

Report on developing a common approach to improve vertical consistency

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Working Group on Financial Accounts and Government Finance Statistics, Expert Group on Sector Accounts, Task Force on Annual Financial Accounts

Executive summary

Vertical consistency across institutional sectors – that is consistency of financial and non-financial transactions – benefits users by increasing quality. Improving vertical consistency requires the cooperation of both financial and non-financial accounts compilers.

This report sets out recommendations on how to improve vertical consistency across institutional sectors in order to improve cross-country comparability. It covers all sectors except for the general government sector (see Section 5). The report's recommendations are the result of discussions between compilers from all EU countries, the European Central Bank (ECB) and Eurostat on quarterly and annual accounts and financial and non-financial accounts by sector.

List of the recommendations

A. Qualitative recommendations

Recommendation I: Regular cooperation between the FA and NFA compilers, and with statistical domains that provide input into sector accounts, is crucial for achieving and maintaining vertical consistency. Cooperation is needed at all stages of the compilation process.

A.1 Development of sources and methods

Statistical registers

Recommendation II: FA and NFA should be compiled from sources that use consistent information on the institutional sector classification of units. In the absence of a common register, the sharing of relevant statistical register information and updates is needed. For counterpart sector reporting (e.g. by banks), reporting agents should have the information needed for a correct classification of counterparts.

Coverage and sub-sectoring

Recommendation III: Sectoral coverage should be as complete and consistent as possible. FA and NFA compilers are encouraged to improve the coverage of the sectors where needed.

Recommendation IV: Sub-sectoring of the population beyond the main sectors regularly disseminated helps to identify the sources of vertical discrepancies. NFA and FA compilers are encouraged to investigate the sources of vertical discrepancies in the various institutional sub-sectors. This investigation should be carried out in particular when benchmarks are being revised, and if large discrepancies at aggregate level are persistent and cannot be resolved.

Monitoring offsetting effect between sectors

Recommendation V: NFA and FA compilers should monitor the potential biases due to offsetting effects between sectors. Compilers are invited to review the plausibility of the sectoral breakdown of transactions focusing on the areas that are mainly based on estimations, such as expert judgements, models, and other soft information. Those reviews should be carried out annually or at least when the benchmarks are being revised.

Data sources

Recommendation VI: NFA and FA compilers should assess the feasibility of using the same data sources and, if available and appropriate, make use of them to promote consistency. When using a single data source, their editing, grossing up and imputation methods should be aligned as far as possible.

Recommendation VII: For large corporations, the sharing of micro/granular data between the NFA/FA compilers can be particularly useful for a structural review of sources of inconsistencies, as well as in regular production.

Property income consistency

Recommendation VIII: NFA and FA compilers should ensure a consistent recording between property income flows and related financial positions. Compilers are encouraged to analyse the plausibility of the implicit rates of return for assets and liabilities, and to regularly monitor the ratios listed in **Error! Reference source not found..** Furthermore, compilers should ensure consistency for specific financial and non-financial transactions as stipulated in ESA 2010. This refers in particular to the imputation of additional financial transactions for:

- the reinvested earnings on foreign direct investment: D.43/F.51
- the investment income attributable to insurance policy holders: D.441/F.62
- the retained earnings attributable to collective investment fund shareholders D.4432/F.52

Revision policy

Recommendation IX: FA and NFA compilers should harmonise their revision policy for both routine and benchmark revisions in line with the principles of the harmonised European revision policy (HERP).

A.2 Manual balancing

Monitoring of consistency during the compilation process

Recommendation X: Compilers should monitor the vertical consistency of sector accounts in order to detect any large discrepancies that will require manual informed adjustments.

Consistent treatment of major events

Recommendation XI: NFA and FA compilers should exchange information on major events (e.g. large corporate events like mergers & acquisitions and relocations) and their treatment.

Known data source quality issues

Recommendation XII: Compilers are advised to make well-documented informed adjustments based on known data source quality issues.

A.3 Automated balancing

Instruments and variables to adjust

Recommendation XIII: If automated balancing is applied it should take into account the relative quality of variables, following the principle that lower quality variables will be adjusted more. Quality should be measured primarily in terms of accuracy and reliability; supplementary criteria like size, volatility and user relevance may be used in addition to identify which variables could be adjusted and to what extent. However, no significant adjustments should be made to variables that are of high quality. The relative quality of the variables should be monitored and reviewed at regular intervals.

Recommendation XIV: All components, both financial and non-financial, should in principle be eligible for adjustment in the automated balancing process.

Joint consideration of horizontal and vertical discrepancies

Recommendation XV: When possible, compilers should aim to jointly consider horizontal and vertical discrepancies. Moreover, balancing may be done jointly for sector accounts and BoP if the compilation processes are sufficiently integrated.

A.4 Plausibility

Recommendation XVI: Regularly review vertical consistency before and after alignment to check for biases, trends, seasonality, correlations, and past revision patterns. Compilers may draw up and run a checklist for plausibility after the manual and automated balancing, e.g. divergence from source data in terms of growth rates.

A.5 Transparency

Recommendation XVII: *Ensure clear documentation on the automated and manual balancing.*

B. Quantitative recommendations

B.1 Target for individual sectors (except government)

Recommendation XVIII: *Compilers are recommended to keep in each compilation round the four-quarter sum/annual vertical discrepancy for each sector (and sub-sector) below 1% of the four-quarter sum/annual GDP ('target'). Depending on the degree of integration with the compilation of the balance of payments, consistency with it needs to be preserved.*

B.2 Maximum automated balancing for individual sectors (except government)

Recommendation XIX: *In each compilation round, compilers can adjust the sector vertical discrepancy via final automated balancing up to a maximum of 2% of the four-quarter sum/annual GDP.*

B.3 Time range for target and automated adjustment

Recommendation XX: *The quantitative target for vertical consistency and maximum automated adjustment applies to the entire length of the time series. However, if that proves impossible, it is recommended to focus on the last 4 years, or the years that are subject to be revised according to the national revision policy. Benchmark revisions provide an opportunity to achieve even better consistency over the time series.*

B.4 Consistency of annual and quarterly data

Recommendation XXI: *Compilers should have the same quantitative target and maximum automated adjustment for annual and quarterly data, the latter being expressed as a four-quarters sum. The seasonality of quarterly discrepancies should be investigated and reduced in line with the aim of small and unbiased discrepancies.*

1. Introduction

In 2016, the CMFB supported the proposal that the WG FGS (then WG FA) and EG SA (then TF QSA) coordinate the work to develop good practices among countries to increase vertical consistency and ensure that any vertical discrepancies are small and unbiased¹.

Work has progressed on priority issues identified in the CMFB report. Quantitative goals for consistency/discrepancies remain to be developed, however, an issue that is addressed in this report. Concerning quantitative goals, the report to the CMFB proposed the following:

‘The EG SA and the WG FA will discuss the usefulness and possible definitions of quantitative goals for vertical discrepancies by sector. This will take into account that enhancing vertical consistency must be seen in the context of other goals and constraints faced by the sectoral accounts, such as the consistency with primary statistics and macroeconomic aggregates.’

The Eurostat Task Force on Cross-Domain Consistency, set up at the DMES meeting in 2018, recognised ‘the work programme on vertical consistency that is pursued by the joint Eurostat/ECB Expert Group on Sector Accounts and ECB’s Working Group on Financial Accounts, and which will remain responsible for the discussion of statistical/technical items that impact on vertical consistency’.

Finally, the ESCB medium-term strategy for financial accounts² includes an objective on developing common recommendations for reconciling vertical discrepancies (or ‘vertical reconciliation’).

