



EUROPEAN CENTRAL BANK

EUROSYSTEM

MANUAL ON INVESTMENT FUND STATISTICS

MAY 2009

CB EZB EKT EKP

2000



**BASED ON REGULATION
ECB/2007/8 AND
GUIDELINE ECB/2007/9**



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MAY 2009

In 2009 all ECB
publications
feature a motif
taken from the
€200 banknote.

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ISBN 978-92-899-0449-0 (online)



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I AIM OF THIS MANUAL

On 27 July 2007, the Governing Council of the European Central Bank (ECB) adopted Regulation ECB/2007/8 concerning statistics on the assets and liabilities of investment funds (hereinafter referred to as the “Regulation”). The Regulation was published in the Official Journal of the European Union (OJ) on 11 August 2007¹ and entered into force on 31 August 2007. It defines the statistical standards for collecting and compiling investment fund (IF) statistics in the euro area. The Regulation is binding on the euro area Member States.

On 1 August 2007, the Governing Council of the ECB adopted Guideline ECB/2007/9 on monetary, financial institutions and markets statistics (hereinafter referred to as the “Guideline”). The Guideline entered into force on 3 September 2007. It was published in the Official Journal of the European Union on 27 December 2007.² In Article 18, the Guideline includes provisions regarding the reporting by the national central banks (NCBs) of statistics on the assets and liabilities of IFs.

This manual contains no additional requirements and has no legally binding status. It aims to further clarify and illustrate the requirements laid down in the Regulation and in the Guideline. A clear and consistent understanding of the statistical requirements contained in the Regulation and Guideline by the statisticians in the NCBs of the European System of Central Banks (ESCB) is essential for the production of harmonised IF statistics. The information in the manual may also be of interest for reporting agents and users of these statistics.

This manual is composed of 12 chapters. Chapter 2 provides further clarifications regarding the definition of IFs. Chapters 3 and 4 provide guidance on how to classify IFs by the nature of their investment and by type of fund. Chapter 5 describes the treatment of master-feeder fund structures. Chapter 6 describes the treatment of short positions. Chapter 7 gives

guidance regarding the compilation of statistics based on security-by-security reporting by IFs. Chapter 8 describes the calculation of accrued interest on debt securities. Chapter 9 includes further guidance regarding the derivation of transactions for assets and liabilities reported by IFs on an aggregated basis. Chapter 10 describes possible methods to be used by NCBs for the purpose of estimating monthly data. Chapter 11 provides guidance regarding the derivation of data in the case of IFs which have been granted derogations. Chapter 12 provides details regarding the annual quality report to be provided by NCBs who choose to collect only the number of units or aggregated nominal amount in the security-by-security reporting.

1 OJ L 211, 11.8.2007, pp. 8 ff.

2 OJ L 341, 27.12.2007, pp.1 ff..

2 DEFINITION OF INVESTMENT FUNDS

2.1 COLLECTIVE INVESTMENT UNDERTAKING

The Regulation defines an IF as “a collective investment undertaking that invests in financial and non-financial assets, within the meaning of Annex II, to the extent that its objective is investing capital raised from the public”. Money market funds within the meaning of Annex I to Regulation (EC) No 2423/2001 of the European Central Bank of 22 November 2001 concerning the consolidated balance sheet of the monetary financial institutions sector (ECB/2001/13)³ are not included in the definition of an IF.

In order to comply with the definition of an IF, an investment undertaking must be “collective”. An investment undertaking is considered a collective investment undertaking if the document which establishes the undertaking allows for investments from more than one investor. Therefore, even if an undertaking de facto only has one investor, but legally (ex ante) more than one investor is allowed, the undertaking is to be considered collective.

The following examples are therefore considered collective undertakings:

- Funds in which there is a majority shareholder (for example, an insurance company), as long as other investors are also allowed in the fund (sometimes referred to as insurance subsidiaries).
- Subsidiaries of a parent IF whose only business is to act as “investment vehicles” for their parent fund, i.e. to undertake investments based on the investment decisions of the parent fund, as long as the document which establishes the subsidiary does not impose any restrictions on the number of the subsidiary’s shareholders/investors.

The following example is therefore not considered a collective undertaking:

- Undertakings which are linked to insurance products whereby the insurance company invests in the undertaking by buying shares/units issued by this undertaking, but where the insurance company is the only holder of the shares/units of the undertaking and the undertaking is not accessible to other participants.

³ OJ L 333, 17.12.2001, pp.1 ff. The Regulation has meanwhile been updated (see Regulation (EC) 25/2009; OJ L 15, 20.1.2009) without changing the definition of money market funds.

3 CLASSIFICATION OF INVESTMENT FUNDS BY THE NATURE OF THE INVESTMENT

In accordance with the Guideline, NCBs shall report statistical information on IF assets and liabilities broken down into the following six sub-sectors: equity funds, bond funds, mixed funds, real estate funds, hedge funds and other funds. The Guideline further specifies that funds of funds shall be classified under the category of funds in which they primarily invest. This chapter provides guidance on how to classify IFs broken down by the nature of their investment.

3.1 INVESTMENT FUNDS, OTHER THAN HEDGE FUNDS

Given the difficulties in adopting harmonised definitions of IFs broken down by the nature of their investment, the glossary of the Guideline simply defines “bond funds” as IFs investing primarily in securities other than shares, “equity funds” as IFs investing primarily in shares and other equity, “mixed funds” as IFs investing in both equity and bonds with no prevalent policy in favour of one or the other instrument, “real estate funds” as IFs investing primarily in real estate, and “other funds” as the residual category (i.e. IFs other than bond funds, equity funds, mixed funds, real estate funds or hedge funds). The glossary further specifies that the criteria for classifying IFs by sub-sector are derived from the public prospectus, fund rules, instruments of incorporation, established statutes or by-laws, subscription documents or investment contracts, marketing documents, or any other statement with similar effect.

The identification of IFs by the nature of the investment may differ across countries. In certain countries, the investment policy may be backed by specific regulatory provisions that allow an ex ante identification of IFs by the nature of their investment. In these countries, the classification of IFs by the nature of the investment should therefore be based on these national provisions.⁴

In countries where national regulatory provisions do not allow IFs to be identified by the nature of their investment, the classification should also be undertaken on an ex ante basis and be determined, as specified in the Guideline, on the basis of the IFs’ prospectuses or other relevant documents. The ex ante approach consists in assessing the investment policy, on the basis of what has been declared by the IF (or the fund manager) and not on the actual investments made.

In the case of IFs which define *lower limits* for the investment in specified asset classes, the word “primarily” in the definition of equity, bond and real estate funds should be understood as “more than 50%”. In other words, if an IF is defined, for example, as investing at least 50% of its assets in equity, the IF should be classified as an equity fund.

In case the IF only defines lower limits and only invests in two instruments (bond and equity), the IF should be classified as a mixed fund when the lower limits for each of the two instruments lie close to 50% (i.e. a fund is not required to have a predefined investment mix of exactly 50/50).

In the case of IFs which define only *upper limits* for the investment in specified asset classes, “primarily” should be interpreted with some flexibility. In general the following guiding principles apply:

- (a) If an IF defines an upper limit for one type of asset, which shows that the IF assigns a prominent role to the specific asset class (even though it may not at all times invest more than 50% in it), the IF should be classified according to this asset class. Therefore if, for example, an IF has defined its investment strategy as investing up to 90% of the assets in equity, the IF should be classified as an equity fund.

⁴ The content of these provisions may, of course, differ across countries. Therefore, it may occur that IFs in one country are required to invest only 50% in a certain asset category in order to be classified in the respective IF sub-sector, while the threshold in another country may be higher (for example 75% or even 90%).

- (b) If an IF assigns upper limits of above 50% for both “securities other than shares” and “shares and other equity”, without stating any explicit preference for either asset class (see (d) below), the IF should be classified as a mixed fund. For example, if an IF has defined its investment strategy as investing up to 60% of the assets in equity and up to 80% of its assets in bonds, the IF should be classified as a mixed fund.
- (c) If an IF defines upper limits from which a lower limit of “more than 50%” for the investment in a specific asset class can be derived, the IF should be classified according to this asset class. For example, if an IF has defined its investment strategy as investing up to 10% in bonds, up to 20% in money market instruments and up to 15% in non-financial assets and not investing in financial derivatives, the IF should be classified as an equity fund since it can be derived that the IF invests more than 50% in equity.
- (d) If an IF assigns upper limits of above 50% for different asset classes, but specifically states its primary objective under normal market conditions, then the IF should be classified according to its primary investment policy as declared for normal market conditions. For example, if an IF has defined its investment strategy as one of investing up to 90% of the assets in equity and up to 70% of its assets in bonds, but it specifically states in its prospectus that under normal market conditions its primary objective is to constitute an equity-oriented portfolio (i.e. investing primarily in equity) then the IF should be classified as an equity fund.
- on a quarterly basis. In this case, an IF which actually invests more than 50% in equity would be classified as an equity fund and would be reclassified into another IF sub-sector when the proportion of equity investment falls below 50%. However, the ex post approach has a number of drawbacks: (i) the allocation of IFs to the different sub-sectors depending on the asset allocation at a specific point in time would not be representative of the investor’s intentions (i.e. an investor decides in what fund to invest and is therefore ex ante aware of the IF’s potential investment decisions), (ii) each time the IF were allocated to a different IF sub-sector, the NCB would have to report a reclassification adjustment,⁵ which could potentially lead to a high level of instability in the stock data, and (iii) the NCBs would have to check the asset allocations of the IFs on a regular basis and reclassify them where necessary, which would entail significant costs for the compilers. Based on these considerations, the *ex ante approach should, in principle, be applied*. However, under certain specific circumstances, NCBs may also opt for the ex post approach. This includes, for example, the case where the ex post approach is the only practical way to confirm the original classification in borderline cases.

A pan-European classification of IFs broken down by investment policy is being developed by the European Fund Categorisation Forum (EFCF). As an alternative to the IF classification based on national regulatory provisions, and in particular for those countries where these provisions do not exist, future classification could potentially be based on the rules defined by the EFCF. However, for the time being, the developments in this area are being monitored and consideration would only be given to applying this approach once the EFCF classification had been broadly accepted by the industry.

The aforementioned rules aim at obtaining a meaningful classification, and thereby also improving the harmonisation of the “mixed funds” category.

Consideration has also been given to classifying IFs ex post, based on the asset allocation observed

⁵ Only changes in the investment policy which represent actual changes in comparison with the investment policy given in the prospectus or related documents should be treated as financial transactions. In this context, also refer to Annex V, Part 2, Section 1.1.6, of the Guideline.

