IMF Working Paper

WP/98/24

INTERNATIONAL MONETARY FUND

Statistics Department

The Statistical Measurement of Financial Derivatives[1]

Prepared by Robert M. Heath

Authorized for distribution by Kevin W. O'Connor

March 1998

Abstract

The *System of National Accounts 1993* (*1993 SNA*) provided new standards for the statistical treatment of financial derivatives. Subsequently, financial derivative markets have evolved, and there have been requests from national statisticians for clarification and amplification of the recommendations in the *1993 SNA* and the fifth edition of the IMF's *Balance of Payments Manual* (*BPM5*). Meeting this need is the main purpose of this working paper. Its recommendations have been widely discussed in international meetings and have been approved by bodies that effect changes in the *1993 SNA* and *BPM5*.

JEL Classification Numbers: B41, C82, E44, F00, G00

Author's E-Mail Address: rheath@imf.org

---

[1]This paper is the product of work arising from the Informal Group on Financial Derivatives that met at the IMF in April 1996, various meetings of the IMF Committee on Balance of Payments Statistics, and the Expert Group meeting held in November 1996 in conjunction with the preparation of the IMF's Manual on Monetary and Financial Statistics. An earlier draft was sent to statisticians in IMF member countries, and many commented. The author wishes to thank all those experts who contributed to the project and the production of the paper. He also extends his thanks to Mr. Russell Krueger of the Fund's Statistics Department who made substantial contributions in the form of ideas and comments and prepared Appendix III, and to Mr. Christopher Wright of the Bank of England, who made important contributions on several issues including the question of offsetability on the market and whose paper on this issue is included as Appendix II.

Contents Page

[2]Written by Mr. Christopher Wright of the Bank of England.

SUMMARY

Over recent years, national statisticians have requested clarification and amplification of the international standards for the statistical measurement of financial derivatives. This paper meets that request. The main clarifications and changes the paper makes to the *1993 System of National Accounts* (*1993 SNA*) and fifth edition of the IMF's *Balance of Payments Manual* (*BPM5*) were approved by the Inter-Secretariat Working Group on National Accounts and the IMF Committee on Balance of Payments Statistics in October 1997.

In many respects, the key recommendations contained in the *1993 SNA* and *BPM5* remain unchanged: financial derivatives should be treated as financial assets, and transactions in them should, in general, be treated as separate transactions, rather than as integral parts of the value of underlying transactions or financial assets to which they may be linked as hedges. Nonetheless, a consensus emerged among statisticians that over-the-counter forward-type contracts, along with futures and options, which are explicitly covered in the *1993 SNA* and *BPM5*, should be regarded as financial assets This consensus is reflected in the paper.

The description of financial derivatives in the paper emphasizes their nature as financial instruments that are linked to a specific financial instrument or indicator or commodity and through which specific financial risks can be traded in financial markets in their own right Regarding specific instruments, the paper concludes that interest rate swaps and forward rate agreements should be recognized as financial assets, and that net cash settlement payments in these contracts and the interest element of cross-currency interest rate swaps should be classified as financial transactions rather than as property income flows as recommended in the *1993 SNA*. The paper sets out the treatment of foreign exchange forward-type derivative contracts, credit derivatives and embedded derivatives. Clarification of the treatment of margin payments and a glossary of terms is provided.

I. INTRODUCTION

When the financial account chapter of the *System of National Accounts,* 1993 (*1993 SNA*) was written (early 1992) only a limited number of statisticians were knowledgeable about financial derivatives and few if any had experience in collecting data. As experience has deepened and widened there have been requests for clarification and amplification of the text of the *1993 SNA* and the fifth edition of the *IMF's Balance of Payments Manual* (*BPM5*). This paper meets this need. In October 1997, the Inter-Secretariat Working Group on National Accounts (ISWGNA) and the IMF Committee on Balance of Payments Statistics approved the changes and clarifications0 to *1993 SNA* and *BPM5* that are incorporated in this paper.

In the process leading up to the preparation of this paper, the Fund brought together experts from the various statistical disciplines in an Informal Group meeting held in Washington in April 1996. The summary report of the Informal Group meeting is attached as Appendix I. Work arising from that meeting was subsequently discussed with balance of payments and monetary statistics compilers in their own fora. In particular, the Expert Group meeting held in November 1996 in conjunction with the finalization of the *Manual on Monetary and Financial Statistics* (*MMFS*) developed several recommendations which are reflected in this paper. The Fund has also involved experts from its own Research Department, and from the accounting profession. An earlier draft of this paper was sent to statisticians in IMF member countries and comments were received from experts in various statistical disciplines.

In many respects, the key recommendations contained in the *1993 SNA* and *BPM5* remain unchanged: The view is still that financial derivatives should be treated as financial assets, and that transactions in them should, in general, be treated as separate transactions, rather than as integral parts of the value of underlying transactions or financial assets to which they may be linked as hedges (*1993 SNA*, paragraphs 11.34 and 11.35). Indeed the emphasis in the discussions held has been to reinforce these conclusions, and validate the *1993 SNA* standards for defining the financial asset boundary. The research has also increased technical knowledge about financial derivatives markets and instruments.

Nonetheless, in preparing this paper there was a debate about the nature of financial derivatives and how they fit into the financial asset boundary. The developments in financial derivative markets in recent years has lead to increased activity in the off-exchange or over-the-counter markets. The view of many compilers, which is also reflected in the views of prudential supervisors and much of the accounting profession, is that many over-the-counter financial derivative instruments are in fact stores of value. In the *1993 SNA* and *BPM5* only those financial derivatives that have market value and are tradable are recognized as financial assets: essentially, exchange traded futures and options, and over-the-counter options. However, while in general terms there might be agreement on what is and what is not an over-the-counter financial derivative instrument, in practice it has proved difficult to draw

guidelines that reflect the growing consensus view without opening up the financial asset boundary to financial arrangements which are generally accepted as not being financial assets and which, at present, fall outside of the *1993 SNA* asset boundary.

Resolving this problem was difficult. One approach is to enumerate financial derivatives by instrument. While this may be an attractive approach in the short term, it is inflexible in the longer term to new market developments. The list would have to be consistently updated. Also, it relies on market terminology which might mean different things to different compilers. Nonetheless, in Section III of this paper the treatment in the national accounts of some of the most common over-the-counter financial derivatives is set out.

A second approach to the problem is to include those financial derivatives which are considered tradeable, given that tradeability is a method of demonstrating value. As many financial derivatives are not traded in the conventional sense, this approach leads to the use of a proxy for trading: "offsetability on the market". This approach is taken by Eurostat in the *1995 European System of Accounts* (ESA). The concept advanced is that when a market participant can readily offset in a liquid market an open position in one contract by taking a counter position in another contract the market participant is, in essence, engaging in trading activity. In fact, offsetability on the market in financial derivative markets is a mechanism for trading specific financial market risks without trading the contracts themselves. Appendix II is a paper from Mr. Christopher Wright of the Bank of England which explains the concept and applicability of "offsetability on the market".

The approach taken in this paper to the problem set out above is to present a description of financial derivative instruments for national accounts purposes that, inter alia, takes into account "offsetability on the market." By describing a financial derivative instrument, it is possible to place financial derivatives in the spectrum of financial instruments, and most importantly can clearly state what is not a financial derivative instrument for national accounts purposes. Additionally, by describing financial derivatives and so emphasizing their difference in nature from other financial assets, the case is made in favor of a separate instrument category in the national accounts for these instruments. From the Fund's viewpoint, developing a description fits naturally into the overall system of national accounts, and is likely to prove of sufficient flexibility to guide national compilers to appropriate and consistent conclusions over the medium term.

In summary, the paper introduces two significant changes to the international statistical standards for the measurement of financial derivatives activity. First, a less restrictive view is now taken as to which financial derivative contracts fall within the existing *SNA* asset boundary so allowing for the inclusion of more over-the-counter (or non-exchange traded) financial derivative contracts. Second, and related to the first point, interest rate swaps and forward rate agreements (FRAs) are recognized as financial assets, and net cash settlement payments in these contracts classified as financial transactions rather than as property income flows as recommended in the *1993 SNA* (paragraphs 11.37 and 11.43). This change has implications for the measurement of national income.

More specifically, in October 1997, the ISWGNA and the IMF Committee on Balance of Payments Statistics approved the following:

- **A revised description of financial derivatives for national accounts purposes (Section II, Part A).**

- **Financial derivatives should be included in the national accounts as financial assets, regardless of whether "trading" occurs on- or off-exchange (Section II, Part B).**

- **A transaction in an asset underlying a financial derivative contract that goes to delivery should be recorded at the prevailing market price for the asset with the difference between the prevailing price and the price actually paid (times quantity) recorded as a transaction in financial derivatives (Section II, Part D).**

- **Interest rate swaps, and forward rate agreements should be classified as financial assets; and net cash settlements payments in these financial derivatives should be classified as financial account transactions rather than as interest. This change will affect recorded interest in the national accounts, and hence have implications for national income (Section III, Part B).**

- **Net cash settlement payments on the interest element of cross-currency interest rate swaps should be classified as financial account transactions (Section III, Part C).**

- **Financial derivatives should be recognized as a separate instrument category of financial assets in the national accounts, and as a separate functional group in the balance of payments reflecting their distinct characteristics (Section V, Part A). (The practical implications of this change need to be considered before it is implemented into the international reporting standards for balance of payments.)**

In commenting on the earlier draft, several compilers recommended that proposals for collection of data on financial derivatives take into consideration accounting standards and practical limitations on data availability. Indeed, in many countries, compilers rely to a significant extent on accounting standards and regulations when collecting information for use in the national accounts and balance of payments. The accounting and regulatory coverage and valuation often affect the types of statistics that can be compiled, the amount of detail available, or information on counterparties, etc.

In numerous countries, accounting practices have severely limited the compilation of data on financial derivatives, not least because many financial derivatives have been treated as off-balance sheet instruments. Also, accounting and regulatory definitions of financial derivatives may differ from definitions preferred for national accounts purposes. However, the

situation regarding recognition and valuation appears to be changing rapidly as banking supervisors and accounting authorities increasingly recommend or require recognition of all derivatives on balance sheets and their valuation on a "fair value" (market value) basis. These changes are in line with the approach taken in this paper to include more over-the-counter financial derivative instruments within the financial asset boundary and to value positions in financial derivatives at market value. It is not possible at this time to predict how widely the changes in accounting standards will be adopted, or whether significant exceptions will be introduced, but the general movement is in line with the approach in this paper.

Of course, the needs of national accounts and commercial accounting are not the same. One significant difference is the practice of accounting regulations to include holding gains and losses on financial instruments in the profit and loss account, whereas in the national accounts the realization of holding gains and losses is recorded as transactions in the financial account. Thus, while, for instance, accounting standards may require interest rate swaps be recognized as financial assets to be valued at fair value, they may also allow gains and losses on these and other interest rate derivative contracts used in association with a primary financial instrument to be included in the determination of interest income and expense. But separate disclosure of these gains and losses is probable. Also, there may be "instruments" such as embedded derivatives and contingencies that may be valued for accounting purposes but are not recognized in the national accounts as financial assets.

II. Conceptual Framework

This section sets outs the conceptual framework for the treatment of financial derivatives. It provides a description of financial derivatives for national accounts purposes; identifies some key characteristics and types of financial derivatives; reassesses which financial derivatives are included within the *1993 SNA* asset boundary; and clarifies the recording of financial derivative transactions.

A. What is a Financial Derivative?

The *1993 SNA* only provides a general definition or description of financial derivatives. This can now be further refined.

Coverage of financial derivatives for national accounts purposes[3]

Financial derivatives are financial instruments that are linked to a specific financial instrument or indicator or commodity, and through which specific financial risks can be traded in financial markets in their own right. The value of a financial derivative derives from the price of an underlying item, such as an asset or index. Unlike debt instruments, no principal amount is advanced to be repaid and no investment income accrues. Financial derivatives are

---

[3]Appendix IV sets out definitions of financial derivatives developed for other purposes.

used for a number of purposes including risk management, hedging, arbitrage between markets, and speculation.[4]

The description of financial derivatives in the previous paragraph highlights the nature of financial derivatives as instruments that enable parties to trade specific financial risks—such as interest rate risk, currency, equity and commodity price risk, and credit risk, etc.—to other entities who are more willing, or better suited, to take or manage these risks. Part B of this section provides a fuller description of how risk is traded on markets through financial derivative instruments. Part B also explains why a financial derivative instrument that is offsetable on the market[5] can be regarded as a financial asset within the *1993 SNA* asset boundary.

The value of a financial derivative contract derives from the price of an underlying item: the reference price.[6] Because the future reference price is not known with certainty, the value of the financial derivative at maturity can only be anticipated, or estimated. The reference price may relate to a commodity, a financial instrument, an interest rate, an exchange rate, or another derivative, or an index or basket of prices, or a spread between two prices. Of course, to calculate the value of any financial derivative instrument it is essential that a prevailing market price for the underlying item be observable. How financial derivative instruments are valued is set out ahead in Part C of this section.

Typically, but not always, a financial derivative instrument allows counterparties to change their risk exposure without trading in a primary asset or commodity. Consequently, financial derivatives contracts are usually settled by net payments of cash, often before maturity for exchange traded contracts such as commodity futures. This logically follows from the use of financial derivatives to trade risk independently of ownership of an underlying item. However, some financial derivative contracts, particularly involving foreign currency, are associated with a transaction in the underlying item. The treatment in the national accounts of transactions (and positions) in financial derivatives, including when the underlying item is delivered, is set out ahead in Part D of this section. A description of over-the-counter foreign currency financial derivative instruments and their treatment is set out ahead in Section III of this paper.

---

[4]The use of financial derivatives can reduce transactions costs, and/or aid price discovery.

[5]For a definition of "offsetable on the market" see the entry for "offsetability on the market" in the glossary of terms at the end of this paper.

[6]In this paper, the term reference price is the price of the underlying item(s) from which the financial derivative contract acquires value. The strike price is the agreed price of the contract at which the counterparties will transact if the financial derivative is exercised. Where the value of a forward contract is based on the difference between two reference prices, such as in an equity swap, there is no agreed strike price as such.

In order to further clarify what is a financial derivative instrument for national accounts purposes, it is worth setting out what are not financial derivative instruments for national accounts purposes.

- A **fixed price contract** for goods and services is not a financial derivative instrument, unless, like commodity futures, the contract is standardized in such a way that the market price risk embodied in it can be traded in financial markets in its own right.

