

## **XII OTHER CHANGES IN ASSETS ACCOUNT**

### **A. Introduction**

- 12.1 This chapter is concerned with the recording of changes in the values of assets, liabilities, and net worth between opening and closing balance sheets that result from other flows - i.e., flows that are not transactions, the transactions being recorded in the capital account and financial account of the System.
- 12.2 Although the entries in the other changes in assets accounts do share the characteristic that they record changes that are not the result of transactions, the entries cover very different kinds of changes in assets, liabilities, and net worth. The first kind consists of changes that are due to factors such as discoveries or depletion of subsoil resources, destruction by war or other political events or destruction by natural catastrophes, all of which actually change the volume of assets. The second kind consists of changes in the values of assets, liabilities, and net worth due to changes in the level and structure of prices, which are reflected in holding gains and losses. Thus, the other changes in assets accounts are subdivided into the other changes in the volume of assets account and the revaluation account.
- 12.3 The chapter discusses the two accounts separately, beginning in each case with an introduction that explains the structure of the account.

### **1. Other changes in the volume of assets account**

- 12.4 The other changes in the volume of assets account records the changes in assets, liabilities, and net worth between opening and closing balance sheets that are due neither to transactions between institutional units, as recorded in the capital and financial accounts, nor to holding gains and losses. The structure of the other changes in the volume of assets account, shown in table 12.1, is similar to that of the other accumulation accounts. The entries for changes in assets are on the left, where non-financial assets, both produced and non-produced, and financial assets are all shown separately. The entries for changes in liabilities and the balancing item, change in net worth due to other changes in volume of assets, are on the right. The balancing item in the account is the sum of the entries for the various categories of changes recorded in the account.

#### **Functions of the other changes in the volume of assets account**

- 12.5 In the capital account, produced assets enter and leave the System through acquisition less disposal of fixed assets, consumption of fixed capital and inventory additions, withdrawals and recurrent losses. In the financial account, most financial assets - claims on other institutional units - enter the System when the debtor acquires something of value and accepts the obligation to make payment, or payments, to the creditor, and they are extinguished when the debtor has fulfilled the obligation under the terms of the agreement. Both the capital and financial accounts also record transactions in existing assets among the institutional sectors, but, aside from associated costs of ownership transfer on assets, these acquisitions and disposals merely change the ownership of the assets without changing the total for the economy as a whole except where the transactions are between residents and the rest of the world.
- 12.6 One important function of the other changes in the volume of assets account, therefore, is to allow certain assets to enter and leave the System in the normal course of events. These entrances and

exits may relate to naturally occurring assets, such as subsoil assets. Such entrances and exits come about as interactions between institutional units and nature, thus contrasting with entrances and exits that come about as a result of transactions, which typically are interactions by mutual agreement between institutional units. These entrances and exits may also relate to assets created by human activity, such as valuables and purchased goodwill or financial assets for which there is neither an actual nor a notional liability.

- 12.7 A second function of the account is to record the effects of exceptional, unanticipated events that affect the economic benefits derivable from assets (and corresponding liabilities). These events include one institutional unit's effectively removing an asset from its owner without the owner's agreement, an action that is not considered a transaction because the element of mutual agreement is absent. These events also include those that destroy assets, such as natural disaster or war. In contrast, transactions, such as consumption of fixed capital or change in inventories, allow for normal rates of loss or destruction.
- 12.8 A third function of the account is to record changes in classifications of institutional units and assets and in the structure of institutional units.
- 12.9 It may be noted that the other changes in the volume of assets account provide a link to the emerging environmental satellite accounts. All of the tangible non-produced assets are natural assets, and recording their economic appearance and disappearance is accomplished here. Moreover, this account provides a place for recording environmental degradation to fixed assets that is not allowed for in consumption of fixed capital. These features of the System that facilitate its use as a starting point for environmental accounting are discussed in chapter XXI.

## **B. Other changes in the volumes of assets account**

### **1. Categories of changes in assets/liabilities and their valuation**

- 12.10 The other changes in the volume of assets account shows changes in assets/liabilities in nine categories:
- K.3 Economic appearance of non-produced assets
  - K.4 Economic appearance of produced assets
  - K.5 Natural growth of non-cultivated biological resources
  - K.6 Economic disappearance of non-produced assets
  - K.7 Catastrophic losses
  - K.8 Uncompensated seizures
  - K.9 Other volume changes in non-financial assets n.e.c.
  - K.10 Other volume changes in financial assets and liabilities n.e.c., and
  - K.12 Changes in classifications and structure.
- 12.11 Most of these entries are specific to produced assets, to non-produced assets, or to financial assets/liabilities, as table 12.1 indicates. (For convenience, the term "financial asset" will be used to cover both financial assets and liabilities, except when the context requires liabilities to be referred to explicitly.) Three entries - catastrophic losses, uncompensated seizures and changes in classifications and structure - may in principle apply to any asset. The annex to chapter XIII may

be referenced to see, at the level of detail of the classification of assets and liabilities, all possible entries provided by the System.

12.12 Many of the entries in the other changes in the volume of assets account are closely linked to entries in the other accumulation accounts. Several of the entries are associated with transactions in the capital account, for example, when an economic appearance is evidenced by a transaction; a number of others reflect changes in assets already on the balance sheet, for example, when a fixed asset is retired prematurely. The application of the general principle of valuation applied to transactions - at the prices observed on the market - is discussed in various sections of chapter X; the general principle of valuation applied to stocks - valued as if they were being acquired on the market on the date to which the balance sheet relates - is discussed in chapter XIII, paragraphs 13.25 to 13.35. That chapter discusses the use of observed prices on the market, the present, or discounted, value of expected future benefits, and current written down values. Some generalizations about the relevance of these valuation principles to the categories of flows in the account are indicated below:

- (a) Economic appearance - that is, when something is deemed to move inside the asset boundary to appear on the balance sheet - in some cases is associated with a transaction on the market, and that transaction can be used to estimate a value. This situation occurs, for example, for purchased goodwill, valuables and historic monuments. In a number of other cases the appearance will probably have to be valued, as will the asset in the balance sheet, at the present or discounted value of the stream of expected future benefits from the asset. This approach must be used, for example, for economic appearance of subsoil assets and of intangible non-produced non-financial assets other than purchased goodwill;
- (b) Economic disappearance of non-produced assets, catastrophic losses and uncompensated seizures refer to the effects of exceptional, unanticipated events on assets already within the asset boundary. Thus, the valuation of the entry in the other changes in the volume of assets account would be the amount recorded for the asset in the last balance sheet (updated as needed for price changes) if the disappearance was total or some percentage of it if less than total.

12.13 Each of the categories of the account will be explained below, with numerical examples drawn from the entries in table 12.1 as illustrations. The subheadings included in the text are for convenience only; they are not subheadings of the classification. The definition of the assets and liabilities are provided only to the extent needed to provide the context for discussing the volume change; for definitions at the level of detail of the classification, reference can be made to the annex to chapter XIII. Valuation is mentioned when category-specific guidance is appropriate. When a category's valuation is clearly tied to a transaction or to an entry in the balance sheet, reference should be made to the appropriate section in the other chapters.

## **2. Economic appearance of produced assets (K.4)**

12.23 The produced assets whose appearance is recorded in the other changes in the volume of assets account are valuables and historic monuments, the latter included with dwellings and with other buildings and structures in the classification of assets. As was described in chapter X, they are objects, structures or sites of significant or special value. The capital account records the acquisition of valuables and historic monuments as newly produced goods or as imports, and it records transactions in existing goods already classified as valuables and historical monuments. In the case of goods that are not already recorded in the balance sheets, it is the recognition of a significant or special value - whether evidenced by a transaction or by the formal appraisal of a good that remains in its owner's possession - that is considered an economic appearance to be recorded in the other changes in the volume of assets account. These valuables and historic monuments have not already been recorded in the balance sheets for any of several reasons: they antedate the accounts, they were originally recorded as consumption goods, or if structures, they have already been written off. An entry for economic appearance of produced assets is shown in table 12.1 on the left side of the account for general government, when the government's stock of fixed assets increases by 3, reflecting the recognition of the historic significance of a monument.

- 12.24 For valuables, such as precious stones, antiques and other art objects, when the high value or artistic significance of an object not already recorded in the balance sheet is first recognized, it is classified as an economic appearance. Hitherto, the object may have been of little value and not considered an asset. For example, a piece of jewellery might have been considered an ordinary good whose purchase would be included in household final consumption expenditure were it not to make its appearance as a valuable because it was made of precious metals or stones. Such an appearance would be recorded for the valuable in the other changes in the volume of assets account, even though it is immediately the subject of a transaction recorded in the capital account.
- 12.25 For historic monuments, when the special archaeological, historical, or cultural significance of a structure or site not already recorded in the balance sheet is first recognized, it is classified as an economic appearance and recorded in the other changes in the volume of assets account. For example, such recognition might be accorded an existing structure or site that is fully written off and thus no longer recorded in the balance sheet. Such recognition would also refer to quality changes in structures and sites that are already within the asset boundary because they are new or only partially written off; the counterpart entry in changes in classification may not be observable, however, at the level of detail in the classification of assets. The structure or site is immediately the subject of a transaction recorded in the capital account.