3.2 DEFINITION OF HEDGE FUNDS

In accordance with the Guideline, NCBs must report statistical information on assets and liabilities relating to hedge funds as a distinct sub-category of IFs. In the glossary of the Guideline, a “hedge fund” is defined for statistical purposes as follows: “any collective investment undertaking, regardless of its legal structure under national laws, which applies relatively unconstrained investment strategies to achieve positive absolute returns, and whose managers, in addition to management fees, are remunerated in relation to the fund’s performance. For that purpose, hedge funds have few restrictions on the types of financial instrument in which they may invest and may therefore flexibly employ a wide variety of financial techniques, involving leverage, short-selling or any other techniques. This definition also covers funds that invest, in full or in part, in other hedge funds provided that they otherwise meet the definition. These criteria to identify hedge funds must be assessed against the public prospectus as well as fund rules, statutes or by-laws, subscription documents or investment contracts, marketing documents or any other statement with similar effect of the fund.”

Since a generally accepted definition for hedge funds does not exist, it has proved difficult to determine the key characteristics to be included in the definition of hedge funds for statistical purposes. Moreover, given the rapidly evolving business, some predominant criteria today may not be as relevant in a few years’ time. The idea was therefore to define key characteristics which allow the identification of hedge funds and their differentiation from other IFs, while at the same time discussing hedge fund characteristics in more detail in this accompanying manual. This chapter therefore contains further clarifications regarding the concepts used in the definition and discusses further potential characteristics of hedge funds which are not explicitly included in the definition given in the Guideline.

3.2.1 FURTHER CLARIFICATION OF THE CONCEPTS

Positive absolute return

A key characteristic of hedge funds is their commitment to achieve positive absolute returns for their investors under all market conditions. This is in contrast to the practice of “IFs other than hedge funds”, which generally aim at tracking a specific market benchmark,⁶ and their performance is then measured relative to this benchmark. Therefore, hedge funds typically indicate in their prospectus and in their advertising documentation that their performance is de-correlated from market trends. In order to achieve positive absolute returns, hedge funds pursue and have the flexibility to apply a much wider range of investment strategies than “IFs other than hedge funds”.

Investment strategies

In order to achieve positive absolute returns, hedge funds have few restrictions on the type of instruments in which they can invest or strategies they can employ.

The investment styles of hedge funds vary widely by taking different exposures, exploiting different market opportunities, using different techniques and different instruments. The major strategies can be separated into three general groups where each strategy consists of different sub-categories. A detailed description of the major sub-categories included in the three general groups of strategies is provided in Table 1. The three general groups of strategies are:

- *Directional/market-trend strategies* consisting of attempts to anticipate market movements and taking positions based on market or securities trends.

⁶ The goal of any IF (other than a hedge fund) is to beat the index, even if only modestly. If, for example, an index is down by 5%, while the IF is down only by 3%, the IF’s performance is still good.

Table 1 Hedge fund strategies

Group	Strategy	Description
Directional strategies	Long/short equity hedge	This directional strategy involves equity-oriented investing on both the long and short sides of the market. The objective is not to be market neutral. Managers have the ability to shift from value to growth, from small to medium to large capitalisation stocks, and from a net long position to a net short position. Managers may use futures and options to hedge. The focus may be regional, such as long/short US or European equity, or sector-specific, such as long and short technology or healthcare stocks. Long/short equity funds tend to build and hold portfolios that are substantially more concentrated than those of traditional stock funds.
	Dedicated short bias	The strategy is to maintain net short as opposed to pure short exposure. Short-biased managers take short positions mostly in equities and derivatives. The short bias of a manager's portfolio must be constantly greater than zero to be classified in this category.
	Global macro	Global macro managers carry long and short positions in any of the world's major capital or derivative markets. These positions reflect their views on overall market direction as influenced by major economic trends and/or events. The portfolios of these funds can include stocks, bonds, currencies and commodities in the form of cash or derivatives instruments. Most funds invest globally in both developed and emerging markets.
	Emerging markets	This strategy involves equity or fixed income investing in emerging markets around the world. Because many emerging markets do not allow short selling, nor offer viable futures or other derivative products with which to hedge, emerging market investing often employs a long-only strategy.
	Managed futures	This strategy invests in listed financial and commodity futures markets and currency markets around the world. The managers are usually referred to as Commodity Trading Advisors (CTAs). Trading disciplines are generally systematic or discretionary. Systematic traders tend to use price and market-specific information (often technical) to make trading decisions, while discretionary managers use a judgemental approach.
Event-driven strategies	Risk (merger) arbitrage	Specialists invest simultaneously long and short in the companies involved in a merger or acquisition. Risk arbitrageurs are typically long in the stock of the company being acquired and short in the stock of the acquirer. By shorting the stock of the acquirer, the manager hedges out market risk, and isolates his/her exposure to the outcome of the announced deal. The principal risk is deal risk should the deal fail to close. Risk arbitrageurs also often invest in equity restructurings such as spin-offs or "stub trades" that involve the securities of a parent and its subsidiary companies.
	Distressed/high-yield securities	Fund managers invest in the debt, equity or trade claims of companies in financial distress or already in default. The securities of companies in distressed or defaulted situations typically trade at substantial discounts to par value due to difficulties in analysing a proper value for such securities, lack of street coverage, or simply an inability on behalf of traditional investors to value accurately such claims or direct their legal interests during restructuring proceedings. Various strategies have been developed by which investors may take hedged or outright short positions in such claims, although this asset class is in general a long-only strategy. Managers may also take arbitrage positions within a company's capital structure, typically by purchasing a senior debt tier and short selling common stock, in the hope of realising returns from shifts in the spread between the two tiers.
	Regulation D, or Reg. D	This sub-set refers to investments in micro and small capitalisation public companies that are raising money in private capital markets. Investments usually take the form of a convertible security with an exercise price that floats or is subject to a look-back provision that insulates the investor from a decline in the price of the underlying stock.
Market neutral strategies	Fixed income arbitrage	The fixed income arbitrageur aims to profit from price anomalies between related interest rate securities. Most managers trade globally with a goal of generating steady returns with low volatility. This category includes interest rate swap arbitrage, US and non-US government bond arbitrage, forward yield curve arbitrage, and mortgage-backed securities arbitrage. The mortgage-backed market is primarily US-based, over-the-counter (OTC) and is particularly complex.
	Convertible arbitrage	This strategy is identified by hedged investing in the convertible securities of a company. A typical investment is long in the convertible bond and short in the common stock of the same company. Positions are designed to generate profits from the fixed income security as well as the short sale of stock, while protecting the principal from market moves.
	Equity market neutral	This investment strategy is designed to exploit equity market inefficiencies and usually involves having simultaneously long and short matched equity portfolios of the same size within a country. Market neutral portfolios are designed to be either beta or currency neutral, or both. Well designed portfolios typically control for industry, sector, market capitalisation, and other exposures. Leverage is often applied to enhance returns.

Sources: T. Garbaravicius and F. Dierick, "Hedge funds and their implications for financial stability", *ECB Occasional Paper Series*, No 34, August 2005, and Credit Suisse/Tremont Index.

- *Event-driven strategies* aimed at generating profits from price movements associated with specific corporate events, such as restructuring, takeovers, mergers, liquidations or bankruptcies.
- *Market-neutral/arbitrage/relative-value strategies* that attempt to extract value from arbitrage opportunities targeted at exploiting market anomalies and inefficiencies. They try to avoid exposure to market-wide movements.

Two further umbrella approaches, which are based on a mix of the categories above, are often quoted as investment strategies:

- *Multi-strategy*: these funds allocate capital dynamically according to different strategies, in response to market opportunities.
- *Funds of hedge funds*: these funds invest in other hedge funds for diversification (see below).

Furthermore, in the case of hedge funds, if *risk dispersion rules* (i.e. the maximum share of investment allowed in a specific asset category) are applicable, they tend to be more flexible than those applied in the case of “IFs other than hedge funds”.

Performance-related fees

Hedge fund managers usually receive *performance-related fees*, in addition to traditional management fees. Some hedge funds specify a “hurdle rate”, which means that the fund manager will not receive a performance fee until a minimum return has been generated. Furthermore, fee structures often contain “high watermark” provisions that require managers to make up for losses before receiving further performance-related fees.

Funds investing in other hedge funds

The definition of hedge funds also covers funds that invest, in full or in part, in other hedge funds, so-called “funds of hedge funds”, provided that they otherwise meet the definition.

Funds of hedge funds can be defined as IFs that invest primarily in hedge funds. In line with the definition of funds of funds in Section 3.3, the word “primarily” should be understood as “more than 50%”. In other words, if an IF is defined as one investing at least 50% of its assets in hedge fund shares, the IF should be classified as a hedge fund.

Funds of hedge funds should also cover IFs that track indices of hedge funds, thereby providing investors with exposure to multiple hedge funds in a single product. Although such IFs could be considered to be tracking a market benchmark, they should nevertheless be classified as hedge funds since they fulfil the hedge fund criteria, such as flexible investment policies, the commitment to achieve positive absolute returns, the minimum investment threshold and the frequent commitment by managers of their own money.

3.2.2 OTHER CRITERIA NOT INCLUDED IN THE DEFINITION

Investors in hedge funds and the distribution channels

Hedge funds are targeted mainly (but not exclusively) at *high net worth* individuals and *institutional* investors, such as pension funds and insurance companies. This targeting strategy is often achieved by imposing a *high minimum investment* threshold. Furthermore, hedge funds are often distributed via private placements and thus not promoted to retail investors.

However, hedge funds have also become more accessible to retail investors, mainly through the development of funds of hedge funds.

Subscription/withdrawal

Hedge funds often have predefined schedules with quarterly or monthly subscriptions and redemptions. Furthermore, many hedge funds have a lock-in period, which is an initial period of time during which investors cannot remove their money. Some hedge funds retain the right to suspend redemptions under exceptional circumstances.

Hedge fund managers

Hedge funds managers will often have their own capital invested in the hedge fund that they manage, so that the preservation of capital is very important.

3.2.3 SUMMARY OF HEDGE FUND CHARACTERISTICS

Table 2 provides a summary of the main characteristics of hedge funds, both those explicitly included in the definition of hedge funds given in the Guideline, as well as additional possible characteristics not specified in the definition.

3.3 FUNDS OF FUNDS

The glossary of the Guideline defines “funds of funds” as “investment funds investing primarily in investment funds’ shares or units”. According to the Guideline, “for the purpose of IFs broken down by the nature of the investment, funds of funds shall be classified under the category of funds in which they primarily invest.”

When classifying funds of funds, the same logic applies as in the case of the IFs broken

down by the nature of the investment discussed in Section 3.1. For example, in the case of an IF that defines a *lower limit* for its investment policy, an IF which invests at least 50% of its assets in equity fund shares should be classified as an equity fund. Similarly, the same guiding principles as described in Section 3.1 also apply to funds of funds which define only *upper limits* for the investment in specified types of investment funds.

