

**Guide on theoretical VAT
– Practical guidelines for
enhanced comparability
across countries**

2023 edition



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1

Introduction

1. One of the distinctive features of the system of national accounts is that it is designed to capture all economic activity within the production boundary, including those activities that are not observed in the basic statistical sources underlying the estimates of the main economic aggregates, such as gross domestic product (GDP) or gross national income (GNI). Inclusion of the non-observed economy in those estimates, referred to as ‘exhaustiveness’, is essential for the quality of the national accounts data, and has therefore been on the research agenda of national accountants for a long time.
2. Exhaustive national accounts data contribute to sounder economic analysis and better-informed policy making. This being said, some of the initiatives to improve exhaustiveness were undertaken in the context of the use of the national accounts data for administrative purposes, namely for determining Member States’ contributions to the EU budget. This was because the relevant legislation¹ recognised exhaustiveness – alongside reliability and comparability – as a key dimension of the quality of the GNI data for own resources (GNI OR). For this reason, Eurostat and the GNI Expert Group (GNIG), who are both charged with the task of verifying sources and methods used to compile GNI OR, have always attached a lot of importance to this issue of exhaustiveness.
3. Against this background, in spring 2020, the GNIG mandated the Sub-group on Exhaustiveness to investigate some issues identified as priority areas in a cross-country comparison of exhaustiveness carried out by Eurostat within the 2016-2019 GNI OR verification cycle. One of these areas concerned ‘Non-collected VAT and exhaustiveness adjustments’². This area did not deal with non-collected VAT as such, but instead explored the links: (i) between the non-collected VAT and the underlying exhaustiveness adjustments; and (ii) between non-collected VAT and the estimations of theoretical VAT. As one of the actions within this area, the sub-group undertook to look in detail at the estimation of theoretical VAT and to propose practical guidelines for improved comparability in this regard. This paper is the result of this work.
4. The work of the sub-group included both country presentations of practices of estimation of theoretical VAT³ and a detailed questionnaire to the GNIG members. The aim of the questionnaire was to identify: (i) the approaches and practices of Member States in estimating the theoretical VAT; and (ii) possible interlinkages between the theoretical VAT calculated on the basis of Supply and Use Tables (SUT) and the Weighted Average Rate (WAR) framework developed for VAT own resource purposes. All Member States responded to the questionnaire, which provided valuable input for the analysis. An overview of the results of the questionnaire is annexed to this paper.
5. Because the work of the Sub-group on Exhaustiveness is undertaken in the context of GNI for own resources, this document makes references to various relevant pieces of the EU legislation that is

(1) Regulation (EU) 2019/516 of the European Parliament and of the Council of 19 March 2019 on the harmonisation of gross national income at market prices and repealing Council Directive 89/130/EEC, Euratom and Council Regulation (EC, Euratom) No 1287/2003 (‘the GNI Regulation’).

(2) The members of the sub-group working on this area were representatives of the national statistical authorities from Belgium, Czechia, Germany, Spain, France, Italy, Hungary, Poland and Slovakia, as well as representatives of Eurostat, DG Budget and DG Taxud.

(3) The countries that gave the presentations were Slovakia, Latvia and Czechia.

part of the legal framework for GNI OR. Some elements relevant for the calculation of theoretical VAT (namely those reflected in the WAR calculations) are – or were – also present in the EU legal acts on arrangements for collecting the VAT own resource.

- 6 This guide was endorsed by the GNI Expert Group in its meeting of 27-28 April 2022. Marcin Bujnowski and Juraj Hustava from Eurostat coordinated the work on the guide and were responsible for the editing of the manuscript. Eurostat is grateful to the members of the GNIG and its Sub-group on Exhaustiveness for their valuable contributions and comments.

2

Definition of 'theoretical VAT receipts'

7. 'Theoretical VAT' is unquestionably a concept of great interest for economic and fiscal analyses. In the domain of national accounts, estimation of theoretical VAT receipts is a crucial first step for estimating exhaustiveness adjustments for non-collected VAT⁽⁴⁾. Theoretical VAT also plays an important role in validating GDP estimates. Nevertheless, the notion of 'theoretical VAT' is not defined in the national accounts manuals, such as the *European System of Accounts (ESA 2010)* or the *System of National Accounts (SNA 2008)*.
8. This being said, various links between theoretical VAT and national accounts are discussed in other pieces of EU legislation. In particular, Commission Decision 98/527/EC on the treatment for national accounts purposes of VAT fraud (the discrepancies between theoretical VAT receipts and actual VAT receipts)⁽⁵⁾ **defines theoretical VAT receipts as 'the amounts of VAT which would be collected if all units subject to VAT were to pay it as required by law'**⁽⁶⁾. This definition was largely supported by the respondents to the GNIG sub-group's questionnaire⁽⁷⁾.

⁽⁴⁾ Exhaustiveness adjustments for non-collected VAT comprise adjustments for VAT evaded without complicity and VAT non-collected due to insolvencies ('missing trader VAT' is also considered under the latter – see Final report on Missing Trader VAT Fraud – document GNIG/08Sp Rev. 1 for more details on this aspect). VAT evaded with complicity is not to be recorded in the accounts. If not otherwise specified, whenever the term 'non-collected VAT' is used in this document, it relates to VAT evaded without complicity and VAT not collected due to insolvencies.

⁽⁵⁾ Commission Decision of 24 July 1998 on the treatment for national accounts purposes of VAT fraud (the discrepancies between theoretical VAT receipts and actual VAT receipts), (98/527/EC, Euratom), Annex.

⁽⁶⁾ A similar definition is offered in the manual *Measurement of the Non-Observed Economy: a Handbook*, (OECD, 2002), which states that the 'theoretical amount of VAT (...) equals the VAT revenues that a government should raise if no VAT was evaded'.

⁽⁷⁾ See annex for details. It is worth mentioning in this context that according to Commission Implementing Regulation (EU) 2020/1948 on the treatment of repayments of VAT to non-taxable persons and to taxable persons for their exempt activities, in compiling national accounts aggregates for the purposes of Regulation (EU) 2019/516, repayments of VAT incurred on purchases, made to non-taxable persons or to taxable persons for their exempt activities, shall be treated in *ESA 2010* as other current transfers (D.7) or capital transfers (D.9), and not as if they were deductible VAT. Therefore they should also be considered in (and not excluded from) the calculation of theoretical (as well as actual) VAT and in the purchaser's price of the relevant use categories.