### **3. Economic appearance of non-produced assets (K.3)**

- 12.14 By definition, non-financial non-produced assets are not created by processes of production. Thus, they are not among the assets that result from gross capital formation, as recorded in the capital account. Some of these assets occur in nature, and others come into existence in ways other than through processes of production as what may be referred to as constructs devised by society. The cases below represent the additions to the volume of these kinds of assets. The term “appearance” is used to contrast with additions that are the result of processes of production as defined in the System. Table 12.1, Account III 3.1 shows an entry for economic appearance of non-produced assets on the left side of the account for non-financial corporations, an addition of 24 to the stock of tangible non-produced assets. Examples of such economic appearance include changes in proven reserves of subsoil assets and bringing natural assets under the direct control, responsibility and management of institutional units.

#### Gross additions to the level of exploitable subsoil resources

- 12.15 In the System, subsoil assets are defined as those proven subsoil reserves of coal, oil and natural gas, of metallic minerals or of non-metallic minerals that are economically exploitable, given current technology and relative prices. The capital account records acquisitions and disposals among sectors of the reserves that exist under those conditions. The other changes in the volume of assets account, in contrast, records increases and decreases that change the total volume for the economy as a whole.
- 12.16 One way in which the reserves may increase is by the discovery of new exploitable deposits, whether as a result of systematic scientific explorations or surveys or by chance. The definition of subsoil assets points to the other way in which economic appearance may occur - by change of the conditions. That is, reserves may be increased by the inclusion of deposits for which exploitation may have been previously uneconomic but becomes economic as a result of technological progress or relative price changes.

#### Transfers of other natural assets to economic activity

- 12.17 The definition of subsoil assets just referred to follows from application of the guidelines for identifying economic assets in the System. As explained in the general introduction to the accumulation accounts and balance sheets in chapter X, economic assets are entities over which ownership rights are enforced by institutional units and from which economic benefits may be derived by their owners. Naturally occurring entities that qualify as economic assets are those that

are under the direct control, responsibility and management of institutional units (see especially chapter X, paragraphs 10.10 to 10.12). Economic appearance is the move to this status.

- 12.18 Not all land included in the geographic surface area of a country is necessarily within the System's asset boundary. Land makes its appearance in the System, therefore, when it is transferred from a wild or waste state to one in which ownership may be established and the land can be put to economic use. In addition, the stock of land may be marginally increased by reclaiming land from the sea by the construction of dykes, as described in chapter X. Increases in the stock of land of this kind are recorded in the other changes in the volume of assets account.
- 12.19 For other natural assets, the first substantial market appearance, generally involving commercial exploitation, is the reference point for recording in this account. For virgin forests, gathering firewood is not commercial exploitation, but large-scale harvesting of a virgin forest for timber is, and brings the forest into the asset boundary. Similarly, drawing water from a natural spring does not bring an aquifer into the asset boundary of the System, but a significant diversion of groundwater does.

#### Quality changes in non-produced assets due to changes in economic uses

- 12.20 The System, in general, treats differences in quality as differences in volume. As explained with respect to goods and services in chapter XVI, different qualities reflect different use values (and in the case of goods and services, different resource costs). Different qualities are, therefore, economically different from each other. The same principle applies to assets. The quality changes recorded here occur as the counterpart of the changes in economic use that are shown as changes in classification, as described below - for example, from cultivated land to land underlying buildings. In this case, the asset is already within the asset boundary, and it is the change in quality of the asset due to changes in its economic use that is regarded as the appearance of additional amounts of the asset.

#### **4. Natural growth of non-cultivated biological resources (K.5)**

- 12.26 The natural growth of non-cultivated biological resources - natural forests, fishstocks, etc. - may take various forms: a stand of natural timber may grow taller, or fish in the estuaries may become more numerous. Although these resources are economic assets, growth of this kind is not under the direct control, responsibility and management of an institutional unit and thus is not production. The increment in the asset must then be regarded as an economic appearance, and it is recorded in the other changes in the volume of assets account. Table 12.1 shows an entry for natural growth of non-cultivated biological resources on the left side of the account for general government, reflecting growth of 4 in, for example, natural forests owned by government.
- 12.27 In principle, natural growth should be recorded gross, and the depletion of these resources should be recorded as an economic disappearance, as described below. This recording would be consistent with the separate recording of acquisitions and disposals described, for example, in the capital account. In practice, however, many countries will record natural growth net because the physical measures that are likely to be the only basis available for the recording are, in effect, net measures. These measures may be used in conjunction with a market price for a unit of the asset to estimate the value of the volume change to be recorded.

#### **5. Economic disappearance of non-produced assets (K.6)**

- 12.28 The capital and financial accounts provide three ways in which an asset can leave the System: through consumption of fixed capital, through withdrawals and recurrent losses of inventories, and through extinguishing financial claims under the terms of the contractual agreements that created them. None of these apply to non-financial non-produced assets. The other changes in the volume of assets account records the departures of these assets in another way - economic disappearance. One form of economic disappearance is depletion. In table 12.1, entries for depletion of natural economic assets are shown on the left side of the accounts for non-financial corporations and

general government, reflecting depletion of mineral reserves or other natural assets owned by non-financial corporations (-6) and by general government (-2). Economic disappearance can take other forms as well, for example, reductions in the level of proven reserves that reflect changes in technology and relative prices or degradation of land and wildlife from improper agricultural practices. In table 12.1, other economic disappearance of non-produced assets is illustrated by an entry of -1 on the left side of the account for non-financial corporations, reflecting such events as revisions in estimated proven reserves.

#### Depletion of natural economic assets (K.61)

- 12.29 The depletion of natural deposits covers the reduction in the value of deposits of subsoil assets as a result of the physical removal and using up of the assets.
- 12.30 In principle, the depletion of natural forests, fishstocks in the open seas and other non-cultivated biological resources included in the asset boundary as a result of harvesting, forest clearance, or other use should be included here, as should the depletion of water resources.

#### Other economic disappearance of non-produced assets (K.62)

##### *Other reductions in the level of exploitable subsoil resources*

- 12.31 The changes recorded here are the negative counterparts of gross additions to the level of exploitable subsoil resources that result from reassessments of exploitability because of changes in technology or relative prices. In practice, only net additions may be available, and these will be recorded under economic appearance of non-produced assets.

##### *Quality change in non-produced assets due to changes in economic uses*

- 12.32 The changes recorded here are, for example, decreases in the value of land that are the counterpart of the changes in land use - for example, from cultivated land to communal grazing land - recorded as changes in classification, as described below. This is symmetrical with the quality changes recorded under economic appearance of non-produced assets, as described above.

##### *Degradation of non-produced assets due to economic activity*

- 12.33 All degradation of land, water resources and other natural assets from economic activity is recorded in the other changes in the volume of assets account. The degradation may be either ordinary, recurring - and, therefore, anticipated - deterioration resulting from economic activity or less predictable erosion and other damage to land from deforestation or improper agricultural practices, the harmful effects on fishstocks of acid rain or excess nutrients from agricultural run-off, etc.

#### Appearance of intangible non-produced assets

- 12.21 Non-financial intangible non-produced assets are constructs devised by society evidenced by legal or accounting actions. They make their appearance in the System when entities are patented, transferable contracts are written, or enterprises are sold at prices that exceed the net worth of the enterprise in question, etc. The patenting consists of the entity being granted legal protection by law or judicial decision. The writing of transferable contracts consists of the coming into force of a binding agreement that provides some economic benefit that can be passed on to a third party independently of the provider of that benefit.
- 12.22 When an enterprise is sold at a price that exceeds its net worth, this excess of purchase price over net worth is the asset "purchased goodwill". Goodwill that is not evidenced by a sale/purchase is not considered an economic asset: the only way that goodwill enters the System is for such a purchase to occur. Two cases must be distinguished. For the sale/purchase of an unincorporated enterprise not treated as a quasi-corporation, the purchased goodwill represents the excess of the

purchase price of this enterprise over its net worth (derived from its separately identified and valued assets and liabilities). Conceptually, the entries are as follows. Prior to the sale, the excess of the purchase price of an enterprise over its net worth enters the balance sheet of the seller, via the other changes in the volume of assets account, as an economic appearance of a non-produced asset so that the enterprise can be sold at its purchase price; this excess is then disposed of by the seller as “disposals of intangible non-produced assets” in the capital account and acquired by the purchaser as “acquisitions of intangible non-produced assets” in the capital account. The purchased goodwill is then recorded in the closing balance sheet of the purchaser. For the sale/purchase of a corporation or quasi-corporation, the purchased goodwill represents the excess of the purchase price of its shares and other equity over their value just prior to the sale/purchase. This excess enters the balance sheet of the seller of shares and other equity prior to the sale as a revaluation of a financial asset so that the shares and other equity can be sold at their purchase price. At the same time, the purchased goodwill enters the other changes in the volume of assets account as an economic appearance of an intangible non-produced asset and is recorded as such in the closing balance sheet of this corporation or quasi-corporation. The sales and purchases of the shares and other equity are recorded in the financial accounts of the seller and the purchaser.