Regarding the ex post approach, the same drawbacks as outlined in Section 3.1 above apply. In such an ex post approach, in the context of funds of funds, the classification should be based on the actual assets held by the IFs in which the funds of funds invest. These assets would have to be monitored at any relevant point in time. Further to the drawbacks outlined in Section 3.1, it would be even more burdensome for the compilers who would have to aggregate portfolios of several IFs to determine the correct IF sub-category. Therefore, as already stated in Section 3.1, the *ex ante approach should, in principle, be applied*. However, as outlined on page 7, under certain specific circumstances, NCBs may also opt for the ex post approach.

Table 2 Hedge fund category characteristics – distinctive features

Characteristics covered by definition	
Positive absolute return	Positive absolute return under all market conditions, without regard to a particular benchmark.
Relatively unconstrained investment strategies	Few restrictions on the type of instruments or investment strategies. May employ a wide variety of investment techniques, including leverage, derivatives, long and short positions in securities or any other assets in a wide range of markets. More flexible risk dispersion rules.
Performance fees	In general, managers receive performance-related fees in addition to traditional management fees.
Additional characteristics not specified in definition	
Investors and distribution channels	Traditionally (although not exclusively) targeted at high net worth individuals and institutional investors. This is often achieved by imposing a high minimum investment threshold. Not widely available to the public. Mainly distributed via private placements.
Subscription/withdrawal	Often predefined schedule with quarterly or monthly subscription and redemption and lock-in periods until first redemption.
Managers	Usually managers also commit their own money.
See also T. Garbaravicius and F. Dierick, “Hedge funds and their implications for financial stability”, <i>ECB Occasional Paper Series</i> , No 34. August 2005.	

3.4 MONEY MARKET FUNDS AND BORDERLINE CASES

Regulation ECB/2001/13 defines “money market funds” as “those [collective investment undertakings] of which the units are, in terms of liquidity, close substitutes for deposits and which primarily invest in money market instruments and/or in [money market fund] shares/units and/or in other transferable debt instruments with a residual maturity of up to and including one year, and/or in bank deposits, and/or which pursue a rate of return that approaches the interest rates of money market instruments”. Regulation ECB/2001/13 further specifies that “primarily shall be deemed to be at least 85% of the investment portfolio”.

Since the definition of money market funds (MMFs) also covers the investment in MMF shares/units, funds of MMFs are covered by this definition, to the extent that they meet the specified criteria.

Classification issues may arise when an IF invests, for example, 80% in money market instruments and, given its other investments, does not comply with the MMF definition. In this case, the IF must be classified according to the IF classification. In this context, the investment in money market instruments should be considered equivalent to an investment in fixed income securities. Thus, if an IF invests “more than 50%, but less than 85%” in money market instruments and does not meet the MMF definition, that IF should be classified as a bond fund. Similarly, an IF investing for example 40% in shares, 30% in bonds and 30% in money market instruments should also be classified as a bond fund.

Classification issues may also arise when an IF invests for example 80% in deposits and, given its other investments, does not comply with the MMF definition. In this case, deposits should be viewed as a separate asset class. Thus, if an IF invests “more than 50%, but less than 85%,” in deposits and does not meet the MMF definition, the IF should be classified as an “other fund”.

An IF investing for example 40% in shares, 30% in bonds and 30% in deposits would be classified as a mixed fund.

For simplicity, guiding principles similar to those given for money market instruments apply to investment in MMF shares/units. Similarly in this case, investment in MMF shares/units should be considered equivalent to an investment in debt securities. Thus, if an IF invests, for example, 80% in MMF shares/units and, given its other investments, does not comply with the MMF definition, this IF should be classified as a bond fund. In theory of course, in order to be consistent with the approaches followed in the paragraphs above, the ultimate investments underlying the issue of MMF shares/units should be considered when allocating the IF to one of the IF sub-categories.

3.5 CHANGES IN INVESTMENT POLICY

In this context, Annex V, Part 2, Sub-section 1.1.6 of the Guideline discusses the treatment of changes in the investment policy of an IF, including MMFs. According to the Guideline, the default is that a change in an IF’s or MMF’s investment policy is recorded as a financial transaction. This follows from the fact that any change in investment policy has to be agreed by the investors prior to the change, so that it is seen as an active investment decision. An NCB may deviate from this default approach and report a reclassification adjustment only if it has ex ante information that the policy change was not due to a conscious decision made by the investors.

In case an NCB discovers that it has misclassified an IF which should actually be classified as an MMF (or vice versa), it should inform the ECB and agree on a follow-up in order to assure a consistent reporting of MMF and IF data, also regarding historical data.

4 CLASSIFICATION OF INVESTMENT FUNDS BY TYPE OF FUND (OPEN-END VERSUS CLOSED-END INVESTMENT FUNDS)

In accordance with the Guideline, NCBs shall report statistical information on IF assets and liabilities broken down into open-end funds and closed-end funds, i.e. by type of IF. This chapter provides guidance on how to classify IFs broken down by type.

The glossary of the Guideline defines open-end IFs as “IFs the units or shares of which are, at the request of the holders, repurchased or redeemed directly or indirectly out of the undertaking’s assets”, and closed-end IFs as “IFs with a fixed number of issued shares whose shareholders have to buy or sell existing shares to enter or leave the fund.”

In some cases, IFs fall somewhere inbetween the closed-end and open-end definition, since they have certain restrictions regarding the issue or redemption of their shares/units. This includes, for example, IFs that only allow investors to buy new shares or redeem shares above a certain minimum amount, which may be very high. In some cases, participations in the IF can only be redeemed or issued at pre-determined points in time (e.g. on a monthly or quarterly basis), or the redemptions and issues may be temporarily suspended due to prevailing market conditions.

In these cases, the IFs should still be recorded as open-end IFs, since the possibility exists, albeit with some restrictions, to buy and/or sell the shares/units directly from/to the IF.

In principle, only IFs that do not issue new shares after the IF is launched and whose shares are not redeemable until the IF liquidates should be recorded as closed-end IFs. However, in the case of closed-end IFs, new shares may also be issued and/or redeemed in exceptional occasions.

5 TREATMENT OF MASTER AND FEEDER FUNDS

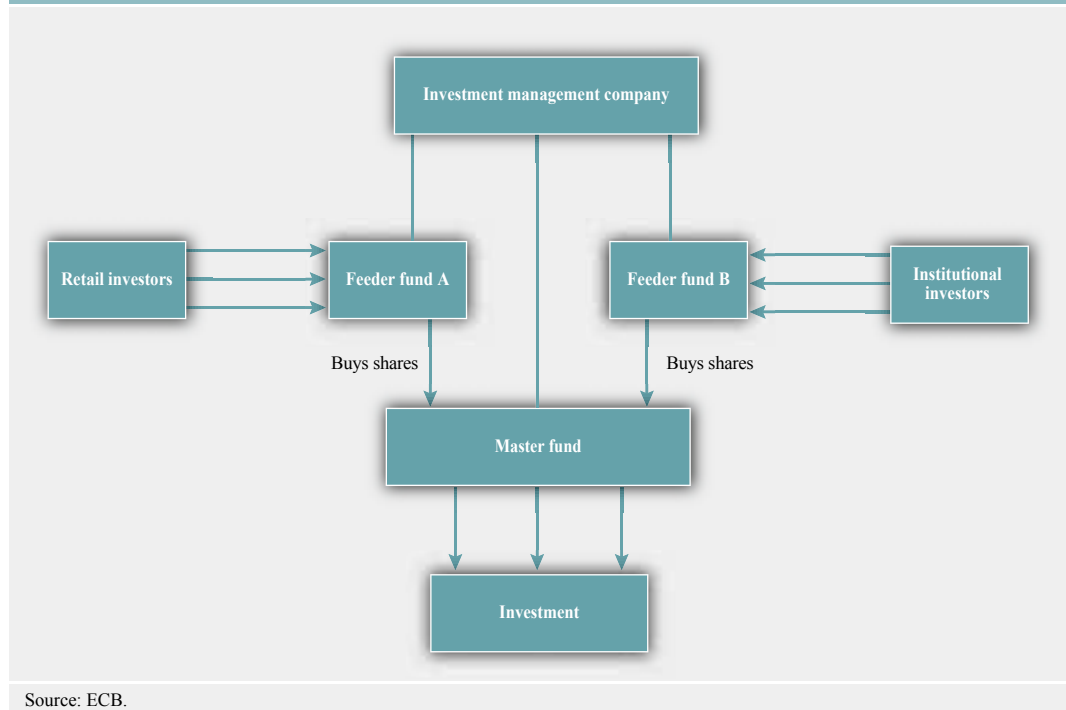
The master-feeder fund structure generally involves the use of a master fund into which separate and distinct feeder funds invest. Chart 1 shows an example of a master-feeder fund structure:

In this structure, an investment management company may have multiple feeder funds, each tailored for a certain category of investors (for example, retail investors or institutional investors). The feeder funds do not invest the capital themselves, but instead buy shares/units from a master fund which invests the capital raised. This structure may be a purely internal structure within the investment management company in order to make use of economies of scale and thereby reduce costs. In this case, the feeder funds only invest in master funds of their own investment management company, and these master funds only receive money from the feeder funds of their own investment management company.

Feeder and master funds, even though encapsulated within one structure, are considered separate legal entities and both comply with the definition of IF provided for by the Regulation. Each feeder fund and master fund should therefore be reported separately to the list of investment funds. In accordance with Article 5.1 of the Regulation, the assets and liabilities of these funds should also be reported on a fund-by-fund basis, i.e. all master and feeder funds should report their assets and liabilities individually.

The reporting of assets and liabilities by both the master and feeder funds leads to a double counting in the aggregated assets and liabilities of the IF statistics, which could be seen as undesirable since the double figures may have a purely administrative background. However, the derivation of consolidated assets and liabilities of IFs at the euro area level will account for this double-counting by netting the inter-IF holdings of shares/units issued by euro area IFs.

Chart 1 Example of master-feeder fund structure



Source: ECB.

Taking into account Article 5.3, which specifies that “subject to the prior approval and in accordance with the instructions of the relevant NCB, IFs may report their assets and liabilities as a group, provided that this leads to results that are similar to fund-by-fund reporting”, and the fact that the ECB will ultimately derive consolidated assets and liabilities of euro area IFs, group reporting could be applied in the case of master-feeder fund structures. Therefore, if the reporting by master and feeder funds on a consolidated basis is preferable in practice, this approach may be followed by NCBs as long as all feeder funds and master funds of one structure are located in the same national territory and belong to the same IF sub-sector in line with Article 18.1(a) of the Guideline. In this case, the consolidated balance sheet will show on its assets side the investments made by the master fund, and on its liabilities side the shares/units issued by the feeder funds broken down by different holders.

However, irrespective of whether or not group reporting is applied, each feeder and master fund must be reported separately in the list of IFs.

6 TREATMENT OF SHORT SELLING

Short positions occur when an institutional unit sells securities of which it is not the economic owner. The party with the short position records a negative asset. Therefore, if an IF short sells securities, this should be recorded as a negative transaction in securities. This applies in the case of selling securities which were acquired by means of both reverse repo-type operations and securities borrowing.

