

**IMF COMMITTEE ON BALANCE OF PAYMENTS STATISTICS
BALANCE OF PAYMENTS TECHNICAL EXPERT GROUP (BOPTTEG)**

ISSUES PAPER (BOPTTEG) # 26 (REVISED)

TREATMENT OF INTEREST ON INDEX-LINKED DEBT INSTRUMENTS

IMF Statistics Department

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BALANCE OF PAYMENTS TECHNICAL EXPERT GROUP

ISSUES PAPER (BOPTTEG) # 26

TREATMENT OF INTEREST ON INDEX-LINKED DEBT INSTRUMENTS

The main issue is how interest accruals should be determined for each accounting period when principal is indexed. An internal working group of the IMF Statistics Department has reviewed the treatment of interest for index-linked debt instruments denominated in domestic currency and offered a clarification on the calculation of interest for these instruments within the existing 1993 SNA concept of interest (the STA position paper is attached). A summary is presented below.

The BOPTTEG issues paper # 25 presents the IMF Statistics Department's proposal that debt instruments with both principal and coupons linked to a foreign currency be classified and treated as though they are denominated in that foreign currency. Following that proposal, all other types of index-linked instruments, except those denominated in a foreign currency but including those that are partially linked to exchange rates (for example, those for which only principal or only coupons are linked to an exchange rate), would be treated as being denominated in domestic currency for the recording of interest and other economic flows.

I. Current international standards for the statistical treatment of the issue

The 1993 SNA follows the so-called "debtor approach" for defining interest, i.e., when principal is indexed, the difference between the eventual redemption price and the issue price is treated as interest accruing over the life of the asset. For determining interest accruals in any given period, para. 7.104 suggests that *In practice, the change in the value of the principal outstanding between the beginning and end of a particular accounting period due to the movement in the relevant index may be treated as interest accruing in that period, in addition to any interest due for payment in that period.*

It seems that the ESA95 chose not to follow this recommendation for instruments linked to indicators other than price indices, as para. 4.46c, which suggests this treatment, mentions only instruments linked to a price index.

The *External Debt Statistics: Guide for Compilers and Users*, drawing on the *ESA95 Manual on Government Deficit and Debt*, states that *in the absence of firm information, the accrual of interest costs should be estimated ... using the most recent relevant observation(s) of the reference index. Revisions to back data should be undertaken when the amount of interest costs that have been accrued is known with certainty* (para. 2.82).

II. Concerns/shortcomings of the current treatment

As the values of indicators used in indexation are not known in advance, interest flows can not be known at the time of issue. Sometimes, they cannot be determined until the instrument is redeemed. This may be the reason why the *1993 SNA* allows flexibility in computing interest flows for each accounting period when principal is indexed. However, this practical approach may lead to counter-intuitive results, including highly fluctuating as well as negative interest flows (such as when the value of the indicator declines during an accounting period). This method includes all changes and fluctuations in the value of principal in each accounting period due to the movement in the relevant index as interest.

The *Annotated Outline* (para. 10.21) noted inadequate guidance for calculating interest for index-linked instruments.

III. Possible alternative treatments

Within the existing *1993 SNA* concept of interest, the IMF Statistics Department proposed that the accrual of interest on index-linked debt instruments denominated in domestic currency be estimated using the most recent relevant observation(s) of the relevant index(es). This method will involve revisions of interest as new information becomes available.

The BOPTeg and AEG discussed this issue at their meetings in December 2004. BOPTeg members expressed reservations on limiting the discussion (as presented in the preceding paragraph). This paper was also presented at the December 2004 AEG meeting as an information item. The AEG expressed the view that the debtor approach did not limit discussion to Alternative 1 from the attachment (IMF Statistics Department's paper), and Alternatives 2 and 4 in the attachment received some support.

