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## Income from Bonds: Treatment in the *System of National Accounts 1993*

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**IMF Working Paper**

Statistics Department

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**Abstract**

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How to account for interest on bonds in a system as integrated as the *System of National Accounts 1993* (1993 *SNA*) has been a source of much controversy. Two main positions emerge: the debtor treatment based on the contractual arrangements of the bonds; and the creditor treatment based on current interest rates and prices of assets/liabilities. Using the discounted cash flow model, this paper explores the treatment of income and other benefits from assets in the 1993 *SNA*. It finds that the debtor approach to bond interest conforms with the 1993 *SNA* recording income and other benefits from assets, as that approach captures the results of effective decision making between institutional units.

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## I. INTRODUCTION

This paper explores the treatment of interest income from bonds in the *System of National Accounts 1993*<sup>2</sup> (*1993 SNA*). There have been many debates on how interest on bonds should be calculated, with two main positions emerging for recording interest income on bonds—i.e., either according to the original or issuance contractual terms of the financial asset (the debtor approach), or according to the market interest rate for the asset in question (the creditor approach). The fundamental difference between the two treatments is the determination of income, in particular the delineation between income, holding gains/losses, and other volume changes.

The debtor and creditor treatments give results that are different in a given period and/or over a period of time. Thus they cannot be accommodated both in an integrated system, such as the *1993 SNA*, or in the international methodological guidelines that are harmonized with the *1993 SNA*. The methodology adopted in the paper consists of first focusing the discussion on assets in general. Second, all the assets are valued with the future returns model.<sup>3</sup> Using a single model brings out the inherent interdependencies of the *1993 SNA* without affecting the validity of the conclusions reached; it recognizes the diversity of assets while leaving out complexities that are not relevant for the discussion.

Section II of the paper focuses on assets and the accounts (recording benefits and “other changes”<sup>4</sup>) that are linked to assets. Section III describes the debtor approach to recording interest on bonds as presented in the *1993 SNA*. Section IV covers the creditor treatment of interest on bonds. Section V presents a summary of the conclusions.

Appendix I reviews the *1993 SNA* treatment of loans. Appendix II summarizes the main differences between the *1993 SNA* and IAS 39,<sup>5</sup> a business standard for financial instruments.

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<sup>2</sup> *System of National Accounts 1993*, prepared under the auspices of the Inter-Secretariat Working Group on National Accounts. References to the various paragraphs of the *1993 SNA* are shown in parentheses throughout the paper.

<sup>3</sup> The *1993 SNA* (13.25 to 13.34) uses four methods to arrive at market valuation or acceptable proxy: observing prices in markets; accumulating and revaluing transactions; the present value of future returns; and, for options, the contingent claim valuation that uses an options pricing model to measure the value of assets that share options characteristics (see *The new international standards for the statistical measures of financial derivatives, Changes to the text of the 1993 SNA*, March 2000).

<sup>4</sup> This not very elegant term refers to changes “other” than those due to transactions.

<sup>5</sup> IAS stands for International Accounting Standards that are issued by the International Accounting Standards Committee (IASC), a nongovernmental body with representatives from national accounting federations and other bodies, whose standards focus on global accounting.

## II. ASSETS IN AN SNA FRAMEWORK

This section illustrates the consistency of treatment and integrated sequencing of accounts in the *1993 SNA*. Assets are first defined and valued in terms of their expected benefits; an explanation is then provided of changes in assets other than from transactions and of the accounting of benefits that accrue from the assets for the current period. The return from assets, a concept not found in *1993 SNA*, is introduced as a link to IAS 39. The same structure is used in Section II on bonds and in Appendix I for loans.

### Value of assets

Assets are entities that are subject to ownership rights and from which economic benefits can be derived. Assets can be produced (fixed assets, inventory, and valuables) or nonproduced (nonfinancial and financial). In other words, assets are heterogeneous, not only in nature but also regarding their age profile or the time of their creation. By valuing assets with the yardstick of current market prices, the *1993 SNA* ensured that assets of various types are made comparable and additive at the specific point in time for which the common valuation applies.

According to the present value of future returns model, the value of the asset is equal to the sum of future benefits, often cash flows discounted by an appropriate discount rate. The discounted cash flows are referred to as the present value of each cash flow. The formula is as follows:

$$\text{Market value} = \sum_{t=1}^N \frac{\text{Expected Benefits}_t}{(1+r)^t}$$

where  $t$  is the period in which benefits are expected

$N$  is the number of periods over which benefits are expected

$r$  is the discount rate

The discount rate that ensures equality between the present values of expected cash flows and the valuation of the assets is referred to as the internal rate of return (IRR). The value of an asset, and consequently of the IRR, may and often does fluctuate during the life of the asset.

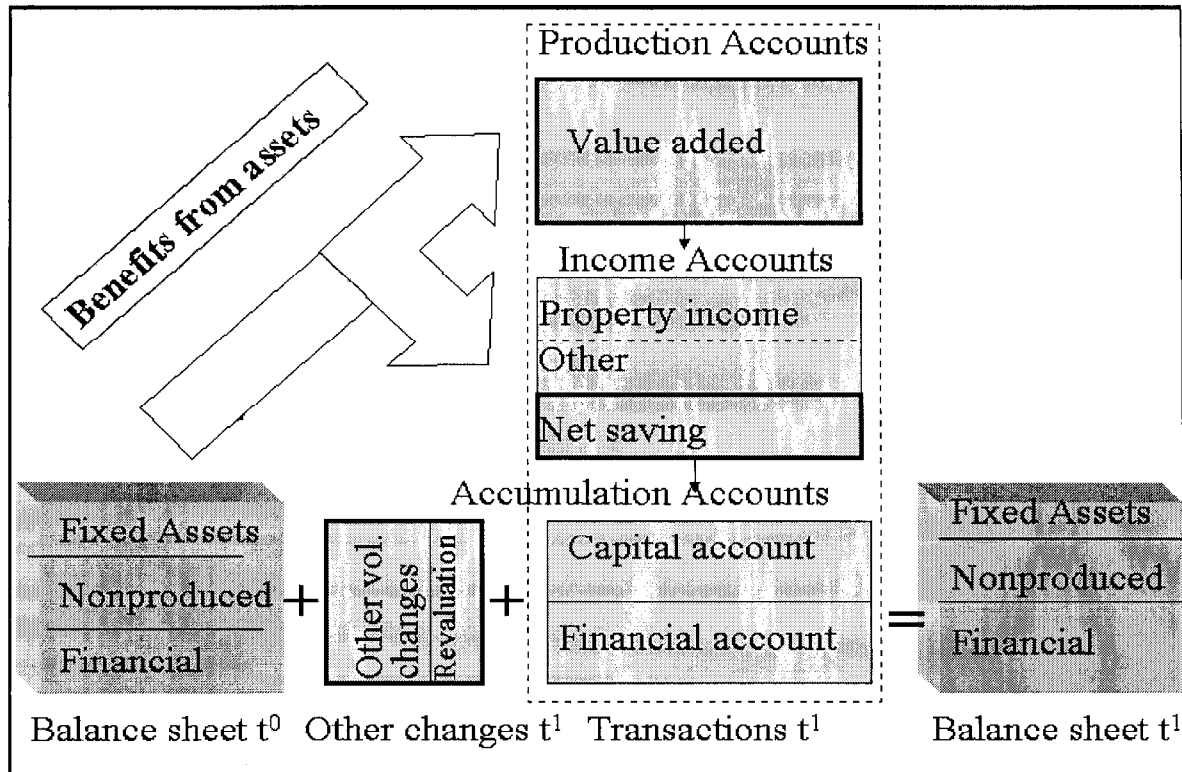
In valuing bond asset at market value, both the debtor and creditor approaches use the current market IRR, referred to as the “yield to maturity.” It is the calculation of interest income, and more specifically the IRR used for such calculation, that is at the heart of the controversy between the debtor and the creditor approaches. The debtor treatment uses the IRR that was current at the time the bond was first issued, referred to as the “original effective discount rate” (presented in Section III). The creditor treatment uses the current market IRR, that is the “yield to maturity” (presented in Section IV).