This treatment overcomes the double-counting that would otherwise arise in the global holdings of a security, given that the security is recorded as an asset both on the balance sheet of the ultimate outright purchaser of the security and on the balance sheet of the original lender (“security provider”) of the security.

6.1 SECURITIES REPURCHASE AGREEMENTS (REPOS)

Repos are securities repurchase agreements where an institutional unit sells securities for cash (“security provider”) at a specified price to another unit (“security taker”) with a commitment to repurchase the same or similar securities at a fixed price on a future date. It is called a repo from the perspective of the security provider and a reverse repo from the perspective of the security taker.

In principle, the security taker should not record the acquisition of the security under a reverse repo as a transaction in securities. However, if the security taker sells on the security (i.e. short sells the security) to a third party, then the security taker/temporary acquirer should record a negative transaction (and the outright purchaser a positive transaction) in the security.

As specified in Annex II, Part 1, paragraph 7, of the Regulation, in the case of repos, “where the temporary acquirer sells the securities/gold received by way of a repo operation, this sale must be recorded as an outright transaction in securities/gold and entered in the balance sheet

of the temporary acquirer as a negative position in the securities/gold portfolio.”

It follows, that in the case of reverse repos, when the IF is the temporary acquirer of a security and sells on the security, this sale should be recorded as a negative (“short”) position in securities. The interest accrued should also be recorded as a negative position (i.e. the interest accrued increases the negative position).

6.2 LENDING OF SECURITIES

Securities lending/borrowing without cash collateral involves one party lending securities to another party with a firm commitment to returning the same (or similar) securities on a specified future date. Contrary to repo-type operations, there is no exchange of cash collateral; instead, securities lending/borrowing is either backed by non-cash collateral or there is no collateral at all.

As set out in the Regulation, securities lending operations are recorded in the same way as repo-type operations. Annex II, Part 1, paragraph 2, of the Regulation specifies that “in order to maintain consistency with the treatment of repo-type operations, securities lent out under securities lending operations remain on the original owner’s balance sheet (and are not transferred to the balance sheet of the temporary acquirer) where there is a firm commitment to reverse the operation and not simply an option to do so”.

It follows that short sales of securities borrowed without cash collateral should also be recorded in a way consistent with that required for short sales of securities received in a reverse repo, namely as negative transactions in securities. Again the interest accrued should be also recorded as a negative position.

7 COMPILATION OF STATISTICS BASED ON SECURITY-BY-SECURITY REPORTING

The Regulation foresees the so-called “combined approach” as its main reporting approach. This approach, described in Annex I, Part 1.2(a), of the Regulation, consists of reporting agents providing the IFs’ debt and equity positions on a security-by-security basis, and other assets and liabilities positions on an aggregated basis.

The information to be provided on a security-by-security basis is defined in Table 2 of Annex I to the Regulation. In general, reporting agents are required to report for each such position two of the following three variables:⁷ (1) number of units (equity) or aggregated nominal amount (debt); (2) security price; and/or (3) total amount.⁸ NCBs may also choose to collect transactions on a security-by-security basis in line with Table 2(c) in Annex I to the Regulation.

Based on the information collected on a security-by-security basis and on an aggregated basis, NCBs then derive the aggregated quarterly assets and liabilities of the IF sub-categories in line with Table 1 of Part 14 of Annex III to the Guideline.

This chapter describes, in conceptual terms, how the statistics on the assets and liabilities of IFs based on the security-by-security data collected from the IFs can be derived. This description covers both the derivation of stocks (including estimation procedures where the necessary information is only partly, or not at all, available from the ESCB’s Centralised Securities Database (CSDB) or compatible national securities database) and the derivation of transactions/reevaluation adjustments from these stocks in case security-by-security information on transactions is not collected directly from reporting agents.

The solutions presented in this manual should be seen as one possible approach. NCBs may choose to apply different methods.

7.1 COMPILATION OF STOCKS

Article 18.5 of the Guideline describes in general terms how the aggregated quarterly⁹ assets and liabilities of the IF sub-categories (in line with Table 1 of Part 14 of Annex III) are derived.

The compilation of stock statistics can be split into two steps: (1) the calculation of the totals for each asset/liability category and also for total assets/total liabilities; and (2) the enrichment of the securities information with reference data covering the issuer sector, issuer residency and issuing currency, as well as the instrument/maturity classification as provided by a reference database, e.g. the CSDB.

The value of each asset and liability position, as shown in Chart 2, can either be derived based on the reported security-by-security information or is directly provided by the reporting agents.

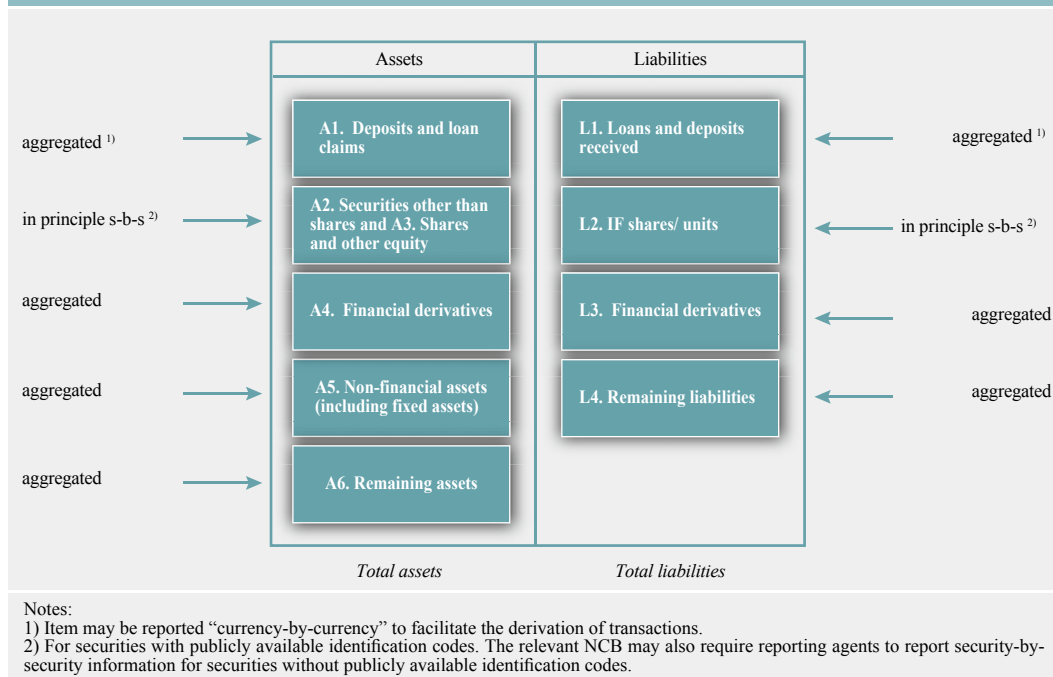
For those aggregated positions where values or prices are reported in currencies other than the euro, the first step includes a currency conversion into euro. For the securities items, the missing third value out of “number of units or aggregated nominal amount”, “price” and “total amount” is also derived, based on the two reported values. With these data, it is possible to add up total assets and total liabilities. Any (positive) discrepancy between total assets and total liabilities will be added as a lump sum either to the (total) securities position on the asset or liability side.

7 As detailed in Table 2e) of Annex I to the Regulation, NCBs may also choose to only collect data for the number of units or aggregated nominal amount. This chapter of the manual only covers those cases where NCBs collect data on two of three variables. Chapter 12 provides details on the quality report to be provided by NCBs who choose to collect data on only one variable.

8 As specified in Table 2 of Annex I to the Regulation, if an IF reports transaction data on a security-by-security basis, it would be sufficient to report only the total amount of the position.

9 Or monthly, where NCBs collect data on IF assets and liabilities on a monthly basis in accordance with Article 6(3) of Regulation ECB/2007/8.

Chart 2 Schematic presentation of assets and liabilities of an investment fund



Alternatively the discrepancy may also be added to remaining assets or remaining liabilities¹⁰.

In a second step, the security-by-security data are enriched with securities reference data from the CSDB or compatible national securities database, covering the following variables: (1) instrument category, (2) instrument maturity,¹¹ (3) issuing currency, (4) issuer sector and (5) issuer residency. "Incomplete" reference information can either mean that the entire securities reference information is missing (security identifier cannot be matched to the CSDB, either because the security is not covered in the CSDB, or because the identifier is inaccurate or incomplete) or that one or more individual fields in the CSDB or local securities database are missing.¹² The proposed estimation method, explained below, aims at filling these gaps by deriving missing information from the most similar complete records, thereby exploiting the information available to the largest extent possible.

Taking into account the five reference variables for stock statistics, there are 31 possible combinations of gaps in the reference data, including the case where no reference data are available at all (error type 1 in Table 3 below).

10 Such discrepancies, if any, should be insignificant, given that all amounts are reported, and IFs should report the required statistical information in accordance with the minimum standards for accuracy, as specified in Annex IV to the Regulation. The allocation of the discrepancy to the securities item is performed mainly due to the fact that the securities item is likely to be the most relevant position. However, in order to simplify the calculations, the discrepancy may also be allocated to remaining assets or remaining liabilities since these are not further broken down.

11 The instrument maturity should first be determined by the instrument category, which provides a split into short-term (up to one year) and long-term (over one year) debt. This approach ensures consistency with other statistics. The long-term debt category should then be broken down into the following groups: "over one and up to two years" and "over two years" by making use of the variables "issue date" and "maturity date".

12 In practice, the case of missing fields should become less relevant since the CSDB or compatible national securities databases should, in principle, have built-in procedures to estimate missing reference information in a consistent way for all statistics relying on the CSDB or a compatible national securities database. However, fallback solutions should be available to fix gaps in the reference data which have not been previously fixed.