- For national accounts purposes, **timing delays** arising in the normal course of business, which may entail exposure to price movements do not give rise to transactions and positions in financial derivatives in the national accounts. Such timing delays include normal settlement periods for spot transactions in financial markets, and those that arise in the normal course of trade in goods and services.

- **Insurance** is not a form of financial derivative. Insurance contracts provide individual institutional units exposed to certain risks with financial protection against the consequences of the occurrence of specified events, many of which cannot be expressed in terms of market prices. Insurance is a form of financial intermediation in which funds are collected from policyholders and invested in financial or other assets which are held as technical reserves to meet future claims arising from the occurrence of the events specified in the insurance policies: that is, insurance manages event risk primarily by the pooling, not the trading, of risk.[7]

- Contingencies, such as **guarantees and letters of credit** are not financial derivatives. The principal characteristic of contingencies is that one or more conditions must be fulfilled before a financial transaction takes place. Typically, these contingencies are not instruments that facilitate the trading of specific financial risks.

- **Embedded derivative-like features** of standard financial instruments that are an inseparable part of the underlying instrument are not financial derivatives for national accounts purposes because the financial derivative is an integral part of the instrument and so the counterparties to both the underlying instrument and the financial derivative are the same. See Section III, Part E ahead for a fuller exposition of the treatment of embedded derivatives.

---

[7]See paragraph 6.135 of the *1993 SNA* for a description of the characteristics of insurance.

Types of financial derivatives

There are two main types of financial derivative contracts: forwards, including swaps, and options.[8] Swaps might be considered distinct from other forward-type contracts because of the different nature of the risks involved.

Under a **forward-type** contract, the two counterparties agree to exchange an underlying item - real or financial - in a specified quantity, on a specified date, at an agreed contract (strike) price or, in the specific example of a swaps contract, the two counterparties agree to exchange cash flows, determined with reference to the price(s) of, say, currencies or interest rates, according to pre-determined rules. Forward-type contracts are unconditional financial contracts because there is an obligation to settle the contract on a specified date. While at inception there is an exchange of risk exposures of equal market value, both parties are potential debtors; a clear debtor/creditor relationship is not established at inception - because typically a forward-type contract is established at zero value - and even if such a relationship does emerge it may change both in magnitude and direction over time. Many forward instruments involve net cash settlement payments, based on the difference between the agreed contact (strike) price and the prevailing market price, or the spread between two reference prices, times quantity, for the underlying item.

Forward-type contracts traded on organized financial derivative markets (organized exchanges) are called futures. Other common forward-type contracts include forward rate agreements (FRAs), and forward foreign exchange contracts. Among the most common swap-type contracts are interest rate and cross-currency interest rate swaps. Section III describes and considers the treatment of FRAs, interest rate swaps, and forward-type foreign exchange contracts.

Under an **option-type** contract, the purchaser of the option, in return for an option premium, acquires from the writer of the option, the right but not the obligation to buy (call option) or sell (put option) a specified underlying item - real or financial - at an agreed contract (strike) price on or before a specified date. The important difference between a forward and an option is that whereas either party to a forward is a potential debtor, under an options contract the buyer has an asset, and the seller has a liability. However, the option may expire worthless; the option will be exercised only if settling the contract is advantageous for the purchaser. The purchaser may make gains of unlimited size, and the writer may experience losses of unlimited size. Options are commonly written on a wide variety of underlying items such as interest rates - including collars, caps and floors - currencies, equities, and commodities. Options are also written on futures, and swaps (known as swaptions), and other instruments such as caps (known as captions).

---

[8] Forwards, swaps and options are also described in paragraphs 11.37 to 11.43 of the *1993 SNA*, and paragraphs 401 to 408 of *BPM5*.

On organized markets, option contracts are usually settled in cash. Some option-type contracts are settled by the purchase of the underlying asset: for instance, warrants are financial contracts that give the holder the right to buy, under specified terms, a certain number of the underlying asset, such as equities and bonds. If warrants are exercised the underlying asset is usually delivered. Warrants can be traded apart from the underlying securities to which they are linked.

B. Which Financial Derivatives Fall Within the *1993 SNA* Asset Boundary?

1993 SNA asset boundary

The revision process for the System of National Accounts, which led to the *1993 SNA*, devoted substantial attention to the production and asset boundaries within the system. Discussions on the asset boundary covered the nature of both nonfinancial and financial assets and the closely related question of whether transactions should be classified as current on the one hand or capital or financial on the other. With regard to nonfinancial assets, discussions covered such areas as military durables, computer software, mineral exploration, and research and development. With regard to financial assets, the review process addressed distinguishing financial assets from nonfinancial assets and distinguishing financial assets from financial arrangements that do not have all the characteristics of assets and are therefore excluded from the financial accounts. Contingent positions such as guarantees are examples of the latter.

The discussions on the nature of assets in general led to a characterization of assets as entities over which ownership rights are enforced and from which economic benefits may be derived by their owners by holding them or using them over a period of time.[9] All traditional financial assets meet the basic criteria for assets at least in the fact that they are a store of value. Most financial assets differ from nonfinancial assets in that there are counterpart liabilities on the part of other institutional units. Only financial assets involve a debtor/creditor relationship between units. However, monetary gold and Special Drawing Rights (SDRs) are treated as financial assets even though they do not involve claims on other units, and shares (equity) differ from other financial assets in the nature of the liability.

In the effort to distinguish financial assets from other financial arrangements that are not assets, the *1993 SNA* notes that most financial assets involve unconditional relationships

---

[9]Financial derivatives are instruments over which ownership rights can be enforced. Also, financial derivatives can bring economic benefits. For instance, a financial derivative may allow end users to smooth cash flow over time by accepting a known future market price for a financial instrument or commodity rather than facing the, as yet, unknown market price at the moment they want/need to transact. Among the economic benefits deriving from a smoother cash flow are a possible reduction in tax bills, the ensuring of sufficient cash to finance planned investment programs, and a reduction in the possibility of getting into financial difficulty because of sudden adverse movements in market prices.

between debtors and creditors. Arrangements that are conditional to one or both units are generally to be excluded from financial assets. For example, loan guarantees are conditional in that the guarantor only incurs a liability if the primary obligor defaults; letters of credit only give rise to transactions if specified documents are presented. Financial assets in the *1993 SNA* generally are unconditional for both units.

Demonstration of value is essential if a financial instrument is to be included within the *1993 SNA* asset boundary. Tradeability is, of course, a sufficient condition for demonstrating value, but it is not a necessary condition. The system does not specify other means for determining value, but does allow for them, for example in the case of a nontradeable arrangement that can give rise to holding gains and losses.

The value of a financial derivative

As noted above, a key characteristic of most derivatives contracts is that transactors commit themselves forward to an agreed price or set of prices at which they will or are willing to transact in an underlying "asset". From this the value of a financial derivative derives from the difference between the agreed contract price(s) and the prevailing, or expected prevailing, market price(s), appropriately discounted, and in the case of options taking into account potential volatility of the price of the underlying instrument, the time to maturity and interest rates.

If the relationship between the agreed contract and prevailing (or anticipated prevailing) market price is a crucial element in the valuation of financial derivative contracts, then by extension the price at which the *1993 SNA* values the underlying asset is a crucial element in determining whether financial derivative contracts have value in the *1993 SNA* system. If the *1993 SNA* requires that the prevailing market price is used to value the underlying asset in the position data, and this differs from the contract price, then the financial derivative contract does have value in the statistical system. The 1993 *SNA* is clear on the valuation of position data: " assets and liabilities are to be valued using a set of prices that are current on the date to which the balance sheet relates and that refer to specific assets" (paragraph 13.25). Thus, underlying assets should be valued at current, not contract, prices, implying that financial derivative contracts have value in the statistical system.

Distinction between on and off exchange traded financial derivatives

In the *1993 SNA*, tradeability was the overriding consideration for establishing the value of financial derivatives (*1993 SNA*, paragraph 11.34). The *1993 SNA* stated that those financial derivatives which have market value and are tradeable are regarded as financial assets. These include futures and options traded on organized exchanges. Also included as financial assets, by convention, are over-the-counter (OTC) option premiums, including those on warrants. For these financial contracts, the commitment of the writer to buy or sell a specified underlying item - real or financial - at a predetermined price on or before a specified

date on the demand of the purchaser, is regarded as a liability, and is valued at the current cost to the writer of buying out his liability (*1993 SNA*, paragraphs 11.36, 11.39 and 11.41).

However, it is now clear that the concept of tradeability is different for forward- type financial derivative contracts than for other financial assets that are traded. This is because, as mentioned above, both parties to the forward-type contract have a potential liability, and, as with other financial instruments, the debtor cannot trade his/her liability. So, once a forward-type is created, the two parties can only extinguish their potential, or actual, liability through settlement or mutual agreement. The trading of forward -type financial derivative contracts on an exchange is in fact a series of creations of contracts, and the extinguishments of contracts through mutual agreement between the clearinghouse and the other counterparties. The counterparty will sell a futures position by buying an exactly opposite or offsetting position, leading to settlement and mutual cancellation of both contracts by the counterparty and the clearing house (see Appendix II). The same is also true for a option writer who wants to sell his/her liability.

Trading in the over-the-counter forward-type financial derivatives market is conceptually the same as on-exchange except that, at present, mutual agreements to extinguish contracts are infrequent. Instead, the emphasis is on the creation of new contracts; this essentially is what is termed as "offsetability on the market." In other words, an entity owning a financial derivative contract, and hence having exposure to the risk underlying the contract, such as interest rate or currency risk, establishes another contract in order to sell, and hence no longer have exposure to, the underlying risk of the first contract.

The entity may trade the risk by immediately creating a new, but "reverse", contract with exactly the same underlying risk characteristics as the one owned. The entity will need to be able to create a contract quickly because there is a risk involved in delay: prices could move adversely. Hence, in over-the-counter financial derivatives markets established procedures exist, such as master legal agreements, which allow for standardization of contracts and legal certainty, and dealers offering quotations more-or-less continuously. These features allow for risk to be traded quickly and efficiently.

Risk can also be traded by purchasing or creating a different financial derivative instrument. In other words, options may be used to trade risk acquired through a forward contract (see Appendix II). The financial markets have developed seemingly infinite methods to trade risk, and so alter risk exposures, through the use of financial derivative instruments.

However, while the underlying risk may have been traded, the entity still faces counterparty risk on the outstanding contracts it owns. If any of the counterparties to the offsetting contracts fail to meet their commitment, the entity faces exposure to the risk that has been traded. So counterparty risk is an important consideration in financial derivative markets. In the organized exchanges, the clearinghouse meets this risk by acting as the

counterparty to all trades and requiring margin to be deposited and paid.[10] To protect against counterparty risk in the over-the-counter market, many participants only "trade" with high quality counterparties and/or require collateral (the same as margin on organized exchanges). In the over-the-counter market, the counterparty risk will be taken into account when valuing the financial derivative.

The requirement for collateral in turn leads to agreed methods of valuation for forward -type financial derivatives contracts. This leads to the conclusion that like on-exchange contracts, over-the-counter (or off-exchange) forward-type financial derivative instruments that are offsetable on the market are, in fact, stores of value that can generate holding gains and losses. Because they remain outstanding, the value of each outstanding contract owned by an entity should be recorded in the national accounts.

It is worth noting that the prices quoted on-exchange are the prices for delivery of the underlying item at settlement and not the value of each forward-type financial derivatives contract (futures). That is, on-exchange trading provides the prevailing reference price for the day of settlement of the contract. The value of each future is derived from the difference between the price agreed when the contract was purchased[11] and the prevailing reference price for delivery of the underlying item on the settlement day. In contrast, the prices quoted for options both on- and off-exchange reflect the value of the financial derivatives asset itself: the value of the option is directly observable. This is because the purchaser of the options premium, unlike the parties to a forward, acquires an asset—the right to purchase or sell an specified underlying item—and the price of that asset has to be established. The asset—premium—can be sold to another counterparty.

Of course, to calculate the value of any financial derivative instrument it is essential that a prevailing market price for the underlying item is observable. It is no coincidence that the most frequently "traded" over-the-counter financial derivatives - interest rate swaps, forward rate agreements (FRAs), foreign exchange swaps, and forward foreign exchange contracts - are based on underlying items for which prevailing market price are readily available: these are common financial risks to be "managed" and they can be readily valued. In the absence of an observable price for the underlying item, the "financial derivative" cannot be valued, cannot be regarded as a store of value, and so cannot be regarded as a financial asset. It may well be that in such instances, the instrument is not in fact a financial derivative as

---

[10]Of course, there is the risk, however remote, that the clearinghouse could default.

[11]The exchange, through its margining practices, may revalue the contract daily and require settlement, in which case the previous revaluation, not the price agreed when the contract was purchased, is relevant. See Section IV for a description of margining practices.

defined above but some other type of arrangement.[12] More details on how value is established is set out ahead in Part C of this section.

In short, developments in financial markets have been such in recent years that the distinction between financial derivatives "traded" on-exchange, and those "traded" off-exchange is one of market arrangements rather than difference of economic substance: to facilitate the trading of financial risk. Indeed, the indications are that arrangements for on- and off-exchange trading are continuing to converge. The *1993 SNA* and *BPM5* make no distinction between on-and off-exchange "traded" option-type contracts, classifying both as financial assets. No distinction should now be made between on- and off-exchange forward-type contracts; both should be regarded as financial assets. Appendix III provides further justification for treating forwards in the same manner as futures.

Thus, financial derivatives, as described above, should be included in the national accounts as financial assets, regardless of whether they are "traded" on- or off-exchange.[13] If the financial derivative cannot be valued because a prevailing market price for the underlying item is not observable, it cannot be regarded as a financial asset.

C. How are Financial Derivatives Valued?

As with other financial assets and liabilities,[14] financial derivatives are to be valued using a set of prices that are current on the date to which the position statement relates. Ideally, these prices should be observable prices on financial markets whenever such prices are available. Many financial derivative instruments require the estimation of value based on prevailing information.

Valuation of option-type contracts

Four factors influence the price of an option: the difference between the contract (strike) price and the value of the underlying item; the price volatility of the underlying item;

---

[12]For instance, in the early 1990s there were attempts in the US to create forward-type financial derivatives based on catastrophe risk. The attempts to launch such products failed at that time because of a lack of a widely recognized representative underlying index. For national income purposes, these "instruments" might well have been regarded as contingencies.

