum. A decides to sell the warehouse to B but the existence of the lease agreement delivering what is now a sub-optimal return, means that A can only achieve a sale price of \$117,800 (the present value of the expected payment stream and return of the capital), i.e., \$120,000 less the difference between the present value of market value of rental income on the property and the present value of the contract (i.e., \$2200) based on the new market rental value of \$7200 per year, and using a 6 percent discount rate.<sup>20</sup>

68. At the same moment, X decides that he does not need the use of the warehouse after all. He therefore enters an agreement with Y to take over immediate use of the facility—Y will take over the contracted payment of \$6000 and will additionally pay X a

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<sup>20</sup> The present value of the difference is: for the first year, \$1200 discounted by 6 percent equals \$1132, and for the second year it is \$1067.

lump sum of \$2200 (the present value of the difference between the contract price and the market rate).

69. What is the effect of these transactions? From A's perspective the situation is straightforward. He has sold an asset and realised a capital gain of \$17,800.

70. B has acquired an asset which is subject to a rental agreement. The existence of the rental agreement meant that he was able to acquire the warehouse for less than its unencumbered value. As the rental agreement proceeds, the present value of his investment will increase until it reaches its full market value of \$120,000, abstracting from both any further price changes and any charges for capital consumption, at the end of the second year, when the contract expires and B will be able to rent the warehouse at the then market price. This accrual of value is directly associated with the rental agreement and should, it would therefore appear, be viewed as an integral part of that contract, i.e., as rental. This will yield income of \$7067 in the first year and \$7133 in the second year, each representing 6 percent of the fair value of the warehouse in the two years (\$117,800 and \$118,867 respectively).

71. The position for X is more complex because the parallels with the case of financial capital are not perfect. When the market value of the warehouse increased, X discovered that he had achieved a holding gain as his rights of use were now worth more than his contractual obligations under the rental agreement. In effect he had acquired an asset—his rights of occupancy as the sitting tenant. At this point he could have agreed to sub-let the warehouse to Y for an annual rental of \$7200. However, he decides instead to sell the rental agreement to Y—i.e., he sells his rights as the sitting tenant. Had the buyer been B, then B would have unencumbered ownership and would have paid the full market value for the warehouse.<sup>21</sup> His decision to sell his rights of occupancy means that he no longer has a contract with B, who will instead look to Y for payment under the rental agreement. The key point to note is that the existence of the fixed payment contract drawn up between A and X, gave to X a form of partial ownership of the warehouse—had the value of warehouses and hence the warehouse rental payments/income fallen, then X would have faced a capital loss to end his contract.

72. In the light of the above, the position of Y is now clear. He has acquired a claim—partial ownership—in respect of the warehouse together with an obligation to make annual payments of \$6,000. Should he wish, Y is free to on-sell his claim to regain his capital outlay. In practice he elects to use his rights under the contract. One year into the contract, Y reviews his position: he has made one annual payment of \$6,000 to B but could still on-sell his rights of occupancy for the second year. On calculating the present value of his claim, he discovers that this is now worth only \$1133 (the present value of \$1,200 discounted at 6 percent), i.e., \$1067 less than he paid to X a year earlier.

73. What has happened is that as the contract has proceeded, the fair value of Y's occupancy rights has been accruing to B. Put another way, the cost to Y of holding the

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<sup>21</sup> That is, \$117,800 to A and \$2200 to X.

rental agreement has exactly equaled the overall benefit to B—the effective rental on the warehouse has been 6 percent of its fair value throughout the contract period with the receipt of rental being delivered partly through cash payments and partly through the accrual of value of occupancy rights moving from the tenant to the ultimate owner.

74. This example may, nevertheless, be judged too artificial. Firstly, it relies on the occupancy rights of the tenant being tradable. In practice, X may have no legal rights either to on-sell or to sub-let, in which case the tenant's occupancy rights are effectively an off-balance sheet item. However, this is not a criticism of the conceptual arguments, but is merely a demonstration that the parallel between real and financial capital markets may not always be perfect: the case where occupancy rights are not tradable is equivalent to the case where the issuer of a bond (the recipient of financial capital) has no right to buy-back his bond (return the capital).

75. The second artificiality is simply that the example has been described in terms of transfers of ownership. This is helpful for exposition because it illustrates clearly the return/cost faced by the new owner/user of the capital. However, the same principles are equally applicable when no transactions occur. As before, the external event causes the fair value of A's warehouse to rise from \$100,000 to just \$117,800, reflecting the existence of the rental agreement which is now delivering cash payments below the new market rental. The point to note here is that the value of the capital (the principal) is functionally related to the length of the remaining contract, in the same way as the principal on a debt security is related to the period to maturity. The subsequent uplift in the value of the capital (principal) occurs not because of any external **event**—the prices of warehouses remain unchanged at \$120,000 over the remainder of the contract—but because the initial external shock (windfall gain, **past event**) gave rise to a new yield to maturity, i.e., the **future income stream** has changed.<sup>22</sup>