3

General framework for the national accounts-based calculation of theoretical VAT

9. The above Decision on VAT fraud describes the steps to be taken by the compiling agencies **to calculate theoretical VAT** receipts. The first step 'is to **bring the VAT base into line with current legislation: in other words, to identify all the transactions which are subject to non-deductible VAT**. Final household consumption is treated as wholly subject to non-deductible VAT, whereas other categories of uses have to be broken down in order to determine a rate of non-deductibility. This calculation is made using the most highly disaggregated national accounts data available. The VAT base is calculated in the light of all current legislation and rules governing VAT.
10. The second step is to **apply the appropriate rate of VAT to each transaction** constituting the VAT base as defined in the previous paragraph. The VAT rates applied must be those in force during the year for which the VAT base has been calculated. Theoretical VAT receipts are calculated in the light of all current legislation and rules governing VAT.'
11. The Decision on VAT fraud does not provide any further detail on the technicalities of calculating theoretical VAT. The only element of the GNI OR framework that sheds some more light on the two stages of the calculation is the annex to the GNI Committee's recommendations on VAT fraud⁸. Specifically, this annex lists the 'particularities' that the model for calculating theoretical VAT should take into account and gives a formula for isolating the tax within the purchaser's price of the transactions on which the non-deductible VAT should be charged.
12. The approach laid down in the Decision on VAT fraud is consistent, as a matter of principle, with the method of calculating the **Weighted Average Rate of VAT** to determine Member States' contributions to the EU budget under the VAT own resource that was stipulated in Council Regulation (EEC, Euratom) No 1553/89 on the definitive uniform arrangements for the collection of own resources accruing from value added tax (until a simplified framework came into force in 2021)⁹. Contrary to the Decision on VAT fraud, the above-mentioned Regulation was more detailed in describing how the national accounts data should be employed in calculating WAR. The individual elements of that WAR calculation relevant for the estimation of theoretical VAT are discussed in detail in Section 5.
13. There is one important aspect to be borne in mind if one wants to make use of the WAR framework (applicable in the past) to calculate the theoretical VAT in national accounts. This aspect concerns the fact that, under the text of the above-mentioned Regulation (EEC, Euratom) No 1553/89 in the calculation of the WAR for the year n (the year under consideration), the VAT legislation in force in the year n was applied to the national accounts of the year n-2. This solution was applied because of the required timeliness of the VAT own resource data. While this constraint was of lesser importance for calculating the weighted average VAT rate, and was found to be an acceptable simplification for the VAT own resource, it was one of the reasons why the results of the WAR calculations could not be simply directly used to calculate the theoretical VAT of the year n.

⁽⁸⁾ Document GNIC/031 – GNI Committee Recommendation on VAT Fraud, Annex: The calculation of theoretical VAT and the comparison with VAT receipts.

⁽⁹⁾ Council Regulation (EU, Euratom) 2021/769 of 30 April 2021 amending Regulation (EEC, Euratom) No 1553/89 on the definitive uniform arrangements for the collection of own resources accruing from value added tax. All references to Regulation (EEC, Euratom) No 1553/89 in this document concern its version before amendments introduced by Regulation 2021/769. See also footnote 10.

However, the **framework/scheme itself can, to a large extent, be used to this purpose, also in the future**, if filled with the relevant data of the year n.

14. It is worth mentioning that the WAR calculations made by the Member States have been subject to detailed scrutiny by Eurostat as part of the VAT own resource verification. As a result, the methodology is well established, and even though there is no single template for those calculations, the comparability of the approaches to calculate the WAR has been increasing over the years, and many aspects of the calculation have been harmonised⁽¹⁰⁾.
15. EU Member States **calculate theoretical VAT within this general framework**⁽¹¹⁾. However, as concluded from the analysis carried out by the GNIG Sub-group on Exhaustiveness, the **actual practices for calculating theoretical VAT vary considerably across the countries**. This variance concerns first and foremost the degree to which the calculation of the theoretical VAT in national accounts integrates the results derived from the WAR-like calculations. To better comprehend this issue, it might be useful to first look at the process for deriving theoretical VAT within the SUT, and, after this, to establish the possible links between that process and the calculations made in the WAR scheme.

⁽¹⁰⁾ The achieved high level of comparability of the WAR calculations was one of the reasons behind the recent decision to freeze the WAR at its level of the year 2016 for determining the VAT own resource for the years 2021 onwards. This is reflected in the abovementioned amendment to Regulation (EEC, Euratom) No 1553/89.

⁽¹¹⁾ Other, non-statistical approaches to calculating the theoretical VAT include fiscal analyses, econometric models, etc. These other approaches are not the subject of this paper, which deals with the national accounts-based calculation only.

4

Deriving theoretical VAT in the Supply and Use Tables and possible interlinkages with the WAR scheme

16. SUT are the part of the national accounts system where the calculation of theoretical VAT comes to the fore, even though the final VAT values in SUT need to be constrained to the actually collected VAT (on an accrual basis).
17. In the supply table, flows of goods and services are valued at basic prices. In the use table, the flows of goods and services are valued at purchasers' prices. Thus, in order to have a consistent valuation for balancing the supply and use of products in the SUT, a transition is needed from the supply at basic prices to the supply at purchasers' prices (or transition of use at purchasers' prices to use at basic prices). *ESA 2010* paragraph 9.33 specifies that the transition from supply at basic prices to purchasers' prices involves:
 - a) reallocating trade margins;
 - b) reallocating transport margins;
 - c) adding taxes on products (except deductible VAT);
 - d) deducting subsidies on products.
18. Element (c) includes, apart from taxes on imports and other taxes on products, the non-deductible VAT. Therefore the compilation of SUT requires explicit identification of the non-deductible VAT.
19. *ESA 2010* paragraph 9.43 specifies that **in compiling SUT, taxes and subsidies on products are usually estimated by product by applying the official tax or subsidy rates to the various demand flows**. With regard to VAT, this implies, in principle, the calculation of theoretical VAT¹².
20. This theoretical VAT estimate is subsequently **assessed with regard to the non-collected VAT** (due to both insolvencies and fraud with and without complicity of the customer). As a result, **the final figures for non-deductible VAT in the supply table should correspond to the VAT amounts actually collected** (on an accrual basis), as recorded elsewhere in the national accounts system¹³. However, as mentioned above, the estimation of (initial) theoretical VAT is essential at the early stage of SUT compilation, where valuation of the supply and use side is made consistent¹⁴.
21. Estimates of the **theoretical VAT made at that stage of the SUT are based on the unbalanced use data**. The national accounts manuals do not give detailed guidance on how to identify in practice the relevant transactions subject to non-deductible VAT and the respective VAT amounts.