[13]Units specializing in issuing financial derivatives can be classified as intermediaries in cases where the financial derivatives are recognized as financial assets.

[14]General principles of valuation are set out in Chapter XIII, Section A, Part 4 of the *1993 SNA*.

the time remaining to expiration; and interest rates. See Box 1 for more details. The option price is the market value of the right that the purchaser has acquired from the option writer to buy/sell a specified underlying item.

In the absence of an observable price, market value can be approximated by using a financial formula, such as the Black-Scholes formula, which incorporates the four factors. This formula is complex. Most organizations with significant options operations value positions in their balance sheets or supplementary accounts using this or similar formulae. Provided this is the case, the compiler can accept the valuation of option positions provided by principals unless there is serious doubt as to the validity in terms of market valuation principles.

At inception, an option-type contract will have a market value equal to the premium paid; its market value will change as reference price(s) change and the settlement date approaches. But during the life of an option-type contract, the writer of an option-type contract will always have a financial derivative liability, and the purchaser will always have a financial derivative asset. An option-type contract can expire worthless; that is, it is not advantageous for the purchaser to exercise the option. If the option-type contract had value in the previous position statement then a valuation change would be recorded in the position statement (see Example 1).

Box 1. Option Pricing

There are four influences on the price of an options contract:

- difference between the contract (strike) price (A) and the value of the underlying item (B). For call options, if A is greater than B, the option is so-called out-of-the-money: purchasing the underlying item by exercising the option would cost the holder of the option more than purchasing the underlying item directly on the market. If B is greater than A, the option is so-called in-the-money: purchasing the underlying item by exercising the option would be cheaper for the holder of the option than purchasing the underlying item directly on the market. The situation is reversed for put options. The sensitivity of an option price to a change in the price of the underlying item is known as its' "delta"; the sensitivity of an option delta to a change in the price of the underlying item is known as its' "gamma".
- price volatility of the underlying item. The more volatile the price of the underlying is expected to be during the life of the option contract, the more the option is worth. The sensitivity of an option price to a change in expected volatility is known as vega.
- time remaining to expiration. The closer an option is to expiration, ceteris paribus, the less it is worth. The sensitivity of an option price to time "decay" is known as theta.
- current interest rate. Generally, the higher the interest rate, the less the option is worth. The sensitivity of an option price to a change in interest rates is known as rho.

Example 1.

An entity owns an option worth 50 at the end of period which expires worthless during period 2. The entries in the national accounts balance sheet are:

	Opening position	Transactions	Other Changes In Volume	Revaluation Account	Closing Position
Financial Derivatives-Assets	50	0	0	-50	0

Valuation of forward-type contracts

The value of a forward-type contract derives from the difference between the agreed contract (strike) price(s) and the prevailing, or expected prevailing, market price(s) on the day of settlement, times the principal amount, appropriately discounted. So, for example, when the agreed rate on an FRA is different from the expected prevailing rate on the day of settlement, one party will expect a receipt of cash, the other party will expect to make a payment of the same amount. The value of this contract, for the asset holder, will be the expected gross receipt discounted by the appropriate discount factor: that is, its net present value (see Box 2). In the specific case of a swap contract based on a notional principal amount, its value derives from the difference between the expected gross receipts and gross payments, appropriately discounted: that is, its net present value.

If the net present value of a forward-type contract is positive (that is, the present value of future amounts receivable is greater than the present value of future amounts payable), the contract is a financial asset. If the net present value is negative (that is, the present value of future amounts receivable is less than the present value of future amounts payable), the contract is a financial liability.

At inception, a forward-type contract in principle has zero net present value:[15] in principle, the two counterparties are trading risk exposures of equal market value.[16] As reference price(s) alter it will acquire value; and, unlike other financial assets, a forward-type contract can switch from a net positive value at the end of one period, to a net negative value at the end of the next. In the position statement, this change in position should be recorded as a valuation change: the net asset position is extinguished by a valuation change, and a net liability position is established by a valuation change (see Example 2).

Box 2. Net Present Value

The net present value (NPV) of any financial instrument can be established by dividing the expected net future receipts (that is, receipts less payments) associated with the instrument by a relevant discount factor.

Formally:

$PV = FA / (1+I)^n$ in which

PV = present value
FA = future amount receivable or payable
I = an appropriate interest rate (expressed as a decimal)
n = number of periods before amount becomes due

$NPV = SUM(PV_R) - SUM(PV_P)$ in which

PV_R = present value of future amounts receivable
PV_P = present value of future amounts payable

[15]In principle a forward-type contract is established with zero value, but in the over-the-counter market, a forward-type contract could have a positive or negative value from inception reflecting, say, counterparty risk.

[16]Difficulties in establishing generally agreed market prices for the risk exposures being traded have hampered the development of markets in some types of risk, such as credit risk. Without market prices, it is not evident to both counterparties that they are trading risk exposures of equal market value, hence discouraging market activity.

Example 2.

An entity owns a forward rate agreement (FRA) which is valued as a positive 100 at the end of period 1. In period 2 interest rates alter so that the FRA is valued at a negative 60 at the end of period 2. The entries in the national accounts balance sheet are:

	Opening position	Transactions	Other Changes In Volume	Revaluation Account	Closing Position
Financial Derivatives-Assets	100	0	0	-100	0
Financial Derivatives-Liabilities	0	0	0	60	60

D. How Should Transactions in Financial Derivatives be Recorded?

The *1993 SNA* recommends that transactions are recorded when economic value is created, transformed, exchanged, transferred, or extinguished. Regarding the valuation of transactions the *SNA* is clear: "transactions in financial assets are recorded at the prices at which the assets are acquired or disposed of" (paragraph 11.44), that is, the price paid.

In principle, transactions in financial derivatives are recorded when financial derivative contracts are created, traded, and extinguished (exercised). When financial derivative contracts are created or traded the value of the transaction recorded is that established by the market. The creation of an options-type contract involves the payment of an option premium: this constitutes the acquisition of a financial derivatives asset by the purchaser; and a liability by the writer. The creation of a forward-type contract does not involve the recording of a financial account transaction in financial derivatives.

Example 3.

An entity owns a commodity future which is exercised for a cash receipt of 50. At the end of the previous period the future was worth 75.

	Credit	Debit
Financial Derivatives - Assets	50	
Currency and Deposits - Assets		50

	Opening Position	Transactions	Other Changes In Volume	Revaluations	Closing Position
Financial Derivatives-Assets	75	-50	0	-25	0

When a financial derivatives contract is settled through a net cash settlement payment made, both counterparties should record a transaction in financial derivatives equal to the cash value of the net settlement payment, and record no transactions in the underlying item. The net cash settlement payment represents the difference between the prevailing and agreed contract (strike) price (or between two reference prices) for the underlying item times quantity. The counterparty making the payment of cash should record a reduction in financial derivative liabilities; the counterparty receiving cash should record a reduction in financial derivative assets (see Examples 3 and 4). If an options-type contract reaches expiration date and is not exercised, no transactions are recorded, and the balance sheet value is revalued to zero.

Example 4.

An entity owns a commodity future that is subject to daily marking to market and the settling of any liability position. In the current period, the entity realizes losses of 25 and realizes gains of 75. By definition, the future has zero value at the beginning and end of the period.

	Credit	Debit
Financial Derivative - Assets	75	
Financial Derivative - Liabilities		25
Currency and Deposits - Assets		50

	Opening Position	Transactions	Other Changes In Volume	Revaluations	Closing Position
Financial Derivatives - Assets	0	-75	0	75	0
Financial Derivatives - Liabilities	0	-25	0	25	0

If the asset—real or financial—underlying the financial derivative contract goes to delivery, such as when a warrant is exercised, then different conceptual issues are raised. One approach is for the compiler to record the transaction in the underlying asset using the price at which the asset is acquired, that is the price actually paid,[17] and record no transactions under financial derivatives. This can be seen as consistent with the *1993 SNA* principle of valuation as quoted previously (*SNA* paragraph 11.44). As regards any distortions caused by immediately on-selling the asset, or subsequently valuing it at market price in the position statement, the difference between the amount actually paid for the asset and its prevailing market price would be recorded as a valuation change. If the financial derivative had value in the previous position statement then an "other change in volume" would be recorded in the next position statement (see Example 5). There are also seen to be practical reporting advantages with this approach: the actual price paid is directly observable and may correspond with some accounting practices.

[17]The price paid may not only include cash, but also other financial assets.

Example 5.

An entity owns a warrant. The entity has a right to purchase 100 equity at 50 each. The entity exercises the right. The prevailing price for the equity when the warrant is exercised is 75, the same as at the end of the previous period, and at the end of the present period.

	Credit	Debit
Equity - Assets		5000
Currency and Deposits- Assets	5000	

	Opening Position	Transactions	Other Changes In Volume	Revaluations	Closing Position
Financial Derivatives-Assets	2500	0	-2500	0	0
Equity - Assets	0	5000	0	2500	7500
Currency and Deposits - Assets	5000	-5000	0	0	0

In pricing the warrant, only the difference between the reference and strike price has been taken into account.

Alternatively, the compiler could record the transaction in the underlying asset not at the price actually paid, but at the prevailing price for the asset. The difference between the prevailing price and the price actually paid (times quantity) is recorded as a transaction in financial derivatives (*BPM5* paragraphs 132 and 402) (see Example 6). There are two justifications for this alternative approach:

- First, the principle of valuation expressed in the *1993 SNA* can be interpreted more broadly than suggested by a strict reading of the quotation in paragraph 11.44. The argument is as follows: A common method of valuation is required to measure transactions in the national accounts so that numerous, varied economic transactions can be linked in a single accounting unit for analytical purposes. The *1993 SNA* recommends use of the price agreed by the two transacting parties, or the market price as it is otherwise termed in *1993 SNA* paragraph 2.68, because, inter alia, the agreed price is considered to be the best measure of economic value. When an underlying asset goes to delivery, the prevailing market price is more likely than the agreed contract price to be the best measure of economic value, and so the prevailing market price should be the recorded transaction price for the underlying asset.

- Second, when the financial derivative being exercised is a financial asset, then the extinguishing of a financial asset/liability is a transaction that needs to be recorded. This transaction has a value - the market price of the financial derivative at the time of settlement - although this value may not be directly observable when the underlying asset is delivered. The sum of the value of the financial derivative and the cash paid equals the prevailing price of the underlying asset.

Example 6.

The example is the same as in Example 5, but the answer uses the alternate approach to recording transactions when the underlying instrument is delivered.

An entity owns a warrant. The entity has a right to purchase 100 equity at 50 each. The entity exercises the right. The prevailing price for the equity when the warrant is exercised is 75, the same as at the end of the previous period, and at the end of the present period.

	Credit	Debit
Financial Derivatives- Assets	2500	
Equity - Assets		7500
Currency and Deposits- Assets	5000	

	Opening Position	Transactions	Other Changes In Volume	Revaluations	Closing Position
Financial Derivatives- Assets	2500	-2500	0	0	0
Equity - Assets	0	7500	0	0	7500
Currency and Deposits - Assets	5000	-5000	0	0	0

In pricing the warrant, only the difference between the reference and strike price has been taken into account.

Among compilers who commented on an earlier draft of this paper, there was an overwhelming preference for the alternative approach although it is recognized that there could be practical difficulties in implementation. The main argument made in favor of this approach was that if the financial derivative is recognized as a financial asset, its exercise is a transaction that should be recorded as such and not as an "other volume" change. Compilers also felt that this alternative approach allows for a more meaningful reconciliation of transactions, valuation changes and positions data, as well as more accurately reflecting actual events and so is preferable from an analytical viewpoint. In coming to this conclusion, it is

important to emphasize the causality: if the financial derivative meets the criteria to be classified as a financial derivative asset then its exercise is a transaction in financial derivatives. Adopting this approach does not mean, for instance, that prices of goods and services agreed in advance of delivery and payment have to be adjusted when calculating transactions flows.

Thus, a transaction in an asset underlying a financial derivative contract that goes to delivery should be recorded at the prevailing market price for the asset with the difference between the prevailing price and the price actually paid (times quantity) recorded as a transaction in financial derivatives.

Two specific issues

First, how should transactions in swap contracts be classified when a swap contract switches from a net asset to a net liability position between end reporting periods? In recording transactions in these contracts, all transactions should be recorded as asset transactions when the contract is in a net asset position, and as liability transactions when the contract is in a net liability position. The appropriate treatment is set out in Example 7.

Second, the *1993 SNA* (paragraph 11.40), explains that the timing of premium payments on options varies: "With some types of options, premiums are paid when the contracts begin, when the options are exercised, or when the options expire. With other types of options, part of the premiums are paid on the day of purchase and the remainders are paid if the market prices of the option decline through the variation margins."

When only part of the option premium is paid at inception, the purchaser has a liability to the writer, and a financial asset of greater value than the initial payment: the value of the full premium reflects the market price of the option at inception. In contrast, the writer has a liability greater than the initial payment received. In principle, at inception, the purchaser and writer should record a financial derivatives transaction at the full value of the premium, and a liability/asset under "other accounts receivable/payable, other" ("other investment, other" in the balance of payments), and any subsequent payments of premium should be reflected in a reduction in the same category. See Example 8. In principle, any interest accruing from this liability/asset should accrue on "other accounts receivable/payable, other." In practice, compilers may face difficulties in implementing the approach set out in this paragraph.

Example 7.

(a) An entity owns a swap that has a net asset value of 100 at the beginning of the period. During the period, the entity makes payments of 60, and receives 20. At the end of the period, the swap has a net asset value of 30.

	Credit	Debit
Financial Derivative- Assets	20	60
Currency and Deposits - Assets	60	20

	Opening Position	Transactions	Other Changes In Volume	Revaluations	Closing Position
Financial Derivatives - Assets	100	60-20=40	0	-110	30

The payments are recorded as debit entries under financial derivatives-assets; as a consequence of the payments, the net asset value of the derivative increases - in essence gross liabilities fall at the moment of the payment, causing an increase in the net asset position, and vice versa.

(b) This is the same example as (a) except that the value of the swap switches from a net asset to a net liability position. At the end of the period, from the entity's viewpoint, the swap has net liability value of 10. On the assumption that the swap had a net asset value when the transactions occurred then the recording of transactions is the same as in (a). The recording of the position data is as follows:

	Opening Position	Transactions	Other Changes In Volume	Revaluations	Closing Position
Financial Derivatives - Assets	100	60-20=40	0	-140	0
Financial Derivatives - Liabilities	0	0	0	10	10

If any of the transactions occurred when the swap had a net liability value, then they should be recorded as transactions in financial derivative liabilities.