### Holding gains/losses and other changes in volume

In the *1993 SNA*, changes in the level of assets can originate from transactions and from other changes.

As illustrated in Box 1, the other changes account plays a key role in the *1993 SNA*, ranking as a main account along with the balance sheet and the transaction accounts (production, distribution and use of income, capital, and financial accounts).

**Box 1. The 1993 SNA Sequencing of Accounts**



Other changes, which are made up of other changes in volume and holding gains/losses (revaluation) are, however, often misleadingly viewed as residual accounts.

“The fact that the two accounts [other changes in volume and revaluation accounts] in question are not widely implemented for the time being should not lead to underestimating their importance and significance. [...] Without a good and common understanding of the meaning of the *1993 SNA*, discussion on many new issues may prove exceedingly confused and fruitless.”<sup>6</sup>

<sup>6</sup> Vanoli, 1999, p. 295.

“Other changes” are extensively covered here because of their crucial importance in elucidating the differences between the debtor and the creditor approaches. The debtor treatment makes full use of “other changes,” in contrast to the creditor treatment, where some of the changes in value are ascribed to income and others to “other changes.”

In the *1993 SNA*, two types of “other changes” are distinguished. These are “other changes in volume”, and “revaluations.” This distinction reflects the volume/price distinction in the national accounts, according to which value is the product of volume and price. Other changes in volume can be caused by “unexpected losses” (e.g., caused by catastrophes), and “economic appearance” (e.g., new discoveries of subsoil assets). Revaluations lead to holding gains and losses, which are either “neutral” (if caused by general changes in prices) or “real” (if the value of an asset changes more than the general price level in the economy). It is a basic distinction in the *1993 SNA* that these “other changes” are to be excluded from core measures such as value added, GDP, and income, because the various types of other changes are not generated by economic activity.

The discount rate model—although not extensively used in the *1993 SNA*—can also serve to explain the factors affecting the valuation of the asset, as summarized in Box 2.

<b>Box 2. Links Between the Terms of the Discount Flow Equation and the 1993 SNA “Other Changes” in Assets</b> (experimental mapping)		
<b>Discount Flow Equation</b>	<b>Sources of changes</b>	<b>“Other changes” in assets (<i>1993 SNA</i>)</b>
Inflation premium built into the “ <i>r</i> ” (denominator)	Expected inflation	Neutral holding gains/losses
Risk-free real interest rate plus risk premium built-in the “ <i>r</i> ” (denominator)	Real interest rate and in risks specific to the assets and the asset issuer	Real gains/losses
Expected benefits (numerator)	E.g., catastrophic losses, impairment, discovery of new exploitable deposits	Other volume gains/losses

In the market value formula used in the model (as presented on page 4), the discount rate “*r*” is composed of: a risk-free real interest rate, anticipated inflation, and a risk premium specific to the assets and/or the issuer of the assets. “Neutral gains/losses” are due to changes in the general price level (inflation), and “Real gains/losses” to changes in the risk-free real interest rate and in the risk premium, the latter usually providing the greater source of volatility because of the general stability of the risk-free real interest rate. “Other volume changes,”



which are inclusive of quality changes, would arise from changes in the expected benefits<sup>7</sup> on assets, such as those caused by catastrophic losses. In other words, the denominator would measure the impact of risks—that is, of the probability of occurrence of events—whereas the numerator would cover the changes in expected cash flows due to events that have been realized (and that differ from the contractual agreements). Section III examines for bonds the relationship among these various terms of the discount flow model.

### Benefits from assets

An asset is “economic” in the sense that its owner can expect economic benefits from it. The benefits that flow from assets will vary according to the class of assets, and by the nature of their use. For instance, an asset may be used by the owner in production, or contracted out to other institutional units (please refer to Box 3).

Box 3. Assets and Their Benefits		
Type of assets	Benefits used by owners in production	Benefits contracted out to other institutional units
Produced fixed assets	Services (production account)	Services (production account)
Nonproduced nonfinancial assets	Value added (production account)	Rent (income distribution account)
Financial assets	Not applicable	Interest and dividends (income distribution account)

Produced and nonproduced nonfinancial assets used in production by the owners generate value added; when used by other institutional units, produced assets generate value added (from service rentals) for their owners, whereas nonproduced assets yield property income (rent<sup>8</sup>) for their owners. Except for derivatives, financial assets yield benefits in the form of interest, distributed income of corporations (inclusive of dividends), reinvested earnings on direct investment, and income attributed to insurance policy holders. For the sake of simplicity, the benefits from financial assets are referred in this paper as interest and dividends.

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<sup>7</sup> For indexed securities, expected benefits are inclusive of the fluctuations in the value of benefits that have been agreed upon by contract. These fluctuations are part of the agreed value, even if the amount cannot be determined at the inception of the contract.

<sup>8</sup> In the case of subsoil assets, rents may also be referred to as “royalties.”

In the 1993 *SNA*, the benefits from contracted-out produced fixed assets are included in the production account, as a source of value added<sup>9</sup> from the rental service that is defined as follows:

“the amount payable by the user of a fixed asset to its owner under an operating lease or a similar contract for the right to use that asset in production for a specified period of time.” (6.181)

The benefits from leasing tangible nonproduced assets are measured by the rent, which is for land:

“... treated as accruing continuously to the landowner throughout the period of the contract agreed between the landowner and the tenant.” (7.128)

whereas those on subsoil assets

“...may take the form of periodic payments of fixed amounts, irrespective to the rate of extraction or more likely they may be a function of the quantity of volume of the asset extracted.” (7.133)

The rent as well as interest and dividends (benefits from financial assets) are recorded as primary income, that is:

“...incomes that accrue to institutional units as a consequence of their involvement in processes of production or ownership of assets that may be needed for purposes of production. They are payable out of the value added created by production. The primary incomes that accrue by lending or renting financial or tangible nonproduced assets, including land, to other units for use in production are described as property incomes.” (7.2)

In a nutshell, the 1993 *SNA* records the benefits and primary income on contracted-out assets on the basis of the initial contractual arrangements. The rate upon which the benefits are calculated is that at the inception of the contractual arrangements on assets, though the nomenclature used to identify that rate varies across the assets (original effective discount rate, original effective interest rate, cost of capital as referred to in Box 4). The underlying principle to record benefits on assets is the same as that of the debtor treatment in recording income on bonds, which is based on the IRR at the time of issue, that is the “original effective discount rate” (for more details, please refer to Section III).

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<sup>9</sup> More specifically, these benefits are part of operating surplus for corporations and of mixed income for households. The value added is “the surplus or deficit accruing from production before taking into account any interest, rent or similar charges on financial or tangible nonproduced assets” (7.8).