As a result, this paper proposes that the BOPTeg discuss all three alternatives through electronic discussion and an outcome paper be prepared¹:

1. The accrual of interest on index-linked instruments uses the *1993 SNA* and *BPM5* approach: when the coupons are index-linked, the full amounts paid as coupons, after indexation, are accrued as interest; and when the value of the principal is index-linked the difference between the eventual redemption price and the issue price is treated as interest accruing over the life of the instrument. (Alternative 1 from the attachment).
2. The accrual of interest on index-linked instruments is measured using the market interest rate expectation at the time of issue, with any deviation of the underlying index from the originally expected path leads to holding gains or losses that will not

¹ At its meeting on October 14-15, 2002, the ISWGNA supported the interpretation that the *SNA* accrues interest on the basis of the debtor approach.

normally cancel out over the life of the instrument. (Alternative 2 from the attachment).

3. Index-linked contracts can be regarded as effectively including embedded derivative contracts, with interest imputed based on a similar instrument that is not indexed. This is similar to approach (2) except that holding gains and losses that do not cancel out over the life of the instrument would be classified under financial derivatives not debt instruments (Alternative 4 from the attachment).

Under alternative 1, two methods of implementation are proposed:

1. Use the movement in the relevant index during that period, a practical approach that the *1993 SNA* proposes may be adopted (Alternative 1 (a) from the attachment).
2. Use the most recent relevant observation of the relevant index. This produces data closer to the conceptual approach outlined in the *1993 SNA*, but estimates of interest would be revised as new information becomes available (Alternative 1 (b) from the attachment).

IV. Points for discussion

Which alternative, among the three presented above, do the BOPTEG members prefer?

If alternative 1 is preferred, which method of implementation is preferred?

References

Annotated Outline for the Revision of BPM5, IMF, April 2004 (Chapter 10).

1993 SNA (para. 7.104).

European System of Accounts 1995 (para. 4.46c).

External Debt Statistics: Guide for Compilers and Users (para. 2.82).

STA POSITION PAPER ON THE TREATMENT OF INTEREST ON INDEX-LINKED DEBT INSTRUMENTS

April 2005

Prepared by the Working Group on Indexed and Foreign Currency Debt

I. BACKGROUND

1. In May 2003, the Statistics Department (STA) of the International Monetary Fund created an internal Working Group on Indexed and Foreign Currency Debt (WGIFCD). The main objective of the WGIFCD was to examine the methodological treatment in the current international statistical standards of indexed domestic-currency debt instruments and foreign-currency debt instruments. The question arose when a member country asked the Fund whether foreign-currency bonds are to be treated differently from bonds indexed to a foreign currency. It was soon realized that it would be useful to broaden the question and review whether the treatment of indexed debt is clear and consistent with the fundamentals of macroeconomic statistics.

2. As a first step, the WGIFCD prepared a paper synthesizing its findings on whether a debt denominated in foreign currency and a debt with both principal and coupons linked to a foreign currency should be treated similarly or differently. In July 2004, STA accepted the WGIFCD's recommendation that debt instruments with both principal and coupons indexed to a foreign currency should be classified and treated in the national accounts as though they are denominated in that foreign currency. This recommendation has specific consequences for the recording of interest and other economic flows.² In determining any currency composition of positions, foreign-currency-linked debt should be classified with foreign-currency-denominated debt. (see STA Position Paper on Debt Instruments Indexed to a Foreign Currency, July 2004.)

3. This paper examines the treatment of interest for index-linked debt instruments denominated in domestic currency and offers a clarification on the calculation of interest for these instruments. The STA position has been to support the debtor approach (over the

² In contrast, under the current statistical guidelines, in the case of debt instruments denominated in a foreign currency, the manuals recommend to classify changes in the value of the principal in domestic currency terms that arise from exchange rate variations as holding gains (non-transactions). In the case of debt instruments indexed to a foreign currency, the manuals treated such changes as interest (transactions). This is in line with how the existing statistical standards treat all index-linked instruments.

creditor approach) for defining interest. Therefore, STA recommendations have been developed within this context, without opening this issue.