Table 3 Different error types in the reference information [X marks missing data]

Variable	Error type															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Instrument category	X		X	X	X	X					X	X	X	X	X	X
Instrument maturity	X	X		X	X	X		X	X	X				X	X	X
Issuing currency	X	X	X		X	X	X		X	X		X	X			X
Issuer sector	X	X	X	X		X	X	X		X	X		X			X
Issuer residency	X	X	X	X	X		X	X	X		X	X		X		

Variable	Error type															
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Instrument category	X	X	X	X							X					
Instrument maturity	X				X	X	X					X				
Issuing currency		X			X			X	X				X			
Issuer sector				X		X		X	X		X			X		
Issuer residency				X			X		X	X					X	

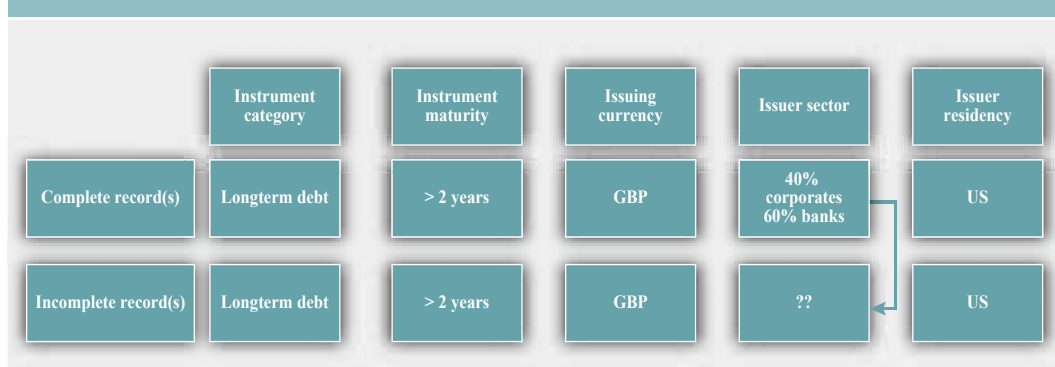
After classifying the gaps by “error type”, the estimation procedure looks for complete security records with similar reference information for all fields which are filled in, including the complete and incomplete record(s). Data are then only estimated for the field(s) with the gap, based on the complete record(s). The advantage of this method is that the estimation of, for example, the issuer sector for a debt security with over two years original maturity issued by a US resident has no impact on the data referring to securities issued by euro area residents. The estimation is carried out separately for assets and liabilities.

with those of the incomplete security, the incomplete record is downgraded to a record in which all fields are missing (error type 1 in Table 3) and is distributed in a second round of processing according to the overall structure of all complete securities records (again separately for the asset and liability side). More sophisticated procedures are in theory also possible, where the record is downgraded step-by-step, i.e. where the requirements for matching are gradually reduced to fewer and fewer fields.

In case there is no matching complete security record¹³ where all completed fields coincide

13 A complete security record refers to a security record where all necessary fields have been completed.

Chart 3 Matching of complete and incomplete records for the estimation of reference data



Source: ECB.

This estimation procedure guarantees that the statistical categorisation is applied to all balance sheet categories where this is required. All assets and liabilities can now be aggregated for reporting.

7.2 DERIVATION OF TRANSACTIONS/ REVALUATION ADJUSTMENTS

Section 1(b) of Article 18 in the Guideline specifies that “where [security-by-security] stock information is available, revaluation adjustments may be derived in accordance with a common Eurosystem method, i.e. the flow-derivation method referred to in Annex V”.

The stock data, as presented in Section 7.1, form the basis for the derivation of transaction/revaluation adjustments and investment income data for securities following a security-by-security approach (i.e. separately for each security).

This section outlines conceptual solutions for the derivation of transactions. The approach presented here consists in the direct calculation of transactions. Revaluation adjustments (consisting of price revaluations and exchange rate adjustments) and other adjustments, which are ultimately to be provided by the NCBs to the ECB, are derived as “stock difference between t_1 and t_0 minus transactions”.

7.2.1 SECURITIES OTHER THAN SHARES

Transactions in securities other than shares which occur between t_0 and t_1 can be derived either by dirty prices or by clean prices. With dirty prices, the transactions are calculated as:

$$TR_{t_0t_1} = (DT_{t_1} - DT_{t_0}) * \frac{(DP_{t_0} + DP_{t_1})}{2} \quad (1)$$

where

DT = debt securities (aggregated nominal amount) and

DP = debt securities (dirty) price in euro.

When clean prices are used in the derivation of transactions, the interest income between

two reporting periods must be incorporated in the transactions. The derivation of the interest income is described in Chapter 8.

$$TR_{t_0t_1} = (DT_{t_1} - DT_{t_0}) * \frac{(CP_{t_0} + CP_{t_1})}{2} + IN_{DT_{t_0t_1}} \quad (2)$$

where

DP = debt securities (aggregated nominal amount) and

CP = debt securities (clean) price in euro.

The following example shows the effect of accrued interest and coupon payments on the IF balance sheet. The example has been simplified in order to distinguish between the effect of accrued interest (which occurs in the first period) and the effect of coupon payments (which occurs in the following period). Further examples are provided in Chapter 8.

At t_0 the IF owns securities other than shares that are worth 100:

As interest accrues, the holdings of securities

A	Balance sheet (t_0)		L
100	Securities other than shares	IF shares/units	100

other than shares increase (between t_0 and t_1 by 5% in one year):

A	Balance sheet (t_1)		L
105	Securities other than shares	IF shares/units	105

The securities other than shares record a positive transaction due to the interest accrued (+5) which is reflected in IF shares/units.

A	Transactions (t_0, t_1)		L
5	Securities other than shares (accrued interest)	IF shares/units	5

If – at t_2 – the IF then receives the coupon payment of 5 stemming from the IF’s holdings

of securities other than shares (i.e. 0.5 per share), “deposit and loan claims” increase by 5 and the holdings of “securities other than shares” again decrease to 100.

A	Balance sheet (t_2)		L
5	Deposit and loan claims	IF shares/units	105
100	Securities other than shares		

The payment of coupons is recorded as a transaction of 5 in “deposit and loan claims”. The securities other than shares record a negative transaction due to the payment of coupon (-5).

If dividends are distributed to the IF’s shareholders, these would be recorded as a negative transaction in IF shares/units issued, together with a corresponding negative transaction on the assets side.

A	Transactions (t_1, t_2)		L
5	Deposit and loan claims	IF shares/units	0
-5	Securities other than shares (minus coupon payment)		

7.2.2 SHARES AND OTHER EQUITY

Transactions in shares and other equity which occur between t_0 and t_1 can be approximated by the following basic formula:

$$TR_{r0t1} = (EQ_{t1} - EQ_{r0}) * \frac{(P_{r0} + P_{t1})}{2} \quad (3)$$

where

EQ = number of shares and

P = price per share in euro.

In line with the ESA 95¹⁴, the following sections describe the treatment of dividend payments and stock splits that have occurred during the reporting period, when deriving transactions/revaluation adjustments.

Dividends paid in cash

The following example shows the effect of dividend payments on the IF balance sheet in the case of dividends paid in cash. The example is simplified in order to distinguish between the effects of accumulation of retained earnings (which occur in the first period) and the effects of payment of dividend (which occur in the second period).

At t_0 , the IF owns 10 shares of a given corporation at a price of 10 per share.

A	Balance sheet (t_0)		L
100	Shares and other equity	IF shares/units	100

During the period t_0, t_1 the value of the shares increases to 10.5 per share due to the accumulation of retained earnings.

A	Balance sheet (t_1)		L
105	Shares and other equity	IF shares/units	105

If – at t_2 – the IF then receives a dividend of 5 stemming from the IF’s holdings of shares (i.e. 0.5 per share), “deposit and loan claims” increase by 5 and the value of “shares and other equity” decreases again to 100.

A	Balance sheet (t_2)		L
5	Deposit and loan claims	IF shares/units	105
100	Shares and other equity		

The following would be recorded as “revaluation adjustments”: before a dividend is paid, any increase in the value of shares due to accumulation of retained earnings is to be treated as a revaluation adjustment in “shares and other equity”. The decrease in the price of the shares (due to payment of dividends) is recorded as a revaluation adjustment. The counterpart entry would be recorded as a revaluation adjustment under IF shares/units issued.

¹⁴ Council Regulation (EC) No 2223/96 of 25 June 1996 on the European System of National and Regional Accounts in the Community (OJ L 310, 30.11.1996, p.1).

A	Revaluation adjustments (t ₀ , t ₁)		L
5	Shares and other equity (increase in share prices due to expectation of dividend)	IF shares/units (increase in asset prices)	5

A	Revaluation adjustments (t ₁ , t ₂)		L
-5	Shares and other equity (decrease in share prices following payment of dividend)	IF shares/units (decrease in asset prices)	-5

The payment of dividends in cash is recorded as a transaction of 5 in “deposit and loan claims” and passed on to the IF shareholders as reinvestment in “IF shares/units” issued.

A	Transactions (t ₁ , t ₂)		L
5	Deposit and loan claims	IF shares/units	5

If dividends are distributed to the IF’s shareholders, these would be recorded as a negative transaction in IF shares/units issued, together with a corresponding negative transaction on the assets side.

Scrip dividends

In the case of scrip dividends, shareholders are offered a choice between cash dividends or more shares – the scrip dividend. The distribution of a dividend in the form of shares increases the investment in the shares by the shareholders.

The following example shows the effect of dividend payments on the IF balance sheet in case of dividends paid in shares, taking the same simplified example as in the previous section where dividends were paid in cash.

In this case, when the IF receives the dividend of 5 in the form of shares stemming from the IF’s holdings of shares (i.e. 0.5 per share), “shares and other equity” increase by 5 and the value of “shares and other equity” remains at 105 (due to the simultaneous decrease in the value per share).

A	Balance sheet (t ₂)		L
105	Shares and other equity	IF shares/units	105

The amounts recorded under “revaluation adjustments” would be identical to those recorded under the example on dividends paid in cash.

In this case, the shareholder has taken an active decision to allocate a proportion of its portfolio in the company instead of cash. Therefore, the payment of dividends in shares is recorded as a transaction of 5 in “shares and other equity” and passed on to the IF shareholders as reinvestment in “IF shares/units” issued.

A	Transactions (t ₁ , t ₂)		L
5	Shares and other equity	IF shares/units	5

Treatment of bonus shares and stock splits

In the case of bonus shares (also referred to as stock dividend or scrip issue) or stock splits, companies increase the number of shares in issue by either further sub-dividing the stock that is already outstanding (stock splits) or by distributing more shares as dividends. In other words, the shares are restructured and shareholders are offered a number of new shares for each share previously held. As an example, a two-for-one scrip issue (i.e. two new shares in addition to one old share) is equivalent to a three-for-one stock split. In contrast to the case when new shares are issued in return for additional funds, no new resources are provided in these cases. Furthermore, these cases do not correspond to active portfolio decisions, given that the shareholder does not have a choice of receiving cash. Therefore, stock splits or the issue of bonus shares do not represent transactions.

Both bonus shares and stock splits increase the number of shares, and both reduce the value per share, all other things being equal. The distinction between the two is a technical one: a bonus share is shown in the accounts of the company as a transfer from retained earnings to equity capital, whereas a stock split is shown as a reduction in the par value of each share.

The CSDB contains two attributes that can be used to derive the correct transactions in case

of stock splits, namely “last split date” and “last split factor”. First, the last split date is used to determine whether a stock split occurred during the reporting period. Second, if a stock split did occur, the last split factor¹⁵ is used to adjust the number of shares and the price of period t_1 holdings in the basic formula (3) to calculate transactions. The amended formula to calculate transactions taking into account stock splits is:

$$TR_{EQ_{0t1}} = (EQ_{t1} * SF - EQ_{t0}) * \frac{(P_{EQ_{t0}} + P_{EQ_{t1}} / SF)}{2} \quad (4)$$

where

SF = last split factor.