Accordingly, at the end of 2019, the WG FGS and the EG SA formally began discussions on a common approach to improving vertical consistency between financial and non-financial accounts, and agreeing quantitative targets for vertical discrepancies. Discussions took place at four meetings³, and three main documents were produced: (i) the end-2019 overview on the country vertical discrepancies; (ii) the March 2020 stocktaking exercise on national reconciliation practices; and (iii) the 2020 report on consistency of property income and their related financial positions. A first workshop of the WG FGS, EG SA and TF AFA was held in December 2020 to discuss the results of these studies, to report on national experience and practices, and to provide a forum for user presentations. A further workshop was held in March 2021 to discuss the first version of the draft recommendations, which was followed up with written comments. These discussions and two subsequent written procedures resulted in several recommendations, which are set out in this report.

¹ [Agenda item 8.2 ‘Vertical consistency of the quarterly financial and non-financial accounts \(ECB DGS/Eurostat\)’](#) of the CMFB plenary meeting of 28-29 January 2016.

² At its December 2019 meeting, the STC approved the implementation plan for the medium-term strategy for financial accounts (10 high-priority and 6 medium-priority work streams). For 2020-2023, the STC agreed to focus on the high-priority work streams, and on the medium-priority work stream ‘M.4 Developing a common approach for reconciling vertical discrepancies’. M.4 aims to develop recommendations for sectors/transactions subject to reconciliation and reconciliation thresholds (maximum published discrepancy and/or maximum reconciliation adjustment).

³ WG FGS (then WG FA) of November 2019; EG SA of December 2019; dedicated workshop on vertical reconciliation recommendations: Part 1: 14-15 December 2020; and Part 2: 17 March 2021.

This report provides in Section 2 an overview of the main reasons for vertical reconciliation. Section 3 presents an overview of the vertical consistency by country and by sector. Section 4 explains the terminology used throughout the report. Section 5 presents the scope of the recommendations, Section 6 sets out the list of proposed recommendations, and finally, Section 7 presents the next steps and the implementation timeline.

2. Why common recommendations for vertical reconciliation?

2.1 Guidance in the statistical manuals

The ESA 2010 and SNA 2008 refer to consistency as fundamental to the quality of national accounts, but do not set out a concrete methodology for vertical reconciliation, i.e. for the elimination or reduction of discrepancies. In fact, ESA 2010 and SNA 2008 allow a differentiation to be made between net lending, net borrowing and net financial transactions. While methodological guidelines were developed for benchmarking and reconciling annual and quarterly national accounts⁴, for ensuring consistency of national accounts⁵, and for the balancing or reconciliation of GDP measures⁶ there is less guidance on dealing with vertical discrepancies. Hence the need to develop guidance for vertical reconciliation.

Selecting and confronting data sources are key steps in the compilation of sector accounts, and a high alignment of these sources (in concept and in coverage) is the best basis for producing accounts that show only limited vertical discrepancies. This topic is usually not covered in statistical manuals, but essential for the quality of the results.

SNA 2008 and ESA 2010 acknowledge that vertical discrepancies exist in practice (SNA 18.20, 22.77; ESA 1.126, 5.18, 20.113) and argue that they can be tolerated. The existence of vertical discrepancies is also recognised in the ESA 2010 transmission programme, where Table 8 includes the variable DB.9 ('discrepancy with net lending / net borrowing of FAs') for each sector; and Table 6 refers to 'net financial transactions' (B.9f) rather than to 'net lending / net borrowing' (B.9). Additionally, arguments for the balancing or reconciliation of GDP measures (SNA 18.14 - 18.19; ESA 12.25) can also apply to vertical reconciliation as supported by Eurostat's [Handbook on quarterly national accounts – 2013 edition](#) (para. 8.1 and 8.79)⁷:

ESA 12.25 *'The balancing or reconciliation process is an integral part of the compilation process of national accounts. It makes optimum use of the diverse sources of information underpinning different measures in the accounts. In broad terms, balancing seeks to fit the statistical basic data underlying the different approaches*

⁴ e.g. [European Statistical System \(ESS\) guidelines on temporal disaggregation, benchmarking and reconciliation — 2018 edition](#).

⁵ e.g. Eurostat's handbook on [Consistency of ESA 2010 based national accounts – 2020 edition](#). Consistency is also addressed in Eurostat's handbook on [Practical guidelines for revising ESA 2010 data — 2019 edition](#). Vertical consistency is mentioned in Section 7.4 of the former and in Sections 5.3, 5.4 and 6.4 of the latter.

⁶ Eurostat's [Handbook on quarterly national accounts – 2013 edition](#).

⁷ Paragraph 8.87 of the Handbook also warns against forcing 'a balance by making large and somewhat arbitrary adjustments over successive quarters with little assurance that the resulting data will be meaningful'.

to the compilation of GDP and the other parts of the accounts into a supply and use framework, and so use all the available information in an effective manner.'

The manuals note that all components - financial and non-financial - could be candidates for adjustment. SNA 2008 explicitly states that a discrepancy in the net lending/net borrowing may indicate an error at any place in the financial and/or non-financial accounts (SNA 18.20). Any examination of statistical discrepancies must be investigated on a case-by-case basis and efforts should be made to identify the sources of the discrepancies. For discrepancies between different measures of GDP, Eurostat's [*Handbook on quarterly national accounts – 2013 edition*](#) states that all components, and not just selected variables, should be eligible for adjustment, as otherwise the few adjusted series would accumulate all the errors in unadjusted series (para. 8.13, 8.20-22 and 8.24).⁸ While the same argument can be extended to vertical reconciliation of financial and non-financial accounts, in practice adjustments made in most countries are mainly for financial transactions (as acknowledged in para. 8.86 of Eurostat's [*Handbook on quarterly national accounts – 2013 edition*](#)) and often for only a few items such as other accounts receivable/payable, unlisted shares and other equity.

ESA 2010 5.244a⁹ stipulates that any statistical discrepancies other than timing differences in other accounts receivable/payable (AF.89) should not be included.

The UN and the ECB [*Handbook of National Accounting: Financial Production, Flows and Stocks in the System of National Accounts*](#), paragraph 7.228, discusses vertical consistency by institutional sector.

7.228. *'National accounts compilers also try to achieve vertical consistency for all institutional sectors. In any case, vertical consistency may be required for some key institutional sectors, such as financial corporations, general government and the rest of the world, while the remaining two sectors, households including non-profit institutions serving households and non-financial corporations, may not be fully reconciled even if they are of high analytical interest. In reconciling these sectors, vertical imbalances might be substantially reduced.'*

2.2 User requirements

Consistency in financial and non-financial transactions facilitates the integrated analysis of sector accounts. Consistency provides users with answers on how financial corporations finance their investments and how household use their savings, among other questions. Users also consider consistency to be an indication of quality, though it is very difficult for them to judge how high consistency, or even full consistency, has been achieved.

⁸ For GDP, the Handbook states (paragraph 8.24) *'it is recommended that the accounts should be completely balanced with a single measure of GDP'*. For the vertical reconciliation of sector accounts, balancing is more difficult as in most countries two institutions are involved. User preferences on the consistency of financial and non-financial transactions are discussed in Section 2.2.

⁹ ESA 2010 5.244a: *'Other accounts receivable/payable do not include: (a) statistical discrepancies other than timing differences between transactions in goods and services, distributive transactions or financial transactions and the corresponding payments.'*

While these points makes consistency an important goal, users know that consistency is not always the direct result of combining source data. They may therefore question whether vertical reconciliation affects the quality of some parts of the accounts (such as other accounts receivable/payable). Furthermore, large differences in discrepancies between countries may raise doubts about the cross-country comparability of sector accounts.

The requirement for users to achieve consistency between the financial and non-financial quarterly sector accounts was explicitly stated in Regulation 1161/2005, the first EU legal basis for collecting non-financial sector accounts on a quarterly basis¹⁰.

In the 2018 ECB WG FGS (then ECB WG FA) users' workshop on the medium-term strategy for financial accounts, users raised questions about high vertical discrepancies in some national data. They also expressed their difficulty to understand why Member States applied seemingly very different approaches in aligning sectors and setting limits on vertical differences.