76. What should be stressed here is that the subsequent increase in the asset, as recorded on B's books, is not a holding gain. The holding gain occurred when A held the asset: had there been no contract with X, A could have sold the warehouse for its new full market price. However, because it was encumbered, its value was lowered because the present value of the future income stream was less than market price. The recorded increase in value in B's books, at end of Year 1 and end of Year 2, of \$1067 and \$1133, respectively, represent a rise in the present value of the future income stream: they do not represent a valuation change **because there have been no price changes** (other than the original price at the beginning of Year 1). That having been said, however, although from a conceptual point of view that is correct, it is unlikely that B would record the increase in asset value as rental income or Y would record an asset (the right of occupancy). Y would probably record a prepayment of rent of \$14200 and amortize it over its two year life.

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<sup>22</sup> While conceptually this parallels finance capital, in most national accounting systems, capital stock estimates are compiled through a perpetual inventory model. As a result, individual contractual arrangements would not be captured where no encumbrance is assumed.

77. While not an exact parallel with finance capital, a key conclusion can be drawn—that rental income on fixed capital, like interest on financial capital, may be delivered through capital up-lift as well as through explicit cash payments. An increase, or reduction, in the fair value of an asset which is “expected” as an integral part of the holding cost/return should therefore be treated as accruing rental payment/income (as it represents the present value of future payments stream, not an exogenous event). Under historical cost accounting, as there is no change in the value of the asset, there will continue to be a fixed rate of return. However, where the fair value of the capital asset is reviewed at each balance sheet date, the agents must acknowledge the occurrence of windfall, **unexpected** gains and losses. Once done, a new yield to maturity will result.

78. Another comparison could be drawn with the construction of a building. Assume the building is being constructed speculatively, that is, the constructor does not have a final sale. However, under present prices a comparable building would sell for \$100,000. The constructor will take 10 months to construct it, at \$10,000 a month. The costs of materials will amount to \$5000 every month, the cost of labor will be \$4000 a month, and the gross operating surplus (GOS) will be \$1000 a month. Assume that costs of input of materials and labor remain unchanged over the ten months, and that the value of work put-in-place is spread equally over the ten months. Also assume that after four months there is an external event which means that the final sale price the constructor can expect to make has risen by 10 percent, that is, instead of being able to sell the building for \$100,000 he will be able to sell it for \$110,000.

79. What are the entries in the national accounts? The value of the work put-in-place for the first four months is \$40,000. However, with the rise in expected sale price, the unfinished building is now worth 10 percent more. That is, the constructor has achieved an unrealized gain of \$4000. This should be entered in the Other Changes of Assets Account as a valuation change. With no further changes in the external environment, the building sells at the expected price of \$110,000. What are the entries for the six succeeding months after the price change at the end of the fourth month? As it has been assumed that the costs of materials and labor are unchanged over this period, and the value of construction continues monotonically, that would mean that the value of work put-in-place rises by \$11,000 a month, and the GOS is \$2000 a month. Consequently, the value of the unfinished building would be \$55,000 at the end of the fifth month, \$66,000 at the end of the sixth month, and so on. It would be incorrect to say that the change in value of the building as it was being constructed represented a value of the work put-in-place of \$10,000 a month—on the basis that was the original expectation—and that the six months’ additional increase in value represented an unrealized price change. The value of the work put-in-place should represent its current price, that is \$11,000 a month.

80. Again, this is not an exact parallel to the change in price of a debt security with a fixed stream of payments. However, the principle is the same: that it is the current price should be applied, in line with the market price principle of the national accounts.

81. In a similar vein, there are strong parallels between the manner in which consumption of fixed capital (COFC) is charged in the System and the creditor approach to the calculation of interest. For both, it is the current cost that matters. Under an historic system of accounting, COFC is based on the cost of the fixed asset when it was acquired (usually new). In periods of changing prices, such a basis for calculation is inappropriate, as the value of the input to the production process may be substantially different from the historic value. As the underlying principles of *1993 SNA* are based on market prices, accrual accounting and the appropriate costs and incomes during any given period, if the value of a fixed asset has changed from its acquisition price, use of the historic price is inappropriate. That is, as the cost of fixed capital changes, so should the cost of the use of that fixed capital.

82. This is the same principle for the cost of finance capital. Even when there is a fixed stream of payments established at the time of issue, the appropriate basis for charging for its use is the current market price.

### **3.6: A Possible Inconsistency with the Use of Financial Derivative Instruments**

83. The conceptual arguments presented thus far have favored the “creditor” approach. However, before drawing conclusions from this, one further question on the consistency of the methodology with the wider framework of the *SNA* needs to be addressed.