7.2.3 INVESTMENT FUNDS SHARES/UNITS ISSUED

According to Paragraph 5.141 of the ESA 95, financial transactions in mutual fund shares include:

- the value of net contributions to a fund (i.e. subscriptions minus redemptions), and
- the property income (interest, dividends), net of a part of management cost, received by mutual funds from the investments they have made and which are allocated but not distributed to the shareholders of the mutual funds. The effect is that property income is reinvested in the fund.

It follows that financial transactions in investment funds shares/units issued can be derived as follows:

$$\begin{aligned} \text{Transactions in IF shares/units} = \\ (\text{Subscriptions} - \text{Redemptions}) + \\ (\text{Property income} - \text{Management charges}) \end{aligned}$$

Alternatively, transactions in IF shares/units issued can be derived as the difference between the transactions in assets and the transactions in liabilities other than IF shares/units issued. This would lead to the same results as the formula of the above paragraph.

7.2.4 ESTIMATIONS WHEN THERE IS NO PRICE INFORMATION IN THE CENTRALISED SECURITIES DATABASE

The formulae to calculate transactions in Sub-sections 7.2.1 and 7.2.2 above require price information for t_0 , as well as t_1 . As price data are reported together with the corresponding stocks, they will not be available from the reporting agents where positions are zero either in t_0 or t_1 . In such cases, the price information is sourced from the reference database. In practice, the reference database may lack the price data for any given security. In this case, it may not be sufficiently accurate to use only the price in t_1 or in t_0 to estimate the transactions, in particular, during periods with strong moves in share prices.

Moreover, an approach is needed to derive transactions for those positions where the reference information has been estimated for the stock data, i.e. where no price information can be available on a security-by-security basis as there is no link to an individual security.

In both cases, transactions on these records may be calculated by using price indices derived from those security-by-security records reported by the reporting agents where full price data are available. The basic idea behind this approach is comparable to the solution for the stock data (Section 7.1) whereby missing information is also derived from the most similar complete records. For transactions, volume-weighted Laspeyres price indices are derived from the records with complete reference data for each equity or debt category (X) of the securities held by the IFs at the end of the previous quarter:

$$PR(X)_{t0t1} = \frac{\sum P_{t1} * S_{t0}}{\sum P_{t0} * S_{t0}}$$

where

P = price and

S = stock.

¹⁵ The “last split factor” is defined as the number of shares before the split divided by the number of shares after the split, i.e. the value $\frac{1}{2}$ denotes a two-for-one stock split.

In cases where the price information for an individual security is missing either in t_0 or in t_1 because the position is zero and the price is not available in the reference database, these price indices ($PR(X)_{t_0 t_1}$) can be used to estimate the missing price by deflating the price observed in t_0 or in t_1 with the price index, and used as input to calculate transactions in line with formulae (1) and (3). If the price is missing in t_0 , the formula used to calculate transactions, using the formula for shares and other equity as an example, is

$$TR_{t_0 t_1} = (EQ_{t_1} - EQ_{t_0}) * \frac{(p_{t_1} / PR(X)_{t_0 t_1} + p_{t_1})}{2}, \quad (5)$$

and, analogously, if price is missing in t_1

$$TR_{t_0 t_1} = (EQ_{t_1} - EQ_{t_0}) * \frac{(p_{t_0} + p_{t_0} * PR(X)_{t_0 t_1})}{2}. \quad (6)$$

The same price indices can also be used to price-adjust the aggregate balance sheet positions in t_0 where no complete reference information is available (AGG). As a last step, transactions are derived as the difference in (adjusted) aggregate positions.

Adjustment of positions in t_0 :

$$AGG(X)_{t_0_adj} = AGG(X)_{t_0} * PR(X)_{t_0 t_1} \quad (7)$$

Calculation of transactions:

$$TR_{t_0 t_1} = AGG(X)_{t_1} - AGG(X)_{t_0_adj} \quad (8)$$

8 CALCULATION OF ACCRUED INTEREST ON DEBT SECURITIES

As specified in Article 18.7 of the Guideline, in the IF data reported by the NCBs to the ECB, “securities other than shares” should include accrued interest, i.e. the holdings of securities other than shares should be recorded at dirty prices. Annex V, Part 4, of the Guideline also specifies that accrued interest on securities is included in the stock data on securities and accrued interest minus interest already paid in the transaction value. Furthermore, accrued interest on securities other than shares should be separately identified and transmitted as an “of-which” position to the ECB.

At the same time, the Regulation is flexible regarding the inclusion/exclusion of accrued interest in the data reported by IFs to the NCBs. As spelled out in Annex II, Table B, of the Regulation, NCBs may require IFs to report, on a security-by-security basis, either clean (excluding accrued interest) or dirty (including accrued interest) prices and/or total amounts of securities excluding or including accrued interest.

This section provides guidance regarding the methodology to be applied for the compilation of accrued interest in the case of stocks and transactions/revaluation adjustments.

8.1 DERIVATION OF ACCRUED INTEREST FOR STOCKS

8.1.1 THEORETICAL BACKGROUND

In case NCBs collect clean prices and/or holdings of securities other than shares excluding accrued interest, the NCBs need to derive the corresponding accrued interest in order to add it to the holdings of securities other than shares before transmitting the data to the ECB. The total amount of accrued interest on securities other than shares must then also be provided to the ECB as an “of-which” position.

In case NCBs collect dirty prices and/or holdings of securities other than shares including accrued interest, the NCBs also need to derive the corresponding accrued interest in order to provide the “of-which” position for accrued interest on securities other than shares.

The basic formula to derive accrued interest, *stemming from coupon payments*, for a specific debt security is:

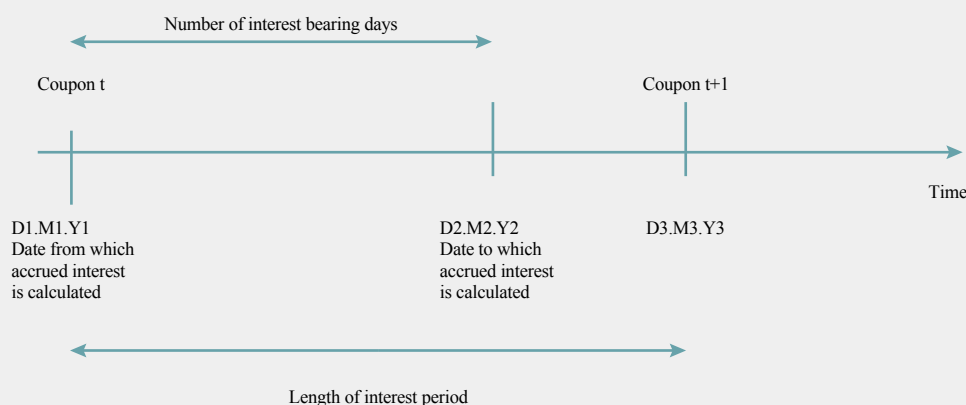
$$AI = C * \frac{N}{Y} = C * \frac{D2.M2.Y2 - D1.M1.Y1}{Y} \quad (9)$$

where

AI = accrued interest,

C = coupon amount (*annualised value*),

Chart 4 Calculation of interest bearing days



Source: ECB.

N = number of interest bearing days = Number of days between “date from which accrued interest is calculated (inclusive) – D1.M1.Y1” and “date to which accrued interest is calculated (exclusive) – D2.M2.Y2” (see Chart 4) and

Y = number of days between two coupon payments (length of interest period), annualised = number of days in a “year”.

There are various ways to calculate the number of interest bearing days and the number of days in a “year”. The accrued interest calculation for a debt security is dependent on the day-count convention specified for the security. The most commonly used day-count conventions are 30/360, 30E/360, Actual/365, Actual/360 and Actual/Actual where the numerator denotes the “number of interest bearing days” and the denominator denotes the number of days in a “year”. Table 4 provides a summary of the most

commonly used day-count conventions and a numerical example showing the calculations and their outcome for a particular security using the different day-count conventions.

The accrued interest for a security should, in principle, be calculated using the day-count conventions which are applicable to that specific security. Day-count conventions are, in principle, available from the CSDB (or a compatible national securities database). In case no information regarding the day-count convention is available, the day-count convention “Actual/Actual” (ICMA¹⁶ method) should be used.

Under the “Actual/Actual” convention, the denominator is the actual number of days in the coupon period multiplied by the number of coupon periods in the year (subject to exceptions

16 International Capital Market Association.

Table 4 Day count conventions¹⁾

Characteristics of security A:
 Nominal amount: 10,000
 Annual coupon rate: 2.75%
 Coupon frequency: 2 per year
 Start of interest period (last coupon date): 22/10/2003
 Date to which accrued interest is calculated: 31/03/2004
 End of interest period (next relevant coupon date): 22/04/2004

Day-count convention	Basic rule for determining the number of interest-bearing days (N)	Basic rule for determining the number of days in a “year”	Formula	Amount
30/360	30 days/month $N=(D2-D1)+30*$ $(M2-M1)+360*(Y2-Y1)$ - if D1 is 31, change to 30. - if D2 is 31 and D1 is 30 or 31, change D2 to 30, otherwise leave at 31	360 days/year	$(10,000*0.0275)$ $*$ $(159/360)$	121.45831
30E/360	30 days/month $N=(D2-D1)+30*(M2-M1)+360*(Y2-Y1)$ - if D1 is 31, change to 30 - if D2 is 31, change to 30	360 days/year	$(10,000*0.0275)$ $*$ $(158/360)$	120.69442
Actual/365	Days/month as per calendar N =number of days between D1.M1.Y1 and D2.M2.Y2	365 days/year	$(10,000*0.0275)$ $*$ $(161/365)$	121.30136
Actual/360	Days/month as per calendar N =number of days between D1.M1.Y1 and D2.M2.Y2	360 days/year	$(10,000*0.0275)$ $*$ $(161/360)$	122.98611
Actual/Actual [ICMA method]	Days/month as per calendar N =number of days between D1.M1.Y1 and D2.M2.Y2	Days/year as per calendar (based on interest period length)	$(10,000*0.0275)$ $*$ $[161/(183*2)]$	120.96994

1) The number of days between two dates includes the earlier date but not the later.

in relation to irregular coupon periods). This method raises particular issues in relation to irregular coupon or calculation periods. When the coupon period is regular:

$$AI = C * \frac{N}{D * F} \quad (10)$$

where

F = coupon frequency and

D = number of days between two coupon payments (D1.M1.Y1 and D3.M3.Y3).

In the case of irregular calculation periods, the approach used is to divide the interest period into notional interest periods.

Similarly to the derivation of the actual amount of accrued interest, the dirty price can also be derived from the clean price and vice versa.

Example: if the clean price is 102 (per cent of the par value) on 31 March 2004, then the dirty price is derived as follows (assuming the 30/360 convention):

$$P_d = P_c + c \left(\frac{N}{Y} \right) \quad (11)$$

where

P_d = dirty price,

P_c = clean price and

C = annual coupon rate.