*Write-off and cancellation of purchased goodwill, transferable contracts, etc., and exhaustion of patent protection*

- 12.34 Just as the appearance of intangible non-produced assets is recorded in the other change in the volume of assets account, so is their write-off, termination, or exhaustion. For purchased goodwill, amortization should be recorded over a period of time after the purchase of an enterprise, following country accounting standards; the exhaustion of patent protection should be recorded over the duration of the patent.

## **6. Catastrophic losses (K.7)**

- 12.35 Consumption of fixed capital, recorded in the capital account, is intended to cover normal accidental damage to the various categories of fixed assets, including cultivated assets. Changes in inventories include recurrent losses on goods held in inventory. Elsewhere in the other changes in the volume of assets account, depletion of non-produced natural assets covers normal rates of extraction, harvesting, etc., and degradation of non-produced assets covers damage due to economic activity. The volume changes recorded as catastrophic losses in the other changes in the volume of assets account, however, are the result of large scale, discrete, and recognizable events that may destroy assets within any of the categories of assets. Table 12.1 shows entries for catastrophic losses on the left side of the accounts for general government and non-financial corporations, reflecting damage resulting from a major earthquake, for example. These catastrophic losses are shown for produced assets - fixed assets (-4) and inventories (-1) - held by non-financial corporations (-5 in all), to fixed produced assets held by general government (-1), and to tangible non-produced assets, such as natural forests, held by general government (-2).

- 12.36 Such events will generally be easy to identify. They include major earthquakes, volcanic eruptions, tidal waves, exceptionally severe hurricanes, drought and other natural disasters; acts of war, riots and other political events; and technological accidents such as major toxic spills or release of radioactive particles into the air.

- 12.37 Included here are such major losses as deterioration in the quality of land caused by abnormal flooding or wind damage; destruction of cultivated assets by drought or outbreaks of disease; destruction of buildings, equipment or valuables in forest fires or earthquakes; and the accidental destruction of currency or bearer securities as a result of natural catastrophe or political events.

## **7. Uncompensated seizures (K.8)**

- 12.38 Governments or other institutional units may take possession of the assets of other institutional units, including non-resident units, without full compensation for reasons other than the payment of taxes, fines, or similar levies. The seizures of assets by governments or other institutional units may

contravene national, or international, law. Such seizures are not capital transfers recorded in the capital account.

- 12.39 If the compensation falls substantially short of the market or related values of the assets as shown in the balance sheet, the difference should be recorded in the entry for uncompensated seizures of assets, as an increase in assets for the institutional unit doing the seizing and a decrease in assets for the institutional unit losing the asset. Table 12.1 illustrates the recording of such uncompensated seizures, when government seizes assets from corporations. The left side of the account for general government records increases in holdings of produced fixed assets (1), tangible non-produced assets (4) and securities other than shares (3). The left side of the account for non-financial corporations records decreases in holdings of produced fixed assets (-1) and tangible non-produced assets (-4), and the left side of the account for financial corporations records decreases in holdings of securities other than shares (-3).
- 12.40 It should be noted that foreclosures and repossessions of goods by creditors are not treated as uncompensated seizures. They are treated as transactions - disposals by debtors and acquisitions by creditors - because, explicitly or by general understanding, the agreement between debtor and creditor provided this avenue of recourse.

## **8. Other volume changes in non-financial assets n.e.c. (K.9)**

- 12.41 The other changes in the volume of assets account also systematically records the effects of unexpected events on the economic benefits derivable from assets, especially the effect of events not anticipated when allowances were specified for the consumption of fixed capital - which reflects normal rates of physical deterioration, obsolescence and accidental damage - or for normal rates of inventory shrinkage. These events include untimely retirements of fixed assets because of unforeseen obsolescence, fragility, etc., and exceptional losses in inventories. In practice it may be difficult to distinguish among the categories shown below.
- 12.42 Although most of the examples given above of items to be recorded here are decreases in assets, the illustration of other volume changes in non-financial assets n.e.c. given in table 12.1 is the entry of 1 on the left side of the account for non-financial corporations, which represents an increase in holdings of fixed assets. Such an increase could come about, for example, to restore to the System an asset that remains in productive use even though it has been fully written off through consumption of fixed capital, as explained in more detail in paragraph 12.48 below.

### **Unforeseen obsolescence**

- 12.43 Consumption of fixed capital does not cover unforeseen obsolescence in these assets, and the amount included for their normally expected obsolescence may fall short of the actual obsolescence. Entries must, therefore, be made in the other changes in the volume of assets account for the decline in the value of the fixed assets - whether a complete or partial write-off - resulting from the introduction of improved technology. The improvement may take the form of improved models of the asset or of a new production process that no longer requires the asset.

### **Differences between allowances included in consumption of fixed capital for normal damage and actual losses**

- 12.44 Consumption of fixed capital does not cover unforeseen damage, and the amount included for their normally expected damage may fall short of (or exceed) the actual damage. For the economy as a whole, this difference should normally be small; for individual units this difference is normally significant and may fluctuate in sign. Adjustments must therefore be made in the other changes in the volume of assets account for the decline (or increase) in the value of the fixed assets due to these events. These losses are larger than normal, but are not on a scale sufficiently large to be considered catastrophic.



#### Degradation of fixed assets not accounted for in consumption of fixed capital

- 12.45 Consumption of fixed capital does not cover unforeseen environmental degradation in these assets. Entries must, therefore, be made in the other changes in the volume of assets account for the decline in the value of the fixed assets from, for example, the effects of acidity in air and rain on building surfaces or vehicle bodies.

#### Abandonment of production facilities before completion or being brought into economic use

- 12.46 Production facilities with long construction periods may cease to have an economic rationale before they are complete or are put into service. For example, some nuclear power plants and industrial sites, especially in formerly centrally planned economies or developing countries, may never be put into service. When the decision to abandon is made, the value of the fixed asset (or in some case, work-in-progress inventories, as explained in chapter X), as recorded in the balance sheet should be written off in the other changes in the volume of assets account.

#### Exceptional losses in inventories

- 12.47 Exceptional losses from fire damage, from robberies, from insect infestation of grain stores, etc., should be recorded here. In this context, exceptional losses tend to be less regular and larger in value than the recurrent losses mentioned in the descriptions of inventory change in chapter X.

#### Other volume changes in non-financial assets, n.e.c.

- 12.48 Any changes in non-financial assets that are not transactions in the capital account, that should not be attributed to holding gains or losses, and that do not fall into one of the categories already enumerated above are to be recorded here. For example, assets may last longer than expected either economically or physically. An entry in the other changes in the volume of assets account permits the restoration to the System of an asset that has been fully written off but is still productive because its anticipated replacement never materialized or because it was much more durable than anticipated. Increases (or decreases) in value resulting from conversions of dwellings to commercial use (or vice versa) also are recorded here as counterparts to changes in classification.

### **9. Other volume changes in financial assets and liabilities n.e.c. (K.10)**

- 12.49 Most financial assets - claims on other institutional units - are created when the debtor accepts the obligation to make a payment, or payments, to the creditor in the future; they are extinguished when the debtor has fulfilled the obligation under the terms of the agreement. Those assets for which not even a notional liability exists, however, cannot be created and extinguished in this way; hence, they enter and leave the System through the other changes in the volume of assets account. Also recorded here are the effects of events not anticipated when the terms of financial claims were set.

#### Allocations and cancellations of SDRs

- 12.50 Special Drawing Rights (SDRs) are international reserve assets created by the International Monetary Fund (IMF) and allocated to its members to supplement existing reserve assets. As explained in paragraph 11.67 of chapter XI, transactions in SDRs are recorded in the financial accounts of the monetary authorities and the rest of the world. However, a new allocation of SDRs by the IMF is recorded in the other changes in the volume of assets account, as is the cancellation of SDRs by the IMF. The first increases assets for the monetary authorities, the second decreases their assets. There is no IMF liability for these assets. The flows can be valued by reference to the value of SDRs as determined daily by the IMF on the basis of a basket of currencies. Table 12.1 shows on the left side of the account for financial corporations an entry for other volume changes in financial assets and liabilities n.e.c. that increases holdings of monetary gold and SDRs by 5; there is no corresponding change in liabilities.