84. A defining characteristic of the “creditor” view of interest accrual on tradable debt is that the resulting income stream is responsive to prevailing market interest rates even when the security has a fixed cash coupon. If the national accounts were to regard borrowing under such instruments as effectively variable rate debt, then how should this be reconciled with the observed use of derivative instruments, in particular interest rate swaps, by some borrowers? Specifically, if the issuer of “fixed rate” tradable debt uses a swap contract to hedge his exposure to interest rate risk, would the fact that interest on the original debt was recorded as accruing at a variable rate give rise either to inconsistencies within the accounts or to the analytical interpretation that the borrower has somehow increased, rather than reduced, his exposure to market rate changes.

85. This issue was, in effect, resolved when the national accounts and the balance of payments methodology was revised<sup>23</sup>. With the adoption of the changes, interest rate swaps are no longer considered to be income items, but are rather to be treated as financial instruments. Accordingly, they have entirely separate, if related, values. For example, if a borrower issues a bond with a fixed stream of payments, but wishes to hedge his exposure and so enters an interest rate swap, exchanging fixed for floating, thereby exchanging cash flows, under the new standards, any payment under the contract will be a financial account transaction. While at inception, the contract will have no value (as the present value of the future streams of payment will be equal—it they were not

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<sup>23</sup> See *The New International Standards for the Statistical Measurement of financial Derivatives: Changes to the Text of the 1993 SNA*, IMF, Washington D.C., 2000 and *Financial Derivatives: A Supplement to the Fifth Edition (1993) of the Balance of Payments Manual*, IMF, Washington D.C., 2000.



there would be room for arbitrage), with the passage of time and changes in market rates, the contract will assume a value: it will become an asset for one party and a liability for the other but there is no *a priori* way of knowing which, neither will the asset (liability) position necessarily persist for the life of the contract: it could switch so that the asset becomes a liability for one party, and vice versa, depending on the market price of the underlying instrument. When a payment is made, the value of the derivative will (usually) fall. Any payment made (receipts received) by the borrower of the bond under the terms of the financial derivative will be treated as a separate transaction from the payment of any coupons or the accrual of interest on the bond<sup>24</sup>—one in the income account, the other in the financial account,<sup>25</sup> demonstrating that income and financial instruments should not become confused.

## Section 4: Practical Issues

### 4.1: Introduction

86. The analysis in the previous section identified a strong conceptual case for the adoption of the “creditor” approach to interest accrual within a revised *SNA*. While we have been unable to assemble arguments of comparable force in defence of the “debtor” model, it is clear that this latter approach continues to command considerable support amongst monetary and financial, and national accounts, statisticians. See Annex 1. In part this may reflect a tacit acceptance of the status quo—the “debtor” principle is widely, although not universally, considered to embody the current *SNA* guidance—but there would seem also to be both an intuitive preference for the amortized cost measure of the cost of borrowing, as well as the view that ultimately the choice must be guided more by practical questions of data collection.

87. The current Section reviews these wider arguments for the adoption of a preferred methodology. By comparison with Section 3, the approach is inevitably somewhat more anecdotal and may, as a consequence, apply rather more selectively within the individual circumstances of countries or markets. While this makes it more difficult to draw concrete conclusions, it has the benefit of being rooted in the experience of both statistical compilers and users.

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<sup>24</sup> Had the change in the treatment of interest rate swaps (to financial instruments) not been made, there could have been confusion with the payment of interest on the bond in its reporting. But the principles of accrual on the bond under the creditor approach would have been unaffected.

<sup>25</sup> An important consequence of the new treatment of all financial derivatives as financial instruments is that, for hedged borrowing, net worth is unchanged, even though income payments may not reflect the hedged position. This result helps to reinforce the importance of analyzing the whole structure of the system (current flows, financial account transactions, other changes, and balances outstanding) rather than just focusing on one aggregate (such as the current account balance or sectoral saving).

## 4.2: Data Collection

88. Perhaps the most frequently heard criticism of the “creditor” approach concerns data collection. Strict adherence to the principles of fair value income recognition for interest requires that the CYTM be recalculated whenever market conditions change. Since market adjustment is continuous in practice, it is often claimed that implementing the “creditor” model would imply a requirement for high frequency data. By contrast, it is argued that the data requirements of the “debtor” model rely upon information provided by the issuers of securities, which is generally thought to be of higher quality than the equivalent data as viewed by the holders. These twin claims need to be examined in more detail.

89. Data requirements under the “creditor” approach are clearly different from those under the “debtor” approach, although whether statistical collection and compilation poses greater problems for one over the other is a more open question. Developing systems which deliver data “fit for purpose” may depend substantially upon the ability of economic agents to record and supply information to the specification required under the standard. But it may alternatively depend upon the scope for compiler estimation, using source data which are less detailed or less precisely specified. If practical data collection and compilation issues are to influence the outcome of the current debate, then the potential and actual use of estimation techniques need to be weighed equally for both approaches.