Example 8.

An entity acquires an option contract worth 50, but only pays 20 at inception. In the subsequent period the entity pays the remaining 30.

Period 1

	Credit	Debit
Financial Derivatives-Assets		50
Currency and Deposits- Assets	20	
Other Accounts, receivable/payable-Liabilities	30	

Period 2

	Credit	Debit
Currency and Deposits- Assets	30	
Other Accounts, receivable/payable-Liabilities		30

Period 2

	Opening Position	Transactions	Other Changes In Volume	Revaluations	Closing Position
Financial Derivatives - Assets	50	0	0	0	50
Other Accounts, receivable/payable - Liabilities	30	-30	0	0	0

III. TREATMENT OF SELECTED FINANCIAL DERIVATIVES

Section III considers the treatment of specific financial derivatives. Those covered in this section are interest rate swaps and forward rate agreements, foreign currency forward-

type over-the-counter contracts, credit derivatives and embedded derivatives.[18] These financial derivatives have been chosen because of their importance in financial markets and/or the uncertainty over their treatment in the national accounts.

A. Introduction

The central bank survey of derivative market activity conducted in April 1995 under the auspices of the Bank for International Settlements (BIS) indicated that interest rate, foreign exchange and currency swaps, and forward rate agreements (FRAs) and forward foreign exchange contracts represented over 85% of outstanding over-the-counter financial derivatives contracts in terms of gross market value.[19] The capture and appropriate classification of transactions and positions in these financial derivatives is of growing importance.

B. Interest Rate Swaps and Forward Rate Agreements

An interest rate swap contract involves an exchange of cash flows related to interest payments, or receipts,[20] on a notional amount of principal, that is never exchanged, in one currency over a period of time. Mostly, counterparties swap cash flows related to interest payments. Settlements are often made through net cash payments by one counterparty to the other. Similarly, FRAs are settled by net cash payments, although these are contracts in which the counterparties agree on an interest rate to be paid, at a specified settlement date, on a notional amount of principal of a specified maturity, that is never exchanged. The purpose of these financial derivative contracts is to alter the counterparties' risk exposure to market rates of interest. As with other forward-type contracts, the value of the interest rate swaps contract at inception is, in principle, zero, but as market interest rates change it acquires value.

In both the *1993 SNA* and *BPM5*, it is recommended that net cash settlement payments associated with interest rate swaps and FRAs be recorded in the income/current account as property income, and repayments of principal associated with swap transactions be recorded in the financial account. Both the *1993 SNA* and *BPM5* state that there are no entries in the financial account with respect to FRAs, because there is only a notional (not an actual) underlying asset. As regards the position statement, both the *SNA* and *BPM5* are silent on interest rate swaps/FRAs.

---

[18]The treatment of employee stock options as financial derivatives is under consideration by the Fund.

[19]Together with over-the-counter options, these financial derivatives represented 95% of outstanding over-the-counter financial derivatives contracts in terms of gross market value.

[20]A swap of cash flows related to interest receipts is a type of asset swap.

In developing the *1993 SNA* recommendations, the main reason for including net cash settlement payments on interest rate swaps and FRAs in the income/current account was that at the time many compilers felt that end-users entered into these contracts to alter the cost of capital, and hence the effective interest rate paid/received. Some compilers still hold to this view. For instance, these compilers argue that if an entity has fixed interest rate liabilities but floating interest rate assets, and is concerned that floating rates are going to fall relative to fixed rates, then, by entering into an interest rate swap, the entity could avoid the impact of these relative interest rate developments on their profits. This approach corresponds to the present international accounting standards[21] and, in some countries, will correspond to the recording of interest by corporations. Indeed, some payments of interest by borrowers to creditors incorporate the interest rate swap settlement amounts, which can be positive or negative.

However, other compilers expressed a number of concerns with the recommended treatment in the *1993 SNA* and *BPM5*:

- Property income is defined in the *1993 SNA* as "income receivable by the owner of a financial asset .... in return for providing funds to ... another institutional unit, " (paragraph 7.88). Neither interest rate swaps nor FRAs involve the provision of capital from one counterparty to another. Problems of analysis with regard to inter-sector interest flows arise: a domestic end-user might borrow from a nonresident but conduct an interest rate swap with a domestic financial institution, with the consequence that there would be inter-sector interest flows even where no capital is provided.

- As such, interest rate swaps and FRAs do not alter the cost of capital, but rather manage cash flows by changing risk exposures. For instance, the end-user that borrows at a floating interest rate, but does not want to let the cost of capital (which may rise or fall) affect their cash flow and the viability of a project's funding, will enter into an interest rate swap in order that any cash flow impact of a change in the cost of capital is offset for the entity by the realized holding gain or loss on the interest rate swap contract.

- It is worth observing that at inception the net present value of interest rate swap and FRA contracts is, in principle, zero and the actual impact on interest costs is unknown. Hence, in some countries with large interest rate swaps markets, the net interest rate settlement data has fluctuated significantly from quarter to quarter. It is not yet established whether the inclusion of these data reduces or increases the volatility of recorded interest: market participants may be using interest rate swaps and FRAs to reduce the volatility of their net interest rate payments.

---

[21]Although, as mentioned in Section I above, it is a practice of commercial accounting standards, unlike the national accounts, to regard some holding gains and losses on financial assets and liabilities as income.

- There is an asymmetric approach in the international manuals to the recording of financial derivatives transactions: whereas net cash settlement payments on interest rate swaps and FRAs are included within the income account, to reflect the impact on the cost of capital, this approach is not adopted for other costs, such as including net cash settlement payments on commodity-linked financial derivative contracts in the goods account, to reflect the impact on the cost of goods.

- The implication of treating net cash settlement payments on interest rate swaps and FRAs as property income, and net cash settlements on traded futures and options "written" on interest rates as financial account transactions, is that interest rate financial derivative contracts are not classified together in the national accounts, although they are highly substitutable: to all intents and purposes to the participants involved, there is no difference between a net cash settlement payment on the exercise of an FRA and that on the exercise of an interest rate future.

With regard to classification of these contracts within the national accounts, the important issue is whether interest rate swaps and FRA contracts can be regarded as falling within the financial asset boundary, and if not what are the characteristics of these contracts that set them apart from other interest rate financial derivative contracts that are included within the financial asset boundary.

In the *1993 SNA* and *BPM5,* interest rate futures are within the asset boundary because they are traded on an organized exchange where market value can be established. It is now established that over-the-counter instruments that meet the description of financial derivatives should be regarded as financial assets - unless a prevailing market price for the underlying item is not observable - because they are stores of value and can generate holding gains and losses (see Section II, Part B above). Indeed, there is a tendency in financial markets to regard the holding of interest rate swaps and FRAs as the acquisition of a financial asset for which the return comes in the form of trading gains and losses. **Thus, interest rate swaps, and FRAs, two of the most common over-the-counter instruments, should be classified as financial assets, and net cash settlement payments associated with interest rate swaps and with FRAs should be classified in the financial account[22] rather than as interest.**

The reclassification of net payments and receipts under interest rate swaps and FRAs from income to financial account transactions will impact on various elements of the national accounts. The reclassification out of property income will affect the balance of primary incomes, and in turn, disposable income and saving both by sector, and for the whole economy. The reclassification of any net payments/receipts with nonresidents will impact both

---

[22]Other similar interest rate products like caps, collars, floors, barrier options, captions etc., are all over-the-counter options contracts and are, by convention, included in the financial account.

on the current external balance and Gross National Income (given that they include net income from abroad). There will only be an impact on Gross Domestic Product if some of the net receipts had been regarded as Financial Intermediation Services Indirectly Measured (FISIM), and so had been classified as services rather than as income. These services would also be reclassified as financial account transactions in financial derivatives. For some countries the impact of the proposed change on GNI could be significant.

C. Foreign Currency Forward-Type Over-the-Counter Contracts

There are three main types of foreign currency forward-type over-the-counter financial derivative instruments. First, foreign exchange swaps: a spot sale/purchase of currencies and a simultaneous forward purchase/sale of the same currencies. According to the BIS's April 1995 survey of derivative market activity, mentioned above, these contracts are the most widely "traded" foreign currency over-the-counter contracts. Second, in terms of market turnover, is forward foreign exchange contracts: two counterparties agree to transact in foreign currencies at an agreed exchange rate in a specified amount at some future agreed date. Third, cross-currency interest rate swaps contracts, sometimes known as currency swaps: these contracts involve an exchange of cash flows related to interest payments and an exchange of principal amounts at an agreed exchange rate at the end of the contract; there might also be an exchange of principal at the beginning of the contract and in these circumstances there may be subsequent repayments, which include both interest payments and the amortization of principal, over time according to predetermined rules.

The treatment of foreign currency swaps is outlined in both the *1993 SNA* and *BPM5*: streams of interest resulting from swap arrangements are to be recorded as property income, and repayments of principal in the financial account.[23] However, the reasons advanced above for classifying net cash settlement payments on interest rate swaps in the financial account apply equally to net cash settlement payments on the interest element of cross-currency

---

[23]One argument in favor continuing to regard the interest element of cross-currency interest rate swap contracts as income is that they are used by borrowers in direct connection with cross-border financing. To the borrower it appears that the two transactions - the original debt and the swap - are one, with the consequence that while it borrowed and owes interest and principal in one, say, foreign currency, the borrower considers that to all intents and purposes its debt is in, say, the domestic currency. Some compilers present their data in this manner: in the position statement, the value of the original debt and the foreign currency swap are linked, and in their income account the interest payments on the original debt and any payments/receipts on the foreign currency swaps are also linked. To the compiler, this is seen to more accurately reflect the position from the borrower's viewpoint. Nonetheless, there are two transactions, the original borrowing and the cross-currency interest rate swap, and the *1993 SNA* and *BPM5* are clear in recommending that financial derivatives should be treated separately to the underlying transactions to which they may be linked as a hedge, because a different institutional unit will be party to the financial derivative transaction than is the case for the underlying transaction that is being hedged.

interest rate swaps. Also, compilers have noted the practical difficulties that arise from the need to dissect cross-currency interest rate swaps into their income and principal components. **Thus, net cash settlement payments on the interest element of cross-currency interest rate swaps should also be classified as financial account transactions.**

In recording transactions and positions in foreign currency derivative contracts, it is required to distinguish between transactions and positions in the financial derivatives contract, and the requirement to deliver and receive underlying principal associated with the contract. The purpose of a foreign currency financial derivative contract is to alter the counterparties risk exposure to market exchange rates; the rate at which the parties will transact in the future is agreed. As with other forward-type contracts, the value of the foreign currency financial derivatives contract at inception is, in principle, always zero, but as market exchange rates change it acquires value.

Any transactions associated with foreign currency contracts should be converted into the unit of account at prevailing market exchange rates, and not at the exchange rate agreed in the contract: the *1993 SNA* is clear that at the time of the transaction, foreign currency must be converted into the unit of account "at the rate prevailing at the moment they are entered in the accounts" (paragraph 3.76). Any initial sale or purchase of currency is a transaction that will be reflected in "currency and deposits" at the exchange rate agreed by the counterparties. In contrast, the exchange rate for the forward sale/purchase of currencies under a foreign currency derivative contract is agreed by the two counterparties at the time of the establishment of the swap contract, and may be different from the exchange rate prevailing at the time of settlement. The consequence being that in the unit of account the value of the currency received (recorded as an increase in "currency and deposits, assets"), does not equal the value of that paid (recorded as a decrease in "currency and deposits, assets"). The difference between the prevailing exchange rate values of the currencies exchanged, measured in the unit of account, should be allocated to transactions in financial derivatives. If receipts of "currency and deposits" exceed payments a reduction in financial derivative assets is recorded; and vice versa. See Example 9.

Example 9.

A US entity enters into a currency swap: it contracts to purchase 100 US dollars for 10, 000 Japanese yen in three months. At end of the period, the dollar/yen exchange rate has changed to 110 yen for one dollar. The accounts for the US entity are compiled in dollars.

First Quarter		$
	Credit	Debit
Financial Derivatives - Assets	9.1	
Currency and Deposits - Assets	90.9	100

Converted at the prevailing exchange rate (110 yen to one dollar), the US entity, in dollar terms, receives more dollars than it pays out in yen. The moment before the exchange the US entity has a derivatives asset due to the change in the exchange rates, but that asset is redeemed when the exchange occurs. Hence, the credit entry under financial derivative- assets.

	Opening Position	Transactions	Other Changes In Volume	Revaluations	Closing Position
Financial Derivatives-Assets	0	- 9.1	0	9.1	0

The entries under financial derivatives - assets both in the transactions and position statements would be the same if the two counterparties undertook a forward foreign exchange contract transaction rather than a currency swap.

In the position statement, the holding of foreign currency should be included on a gross basis within "currency and deposits," converted into the unit of account at the prevailing exchange rate. The foreign currency derivatives contract acquires a market value in its own right as the market prices of currencies alter, because the exchange rate (s) at which the counterparties will exchange in the future is different from the exchange rate expected to be prevailing at the time of exchange. This market value should be recorded as a position in a financial derivative with any change in value since the previous position statement recorded as a valuation change. A contract with a positive market value being recorded as an asset; and a contract with a negative market value being recorded as a liability. See Example 10.

The appropriateness of valuing a foreign currency derivatives contract from an analytical viewpoint is evident from the following example: A country borrows yen which are swapped into dollars with a nonresident counterparty. If the swap contract was assumed to have no value, or is not included in the accounts because it is not traded, the financial liability in the borrowing countries' accounts would "only" be the yen borrowing, converted into the domestic currency. This could misrepresent the actual liability facing the country. For instance, if there was a dollar appreciation against both the yen and the domestic currency,

then the actual liability of the country, in domestic terms, would have increased because more domestic currency would be required to repay the dollars than the original yen borrowing. This difference between the domestic currency value of the dollar and yen liabilities is the value of the swap contract, a liability. So valuing the foreign currency swap contract in the position statement more accurately reflects the true external position.

Example 10.