## Writing-off bad debts by creditors

- 12.51 Recognition by a creditor that a financial claim can no longer be collected, due to bankruptcy or other factors, and the consequent removal of that claim from the balance sheet of the creditor should be accounted for here, along with removal of the liability of the debtor. Table 12.1 illustrates this type of other volume changes in financial assets and liabilities n.e.c. On the left side of the account for financial corporations there is an entry of -4 for loan assets, which is matched by an entry of -4 for loan liabilities on the right side of the account for non-financial corporations.
- 12.52 Cancellation of debt by mutual agreement between debtor and creditor is not included here; it is treated as a capital transfer from the creditor to the debtor in the capital account with a simultaneous extinction of a claim in the financial account, as explained in paragraph 11.23 of chapter XI.
- 12.1 Non-life insurance
- 12.2 Item a covers both the service charge which is payable for the future period and the level of claims expected in respect of this period. In commercial accounting terms, these items are referred to as provisions for unearned premiums and provision for unexpired risk.
- 12.3 Provision for unearned premiums result from the fact that, in general, insurance premiums are due to be paid at the start of the period covered by the insurance, and this period does not normally coincide with the accounting period itself. Only that part of the premium covering the accounting period is treated as earned by the insurance company in the period. The remainder is a liability of the insurance company to the policy holder and an asset of the policy holder, akin to a trade credit, that could be returned to the policy holder if the policy is cancelled before the end of the period originally covered by the premium.
- 12.4 Items b to d are described in commercial accounting terms as provisions for claims outstanding and equalisation provisions. They are reserves that insurance enterprises hold in order to cover the amounts they expect to pay out in respect of claims that are not yet settled, claims not settled, claims which are not yet notified and therefore may be unknown to the insurance company or claims that may be disputed. When both the beneficiary and the amount of the claim to be paid are known, reserves against outstanding claims are assets of the beneficiaries and liabilities of the insurance enterprises. However, when either the amount of the claim or the beneficiary or both) are unknown, the reserves are strictly provisions rather than liabilities of the insurance enterprise. The fact that insurance enterprises allow for some variability from year to year in the level of claims underlies the practice in the System of using expected claims in the derivation of the level of service charge made by insurance enterprises. This is also the basis of the term in commercial accounting for equalisation provision. All these provisions are included within the asset boundary of the System because it would be misleading not to show a deduction from the net worth of the insurance enterprise for these amount, even if the beneficiaries are unknown and thus matching assets cannot be recorded.

### *Time of recording of claims*

- 12.5 Valid claims accepted by insurance enterprises are considered due for payment when the eventuality or accident that gives rise to the claim occurs. However, in some cases the claims may not be made until some considerable time after the event giving rise to the claim occurs. One example is a medical condition arising from working conditions. (This is known as a “long-tail” claim.) In such cases the claims may be disputed and this may lead to further delays in the payment of the claim. Nonetheless, the System recommends that the claims should be recorded in the period when the event giving rise to the claim occurred. When claims that have been outstanding for some time are eventually settled, revisions to past accounts are necessary to show the payment recorded in the secondary distribution of income of the appropriate period, with consequential effects on the entries in the accumulation accounts (including balance sheets) for all subsequent periods to date.

## 12.6 Pensions

- 12.7 The increase in pension entitlements are different for the two common types of pension plan, defined contribution plans and defined benefit plans.
- 12.8 Under a defined contribution plan, the increase in pension entitlement each year comes from two sources. The first of these is the value of the actual contribution made by the employer and employee (in some cases non-employed persons also) in the year in question. These contributions accumulate in a fund earmarked for the future pension payments and a pension fund manager (who may be the employer or a designated other unit) has the responsibility to invest these funds for the benefit of future pensioners. The property income earned on these funds plus the actual contributions of the current period, less the service charge for managing the scheme represent the addition to pension entitlements for defined contribution schemes. For defined contribution scheme, it is necessarily the case that the fund holds assets exactly equal to the value of the liabilities of the scheme towards its current and future pensioners, but these may not be identified as such and are classified according to the type of instrument in which they are held rather than according to the purpose for which they will be used.
- 12.9 In the same accounting period there will be decreases in the entitlements representing the amount of pensions actually paid out.
- 12.10 Under a defined benefit pension schemes, there are also two sources of increase in pension entitlements in a year. The first of these is the sum of the contributions by the employer and employee in the current period. These contributions must be exactly equal to the increase in entitlement that comes from the employee earned from his employment in that year. If necessary, there is an imputed contribution by the employer to make up any shortfall between the actual contributions and the size of this entitlement plus the cost of managing the scheme in the year. (If the sum of the actual contributions exceed this amount, the amount recorded as the employer's contribution is reduced so equality is reached.) The second source of increase in the entitlement is the increase in the start-of-year entitlement by the fact that the point at which the pensions are due to be paid is one period nearer and thus less discounting is applied to derive the value of the future entitlement. The size of this source of increase is recorded as such regardless of whether the assets earmarked to make the payments have increased by this amount or even if there are any earmarked assets at all.
- 12.11 In the same accounting period there will be decreases in the entitlements representing the amount of pensions actually paid out.

### Counterpart of "other accounts receivable/payable" for defined benefit pension funds

- 12.53 Defined benefit pension plans are those in which the level of pension benefits promised to participating employees is guaranteed. Benefits are related by some formula to participants' length of service and salary and are not totally dependent on the assets in the fund. For defined benefit plans, an entry in the other changes in the volume of assets account captures changes in the actuarially determined liability that result from changes in benefits structure, which are to be distinguished from changes in the age and service composition of the beneficiary pool. Examples of changes in benefit structure include changes in the formula, reductions in the pensionable age, or funding for an annual increase (usually defined as constant  $x$  per cent per year) in future pensions or in all pensions in the course of payment. Such a change is illustrated in table 12.1 by entries for other volume changes in financial assets and liabilities n.e.c. on the right side of the account for financial corporations, where liabilities in the form of insurance technical reserves increase by 2, and on the left side of the account for households, where assets in the form of insurance technical reserves also increase by 2.

## Miscellaneous other volume changes in financial assets

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

### **10. Changes in classifications and structure (K.12)**

- 12.55 The other changes in the volume of assets account records changes in assets and liabilities that reflect nothing more than changes in the classification of institutional units among sectors, changes in the structure of institutional units and changes in the classification of assets and liabilities.

#### Changes in sector classification and structure (K.12.1)

- 12.56 Reclassifying an institutional unit from one sector to another transfers its entire balance sheet. For example, if an unincorporated enterprise becomes more financially distinct from its owner and takes on the characteristics of a quasi-corporation, it and its balance sheet move from the household sector to the non-financial corporations sector; or if a financial corporation is newly authorized to take deposits, it may be reclassified from “other financial intermediaries” to “other depository corporations”.
- 12.57 Table 12.1 shows an example of such a change in sector classification, for example, when an unincorporated government enterprise becomes a public non-financial quasi-corporation and moves from general government to non-financial corporations. The entries for changes in sector classification and structure are shown on the left side of the account for general government as decreases in holdings of produced fixed assets (-3), tangible non-produced assets (-1), and shares and other equity (-2); on the right side of the account for general government there is a decrease in loan liabilities (-1). Corresponding entries are shown on the left side of the account for non-financial corporations as increases in holdings produced fixed assets (3), tangible non-produced assets (1), and shares and other equity (2); on the right side of the account for non-financial corporations is an increase in loan liabilities (1).
- 12.58 Changes in structure are also recorded here. The financial account does not cover the disappearance or appearance of certain financial assets and liabilities because of corporate restructuring. When a corporation disappears as an independent legal entity - and thus as an institutional unit in the System - because it is absorbed by one or more other corporations, all claims/liabilities, including shares and other equity that existed between that corporation and those that absorbed it, are eliminated. The disappearance of these financial instruments is recorded under changes in sector classification and structure.
- 12.59 Symmetrically, when a corporation is legally split up into two or more institutional units, new claims and liabilities, including shares and other equity, may appear between the new institutional units. The appearance of these financial instruments is recorded in this category also.

#### Changes in classification of assets and liabilities (K.12.2)

- 12.60 The capital account and the financial account may record transactions in which an asset is classified differently from the category in which it was held in the opening balance sheet. This is the case when the purpose for which an asset is used changes, such as for example, non-monetary gold becoming monetary gold or pasture becoming building lots. The change in classification is recorded here with the same value for both entries - the value of the asset before its use changed. If the change in the use of a non-produced non-financial asset means a change in its value, this change in value is treated as a change in quality - i.e., a volume change - and recorded under economic appearance or economic disappearance of non-produced assets, as described above.

*Monetization/demonetization of gold (K.12.21)*

12.61 As explained in paragraph 11.65 of chapter XI, monetization and demonetization of gold are accomplished by entries for changes in the classification of gold held by the monetary authorities, as counterparts to entries in the capital account. In the capital account, the monetary authorities purchase gold from inventories or valuables held by institutional units or the rest of the world. Monetization occurs when the monetary authorities reclassify the gold from a produced asset to the reserve assets held by the monetary authorities. Similarly, demonetization occurs when the monetary authorities transfer gold from reserve assets to inventories or valuables, which are subsequently sold to institutional units or the rest of the world, with these transactions being recorded in the capital account. The flows can usually be valued by reference to the price on organized markets or in bilateral arrangements through central banks. Table 12.1 illustrates monetization of gold on the left side of the account for financial corporations, with a decrease in holdings of valuables (-2) and an increase holdings of monetary gold and SDRs (2) by financial corporations.