In this particular example:

$$P_d = 102 + 2.75(159/360) = 103.214583$$

The following paragraphs refer to the calculations of outstanding amount of accrued interest for different types of bonds.

In the case of bonds that are issued at discount¹⁷/premium on their face value, when the bond matures, the investor will receive a lump sum equal to the initial investment plus/less interest that has accrued. In other words, in the case of securities issued at a discount or at a premium and which do not pay coupons, the accrued interest is equal to the difference between the redemption price and the issue price of the security. In this case, the interest accrues over the

life of the bond and is automatically reflected in the price of the instrument. The interest accrued over a given period can be derived by taking the difference between the nominal amount valued at the redemption price and the nominal amount valued at the issue price divided by the life of the instrument (for the same nominal amount).

The clean price in the case of a bond issued at a discount or at a premium can be derived by subtracting from the dirty price the part related to the interest accrued.

In the case of bonds issued at a discount/premium and with coupon payments, the interest accrued has two components: (1) the interest accrued due to coupon payments; and (2) the amount of interest accruing due to the difference between redemptions price and issue price.

In the case of bonds issued at a discount and paying a coupon, the interest due to the discount accrues until the bond is redeemed and is added to the accrued interest due to coupon payments. In this case, the total accrued interest is greater than the accrued interest due to coupon payments since the issuer price is lower than the redemption price.

In the case of bonds issued at a premium and paying a coupon, the interest due to the premium accrues negatively until the bond is redeemed and is added to the accrued interest due to coupon payments. In this case, the total accrued interest is lower than the accrued interest due to coupon payments since the issuer price is greater than the redemption price.

8.1.2 USE OF THE CENTRALISED SECURITIES DATABASE

In the CSDB, a daily accrued income factor (which provides the accrued income per unit and per day) is calculated for each security.¹⁸

¹⁷ Zero coupon bonds should be treated as securities issued at a discount.

¹⁸ The CSDB includes the possibility of calculating accrued income on a security-by-security basis following the so-called debtor and creditor approach. In conformity with the SNA 93, the approach chosen for the purpose of this manual is the debtor approach.

This daily accrued income factor takes into account the accrued interest for bonds paying a coupon as well as the interest accrued in the case of bonds issued at a discount or at a premium. Therefore the accrued income can be derived as follows:

Interest income (debt):

$$IN_{DT_{t_0t_1}} = \frac{(DT_{t_0} + DT_{t_1})}{2} * DAYS * ACF \quad (12)$$

where

DT = debt securities (aggregated nominal amount),

DAYS = number of interest bearing days = number of days between “date from which accrued interest is calculated (inclusive), t_0 ” and “date to which accrued interest is calculated (exclusive), t_1 ” = number of days between t_0 and t_1 and

ACF = accrued income factor = daily security specific accrued income factor in %, calculated following the debtor approach. The factor includes the combined effect of interest due to coupons and income accrued due to a difference between the issue and the redemption price.

Using the CSDB, the accrued interest can therefore be derived using the attribute “accrued income factor” and the “last coupon date” which allows deriving the number of interest bearing days. Alternatively, since the CSDB explicitly provides the attribute “accrued interest”, this attribute can be directly used instead of deriving it based on “accrued income factor” and the “last coupon date”.

8.2 DERIVATION OF ACCRUED INTEREST FOR TRANSACTIONS

As specified in the ESA 95 (Paragraph 4.50), accrued interest is to be recorded as a transaction until it is paid. The interest accruing in each period prior to maturity should be recorded as a financial transaction that represents a further acquisition of the financial asset. When accrued

interest is paid, it is considered as a decrease in the amount held of the respective financial asset.

The amount of accrued interest between t_0 and t_1 to be added to the total value of the transactions as defined in Section 7, can be derived according to the following basic formula:

Interest income (debt):

$$IN_{DT_{t_0t_1}} = \frac{(DT_{t_0} + DT_{t_1})}{2} * DAYS * ACF - IP_{t_0t_1} \quad (13)$$

where

DT = debt securities (aggregated nominal amount),

DAYS = number of interest bearing days = number of days between “date from which accrued interest is calculated (inclusive), t_0 ” and “date to which accrued interest is calculated (exclusive), t_1 ” = number of days between t_0 and t_1 ,

ACF = accrued income factor = daily security specific accrued income factor in %, calculated following the debtor approach. The factor includes the combined effect of interest due to coupons and income accrued due to a difference between the issue and the redemption price and

IP_{t_{0t₁}} = interest paid during the period t_0 to t_1 .

In order to derive the interest paid during the period t_0 to t_1 (*IP_{t_{0t₁}}*), the attributes shown in Table 5 are also available from the CSDB.

Table 5 Attributes available from the CSDB in order to derive the interest paid

Attribute name	Description
Last coupon rate (C)	Last coupon rate in % actually paid.
Last coupon date	Date of last coupon rate paid.
Coupon frequency (F)	Frequency per year, in which the last coupon rate is being paid out: “annual” transforms into 1, “semi-annual” into 2, etc.

Interest paid:

$$IP_{t_0t_1} = \frac{(DT_{t_0} + DT_{t_1})}{2} * Ct * \frac{1}{F} * n \quad (14)$$

where

n = number of coupons paid in the period t_0 to t_1 .

The date of the last coupon rate paid makes it possible to identify whether the last coupon rate actually paid falls into the reporting period or not.

An alternative way to derive accrued interest for transactions is by taking the difference between

the total income accrued for stock positions on the respective end-period reporting dates.

$$IN_{DTt_0t_1} = IA_{t_1} - IA_{t_0} \quad (15)$$

where

IA_{t_0} = interest accrued in t_0 and

IA_{t_1} = interest accrued in t_1 .

The following numerical example shows the calculations and their outcome for transactions in accrued interest for a particular security:

Table 6 Calculation of transactions in accrued interest – numerical example

Characteristics of security A:						
Nominal amount (DT): 10,000	Last coupon date: 22/10/2007					
Annual coupon rate: 2.75%	Next coupon date: 22/04/2008					
Coupon frequency: 2 per year	ACF (using Actual/Actual) = 0.000075136 (=0.0275/366)					
	Number - of days of accrued interest (N)	Accrued interest (AI) =N*DT*ACF	Coupon paid (IP)	Number of days between end-period reporting date	Monthly transactions (DT*ACF*days)–IP [Approach 1]	Monthly transactions AI (t) – AI (t-1) [Approach 2]
22/10/07	0	0.0	0.0			
31/10/07	9	6.8	0.0			
30/11/07	39	29.3	0.0	30	22.50	22.5
31/12/07	70	52.6	0.0	31	23.30	23.3
31/01/08	101	75.9	0.0	31	23.30	23.3
29/02/08	130	97.7	0.0	29	21.75	21.8
31/03/08	161	121.0	0.0	31	23.30	23.3
22/04/08			137.5			
30/04/08	8	6.0	0.0	30	-115.00	-115.0
31/05/08	39	29.3	0.0	31	23.30	23.3
30/06/08	69	51.8	0.0	30	22.50	22.5
31/07/08	100	75.1	0.0	31	23.30	23.3
31/08/08	131	98.4	0.0	31	23.30	23.3
30/09/08	161	121.0	0.0	30	22.50	22.6
22/10/08			137.5			
31/10/08	9	6.8	0.0	31	-115.00	-114.0
30/11/08	39	29.3	0.0	30	22.50	22.5
31/12/08	70	52.6	0.0	31	23.30	23.3

Note: Differences between Approach 1 and Approach 2 may be due to rounding.

9 DERIVATION OF TRANSACTIONS FOR ITEMS REPORTED ON AN AGGREGATED BASIS

9.1 OVERVIEW

As set out in Table 1 of Part 14 to Annex III of the Guideline, NCBs report all assets and liabilities of IFs, in terms of stocks and flow adjustments (revaluation adjustments and reclassification adjustments) to the ECB. However, according to the Regulation, in the case of revaluation adjustments/transactions, not all these items are necessarily reported by reporting agents to the NCB, although the NCB may extend its requirements to cover all these items.

As a minimum, IFs report data on revaluation adjustments or transactions for the following set of items: (i) securities not collected on a security-by-security basis (total currencies),¹⁹ (ii) total financial derivatives (if not exempted), and (iii) total non-financial assets, mainly real estate (if not exempted).

Items where no revaluation adjustments or transactions need to be reported by the IFs include (i) deposits and loans claims, (ii) remaining assets, (iii) loans and deposits received, (iv) remaining liabilities and (v) those items where the NCBs may exempt IFs from reporting them, if the quarterly stocks represent less than 5% of IF shares/units issued (financial derivatives and non-financial assets).

For the purpose of deriving data on revaluation adjustments or transactions, reporting agents can, subject to the instructions of the NCB, apply the two alternative methods that are already used in the context of MFI balance sheet statistics,²⁰ the so-called “transaction method” or the so-called “balance sheet method”. Under the transaction method, reporting agents consider all transactions which occur during the reference period and report them at transaction value. It follows that this method includes realised gains/losses, resulting from a sale of a security, in revaluation adjustments. Under the balance sheet method, transactions are calculated by taking the sales at the value at which they were

recorded in the balance sheet at the end of the previous period, and purchases at the value at which they are recorded in the balance sheet at the end of the current period. Intra-period buy-sell operations of the same security are not recognised. It follows that realised gains/losses are not covered.

9.2 DEPOSITS AND LOANS

The value of euro denominated deposits will not change over time and net transactions can be derived directly as differences in stocks.²¹ For deposits in other currencies, the value expressed in euro will change dependent on the development of the exchange rate against the euro. Therefore, in order to derive the revaluation adjustment for deposits, the NCBs might choose to collect deposits broken down by the relevant currencies.

The same approach could also be followed in case of loans which may be taken by IFs, in particular hedge funds, to leverage the investments.

IFs may also hold loans as investments on the assets side. The value of these loans may depend not only on the currency of the loan, but also on the interest rates prevailing on the market and the creditworthiness of the debtor. Therefore, collection of a currency breakdown may not be sufficient to compile high quality revaluation adjustments. In cases where the investment in loans by IFs is significant on a national level, the relevant NCBs should consider collecting the revaluation adjustments or transactions from the reporting agents.

The transaction value of deposits and loans excludes fees. It also excludes accrued interest that is receivable/payable but has not yet been

19 In the case of the combined approach, for securities without publicly available identification codes and, in the case of the aggregated approach, for all securities.

20 For a detailed description of the two methods in the context of MFI balance sheet statistics, please refer to the “Guidance notes to the Regulation ECB 2001/13 on MFI balance sheet statistics”.

21 Valuation changes in the case of time deposits with a fixed interest rate are disregarded in this example.

received or paid. Accrued interest on deposits and loans is recorded under remaining assets/remaining liabilities.