<b>Box 4. Terminology Related to Rates Prevailing in the Life of Assets under Contractual Arrangements used for Different Assets</b>				
	<b>Produced assets</b>	<b>Nonproduced assets</b>	<b>Financial debt instruments</b>	<b>Financial equity instruments</b>
<b>Contractual benefits</b>	<b>Rental</b>	<b>Rent</b>	<b>Contractual interest</b>	<b>Dividends</b>
<b>Discount rate at the time the asset was leased/lent/bought</b>	Original effective discount rate	Original effective discount rate	Original effective interest rate	Cost of capital
<b>Discount rate that reflects the value changes in assets during the contractual period</b>	Current discount rate	Current discount rate	Yield to maturity	Current cost of capital

The discount rate that prevails at the time the asset was leased/lent/bought obviously differs from the discount current rate or yield to maturity or current cost of capital (as referred to in Box 4) that ensures equality between the present value of expected cash flows and the current valuation of the asset. The discounting of expected benefits with the “current” discount rate will obviously give rise to valuation changes in the contracted out asset as the current rate changes. The recording of benefits and income on assets is not affected by these valuation changes in the asset:

“In effect, it is a basic principle of the System that holding gains/losses, nominal or real, whatever their origin is, must not influence the measurement of value added, income, saving as well as net lending or borrowing.”<sup>10</sup>

The following example illustrates these accounting principles:

“Suppose an asset is bought for 100 and five years later it is worth 500. Over five years there has been a nominal holding gain of 400. If the asset is sold, the realized holding gain is 400. If the asset is not sold, there is an unrealized gain of 400. This gain, however, relates to the five year period and for income calculations, one would only want the gain within the relevant accounting period, say a year. Suppose at the end of the previous year the asset was worth 450. During this year, the nominal holding gain is 50. Suppose the rate of inflation in the year is 10 per cent. Then 45 of this 50 is needed simply to maintain the real value of the asset. This 45 is called the neutral holding gain. The real holding gain is the remaining 5. What should be included in income? The 1993 SNA says none of them because income must be measured on the same basis as production where holding gains are rigorously excluded.”<sup>11</sup>

<sup>10</sup> Vanoli, 1999, p. 283.

<sup>11</sup> The Canberra Group, Expert Group on *Household Income Statistics*, p. 26.

## **Return from assets**

The *1993 SNA* does not have any single account that shows the return on assets, defined here in the financial sense of change in wealth that results from owning the asset, inclusive of benefits, such as interest and dividends, and the other changes in the value of the asset.

To record the return on assets in the *1993 SNA* entails taking into account the transacted benefits from assets (services, rent, and interest and dividends) plus the revaluation of the underlying assets and other changes in volume (as defined in a national accounts framework). The accounts related to transacted benefits can be found in the production accounts and the income account, whereas those related to valuation changes in the assets are part of the other changes accounts (as illustrated in Box 1).

## **III. INTEREST INCOME ON BONDS: THE DEBTOR PRINCIPLE**

### **Valuation of bonds**

The value of a bond, like that of any financial asset, derives from the cash flows that are expected from it. For simplicity sake, the discount flow model is applied here only to straight bonds, that is, options-free securities.<sup>12</sup>

As noted in Section II, the discount rate is made up of three parts: real risk-free rate of interest, expected rate of inflation, and risk premium. In the case of financial assets, risk premium is made up of a maturity premium and a credit risk premium. The real risk-free rate of interest can be defined as follows:

“The real risk-free rate of interest (RFR) is the economic cost of money, that is, the opportunity cost necessary to compensate individuals for foregoing consumption. As discussed previously, it is determined by the real growth rate of the economy with short-run effects due to ease or tightness in the capital market.”<sup>13</sup>

The addition of real risk-free rate of interest to expected inflation provides the nominal risk-free rate of interest, that is, the interest rate that is only associated with a few selected types of short-term government paper.<sup>14</sup>

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<sup>12</sup> While fixed income debt instrument with embedded options are priced on the basis of expected cash flows, the expectations are affected by embedded options, which use other valuation models, e.g., Monte Carlo simulation (e.g., mortgaged-backed securities).

<sup>13</sup> Reilly and Brown, 2000, p. 563.

<sup>14</sup> Examples would be U.S. treasury bills, French “bons du trésor,” the German “U-Schätze,” the British short-term gilt-edged bonds, and the Canadian treasury bills that would be viewed as benchmark of default-risk free securities in their respective markets.

Risks associated with bonds can take two forms: those associated with the bond itself, that is, its term structure (maturity premium); and those associated with the issuers of the bond (credit risk). Risks embodied in the maturity premium include interest rate risks, yield curve risks, volatility risks, reinvestment risks, liquidity risks, and event risks. How much these risks affect the value of bonds depends upon the specific features of the bonds, that is, the magnitude and the dates of expected streams of payments (coupons and capital), and the term structure of interest.<sup>15</sup> For instance, the price of a high-coupon bond would generally be higher than one with a lower coupon rate. The term structure of interest rates, that is, the various levels of rates based on their term,<sup>16</sup> is largely determined by expectations regarding inflation, since the expectations concerning the real rate of return are generally stable.

The credit risk, also known as default risk of the issuer, is determined by the capacity of the issuers to generate the cash flows from operations and the issuers' financial obligations in terms of interest and principal payments. The difference in risk with certain government bonds that are free of credit risk (but otherwise identical in all other respects) is referred to as the yield spread.

The *1993 SNA* refers to the interest rate on any given instrument as the nominal interest rate of that instrument, and distinguishes it from the "real" rate of interest as follows:

"When a debtor is able to discharge his liability to the creditor by repaying principal equal in money value to the funds borrowed the associated interest payments are described as 'nominal.' Such interest payments do not represent the 'real' return to the creditor when, as a result of inflation, the purchasing power of the funds repaid is less than that of the funds borrowed. In situations of chronic inflation the nominal interest payments demanded by creditors typically rise in order to compensate them for the losses of purchasing power that they expect when their funds are eventually repaid." (7.109)<sup>17</sup>

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<sup>15</sup> The term structure of the interest rate affects the value of the bond through the interest rate risk. That risk is linked to the characteristics of the bond: its maturity (the longer the maturity, the greater, generally, the sensitivity to interest rate changes), and its coupon rate (the higher the coupon rate, the greater, generally, the sensitivity to interest rate changes). The formal maturity measure is known as the "duration, that is, a weighted maturity of all the cash flows on the bond, including the coupons, where the weights are based upon both the timing and the magnitude of the cash flows." Damodaran, 1996, p. 399. The duration is less or equal to the maturity of the bond.

<sup>16</sup> As measured by the yield curve.

<sup>17</sup> While the *1993 SNA* shows the nominal interest in the allocation of income, it proposed in Annex B to Chapter XIX a parallel treatment of interest under significant inflation that would deduct from nominal interest the component that represents a protection against inflation. The most appropriate treatment in the national accounts of situations of high inflation has been the source of a debate that remains to be settled, and to which André Vanoli (1999) and Peter Hill have contributed.

The content of real interest rate and nominal interest rate as used in the *1993 SNA* differs from that in the finance literature as shown below in Box 5.

To avoid ambiguity, this paper uses the self-describing terms “risk-free real interest rate,” “inflation premium,” and “risks premium,” as applicable. The terms interest rate, current interest rate, or market interest rate, which are equivalent to the *1993 SNA* “nominal interest rate,” are used interchangeably.