A US entity agrees to sell 20,000 yen for 200 dollars in six months time. The implied exchange rate being 100 yen to one dollar. Three months after this forward foreign exchange contract is agreed (end period 1), the prevailing dollar/yen exchange rate for three months forward, that is when the contract will be exercised, is 110 yen to one dollar. Three month US interest rates are 4 per cent. The position data for the US are:

US dollars

	Opening Position	Transactions	Other Changes In Volume	Revaluations	Closing Position
Financial Derivatives-Assets	0	0	0	18	18

The US entity is due to receive 200 dollars in three months time even though at the current prevailing exchange rate for three months ahead 20,000 yen is only worth 181.81 dollars. Hence, at the current prevailing exchange rate, the forward foreign exchange contract is an asset to the US entity. After the application of the discount factor, this asset is worth 18 dollars.

D. Credit Derivatives

All of the financial derivatives described so far in this section are designed with the purpose of trading market risk. However, financial derivatives are also used to trade other types of risk. Those financial derivatives whose primary purpose is to trade credit risk are known as credit derivatives. At the time of writing this is a fast growing market, which is being studied closely by prudential regulators and the accounting profession. The type of contracts involved are the same as with market risk: option-type and forward-type contracts.

One form of credit derivative is a straightforward swap contract: the cash flows and capital gains and losses related to the liability of a lower rated entity are swapped for cash flows related to a guaranteed interest rate such as an inter-bank rate plus a margin; a so-called total return swap. As with other swaps, these are financial derivative instruments. Another type of credit derivative is an option-type contract based on the interest rate spread between a high quality credit and a lower quality credit: a so-called spread option. For instance, if the spread narrows over the life of the option, the purchaser of the option benefits. This is a straightforward option, and so is a financial derivatives instrument. The interest rates on the

liabilities of both the high and lower rated credits are usually readily observable, so the option can be valued.

A third type of credit derivative is a so-called credit default swap: the risk premium inherent in an interest rate on a bond (s) or loan (s) is swapped—on an ongoing basis—for a cash payment in the event of default by the debtor. There is an exchange of risk exposure—one party has swapped the risk premium for essentially a guaranteed rate of interest, the other has swapped the default risk for the risk premium—and these instruments are apparently valued using the expected yield curve. Thus, these instruments appear to have the characteristics of financial derivative instruments and so the presumption is that they should be treated as such. There are some contracts established whereby one entity makes only a single payment to another in order to be protected financially against, say, a catastrophe. In such examples a reference price may not be readily available, so that these particular single premium contracts may not have value for national accounts purposes. As financial protection is being provided against the occurrence of specific events, it is possible that they are a form of insurance.

There is a fourth form of credit derivative known as a credit-linked note. These instruments are a combination of a regular bond and a credit option. These are a form of embedded derivatives, and so the embedded option should not be separately recorded and valued in the national accounts (see ahead).

In summary, there is no inherent reason why a so-called credit derivative cannot be classified as a financial derivative asset. Indeed the understanding is that these financial derivatives, like those involving market risk, are frequently drawn up under standard master legal agreements, and involve collateral and margining procedures, which is leading towards agreed methods of valuation.

E. Embedded Derivatives

Some financial instruments include derivatives embedded within them. These are known as embedded derivatives or embedded options. For example, corporate securities may have an option to convert into equity, may be callable (can be bought by the issuing entity), or puttable (can be sold back to the issuing entity) after a specified period, may permit repayment of principal in a different currency to that of issuance, and may limit increases in floating rate payments. The *1993 SNA* and *BPM5* do not explicitly cover the treatment of these financial derivatives except to recommend that options that allow the purchaser of a corporate bond to convert the bonds into equity may be recorded and valued as a separate tradeable financial derivative. The valuation of the option can be approximated by comparing the difference in price between the "convertible" bond, and a similarly rated corporate bond that does not contain a conversion option.

Since embedded derivatives can significantly alter the characteristics of an instrument, the issue arises as to whether these financial derivatives should be treated as separate instruments or as part of the underlying instrument.

The *1993 SNA* and *BPM5* recommend that financial derivatives should be treated separately to the underlying transactions to which they may be linked as a hedge,[24] because a different institutional unit will be party to the financial derivative transaction than is the case for the underlying transaction that is being hedged. By definition, an embedded derivative has the same two counterparties for both the underlying financial instrument and the financial derivative. Thus, the reasoning employed in the *1993 SNA* and *BPM5* for separately identifying and valuing financial derivatives does not apply in the case of embedded derivatives.

As well, there are practical reasons for not separately identifying and valuing embedded derivatives. First, embedded derivatives need to be identified: that the counterparties are the same as for the underlying financial instrument adds a degree of difficulty and subjectiveness to the identification of the embedded derivative, compared with the situation in which the financial derivative is a separate contract. Different respondents may have different views as to what clauses in a contract are, and which are not, embedded financial derivatives, increasing the possibilities of asymmetric reporting between and within institutional sectors. Second, for the contract to be regarded as a financial asset, demonstrative value would need to be established. But the price of the underlying financial instrument and financial derivative are intertwined. The value of the financial derivative is not separately identifiable if a transaction occurs in the underlying financial instrument, and if statisticians separately valued the financial derivative in the position statement, offsetting adjustments would be required in the valuation of the underlying financial instrument. Third, there is the practical difficulty of identifying the payment of premium associated with the establishment of the embedded option.

So, financial derivatives that are embedded in a primary instrument, such that the counterparties to both the underlying instrument and the financial derivative are the same, should not be separately recorded and valued in the national accounts. In other words, if a primary instrument such as a security or loan contains an embedded derivative, the instrument should be valued and classified according to its primary function, such as a security or loan, even though the value of that security or loan may well be different from comparable securities and loans because of the embedded derivative. That is, the financial derivative component should not be separately recorded, but considered to be part of the primary instrument. If the financial derivative becomes detached from the primary instrument such that there are different counterparties to the financial derivative and the primary instrument then

---

[24]It is possible that many hedges are incorrectly recorded in national accounts, or remain undetected, and bias estimates in an unknown manner. Usually, hedges will cause only small errors, but substantial errors might occur where exchange rate volatility is high, or where basic agricultural or mineral commodities are hedged.

the financial derivative is no longer considered embedded. Because embedded derivatives can significantly affect financial flows, separate compilation procedures may be needed to account for their effects.

IV. Treatment of Margin Payments

Section IV clarifies the treatment of margin payments in the national accounts. This section introduces the terms repayable and nonrepayable margin regarding them as more appropriate for statistical purposes than the terms initial and variation margin.

A. Introduction

In the *1993 SNA* (paragraph 11.40) a distinction is made between "initial" and "variation" margin, reflecting common terminology in organized financial derivatives markets. However, as the use of margin or collateral has become more prevalent in financial markets - the depositing of collateral is becoming more common in over-the-counter financial derivative markets, as well as for other financial transactions, such as securitized lending -, and as different institutional arrangements exist in different markets, it has become apparent that the terms "initial" and "variation" have limited applicability, and can convey different meanings to different compilers. As a consequence, this paper places an emphasis on the terms "repayable" and "nonrepayable" margin,[25] in order to clarify, rather than revise the recommendations contained in the *1993 SNA* and *BPM5*.

B. Repayable Margin

Repayable margin is margin or collateral deposited to protect a counterparty against the credit risk associated with a financial derivative contract, but which remains under the ownership of the entity that deposits the margin. The margin/collateral is repayable to the depositor when the depositor extinguishes their position in the financial derivative contract. While the use of the margin/collateral may be restricted, if the entity depositing the margin retains the risks and rewards of ownership, such as the right to receive dividends, coupons, and/or interest, it still owns the margin: the margin/collateral is said to be repayable.

The type of financial asset being deposited as repayable margin determines whether entries are required in the national accounts. When repayable margin deposits are made in "currency and deposits," transactions are recorded in the financial account under "currency and deposits" (see Example 11). These entries arise because the margin deposit is a liability of the depositary institution in which these funds are held. No financial derivative transactions are to be recorded. Some compilers may prefer to classify these repayable margin deposits

---

[25]Repayable margin is more akin to initial margins, and nonrepayable margin to variation margin.

within "other accounts receivable/payable" in order to reserve the term "deposits" for monetary liabilities.

Example 11.

An entity purchases a futures contract and pays brokerage fees of 12 units. The entity is asked to deposit repayable margin of 250 to the broker as security against adverse market movements.

	Credit	Debit
Financial services		12
Financial account		
Currency and Deposits-Assets	262	250

When repayable margin deposits are made in noncash assets, such as securities, no transactions are recorded in the national accounts. This is because there has been no change in ownership of these assets; a transfer of non-cash assets between depositary institutions does not, in itself, generate transactions in the national accounts.

C. Nonrepayable Margin

Nonrepayable margin is margin or collateral that is paid to reduce or meet a financial liability arising from a financial derivative contract. The entity that pays nonrepayable margin no longer retains ownership of the margin/collateral nor has the right to the risks and rewards of ownership, such as receiving dividends, coupons, and/or interest. For example, in some organized financial derivatives markets, contracts are marked to market and profits and losses realized on daily basis; nonrepayable margin is paid to meet the loss on the financial derivative instrument (see Example 4). The payment of nonrepayable margin will always require entries in the national accounts.

Margining arrangements can be complex, and procedures differ between countries. For instance, in some countries, repayable and nonrepayable margins are handled in a single account and it may be difficult to distinguish between them. The actual institutional arrangements should be reviewed. The important consideration is whether the entity that deposits the margin still has effective ownership of the margin. When repayable margin is subsequently used to meet or reduce a financial liability, that is the entity that deposits the margin/collateral no longer retains ownership, the transaction is recorded in the same manner as nonrepayable margin: see the previous paragraph above and Example 12.

Example 12.

An entity has a liability position of 50 in a futures contract and has to pay nonrepayable margin of that amount to the clearing house.

	Credit	Debit
Financial Derivatives-Liabilities		50
Currency and Deposits- Assets	50	

By paying the nonrepayable margin, the entity is settling its liability in financial derivatives hence the debit entry under financial derivatives liabilities.

V. Selected Classification Issues

Section V provides guidance on the classification of financial derivative transactions and positions. This section makes the case for recording financial derivatives as a separate instrument category within the national accounts and as a separate functional heading in the balance of payments, while noting the practical difficulties involved in implementing such a change. Possible appropriate subclassification for international reporting purposes are discussed.

A. Functional Classification of Financial Derivatives

In the *1993 SNA*, all financial derivative contracts which are financial assets are included under "securities other than shares". That is, transactions, and positions, should be grouped together as a single group under "securities other than shares" within the financial account. Within the balance of payments, *BPM5* recommends that financial derivative transactions and positions should primarily be included under "portfolio investment", although, depending on the nature of the transactors, such transactions and positions could be included under "reserve assets" - if a monetary authority owns or transacts in financial derivative assets, and the assets meet the criteria of a reserve asset - or "direct investment" - if the transactors are in a direct investment relationship, and they are not banks/financial intermediaries.

Alternatively, transactions and positions in financial derivatives could be included under a separate instrument category of financial assets in the national accounts, and a separate functional heading in the balance of payments entitled "financial derivatives". The rationale is as follows: In the *1993 SNA* and *BPM5*, financial derivatives assets—that is financial derivative contracts that are tradeable and have market value—are included under

"securities other than shares", and "portfolio investment", because of their tradeability. However, those over-the-counter financial derivatives now classified as financial assets - if a less restrictive view is taken of the financial asset boundary - do not fall naturally into the securities category.[26] One possibility is to classify tradeable financial derivative assets/liabilities as securities, and nontraded financial derivative assets/liabilities—essentially those financial derivatives that are offsetable on the market—as "other investment." Indeed, the Informal Group on the Measurement of Financial Derivatives concluded that in principle financial derivatives could exist within a number of financial asset categories, and recommended that, where relevant, a sub-category of derivatives be added to the components of the classification. However, from the above discussion it is by no means clear that the distinction between traded and nontraded financial derivatives is as clear cut as previously thought. On the other hand, financial derivatives assets and liabilities could be grouped together as a separate financial derivatives category, reflecting their distinct characteristics; they are different in nature from other financial assets. The exceptions in the balance of payments with regard to direct investment and reserve assets would remain.

Among compilers who commented on the earlier draft of this paper there was strong support for the alternative approach. Therefore, there should be a separate instrument category in the national accounts, and a separate functional category in the balance of payments for financial derivatives. Also, financial derivative transactions should be separately identified within "direct investment" and "reserve assets." Some compilers noted the practical difficulties in implementing such changes in the short term given that many countries are still developing systems to capture financial derivatives activity. Also, there would be a need to consider the practical implications of these presentational changes for reporting at the international level. In addition, if net settlements on interest rate swaps and FRAs are reclassified from the income account to the financial account this will also necessitate presentational changes in the current account.

Financial derivatives should be recognized as a separate instrument category of financial assets in the national accounts, and a separate functional group in the balance of payments reflecting their distinct characteristics. The practical implications of this change need to be considered before it is implemented into the international reporting standards for balance of payments.

B. Subclassification of Financial Derivatives

At present, in the national accounts, financial derivative transactions and positions data are classified by institutional sector of the counterparties. A classification by short- and long-term financial derivatives is optional. Within the balance of payments, data are to be recorded by institutional sector under "portfolio investment". Regardless of the presentation of financial

---

[26]Also, unlike securities, no investment income arises from the ownership of a financial derivative instrument.

derivatives in the national accounts and balance of payments, the institutional breakdown should be retained.

No firm consensus has arisen over any further subclassification. Compilers may subclassify by risk category of financial derivatives in their own national presentations - although a list of risk categories may require revision over time as financial derivative markets develop -, and/or by major types of financial derivatives, such as options and forwards. Collection of data subclassified by risk type could enhance analysis of important components of the national accounts; for example, interest rate risk data could be used to analyze effective borrowing costs. Classification by market risk category was the approach adopted in the BIS's April 1995 central bank survey of derivative market activity. In addition, compilers may consider subclassifying financial derivatives into "exchange-traded" and "over-the-counter" categories, since the counterparty risks involved may differ markedly, and since changes in activity in relative terms could signal changes in market practices and relative efficiencies.

SUMMARY OF FINDINGS AND RECOMMENDATIONS OF THE IMF INFORMAL GROUP ON THE MEASUREMENT OF FINANCIAL DERIVATIVES: APRIL 1996

This report presents the findings and recommendations of the IMF Informal Group on Financial Derivatives, which met in Washington D.C. on April 22-24, 1996. Its terms of reference were:

In the light of (1) experience in applying the new balance of payments and SNA standards for financial derivatives, and (2) continuing innovation in financial markets, the informal group will advise on issues related to implementation with the objective of amplifying or clarifying the methodologies, as needed.