Therefore, the purpose of common recommendations for vertical reconciliation is to improve consistency between financial and non-financial accounts, to improve the comparability of the reconciliation measures across countries and to ensure that the reconciliation process underlying the data is transparent for users. Importantly, the intention is neither to 'hide' vertical discrepancies, nor to reduce them to zero at the cost of affecting the quality of the accounts.

3. Analysis of consistency by country and sector

At the end of 2019, a study on vertical consistency by country and sector for the period 2015-2018 was carried out¹¹. Vertical discrepancies based on four-quarter sums data¹² and annual data were analysed, and led to similar conclusions:

- General government discrepancies were generally negligible compared to other sectors (an average absolute vertical discrepancy of 0.1% of GDP for 2018).
- For households and non-profit institutions serving households (NPISH), differences were small or moderate in 2015-2018 for most European countries. Some countries reconcile the household sector by adjusting financial and/or non-financial items for which the data sources are considered incomplete or of relatively low quality. In many countries vertical discrepancies tend to largely offset each other over time and, as a result, the four-quarter averages are low in most countries. Few countries had discrepancies above 2% of GDP in 2018.

¹⁰ [REGULATION \(EC\) No 1161/2005 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 July 2005 on the compilation of quarterly non-financial accounts by institutional sector](#) .

¹¹ Consistency of ESA 2010 data transmission Table 6 and Table 8.

¹² The conventional way to measure vertical discrepancies based on quarterly data is to calculate them on a four-quarter moving sum basis, which smooths the results because of intra-annual offsetting and applied annual balancing procedures. A large part of quarterly discrepancies can be explained by intra-annual time of recording mismatches between non-financial and financial accounts.

- For non-financial corporations (and for the household sector), there has been an improvement over time. Only few countries had discrepancies above 2% of GDP in 2018. In some countries, the non-financial corporations sector has been chosen to offset the 'net errors and omissions'¹³ stemming from the balance of payments.
- For the financial corporations sector, data availability is typically better than it is for the non-financial sectors, and many countries usually achieve consistency. Only few countries had discrepancies above 2% of GDP in 2018.
- For the rest-of-the-world accounts, vertical consistency is generally at the same level as for the other sectors. Only one country had discrepancies above 2% of GDP in 2018.

When comparing net lending as measured from the non-financial accounts (B.9) with net financial transactions from the financial accounts (B.9f) for 2015-2018, it was observed that vertical discrepancies for the last year, 2018, had been largely reduced compared to 2015. However, sizeable vertical discrepancies persist over the whole time series of sector accounts.

Bear in mind that country results reflect in part the policy chosen for vertical discrepancies and the use of automated reconciliation methods. In other words, it is not possible to draw clear-cut conclusions on data quality when comparing results between countries, as no or small discrepancies might also conceal significant quality issues. Countries are therefore invited to apply the harmonised set of practices on reducing vertical discrepancies presented in this report.

4. Terminology

This section aims to clarify the terminology used for the balancing process. It first shows balancing with respect to the whole statistical process of national accounts, and then goes on to discuss the details and characteristics of the balancing process.

The ESA 2010 does not give a comprehensive definition of the process of producing national accounts statistics. Some methodological and procedural aspects of the compilation are available in specific guidelines¹⁴, but others such as balancing for vertical discrepancies are not explicitly defined and implementation is at the discretion of data compilers.

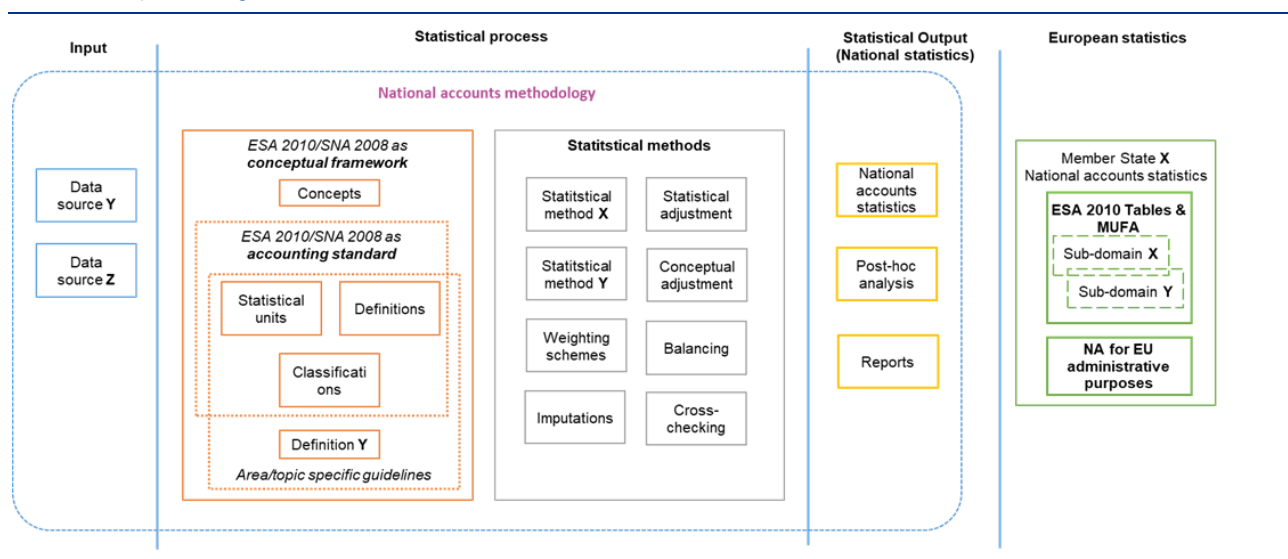
Therefore, the national accounts methodology applied by each country extends beyond the guidelines of the ESA 2010 manual.

¹³ 'Net errors and omissions' is the equivalent term of 'statistical discrepancies between non-financial and financial accounts' used in BOP statistics.

¹⁴ e.g. the [ESS guidelines on seasonal adjustment](#) and the [European Statistical System \(ESS\) guidelines on temporal disaggregation, benchmarking and reconciliation – 2018 edition](#).

Figure 1

Process of producing national accounts



Balancing is a statistical method that comes at the end of the production process of national accounts. Even when the data are comprehensive and of good quality, they are still unlikely to be consistent and the confrontation and balancing process can lead to both consistency and an improvement in the quality of the estimates. If the basic data are incomplete and of variable quality, then the better-quality data can be used to impute missing values and improve the quality of the other estimates.

4.1 Development of sources and methods

Development of sources and methods refers to the alignment and enrichment of sources and methods prior to the actual quarterly or annual compilation. Such changes are structural, as they require sufficient preparation. Sources and methods may be developed infrequently, depending on the revision policy, or in some cases only for benchmark revisions.

4.2 Balancing

The process for compiling national accounts attempts to make best use of the wide range of information available. As this leads to inconsistent estimates most of the time, it is necessary to carry out a balancing process.

Balancing is a statistical method to confront and reconcile data using the accounting identities embedded within the national accounting framework. Data confrontation is the process of comparing data from different sources and of various frequencies, in order to assess their coherence. Data reconciliation is the process of adjusting data derived from two different sources in order to remove, or at least reduce, the differences.

Balancing involves also, in its last step, checking the economic plausibility of the estimates.

The Eurostat *Handbook on quarterly national accounts* outlines the main advantages of balancing:

- the process of confrontation leads to better estimates of key macroeconomic indicators and their components, as it is easier to identify and remedy inconsistencies at a detailed level;
- the outcome of the balancing process paints a coherent and consistent picture of the economy;
- the balancing process makes the best use of the data available, with the most accurately measured components used to bolster weaker data;
- national accounts compilers learn where the strengths and weaknesses are in their basic source data, and may take action to improve the latter;
- national accounts compilers, who may only be responsible for deriving preliminary estimates of a few components, have their experience and knowledge broadened and become better at their job by working in a comprehensive national accounting framework.