<b>Box 5: Interest Rate Terminology</b>	
<b><i>1993 SNA (paraphrase)</i></b>	<b>Finance literature</b>
Real interest rate (risk free) + Risk premium = <b>Real interest rate</b> (inclusive of risk) + Inflation premium = Nominal interest rate (inclusive of risk)= market interest rate	Real interest rate (risk free) + Inflation premium = Nominal interest rate (risk free) + Risk premium = Market interest rate

At the time of issue, the market interest rate will determine the issue price of the bond, given that the maturity and expected cash flows are fixed by contract. Bonds can be issued with periodic coupon payments or with no coupon (zero-coupon bonds), and there is a clear inverse relationship between the issue price and the market interest rate. For instance, if the coupon rate (say, 6 percent) is set equal to the market interest rate (6 percent) at the time of issue, the bond will be issued at par; if the coupon rate is higher than the market rate, the bond is issued at premium, and at discount if the coupon rate is lower. Zero-coupon bonds are always issued at discount, the magnitude depending upon the level of the interest rate: the higher the rate, the higher the discount.

Over the life of the bond, the value of the bond will fluctuate according to the fluctuations in market interest rates. Indeed, given a current market interest rate of 6 percent, an investor would buy a bond at par only if the coupon is set at 6 percent. If the market rate increases to 6.5 percent after the bond was issued, an investor would require a 6.5 percent coupon for a similar bond issued at par. If the holder of the 6 percent bond wants to sell, there will be no market parties willing to pay the par value, as they can obtain 6.5 percent on a similar bond. The holder cannot force the bond issuer to change the bond features, and has therefore to adjust the value of the bond so that a buyer would realize a yield of 6.5 percent. This means adjusting the value of the bond below par. This principle applies to any bond, regardless of the value at which the bond was purchased: increase in market interest rates will result in a decline in the bond value; and vice versa, a decrease in market interest rate will increase the value of a bond.

The fluctuations in interest rates reflect changes in the expected real rate, in the expected inflation rate, and in the risk of the specific instrument, inclusive of the maturity premium and the credit risk of the issuers.

### **Holding gains/losses and other changes in volume on bonds**

The value of an asset can change due to factors that affect both the denominator and the numerator of the discount flow equation. As suggested in Section II, changes in the denominator may create neutral gains/losses if due to changes in inflation (inflation changes would affect the value of all assets), and nominal real gains/losses if due to changes in risks (maturity and credit) that are specific to the term of the bonds and to the issuers.

Volume changes would arise when the bond issuers skip paying some of the coupons on the due date, an event that changes the expected benefits. These cases, known in business accounting as impairments (covered in more detail under loans in Appendix I), would be recorded as other changes in volume under “miscellaneous other volume changes” in financial assets, which the *1993 SNA* defines as:

“Any changes in financial assets and liabilities that are not transactions in the financial account, that should not be attributed to holding gains or losses, that are not changes in classification and that do not fall into one of the enumerated categories above are to recorded here.” (12.54)

If the owner of a bond recognizes that the bond issuers will completely default on their financial contractual obligations, the *1993 SNA* would account for a total write-off only under the following circumstances:

“Recognition by a creditor that a financial claim can no longer be collected, due to bankruptcy or other factors, and the consequent removal of that claim from the balance sheet of the creditor should be accounted for here [in other changes in volume] along with the removal of the liability of the debtor.” (12.51)

### **Interest income**

Interest income from a bond can come from two sources: coupon interest, where the interest is paid at periodic moments; and the difference between the issue and the redemption price, where the interest is paid at maturity. With the accrual principle, as defined in the *1993 SNA*, interest from these two sources is recorded continuously over the life of the bond.

“...the difference between its [the bond’s] issue price and its face or redemption value when it matures measures interest that the issuer is obliged to pay over the life of the bond. Such interest is recorded as property income payable by the issuer of the bond and receivable by the holder of the bond in addition to any coupon interest actually paid by the issuer at specified intervals over the life of the bond. In principle, the interest accruing is treated as being simultaneously reinvested in the bond by the holder

of the bond. It is therefore recorded in the financial account as the acquisition of an asset, which is added to the existing asset. Thus the gradual increase in the market price of a bond that is attributable to the accumulation of accrued, reinvested interest reflects a growth in the principal outstanding—i.e., in the size of an asset. It is essentially a quantum or volume increase and not a price increase. It does not generate any holding gains for the holder of the bond or holding loss for the issuer of the bond. [...] Bonds change quantitatively over time as they approach maturity and it is essential to recognize that increases in their values due to the accumulation of accrued interest are not price change and do not generate holding gains.” (12.110)

In other words, the income is to be calculated on the basis of the *contractual arrangements* at the time of issue.<sup>18</sup> The recording of coupons is explicitly stated, and so is the amortization between the *issue* price and the *face*, or redemption, value of the bond. The income is fully determined at the time the bond is issued, according to the contractual arrangements, and this is also further reinforced at the more general level of tradable instruments:

“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.” (7.93)

In the unusual circumstance of no change in the market interest rate over the life of the bond, the value of a bond issued at par with coupons will gradually increase to reflect the accrual of the coupon up to the coupon date; will return to par the day the coupon is paid out, resuming its gradual increase up to the next coupon payment; and so forth until maturity, when the face value and the last coupon are paid out. The changes in the value of the bond are transactions changes (interest payable). For instance, for an annual coupon of 5 percent on a \$1,000 bond, the value of the bond will increase to close to \$1,050<sup>19</sup> just before the date at which the coupon is due for payment, and will then return to \$1,000 the day the coupon is paid out. From then on, the interest will again accrue on the bond up to the next payment of the coupon, and so on.

Likewise, assuming the unusual circumstances of no change in market interest rate and assuming a bond issued at discount with no coupon (zero-coupon bond), the interest—that is, the difference between the issue price and the maturity price—will be accrued over the life of

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<sup>18</sup> 1993 SNA quotations that clearly describe the debtor treatment for interest income can also be found in 7.98 and 7.99 for bills, 7.100 for bonds and debentures, 7.101 for zero-coupon bonds, 7.103 for other bonds, including deep-discounted bonds, and 7.104 for index-linked securities.

<sup>19</sup> Referred to as full price (or dirty price) in the market. For market purposes, the bond is quoted at its “clean” price, that is, exclusive of the accrued coupon. The interest accrual is calculated daily.



the bond, and the resulting interest payable will increase the value of the bond up to the redemption value at maturity.

Although it bases the income calculation upon the original contractual arrangements, the 1993 SNA fully recognizes that the economic conditions prevailing during the life of the bond would change the value of the bond. These changes generate nominal holding gains:

“The prices of marketable bonds also change, however, when the market rates of interest change, the prices varying inversely with the interest rate movements. ...Changes that are attributable to changes in market rates of interest constitute price changes and not quantum changes. They therefore generate nominal holding gains or losses for both the issuers and the holders of the bonds. An increase in interest rate generates a nominal holding gain loss for the holder of the bond, and vice versa in the case of fall in interest rates” (12.111)

### Return on bonds

The return on bonds will be the interest income plus the changes in the value of the bond. As we saw earlier, the latter may be caused by changes in the environment surrounding the bonds, such as inflation expectations or the credit risk of the issuer. For instance, a decrease in the credit risk of an issuer means a lower current interest rate, and a higher value of the bond.