⁽¹²⁾ See also *UN Handbook on Supply and Use Tables and Input Output-Tables*, paragraphs 7.138-7.148.

⁽¹³⁾ To be precise, *ESA 2010* paragraph 9.43 states that, after the step described in the previous paragraph, '(...) an assessment should be made of the differences with the tax assessments or the amounts actually paid'. This is because 'taxes and subsidies on products are the amounts due for payment only when evidenced by tax assessments, declarations, etc. or the amounts actually paid'. See also *ESA 2010* paragraph 4.27, which provides for three options for recording taxes: two based on the assessments and declarations (4.27 a) and one based on time-adjusted cash receipts (4.27 b). For the sake of clarity, it is considered in this document that the time-adjusted cash method is followed in the recording of taxes (and that's what the terms 'actually collected VAT' or 'actual VAT' refer to in the document).

⁽¹⁴⁾ This being said, it should be noted that some countries do not consider theoretical VAT for the transition from basic prices to purchaser's prices in SUT and subsequent balancing, but instead apply the actual VAT throughout the whole SUT-balancing process. Thus, some of the steps discussed further down in this section may not be fully applicable to them.

- Therefore, the way to perform this calculation is to a great extent at the discretion of compilers. It is also left to the discretion of compilers to what extent they make use of the (former) WAR scheme that offers a detailed framework suitable for that purpose.
22. Results of the GNIG sub-group's questionnaire show that countries tend to perform this calculation in a more straightforward way, without considering all the details that are dealt with in the WAR. Out of 27 Member States that replied to the survey, 14 indicated that 'estimation of theoretical VAT based on SUT is made by the national accountants independently of the WAR calculation framework'. Of these 14 countries, 8 said that 'the calculation uses a different, less comprehensive scheme', while the other 6 indicated that 'the calculation uses a different scheme and that details of the WAR scheme are not known to the national accountants'.
 23. It seems that the calculation of theoretical VAT is fully based on the WAR scheme in only 5 EU countries, as these 5 countries reported that 'SUT integrate the results of the WAR calculations for the year in question (year n); the WAR scheme – modified where appropriate – is filled with the relevant unbalanced use data for the year n; the level of detail of the WAR calculations is retained'. In another 5 countries, the WAR scheme is partly applied to calculate theoretical VAT: 'SUT integrate the results of the WAR-like calculations for the year in question (year n); the WAR framework is used, but at a more aggregated level, without considering all the details of the WAR calculations'¹⁵.
 24. Once the valuation of supply and use has been brought in line, the two sides are in the next step balanced in the SUT framework at the product level. The new, balanced data arrived at at this stage can be considered as almost 'final', having used all relevant sources of information employed in the national accounts compilation process and having undergone almost all¹⁶ necessary validation, conceptual, exhaustiveness and balancing adjustments.
 25. This means that the balanced data may be considered as a more suitable basis for the fine-tuned calculation of theoretical VAT than the unbalanced data entering the SUT framework. This calls for recalculation of the theoretical VAT arrived at before balancing.
 26. From the analysis of the questionnaire, it is apparent that the non-deductible VAT behind the relevant balancing adjustments is in most cases derived automatically in an IT balancing tool. The automated process takes into account the balancing adjustment for the individual product and modifies the theoretical VAT for that product accordingly, so that: (i) the balance between supply and use of individual products is achieved; and at the same time (ii) the purchasers' price accurately reflects the amounts of VAT for individual products.
 27. As a result of this balancing process, it is possible to obtain a **new estimate of theoretical VAT, based on the balanced use data**. Because of the advantages of using balanced rather than unbalanced data outlined above, the estimate of theoretical VAT derived at this stage of the SUT compilation can be seen as more accurate than the one based on the unbalanced data. For this reason, the estimate of theoretical VAT based on the balanced use data should be considered the **final estimate of theoretical VAT receipts in SUT**. However, some fine-tuning is still needed. Depending on the way the VAT evaded with complicity was treated throughout this process, the estimate of VAT evaded with complicity may have to be added, outside SUT, to the thus-established theoretical VAT. Furthermore, theoretical VAT behind transactions not covered in SUT, such as building land, should be added in order to arrive at the **ultimate value of the national accounts-based theoretical VAT**¹⁷.
 28. It is worth mentioning that although the WAR calculations for VAT own resource purposes usually take as a starting point the balanced SUT data (for the year n-2), using this framework to calculate theoretical VAT in the year n would require – to avoid a vicious circle – feeding the framework with the unbalanced (rather than balanced) SUT data for the year n.
 29. This means that the advantages of using a WAR-like framework for calculating theoretical VAT can be exploited at the stage of SUT compilation where valuation of the supply and use side is made

⁽¹⁵⁾ For completeness, three countries reported that 'Estimation of theoretical VAT for SUT is not made by the national accountants; it is based on other, non-statistical approaches (fiscal analyses, econometric models, etc.)'.

⁽¹⁶⁾ As it will be seen in Section 6, adjustments due to non-collected VAT are made after balancing of SUT.

⁽¹⁷⁾ The latter aspects are discussed in more detail in Section 5.5.

consistent. It is at that stage, i.e. before balancing, that the SUT could integrate the theoretical VAT results derived from the WAR-like calculations. They would be subsequently fine-tuned in the automated process of determining theoretical VAT amounts linked to the balancing adjustments of the relevant use categories.