Remember that the basic statistical information used in the accounts has in most cases already undergone a number of statistical adjustments prior to the balancing process. For example, if administrative sources of data are used it may be necessary to modify the figures so that the definitions align with those required for the national accounts (conceptual adjustment). Survey data are frequently adjusted to minimise non-sampling errors, such as those arising from non-response or inadequacies of the sampling frame. They may then be adjusted further in light of scope and coverage deficiencies. The adjustments made during the balancing process may therefore be seen as the final stage in the statistical estimation process.

4.3 Types of balancing

National accounts need to be integrated in three dimensions: horizontal, vertical and related to stocks and flows, and data balancing must be carried out accordingly. The UN and the ECB [*Handbook of National Accounting: Financial Production, Flows and Stocks in the System of National Accounts*](#) discuss these three types of balancing.

4.3.1 Horizontal balancing

The accounts must be horizontally consistent in such a way that total uses are equal to total resources and total (changes in) assets are equal to total (changes in) liabilities.

Horizontal balancing refers to the maintenance of the equivalence for each transaction, revaluation and other changes in volume and balance sheet item; flows and stocks balance out when summed over all resident sectors and the rest of the world.

4.3.2 Vertical balancing

The accounts also need to be vertically consistent so that, for each resident sector and for the rest of the world, the sum of all resources minus the sum of all uses - net lending (+)/net borrowing (-) as compiled in the capital account - is equal to the changes in the financial assets minus the changes in liabilities - net lending (+)/net borrowing (-) as compiled in the financial account. It is not uncommon however to see a statistical discrepancy between the estimates of net lending/borrowing in the capital and financial accounts.

To obtain integrated accounts, compilation work must be extended to vertical balancing, which refers to maintaining identities between non-financial and financial transactions within the system of accounts.

4.3.3 Balancing related to stocks and flows

Consistency between the flow accounts and the balance sheet data must be maintained. This also applies to consistency of from-whom-to-whom data through the incorporation of the counterpart sector dimension in the overall compilation process.

The accounts should also be balanced in terms of stocks and flows, so that the change in the balance sheet for each asset and liability category is equal to the changes arising from non-financial transactions, financial transactions, revaluations and other changes in the volume of assets.

4.4 Manual vs automated balancing

The balancing of accounts can be either manual or automated. A combination of both approaches is also possible and often applied in practice.

Manual balancing, also called ‘ad-hoc balancing’, requires that the whole process is supervised by experts that make decisions on how to reconcile each of the differences observed. This ensures that the results reflect the economic reality and that any complex patterns observed are adequately examined and addressed in the balancing process. It also enables expertise and experience to be incorporated into the feedback loop during quality checks and possible deficiencies in data sources and/or statistical methods applied in previous steps of the production process to be addressed.

The decisions taken by the experts in manual balancing should be ‘informed’, meaning that all available information has been considered, assumptions and limitations have been clearly identified and results reflect the economic reality. It is highly advisable to document decisions, assumptions, and limitations, so that the whole process can be followed if source data or assumptions are revised. On the downside, manual balancing can become costly both in terms of time and human resources, as there needs to be proper documentation and metadata on the decisions made to ensure that consistent decisions can be made in case of future revisions of the data if the balancing is performed by another expert.

Automated balancing aims to reconcile the accounts by applying mathematical techniques to solve a number of mathematical equations that are subject to specific constraints, such as constrained-optimisation problems with hard and/or soft constraints. Expert knowledge is incorporated into the automated balancing process by assigning weights to variables depending on the degree of uncertainty for each variable and by defining the applicable constraints that need to be satisfied. The methods used are generally based on ‘weighted least squares optimisation’ (i.e. the method proposed by Richard Stone for balancing an accounting system)¹⁵.

¹⁵ A simple automated balancing method would be to allocate all the adjustment to a single variable which is considered of particularly low quality. Such methods are sometimes referred to as residualisation and should be used as a fallback solution only.

Automated balancing, once implemented, is faster and less resource intensive, while the results are reproducible and consistent for the entire time series. On the downside, it does not make use of the additional information that the compiler may have on specific events, transactions or revisions, from related adjustments made in previous periods or metadata of data sources. Moreover, if not well-designed, automated balancing may result in implausible results, and their root cause analysis may be difficult and time-consuming if the process is not well understood and documented. Automated balancing requires that weights and constraints are regularly revised to reflect the quality of the underlying data sources and methods. This, however, may result in revisions to the entire time series. It is also important to assess the plausibility of the results of this automated process against the observed economic reality and, if needed, it must be possible to analyse how different hypotheses affect the results. Automated balancing is often the last step in the reconciliation process, which may be required if manual balancing has not sufficiently reduced discrepancies.

Most countries have regular reconciliation practices and quantitative goals for acceptable vertical discrepancies. Their general approach is to address major discrepancies manually. Some countries balance the remainder automatically, although the borderline between the two and the degree of complexity of the automated balancing varies between countries. Addressing small discrepancies through automated balancing leads to more consistent balancing over time and allows more time to focus on the more problematic data in manual balancing.

Moreover, quarterly accounts need to be balanced in a very short timeframe and with less data available. Compilers may achieve a better outcome in these circumstances using automated procedures as a complement to manual balancing. Importantly, however, automated balancing should be limited and should not replace manual balancing and improvements in sources and methods. Countries decide whether automated balancing is needed to reach acceptable vertical discrepancies.

5. Scope of the recommendations

The scope of the recommendations is in line with the 2016 proposal supported by the CMFB to develop good practices among countries to lead to discrepancies that are small and unbiased, i.e. not exhibiting a trend or seasonality. Recognising the diversity of sources and methods, the recommendations list good practices without specifying specific tools to be used.

As explained in Section 4.3, consistency in national accounts targets three dimensions: horizontal, vertical and between stocks and flows¹⁶. Consistency along all three dimensions is equally important to users. Any adjustments to achieve consistency for any dimension will also probably trigger the need for proper and careful adjustment along the other two dimensions, which can be a challenging task for data compilers. However, the present recommendations may not cover stocks and flows issues comprehensively.

Concerning sector detail, the recommendations were defined taking into account the mandatory sector detail for Table 801 from the ESA 2010 transmission programme, that is non-financial corporations (S.11), financial

¹⁶ The change in the balance sheet for each asset and liability category is equal to the changes arising from non-financial transactions, financial transactions, revaluations and other changes in the volume of assets.

corporations (S.12), general government (S.13), households and NPISHs (S1M=S.14+S.15) and the rest of the world (S.2).

For the government sector, the prevalence of sector specific guidance is acknowledged, and reference is made to the Manual on quarterly financial accounts for general government in its current edition (part 1.c, page 34).¹⁷

'Some countries have traditionally reported zero discrepancies by placing the real discrepancy within the other accounts receivable/payable category (F.8), since that is often the part of the financial account with the weakest quality, although ESA2010 paragraph 5.244a appears to instruct not to do so. Member States have previously committed to an acceptable plausibility threshold of ± 2 % of quarterly GDP. In practice, many countries nowadays never exceed this threshold, while a small minority continuously exceeds the threshold. For those countries that de facto include the discrepancy within F.8, the threshold is evaluated on other economic flows of F.8 where appropriate or on the size of unexplained F.8 transactions.'

For this reason, the government sector is out of the scope of the recommendations presented here.

For the rest-of-the-world accounts, recommendations need to consider the EU-wide work to increase consistency or achieve full consistency of these accounts and balance of payments. This involves showing net errors and omissions that are close or identical to vertical discrepancies. For balance of payments, there is no general policy/recommendation for EU countries on net errors and omissions, but the reasons behind increasing net errors and omissions and positive or negative biases are to be investigated. For the quarterly euro area data, the ECB considers that net errors and omissions larger than 1% of GDP are worrying, and makes an effort to reduce them¹⁸.