90. Pure data collection using the “creditor” approach would generally imply a high compliance burden. However, under stable market conditions, the approach is well suited to estimation, using lower frequency data. In discussing the practical implementation of fair value recording, the Joint Working Group of the IASC indicate an acceptable estimation procedure, and similar techniques have either been proposed or are already in use for some statistical data. In essence, such approaches are very similar in their effect, either using an opening and closing CYTM applied to an average within period balance, or using a benchmark interest rate applied to opening and closing balance sheet positions. This latter variation is in use within the Australian National Accounts and Balance of Payments where the technique is described as:

*“... being relatively straight-forward to apply, as interest on tradable debt is simply calculated by multiplying the market value of the stock of debt outstanding by the prevailing interest rate. ... the ABS method is simple to apply. Prevailing interest rates are readily observable, and market values of securities outstanding are available from our sectoral balance sheets.”<sup>26</sup>*

91. In practice, the gulf between the requirements for pure data collection and acceptable estimation is little different under the “debtor” approach. Rigorous application of the “debtor” model necessitates detailed information on the issuance and current

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<sup>26</sup> See Peter Harper, “Accounting for Interest on Debt Securities: Why The Creditor Approach Should Be Preferred.” Australian Bureau of Statistics, October 1999. Available on the IMF website.

holders of individual securities because two bonds with identical market value but different maturities may deliver very different interest streams if based on their amortized cost. Collection systems based on this degree of detail are not typical although such systems do exist and have been shown to be effective. One such is used by Statistics Canada, which was developed to generate monthly interest flows for the Canadian balance of payments, following the “debtor” approach:

*“ ... A sine qua non condition to accrue interest, however, is to accrue it on a security by security basis. In the same way, the calculation of market value of security is conditional upon having access to a security by security inventory since each security has a different market value, depending upon the characteristics of the bond (its coupon, its maturity, its currency) and the risk of the issuer in relation to market conditions.”<sup>27</sup>*

92. In marked contrast to the security by security approach of Statistics Canada, the “debtor” approach is commonly implemented using estimates based on a simplifying approximation. While the authors of this paper have not attempted a comprehensive review of such systems, that reported by the UK Office for National Statistics may be representative:

*“The source data used to produce estimates which are consistent across the board are necessarily wholly debtor-oriented. Either a total figure for interest payable obtained from debtor sources is allocated prorata to the size of creditor holdings, or the total payable figure is calculated by applying the nominal interest rate to the face value of the security and allocated as before.”<sup>28,29</sup>*

93. While this approach may be a practical solution to a difficult conceptual problem, it cannot be used for the external sector/balance of payments for holdings of assets issued by nonresidents as there is no information available from the debtor side, unless there is security-by-security information of the assets holdings, which information would need to include, the issue price and the coupon (if any). For the most part, this information is unavailable to the compiler. Accordingly, whatever interest is reported by the asset holder must, perforce, be used by the compiler, which is likely to be the acquisition rate.

94. Discriminating between the “debtor” and “creditor” models on grounds of ease of data collection can thus be seen to depend upon the approach taken towards data estimation. Both models are costly to implement if data are to be measured rigorously.

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<sup>27</sup> *Investment in Canadian Bonds* Prepared by Lucie Lalberte Balance of Payments Division, Statistics Canada, March 1996.

<sup>28</sup> Extract from response by the UK Office for National Statistics to the IMF questionnaire on Interest Accrual, May 2000.

<sup>29</sup> There is always a problem of allocation of interest among the creditors, whether for the debtor or the creditor approach, if balances outstanding are used as an indicator—as there is no way of knowing intra-period changes in holdings between sectors.

But both models have also been implemented using relatively low cost techniques. Both sets of approximation appear vulnerable: that for the “creditor” model will perform less well when market conditions are volatile; while that for the “debtor” model may allocate interest inappropriately to creditor sectors if the technique assumes that interest flows can be pro-rated to the total market value of sectoral holdings. The first of these problems is a function of data frequency so that the cost-benefit function could be “optimized” by modifying the frequency of data collection. The vulnerability of estimation under the “debtor” model, on the other hand, is less amenable to “fine tuning”—rejecting the assumption of proportionality between balance sheet positions and the allocation of interest flows may imply a quantum change to a security by security system.

### **4.3: Commercial Practice and Legal Requirements**

95. Of course, any collection system which requires reporting agents to supply information on interest flows (debits or credits), is itself dependent upon the form in which these source data are held. We saw, in Section 2 above, that, while accounting standards are moving towards the adoption of fair value rules, current practice is still based on the amortized cost. This means that data collected from the issuers of securities will be consistent with the “debtor” approach, while that from holders may only be available on an “acquisition” basis.<sup>30</sup>

96. Commercial accounting practice imposes an important constraint on the practical options available to statisticians both directly, because it carries legal force, and indirectly through the associated implications from tax law and wider market practice. For the present, any widespread legal backing for public disclosure of income on a full fair value basis remains some way in the future. Until such time as this occurs, there may be little incentive to develop the more complex management systems required to apply the fair value rules.<sup>31</sup>

97. As an example, prior to 1996, UK market practice for the reporting of debt securities was substantially determined by the differential tax treatment for coupon payments and returns delivered through capital uplift. In a trading book the payment of

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<sup>30</sup> Data compiled from creditor sources using the “acquisition” model, will fall somewhere between the “debtor” and “creditor” alternatives. If a security has been held since issue, then “acquisition” data is identical to data from a “debtor” source. By contrast, where securities are actively traded, “acquisition” based data will approximate the “creditor” model.