This report will be conveyed to the *IMF Committee on Balance of Payments Statistics*, the *Inter Secretariat Working Group on the National Accounts*, and the *IMF Expert Group on Monetary and Financial Statistics* which will meet, in November 1996, in conjunction with the finalization of the *Manual on Monetary and Financial Statistics.*

Findings

Participants in the Group indicated that their countries either collect or intend to collect financial derivatives data consistent with the recommendations contained in the *System of National Accounts, 1993* (*1993 SNA*), the *European System of Accounts* (*ESA*) (for European Union member countries), and the fifth edition of the *IMF Manual on Balance of Payments Statistics* (*BPM5*). Arising from experiences the following findings were drawn:

- Cooperation among all national statisticians collecting financial derivatives data (e.g., banking, financial accounts or balance of payments data etc), should be encouraged. Through this approach, experience can be shared, concepts harmonized, and the burden on reporting entities kept to a minimum in a field of statistics where there is considerable complexity.

- Separate approaches to reporting entities are required because the needs of economic accounts statisticians and banking supervisors for financial derivatives data differ; for instance, supervisors require data on a consolidated basis, while economic statisticians require data on a residency basis. Standards developed under the auspices of the BIS of internationally agreed supervisory reporting requirements are expected to be implemented in the course of 1997/1998.

- The Group found that the supervisory and accounting requirements to mark derivative instruments to market have assisted economic accounts statisticians in the collection of position data.

- There is interest in sharing experiences in implementing the recommendations of the *1993 SNA* and *BPM5* across countries.

Discussions and recommendations

The Group focused its discussions on those issues of most concern. The following points emerged.

- The Group reviewed in detail the inclusion of financial derivatives within the **financial asset boundary**. The Group's consensus view was that the criterion of "offsetability on the market" should be added to "tradeability" as a method of demonstrating value; this was considered to be a clarification of the existing standards. The Group recommended this approach for instruments which could be "offset" within the same instrument category; for instance, a "swap" position could be offset by acquiring another "swap". This treatment would be consistent with the draft *ESA*. It was agreed that the Fund would consult with Eurostat and the EMI on the background for the *ESA* recommendation, and produce a paper on the asset boundary for financial derivatives for the *IMF Committee on Balance of Payments Statistics* and the *Expert Group Meeting* in November 1996.

- The Group discussed the possible need to develop a **definition of financial derivatives** to facilitate delineation of the financial asset boundary. No consensus was reached as to whether it was better to develop such a definition or to continue to follow the present approach of enumerating instruments that are generally considered to be derivatives. Further investigation is appropriate, including drawing on the draft definition of financial derivatives prepared by the U.S. Financial Accounting Standards Board (which was presented to the meeting).

- The Group concluded that in principle derivatives could exist within a number of **financial asset categories** and recommended that, where relevant, a sub-category of derivatives be added to the components of the classification.

- The Group discussed the coverage of instruments which could give rise to property income flows, in particular **interest rate swaps** and **forward rate agreements (FRAs)**. No consensus emerged as to the classification of net settlement payments arising from these instruments. Some participants favored including these payments in the current account (as presently recommended by the international standards); others the financial account; and others did not have a definitive view either way. Those participants who favored, on conceptual grounds, the "financial account approach" were also concerned about the difficulties for data collection, presentation, and interpretation when settlement of selected interest rate derivatives products are recorded in the income account. In particular, these participants were concerned about the anomalous presentation of cross border and inter-domestic sector interest flows where there is no credit position; the difficulties in reconciling position and

transactions data; and the sharp escalation in the scale and associated volatility of recorded investment income data. The Group noted that a serious problem had been identified in some countries, and further research in this area is called for. The Group recommended that the issue be addressed by the *Expert Group Meeting* in November 1996. The Group also recommended that where feasible these data be separately identified in the income account.

- The Group reviewed the **margining arrangements** in national markets, and concluded that although these operations are complex and differ widely among countries, the international standards are flexible enough to cover the different market practices. However, the classification of margin payments was questioned by a number of participants. In particular, the inclusion of margin payments in deposits was seen as a problem, because of market practices and the potential impact on the monetary aggregates. The Group recommended that the treatment of margins be reviewed after the EMI review of margining arrangements in Europe is completed.

- Participants shared experiences on measuring position data. It was found that in general there were no serious problems in gathering data from banks on a market value basis. However, several participants found difficulty in obtaining data on a residency basis or by domestic sector. Extensive market value information was collected in the BIS survey of market activity conducted in the spring of 1995 among 26 participating countries.

- Participants shared experiences on the treatment of **repurchase and securities lending arrangements**. Many participants noted the convergence of treatment of these arrangements as collateralized loans. It was recognized in this connection that national practices in the collection of data on such transactions would be influenced by accounting practices in different countries.

IMF INFORMAL GROUP ON THE MEASUREMENT OF FINANCIAL DERIVATIVES
April 22-24, 1996

LIST OF PARTICIPANTS

CHAIRMAN

Mr. Kevin W. O'Connor
IMF, Statistics Department

PARTICIPANTS

Australia

Ms. Barbara Dunlop
Australian Bureau of Statistics

Mr. Robert McColl
Australian Bureau of Statistics

Canada

Mr. Patrick O'Hagan
Statistics Canada

France

Mr. Jean-Baptiste Bourguignon
Banque de France

Germany

Dr. Rudolf Seiler
Deutsche Bundesbank

Japan

Ms. Kazuko Tanaka
Ministry of Finance

Mr. Shinji Isaki
Bank of Japan

United Kingdom

Mr. C. B. Wright
Bank of England

United States

Mr. Christopher Bach
Bureau of Economic Analysis

Mr. Ralph Kozlow
Bureau of Economic Analysis

Mr. Russell Scholl
Bureau of Economic Analysis

Mr. John Rutter
Bureau of Economic Analysis

Mr. Ashby McCown
Department of the Treasury

Mr. Jeffrey Mahoney
U.S. Financial Accounting
Standards Board

International Organizations

Mr. Rainer Widera
Bank for International Settlements

Ms. Carin Pronk
European Monetary Institute

Mr. Mahinder S. Gill
IMF, Statistics Department

Mr. David Folkerts-Landau
IMF, Research Department

Mr. Jack Bame
IMF, Statistics Department

Mr. Robert Hauswald
IMF, Research Department

Mr. Robert M. Heath
IMF, Statistics Department

Mr. Russell Krueger
IMF, Statistics Department

Mr. John Motala
IMF, Statistics Department

MARKET VALUE, TRADEABILITY AND THE OFFSETABILITY CRITERION[27]

Introduction

This appendix is concerned with the recognition of current value for financial derivatives and other contingent instruments. Its aim is to amplify and clarify the current international guidance, in the *1993 System of National Accounts* (*1993 SNA*) , for the recording of derivative instruments as financial assets, only when they "have market value and are tradable". (*1993 SNA*, Chapter 11 paragraph 34).

Statistical compilers have placed a range of interpretations on this guidance. At one extreme, it has been taken to restrict the recording of derivatives, on balance sheet, to products provided through organized exchanges. At the other extreme, compilers are seeking to include virtually any contractual arrangement between willing counterparties which can potentially be linked to some underlying asset or liability position.

An early amplification of the guidance was presented by Eurostat in the revised *European System of National and Regional Accounts* (*ESA 95*). The *ESA 95* adds an alternative test to "tradeability", namely whether the instrument is "offsetable in the market" (*ESA 95*, Chapter 5). The point here is that statisticians recognized the need to embrace both the over-the-counter (OTC) and exchange traded markets in any data collection, if the resulting statistics are to be analytically meaningful.

In Section 2, the meaning of the term "offsetability" is examined in the context of market practice so as to clarify the principle which *ESA 95* seeks to apply. Section 3 considers how market practitioners and prudential supervisors use offsetability as a material factor when assessing the market risk exposure of a trading book portfolio. Section 4 then considers the practical limits of offsetability and applies the principle to some illustrative examples as a test of the existence of market value. Finally, in Section 5 the paper concludes that offsetability does provide a valid test of market value and therefore commends the *ESA 95* expansion as a useful clarification of the *1993 SNA* guidance.

Section 2: What does the ESA mean by "offsetable in the market"?

Conventional bearer securities generally give the holder the ability to cancel or liquidate their position by selling the instrument into a secondary market. For most other forms of financial asset, the holder will generally be in a contractual relationship with the issuer which governs the terms and conditions under which the instrument can be liquidated.

---

[27]This Appendix was written by Mr. Christopher Wright of the Bank of England.

Bills, bonds and ordinary shares provide examples of the former class while deposits, loans and mutual or investment fund shares typically fall into the latter.

Financial derivatives do not fit neatly into either of these patterns. They are not strictly bearer instruments so that counterparties are generally not free to transfer their interest in the contract to a third party either through an organized secondary market or by private negotiation. Equally, derivative contracts do not typically place an obligation on the issuer to cancel and settle the contract other than at maturity. Such restrictions pose few difficulties when the derivative instrument is acquired to hedge the market risk associated with an underlying asset held as an investment. However, issuers of derivative instruments generally do so to order so that risk management requires an ability to cancel or liquidate open positions in derivatives as part of a continuous process of portfolio adjustment. This need has been met through the use of offsetting or mirror image contracts.

In most exchange traded markets, the process of offsetting has the appearance of secondary trading. For example, if an end user (A) purchases a long position through a broker (B), who is a clearing member, then the broker will stand as a matched principal between A and another trading member of the Exchange (C). If subsequently A wishes to "sell" the contract, he will, in practice, purchase an offsetting short position from B who will again stand as a matched principal, although possibly with a different trading member (D). The brokers' two matched positions are passed to the clearing house who thereafter stand as counterparty to the deals, for settlement purposes. The clearing house will recognize that it holds matched long and short positions with the broker and will cancel, or "close out", these positions. A's position with the broker will similarly be closed out. The two trading members, C and D, will however continue to hold open positions, with the clearing house standing between them as a matched principal. In this way, A has transferred his original long position to D but the mechanism by which this has been achieved has involved several distinct steps rather than a straight transfer of the contract.

The same basic principles, for the transferring of open positions, apply equally to the over-the-counter market. As before, if A wishes to cancel an open position, the normal mechanism is to open an offsetting position. If this were to be done with the original counterparty then the two contracts would be closed out and a single settlement payment would pass between the counterparties to reflect the accumulated holding gain or loss on the original contract at close out. However, the offsetting contract will commonly be with a different counterparty and, in this circumstance, both contracts will continue to appear on balance sheet since the absence of a clearing house means that no mechanism exists for their cancellation. The net effect on settlement flows will nevertheless be identical in the two cases with the only material difference being that, in the final example, A continues to face credit or default risk in respect of his two counterparties. In practice, even this difference could be mitigated if the OTC contracts were themselves subject to some form of collateral or margining provision.

The above examples illustrate a range of cases involving the use of offsetting in the market. In its purer forms, offsetting is recognized as effecting the closing out or cancellation of a contract in a way which closely parallels either the redeeming or on-selling of a primary instrument. In some other cases, no close out occurs and, instead, the agent continues to report both the original and the offsetting contract on balance sheet. This might equally apply to exchange traded contracts, for example where a broker stands as a matched principal between an end-user and the exchange, or within the OTC market, where users or dealers seek to hedge an open position.

The offsetting of market risk can also be effected in other ways. For example, a long forward position might be offset by the purchase of a put option. In this situation, the option premium represents the cost to the purchaser of covering the risk of sustaining a loss on the forward contract while leaving open the possibility that the forward will deliver a holding gain. If the forward price subsequently moves in favor of the holder of the forward contract (i.e., the marked to market value of the forward contract rises), he could choose to liquidate his position by writing an option against his prospective profit from holding the forward to maturity. If the premium received is greater than that paid, then the holder of the forward has effectively closed out his forward position profitably even though the forward, and the two options, may still have some months to run.

Offsetting strategies may thus take many forms and can provide full or partial protection against market risk. They can involve the use of exactly offsetting "mirror image" contracts but may equally be structured to use a range of products and may also involve a mix of exchange traded and OTC instruments.

The ESA places no limitation on the use of offsetability in defining the asset boundary. Contingent assets are considered to be financial assets within the system "in cases where the contractual arrangement itself has a market value because it is tradable or can be offset in the market" (*ESA 95*, Chapter 5, paragraph 5). Market value is the key to the asset boundary, but tradeability and offsetability are each considered to provide a sufficient test of value.

The pairing of tradeability and offsetability here is no accident. The examples cited in this section show how arrangements for the offsetting of contracts can deliver systems which are functionally equivalent to secondary trading, and markets which are indistinguishable from those for most negotiable instruments. This correspondence can be almost total where a clearing house stands between counterparties and effects the closing out of matched contracts, but the same principles apply throughout the more loosely organized OTC markets.

Over-the-counter traders are, moreover, developing systems which bring these markets even more closely into line with organized exchanges. The growing use of collateral, to reduce or eliminate credit risk, parallels the arrangements for daily margining, which serves the same purpose, in the exchanged traded markets. This development is preparing the way for experimental arrangements for multi-lateral netting through so-called OTC clearing houses. Should these schemes prove successful, and in particular if they provide for the

closing out of matched contracts, then the use of offsetting to close out open positions in OTC markets will increasingly take on the appearance, as well as the effect, of secondary trading.

Section 3: Offsetability, netting and market value - A risk management perspective

The marked to market value of a derivative contract shows the expected liquidation value or replacement cost if the contract were to be closed out. For institutions actively engaged in trading derivative positions, regular marking to market of the trading book provides valuable management information on holding gains and losses and also indicates the value at risk in the event of counterparty default.

The monitoring of credit (default) risk is a core function for any internal management information system. However, for authorized banks, it is also subject to external audit and control by supervisors. In recent years, these external controls have been substantially harmonized internationally under the terms of the Basle Accord and, within Europe, the Solvency Ratio Directive (SRD), and the Capital Adequacy Directive (CAD).

The SRD and the CAD lay down minimum capital reserve requirements for a range of asset types and issuing sectors, as they appear on the balance sheet respectively in the banking and the trading books. For derivatives, these are based on the gross value of all contracts with a positive marked to market value. For this principle to become operational, there must be agreed standards covering both the valuation of contracts and the criteria by which matched contracts can be considered "closed", and thus can be netted out from any gross measure.