6. List of recommendations

The following 21 recommendations are grouped under two headings - 'Qualitative recommendations' (I-XVII) and 'Quantitative recommendations' (XVIII-XXI), with a short reasoning provided for each one.

A. Qualitative recommendations

The qualitative guidance complements the guidance presented in the 2016 CMFB report¹⁹.

¹⁷ <https://ec.europa.eu/eurostat/documents/3859598/8465769/KS-GQ-17-012-EN-N.pdf/27ae60c6-26f6-4f57-b5c7-984f2d216b31>

¹⁸ The balancing mechanisms for the euro area balance of payments and international investment position compilation can be found at: https://www.ecb.europa.eu/pub/pdf/other/bop_iipc_201029.en.pdf
In Section 2: 'The adjustments in the new balancing mechanism aim to keep absolute n.e.o. in the euro area b.o.p. and "vertical discrepancies" in EAA statistics below a threshold which is currently set at €30 billion, broadly corresponding to 1% of euro area quarterly GDP'.

¹⁹ Agenda item 8.2 'Vertical consistency of the quarterly financial and non-financial accounts (ECB DGS/Eurostat)' of the 28-29 January 2016 CMFB plenary meeting ([main conclusions and list of actions](#)).

Recommendation I: Regular cooperation between the FA and NFA compilers, and with statistical domains that provide input into sector accounts, is crucial for achieving and maintaining vertical consistency. Cooperation is needed at all stages of the compilation process.

Various examples provided by national compilers have underlined that cross-domain or cross-institution cooperation is a key for addressing vertical discrepancies.

A.1 Development of sources and methods

Consistency of sector delineation

In the March 2020 stocktaking exercise on national reconciliation practices for the financial and non-financial sector accounts in EU countries ('the stocktaking exercise'), 26 countries reported that they apply practices of harmonising the sector delimitation between financial accounts (FA) and non-financial accounts (NFA). Five countries (BE, DK, EE, HU, LT) mentioned their use of a common statistical register, while others (AT, FI, IE, SI) carry out sector classification checks. Most countries did not specify how they ensure the harmonisation of sector delimitation. In a survey conducted by the CMFB, 14 NCBs indicated to have access to the institutional sector code in the national statistical business register²⁰, which implies that in many countries this information is not mutually shared.

Statistical registers

Recommendation II: FA and NFA should be compiled from sources that use consistent information on the institutional sector classification of units. In the absence of a common register, the sharing of relevant statistical register information and updates is needed. For counterpart sector reporting (e.g. by banks), reporting agents should have the information needed for a correct classification of counterparts.

The main starting point of any statistical process is to specify the scope of the statistical/institutional units. Relying on common or harmonised statistical registers that are regularly updated in order ensure a full coverage of the economy is crucial for NFA/FA compilers. It is recommended that information on the institutional sector code are mutually shared. National and European initiatives for sharing or providing mutual access to business registers for statistical purposes are also important for vertically consistent national accounts.

Coverage and sub-sectoring

Recommendation III: Sectoral coverage should be as complete and consistent as possible. FA and NFA compilers are encouraged to improve the coverage of the sectors where needed.

Improvement of the quality of data for certain financial sub-sectors - and in particular for other financial institutions (OFIs i.e. sectors S.125, S.126 and S.127) for which no harmonised data collection from reporting agents exist – has been a high priority work stream for the WG FGS since 2016. Although most

²⁰ CMFB meeting in July 2021 - item 4.1 - Outcome of the 2021 CMFB survey regarding the implementation of the CMFB recommendations on the mutual use of SBRs.

countries have developed national surveys and other data sources, it remains a challenge to ensure that the data for the OFI sector has full coverage and is of a high quality. Sectoral coverage issues may also exist, for example, for newly created entities and for unincorporated/small business.

Recommendation IV: *Sub-sectoring of the population beyond the main sectors regularly disseminated helps to identify the sources of vertical discrepancies. NFA and FA compilers are encouraged to investigate the sources of vertical discrepancies in the various institutional sub-sectors. This investigation should be carried out in particular when benchmarks are being revised, and if large discrepancies at aggregate level are persistent and cannot be resolved.*

For certain sectors and sub-sectors, large positive or negative net lending may indicate sources of vertical discrepancies. For example, the net lending of investment funds (S.124) is expected to deviate from zero only in the case of net-acquisitions of non-financial assets; a positive net lending may indicate that income is not fully distributed as required by ESA²¹. Compiling the financial sector in the non-financial accounts for the same sub-sectors as in the financial accounts would facilitate this analysis. Another example is an investigation of the net lending of NPISHs (S.15) – which may also reveal issues that could not be detected from the combined sector households and NPISHs.

Unlike the financial corporation sector (S.12), the non-financial corporation sector (S.11) does not require further sub-sector breakdown in NFA and FA dissemination, but additional breakdowns (e.g. by ownership – public, foreign controlled) might be available on both sides²². A closer look within those dimensions could help to identify and eliminate sources of vertical discrepancies.

Monitoring the offsetting effect between sectors

Recommendation V: *NFA and FA compilers should monitor potential biases due to offsetting effects between sectors. Compilers are invited to review the plausibility of the sectoral breakdown of transactions focusing on the areas that are mainly based on estimations, such as expert judgements, models, and other soft information. Those reviews should be carried out annually or at least when the benchmarks are being revised.*

The long-term analysis of annual vertical discrepancies for 1995-2018²³ revealed that significant offsetting (negative correlation) can occur among sectors, mainly between non-financial corporations (S.11) and households/NPISH (S.1M).

The stocktaking exercise showed that 16 countries carry out analyses to spot potential biases. Of those, 11 have found biases. The most common offsetting effect between sectors was 'B.9>B.9F' in non-financial

²¹ ESA 2010 4.69 states that the property income received by mutual funds is recorded as shareholders' property income even if it is not distributed but reinvested on their behalf. A positive financial accounts net lending indicates that the reinvestment is not recorded as a financial transaction.

²² The ECB WG FGS medium-term strategy for financial accounts explores compilation procedures for foreign controlled non-financial corporations.

²³ As presented in the virtual workshop of December 2020 on developing common recommendations for vertical reconciliation of sector accounts.

corporation sector (S.11) versus 'B.9<B.9F' in the household and NPISH sector (S.1M) and sometimes also in the financial sector (S.12).

To improve the delineation of the household and the non-financial corporate sector, the recording of self-employment has been discussed in EG SA meetings and a technical paper (note on the recording of self-employment²⁴) was published in August 2019 on Eurostat's website.

Data sources

Recommendation VI: *NFA and FA compilers should assess the feasibility of using the same data sources and, if available and appropriate, make use of them to promote consistency. When using a single data source, their editing, grossing up and imputation methods should be aligned as far as possible.*

Most of the data sources are different for the FA and NFA, which is one possible reason for vertical discrepancies. Deriving the balancing item from different data sources can have the advantage of allowing for a crosschecking of the sources. Using counterpart sector information that is available for selected transactions can have the advantage of providing horizontally consistent data. However, the use of different data sources often implies differences in accounting treatments, or even discrepancies in the coverage or delineation of the sectors.

If available FA and NFA compilers may decide to use the same data sources, as this increases the likelihood of a consistent recording. However, a single data source is not enough to guarantee the consistency between FA and NFA. The treatment of data in both should be the same, i.e. similar editing, grossing up and imputation methodology. Furthermore, all aspects of the data processing should be considered (e.g. data vintages).

Recommendation VII: *For large corporations, the sharing of micro/granular data between the NFA/FA compilers can be particularly useful for a structural review of sources of inconsistencies, as well as in regular production.*

Most of the NA adjustments occur at aggregate level, although large corporations' data can also be improved at individual level. Where those data are available, collaboration between NFA and FA compilers in compiling the NFA and FA accounts up to the B9 figures for the individual companies can reduce vertical discrepancies at entity level, thereby also limiting discrepancies at aggregate level.