<sup>31</sup> However, concerns about symmetry and consistency between two parties to a transaction have been evidenced in the accounting standards with respect to the repurchases agreements (repo). In that case, for example, both the International Accounting Standards Committee (in IAS 39) and the Financial Accounting Standards Board (FASB 125) indicated a concern that a security under a repo could be reported as being held by two parties at the same time. Both standard setting institutions sought to ensure that did not happen. Similarly, it is possible that, in time, these institutions will extend that concern about symmetry to interest (quite apart from other reasons to adopt fair value accounting).

coupon was therefore seen as a one-off event, not something to be accrued over the life of the holding. Securities houses often either did or did not want coupon for tax reasons and would therefore deliberately buy/sell just before the "ex date." While subsequent tax reforms have removed this distinction for wholesale trading, In the market for UK Government bonds (Gilts), for example, prices are still quoted clean, to reflect prevailing interest rate expectations via the yield on the bond.

98. A similar example is strips market in London. The strips market grew out of the practice of securities houses viewing the principal and coupon as separate products. The development of strips demonstrates that coupons should not be seen as "interest" but merely part of a future payments stream (in this case, independently of the final, bullet payment) and priced accordingly.

99. From these examples, it will be seen that there may be little incentive for firms to record and monitor "interest" using the fair value approach. In addition, the indirect estimation of interest flows may be hampered by the way in which some markets record and publish price information.

#### **4.4: The Debtor Principle in Government Finance Statistics**

100. Thus far, the focus of this Section has been on data collection and sourcing. However, support for the "debtor" approach has also been based on user needs, particularly in the field of government debt management.

101. Central to this issue is the question of how debt managers perceive their strategic role. Traditionally this has been cast as one of minimizing Government funding costs for a given view of interest rate risk. Put simply, the aim has been to minimize the funding costs of each new issue on the assumption that it will be outstanding to maturity. Under such a rule, no policy objective has been formulated in respect of the market value of debt and, consequently, no role is given to prevailing market rates as indicative of the opportunity cost of existing issued debt.

102. More recently, the move to public sector surpluses in a number of OECD countries, coupled with a concern for the liquidity of government bond markets, has motivated some buying in/switching, facilitating higher new issuance than would otherwise have been the case, and helping to concentrate liquidity in the most actively traded stocks. Buy-backs and switches are now becoming a common feature of debt management. The United Kingdom is active in both. Belgium, the Netherlands, Austria, Spain, Italy, Sweden, Ireland and France have also recently been active in these operations in the EU, while the United States have undertaken some large buy-backs, and Canada have used switches. Such activity is currently small relative to the overall stock of public debt. But the fact that it is now occurring may be indicative of Finance Ministries endorsing more forward-looking objectives within the remit of debt managers.

103. In practice, incentives to refinance debt may arise in a number of ways: for example, governments might set objectives for their net debt, on a marked to market

basis, at some future horizon; or patterns may develop where governments perceive trade-offs between the cash measure of the debt interest bill and the nominal value of outstanding debt. The point to note here is that the ultimate drivers are likely to be based as much in short term presentational pressures—to meet a cash flow objective or an EU Stability Pact target - as in a strategy to minimize funding costs over the longer term.

104. Nevertheless, longer term thinking about the role and objectives of debt managers is likely to require the further development of forward looking funding strategies and the wider use of buy-backs and switch auctions. Just how far this process can go will depend on the circumstances of individual markets. It may be that large quantities of old debt could not be exchanged for new without paying some premium, so that it may remain prudent for a public debt manager to assume that any bond once issued will remain in the market until maturity, and that the debt manager is committed to the full set of cash flows on it until that time. But it must also now be the case that more attention than in the past will be given to the options for lucrative switching operations to take advantage of lower funding costs within benchmark issues, or to modify the maturity structure of debt to reflect longer term strategic goals.

105. Several tentative conclusions may be drawn here:

first, that debt managers remain bound by the objectives and preferences set out by governments, and that these in turn may be subject to a range of political and institutional influences;

second, that it is vitally important for governments to be aware of the **cash flows** to which they are committed in each period as well as to changes in their “wealth.” Moreover, the cash flows can be measured precisely, whereas present values require discount rates to be estimated; but

third, complete and consistent application of the accruals method using current market valuations/yields may give a good measure **over time** of the true burden of **servicing** debt.

106. In brief, data requirements for debt managers, and the public finances more generally, may continue to include both cash based and cost based accounts. But there may also now be an emerging role for market value accounts. In this context, debt managers will wish to monitor the current yield to maturity on existing as well as new debt.