As an example, let us assume a five-year zero-coupon bond issued at \$747 with a redemption value of \$1,000. The IRR at the time of issue, that is the original effective discount rate, is 6 percent.<sup>20</sup> The accrual of the \$253 income over its lifetime will result in \$45 income the first year. The interest not being paid out, the accrued interest will be recorded both in the income and financial accounts. This will increase the value of the bond to \$792 at the end of the first year due to interest payable, as shown in the first line of Table 1.

<b>Table 1: A Zero Coupon 5 Years Bond Issued at 6%, with Yield to Maturity that Changes to 5% at the End of the First Year</b>					
Year	Year opening value	Interest payable changes	Valuation changes	Year closing value	Return on bond for holder
1	747	45	31	792 (823 after the change)	76
2	823	48	-7	864	41
3	864	50	-7	907	43
4	907	53	-8	952	45
5	952	57	-9	1000	48
1 to 5	$747^{(t=1)}$	$253^{(t=\sum 1 \text{ to } 5)}$	$0^{(t=\sum 1 \text{ to } 5)}$	$1000^{(t=5)}$	$253^{(t=\sum 1 \text{ to } 5)}$ (6%)

<sup>20</sup> The example was drawn from Joisce and Wright, 2001, pp. 9-10.

Now assume a change in conditions, such as a lower default risk, with the price of the bond increasing to \$823 at the end of the first year. Such a change brings the market rate (referred to as yield to maturity) to 5 percent. If these conditions prevail for the remaining life of the bond, its value will be \$864, \$907, and \$952 in the subsequent years, as illustrated in Table 1.

The interest payable is based on the original effective discount rate and the value at the beginning of the year; the latter value in turn results from the value at the beginning of the previous year and the accrued interest over the previous year. For instance, in year 2 interest is derived as 6 percent over the sum of the initial value (747) and accrued interest (45). The year opening and closing values in the Table are derived using the 5 percent yield to maturity, that is the rate that reflects market interest rates after the first year. After the year in which the market interest changed, this closing value is lower than the year opening value plus the accrued interest calculated on the basis of the original rate of 6 percent, which implies a holding loss for the holder. As a result, the return for the holder is lower than the interest income (for instance, in year 2, the return is 41 and the contractual interest income is 48). The annual returns on bond include the effect of holding gains and losses, and are thus not useable as an income measure in national accounts.

If the bond is sold before maturity, the gains will be realized through a financial transaction. However,

“... as holding gains are recorded on an accruals basis in the System, the distinction between realized and unrealized gains, although useful for some purposes, is not so important in the System and does not appear in the classifications and accounts.”  
(12.72)

#### **IV. INTEREST INCOME ON BONDS: THE CREDITOR TREATMENT**

The first part of this section illustrates the income derived from the creditor approach and explains how it differs from the income of the *1993 SNA* and that of fair value accounting of IAS 39 (see Appendix II for a summary of IAS 39 guidelines). The second part reviews some of the premises on which the creditor treatment is based, and the third part explores the impact the creditor approach would have on the *1993 SNA*.

##### **A. Description of Bond Income Under the Creditor Approach**

The creditor approach defines income as the result of multiplying the relevant current interest rate (market yield) by the market value of the instrument. The changes in the value of the bond that occur when interest rates change are recorded as revaluations.

The treatment is illustrated in Table 2 with the same example as Table 1, but made simpler by the use of a bond, with 6 percent annual interest coupons, issued at par (instead of a zero-coupon bond). The debtor treatment is shown in italics.

Under the creditor treatment, assuming that the interest transactions were the only economic transactions of a government over the life of the bond, the government would show a deficit (net interest expense) of \$265, and a capital loss of \$35 due to a decrease in market interest rates after the bond was issued. The interest expense of \$265 is made up of the market yield multiplied by the bond market value (\$60, \$52, \$52, \$51, \$50). If rates had increased, the deficit would be higher than \$300, with the difference showing as capital gain for the government.

<b>Table 2: A 6% Coupon 5 years Bond Issued at Par, with Yield to Maturity that Changes to 5% at the End of the First Year</b>						
Year	Year opening value	Interest expense (creditor approach)	Valuation changes (creditor approach)	Interest expense (debtor approach)	Valuation changes (debtor approach)	Year closing value
1	1000	60	35	60	35	1035
2	1035	52		60	-8	1027
3	1027	52		60	-8	1019
4	1019	51		60	-9	1010
5	1010	50		60	-10	1000
1 to 5	$1000^{(t=1)}$	$265^{(t=\sum 1 \text{ to } 5)}$	$35^{(t=\sum 1 \text{ to } 5)}$	$300^{(t=\sum 1 \text{ to } 5)}$	$0^{(t=\sum 1 \text{ to } 5)}$	$1000^{(t=5)}$

Under the 1993 SNA, the net expense (and thus the deficit) over the life of the bond would be \$300 (annual expense of \$60) as per the original contractual arrangements whatever the fluctuations in market interest rates after the bond was issued.

Under IAS 39, the net expense (and thus the deficit) would also be \$300 over the life of the bond. This would be made up of annual expenses of \$95, \$52, \$52, \$51, \$50. The IAS 39 calculates the interest expense as the yield multiplied by the market value (as per the creditor approach) but also includes in income the change in the value of the bond (\$35). The income from IAS 39 effectively records the full return on bonds (as was presented in Section II, under "Return on bonds").

The income under the creditor treatment (\$265 over the life of the bond from the example) is not consistent with the income (\$300) either from the 1993 SNA or from IAS 39. By drawing pieces from each of the two systems (yield multiplied by market value from IAS 39, and selected other changes from the 1993 SNA), the creditor income ends up being inconsistent with both.

## B. Selected Premises of the Creditor Approach

The following reviews some of the premises on which the creditor treatment is based.

### Other changes in the valuation of assets

Under the creditor approach, it has been suggested that changes in the value of bonds when market interest rates are stable are measurement errors:

“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 mismeasurement somewhere in the other changes of assets account.”<sup>21</sup>

The value of the bond of will change through the years according to a mixture of changes in real interest rate, inflation expectations, maturity premium, and credit risk. The impact of these factors will vary depending upon the circumstances at hand. The \$35 revaluation change in the first year is of the same nature as the \$8, \$8, \$9, and \$10 in subsequent years, and the changes arise from, among other things, real interest rate and volume changes.

The creditor treatment recognizes only the first-year change, whereas the debtor treatment remains consistent by continuing throughout the life of the bond to incorporate the impact of the factors that affect the bond valuation. The gain of \$35 is a mixture of the same offsetting forces as those described when the market conditions are stable, plus additional forces brought about by decrease in the market interest rate to 5 percent. The latter decline can be due to a number of factors, either lower inflation expectation (nominal holding gain), lower credit risk of the issuer (real gain), or lower risk-free real rate of interest (real gain). The *1993 SNA* calls for the impact of all these factors to be recorded as nominal holding gains/losses, which the debtor treatment does. The creditor approach treats these changes as revaluation during a period of changing interest rates, but as income when the rate is stable, as shown below.

<u>Income (debtor)</u>	<u>Revaluation</u>
Year 1: 60	35
Year 2: $60-8 = 52$ ,	
Year 3: $60-8 = 52$ ,	
Year 4: $60-9 = 51$ ,	
Year 5: $60-10 = 50$ .	