To ensure a consistent treatment of large corporations, some countries have set up 'Large Cases Units' to deal with the statistical data of selected large companies. Other countries have carried out ad hoc reviews of entity level data in order to identify structural causes of discrepancies.

Property income consistency

Recommendation VIII: *NFA and FA compilers should ensure a consistent recording between property income flows and related financial positions. Compilers are encouraged to analyse the plausibility of the*

²⁴ [Information note on the recording of self-employment and related income flows in sector accounts.](#)

implicit rates of return for assets and liabilities, and to regularly monitor the ratios listed in **Error! Reference source not found.** Furthermore, compilers should ensure consistency for specific financial and non-financial transactions as stipulated in ESA 2010. This refers in particular to the imputation of additional financial transactions for²⁵:

- the reinvested earnings on foreign direct investment: $D.43/F.51$ ²⁶
- the investment income attributable to insurance policy holders: $D.441/F.62$ ²⁷
- the retained earnings attributable to collective investment fund shareholders $D.4432/F.52$ ²⁸

Table 1

Property income overview*

	ASSETS	LIABILITIES
Implicit interest rate **	receivable: D. 41G assets: F. 2M + F. 3 + F. 4 + F. 8	payable: D. 41G liabilities: F. 2M + F. 3 + F. 4 + F. 8
Implicit return on equity	receivable: D. 42 + D. 43 assets: F. 51	payable: D. 42 + D. 43 liabilities: F. 51
Implicit return on other property income	receivable: D. 44 assets: F. 52 + F. 6	payable: D. 44 liabilities: F. 52 + F. 6

* Relation between (four-quarter cumulated sum or annual) investment income and average stock of the period.

** An alternative measure of the implicit interest rate excludes F.8.

For further explanation, see ECB-Eurostat Property Income Report²⁹.

Revision policy

Recommendation IX: FA and NFA compilers should harmonise their revision policy for both routine and benchmark revisions in line with the principles of the harmonised European revision policy (HERP).

²⁵ Further to the variables below a good correspondence is expected for *D.8 Adjustment for the change in pension entitlements* and *F.63 Pension entitlements*, even if the equation is not explicitly mentioned in the ESA.

²⁶ ESA 2010 4.66: 'In addition, retained earnings are treated as if they were distributed and remitted to foreign direct investors in proportion to their ownership of the equity of the enterprise and then reinvested by them by means of additions to equity in the financial account.'

²⁷ ESA 2010 4.68 states that the investment income attributable to life insurance policy holders is recorded as payable by the insurance company and receivable by households in the allocation of primary income account. Unlike the case of non-life insurance or pensions, the amount carries through to saving and is then recorded as a financial transaction, specifically an increase in the liabilities of life insurance corporations, in addition to new premiums less the service charge less benefits payable.

²⁸ ESA 2010 4.69 states that the property income received by mutual funds is recorded as shareholders' property income even if it is not distributed but reinvested on their behalf. ESA 2010 5.167: 'Transactions in investment fund shares or units include the value of net contributions to a fund.'

²⁹ [Eurostat Review on National Accounts and Macroeconomic Indicators \(EURONA\), Consistency of property income \(page 77\)](#)

The stocktaking exercise showed that the revision of financial accounts (FA) and non-financial accounts (NFA) is broadly harmonised in 21 countries, and 13 of these countries fully or partially follow the harmonised European Revisions Policy (HERP)³⁰. The HERP covers both FA and NFA and recommends a consistent revision method for both.

Harmonising the revision policy for routine revisions ensures that vertical discrepancies are not due to different vintages of source data. HERP also enables compilers to conduct deeper revisions extending to the back series in the third quarter every year in case the back series need to be revised.

Moreover, if benchmark revisions are conducted in a harmonised way, this allows regular (at least every 5 years) common structural reviews of sources and methods, as well as pending methodological issues. Carrying out benchmark revisions at the same times will avoid additional temporary inconsistencies between financial and non-financial accounts.

A.2 Manual balancing

Monitoring of consistency during the compilation process

Recommendation X: *Compilers should monitor the vertical consistency of sector accounts in order to detect any large discrepancies that will require manual informed adjustments.*

Consistency needs to be monitored during the compilation process to ensure that the vertical consistency target (recommendation XVIII) is reached respecting the limit for automated balancing (recommendation XIX). For a timely and efficient monitoring, procedures need to be in place to facilitate the comparison of B.9 and B.9f by the compilers of the accounts at an early stage in the compilation process. The comparison should be made before either part of the accounts is finalised to ensure that the manual balancing adjustments can still be made to the most appropriate financial and/or non-financial transaction. For unusually large discrepancies, investigations may detect large events or developments, thus providing the basis for informed adjustments. For large vertical discrepancies in the Rest of the world (RoW) balance of payments (BoP) compilers should be contacted to investigate and possibly resolve issues jointly.

Consistent treatment of major events

Recommendation XI: *NFA and FA compilers should exchange information on major events (e.g. large corporate events like mergers & acquisitions and relocations) and their treatment.*

It is advisable to inform and consult compilers of other affected statistical data sets (e.g. balance of payments, security holdings statistics and balance sheet items statistics) as soon as possible.

³⁰ See CMFB communication [A Harmonised European Revision Policy for Macroeconomic Statistics \(2017\)](#) and the Eurostat publication [Practical guidelines for revising ESA 2010 data \(2019\)](#).

For cross-border corporate events, the compilers of the countries concerned (in particular BoP compilers through the FDI network) should be included in the information exchange, and must respect any confidentiality constraints.

Known data source quality issues

Recommendation XII: *Compilers are advised to make well-documented informed adjustments based on known data source quality issues.*

When a data source quality issue is known and can be quantified, compilers should introduce manual adjustments. In the medium term, the reason for the quality issue should be tackled. However, data source issues may also be due to known and justified methodological differences between national accounts and source data which will persist. Continuous manual adjustments based on information may then be necessary. One possible need for manual informed adjustments is in the case of a partial survey, for which appropriate grossing-up procedures are not available or fail to fully capture a certain development. In this case, the direction of the adjustment is known, and manual adjustments are justified.

A.3 Automated balancing

Ideally, automated balancing should not be needed (sufficient progress should have been made thanks to efforts on data sources, sector delineation, interinstitutional cooperation, compilation practices like manual balancing, etc.). However, should compilers decide to implement automated balancing, it must be well-designed and monitored (see qualitative recommendations XIII to XVII below) and have a limited quantitative impact (see quantitative recommendation XIX that limits the use of automated balancing to 2% of GDP).

Instruments and variables to adjust

Recommendation XIII: *If automated balancing is applied it should take into account the relative quality of variables, following the principle that lower quality variables will be adjusted more. Quality should be measured primarily in terms of accuracy and reliability; supplementary criteria like size, volatility and user relevance may be used in addition to identify which variables could be adjusted and to what extent. However, no significant adjustments should be made to variables that are of high quality. The relative quality of the variables should be monitored and reviewed at regular intervals.*

As not all data are of the same quality, an agreed 'weighting' can be applied (e.g. a quality matrix). This can serve to adjust and reconcile the accounts by keeping the highest-quality data nearly or fully untouched while adjusting the instruments/transactions that expert compilers consider to be of lower quality.

Recommendation XIV: *All components, both financial and non-financial, should in principle be eligible for adjustment in the automated balancing process.*

Most countries make adjustments (both manual and automated) to financial transactions, often to other accounts payable (F.89), non-listed shares (F.512) and other equity (F.519). Even though it is generally reasonable to carry out vertical alignment by adjusting the financial accounts side due to the higher volatility and the scale of the financial transactions, settling the discrepancies should not simply be a 'by-default' exercise.