The bilateral netting of exactly matched contracts has long been considered to reflect the reality that a position has been closed out. But, more recently, regulators have agreed broader standards for the bilateral netting of derivative positions under so-called legal rights of offset. Under such schemes, participating institutions have the right to net their bilateral positions over a prescribed, but fairly broad, range of derivative instruments, thereby reducing their capital requirements for SRD and CAD purposes.

Netting agreements have the potential to lower substantially the risk weighted asset total which determines a bank's capital headroom for credit risk purposes but netting, other than of matched contracts, need not imply a close-out, since bilateral positions may still be open to market risk. Put simply, while the bilateral position of two counterparties may show exactly balancing assets and liabilities on a given date, and hence no current credit exposure, future market price movements may unbalance this position leaving both counterparties susceptible to revaluation effects and hence to future credit exposure.

In this context, netting must not be confused with offsetting, as described in Section 2. The former is concerned solely with the management of credit risk while the latter is used to limit or eliminate market risk. It is only when credit and market risk exposures are both removed that the closing out of contracts can be effected.

Nevertheless, the widening use and acceptance of bilateral and, to a lesser extent, multilateral netting agreements supports the view that contracts covered by such agreements do have market value. Matched offsetting contracts apart, the application of the principle of bilateral netting requires that supervisors and market practitioners are confident the instruments have current value, and that this can be reliably measured.

The development of thinking about valuation can be traced through recent supervisory legislation. The Solvency Ratio Directive, which took effect in 1991, established dual criteria for the measurement of credit exposure. At that time, the primary basis for the measurement of credit risk, known as "original exposure", was calculated as a proportion of the notional value of the contract. However, the SRD also made provision for a separate alternative calculation based upon the marked to market or replacement cost value. By 1996, in an amendment to the SRD, the replacement cost method had gained the ascendancy. The original exposure method may still be used in respect of banking book positions but, in the UK at least, only with the express consent of the relevant supervisor. The presumption now is that the replacement cost approach should normally be adopted and, for certain instruments and all trading book items, the replacement cost method must be used.

Supervisors have consequently acquired a new role in monitoring and refereeing the valuation practices of their institutions. Where the method of valuing of an instrument is complex, as is the case for many option-like products, approval of the method must be sought from the supervisory authority. This process has facilitated closer harmonization across the industry and, importantly, is minimizing the scope for the two counterparties to a contract to assign a materially different valuation. Where this is achieved, the contract can be said to have a mutually recognized market value.

Section 4: Assessing the offsetability principle

The descriptions of offsetting in Section 2, provide the starting point for assessing the usefulness of the *ESA 95* principle. As already seen, offsetting can be functionally equivalent to secondary trading so that the closeness of this parallel will normally indicate the basis for attributing market value.

In Table A, the key characteristics of a number of possible transaction types are compared. The transactions have been grouped according to their closeness to pure secondary trading, as judged by the way in which they impact on credit and market risk, and on whether the transaction causes the close-out of a contract. The main point to emerge is that there is no clear divide between tradeability and offsetability: offsetting transactions comprise an overlapping spectrum of characteristics with the single common feature that the market risk associated with the contract is transferred to a third party.

TABLE A
TRADEABILITY SPECTRUM

	Type of Transaction	Credit Risk	Market Risk	Close out effected	Basis of market valuation
1	Contract sold direct into a secondary market.	Transferred to third party.	Transferred to third party.	Yes	Market quotation.
2	Offsetting contracts purchased through an organized exchange using a single broker.	Transferred to third party.	Transferred to third party.	Yes	Options by market quotation; other values derived from the market price of the underlying.
3	Offsetting contracts purchased through an organized exchange using two separate brokers.	Protected by margining.	Transferred to third party.	No	Options by market quotation; other values derived from the market price of the underlying.
4	Offsetting contracts purchased over the counter and subject to collateral.	Protected by collateral.	Transferred to third party.	No	Derived from the market price of the underlying.
5	Offsetting contracts purchased over the counter but not subject to collateral.	Original exposure retained.	Transferred to third party.	No	Derived from the market price of the underlying.
6	Contract purchased for which an offset is not readily available.	Original exposure retained.	Exposure retained.	No	Undefined where the market price of the underlying is itself uncertain.

The table confirms that the boundary between exchanged traded and OTC markets is an inappropriate guide to the financial asset boundary for derivative instruments. The closing out of offsetting contracts is not invariably achieved when transacting with an exchange (Example 3) and, in these circumstances, arrangements for covering credit risk may appear equivalent in their effect to provisions now appearing within the OTC market. (Examples 3 and 4). Moreover, the basis on which the market values of exchange traded instruments are measured are not always straightforward. While some contracts (specifically options) are quoted in a manner directly analogous to that on a secondary market, the current value of futures contracts is derived, inter alia, from the quoted forward price of the underlying.

On this basis, the use of offsetting in the OTC market is seen to be no different, in form or effect, from that practiced on organized exchanges. Contracts are priced, and balance sheet holdings valued, using methods which derive inter alia from the quoted price of an underlying security. In the case of new contracts this may be done through competitive quotations while, for existing contracts, valuation principles are subject to external audit by supervisors. In either case, market and regulatory pressures point towards the emergence of a single price. This process is greatly assisted by market developments which aim to reduce, or eliminate, those aspects of OTC contracts which are less easy to value. The use of collateral, to remove credit risk, is an obvious example. The adoption of internationally accepted master agreements also simplifies valuation by providing a standardized legal framework.

The limits of offsetability as a guide to market value seem thus to be governed by practical rather than theoretical considerations. If a contract cannot be offset in the market, either because willing counterparties are not forthcoming, or because the form and purpose of the contract is unsuitable, then the grounds for attributing market value would appear unsound. This may occur where the market for the underlying instrument, for which the derivative contract is a hedge, is itself illiquid. This will, at best, make the balance sheet value of the derivative uncertain but may also mean that key thresholds, for example the strike price in the case of an option, are effectively unobservable.

For the vast majority of OTC derivative contracts, such considerations are not an issue. For example, in the case of an interest rate swap the terms of the pay and receive legs are set so as to balance the perceived cost and benefits to the counterparties using market information on expected future rates. In inter-dealing trading, this will normally mean that the swap is assigned zero value by both counterparties. As market expectations about future interest rates change, the future discounted cash flow expected from the contract will alter and the swap will be viewed as an asset by one counterparty and a liability by the other. If, at this point, the second counterparty decides to offset his market risk, he will enter a new swap contract with new terms which reflect the changed market expectations. The new contract will again have a zero market value. The two contracts thus held will not be identical with the first contract continuing to show as a liability on the balance sheet. The second swap contract effectively freezes the loss sustained on the first contract as indicated by its marked to market value. All future potential gains or losses are ruled out however because the market risk on the remainder of the contract has been offset.

A counter example may occur in the case of a credit derivative. This is a contract which is triggered by a market event, usually a counterparty default, rather than by market prices. A typical scenario here might be that a lender purchases an option to guarantee his return on a loan. If the lender subsequently wishes to cancel the default option, the question arises as to whether the contract has market value and is tradable or offsetable in the market. The issue here is a complex one, but in essence depends upon the practical limitations of offsetting to cover event risk. The contract appears closer in form to insurance (see *1993 SNA*, Chapter 6.135) where event risk is managed primarily by the pooling of risk.

Section 5: Summary and conclusions

Financial derivatives are bilateral contracts between counterparties for the purpose of transferring risk. They are typically not bearer instruments, but are effectively traded in liquid markets because counterparties are free to open offsetting contracts which exactly neutralize their exposure to market risk. In exchange traded markets, contracts are standardized, and the presence of a central clearing house allows matched offsetting contracts to be closed out. In over-the-counter trading, the closing out of contracts is less common, because offsetting will typically be undertaken using a different counterparty, so that an exposure to credit (default) risk will often remain.

This appendix has described the market practice of offsetting in its various forms. It has shown that, in certain circumstances, the purchase of an offsetting contract can be functionally equivalent to secondary trading. Moreover, this appendix has demonstrated that no clear divide can be drawn between transactions which satisfy this equivalence and other forms of offsetting where counterparties remain exposed to credit risk.

The paper has assumed a direct link between tradeability and market value and, by extension, has argued that offsetting in the market also requires an ability to attribute current value. The use made of marked to market or replacement cost pricing in the monitoring and management of credit risk is cited as evidence that a broad spectrum of contracts, in both exchange traded and over-the-counter markets, have value and should be included within the financial asset boundary.

The ability to offset risk in the market is thus a key principle when assigning market value to risk transference products. An inability to offset may reflect a lack of willing counterparties, which in turn could be due to illiquidity in the market for the underlying instrument, and hence the absence of any reliable means of assessing value. It may, alternatively, reflect legal or institutional rigidities which rule out the scope for such activities. Bilateral contingent instruments, such as guarantees and many insurance products, probably fall into this latter exclusion. In such cases, the guaranteed or insured risk is tied to a named counterparty event (for example life insurance) so that the purchaser may not be free to on-sell or offset his rights under the contract other than by cancellation of the contract through the issuer.

Borderline cases will of course continue to require close attention. The current rapid growth in the market for credit risk derivatives provides an important example. Such products will need to be examined on a case by case basis but, where they are structured to cover a specific counterparty event, for example A defaulting on a loan repayment to B, then B is unlikely to be able to on sell or offset his rights under the contract to a third party.

In conclusion, the *ESA 95* amplification of the *1993 SNA* guidance on the financial asset boundary for derivative instruments, is supported by the analysis in this appendix. It is

therefore recommended that "offsetability on the market" be added as an alternative criterion to tradeability within the appropriate *1993 SNA* text.

OVER-THE-COUNTER FORWARDS[27]

This appendix discusses over-the-counter (OTC) forwards; that is, those that are not traded on organized exchanges. Forwards traded on organized exchanges are known as futures.

The *1993 SNA* provides differing treatments of OTC forwards and futures. Forwards are not regarded as financial assets because they are not market traded, do not have a market valuation, and deal with future transactions only. Thus, they are neither in the *1993 SNA* financial account nor balance sheet. In contrast, futures are financial assets because they are traded on organized exchanges and have market valuations.

The arguments for treating forwards, like futures, as financial assets are as follows:

- In concept, forwards and futures are very close. Both (1) are binding, noncontingent contracts that give rise to actual economic rights and obligations between institutional units, (2) have measurable economic valuations, (3) have valuations that are derived in similar ways, (4) give rise to payments between institutional units at settlement, and (5) serve similar functions.

- In practice, the distinction between market-traded futures and off-market forwards is tenuous and sometimes arbitrary because many forwards are negotiable in what are close to organized markets. Also, commercial practice often results in pairing of transactions in futures and forwards; financial enterprises frequently hedge positions in exchange-traded futures with OTC forwards, and vice versa. Recognition of an exchange-traded future as a financial asset without recognition of the corresponding OTC forward will bias sectoral balance sheets, and possibly generate excessively volatile estimates of flows.

- Valuations of the two instruments are similar but not identical: in principle the value of both derives from the difference between the agreed contract (strike) price(s) and the prevailing, or expected prevailing, market price(s) on the day of settlement, times the principal amount, appropriately discounted. However, in practice, a futures contract is likely to be revalued and settled on a daily basis, so the price at the previous revaluation rather than the contract price is relevant.

- Institutionally, international accounting standards organizations and bank regulators have increasingly treated forwards in a manner which is equivalent to treating them as financial assets. Depending on the national regulatory environment, the economic value of forwards will increasingly be required to be reflected in commercial

---

[27]This appendix was written by Mr. Russell Krueger of the Fund's Statistics Department.

accounting statements. Also, international bank capital adequacy standards, as promulgated by the Basle Committee on Bank Supervision, already implicitly include the economic value of forwards.

- Economically, forwards are financial instruments with significant economic values that give rise to significantly large economic transactions.

The traditional designation within some jurisdictions of forwards or other instruments as "off-balance sheet" does not imply that they have no value. An "off-balance sheet" forward is constructed of two legs, one which delivers cash or other financial instrument, and the other which receives cash or other financial instruments. The gross value of each leg can be substantial; for example, a British bank may have a forward contract to deliver 10 million U.S. dollars and receive an equivalent amount of Deutschmarks. However, if (1) the gross receipts and payments are equal at the inception of the contract, and (2) national practice does not recognize changes prior to settlement in the value of each leg (in this case, as the exchange rate changes), then the net value is construed to be zero and the forward need not be reflected on the bank's balance sheets.

However, although forwards may be considered off-balance sheet, typically changes occur in the value of each leg prior to settlement that can be assigned economic values and which affect the net economic value of the forward. Accounting and regulatory organizations are increasingly requiring that entities recognize on their balance sheets the net economic values of forwards.

DEFINITIONS OF FINANCIAL DERIVATIVES

This appendix sets out definitions of financial derivatives developed by the Bank for International Settlements, and the Group of Thirty.

Bank for International Settlements

The BIS provided a definition in conjunction with its work of creating a reporting system on derivatives.[28]

"A financial derivative is a contract whose value depends on the prices of underlying assets, but which does not require any investment of principal in those assets. As a contract between two counterparties to exchange payments based on underlying prices or yields, any transfer of ownership of the underlying asset and cash flows becomes unnecessary."

A footnote to the above definition describes major types of derivatives.

"There are two broad classes of derivatives: contracts with forward characteristics and contracts with options characteristics. Forward contracts have two-way transfers of risk and, by market convention, their initial market value is zero—this enables counterparties to assume potential risk exposures with no up-front cash payment. Options have one-way transfer of risk for which the option writer receives an up-front cash payment (the option premium) equal to the expected value of the option payoff at contract initiation. This premium can be a small fraction of the potential payoff from the option, providing the option buyer with significant leverage."

Group of Thirty

The Group of Thirty, a private consultancy group, provided a definition in a study it prepared on trading practices and their regulation.

"In general terms, a derivatives transaction is a contract whose value depends on (or "derives" from) the value of an underlying asset, reference rate, or index. This study focuses on global "over-the-counter" derivatives—those privately negotiated contracts provided directly by dealers to end-users, as opposed to standardized contracts (such as futures) sold on exchanges. The main over-the-counter derivatives include swaps, forwards, and options, based on interest rates, currencies, equities, and commodities."

---

[28] See BIS. Issues of Measurement Related to Market Size and Macroprudential Risks in Derivatives Markets. (Basle: February 1995).

It further states, "The term derivative also is used by some observers to refer to a wide variety of debt instruments that have payoff characteristics reflecting embedded derivatives, or have options characteristics, or are created by "stripping" particular components of other instruments such as principal or interest payments."