*Changes in classification of assets or liabilities other than monetization/demonetization of gold (K.12.22)*

12.62 Changes in land use for a particular parcel of land are recorded here, with the same absolute value used for both entries - a negative entry for the old category, a positive one for the new category. The change in land value resulting from this change in use - the counterpart flow - is recorded in economic appearance and disappearance of non-produced assets as a change in quality, which is considered a change in volume, as discussed above. An economic appearance records an increase in quality, and an economic disappearance records a decrease in quality. Other changes that might be recorded here are conversions of dwellings to commercial use or vice versa.

**C. The revaluation account**

12.63 The revaluation account, shown in table 12.2, records the positive or negative holding gains accruing during the accounting period to the owners of financial and non-financial assets and liabilities. Holding gains on assets, whether positive or negative, are recorded on the left side of the account and those on liabilities on the right side. The revaluation account shows the nominal holding gains accruing on assets and liabilities. These are then decomposed into neutral holding gains and real holding gains, shown in two sub-accounts. The nominal holding gain on a given quantity of an asset is defined as the value of the benefit accruing to the owner of that asset as a result of a change in its price or, more generally, its monetary value over time. The value of the holding gain on a liability is equal to the change in the price, or monetary value, of that liability but with the sign reversed. A positive holding gain, whether due to an increase in the value of a given asset or a reduction in the value of a given liability, increases the net worth of the unit in question. Conversely, a negative holding gain - i.e., a holding loss - whether due to a reduction in the value of a given asset or an increase in the value of a given liability, reduces the net worth of the unit in question.

**Table 12.2. Account III.3.2: Revaluation account**

12.64 A neutral holding gain is defined as the value of the holding gain that would accrue *if* the price of the asset changed in the same proportion as the general price level - i.e, merely kept pace with the general rate of inflation or deflation. It is the value of the holding gain needed to preserve the real value of the asset in question intact over time. A real holding gain is defined as the value of the additional command over real resources accruing to the holding of an asset as a result of a change in its price relatively to the prices of goods and services in general in the economy. Nominal, neutral

and real holding gains, and the interrelationships between them are explained more fully in the following sections.

- 12.78 When the relative price of an asset rises over a given period of time, the asset can be exchanged for a greater volume of the goods, services and assets covered by the general price index at the end of the period than at the beginning. The holding gain is described as “real” because it measures the value of the additional (positive or negative) goods, services and assets that may be acquired by the owner of the asset by disposing of it at the end of the period instead of at the beginning.
- 12.65 The balancing item in the revaluation account is described as changes in net worth due to nominal holding gains/losses. It is defined as the algebraic sum of the positive or negative nominal holding gains on all the assets and liabilities of an institutional unit. As the revaluation account is decomposed into two separate accounts for neutral and real holding gains, its balancing item may similarly be decomposed into two further balancing items: changes in net worth due to neutral holding gains/losses and those due to real holding gains/losses. The latter shows how much of the change in the real net worth of an institutional unit is attributable to real holding gains. It is therefore an item of considerable analytic interest.
- 12.66 In order to simplify the terminology and exposition, holding losses will not usually be referred to explicitly unless the context requires it. The term “holding gains” is used to cover both holding gains and losses on the clear understanding that holding gains may be negative as well as positive. Similarly, the term “assets” may be used collectively to cover both assets and liabilities, unless the context requires liabilities to be referred to specifically.
- 12.67 Holding gains are sometimes described as “capital gains”. The term “holding gain” is widely used in business accounting and is preferred here because it emphasizes the fact that holding gains accrue purely as a result of holding assets over time without transforming them in any way. Holding gains include not only gains on “capital” such as fixed assets, land and financial assets but also gains on inventories of all kinds of goods held by producers, including work-in-progress, often described as “stock appreciation”. 12.72 The nominal holding gains recorded in the revaluation account are those accruing on assets or liabilities, whether realized or not. A holding gain is said to be realized when the asset in question is sold, redeemed, used or otherwise disposed of, or the liability repaid. An unrealized gain is therefore one accruing on an asset that is still owned or a liability that is still outstanding at the end of the accounting period. A realized gain is usually understood as the gain realized over the entire period over which the asset is owned or liability outstanding whether this period coincides with the accounting period or not. However, as holding gains are recorded on an accruals basis in the System, the distinction between realized and unrealized gains, although useful for some purposes, is not so important in the System and does not appear in the classifications and accounts.

#### Nominal holding gains (K.11)

- 12.68 Nominal holding gains depend upon changes in the prices or, more generally, the monetary values, of assets and liabilities over time. The relevant prices or values for assets that are exchanged in transactions between institutional units are those recorded in the accumulation accounts of the System. In order to be consistent with the accumulation accounts, assets in the opening and closing balance sheets are valued at their acquisition values at the times the balance sheets are drawn up: i.e., including the costs of ownership transfer that would be incurred by the purchaser in the case of non-financial assets. These are the values at which assets enter the balance sheets of their owners. In the case of non-transferable financial assets and liabilities such as loans, the monetary value is the amount of principal outstanding. Not all assets and liabilities have market prices in the ordinary sense of the term “price”. In particular, assets and liabilities denominated in purely monetary terms - such as cash and deposits - do not have physical units with which prices can be associated. In such cases, the relevant “quantity” unit is effectively a unit of currency itself - e.g., one dollar - so that the price per unit is always unity. By definition, therefore, the market prices of such assets and their corresponding liabilities cannot change over time. On the other hand, the relevant quantity unit for an asset such as a bill, bond or share is the security itself, the market price of which may change

over time. The term “price” has therefore to be used in a broad sense to cover the unitary prices of assets such as cash, deposits, loans, etc., and the corresponding liabilities as well as conventional market prices.

12.69 Nominal holding gains may accrue on assets held for any length of time during the accounting period and not merely on assets that appear in the opening or closing balance sheets. Nominal holding gains may refer to any period of time and must be defined accordingly. The nominal holding gain accruing to the owner of a particular asset, or given quantity of a specific type of asset, between two points of time is defined as:

the monetary value of that asset at the later point in time

*minus*

the monetary value of that asset at the earlier point in time

assuming that the asset itself does not change, qualitatively or quantitatively, in the meanwhile.

12.73 For purposes of calculating nominal holding gains, acquisitions and disposals of assets must be valued in the same way as in the capital and financial accounts in order to ensure consistency within the System as a whole. In the case of fixed assets, therefore, the value of an acquisition is the amount paid by the purchaser to the producer, or seller, plus the associated costs of ownership transfer incurred by the purchaser, while the value at which the disposal of an existing fixed asset is recorded is the amount received by the seller from the purchaser minus the costs of ownership transfer incurred by the seller. It is useful to distinguish four different situations giving rise to nominal gains and the methods of valuation to be employed in each case:

- (a) An asset held throughout the accounting period: the nominal holding gain accruing during the accounting period is equal to the closing balance sheet value minus the opening balance sheet value. These values are the estimated values of the assets if they were to be acquired at the times the balance sheets are drawn up. The nominal gain is unrealized;
- (b) An asset held at the beginning of the period that is sold during the period: the nominal holding gain accruing is equal to the actual or estimated disposal value minus the opening balance sheet value. The nominal gain is realized;
- (c) An asset acquired during the period and still held at the end of the period: the nominal holding gain accruing is equal to the closing balance sheet value minus the actual, or estimated, acquisition value of the asset. The nominal gain is unrealized;
- (d) An asset acquired and disposed of during the accounting period: the nominal holding gain accruing is equal to the actual, or estimated, disposal value minus the actual, or estimated, acquisition value. The nominal gain is realized.

As already noted in chapter X, it follows that if a non-financial asset is purchased and subsequently resold at the same price, excluding costs of ownership transfer, the unit involved incurs a nominal holding loss equal to the value of the costs of ownership transfer incurred on both the initial purchase and subsequent resale of the asset.

12.83 As explained above, the total nominal holding gains accruing on a particular category of asset over a given period of time include those accruing on assets acquired or disposed of during the accounting period as well as on assets that figure in the opening or closing balance sheets. It follows that it is not possible to calculate total holding gains from balance sheet data on their own, except in certain special cases or on certain assumptions. In order to calculate total holding gains directly, therefore, it is necessary to keep records of all the assets acquired and disposed during the accounting period and the prices at which they were acquired and disposed of, as well as the price and quantities of

assets held at the beginning and end of the period. In practice, however, the requisite data are unlikely to be available, although the increasing use of microcomputers for both management and accounting purposes by businesses may make the direct calculation of total nominal holding gains using the kinds of formulas given in the annex increasingly feasible.

12.84 However, if records are kept of the values of all transactions and other volume changes in assets, without necessarily recording the prices at which those transactions or changes occur, it is shown in the annex that the value of the total nominal gains may be derived residually by subtracting the total value of all transactions and other volume changes from the difference between the values of the asset recorded in the closing and opening balance sheets. This indirect method of calculating total nominal holding gains is only valid when appropriate valuation methods are used both for balance sheets and for transactions and other changes. Quantities of the asset held at the beginning and end of the period must be valued in the opening and closing balance sheets at the prices that would have to be paid to acquire them at the times to which the balance sheets relate, and all actual or imputed transactions or other volume changes must be valued at the prices prevailing at the times they take place.