The Eurostat *Handbook on quarterly (non-financial) national accounts* strongly recommends that all components be estimated directly. All components should also, in principle, be eligible for adjustment in the balancing process. However, some may be judged to be so highly accurate that they are not modified in the automated balancing. Countries currently tend to only adjust the financial accounts due to practical constraints, but both financial and non-financial accounts should, in principle, be eligible for adjustment in the automated balancing process.³¹

Joint consideration of horizontal and vertical discrepancies

Recommendation XV: *When possible, compilers should aim to jointly consider horizontal and vertical discrepancies. Moreover, balancing may be done jointly for sector accounts and BoP if the compilation processes are sufficiently integrated.*

Although the main focus is to reduce the size of the vertical discrepancies, reconciling national accounts has more than one dimension. The horizontal reconciliation should be considered when conducting a vertical reconciliation. This could be done as a first-best.

This could prove difficult, however, in countries where the data compilers are split between departments and/or institutions. As a second-best, compilers should collaborate to ensure that the overall quality is not affected by uncoordinated balancing adjustments. If large adjustments are needed, this should be communicated between the relevant compilers. In the case of recurring large adjustments, a good practice is to intensify the collaboration e.g. in the form of a small task team involving the relevant parties.

A.4 Plausibility

Recommendation XVI: *Regularly review vertical consistency before and after alignment to check for biases, trends, seasonality, correlations, and past revision patterns. Compilers may draw up and run a checklist for plausibility after the manual and automated balancing, e.g. divergence from source data in terms of growth rates.*

Ideally, the vertical discrepancy over time should be small and fluctuate around zero. Biased time series of the vertical discrepancy can indicate a structural problem. For assessing the plausibility of the alignment methods, the data before and after the alignment should be monitored. The analysis should also include the review of the time series of the adjusted items in order to avoid implausible paths for those items.

Persistent adjustments of financial transactions to correct for a structural vertical discrepancy can lead over time to implausible financial stocks. Although practical solutions may be applied in the short term (for

³¹ Arguments in favour of restricting the adjustments to only a few variables relate to: (i) the lower quality of some items; (ii) the requirement to adjust more the instruments with large transactions; and (iii) the technical complexity of setting and monitoring an algorithm with more variables. An operational reason for restricting variables for adjustment relates to information that is compiled and published outside the national accounts. An example is monthly data whose publication precedes the overall balancing process. One operational reason for adjustments focusing on the financial accounts in practice is that in general quarterly FA are compiled after QSA. Moreover, if QSA are benchmarked to ASA (and the latter to GDP and main aggregates), reconciliation of QSA may be difficult.

instance, corresponding corrections in ‘other changes in volumes’ in the financial side), in the medium term such issues should be further investigated.

A.5 Transparency

Recommendation XVII: *Ensure clear documentation on the automated and manual balancing.*

Communication and transparency are key for ensuring the correct use and meaningful results of the analysis conducted by users. Following these principles, a (non-exhaustive) list of potential good practices could include:

1. Documenting as appropriate the ‘before and after’ vertical discrepancies as a result of the application of manual and/or automated balancing.
2. Background documents and notes displayed on national websites and in the CMFB national self-assessment reports (level 3) under the MIP quality framework³². These documents should provide a summary on the vertical reconciliation approach, the main reasons for the adjustment and a brief explanation of the arithmetic algorithms used, if applicable.
3. The ECB and Eurostat, with the support of national compilers, should produce information to help users understand the common and different features of national reconciliation approaches, and the approach for reconciling European aggregates.

B. Quantitative recommendations

The Eurostat *Handbook on quarterly national accounts* discusses the advantages and disadvantages of showing the statistical discrepancies. While the discussion focuses on statistical discrepancies of GDP, the argumentation is also relevant for net lending/net borrowing.

Statistical discrepancies often remain in the various estimates. This practice is commonly justified on the grounds of not wishing to make too large changes to the basic data, and of not knowing where precisely any such adjustments may be made. It is also often argued that such adjustments may be viewed as largely arbitrary and lacking transparency.

A counter argument is that accounts that contain discrepancies may be seen as ‘unfinished’ and not providing a wholly consistent view of what is happening in the economy, shifting this task to the users. It can also be argued that the basic statistics are not being used in an optimal way and the best service is not being provided to users who expect the national accounts experts to produce consistent estimates.

The medium- to long-term goal is to have sector accounts with an acceptable level of vertical discrepancy for all countries and sectors, achieved with comparable and documented reconciliation practices. However, large uninformed adjustments should clearly be avoided as this would damage trust in the accounts. Two sets of quantitative recommendations are therefore proposed:

³² <https://www.cmfb.org/main-topics/mip-quality>

1. Target/goals to achieve by sector. Users may prefer fully harmonised reconciliation practices. However, they could be difficult to achieve and may not even be desirable given national differences in statistical sources and economic structures. It is more appropriate to agree on thresholds in the form of target values for 'tolerable' vertical discrepancies combined with the above-developed qualitative guidance how to achieve this. Currently, most countries do not aim for zero discrepancies and consider small ones acceptable. The consistency with balance of payments (BoP-RoW consistency) needs to be preserved, and for the government sector the specific guidance from Eurostat Directorate D is adopted (see Section 5).
2. An upper threshold for the effect of automated balancing once the manual balancing has been performed. The upper limit for automated adjustments takes into account the potential caveats of automated balancing (see Section 4.4). It should encourage countries to improve their sources and find additional information for manual balancing in order to reach the targets/goals. Limiting the amount of automated balancing may also increase trust in the final results. There is no general recommendation to implement automated balancing, but a recommendation to monitor its impact in case automated balancing is found useful.

Quantitative recommendations expressed as a % of GDP are preferred, as key financial and non-financial sector accounts indicators are also expressed as a ratio to GDP or related income measures (e.g. debt, savings and investment ratios). There are, however, a few EU countries with very sizeable financial sectors relative to their GDPs³³. An EU-wide criterion expressed as a % of GDP may then need to be supplemented by a specific national objective for the financial sector that takes into account its exceptional size. As this concerns only a few countries and to a very different extent, no specific denominators and thresholds are defined here for these cases (see also the below acknowledgement regarding targets for individual sectors in the case of large financial transactions with the RoW).

B.1 Target for individual sectors (except government)

Recommendation XVIII: *Compilers are recommended to keep in each compilation round the four-quarter sum/annual vertical discrepancy for each sector (and sub-sector) below 1% of the four-quarter sum/annual GDP ('target'). Depending on the degree of integration with the compilation of the balance of payments, consistency with it needs to be preserved.*

Tools to reach the target of 1% of annual GDP in absolute value as maximum recommended vertical discrepancy include: developing sources and methods, manual balancing and automated balancing.

Vertical consistency and consistency between national accounts and the BoP are both high priorities. If countries achieve BoP-RoW consistency, the vertical discrepancy in BoP (net errors and omissions) will be equal to the vertical discrepancy for the RoW, and will be mirrored by the sum of vertical discrepancies of the resident sectors. Countries with large financial sectors relative to GDP typically also have large financial transactions between the financial sector and the RoW. Exceptionally large financial transactions with the RoW can lead to initially large vertical discrepancies in BoP (errors and omissions), the RoW and the

³³ In the EU this is the case for Luxembourg and - to a lesser extent - Cyprus, Malta, Ireland and the Netherlands (total financial assets/liabilities in % of GDP, data for 2019).

financial sector. In such cases, countries should not distribute the vertical discrepancy to sectors that are not part of these transactions, and it should be acknowledged that achieving the 1% target may require more time and further work by BoP compilers and national accountants.