30. One of the key recommendations of this paper is that, to improve the comparability, reliability and exhaustiveness of national accounts, **the SUT compilers should consider taking into account the elements of good practice offered by the detailed, comprehensive and well-tested WAR scheme (as defined in the VAT OR legal framework in place until 2021) when designing the model for calculating theoretical VAT. Furthermore, the SUT compilers should consider integrating the theoretical VAT receipts resulting from that model into SUT before balancing supply and use by product.** This recommendation was also recognised by the respondents to the GNIG sub-group's questionnaire: around 2/3 of the countries confirmed in the questionnaire that they would see the advantages of integrating the elements of WAR calculations into the estimation of theoretical VAT for SUT.
31. The following section of the document takes a closer look at the individual aspects of calculating theoretical VAT and discusses the related good practices identified in the WAR scheme. This part of the paper benefits from the experience gained by Eurostat in verifying the VAT own resource statements¹⁸.

⁽¹⁸⁾ Some of the aspects discussed below are touched upon in the *Internal Guide to the VAT-based own resource – 'The VAT OR Guide'*, European Commission 2016.

5

Individual aspects of the estimation of theoretical VAT and related good practices identified in the WAR scheme

32. As pointed out in Section 3, contrary to the WAR calculations, there are no legal provisions on the technicalities for calculating the theoretical VAT in national accounts. Therefore it might be useful to look at how the (former) WAR legislation dealt with the individual aspects of that calculation with a view to applying the resulting relevant good practices to the calculation of the theoretical VAT in SUT.
33. The method and rules for calculating the WAR were laid down in Articles 3-6 of Regulation (EEC, Euratom) No 1553/89, which was in force before Council Regulation (EU, Euratom) 2021/769. As already mentioned, the approach is essentially as follows:
 - the Member State must break down, by VAT rate applied, all transactions that are taxable under its legislation and that do not entitle the customer to the deduction of VAT;
 - the breakdown by rate of VAT is applied to a number of national accounts categories, if subject to non-deductible VAT; these categories are explicitly listed in Article 4 of the Regulation;
 - the VAT rates used for the calculation are those that affect the VAT revenue collected during the year in question (year n); and
 - some specific calculations are needed to accurately reflect taxation of individual sectors, activities or products.
34. Within this general approach there are many specific aspects that might impact the reliability, comparability and exhaustiveness of the WAR calculation. Those specific aspects that are relevant to estimating theoretical VAT are discussed in more detail below.

5.1 Sources

35. Regulation (EEC, Euratom) No 1553/89, before the amendment introduced by Regulation (EU, Euratom) 2021/769, contained a number of provisions on the data to be used in the WAR calculations¹⁹. In particular it stipulated that:
 - a) the WAR calculations should be performed and submitted, through the so-called VAT statements, annually (before 31 July of the year n+1);
 - b) the breakdown of transactions by statistical category must be carried out by means of data taken from national accounts prepared in accordance with the European System of Accounts (ESA);
 - c) to both identify transactions subject to non-deductible VAT and carry out the breakdown by rate of VAT, Member States may refer to data taken from sources complementary to the ESA and capable of being adapted to the ESA (that is, in the first instance, from internal national accounts if they provide the necessary breakdown, or, if not, from any other appropriate source); and

⁽¹⁹⁾ See Council Regulation (EEC, Euratom) No 1553/89, Articles 4 and 7.

- d) the data to be used to establish the base must be the most recent data available when the statement is produced.
36. Relating these requirements to the estimation of theoretical VAT in national accounts, one can definitely consider **performing the calculations annually** as a good practice.
37. When it comes to the **timeliness** of the calculation of theoretical VAT, this is determined by the national accounts compilation process. The unbalanced data underlying the calculation of theoretical VAT should have undergone the necessary validation, conceptual and exhaustiveness adjustments. After the initial theoretical VAT has been determined, the process of balancing the supply and use of products in SUT takes place which, after some final fine-tuning, results in the final estimate of theoretical VAT, based on the balanced data. A certain drawback of this process is related to the fact that the balanced SUT are available relatively late. According to the *ESA 2010* transmission programme, the balanced SUT should be published no later than 36 months after the reference year. Thus, the compilers face the usual problem of accuracy versus timeliness. It has to be accepted that a reliable, high-quality estimate of theoretical VAT takes time and, in most cases, becomes available for analytical purposes no earlier than 1.5-3 years after the reference period²⁰.
38. As already said, Regulation (EEC, Euratom) No 1553/89 stipulated that, whereas the VAT rates used for the calculation of the WAR are those that affect the VAT revenue collected during the year in question (year n), the national accounts data to be used are those relating to the year n-2. This explains why the WAR calculations can be submitted within 7 months after the reference year²¹.
39. The practice of calculating the WAR shows that the n-2 national data used in it are usually the balanced SUT data. As discussed above, the data with which to fill a scheme to calculate the theoretical VAT for SUT will usually be the unbalanced data of the year n.
40. On points (b) and (c), it is self-evident that the SUT data employed in calculating theoretical VAT should be ESA-compliant. It is also clear that even the most detailed SUT data will not provide the breakdown that would correspond to the details of the VAT taxation of individual products, activities or sectors. Therefore, inevitably, **supplementary information from other sources has to be explored in order to accurately reflect the VAT legislation in place**. These sources include detailed fiscal and/or administrative records or statistical surveys. In certain cases, in order to establish the necessary splits by VAT rates, one has to resort to one-off studies, different weighting patterns, expert estimates or assumptions. In any case, it is good practice to regularly review such expert estimates and update the underlying assumptions as appropriate.
41. The issue of the data vintage mentioned in point (d) is less relevant for the calculation of theoretical VAT in SUT, as SUT are always compiled based on the most recent data. In cases where SUT are subsequently revised, the theoretical VAT (and related national accounts adjustments) should in principle also be recalculated.

5.2 Scope of the national accounts transactions to be used; determining the theoretical VAT base

42. The first step of the calculation of theoretical VAT is to identify all the transactions that are subject to non-deductible VAT. This constitutes **the VAT base** to which the appropriate rates of VAT by product should be then applied, in the second step, to determine the amounts of theoretical VAT.

⁽²⁰⁾ In their replies to the GNIG sub-group's questionnaire, countries indicated a range of 6-36 months.

⁽²¹⁾ This solution also implies that the national accounts data for the year n-2 have to be cleared of VAT (applicable in the year n-2) before they can be allocated to the VAT rates applicable in the year n in the WAR calculations. This is discussed in more detail in Section 5.5.