II. A BREAKDOWN OF INTEREST-BEARING INSTRUMENTS

4. For the purpose of defining and measuring interest, it is useful to distinguish between the following three categories of arrangements:

- **Domestic-currency-denominated fixed-rate instruments.** At inception, the contracting parties determine all future cash flows that the debtor must make in domestic currency. Following the approach for defining interest as recommended in the *System of National Accounts 1993 (1993 SNA)*, interest for these instruments is the difference between the sum of all debtor's payments and the principal the creditor makes available to the debtor. The information needed to calculate all interest accrual is known at inception.
- **Foreign-currency-denominated fixed-rate instruments.** At inception, future cash flows are determined in the relevant foreign currency. The recording of interest on foreign currency fixed-rate instruments is also straightforward, following the *1993 SNA*. Interest is defined according to the formula described above, with the only difference being that, in the first instance, a foreign currency is used as the unit of account. Interest expressed in foreign currency is to be converted into the domestic currency units at the mid-point market exchange rate for the periods in which the interest accrues. The information needed to calculate all interest accrual in the currency of denomination is known at inception.
- **Indexed-linked instruments.** The indexation mechanism links the coupon and/or principal payments to indicators agreed by the parties, and the values of the indicators are not known in advance. As a result, the amount of interest cannot be known at the time of issue. For some instruments, it can only be determined at the time of redemption. Indexed instruments include those indexed to an interest rate, the consumer price index, a stock exchange index, a commodity price, an exchange rate, etc.

5. As stated in paragraph (2) above, STA recommended that debt instruments with both principal and coupons linked to a foreign currency be classified and treated as though they are denominated in that foreign currency. All other types of index-linked instruments, except those denominated in a foreign currency but including those that are partially linked to exchange rates (for example, those for which only principal or only coupons are linked to an exchange rate), would be treated as being denominated in domestic currency for the recording of interest and other economic flows.

III. CURRENT TREATMENT OF INTEREST FOR INDEX-LINKED DEBT INSTRUMENTS

6. The indexation mechanism links the amount of coupons and/or principal to changes in indicators agreed by the parties involved. The current treatment is the same in the various statistical manuals and is described in the following extract from the 1993 SNA:

When the coupon payments are index linked, the full amounts of such payments are treated as interest receivable and payable, in the same way as the interest receivable and payable on any other security paying a contractually agreed variable income. When the value of the principal is index linked, the difference between the eventual redemption price and the issue price is treated as interest accruing over the life of the asset in the same way as for a security whose redemption price is fixed in advance. In practice, the change in the value of the principal outstanding between the beginning and end of a particular accounting period due to the movement in the relevant index may be treated as interest accruing in that period, in addition to any interest due for payment in that period. The interest accruing as a result of the indexation is effectively reinvested in the security and this additional investment must be recorded in the financial accounts of the holder and issuer. (paragraph 7.104)

7. The following conclusions regarding index-linked debt instruments can be derived from the above text:

- Interest is defined as the difference between the future cash flows debtor makes to the creditor and the principal the creditor makes available to the debtor: all the coupons plus (or minus) the difference between the redemption value of the debt instrument and its issue value. First, when *the coupon payments are index linked, the full amounts of such payments are treated as interest*. And, second, when *the value of the principal is index linked, the difference between the eventual redemption price and the issue price is treated as interest accruing over the life of the asset in the same way as for a security whose redemption price is fixed in advance*.

This treatment appears to be consistent with the so-called debtor approach for defining interest accrual.

- *In practice, the change in the value of the principal outstanding between the beginning and end of a particular accounting period due to the movement in the relevant index may be treated as interest accruing in that period, in addition to any interest due for payment in that period.*³

³ This treatment is also suggested in ESA95 para. 4.46c, which mentions only instruments linked to a price index. Paragraph 5.138e mentions also instruments linked to a commodity or exchange rate index with reference to “interest that is accrued over the life of the security.” However, it seems that the ESA95 chose not to follow this recommendation for instruments linked to indicators other than price indices.