#### **4.5: Impact on Sectoral and National Savings Estimates**

107. One of the concerns that has been raised about the creditor approach, as hinted in the previous section, is the impact it will have on sectoral and, by extension, national saving. Critics of the creditor approach argue that one of the purposes of so-called fixed rate debt is that it provides an assured payment stream, and that interest payments are known in advance. And by adopting the creditor approach that certainty would be

eliminated: that, in effect, all debt becomes floating, and that extraneous changes in interest rates would increase (decrease) sector/national saving with no changes in the behavior of the borrowers/lenders.

108. This charge is correct: under the creditor approach, a sector/nation would find its deficit (surplus) increased (decreased) following an increase in market rates for debt. But that is what has happened under an accrual system which requires market pricing of assets and liabilities. The same is true whether for financial instruments or for fixed capital as noted. To believe that sectoral savings are unaffected by a change in interest rates represents a failure to understand the nature of financial markets, or of a system which is based on accruals and market prices.

109. Analysts who are unused to measurement of changes induced by a proper accrual system of accounting adoption of the creditor approach would require re-education in national accounting and balance of payments concepts. However, this is less of a change, indeed merely a clarification of the changes, that resulted from the introduction of the *1993 SNA* and *BPM5*. Moving from a “due for payment” basis, or even a strict cash basis of accounting involved considerably more adjustment. Moreover, what the introduction of the creditor approach would also mean is that more interest/emphasis would be placed on other aspects of the national accounts and balance of payments than on the “above the line” transactions. The financial account, and above all, the balance sheet/IIP would become much more important as analytical tools than they are at present.<sup>32</sup> In particular, *net worth* and *changes in net worth due to saving and capital transfer* would be important analytical concepts and balances. At present, there is a potential wealth of information that is undeveloped in the system for lack of recognition of its importance.

#### **4.6: Materiality**

110. The authors of this paper have not had the time to review the materiality of the issue. However, the IMF Committee on Balance of Payments Statistics had stressed the importance of this issue, not least for the need for consistency across the system.

111. It should need no pointing out that the yield curve has shifted downwards considerably during the last several years, the result of general reduction in inflation and inflationary expectations. Moreover, as governments have moved into surplus or sold off their assets they have retired a considerable amount of debt outstanding (as noted above). There have been two primary results from these developments. The first is that debt that was issued in a period of higher inflation usually carried a higher coupon payment than equivalent debt issued recently. There will be a substantial portion of long-term debt issued in periods of higher coupon which are still outstanding in the market. The prices on most of these instruments will have risen as the yield has fallen. At the same time, the increasing scarcity of certain instruments that have resulted from governments’ reducing their borrowing needs and/or retiring debt has meant that, in some countries, the yield curve has become inverted. Part of the reason for this is that certain lenders (notably life

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<sup>32</sup> Though analysis of, and emphasis on, the IIP (and external debt) have become more important for countries’ external position, national balance sheets have been developed for very few countries.

insurance companies and pension funds) with very long-term durations for their liabilities, need long-term assets to match. As the supply has dwindled, the price has risen, pushing down the yield.

112. As a result of these developments, there may be a considerable difference between the measured interest payments under a debtor approach versus a creditor approach. Accordingly, compared with the creditor approach, under the debtor approach, there may be a misrepresentation of sectoral/national saving (dissaving): some will be higher, some lower. Conversely, if inflation concerns rise, (or for other reasons), so that the yield curve again shifts, this time upwards, there could be a comparable change the other way. The importance of the issue is one that is unlikely to diminish unless the yield curve remains relatively unchanged for a very long time.

#### **4.7: Summary**

113. The conclusions from the current section are more evenly balanced than was the case in Section 3. Data collection raises difficulties under both approaches but the existence of acceptable estimation methods, means that this does not provide a basis for discrimination. Similarly, appealing to wider accounting and legal requirements reveals important inconsistencies between current standards and both statistical approaches, although with the prospect of much clearer consistency between the “creditor” model and wider accounting standards in the future.

114. Finally, from the perspective of user demand, we have seen that, in one important area, current preferences continue to favor the “debtor” model, although here too, we have identified trends in user behavior which point to the scope for this balance to change over time.

### **Section 5: Clarifying the Standards**

#### **5.1: Weighing the Arguments and Why the Creditor Approach is Favored**

115. The authors of this paper feel that the creditor approach is overwhelmingly the better choice. It is consistent with the underlying principles of the national accounts and the balance of payments of the use of market prices because that principle applies with equal force to use of capital, produced or financial. Interest on a security with a fixed payment is no more immune from the principles of market prices than anything else. The authors are of the view that once the market price principle is applied to the value of debt securities outstanding, it must, *mutatis mutandis*, be applied to the income stream associated with that instrument. It is an integral part of the logic of the System. If there is not consistency between the price for the underlying security and the price for its use, the System will only balance by introducing artificial “reconciliation items.”