43. Article 4 of the previously applicable Regulation (EEC, Euratom) No 1553/89 listed the following categories to which the breakdown by rate of VAT is to be applied, if subject to non-deductible VAT, in order to identify the base for calculating the WAR:
- final consumption of private households, including consumption on the farm by flat-rate farmers and their direct sales to final consumers;
 - intermediate consumption of private non-profit institutions and general government;
 - intermediate consumption of other sectors;
 - gross fixed capital formation of private non-profit institutions and general government;
 - gross fixed capital formation of other sectors;
 - improved and unimproved building land²²;
 - transactions involving gold other than gold for industrial use.
44. Over the years, this list has been modified as a result of the WAR verification activities performed by Eurostat that led to a more comparable framework. Thus, in practice, the following categories of transactions (for the part subject to non-deductible VAT) are included in the WAR calculations in the Member States, and should be considered in the calculation of theoretical VAT:
- household final consumption expenditure (HFCE) (domestic concept);
 - intermediate consumption of S.13 (General Government) (after applying pro-rata of non-deductibility for the sector);
 - intermediate consumption of S.15 (Non-Profit Institutions Serving Households – NPISH) (after applying pro-rata of non-deductibility for the sector);
 - intermediate consumption of S.11 (Non-financial corporations), S.12 (Financial corporations) and S.14 (Households) (after applying pro-rata of non-deductibility for the individual activities);
 - social transfers in kind purchased by S.13;
 - social transfers in kind purchased by S.15;
 - gross fixed capital formation (GFCF) of S.13 (after applying pro-rata of non-deductibility for the sector);
 - gross fixed capital formation of S.15 (after applying pro-rata of non-deductibility for the sector);
 - gross fixed capital formation of S.11, S.12 and S.14 (after applying pro-rata of non-deductibility for the individual activities);
 - acquisitions less disposals of valuables; and
 - improved and unimproved building land.
45. As can be seen above, for some types of transactions, it is necessary to apply a ‘pro-rata of non-deductibility’ to account for the fact that only parts of the relevant expenditure of the given institutional sector or activity are subject to non-deductible VAT. In these cases, the ‘pro-rata of non-deductibility’ has to be applied based on the share of exempt output in the total output of the given sector/activity²³.
46. Furthermore, expenditure on some products that are subject to national **restrictions in the right to deduct input VAT** (e.g. business cars and related expenditure, ‘representation costs’, etc.) should be considered across the board, irrespective of the pro-rata of non-deductibility for the activities or sectors (as appropriate).
47. The main differences between the two lists of categories are briefly discussed below.
48. **Social transfers in kind** are goods and services that are either: (i) purchased on the market by non-market producers; or (ii) produced by non-market producers and provided for free or at prices that are not economically significant to individual households. In the latter case (goods and services produced by S.13 and S.15), the relevant expenditure subject to non-deductible VAT should already be included in the calculations under the heading ‘Intermediate consumption of S.13/S.15’. However, in the former case (goods and services purchased by S.13 and S.15), the relevant transactions are not included in intermediate consumption, but only in the final consumption

⁽²²⁾ As defined in Article 12(3) of Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax (VAT Directive).

⁽²³⁾ See Section 5.4 for more details.

expenditure of S.13/S.15 and should therefore be separately included in the calculation of theoretical VAT.

49. Transactions in **valuables** should be taken into account, as long as they are subject to non-deductible VAT. As one type of valuables is precious stones and metals, they encompass the category 'transactions involving gold other than gold for industrial use' listed in Regulation (EEC, Euratom) No 1553/89. In some countries, there is a special margin scheme for taxation of second-hand goods, works of art, collectors' items, antiques, etc. This scheme requires specific calculations to determine the amounts of non-deductible VAT behind these transactions.
50. Similarly, if subject to non-deductible VAT, transactions in **building land** should be included in the calculation of theoretical VAT. As these transactions are not recorded in GFCF²⁴, an explicit adjustment to account for the non-deductible VAT on building land should be made once the theoretical VAT based on the national accounts use categories is derived in SUT. As the VAT amounts in question are included in actual VAT receipts, the above-mentioned adjustment to theoretical VAT should be made before the VAT gap is determined.
51. The results of the GNIG sub-group's questionnaire confirm that countries usually consider most of the above-mentioned categories of expenditure in their calculations of theoretical VAT in national accounts. It is worth noting that in five cases the national concept of HFCE was indicated in the questionnaire as the relevant use category. It should be pointed out that **the correct concept of HFCE in the context of theoretical VAT calculation is the domestic concept**, as what is at stake is the consumption of taxable goods and services on the economic territory of the country, regardless of whether the purchases are made by the resident or non-resident households. Consumption of non-resident households on the economic territory of the country should therefore be included and consumption of resident households abroad should be excluded.
52. The use categories that are relatively rarely considered for calculating theoretical VAT (indicated by around 50% of the countries) are social transfers in kind purchased by S.15 and valuables. This is justified by the fact that the values of these flows are usually quite small. It seems from the questionnaire responses that transactions in building land are also often disregarded.
53. Finally, around 25% of the respondents to the questionnaire indicated that when determining the parts of intermediate consumption and GFCF that are subject to non-deductible VAT, the pro-rata of non-deductibility is applied at the level of the total economy and not by individual sectors (the latter being the practice followed in the WAR calculations).
54. When defining the scope of the WAR calculation, Article 4 of Regulation (EEC, Euratom) No 1553/89 requires the consideration of all transactions that are *taxable* under the legislation of a given Member State and that do not entitle the customer to the deduction of VAT. In the context of theoretical VAT, it is self-evident that what should be included in its calculation are all such *taxable* (as opposed to *taxed*) transactions. This means that transactions **involving concealed activities**²⁵ should be included and recorded at the applicable VAT rate in the calculation of theoretical VAT. Given that *ESA 2010* requires the inclusion of concealed activities in national accounts, this implies that, in principle, no special treatment/explicit adjustment to the national accounts (SUT) data is needed to ensure the proper inclusion of such activities in the calculation of theoretical VAT²⁶.
55. Moreover, **illegal activities** should also be considered within the scope of the calculation as long as they are taxable (and related VAT is non-deductible). VAT is a tax on consumption and, to secure the neutrality of the tax and prevent distortion in competition, the illegal character of the supply is in principle irrelevant. Therefore, those cases where the product (good/service) itself is legal, but the circumstances of its supplying are unlawful, should in principle be treated as taxable transactions. On the other hand, those cases where the product itself is prohibited should be treated as out-of-scope of VAT. In other words, illegal activities for which a legal market exists and

⁽²⁴⁾ Apart from the costs of ownership transfer.