8. As the values of indicators used in indexation are not known in advance, interest flows can not be known at the time of issue. Sometimes, they cannot be determined until the instrument is redeemed. This may be the reason why the *1993 SNA* allows flexibility in computing interest flows for each accounting period when principal is indexed. However, this practical approach may lead to counter-intuitive results, including negative interest flows (such as when the value of the indicator declines during an accounting period).⁴

IV. POSSIBLE ALTERNATIVES

9. Four alternative approaches for dealing with indexation of debt instruments are discussed below.⁵ They are (1) the method described in the *1993 SNA* paragraph 7.104, with variations in the practical implementation, (2) an interpretation of the debtor approach, (3) application of the creditor approach, and (4) an embedded derivative approach.

Alternative (1)

10. Alternative (1) uses the *1993 SNA* (and *BPM5* (paragraph 397)) definition of interest and clarifies the determination of interest accruals in each accounting period. Accordingly, when the coupons are index-linked, the full amounts paid as coupons, after indexation, are accrued as interest; and when the value of the principal is index-linked the difference between the eventual redemption price and the issue price is treated as interest accruing over the life of the instrument.

11. This approach has the advantage of simplicity, because the amount of interest recorded is equal to the actual amounts the debtors will have to pay to their creditors over and above the repayment of the initial principal. A disadvantage, however, is that the interest can only be determined ex-post.⁶ In practice, this means that the amounts of interest accruing

⁴ Assume that the principal advanced is 1000, the value of index at the beginning of the period is 100 and at the redemption date is 110, there are two accounting periods during the life of the instrument, and the value of the index at the end of the first accounting period is 120. Then, the interest for the life of the instrument according to the *1993 SNA* is 100 ($[1000 \times 1.10] - 1000$), which is the actual amount the debtor pays to the creditor. The proxy method suggested by the *1993 SNA* for calculating interest flows for each accounting period results interest flows of 200 ($[1000 \times 1.20] - 1000$) in the first accounting period and -100 ($[1000 \times 1.10] - 1200$) in the second accounting period.

⁵ These alternatives approaches would apply to indexed debt, except for debt with both principal and coupons indexed to a foreign currency, which are treated as though denominated in foreign currency, as noted in paragraph 2.

⁶ If a resetting mechanism is used, all actual cash flows for the instrument are known before maturity, at the time of the last resetting to the indexation formula (i.e., one reset period prior
(continued)

in each period are estimates in the first instance, to be revised when all actual payable amounts will be known.

12. Under alternative (1), there are two possibilities for making the initial estimates of interest accruing in an accounting period:

- (a) Using the movement in the relevant index during that period (as suggested in the *1993 SNA*)⁷, which may result in negative interest. This method will include all changes and fluctuations in the value of principal in each accounting period due to the movement in the relevant index as interest. Estimates of interest are revised when actual amounts are known.
- (b) Using the most recent relevant observation(s) of the relevant index(es). The *External Debt Statistics: Guide for Compilers and Users (External Debt Guide)* recommends this approach. It states that *in the absence of firm information, the accrual of interest costs should be estimated ... using the most recent relevant observation(s) of the reference index. Revisions to back data should be undertaken when the amount of interest costs that have been accrued is known with certainty* (para. 2.82).⁸ Estimates of interest are revised as new information becomes available.

13. Over the entire life of the instrument, holding gains and losses due to changes in market value of the instruments (as a result of changes in interest rates or credit ratings) will cancel out.

Alternative (2)

14. Alternative (2) assumes that interest for indexed instruments under the debtor approach can be measured using the market interest rate expectation at the time of issue. Accordingly, interest is the difference between the issue price and the market expectation, at inception, of all payments that the debtor will have to make; it is recorded as accruing over the life of the instrument. This definition records as income the yield-to-maturity at issuance, which incorporates the results of the indexation that are foreseen at the moment the instrument was created. Any deviation of the underlying index from the originally expected path leads to holding gains or losses that will not normally cancel out over the life of the instrument. As the interest accruals are determined ex-ante, they are not subject to revisions later on. The disadvantage of this approach is that interest is not recorded in conformity with

to the maturity). The resetting mechanism involves updating the indexation at periodic intervals and the calculation of cash flows using the updated index until the next reset date.