116. Criticism of the creditor approach is usually based on four arguments: (i) that there is an implicit agreement of what interest is at the outset of the contract (i.e., at issue): therefore, it is this market price that should apply throughout the life of the security; (ii) that there is a mixing of holding gains/losses that results when the creditor approach is used; (iii) that it is impractical; and (iv) that users would find the creditor approach difficult to interpret and that the impact on sectoral and national saving estimates would be the opposite of the intention of the borrowing (it is often argued that this applies with particular force for government, but it may be argued that national saving (the balance of payments current account balance) would become more difficult to understand. We hope that we have been able to demonstrate that none of these concerns stand up to closer scrutiny.

117. On the first, it has been shown that the agreement between the lender and borrower at inception is one of a fixed stream of payments, wherein there is nothing predetermined about which proportion represents interest and which proportion represents principal. It has been demonstrated that within the parameters of the System, the price of interest, the payment for the use of finance capital, is subject to change in the same way as all other economic elements.

118. In support of their arguments against the creditor approach, critics often claim that the creditor approach draws no distinction between “interest” and “yield.” By this, it is argued that “interest” is, in some way, what was set at the time of issue, whereas “yield” is the return based on current market conditions. The authors of this paper agree that the creditor approach does not make a distinction between “interest” and “yield” as they do not see there is a difference: “interest” is the price for the use of finance capital at any one time, that is, its “yield.”

119. The authors feel that as a result of the invalidity of the first concern, there can be no substance to the second criticism. As there is nothing predetermined about what amount of the future payments stream is interest, there can be nothing predetermined about any “transformation” into a holding gain/loss. Accordingly, each instance of a price change in the security (i.e., the present value of the future stream of **payments**) results in a new stream of interest payments, not a transformation of a capital gain into income.

120. As to the third argument against the creditor approach, that it is impractical, the authors agree that a comprehensive application of the creditor approach is indeed very data intensive. But, equally, it has been pointed out that a) it is possible to develop a relatively simple procedure that applies the creditor principles without incurring considerable cost to either the compiler or the respondent; and b) it has also been indicated that a comprehensive implementation of the debtor approach is not easy or cheap. Moreover, while there may be practical grounds that prevent, or inhibit, the introduction of any concept in statistics, that does not undermine the validity of the concept.

121. As to the arguments presented about the impact on users, the authors of the paper agree that there are several instances where the users of the statistics may be

uncomfortable with a situation where fixed payments do not equal fixed interest stream. This is particularly applicable for users of government finance statistics. However, it would not be the first time that macroeconomic concepts have been changed or clarified and prompted a re-education of users. Therefore, to help address these concerns, the authors feel that the explicit<sup>33</sup> adoption of the creditor approach should be accompanied by a determined effort on the part of compilers of macroeconomic statistics to educate the users of the implications and to reinforce the comprehensiveness of the System: so that focus is also placed on the financial account and the balance sheet (and the IIP) as well as on the production account and the income and use of income accounts. It is also conceivable that there be a continuing need for the debtor approach in government finance statistics where cash based, and historic cost, data may be compiled as supplementary or complementary to the market price/accruals basis of the national accounts.

### **5.3: Conclusions and recommendations**

122. The authors of this paper are of the view that the arguments for the adoption of the creditor approach are compelling. We feel that the application of national accounting principles can lead to only one conclusion. Once 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 choice of the creditor approach was consistent with the System' overall integrity. We feel that that at present it is implicit in the System.

123. While there may be strong practical arguments for using the debtor approach in any given country's compilation system, these practicalities should not be taken to represent strong conceptual arguments. If the debtor approach were chosen, the System would be forced to resort to artificial adjustments to try to ensure some semblance of consistency between transactions, other flows and balances outstanding at market prices, artificiality that would have no meaning and which would only serve to distort interpretation, not to enhance it. Accordingly, we would like to recommend:

(a) that the creditor approach be adopted and that adoption be made explicit.

124. We also recognize that in this area, as in many other areas of macroeconomic statistics, there is often a gap between concept and measurement. Accordingly, we wish to recognize that problem and recommend

(b). that countries be encouraged to move to a means of using a creditor approach as soon as is practical.

125. Moreover, and consistent with the above, we recommend

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<sup>33</sup> The authors hope that the paper has indicated that the *1993 SNA* and *BPM5* have implicit in them the creditor approach.

(c). that when countries are contemplating switching their macroeconomic statistics,<sup>34</sup> they undertake an education program to advise users of the implications of the changes from an analytical point of view.

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<sup>34</sup> Or part thereof, although it is not recommended to make any change to any one of the four areas of macroeconomic statistics without introducing the same change to the others.

### **Summary of responses to the IMF questionnaire on the appropriate treatment of accrual of interest on debt securities with a fixed stream of payments**

In March, 2000, the Statistics Department of the IMF prepared a paper on the appropriate treatment for the accrual of interest on debt securities with a fixed stream of payments. The paper included a questionnaire which sought views on both conceptual and practical issues. The paper was sent to the Fund's correspondents in the four areas of macroeconomic statistics, i.e., national accounts, balance of payments, government finance statistics and monetary and financial statistics. The questionnaire is attached at the end of this annex.