⁽²⁵⁾ A concealed activity can be defined as a transaction that is taxable, but where no output VAT is reported to the tax authorities; this can be with or without complicity of the customer.

⁽²⁶⁾ This being said, given that in national accounts the purchaser's price of transactions subject to VAT fraud with complicity should not include the evaded VAT (unlike cases of VAT fraud without complicity), there is a need to properly take this into account when deriving VAT from the purchaser's price of the relevant taxable transactions. This is discussed in more detail in Section 5.5.

- which can be in competition with that legal market can be considered as subject to VAT, but not illegal activities for which a legal market does not exist.
56. Having said this, given that the definition of an illegal activity is determined by national laws and there are no explicit rules in the VAT Directive prescribing when (illegal) activities are outside the scope of VAT, the application of VAT in this area is very much dependent on Member States' practices and jurisprudence.
 57. Therefore, the compilers of theoretical VAT should consult the competent fiscal authorities to determine whether the individual cases of illegal activities are to be considered as taxable or not. Looking at the three types of illegal activities which it has been agreed to include in national accounts, it would seem that in most cases²⁷:
 - smuggled alcohol and tobacco should be treated as taxable;
 - production and trafficking of illegal drugs should be treated as out-of-scope of VAT, unless the drugs in question are not prohibited (such as cannabis in some Member States);
 - prostitution should be treated as taxable if not prohibited, and as out-of-scope if prohibited or not regulated.
 58. Including in their estimation of the theoretical VAT any concealed activities and those illegal activities considered taxable (even if not taxed in practice) was confirmed by almost 80% of the respondents to the GNIG sub-group's questionnaire.

5.3 VAT rates and changes in VAT rates

59. Once the scope of transactions that are subject to non-deductible VAT has been set, the amounts of theoretical VAT related to each transaction have to be calculated. This is done by determining the VAT rates applicable to each transaction, by product. As mentioned above, it is critically important to have the product breakdown that corresponds well to the VAT legislation in force and enables the identification of transactions that are subject to the individual VAT rates. In practice, even the most disaggregated product breakdowns available in SUT will not ensure a one-to-one match with the details of the VAT legislation, and the products have to be split by using auxiliary information.
60. In the WAR calculations, effort is made to accurately **identify all cases where the given product has to be split and allocated to the correct VAT rates** to reflect the legislation. The methods for the split are documented in the VAT own resource statements.
61. Sometimes the split of products to several VAT rates is triggered by **changes in taxation that occur in the given year**. These changes should be accurately reflected in the calculation of theoretical VAT. One specificity of the WAR calculation that is not relevant for the estimation of theoretical VAT should be mentioned here. In the WAR scheme, transactions in respect of which the rate changed during the year in question must be allocated to the old and new rates by applying a time-lag for collecting VAT. The rationale for the time-lag is to bring the data to the cash-accounting basis and thus align the WAR to the other parts of the VAT statements, in particular to the cash-based calculation of the VAT receipts. When calculating theoretical VAT in national accounts, the application of the time-lag is not needed, as the whole calculation is based on the accrual accounting principle. Therefore, for example, if a change in the VAT rate for a given product enters into force in the middle of a given year, then half of the net expenditure should be treated as taxable with the old rate and the other half as taxable with the new one.
62. In the WAR calculations, depending on the way they are made, there may be a need to properly distinguish between zero-rated transactions²⁸ and VAT-exempt transactions. A convention has

⁽²⁷⁾ Again, the interpretation may vary depending on the individual countries' legal situation.

⁽²⁸⁾ Genuine zero-rated taxation, similar to exemption with the right to deduct input VAT, is only applicable to some specific transactions

been adopted in the WAR to allocate zero-rated transactions to a 0% VAT rate column (and not to treat them as exempt) when calculating the weighted average VAT rate. The issue is less relevant for the calculation of theoretical VAT that sums VAT payable on each individual relevant transaction, as the amount of payable VAT will in both cases be zero. Nevertheless, it may still have some indirect impacts, such as through the pro-rata of non-deductibility²⁹.

5.4 Individual categories of expenditure – technicalities of calculation and specific adjustments

63. Identifying all transactions subject to non-deductible VAT and allocating them, by product, to respective VAT rates makes it possible to calculate the (initial) amounts of theoretical VAT. However, in some cases this is not straightforward, and some nuances have to be considered to ensure a high level of accuracy in the calculation.
64. This section of the paper looks at the above-mentioned individual categories of expenditure included in the base for calculating WAR (and estimating theoretical VAT), and discusses some technicalities of the calculation specific to each of them. These technicalities are related to fine-tuning of the VAT base as well as to the proper allocation of transactions on some products to the VAT rates.

Household Final Consumption Expenditure (domestic concept)

65. This is the most important expenditure category, accounting for a substantial share of the VAT base, and therefore impacting theoretical VAT to the highest extent. Therefore, some aspects of the calculation that are equally applicable to other expenditure categories will be discussed under this heading.
66. One important issue to bear in mind, and one already mentioned, is the need to use the **domestic concept of HFCE**. It was also said that, according to Decision 98/527/EC, HFCE should be treated as wholly subject to non-deductible VAT (whereas other categories of expenditure have to be broken down in order to determine a rate of non-deductibility).
67. Notwithstanding this, the HFCE figures must be adequately adjusted to reflect some **special VAT schemes** applicable to certain units or products. First and foremost, this concerns the correction due to the **exemption from VAT of small firms**.
68. In each Member State, enterprises with a turnover below a certain threshold are exempt from VAT. This means that they also cannot deduct the VAT on their inputs. Consequently, the amounts relating to the purchases of households from those small firms must be identified and taken aside in the calculation of theoretical VAT. At the same time, the intermediate consumption and GFCF of small firms should be fully reflected in the calculation of theoretical VAT, irrespective of the branch in which these firms operate and the branch's pro-rata of non-deductibility, as all of this expenditure is subject to non-deductible VAT³⁰.

in a handful of Member States: Belgium, Denmark, Ireland, Malta, Finland and Sweden.