### **Liquidity of assets**

It has been suggested that by recognizing the greater liquidity of bonds, the *1993 SNA* accepted the creditor treatment of income on bonds. Indeed the *1993 SNA* effectively recognized the greater liquidity of bonds (by providing a valuation for bonds that differs from that of non negotiable debt instruments). Nevertheless, the System still accounts for the income on bonds along the same principles as that of other assets, basing it on the arrangements agreed upon, exclusive of changes in value:

“However, the System excludes from the calculation of income any assets received or disposed as a result of capital transfers that merely redistribute wealth between different units, and also any assets received or disposed as a result of ‘other volume

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<sup>21</sup> Joice and Wright, 2001, p. 18.

changes' as described in chapter XII. It also excludes any real holding gains or losses on assets or liabilities due to changes in their relative prices." (1.63)

The liquidity of assets indeed increased in recent years due to the greater sophistication of financial arrangements. In terms of accounting treatment, the impact of this increased liquidity is felt much more on nonnegotiable debt assets, such as loans, whose current valuation in the *1993 SNA* differs from that of the main stream of assets. Such difference in valuation is increasingly being questioned as the existing loan valuation falls short of reflecting current market conditions. Appendix I discusses this issue in more detail for loans.

### Monetary transactions

The *1993 SNA* clearly distinguishes transactions (production, income, capital, and financial transactions) from other changes and balance sheet accounts (as illustrated earlier in Box 1). Except for very specific cases, transactions in the *1993 SNA* represent agreements expressed in monetary terms between institutional units (item 1 in Box 6):

"... all flows are recorded in monetary terms, ... the distinguishing characteristic of a monetary transaction is that the parties to the transaction express their agreement in monetary terms." (3.16)

"All monetary transactions are interactions between institutional units; that is, all monetary transactions are two-party transactions." (3.17)

"When institutional units exchange these items with other institutional units for cash, the values required by the System are directly available. These transactions are recorded at the actual exchange value agreed upon by the two parties." (3.71)

The specific cases where the System recognizes transactions that are not monetary and that need consequently to be valued are items 2 and 3 as shown in Box 6 below.

Box 6. Types of Transactions			
Description	Units involved	Valuation	Examples
1. Observable in value terms	2	Monetary transactions	Purchase of goods or services
2. Observable but not immediately valued	2	A value in monetary terms is attributed	Barter of goods, education services provided free by government
3. Physically observable	1	A value in monetary terms is attributed	Own account, such as consumption of fixed capital

The creditor approach revalues transactions (e.g., income) that already have a monetary value (item 1). The System recognizes the fact that the monetary agreement may span more than one accounting period by adopting the accrual principle, where the value agreed upon is spread over the period in which the service is rendered and/or the income is earned. Accrual does not call for revaluation of transactions, but for the allocation across the periods of the monetary value covered by contractual arrangements.

The value of transactions and stocks in the *1993 SNA* are all based on the market, but this works out differently for transactions as recorded in the current, capital and financial accounts and the stocks as recorded on the balance sheets. The transactions are valued according to the terms agreed upon by the institutional units (at prices agreed between a willing buyer and a seller), while the stocks reflect value changes caused by changing economic conditions of the market. Resulting discrepancies are recorded in the other changes in value accounts (see also Box 1). As such, the System clearly distinguishes transactions, which are based on economic decisions, from other flows, which simply reflect changing conditions in the market. For instance, while the market valuation is applied to the full debt outstanding, it is well understood that transactions on the bond may change the value of the bond (especially affected if the debtor reduces materially the supply of its bond by attempting to repurchase it). To value transactions differently from the terms agreed upon by institutional units goes against the essence of the System.

### **C. How the Creditor Approach Would Affect the *1993 SNA***

The following first presents the sequencing of the *1993 SNA*, and subsequently explores how it would be affected by using principles along the lines of the creditor treatment. The sequencing is illustrated first with the leasing of fixed assets, and then with bonds.

According to the *1993 SNA*, the rental of a fixed asset remains unchanged throughout the life of the contract, whereas the value of the leased asset fluctuates as a result of external events, such as fluctuations in market interest rates. If the owner sells the fixed asset, the new owner assumes the contractual leasing arrangements (the original rentals are linked to the fixed asset). For the owner, a sale of the asset for cash will appear as a capital transaction in fixed assets, and an equivalent increase of cash in the financial account. The owner's fixed assets will be reduced by the same amount as the capital transaction, with an equivalent increase in the cash assets. The changes in assets are completely accounted for by transactions, since the fixed asset would have been reevaluated prior to the transaction. The sale simply realizes the gain/loss that had already been accounted for in the revaluation accounts.

According to the *1993 SNA*, the income from a bond remains unchanged throughout the life of the bond contract, whereas the value of the bond fluctuates as a result of external events, such as fluctuations in market interest rates. If the owner sells the bond, the new owner assumes the contractual interest arrangements (the original contractual arrangements are linked to the bond). For the owner, a sale of the bond for cash will appear as a financial transaction in bond and an equivalent increase of cash in the financial account. The owner's assets in bonds will be reduced by the same amount as the financial transaction, with an equivalent increase in cash

assets. The changes in assets are completely accounted for by transactions since the bond would have been reevaluated prior to the transaction. The sale simply realizes the gain/loss that had already been accounted for in the revaluation accounts. A similar sequencing would apply for rent, a property income, which is recorded in the *1993 SNA* according to the original contractual payments attached to the nonproduced asset, with the changes in the value of the asset recorded in the revaluation accounts. This is in conformity with the debtor treatment of interest bond, where the changes in the value of the assets are recorded in the revaluation accounts.

Introducing the principles of the creditor approach would have a multifold impact on the System. The System now carefully ensures that transactions<sup>22</sup> reflect the results of effective decision making between institutional units; the creditor treatment would lead to recording as transactions, potential decisions that could be taken in light of changes in economic conditions. If applied to bonds, the creditor treatment would blur the distinction in valuation that currently exists between transaction accounts and the accounts that record changes in economic conditions; transaction accounts would no longer reflect effective economic decisions between institutional units. If implemented only for bonds, these principles would introduce major inconsistencies with treatments of other assets in the System. However, if extended to other assets under contractual arrangements, they would entail a major rewrite of the System: the services for fixed assets under operational leases would be recorded according to the current rental that such assets could fetch in the market; for nonproduced natural assets, the current rent that natural assets could fetch; for equity, the income would be based on the current yield on equity; and for debt instruments, the income would be based on the current rate of the debt. Extended to other income accounts under contracts that span over more than one period, the principles of the creditor approach would lead to disregarding the value on which wages are recorded (contractual arrangements) in favor of what could be earned. The trade in goods and services that span more than one period (term contract) would be revalued according to the conditions of the period under measurement.

## V. CONCLUSION

The treatment of income on bonds was examined against the accounting treatment of other categories of assets in the *1993 SNA* framework.

First, the research showed that the *1993 SNA* uses the basic principles of the debtor approach (the initial contractual arrangements) not only for bonds, but also to account for the benefits that flow from all other assets that have been contracted out to other institutional units. The debtor approach to measuring interest on bonds (i.e., according to the original contractual terms) is consistent with the income valuation principles used for other assets in the *1993 SNA*. The benefits or income from assets placed at the disposal of other institutional units are recorded according to the contractual terms:

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<sup>22</sup> With the special cases noted in Box 6.

- rental income for produced assets;
- rent (including royalties ) for nonproduced nonfinancial assets; and
- interest and dividends for financial assets.

The amounts to be shown as benefits/income are those specified in the contractual arrangements, and they exclude any changes in the value of assets. The changes in the value of assets are accounted for as “other changes” and recorded as capital and financial transactions when the assets are exchanged or transferred between institutional units.