Many of the questions were open-ended and are not easily quantifiable. Several of them refer to countries' practices, while this paper focuses on the conceptual issues. Accordingly, this annex primarily addresses the first question which asks:

**In your opinion, which of the three recording principles mentioned in the introduction is conceptually preferable?**

There was a potential of 728 responses (that is, the four subject matter areas from 182 countries). In the event, 56 countries replied, with four of them providing more than one response, to provide a total of 151 responses for the four subject matter areas. The attached table summarizes these responses to this question. There are several interesting aspects.

There were 35 responses for the national accounts, 47 for balance of payments, 34 for government finance statistics and 35 for monetary and finance statistics. Two thirds of the responses supported the debtor approach, 20 percent supported the creditor approach, and most of the balance supported the acquisition approach (there were two "other" responses which provided a mixture of approaches for the monetary and financial statistics). Support for the debtor approach was almost exactly the same for all four subject matter areas. However, for the creditor and acquisition approaches, there was a marked greater degree of support from the balance of payments than for the other three.

Twenty seven countries provided responses that covered all four subject matter areas. Of these, 15 supported the debtor approach for all of them, 6 supported the creditor approach for all of them, 2 supported the acquisition approach for all of them, while 4 saw no need for consistency of treatment across the four subject matter areas.

One country had conflicting views: one of the responding agencies supported the acquisition approach for the balance of payments while two other agencies supported the creditor approach.

Those supporting the creditor approach were largely in agreement with the views presented in this paper. The acquisition approach was favored by many for practical reasons and because that was felt to best reflect economic theory and reality.

The bald figures might appear to provide strong support for the debtor approach. However, on closer examination of the results, the basis for this support fell primarily into one (or more) of the following:

- that the creditor approach mixed up income and holding gain and losses
- that the debtor approach was their interpretation of the *1993 SNA* and/or *ESA95* (without elaboration)
- that the parallels with the use of produced capital implied that the debtor approach was appropriate
- that government finance statistics (GFS) require data using the debtor approach (as indicated for several countries by the “performance criteria” for the EMU countries)
- that practical issues were paramount and that presently the debtor approach was used.

Regarding these concerns, the authors of the paper feel that they have been able to address the first three issues:

- that there is no mixing of income with holding gains and losses
- that a close and more thorough-going assessment of *1993 SNA* and *ESA95* leads to the opposite conclusion: that these two international standards support the creditor approach
- that the economic and statistical basis for the charge for the use of both produced
- nonproduced capital leads to the conclusion that the creditor approach is the appropriate choice.

Regarding the interpretation of the requirements for GFS, the new GFS manual is still in the development stage. The outcome of the discussion on this paper (and others) will inform the process for GFS. However, as to the “performance criteria” for EMU countries, securities debt under those criteria is not measured at market price. The disconnect discussed in this paper between flows of interest using the debtor approach and the use of the market price for the value of the position outstanding for underlying instrument is not a cause for concern under those criteria. Accordingly, using the debtor approach may be preferable in this circumstance as it will mean that there is consistency between the basis for the measurement of the interest flow and the position of the underlying instrument. Using a creditor approach will cause discontinuities between the flows and the balances. However, as the market price principles of *ESA95* (and the *1993 SNA*) are not used for debt securities, the issues discussed in this paper are not relevant to the “performance criteria.” It may be that there could be a comparable approach to the treatment of accrued interest on debt securities with a fixed payment stream in GFS to

that used for the treatment of interest rate and currency swaps: that supplementary information be provided.

As to practical issues, the authors recognize that there are implementation difficulties which may make the introduction of the creditor approach more expensive and difficult than the debtor approach. However, they feel that practical issues qua practical issues should not necessarily affect the conceptual basis.

Very few countries practice a consistent approach, with data sources reflecting all the three approaches outlined in the paper.

**The questions in the IMF Questionnaire were:**

1. In your opinion, which of the three recording principles mentioned in the introduction is **conceptually** preferable?
2. What is, or are, the main considerations for your choice(s)?
3. Would your answers to question 1 change if practical considerations were taken into account? Please explain.
4. Do you see a place for an approach other than the three mentioned in question 1? If so, please describe that approach and its (dis) advantages.
5. What is (are) the approach(es) presently used in your system? (Please indicate the statistics you collect and any adjustments you make to change the basis(es). Also please note if the basis(es) for reporting is [are] not known.)
6. Are there differences between the way interest is recorded between the holder of the security and the issuer?
7. Do you attempt to reconcile those differences? If so, please specify how.
8. If your statistics include the values of securities both assets and liabilities, are they valued as assets on the same basis as they are valued as liabilities?
9. Are debt securities assets and liabilities both recorded at market prices?
10. Do you have other comments regarding this issue?

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