GLOSSARY OF TERMS

This glossary provides definitions of terms included in the main text.

A

Asset Swap: A swap involving cash flows on assets.

B

Barrier options: An option which is only exercised when the underlying item reaches a predetermined price.

Black Scholes options pricing model: A mathematical formula used to value options.

C

Call option: An option that gives the holder the right, but not the obligation, to buy an underlying item.

Cap: An option that sets a ceiling on the rate paid on an underlying item. Most commonly, caps are written on interest rates. The purchase of a cap option protects the purchaser from increases in interest rates. If the agreed contract (strike) price or rate is exceeded on the settlement date, the writer pays the purchaser the difference between market and contract price, times the notional principal.

Caption: An option to purchase a cap.

Collar: A combination of the purchase of a cap option and the sale of a floor option, creating a price boundary for the underlying item. Most commonly, collars are written on interest rates. Sometimes a collar is termed a corridor.

Collateral: An asset, usually a financial asset, provided by one counterparty to another to reduce the latter's credit risk.

Commodity future: A contract traded on an organized exchange, in which the counterparties commit to buy or sell a specified amount of a commodity at an agreed contract (strike) price on a specified date.

Commodity option: An options contract that gives the purchaser the right but not the obligation to purchase (call) or sell (put) a specified amount of a commodity at an agreed contract (strike) price on or before a specified date.

Commodity swaps: A swap of two payment streams. One payment stream represents the currently prevailing spot price, the other an agreed contract (strike) price, for a specified quantity and quality of a specified commodity. Settlements are usually made as net cash payments.

Contingent instruments: Financial arrangements that do not give rise to unconditional requirements either to make payments or to provide other objects of value. The principle characteristic of contingent instruments is that one or more conditions must be fulfilled before a financial transaction takes place. The arrangements themselves may not have transferable economic value.

Credit default swap: A credit derivative in which the counterparties swap the risk premium inherent in an interest rate on a bond(s) or loan (s) - on an ongoing basis - for a cash payment in the event of default by the debtor.

Credit Derivative: A financial derivatives whose primary purpose is to trade credit risk.

Credit-linked note: An embedded derivative instrument combining a regular bond and a credit derivative.

Credit (or counterparty) risk: The risk that the entity on which a financial claim is held will default.

Cross-Currency Interest Rate (Currency) swap: An exchange of specified amounts of two different currencies of equal net present value, with subsequent repayments, both interest and repayment flows, made according to predetermined rules.

D

Direct investment: A category of international investment in which a resident entity in one economy obtains a lasting interest in an enterprise resident in another. A direct investment is established when a resident in one economy owns 10 percent or more of the ordinary shares or voting power, for an incorporated enterprise, or the equivalent, for an unincorporated enterprise. Once established, all subsequent transactions between affiliated enterprises, both incorporated and unincorporated, are direct investment transactions. The one exception is transactions between financial intermediaries, which are limited to permanent debt (loan capital reflecting a permanent interest) and equity (share capital) investment. Other securities transactions of the financial intermediaries are classified as portfolio investment.

E

Economic benefits: The benefits that accrue, usually in the form of an increase in welfare, from transactions between willing and independent entities, and from the holding of assets, both real and financial.

Economic value: The value that entities place on resources, as represented by the price at which willing and independent buyers and sellers are prepared to exchange these resources. In the *1993 SNA* and *BPM5*, the market price is regarded as the best measure of economic value.

Equity option: An option which gives the purchaser the right, but not the obligation to buy (call) or sell (put) an individual equity, a basket of equities, or an equity index at an agreed contract (strike) price on or before a specified date.

Equity swap: A swap in which one party exchanges a rate of return linked to an equity investment for either the rate of return on another equity investment, (such as swapping rates of return on different equity indices), or for the rate of return on a nonequity investment, such as an interest rate. Net cash settlement payments are usually made.

Exercising a financial derivative: For final settlement, the act of transacting in a financial derivative such as to acquire or sell the underlying item, or to receive or pay a net cash settlement based on an agreed contract (strike) price, or on the difference between two reference prices.

Expiration date: The final date for the exercise of an option.

F

Financial assets: Financial assets are defined in the *1993 SNA* as assets in the form of (1) financial claims that fall within the financial asset boundary; (2) monetary gold; (3) Special Drawing Rights (SDRs); (4) shares in corporations; and (5) certain kinds of financial derivatives.

Financial asset boundary: The boundary between those financial contracts which meet the criteria to be classified as financial assets, and those that do not.

Financial risk: The risks inherent in holding and transacting in financial claims and liabilities.

Floor: An option that sets a floor on the rate paid on an underlying item. Most commonly, floors are written on interest rates. The purchase of a floor option protects the purchaser from declines in interest rates. If the market rate falls below the contract (strike) price or rate, the writer pays the purchaser the difference between market and contract price, times the notional principal.

Foreign exchange swaps: A sale/purchase of currencies and a simultaneous forward purchase/sale of the same currencies

Forward-type contract: A contract in which two counterparties commit to exchange an underlying item - real or financial - in a specified quantity, on a specified date, at an agreed contract (strike) price or, in the specific example of a swaps contract, the two counterparties agree to exchange cash flows, determined with reference to the price(s) of, say, currencies or interest rates, according to pre-determined rules. In essence, the two counterparties are trading risk exposures of equal market value. Market terminology often uses the word "forward" to denote an over-the-counter - as opposed to an exchange traded - non-swap forward-type contracts.

Forward Foreign Exchange contract: A forward contract whereby the counterparties commit to transact in foreign currencies at an agreed exchange rate in a specified amount on some agreed date.

Forward Rate Agreement (FRA): A forward contract in which two counterparties agree on a specified interest rate to be paid, at a specified settlement date, on a notional amount of principal of a specified maturity in one currency, that is never exchanged. At settlement, a net cash payment is made equal to the difference between the specified rate and the actual market interest rate times the notional amount of principal. Which counterparty pays and which receives depends on whether the actual market rate is above or below the specified rate.

Futures: Forward contracts traded on an organized exchange. Futures contracts are highly standardized in order to facilitate the creation of liquid markets.

G

Gross Market Value: A measure of the cost of replacing a financial derivatives contract at prevailing market prices. The value may be positive or negative. Gross market value was used as a measure of the size of the "global" over-the-counter derivatives market in the 1995 BIS central bank survey of derivatives market activity.

H

Hedging: A method of reducing financial risk by acquiring a position in one instrument which offsets, either partially or entirely, a risk inherent in another position held or anticipated to be held.

Holding gains and losses: The nominal gains and losses arising from a change in the market value of a financial asset while it is held by the investor.

I

Illiquid: Instruments that are rarely if ever traded. (See also "liquid market")

Initial margin: Margin payments that are made on the acquisition of a financial derivative contract. Initial margin is most commonly associated with transactions on organized exchanges, because the exchange acts as the counterparty to all transactions, and requires initial margin to protect it against the credit risk of its counterparties.

Interest Rate swaps: Interest rate swaps involve an exchange of cash flows related to interest payments, or receipts, on a notional amount of principal in one currency over a period of time. For example, payments based on a floating rate of interest are swapped for payments based on a fixed rate of interest. Typically, on each settlement date net cash settlement payments are made by one counterparty to the other reflecting the difference between the fixed and floating rates of interest, times the notional amount of principal.

Institutional sector: For purposes of the system of national accounts, institutional units that are resident in the economy are grouped together into five mutually exclusive sectors: non-financial corporations, financial corporations, government, non-profit institutions serving households, and households. Institutional units resident abroad are in the "rest of the world."

L

Leverage: Having exposure to the full benefits arising from holding a position in a financial asset, without having had to fund the entire value of the position.

Liquid market: A market in which individual market participants can transact quickly and efficiently without, in normal circumstances, significantly altering the prevailing market price. Characteristics of a liquid market include a small spread between buying and selling prices, and the ability to transact in large amounts.

Long term: In regard to financial assets and liabilities, the *1993 SNA* defines long term as an original maturity of more than one year, or more than two years to accommodate national practices.

M

Marked to market: Revaluing the price of a financial asset or liability to reflect the prevailing market price(s).

Market price: The amount of money that a willing buyer pays to acquire something from a willing seller when both are independent parties and when all considerations are solely commercial.

Market risk: The risk of holding a financial asset whose price may alter because of changes in general market conditions.

N

Net cash settlement payments: Payments made in cash on the exercise of a financial derivative by one counterparty to meet its net liability to another counterparty.

Net negative value: A liability position equal to the discounted value of net payments accruing from a financial derivative contract.

Net positive value: An asset position equal to the discounted value of net receipts accruing from a financial derivative contract.

Net present value: The net present value of any financial instrument is the discounted value of expected net future receipts (that is, gross receipts less gross payments) associated with the instrument.

Nonrepayable margin: Margin or collateral that is paid to reduce or meet a financial liability: the entity that pays nonrepayable margin no longer has ownership of the margin paid nor has the right to the risks and rewards of ownership, such as receiving dividends, coupons, and/or interest from the debtor.

Notional amount: The principal amount of a financial derivatives contract necessary for calculating payments or receipts but which is not itself exchanged.

O

Offsetability on the market: A means of trading specific financial risks in financial markets in their own right. A financial derivative instrument that facilitates such trading but cannot be traded itself is said to be "offsetable on the market."

Option: A contract that gives the purchaser the right but not the obligation to buy (call option) or sell (put option) a specified underlying item - real or financial - at an agreed contract (strike) price on or before a specified date from the writer of the option.

Option premium: The payment by the purchaser of the option to the writer for the option. The value of the option premium, at inception, reflects the market price of the option.

Option writer: The seller of an option contract.

Organized financial derivatives exchanges (organized exchanges): A market in which financial derivatives contracts are traded, usually in standardized form. In order to reduce the credit

risk of trading on-exchange, a clearing house acts as the counterparty to all transactions, and, in return, requires the depositing and payment of margin/collateral.

Other accounts receivable/payable, other: A subcategory in the *1993 SNA* classification system for financial assets that includes all receipts and payments not classified elsewhere in the financial accounts.

Over-the-counter (OTC) financial derivatives: Financial derivatives in which transactions occur outside of an organized exchange (off-exchange) and involve major market participants, such as financial institutions.

P

Position statement: The stock of assets and liabilities at a point in time.

Portfolio investment: Portfolio investment is a category of international investment that includes investment in securities. In the fifth edition of the IMF's Balance of Payments Manual these securities are defined as bonds and notes, money market instruments, and financial derivatives. The essential characteristic of instruments classified as portfolio investments is that they are traded or tradeable.

Prevailing market price: The price at which the same or similar items are traded in significant quantities, and in similar circumstances, against cash. Usually the price quoted on a liquid market.

Price discovery: A process of ascertaining, and making publicly available, a market price for an asset/liability, and in doing so helping to allocate resources in an economically efficient manner. Financial derivatives sometimes aid the discovery of the expected future market price for an asset/liability.

Property income: 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.

Put option: An option that gives the holder the right, but not the obligation, to sell an underlying item.

R

Reference price: In the context of this paper, the reference price refers to the price of the underlying item from which the financial derivative will acquire its value. (See "underlying item")

Repayable margin: Margin or collateral that is deposited to protect a counterparty against credit risk associated with a financial derivative position, but which remains under the ownership of the entity that deposits the margin. The margin/collateral is repayable to the depositor when the depositor extinguishes their position in the financial derivative contract. Although use of the margin/collateral may be restricted, an entity still owns the margin if the entity depositing the margin retains the risks and rewards of ownership, such as the right to receive dividends, coupons, and/or interest from the debtor.

Reserve assets: A category of international investment that covers external assets that are readily available to and controlled by monetary authorities for direct financing of payments imbalances, for indirectly regulating the magnitude of such imbalances through intervention in exchange markets to affect the currency exchange rate, and/or for other purposes. Reserve assets comprise monetary gold, Special Drawing Rights (SDRs), reserve position at the Fund, foreign exchange assets, and other claims.

Risk category of financial derivatives: Many market participants classify their positions in financial derivatives by the type of underlying risk. The most common types of risk being interest rate, foreign exchange, equity, and commodity price risk.

S

Securities other than shares: A category in the *1993 SNA* classification system for financial assets that includes bills, bonds, certificates of deposit, commercial paper, debentures, tradable financial derivatives, and similar instruments normally traded in financial markets.

Short term: In regard to financial assets and liabilities, the *1993 SNA* defines short term as an original maturity of one year or less, with a maximum of two years to accommodate national practices.

Spread option: A credit derivative contract based on the interest rate spread between a high quality credit and a lower quality credit.

Strike price: The price agreed in a financial derivative contract at which transactions, if any, in the underlying asset take place. Also called contract price.

Swaps: A forward-type financial derivative contract in which two counterparties agree to exchange cash flows determined with reference to prices of, say, currencies or interest rates, according to pre-determined rules.

Swaptions: An option contract which is exercisable into a swap. If the option is exercised, the counterparties will either enter into a swap, or the purchaser will receive a cash settlement reflecting the market value of the premium.

T

Total return swap: A credit derivative under which the cash flows and capital gains and losses related to the liability of a lower rated entity are swapped for cash flows related to a guaranteed interest rate such as an inter-bank rate plus a margin.

Trading gains and losses: The nominal gains and losses arising from trading in financial assets/liabilities.

U

Unconditional financial contract: A contract whose claims and obligations are known to both counterparties, and are not dependent upon circumstances and events.

Underlying item: In this paper, underlying item is used in a general sense to refer to all items that may underlay a financial derivatives contract. These include commodities, financial instruments, interest rates, exchange rates, other derivatives, an index or basket of prices, or a spread between two prices.

V

Variation margin: Margin that is paid during the life of the financial derivatives contract, and is affected by its price. As the price of the financial derivative contract moves against one counterparty, and his/her liability position increases, variation margin is paid by that counterparty. Variation margin is most commonly associated with transactions on organized exchanges, because the exchange acts as the counterparty to all transactions, and requires variation margin to protect it against the credit risk of its counterparties. On some markets, variation margin is paid over from the counterparty with the net liability position, to the counterparty with the net asset position, as a form of on-going settlement of liabilities.

Volatility: The measure of the variability of the price of a financial asset or liability over a specified time period.

W

Warrants: Option-type tradeable instruments giving the holder the right to buy, at an agreed contract (strike) price for a specified period of time, from the issuer of the warrant, a specified amount of the underlying asset, such as equities and bonds.