⁽²⁹⁾ If zero-rated transactions are not treated as exempt, they would not enter the numerator in the calculation of the pro-rata of non-deductibility.

⁽³⁰⁾ See the section on intermediate consumption for details on this aspect.

69. The negative correction to HFCE is based on the turnover data of the exempt small firms. Within the turnover of these small firms, it is necessary to identify the sales made to households. If this information is not available, some practical assumptions can be made. One such practical assumption that is made in many countries is to apply a ratio of 75% to determine the sales to final consumers. The next step is then to break down the total amount of sales by small firms to households by product. Where there is a lack of detailed data, this breakdown can be done in different ways, such as by analysing the product or activity breakdown of the small units/ unincorporated enterprises. Theoretical VAT on HFCE should then be decreased by the amounts of tax derived by multiplying the sales of small firms to households (by product) by the VAT rate applicable to the individual products.
70. Another adjustment to consider has to do with the **special flat-rate VAT scheme for farmers**. Some Member States have implemented this scheme in order to offset the VAT charged on purchases of goods and services made by the flat-rate farmers while freeing them from the obligation to present a VAT return. For this purpose, a flat-rate percentage (which may be fixed separately for agriculture, forestry and fisheries) is applied to the price of the agricultural products and services supplied by flat-rate farmers to taxable persons. This solution excludes any forms of deduction of input VAT.
71. The correction to HFCE to be considered to accurately reflect the impact of this scheme on theoretical VAT involves the following steps. Firstly, flat-rate farmers' own consumption and their direct sales to households should be identified within HFCE by product. Secondly, a 'derived rate' of VAT should be calculated as a ratio of the VAT on inputs of flat-rate farmers and of their output. Finally, the 'derived rate' should be applied to the amounts identified in the first step, instead of the VAT rates at which the relevant agricultural products are usually taxed.
72. A specific taxation regime common to all Member States is the **margin scheme for tour operators**. Under this scheme, only the value of the margin of tour operators, and not the whole value of the package holidays they supply, is taxed to the final consumer in the country where the tour operator is located. At the same time, the inputs into the holiday package (accommodation, transport, tourist-guide services, etc.) are subject to non-deductible VAT payable by the tour operator if the relevant services are supplied (and are taxable) in the considered country. On the other hand, those services included in the package that are supplied abroad are not taxable in the country in question.
73. Because the theoretical VAT should be calculated for all transactions subject to non-deductible VAT, both the margin of tour operators (on which households pay non-deductible VAT) and the inputs into the package taxable in the considered country (on which the tour operators pay non-deductible VAT) should be included in the calculation and allocated to the respective VAT rates at which they are taxed³¹. So, in order to properly reflect the scheme in the calculation of the theoretical VAT, the following steps should be taken:
- the margin of tour operators (made on both package holidays in the country and package holidays elsewhere in the EU)³² should be identified and allocated to the standard VAT rate;
 - the values of components of the package holidays that occur in the country (accommodation, transport, tourist-guide services, etc.) should be identified and allocated to the respective VAT rates; and
 - the values of components of the package holidays abroad should be identified and excluded (but margin made on the package holidays in the EU should be included – see above).
74. The numerical example below illustrates the recommended treatment of the margin scheme for tour operators.

⁽³¹⁾ It should be noted that, in most cases, the individual inputs into the package and the margin will be taxed at the different VAT rates (e.g. accommodation services are often taxed at a reduced rate, while tourist-guide services and the margin of tour operators are in most cases taxed at a standard rate).

⁽³²⁾ In fact, when services are supplied (take place) outside the EU there is no VAT involved whatsoever. So in principle, margin should be split into margin on tours in the EU and margin on tours outside the EU (and the latter should be treated as exempt).

Table 1. Recommended treatment of the margin scheme for tour operators in the calculation of theoretical VAT.

HFCE (Classification of Products by Activity - CPA items)	Value net of VAT	Exempt / out-of-scope	Reduced VAT rate	Standard VAT rate
79.12 Tour-operator services	(100)			
of which:				
domestic tours	(20)			
of which:				
margin	4			4
tours abroad	(80)			
of which:				
margin	16			16
Total HFCE	20			20
Intermediate consumption (IC) of exempt branches (CPA items)				
		NACE 79.12 'Tour-operator activities'		
		Rate of non-deductibility: 100%		
(components of domestic tours)*				
accommodation	10		10	
transport	5			5
tourist-guide services	1			1
(components of tours abroad)*	64	64		
Total IC	80	64	10	6
Total (HFCE+IC)	100	64	10	26

* items allocated after decomposition of the HFCE item 79.12 'Tour-operator services' into margin and components of package holidays

75. From the replies to the GNIG sub-group's questionnaire, it may be concluded that around half of the countries take the operation of the above-mentioned special VAT schemes into account in their calculations of theoretical VAT. There may be other special taxation schemes in place in the individual countries that may require specific calculations in the context of theoretical VAT. However, they will not be discussed in this paper.
76. Apart from the reflection of the special taxation schemes, the theoretical VAT calculations should ensure the proper treatment of **own-account consumption**. As there is no VAT involved in the consumption of goods produced on own-account, the respective amounts of HFCE (and GFCF) should be taken aside in these calculations.
77. The estimates of HFCE include **income in kind** received and consumed by households and **tips** paid by them on certain services. There might be some specific VAT rules related to these elements in the individual countries, and there is a need to take due account of these rules, given that theoretical VAT should be calculated on all taxable transactions (subject to non-deductible VAT). The compilers of theoretical VAT should consult the tax authorities to determine the treatment of these flows under the VAT legislation. For example, if income in kind or tips are considered non-taxable, their respective amounts should be excluded from the VAT base. 16 Member States explicitly confirmed in the questionnaire that they duly consider these aspects in their estimation of theoretical VAT.
78. Among other good practices identified in the WAR scheme that relate to HFCE, it is worth mentioning one which is followed by a handful of countries that exclude from the VAT base **tax-**

free purchases in duty-free shops. The relevant information is in that case derived from the annual accounting statements or VAT-reports data of the companies owning these shops.