The debtor treatment ensures that the income results are comparable across the various classes of assets (in other words, they assure the consistency among macroeconomic accounts). It also provides for the macro/micro consistency of income based on historical cost accounting, and, *over the life of the bonds*, on the income derived from “fair value” (corporate accounting standard), although the timing and amount of income recognition differ in the latter case.

Second, the research also showed that the creditor treatment is not in conformity with the *1993 SNA*, nor with IAS 39. Unlike *1993 SNA* where the income is based on the initial contractual arrangements, the creditor approach calculates income by imputing the relevant current interest rate to the market value of the bond. Unlike IAS 39, the creditor treatment excludes from income changes in the bond’s value that are caused by changes in interest rates. (These changes are included as income in fair value accounting.)

Introducing the creditor approach into the *1993 SNA* would lead to the revaluation of transactions where a monetary value already exists—a practice not in conformity with the System. For bonds, it would involve shifting the value from terms agreed upon to an imputed interest varying with every change of market conditions. For other assets, it would entail recalibrating the value of transactions that span contractually across periods, and would lead to adjusting the value of wages if market conditions differ from the contractually agreed wages. It would also involve modifying the other changes account accordingly and developing new analytical tools to interpret the results. The impact of such major changes needs to be carefully assessed against the analytical needs that the creditor approach purports to satisfy.

The discussion concerning the creditor treatment helped to shed more light on the System. It reinforced the use that the System makes of market valuation and the prominence it gives to the “other changes” accounts. (In fact, Appendix II shows that market valuation is more extensively applied in *1993 SNA* than in IAS 39.)

At the same time, the intensity of the debate on the recording of interest is emblematic of concerns raised by macroeconomic statisticians about the capacity of measuring the full complexity of the rapidly changing financial reality. New institutions and financial arrangements can challenge the *1993 SNA*, as did financial derivatives. There are aspects of economic activities—such as those related to trusts, banks in liquidation, build-operate



transfers and structures to transfer risk—where it would be very useful to pursue the research. To end up with a few pertinent citations from the *1993 SNA*:

“The central framework of the *SNA* presents a number of characteristics which give it the advantages of an integrated accounting structure. ... (21.1) ... The counterpart of these benefits is that there are certain limitations as to what may be accommodated directly in the central framework. (21.2) ... Additional or different requirements necessitate the development of complementary or alternative categories and concepts. (21.3) ... Satellite accounts or systems generally stress the need to expand the analytical capacity of national accounting for selected areas of social concerns in a flexible manner. ...” (21.4)

## THE 1993 SNA TREATMENT OF LOANS

### Valuation of loans

At the time the loans are issued, their valuation is similar to that on bonds, with the price reflecting a rate of discount that embodies market interest rate and a risk premium specific to the loan maturity structure (maturity premium) and to the borrower (default risk premium). However, unlike bonds that are constantly revalued throughout their life to reflect changes in market interest rates and in the underlying risks of the instruments, the 1993 SNA bases the value of the loans throughout their life on the contractual price that prevailed at the time they were arranged, adjusted only to take into account interest payable. Such valuation completely disregards the impact of changes in maturity and credit risk that effectively affect the loan value. Unlike other assets in the System where tradability was not an issue in their valuation, the 1993 SNA justifies a special treatment for loans on the basis of their being nonnegotiable,<sup>23</sup> creating a major inconsistency in valuation with other assets in the System.

The 1993 SNA essentially values loans as if they represent money, and not as the contractual arrangements that they effectively are:

“The monetary value of some assets and liabilities—cash, deposits, loans, advances, credits, etc.—remain constant over time. As already noted, the ‘price’ of such asset is always unity while the quantity is given by the number of units of the currency in which they are denominated. The nominal holding gains on such assets are always zero. For this reason the difference between the values of the opening and closing stocks of such assets is entirely accounted for by the values of the transactions in the assets, this being one case in which it is possible to deduce the latter from the balance sheet figures.” (12.107)

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<sup>23</sup> Negotiable, a term used in 1993 SNA, represents the likelihood that the asset will be sold quickly (referred to as marketability in financial terms). Marketability, along with some certainty in the expected price, and continuity of price unless due to substantial new information, are components of liquidity. Liquidity, in turn, is simply a characteristic of a “good” market for a given asset, as are information, transaction cost, and external efficiency or information efficiency. For more information on liquidity, please refer to Reilly and Brown, 2000, p. 108. The authors suggested, for a more formal discussion of liquidity and the effects of different market systems, Sanford J. Grossman and Merton H. Miller, “Liquidity and Market Structure,” *Journal of Finance*, Vol. 43, No. 3 (July 1988), pp. 617-33; and Puneet Handa and Robert A. Schwartz, “How best to supply liquidity to a securities market,” *Journal of Portfolio Management*, No. 22 (Winter 1996), pp. 44-51.

### **Holding gains/losses and other changes in volume on loans**

The *1993 SNA* loan valuation has, understandably, a major impact on the “other changes” in loans since they must be made equal to zero, which creates further distortion in the System.

First, the *1993 SNA* does not recognize overall holding gains/losses on loans (see previous quote). However, since loans are “assets of fixed monetary value” (12.108), they are obviously subject to neutral gains/losses due to inflation. In order to maintain the overall nominal gains/losses unchanged, the *1993 SNA* has to attribute a value to the real holding gains/losses that has to be equal, with the sign reversed, to that of the neutral gains/losses. This means that changes in inflation would create simultaneously real gains/losses (that should be specific to the assets) of equal value to neutral losses/gains, the latter effectively linked to inflation (general to all assets).

Second, the only entries that the System recognizes under the “other volume changes” are either removing loans from the balance sheet, or showing the value of other changes as is. Removal from the balance sheet can occur through two types of volume changes. The first type arises from the creditor’s recognizing that a claim can no longer be collected. In such cases, the loan is to be removed from the balance sheet of both the creditor and debtor (12.51 and 10.140). The second type is a reclassification to securities of loans that provided a potential source of liquidity through securitization, and “by becoming de facto negotiable” (11.75). The resulting securities, either debt or equity, are valued at current market value (13.67 to 13.69 for debt, and 13.73 for shares).<sup>24</sup>

Since the remaining “other volume changes” have to be nil, this means that partial write-off, known in financial accounting as impairment, cannot be accommodated for loans in the *1993 SNA*. Impairments are defined as follows by IAS:

“IAS 39 requires that an impairment or bad debt loss be recognized. The impairment calculation compares the carrying amount<sup>25</sup> of the financial asset with the discounted present value of the currently estimated amounts and timings of payments. Thus, impairment is recognized if any interest or principal payments are reduced, forgiven, or delayed. The financial instrument's original effective interest rate is the rate to be used for discounting. Any impairment loss is charged to net profit or loss for the period. Impairment or uncollectability must be evaluated individually for material financial assets. A portfolio approach may be used for items that are individually small. [IAS 39.109] Once impairment has been recognized, if the fair value of the financial asset

<sup>24</sup> It should be noted that provisioning and unilateral repudiation of loans by a debtor are not recognized by the *1993 SNA*, whereas the cancellation of debt by mutual agreement is recorded as a capital transfer and a financial transaction (10.139).