12.85 The basic identity linking balance sheets, transactions, other volume changes and nominal holding gains may be expressed as follows:

the value of the stock of the asset in the opening balance sheet

*plus*

the value of quantities of the asset acquired, or disposed of, in transactions

*plus*

the value of other volume changes in the asset

*plus*

the value of the nominal holding gains on the asset

*equals*

the value of the stock of the asset in the closing balance sheet.

The identity follows from the ways in which the various items are defined and valued. Each of the five elements that make up the identity can be calculated directly and independently of the other four elements. Thus, each element has the same status, none of them being defined residually as a balancing item. The identity is similar in this respect to the identity between the values of the total supplies and total uses of some good or service.

12.86 Nevertheless, it follows that if any four out of the five elements are calculated directly, the fifth can be estimated residually. For this reason, the identity can be exploited to estimate nominal holding gains from the other four elements, but without this implying that nominal holding gains are a balancing item in the System.

12.87 There may be situations in which the only information available about certain kinds of assets consists of their values in the opening and closing balance sheets. This may happen in the case of certain financial assets, for example, or inventories. It can be seen from the above identity that it is not possible to infer from balance sheet data alone either the total value of the transactions and other volume changes taking place within the accounting or the total value of the holding gains, but only their combined value. However, in certain special cases it may be possible to isolate one or the other. For example, if the price of the asset remains constant throughout the accounting period, the



difference between the opening and closing balance sheet values must be entirely attributable to transactions and other volume changes. This condition is satisfied for monetary assets, for example, but not for financial assets such as bills or bonds whose market prices may change during the accounting period. Similarly, it is not possible to infer the value of changes in inventories from balance sheet data alone unless the price of the good in question happens to remain constant throughout the period. In general, goods entering or leaving inventories must be valued at the prices prevailing at the times the changes occur as if they were actually being bought or sold on the market.

- 12.88 Nominal holding gains may accrue on an asset that does not appear in either the opening or closing balance sheet if there have been transactions or other changes in the asset during the accounting period. Suppose a financial asset, such as a share, is purchased speculatively and sold again within the same accounting period. If the sale price is not equal to the purchase price, neither the total value of the transactions nor nominal holding gains can be zero. Indeed, the nominal holding gain must be equal to the total value of the transactions (the sale less purchase) but with the opposite sign. Unless the nominal holding gain is recorded, the value of the transactions cannot be reconciled with the zero values in the balance sheets. Another example is provided by producers who build up inventories and run them down again, all within a single accounting period. If the price of the good rises while held in inventory, the value of the withdrawals exceeds that of the entries, so that the total value of the changes in inventories is negative. The value of the nominal holding gains is equal to the value of the change in inventories, but with the opposite sign.

#### Neutral holding gains (K.11.1)

- 12.74 Nominal holding gains are partitioned into neutral holding gains and real holding gains. Neutral holding gains can be regarded as analytical constructs designed to facilitate the derivation of real holding gains. A neutral holding gain is defined as the value of the holding gain that would accrue if the price of the asset changed over time in the same proportion as the general price level. If the price of the asset changes by the same proportion as other prices, on average, its real value - i.e., the volume of other goods and services for which it can be exchanged - is neither increased nor decreased, whatever the general rate of inflation. In other words, a neutral holding gain is the value of the nominal holding gain needed to preserve the real value of the asset intact.
- 12.75 In order to calculate the neutral holding gain on an asset, it would be desirable to select a comprehensive price index covering as wide a range of goods, services and assets as possible. In practice, the price index for final expenditures would be an acceptable choice for most countries, although other comprehensive indices could be used depending upon the availability of data. A comprehensive index of this kind, however, may be available only once a year, or at best quarterly, and after a significant lapse of time. As holding gains may accrue on assets held for only short periods of time, it may also be necessary to make use of an index that measures changes in prices monthly and which becomes available without too much delay. The consumer price index (CPI) usually meets these requirements and an acceptable procedure would be to use the CPI to interpolate and extrapolate movements in a more broadly based index in order to calculate neutral holding gains.
- 12.76 Let the general price index be denoted by  $r$ . The neutral holding gain  $NG$  on a given quantity  $q$  of an asset between times  $o$  and  $t$  is then given by the following expression:

$$NG = p_o q (r_t / r_o - 1) \quad (2)$$

where  $(p_o q)$  is the monetary value of the asset at time  $o$ . The same term  $r_t / r_o$  is applied to all assets and liabilities. Thus, the proportionate movements in neutral holding gains are the same for all assets and liabilities, both financial and non-financial.

- 12.89 Neutral holding gains have to be subtracted from nominal holding gains to obtain real holding gains. As already explained, the neutral holding gain on an asset over a given period of time is equal to the value of the asset at the beginning of the period multiplied by the proportionate change in some comprehensive price index selected to measure the change in the general price level. Neutral

holding gains can therefore easily be calculated for assets held throughout the accounting period that appear in both the opening and closing balance sheets. It is more difficult, however, to keep track of the neutral holding gains on assets that are acquired or disposed of during the accounting period as it is necessary to know the times at which the various acquisitions and disposals took place - information that is unlikely to be available in practice. For this reason it will usually be difficult, and sometimes impossible, to obtain accurate, precise estimates of neutral, and hence real, holding gains.

12.90 A possible method of estimation suggested in the annex to this chapter is to use the same information, and a similar methodology, as that used to calculate nominal holding gains. The method of estimating neutral holding gains has three steps:

- (a) The closing balance sheet value is revalued to what it would have been if the price of the asset had changed at the same rate as the general price index over the period;
- (b) The total value of the transactions and other volume changes is revalued to eliminate the effect of any change in the relative price of the asset during the period;
- (c) The adjusted value for total transactions and other volume changes is subtracted from the difference between the adjusted closing balance sheet value and the opening balance sheet value.

12.91 It is worth noting that there is no simple method that can be used in all circumstances to divide, or partition, the absolute values of nominal holding gains into neutral and real holding gains given that holding gains - whether nominal, neutral or real - can be negative as well as positive. For example, the nominal holding gains on monetary assets are zero, but there can nevertheless be substantial positive neutral gains and negative real gains, depending upon the general rate of inflation.

#### Real holding gains (K.11.2)

12.77 The real holding gain on an asset can be expressed as the difference between the nominal and the neutral holding gain on that asset. Subtracting expression (2) from (1) above, the real holding gain  $RG$  on a given quantity  $q$  of an asset between times  $o$  and  $t$  is given by

$$\begin{aligned}
 RG &= G - NG \\
 &= (p_t / p_o - r_t / r_o) p_o q
 \end{aligned}
 \tag{3}$$

The values of the real holding gains on assets thus depend on the movements of their prices over the period in question, relatively to movements of other prices, on average, as measured by the general price index. An increase in the relative price of an asset leads to a positive real holding gain and a decrease in the relative price of an asset leads to a negative real gain, whether the general price level, as measured by  $r$ , is rising, falling or stationary.

12.79 As already noted, the nominal holding gains on financial assets and liabilities whose values are fixed in monetary terms are always zero. During inflation, the neutral gains on such assets and liabilities must be positive, and hence the real holding gains must be negative and equal in absolute value to the neutral gains. In other words, the real value of an asset/liability of fixed monetary value declines both for the creditor and the debtor as a result of inflation. Of course, from the point of view of the debtor a reduction in the real value of a liability represents an increase in real net worth. In effect, there is implicit transfer of real purchasing power from the creditor to the debtor equal in value to the negative real holding gain on the asset/liability. When such transfers are anticipated by creditors, correspondingly higher nominal rates of interest may be demanded on loans to compensate for the expected transfers or loans with fixed monetary values may be replaced by indexed loans.

- 12.80 As changes in relative prices may be either positive or negative, the owners of some assets benefit from real holding gains while the owners of other assets experience real holding losses. It cannot be assumed that such real gains and losses cancel each other out, even in a closed economy, as it is possible that asset owners benefit at the expense of units that do not own any or vice versa. Whether or not they cancel out, it is clear that real holding gains may lead to a significant redistribution of real net worth among institutional units, sectors and even countries, the extent of which depends on the amount of variation in the relative price changes taking place. While such variation may occur even when there is no general inflation, there are systematic effects that are associated with the general rate of inflation as a result of the decline in the real values of monetary assets and liabilities when the general price level is rising.
- 12.81 As real holding gains increase or decrease the purchasing power of the owners of assets, they must exert an influence on their economic behaviour. Real holding gains are important economic variables in their own right that need to be taken into account as well as income for purposes of analysing consumption or capital formation. It can be argued that real holding gains ought to be assimilated with income as defined in the System to obtain a more comprehensive measure of income, but there is no consensus on this. Apart from the practical difficulty of estimating real holding gains and losses, it is likely that their impact on economic behaviour is not the same as that of income received in cash or in kind. Nevertheless, it is clear that information on real holding gains needs to be made available to users, analysts and policy makers.
- 12.92 As real holding gains may be obtained residually by subtracting neutral from nominal holding gains, the feasibility of calculating real holding gains depends on the feasibility of calculating neutral and nominal gains. There is nothing further to add so far as their estimation is concerned.