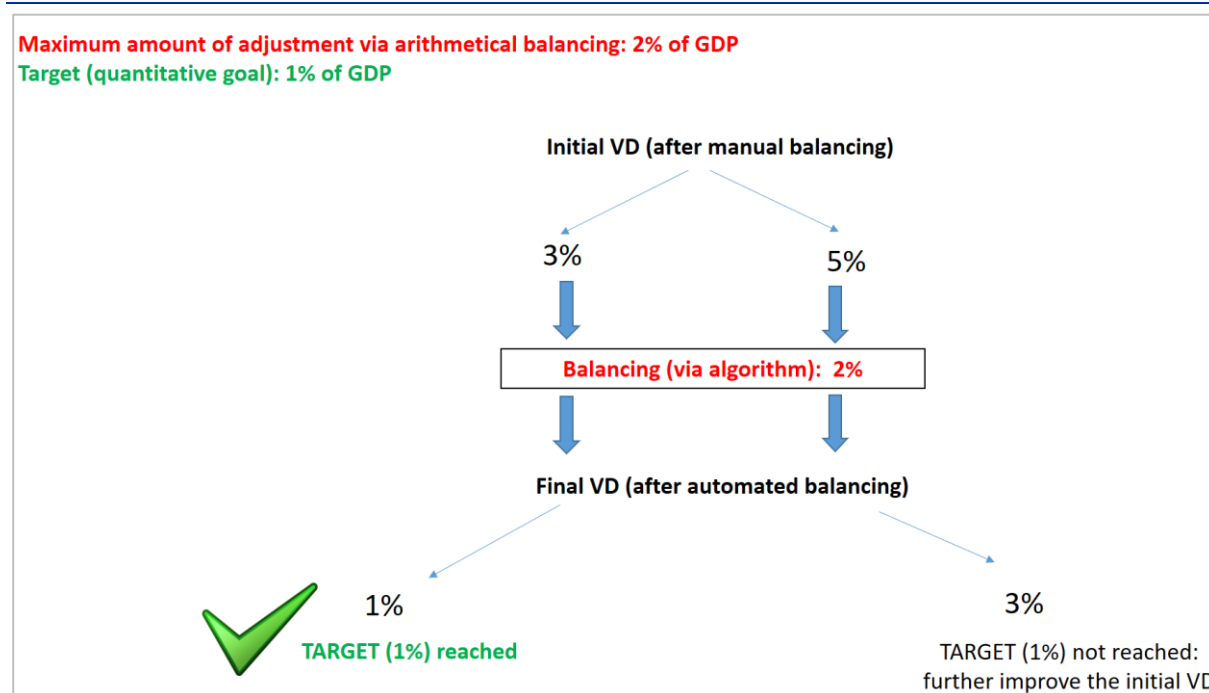
B.2 Maximum automated balancing for individual sectors (except government)

Recommendation XIX: In each compilation round, compilers can adjust the sector vertical discrepancy via final automated balancing up to a maximum of 2% of the four-quarter sum/annual GDP.

No sector should be adjusted by more than 2% of the four-quarter sum/annual GDP via automated balancing. If the target is not reached additional development of sources and methods and informed manual balancing needs to be carried out. Therefore, final automated balancing cannot be a replacement for structural improvements and informed manual adjustments (see Figure 2).

Figure 2

Target & maximum automated balancing



B.3 Time range for target and automated adjustment

Recommendation XX: The quantitative target for vertical consistency and maximum automated adjustment applies to the entire length of the time series. However, if that proves impossible, it is recommended to focus on the last 4 years, or the years that are subject to be revised according to the national revision policy. Benchmark revisions provide an opportunity to achieve even better consistency over the time series.

Consistency is one of the key elements of national accounts. In theory, the entire time series should follow a consistent method of reconciliation. However, in practice, it is not always possible to implement a large reconciliation method to a long period at the same moment. A minimum requirement would be to publish

vertically consistent time series data for the most recent four reference years in any given quarter and apply it for the whole time series in the third quarter of the year according to the principles of HERP.

Benchmark revisions should address issues that have not been possible to address during the routine revision cycle³⁴.

B.4 Consistency of annual and quarterly data

Recommendation XXI: *Compilers should have the same quantitative target and maximum automated adjustment for annual and quarterly data, the latter being expressed as a four-quarters sum³⁵. The seasonality of quarterly discrepancies should be investigated and reduced in line with the aim of small and unbiased discrepancies.*

The purpose of quarterly sector accounts is to produce analytically-valuable data for every reference quarter of the year. Given the higher volatility of financial compared to non-financial transactions, the quarterly financial accounts are typically not analysed based on single quarterly values but on moving four-quarters sums. The recommendations for quarterly data are therefore expressed in terms of four-quarter sums.

The fact that the quantitative recommendations are not specified for individual quarters, but for four-quarter cumulated sums, gives the compilers more flexibility and takes into account that it may not be feasible to implement all recommended reconciliations measures in every compilation round.

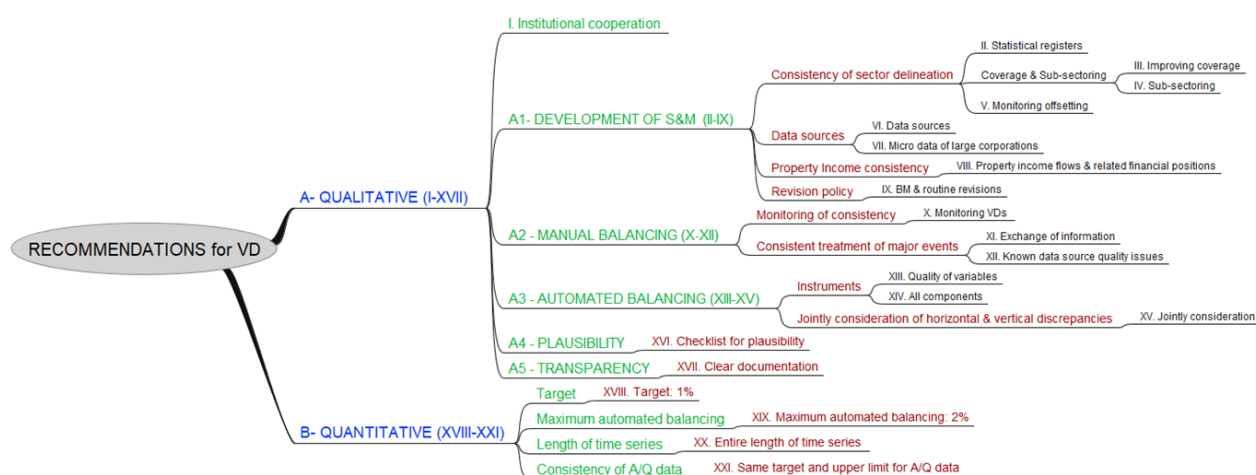
The seasonality of quarterly discrepancies should be investigated and reduced in line with the aim of small and unbiased discrepancies. Seasonality in the vertical discrepancies indicates different seasonal patterns in the two domains that require a harmonisation of the methodology.

It is often the practice to first balance the annual data. This allows all parts of the system of national accounts to be eligible for balancing and not only the part that is last in the quarterly production routines (i.e. the quarterly FA). In addition, for the annual accounts both the quality and availability of data is higher and therefore the discrepancy is more stable over time as compared to the quarterly accounts.

³⁴ In rare cases, benchmark revisions considered for other purposes may result in a deterioration of vertical consistency. If they are implemented, the reasons for this decision should be documented.

³⁵ For example, for the quarterly data, the quantitative target and maximum automated adjustment should be considered for the sum of 18Q3+18Q4+19Q1+19Q2, 18Q4+19Q1+19Q2+19Q3, and so on.

ANNEX : Overview of the recommendations



List of abbreviations and acronyms

CMFB	Committee on Monetary, Financial and Balance of Payments Statistics
DMES	Eurostat's Directors of Macro-Economic Statistics
EG SA	ECB/Eurostat Expert Group on Sector Accounts
STC	ESCB Statistics Committee
TF AFA	Eurostat Task Force on Annual Financial Accounts
TF QSA	ECB/Eurostat Task Force on Quarterly Sector Accounts (now EG SA)
WG FA	ESCB Working Group on Financial Accounts (now WG FGS)
WG FGS	ESCB Working Group on Financial Accounts and Government Finance Statistics



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