<sup>25</sup> The carrying amount is the acquisition value adjusted with interest payable, as calculated with the effective interest rate method (the debtor principle).

increases in a subsequent period such that the impairment loss is reduced or eliminated, a reversal of the impairment loss is recognized, up to what the amortized-cost carrying amount would have been at the time of reversal. [IAS 39.114] Impairment is also an issue for a financial asset carried at fair value, particularly if the fair value change is reported directly in equity. IAS 39 requires that impairment be assessed for these financial assets as well and, if impaired, any loss reported in equity is charged against net profit or loss.”<sup>26</sup>

Problems associated with the 1993 SNA valuation of loans have been recently the subject of a paper<sup>27</sup> for cases where the loans become nonperforming, that is, when the debtor fails to respect the contractual arrangements.

The 1993 SNA loan valuation not only creates problems of consistency within the System, it may also lead to major problems of interpretation of the accounts, especially under conditions of high current interest rates caused by either high inflation or default risks, or both. These problems may be highly policy-relevant, as evidenced by new research results that stress the importance of balance sheet information:

“This paper examined the probability and intensity of financial crises during the 1990s with a view to improve crisis prevention and mitigation policies....

The importance of corporate liquidity is a novel result, and suggests that governments should have corporate sector balance sheet sufficient in quantity, quality and timeliness to alert them in crisis threats.”<sup>28</sup>

### **Interest on loans**

The 1993 SNA valuation of loans does not affect, however, the interest to be recorded in the income account, defined as:

“Under the terms of the financial instrument agreed between them interest is the amount that the debtor becomes liable to pay the creditor over a given period of time without reducing the amount of principal outstanding.” (7.93)

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<sup>26</sup> Deloitte, Touch, Tohmatsu, *IAS Plus Standards: IAS 39, Financial Instruments: Recognition and Measurement*, p. 9.

<sup>27</sup> Please refer to Bloem and Gorter, 2001 and the electronic discussion group on this subject at <http://www.imf.org/external/npl/eng/discuss/index.htm>.

<sup>28</sup> Stone and Weeks, 2001, p. 21.

Although the 1993 SNA does not explicitly say so, the logic of the System would imply that the interest would need to be accrued even if not paid at least for the period under contract. The System recognizes interest payable after due payment date as arrears:

“When accrued interest is not paid when due on financial asset, this gives rise to interest arrears. As accrued interest is already recorded in the accounts under the appropriate asset or under this category [Other accounts receivable/payable except trade credits and advances; the code now is F.89], no separate entry for such arrears is required. When they are important it may be useful to group all arrears of interest and repayment under a memorandum item.” (11.101)

### **Return from loans**

The return from loans will only cover the interest accrual and no holding gains/losses. The other changes in volume that arise from write-offs can be factored in as part of the return. However, this would not apply to the other changes that may reflect the reclassification of loans to securities. In other words, the return from loans would be distorted from that compiled for other assets because of the substantial differences in valuation.

### HOW IAS 39 COMPARES TO THE *1993 SNA*

The IAS 39 is here briefly compared to the *1993 SNA*. The main difference between the two accounting systems is the key role given to revaluation accounts in the SNA; in corporate financial accounting, revaluations of assets are shown in the income statement or in equity. IAS 39 values financial assets according to three possible valuations: fair value, amortized cost, and at cost in exceptional cases. The fair value is extensively used, encompassing the following financial assets: investment held for maturity, such as fixed maturity investment; financial assets held for trading, including derivatives for trading; and available for sale financial assets.

Under fair value, both the *1993 SNA* and the IAS 39 record the same value in terms of assets; however, the IAS 39 differs from SNA on five points:

- it shows some valuation changes as income and other changes directly into equity (versus other changes in assets accounts in the *1993 SNA*);
- it records as income on debt security the valuation changes on assets plus the market interest rate applied to the fair value (contractual interest arrangements in the *1993 SNA*, with the valuation changes reflected in other changes in assets accounts);
- it records dividends and change in the value of equity as income (only dividends recorded as income in the *1993 SNA*);
- it records the changes in the value of derivatives as income (completely excluded from income in the *1993 SNA*, where such changes are recorded in the accumulation accounts and balance sheet items); and
- it shows financial assets at fair value, whereas financial liabilities are measured at original recorded amount less principal repayments and amortization of discounts and premiums; this creates asymmetry (the *1993 SNA* is symmetric in its valuation).

Furthermore, originated loans and receivables that are not held for trading, and some held-to-maturity investments are measured at amortized cost, less reductions for impairment or uncollectibility. Amortized cost means after amortization of premium or discount arising at initial acquisition using the effective interest method. It should be noted that corporate accounting values nonfinancial assets largely at cost, unlike the *1993 SNA*, where such assets are at market value.

## REFERENCES

- Bloem, Adriaan M., and Cornelis N. Gorter, 2001, "The Statistical Treatment of Nonperforming Loans in Macroeconomic Statistics," IMF Working Paper 01/209 (Washington: International Monetary Fund).
- Brigham, Eugene F., and Joel F. Houston, 1998, *Fundamentals of Financial Management* (Stamford, Connecticut: Dryden Press, Harcourt Brace College Publishers, 8<sup>th</sup> ed.)
- Damodaran, Aswath, 1996, *Investment Valuation: Tools and Techniques for Determining the Valuation of any Asset* (New York: John Wiley & Sons).
- Deloitte, Touche and Tohmatsu, 2001, *IAS Plus Standards: IAS 39, Financial Instruments: Recognition and Measurement*, pp. 34-57. Available via the Internet: (<http://www.iasplus.com/standard/ias39.htm>).
- Dippelsman, Robert J., and Nils O. Maehle, 2001, "Treatment of Mobile Phone Licenses in the National Accounts," IMF Working Paper 01/72 (Washington: International Monetary Fund).
- Fabozzi, Frank J., 2000, *Fixed Income Analysis for the Chartered Financial Analyst Program* (Pennsylvania: Frank J. Fabozzi Associates).
- Inter-Secretariat Working Group on National Accounts (Commission of the European Communities, International Monetary Fund, Organization for Economic Co operation and Development, United Nations, World Bank), *System of National Accounts 1993*, Brussels/Luxembourg, New York, Paris, Washington, D.C.
- Joise, John, and Chris Wright, 2001, "Statistical Treatment of Accrual of Interest on Debt Securities," IMF Working Paper 01/132 (Washington: International Monetary Fund).
- Organization for Economic Cooperation and Development, 2001, *Measuring Capital: A Manual on the Measurement of Capital Stocks, Consumption of Fixed Capital and Capital Services*, unclassified (Paris).
- Price Waterhouse Coopers, 2000(?), *International Accounting Standards: Financial Instruments: Understanding IAS 39*. Available via the Internet: (<http://www.pwcglobal.com/extweb/pwcpublications.nsf>)
- Rcilly, Frank K., and Keith C. Brown, 2000, *Investment Analysis and Portfolio Management* (Stamford, Connecticut: Dryden Press, Harcourt College Publishers, 6<sup>th</sup> ed.).
- Stone, Mark R., and Melvyn Weeks, 2001, "Systemic Financial Crises, Balance Sheets, and Model Uncertainty," IMF Working Paper 01/162 (Washington: International Monetary Fund).
- The Canberra Group, 2001, Expert Group on *Household Income Statistics: Final Report and Recommendations* (Ottawa).
- Vanoli, André, 1999, "Interest and Inflation Accounting," *Review of Income and Wealth*, Series 45, No. 3 (September).
- [IMF Working Papers published since 1997 are available at <http://www.imf.org/external/index/st.htm>].