#### Fixed assets

- 12.70 Nominal holding gains are calculated with reference to assets or liabilities that themselves remain qualitatively and quantitatively unchanged during the period over which the holding gain is measured. Thus, changes in the value of physical assets such as structures, equipment or inventories held by producers that are attributable to some physical or economic transformation of those assets over time, whether improvement or deterioration, are not counted as holding gains. In particular, the decline in the value of the fixed assets owned by producers due to their physical deterioration or normal rates of obsolescence or accidental damage is recorded as consumption of fixed capital and not as a negative holding gain. Similarly, as explained in chapter VI, paragraphs 6.64 and 6.65, when the storage of goods whose supply or demand is subject to seasonal influences is essentially an extension of the process of production, the increase in the value of the goods that is due to this production is not to be counted as a nominal holding gain.
- 12.101 Nominal holding gains on fixed assets may be obtained by subtracting the total value of transactions, including consumption of fixed capital, and other volume changes from the difference between values of the assets recorded in the closing and opening balance sheets. For this purpose, the stocks of assets recorded in the balance sheets must be measured net of the accumulated consumption of fixed capital and must be valued at the purchasers' prices prevailing on the date to which the balance sheet relates.
- 12.102 In this context, it is convenient to make use of the concept of net fixed capital formation even though this aggregate is not shown explicitly in the accounts of the System. Net fixed capital formation is defined as:

gross fixed capital formation

*minus*

consumption of fixed capital.

The basic identity linking transactions, other volume changes, nominal holding gains and balance sheet values is then written as follows for fixed assets:

(a) The value of the net stock of the fixed asset at the beginning of the period;

*plus*

(b) The value of net fixed capital formation in the asset (i.e., the net value of all transactions);

*plus*

(c) The value of other volume changes in the asset;

*plus*

(d) The value of nominal holding gains on the asset;

*equals*

(e) The value of the net stock of the fixed asset at the end of the period.

It is worth noting that, even in the absence of other volume changes, the difference between the net (or gross) values of the opening and closing stock of an asset valued at current prices is not equal to net (or gross) fixed capital formation at current prices, unless the price of the asset remains constant throughout the period. Apart from any other volume changes, the difference between the net values of the opening and closing stocks of fixed assets, valued at the beginning and end of period prices, respectively, must include nominal holding gains as well as net fixed capital formation. Such gains could be relatively large when the price of the asset is rising strongly within the period. In effect, the transactions taking place within the period are valued at the average prices of the period, which may be expected to lie between the opening and closing prices. For this reason, it is important to base the calculation of the consumption of fixed capital on the average prices of the period, as recommended in chapter VI, and not on the opening and closing prices.

12.103 Nominal holding gains may occur on existing fixed assets either because of general inflation or because the relative price of the asset changes over time. When assets of the same kind are still being produced and sold on the market, an existing asset should be valued in the opening or closing balance sheet at the current purchasers' price of a newly produced asset less the accumulated consumption of fixed capital up to that time also calculated on the basis of the prices prevailing at the time the balance sheet is drawn up. Changes in the prices of new assets between the beginning and end of the accounting period will, therefore, lead to nominal holding gains on existing assets of the same type. When new assets of the same type are no longer being produced, the valuation of existing assets may pose difficult conceptual and practical problems. If broadly similar kinds of assets are still being produced, even though their characteristics may differ significantly from those of existing assets (for example, new models of vehicles or aircraft), it may be reasonable to assume that, if the existing assets were still being produced, their prices would have moved in the same way as those of new assets. However, such an assumption becomes questionable when the characteristics of new assets are much improved by technical progress.

#### *Inventories*

12.104 The estimation of nominal holding gains on inventories may be difficult because of lack of data on transactions or other volume changes in inventories. As explained in chapter VI, transactions in inventories may not be adequately recorded because they are internal transactions. Goods entering inventories can be regarded as being acquired by the owner of an enterprise from itself as producer, while goods leaving inventories can be regarded as being disposed of by the owner to the producer for use in production or for sale. These internal transactions should be valued at the prices

prevailing at the times they take place in the same way as transactions in any other kind of asset. When the transactions are properly valued in this way, nominal holding gains on inventories are given as follows:

(a) The value of the closing inventories at end-of-the-period prices;

*minus*

(b) The value of the opening inventories at beginning-of-the-period prices;

*minus*

(c) The value of entries minus the value of withdrawals and recurrent losses, valued at the prices prevailing at the times the entries and withdrawals take place;

*minus*

(d) The value of other volume changes.

Other volume changes are likely to consist of inventories of goods destroyed as a result of exceptional events such as natural disasters (floods, earthquakes, etc.) or major fires. Current losses of goods from inventories - for example, losses due to regular wastage or pilfering - are grouped with withdrawals. Both exceptional and current losses on inventories obviously reduce the magnitude of any nominal holding gains on inventories.

12.105 Unless records are kept of the quantities of goods entering and leaving inventories and their prices at those times, it is not possible to measure the value of changes in inventories directly. As such records may not be available, it becomes necessary to try to deduce the value of changes in inventories from the value and quantities of the opening and closing inventories using methods such as those illustrated in equations (4) and (5) above that attempt to partition the difference between the values of the opening and closing stocks of assets into transactions and nominal holding gains. Such methods are only as good as the assumptions on which they are based. The difficulty of estimating the value of changes in inventories from balance sheet data alone obviously increases as the rate of inflation increases. It should also be noted that this is not only a problem for the accumulation accounts as the values of changes in inventories of inputs and outputs are needed in order to measure intermediate consumption, output and value added and hence all the balancing items of the System.

12.106 Work-in-progress is a stock of outputs that are not yet in a form in which they are ready for sale, use or transfer to other institutional units. Additions to work-in-progress are recorded as they occur and valued at the prices at those times. The prices are estimated by multiplying the actual or estimated basic price of the finished product at the time the addition to the work-in-progress takes place by the fraction of the total production costs incurred in producing the addition. Work-in-progress carried forward from the previous period is valued in the opening balance sheet using the price of the finished product at the date to which the balance sheet relates. Similarly, the total amount of work-in-progress recorded in the closing balance sheet is valued using the price of the finished product at the end of the period. Withdrawals from work-in-progress take place when the production is completed, the total work-in-progress completed during the entire production process being then transformed into a finished product. Nominal holding gains on work-in-progress may then be obtained residually by subtracting the value of the additions minus withdrawals from work-in-progress during the period from the difference between the opening and closing balance sheet values. Because some production processes may take years to complete, the whole of the output from some production process during a given period may be entered into inventories as additions to work-in-progress. Even when there is only modest inflation there may be substantial nominal holding gains on the work-in-progress.

### *Financial assets*

- 12.68 Nominal holding gains depend upon changes in the prices or, more generally, the monetary values, of assets and liabilities over time. The relevant prices or values for assets that are exchanged in transactions between institutional units are those recorded in the accumulation accounts of the System. In order to be consistent with the accumulation accounts, assets in the opening and closing balance sheets are valued at their acquisition values at the times the balance sheets are drawn up: i.e., including the costs of ownership transfer that would be incurred by the purchaser in the case of non-financial assets. These are the values at which assets enter the balance sheets of their owners. In the case of non-transferable financial assets and liabilities such as loans, the monetary value is the amount of principal outstanding. Not all assets and liabilities have market prices in the ordinary sense of the term “price”. In particular, assets and liabilities denominated in purely monetary terms - such as cash and deposits - do not have physical units with which prices can be associated. In such cases, the relevant “quantity” unit is effectively a unit of currency itself - e.g., one dollar - so that the price per unit is always unity. By definition, therefore, the market prices of such assets and their corresponding liabilities cannot change over time. On the other hand, the relevant quantity unit for an asset such as a bill, bond or share is the security itself, the market price of which may change over time. The term “price” has therefore to be used in a broad sense to cover the unitary prices of assets such as cash, deposits, loans, etc., and the corresponding liabilities as well as conventional market prices.
- 12.71 The characteristics of financial assets and liabilities may also change over time, in particular the proximity to maturity of securities with fixed redemption dates. For example, most or all of the increase in the market value of a bill or a bond issued at a discount as it approaches its redemption date may be attributable to the accumulation of unpaid interest accruing to its holder. The increase in the market value of a bill or bond due to the accumulation of accrued interest in this way represents a growth in the asset itself and is not a price increase. It does not generate a holding gain.
- 12.107 The monetary values of some assets and liabilities - cash, deposits, loans, advances, credits, etc. - remain constant over time. As already noted, the “price” of such an asset is always unity while the quantity is given by the number of units of the currency in which they are denominated. The nominal holding gains on such assets are always zero. For this reason the difference between the values of the opening and closing stocks of such assets is entirely accounted for by the values of the transactions in the assets, this being one case in which it is possible to deduce the latter from the balance sheet figures.
- For monetary assets and liabilities for which both  $po$  and  $pt$  are unity by definition, nominal holding gains are always zero. However, the neutral holding gains on monetary assets and liabilities are not zero when the general price level is changing, in which case the real holding gains are also not zero.
- 12.108 In order to calculate the neutral and real holding gains on assets of fixed monetary value, however, data on the times and values of transactions are needed as well as the opening and closing balance sheet values. In principle, the exact expression for neutral holding gains given in the annex to this chapter should be used. Suppose, for example, a loan is made and repaid within the accounting period while the general price level is rising. The neutral gain on the loan is positive and the real gain negative, the amount depending upon the length of time the loan is outstanding and the rate of inflation. It is impossible to record such real losses without data on the value of the loans made and repaid during the accounting period and the times at which they are made and repaid. In general, it may be inferred that if the total absolute value of the positive and negative transactions is large in relation to the opening and closing balance sheet levels, approximate estimates of the neutral and real holding gains on monetary assets and liabilities derived from balance sheet data alone may not be very satisfactory. Even recording the values of financial transactions on a gross basis - i.e., recording loans made and repaid separately as distinct from the total value of loans minus repayments - may not be sufficient without information on the timing of the loans.