⁷ *BPM5* provides no “practical” suggestion for calculating interest.

⁸ The *External Debt Guide* approach draws on the *ESA95 Manual on Government Deficit and Debt*.

the 1993 SNA as the difference between future cash flows and the initial cash flow unless ex-ante market expectations are exactly met.

15. Another disadvantage is that the logical conclusion of this approach is that all debt instruments are fixed-rate, given that all variable rate instruments are by definition linked to an index of some sort.⁹

Alternative (3)

16. Alternative (3) uses the so called creditor approach definition of interest. Accordingly, interest is the income that follows from applying, at any point in time, the accrual principle to the difference between the instrument's current market price and the market expectation of all remaining payments the debtor will have to make. The accrual of interest under the creditor approach reflects current market conditions and expectations. Like alternative (2), holding gains and losses may not cancel out because recorded interest would reflect market rates each period, and these may be influenced by factors additional to the specified index. No revisions of the accounts of previous periods are needed.

Alternative (4)

17. Alternative (4) follows an embedded derivative approach. If index-linked contracts are regarded as effectively including embedded derivative contracts, an argument can be made for imputing interest based on a similar instrument that is not indexed. Any remaining difference between the issue and redemption price would then be attributed as a flow on the interest rate derivative contract. This is similar to approach (2) except that holding gains and losses that do not cancel out over the life of the instrument would be classified under financial derivatives not debt instruments. All other holding gains and losses from period to period would be classified under the debt instruments.

18. In addition to having the same drawbacks as described under (2) above, this approach assumes that the embedded derivative can be separately identified and valued, runs counter to existing 1993 SNA methodology for the treatment of embedded derivatives, and to International Accounting Standard 39 (IAS39) for debt instruments valued at fair value. It assumes that data are available on comparable instruments, because without such information interest cannot be measured, and that any differences in interest so observed is solely due to the indexation and takes no account of the underlying liquidity of the markets or other characteristics of the instruments and the markets in which the instruments trade.

⁹ The *External Debt Guide* (para. 6.15) defines variable-rate debt instruments as “those on which interest costs are linked to a reference index—for example, LIBOR, or the price of a specific commodity, or the prices of a specific financial instrument that normally changes over time in a continuous manner in response to market pressures.” Indeed, both the debtor and creditor may have a variety of economic reasons for structuring a contract with a particular type of market-related index.

19. It is worth noting that the IAS39 recommends that embedded derivatives should be accounted separately if economic characteristics and risks of the embedded derivative are not closely related to those of the host contract and the combined instrument is not measured at fair value with changes in fair value reported in profit or loss (IAS39 para. 11). This approach was adopted to close a loophole whereby companies could avoid recording gains and losses on derivative instruments in income (and hence in capital and reserves) by “attaching” them to unrelated instruments valued at nominal value. It mentions equity-indexed and commodity-indexed interest or principal payments as embedded derivatives that have economic characteristics and risks not closely related to host contracts (IAS39 para. AG30). However, whether valued separately or not, the outcome of embedded derivatives are reflected in profit or loss.

Recommendation

20. The Intersecretariat Working Group on National Accounts (ISWGNA) is of the opinion that the *1993 SNA* follows the debtor approach. Given this position, STA proposes that the accrual of interest on index-linked debt instruments be estimated using the most recent relevant observation(s) of the relevant index(es), which is alternative 1.b above, as suggested in the *External Debt Guide*. This method will involve revisions of interest as new information becomes available, but these are likely to be relatively small.

21. STA further suggests that the various alternatives described above be considered in any further debate on the definition and recording of interest.