9.3 FINANCIAL DERIVATIVES

When a new financial derivative contract is created, it should be recorded on balance sheet, and the initial asset/liability position should be recorded as a financial transaction. The transaction value should not include fees or repayable margin payments. In the case of forward-type contracts and warrants, the transaction value is normally zero, and for option-type contracts, the transaction value corresponds to the premium.

During the life of a financial derivative, changes in its market value should be recorded as revaluation adjustments. Favourable (positive) changes in the market price should be recorded on the assets side and unfavourable (negative) changes in the market price should be recorded on the liability side. Payments due to marking to market, which results in a change of value of a financial derivative position, should be recorded as financial transactions.

When a financial derivative is settled, any associated payments (excluding fees) should be recorded as financial transactions.

Purchases or sales of financial derivatives on secondary markets should be recorded as financial transactions, valued at transaction prices.

9.4 NON-FINANCIAL ASSETS

The most relevant item within non-financial assets is holdings of real estate. Given that the geographical areas of investment, as well as the type of real estate invested in, are likely to differ considerably between investment funds, it seems almost impossible to derive transaction data from reported stocks without further information.

From a practical point of view, there seem to be two general approaches for the data provision: given that transactions in real estate are

relatively infrequent, the NCBs might require IFs to directly report transactions in real estate in addition to the stock data. An alternative approach would be for IFs to report revaluation adjustments related to holdings of real estate in addition to the stock data, providing the necessary input to derive transactions.

In the context of non-financial assets, it may be difficult to allocate geographically non-financial assets that are not real estate, such as for example works of art. In this case, for simplicity purposes, the non-financial assets could be allocated as domestic.

9.5 REMAINING ASSETS/LIABILITIES

The most relevant item within remaining assets/liabilities is accrued interest receivable/payable on loans/deposits. Accrued interest that it is not actually paid should be recorded as a financial transaction. The transaction value does not exclude taxes levied on interest.

10 DERIVATION OF MONTHLY DATA (METHODS FOR ESTIMATION TECHNIQUES)

As specified in Article 18.6 of the Guideline, for reference months that are not end-quarter months, the monthly data on IF assets and liabilities other than investment fund shares/units issued must be estimated on the basis of the collected monthly and quarterly data.²² The estimates can be made either by the NCBs, preferably at individual fund level (alternatively by IF sub-sector), or the NCBs may request the ECB to make the estimates, in which case the ECB may request additional information such as fund-by-fund or security-by-security data.

The purpose of this section is to describe some possible methods to be used by the NCBs for the purpose of estimating the monthly data, both for stocks and transactions/revaluation adjustments. Two approaches are considered: (i) the *temporal disaggregation method*, which may be used when NCBs collect only IF shares/units on a monthly basis and when the structure of the IF's securities portfolio is assumed to change during the quarter, and (ii) *use of the CSDB or local securities database*, which would be possible when the structure of the IF's securities portfolio can be assumed to be quite stable during the quarter, or when monthly security-by-security information is collected from IFs.

10.1 TEMPORAL DISAGGREGATION METHODS²³

These are methods that exploit the information provided by the functional relationship estimated at a lower frequency (e.g. quarterly) between an indicator ("anchor" variable) and the variables to be interpolated. The information provided by the functional relationship is then used together with the anchor variable, which is also available at higher frequency (e.g. monthly), to obtain monthly estimates of the other variables. This procedure allows interpolating data for both stocks and flows.

In the case of IF statistics, the estimation of intra-quarter monthly data on assets and liabilities of IFs (stocks and flows) will be based

on the data available at a monthly frequency (stocks and flows), which will serve as anchor values (such as the "investment funds shares/units issued"), and the observed exhaustive quarterly breakdowns (stocks and flows) collected from reporting agents.

In the case of *stock* data, the quarterly end-period stocks coincide with the monthly stock data with reference to the end-quarter month. The estimated intra-quarter monthly observations are thus obtained by interpolating available quarterly stock data. On the other hand, in the case of *flow* data, monthly estimates are derived by *distributing* the quarterly flow data, since quarterly flows should be equal to the sum of the three monthly flows.

Several alternative procedures have been proposed in the literature to deal with the temporal disaggregation of data and missing observations (including forecasting)²⁴. Among the procedures that make use of the indicators available at the desired higher frequency and related to the series to be estimated, is the procedure proposed by Chow and Lin,²⁵ and further developed by others.²⁶ These procedures are presented in this manual as possible "interpolation" techniques to derive monthly data on IF assets and liabilities.

The Chow-Lin procedure can, in formal terms, be expressed as follows: let y_t be the unknown series to be estimated at monthly level and Y_t its available quarterly values, while w_t is

22 Unless all required data are collected on a monthly basis, as set out in Article 5(3) of the Regulation.

23 These methods were also used to compile historical monthly series for euro area loans and deposits to other resident sectors by type of sub-sector (www.ecb.int/stats/pdf/money/aggregates/technical_notes.pdf).

24 For a review of the different methods, see Eurostat, *Handbook of Quarterly National Accounts*, Part III, European Commission, Luxembourg, 1999.

25 See G. Chow and A.L. Lin, "Best linear unbiased interpolation, distribution and extrapolation of time series by related series", *The Review of Economics and Statistics*, 53, 1971.

26 See R.B. Fernández, "A methodological note on the estimation of time series", *The Review of Economics and Statistics*, 63, 1981, and R.B. Litterman, "A random walk, Markov model for the distribution of time series", *Journal of Business and Economic Statistics*, 1, 1983.

the indicator (or “anchor” series) available at monthly level, and W_t in quarterly terms. The unknown relationship at monthly level between the anchor series and the variables to be interpolated can be expressed as:

$$Y_t = \alpha w_t + u_t \quad (16)$$

where

u_t is the disturbance error, and is estimated by using the information provided by the relationship at quarterly level between the anchor series and the variables to be interpolated:

$$Y_t = \beta W_t + e_t \quad (17)$$

Thus, the Chow-Lin procedure takes into account the historical relationship between the control variable (e.g. investment fund shares/units issued) and the sub-components at the quarterly level.

In order to derive the final monthly estimates, a *two-step* procedure can be applied. As a *first step*, the Chow-Lin procedure with AR(1) errors is implemented, using as an indicator the monthly investment fund shares issued. However, in the case of assets and liabilities of IFs, the interpolation problem is complicated by the existence of horizontal (or *adding-up*) constraints, e.g. the sum of the monthly series for the assets and liabilities has to coincide with the total assets/liabilities, and these are not necessarily satisfied by the interpolation procedure. To tackle this issue, in a *second step* the horizontal aggregation errors resulting from the application of Chow-Lin (first step) can subsequently be distributed to the monthly interpolated series by using the Denton adjustment procedure.²⁷

Finally, a non-negativity constraint has to be imposed when deriving the monthly stock data. This can be imposed in the second step of the interpolation phase together with the additivity constraint, such that in all the cases where the result of the first step interpolation is negative, the observation is set to one,²⁸ and any resulting

additivity discrepancy between the monthly interpolated balance sheet items and the correspondent total assets/liabilities is then adjusted together with the other horizontal discrepancies.

Where the Chow-Lin procedure is applied, the initial forecasts must be based on a sufficient number of historical data points to obtain acceptable results. Therefore, existing historical data, even though not necessarily in line with the requirements as set out in the Regulation, will need to be used.

10.2 USE OF THE CENTRALISED SECURITIES DATABASE OR A LOCAL SECURITIES DATABASE

The information available on a security-by-security basis regarding the holdings of securities by IFs at the end of the quarter could possibly be used (for certain IF sub-sectors) to estimate transactions for the reference months that are not end-quarter months. This approach would be based on the assumption that the structure of the IF's securities portfolio does not change during the quarter. In this case, the security-by-security information on assets held by IFs at the end of the previous quarter, combined with security prices available from the CSDB or local securities database, could be used as a basis for estimating the developments during the quarter. Given the irregular nature of transaction data, price information should be taken in consideration. In this way, this method can also complement the temporal disaggregation methods for deriving transactions, especially when strong changes in prices for one or more security category are observed.

²⁷ See F. Denton, “Adjustment of Monthly or Quarterly Series to Annual Totals: An Approach Based on Quadratic Minimization”, *Journal of the American Statistical Association*, 66, 1971.

²⁸ Negative values resulting from the application of the Chow-Lin procedure in the first step cannot be set to zero, since this would, in the case of many negative values, lead to a problem of singular matrices in the second step.

II DEROGATIONS REGARDING REPORTING FREQUENCY

Article 3 of the Regulation states that “derogations may be granted to IFs that are subject to national accounting rules which allow the valuation of their assets less frequently than quarterly” and that “the IFs to which such derogations apply shall be subject to the requirements set out in Article 6 of this Regulation at a frequency consistent with their accounting obligations regarding the timing of valuation of their assets”.

Furthermore, Article 18 of the Guideline specifies that “notwithstanding such derogation, the monthly and quarterly IF data reported by NCBs to the ECB shall always include data relating to these IFs.”

In most cases, the IFs to which such derogations will be granted are likely to be closed-end real estate funds, since these type of funds often value their non-financial assets (mainly consisting of property) only on an annual or semi-annual basis. The categories of IFs to which the derogations may be granted have been published in a Decision of the European Central Bank concerning derogations granted under Regulation ECB/2007/8 concerning statistics on the assets and liabilities of investment funds (ECB/2009/4).²⁹

Since the changes in their non-financial asset positions will depend on the development of property values as well as buying and selling of properties, the estimated monthly and quarterly data should ideally take these into account. However, in case the appropriate information is not available, NCBs could simply repeat the last available stock data until new information becomes available. Once the new information becomes available, the transaction between time t-1 and time t can be redistributed taking into account the number of months between t-1 and t.

In case the assets are only valued on an annual basis, the redistribution of the annual transaction will lead to revisions in the monthly

and quarterly data provided for an entire year. While this does not comply with the revision policy set out in Article 18.3 of the Guideline, an exception to the revision policy can be made in this case.

In the case of IFs other than real estate funds (or other funds investing mainly in non-financial assets) to which such derogations are granted, monthly and quarterly estimations could possibly be derived by using the CSDB or local securities database as described in Section 10.2. Alternatively, the same approach as for real estate funds, as described above, could be applied.

²⁹ OJ L 72, 18.03.2009, p. 21.

12 ANNUAL QUALITY REPORT REFERRED TO IN ANNEX I OF THE REGULATION

As specified in Annex I, Part 3, Table 2 (e), of the Regulation, NCBs may choose to collect only security-by-security information on the “number of units or aggregated nominal amount” instead of also collecting security-by-security information such as the price of the security or the total amount of the security. However, if an NCB chooses to adopt this approach, it “must check, and inform the ECB, at least once a year that the quality of the aggregated data reported by the NCB, including the frequency and size of revisions, is unaffected”.

In order to check the quality of the aggregated data reported to the ECB, the NCB could cross-check the data, for a representative sample of IFs, by comparing the data published in the annual accounts of these IFs with the data derived from the security-by-security information and the prices available from the CSDB.