## *Bonds*

- 12.109 A bond is a security that gives the holder the unconditional right to a fixed money income or contractually determined variable money income over a specified period of time and also the right to a fixed sum as repayment of principal on a specified date or dates, except in the case of perpetual bonds. Bonds are usually traded on markets and the holder of a bond may change several times during the life of the bond. The issuer of such a bond may, therefore, repay the principal outstanding at any time by purchasing it back in advance of the date on which it matures.
- 12.110 As explained in chapter VII, when bonds are issued at a discount, including deep discounted and zero coupon bonds, the difference between its issue price and its face or redemption value when it matures measures interest that the issuer is obliged to pay over the life of the bond. Such interest is recorded as property income payable by the issuer of the bond and receivable by the holder of the bond in addition to any coupon interest actually paid by the issuer at specified intervals over the life of the bond. In principle, the interest accruing is treated as being simultaneously reinvested in the bond by the holder of the bond. It is, therefore, recorded in the financial account as the acquisition of an asset which is added to the existing asset. Thus the gradual increase in the market price of a bond that is attributable to the accumulation of accrued, reinvested interest reflects a growth in the principal outstanding - i.e., in the size of the asset. It is essentially a quantum or volume increase and not a price increase. It does not generate any holding gain for the holder of the bond or holding loss for the issuer of the bond. The situation is analogous to that of a good, such as wine, that matures while it is being stored. Any increase in the price of the wine that is attributable to an improvement in its quality reflects an increase in volume and not price. Bonds change qualitatively over time as they approach maturity and it is essential to recognize that increases in their values due to the accumulation of accrued interest are not price changes and do not generate holding gains.
- 12.111 The prices of marketable bonds also change, however, when the market rates of interest change, the prices varying inversely with the interest rate movements. The impact of a given interest rate change on the price of an individual bond is less, the closer the bond is to maturity. Changes in bond prices that are attributable to changes in market rates of interest constitute price and not quantum changes. They therefore generate nominal holding gains or losses for both the issuers and the holders of the bonds. An increase in interest rates generates a nominal holding gain for the issuer of the bond and an equal nominal holding loss for the holder of the bond, and vice versa in the case of fall in interest rates.
- 12.112 Nominal holding gains or losses may accrue on bills in the same way as for bonds. However, as bills are short-term securities with much shorter times to maturity, the holding gains generated by interest rate changes are generally much smaller than on bonds with the same face values.

### **1. Foreign assets**

- 12.113 Foreign assets consist mainly of financial claims over non-resident institutional units. All immovable assets such as land and buildings within an economic territory are treated in the System as owned by resident units, including those legally owned by foreigners. When foreigners own land or buildings, their ownership is deemed to be delegated to notional resident units. The equity of such a notional unit is then owned by the foreign unit.
- 12.114 The value of a foreign asset is measured by its current value in foreign currency converted into the currency of the country in which its owner is resident at the exchange rate. Nominal holding gains may therefore occur not only because the price of the asset in local currency changes but also because the exchange rate changes. The total value of the nominal holding gains accruing over the period may be calculated in the usual way by subtracting the value of transactions from the difference between the opening and closing balance sheet values. For this purpose, transactions in the foreign assets must be converted into the national currency using the exchange rates at the times the transactions occur, while the opening and closing balance sheet values must be converted using the exchange rates prevailing at the dates to which the balance sheets relate. This implies that the total value of the transactions - acquisitions less disposals - expressed in the foreign currency is,

in effect, converted by a weighted average exchange rate in which the weights are given the values of transactions conducted on different dates.

12.115 Neutral holding gains are calculated in the same way as for any other type of asset by calculating what the holding gains would have been if the prices of the assets, expressed in national currency, had moved in the same way as the general internal price level. Real holding gains, again expressed in national currency, can then be derived residually by subtracting the neutral from the nominal gains. The real holding gains (losses) of creditors in one country need not be equal to the real holding losses (gains) of debtors on the same assets in another country when the general rates of inflation are not the same in the two countries.

## 2. The measurement of holding gains

12.82 In order to obtain precise definitions of holding gains over periods of time during which the quantities of assets held may be varying from day to day, it is necessary to utilize algebraic expressions involving prices and quantities similar to those used to define index numbers. In order to simplify the main text, the derivation of the algebraic expressions that define nominal, neutral and real holding gains is given in an annex to this chapter. The main conclusions of the annex are summarized in this section.

## 3. Estimates of holding gains from balance sheet data

12.93 As noted above, there may be situations in which the only information available about certain kinds of assets consists of balance sheet data. This situation is quite common in the case of inventories, for example, or certain types of financial assets. It should be noted that in the case of inventories, estimates of both the transactions and the nominal holding gains have to be made in order to be able to compile the production account and hence other accounts of the System.

12.94 Although it is not possible to obtain reliable, accurate estimates of transactions and holding gains from balance sheet data alone, it becomes possible to deduce the values of both the transactions and other changes and the nominal holding gains if assumptions are made about the paths followed by both the prices and the quantities of an asset between the beginning and the end of the accounting period.

12.95 The simplest and most convenient assumptions to make are that both the prices and quantities of the asset change at constant linear rates between the beginning and end of the accounting period; i.e., that the sequences of prices and quantities linking the opening and closing levels are simple arithmetic progressions. Given these assumptions it is easy to show that:

$$\text{the value of the transactions and other volume changes} = \bar{p}(q_n - q_o) \quad (4)$$

$$\text{the value of the nominal holding gains} = \bar{q}(p_n - p_o) \quad (5)$$

$$\text{where } \bar{p} = \frac{1}{2}(p_o + p_n)$$



and  $\bar{q} = \frac{1}{2}(q_o + q_n)$

12.96 It is also easily verified that (4) and (5) sum identically to equal the value of the difference between the values recorded in closing and opening balance sheets,  $(p_n q_n - p_o q_o)$ . If  $q_n / q_o > q_n / q_o$ , the value of the transactions given by (4) exceeds the value of the holding gains given by (5). If the two ratios are equal, the difference between the values of the opening and closing stocks is divided equally between transactions and holding gains. Equation (4) is often used to estimate the value of changes in inventories, 12.97 The nominal holding gains given by (5) may be further decomposed into although it is equally applicable to other assets, including financial assets.

neutral and real holding gains, given the additional information on the change in the general price index over the accounting period. Let  $r_n$  equal the value of the general price index on day  $n$  based on  $r_o = 1$ . It can easily be shown that:

the value of the neutral holding gains =  $(r_n - 1)p_o \bar{q}$  (6)

the value of the real holding gains =  $(r_n - 1)p_o \bar{q}$  (7)

The real holding gains are, of course, zero if the change in the price of the asset  $p_n / p_o$  is equal to the change in the general price index  $r_n$ .

12.98 The quality of the approximate measures given in expressions (4) and (5) depends on the realism of the underlying assumptions about the movements of prices and quantities. While the assumption that the price of the asset increases at a constant rate during the accounting period may be not unreasonable, the assumption that the quantity of the asset changes at a constant rate may be questionable in many cases. In particular, if there are fluctuations in the quantity of the asset held, estimates based on expressions (4) to (7) may diverge significantly from the true figures. Fluctuations in inventories are likely to occur in industries in which the supply or the demand for the product is subject to strong seasonal influences. The use of expressions (4) to (7) may give poor estimates in such situations.

12.99 Expressions (4) and (5), which differ only in so far as the p's and q's are interchanged, display clearly the duality between the values of transactions and other changes in assets and the values of the nominal holding gains on those assets. Approximate estimates of this kind may also serve as a useful check on the value of nominal holding gains derived residually from data on transactions and other changes and the difference between the closing and opening balance sheet values. In many situations, there may be no good reason for expecting the approximate measure of the value of nominal holding gains given by (5) to diverge markedly from the true measure. In such cases, a major discrepancy between a measure of nominal holding gains obtained residually from transactions and balance sheet data and the approximate measure may bring into question the reliability and consistency of the entire data set, including the transactions data, and signal the need for revisions.