Intermediate consumption

79. Unlike HFCE, only part of intermediate consumption is subject to non-deductible VAT. In most cases, businesses can deduct the VAT paid on the inputs into their production. However, in cases where output is exempt from VAT, the VAT payable on the corresponding inputs cannot be deducted. In order to accurately estimate the theoretical VAT, those portions of intermediate consumption (and of GFCF) on which non-deductible VAT is payable must be identified and included in the calculation.
80. In the national accounts, it is not possible to determine which concrete inputs were used to produce exempt output. Therefore the inputs subject to non-deductible VAT have to be estimated by means of the so-called **pro-rata of non-deductibility**. The pro-rata of non-deductibility is arrived at by:
- analysing output of a given sector/activity by product;
 - identifying the products and the respective amounts of output that is VAT-exempt; and
 - calculating the share of exempt output in the total output of the given sector/activity.
81. This share is then applied to the total intermediate consumption (and to the total GFCF) of that sector/activity³³.
82. Exemption from VAT may be analysed from the perspective of institutional sectors or from the perspective of activities. This is reflected in Article 4 of Regulation (EEC, Euratom) No 1553/89 which, when listing the categories relevant for calculating the WAR, distinguishes intermediate consumption (and GFCF) of NPISH and general government on one hand and intermediate consumption (and GFCF) of other sectors on the other hand. Therefore, in most cases, the WAR calculations are made separately for the whole sectors S.13 and S.15 (for all activities), while for sectors S.11, S.12 and S.14, the calculations are made by activity (for all three sectors).
83. For the non-market sectors (S.13 and S.15), it is appealing to use the proportion of non-market output (P.13) to the total output of the given sector as a proxy for the proportion of exempt output to total output. However, one has to bear in mind that even within the non-market output there may be some incidental sales ('payments for non-market output' – P.131) that can be taxable. On the other hand, some products sold by these sectors and recorded as market output (P.11) can be exempt from VAT. Therefore, it seems more accurate to calculate the pro-rata of non-deductibility by analysing the output of these sectors by product.
84. For the market sectors, it is good practice to look at the individual activities and calculate the pro-rata of non-deductibility for each of them. In the WAR calculations, this is usually done at the level of the NACE division (two digits). Some countries limit themselves (for the WAR) to calculating the pro-rata of non-deductibility only for some activities, e.g. the NACE divisions in which the main activity is VAT-exempt, assuming that the share of exempt secondary output in other divisions would be negligible. However, for the sake of exhaustiveness, it is advisable to consider all activities.
85. As mentioned above, a positive adjustment to intermediate consumption (and GFCF) entering the calculation of theoretical VAT is needed to account for the **inputs of exempt small firms**. Ideally, the output of exempt small firms should be separately identified (by product and activity) and excluded from the calculation of pro-rata of non-deductibility by activity. The same should then be done on the intermediate consumption (and GFCF) side, so that the pro-rata is only applied – by activity – to the inputs of 'regular' enterprises (i.e. those outside the exemption scheme). Subsequently, total intermediate consumption of the exempt small firms (that is fully subject to non-deductible VAT) should be added³⁴, by product, to the portions of intermediate consumption

⁽³³⁾ But see the remarks below on the correction to intermediate consumption of the exempt small firms.

⁽³⁴⁾ To be noted that while correction to the HFCE due to small firms concerns only part of their output (sales to final consumers), the

obtained after applying the pro-rata (for the 'regular' units). The non-deductible theoretical VAT that is behind intermediate consumption determined in this way should be then calculated by applying the applicable VAT rates by product.

86. This being said, it is acknowledged that, in the WAR calculations, most countries follow a simplified approach in which the pro-rata of non-deductibility are calculated for the whole activity (without distinguishing between the exempt small firms and 'regular' units) and applied to the total intermediate consumption of the individual activities. The intermediate consumption of small firms is then simply added on top, which leads to some double-counting of the VAT base (especially if there are many exempt small firms in NACE activities with a high share of exempt output).
87. In some countries, the VAT legislation may provide for a **restriction in the right to deduct input VAT on some specific products**. The most frequent examples of such restrictions concern business cars and related expenditure (e.g. fuel), and 'representation costs' (hotel and restaurant services and purchases of food and beverages for representation purposes by the business sector). The consequence of such a restriction is that only a specified percentage of the expenditure of businesses on a given product is subject to deductible VAT, while the VAT is non-deductible for the remaining part. Thus, the part of the expenditure on these products falling under the restriction in the right to deduct VAT should be considered across the board for the WAR and theoretical VAT calculations, irrespective of activities in which the businesses operate. The affected products should therefore be separately identified within intermediate consumption and GFCF, as appropriate, and the relevant part of the expenditure on these products should be determined irrespective of the pro-rata of non-deductibility of the individual activities.
88. It is recommended to consult the fiscal authorities to determine the exact scope of the restriction, especially for business cars. Depending on the way the restriction is designed in the legislation (and depending, for example, to what extent it covers the private use of business cars), it may have to be considered that the private use of business cars should usually be already identified as income in kind and included in HFCE (as subject to non-deductible expenditure VAT).

Gross Fixed Capital Formation

89. The remarks on calculating the pro-rata of non-deductibility in order to arrive at the portions of intermediate consumption on which non-deductible VAT is payable also apply to GFCF. In principle, **the same pro-rata of non-deductibility** should be applied (by sector/activity) to both categories.
90. GFCF of all institutional sectors should be considered. This implies that investment in dwellings made by households should also be included in the calculation. Taxation of dwellings and other buildings should be carefully analysed and accurately reflected, as different VAT rates (or exemptions) usually apply depending on the type of building supplied or the characteristics of the dwellings.
91. In principle, the **costs of ownership transfer** embedded in the GFCF estimate (for both existing and new fixed assets, as well as for non-produced assets) should also be separately identified and allocated to the respective VAT rates. For dwellings, this may for example include some fees charged by real-estate agents and notaries (usually standard-rated), as well as stamp duties and administrative fees (that would be exempt).
92. Just like own-account HFCE, **own-account GFCF** (e.g. in software, R&D, originals, mineral exploration, machine tools produced by engineering enterprises, and construction) should be taken aside. There is no VAT attached to the fixed assets produced on own-account, and the inputs into this production are already accounted for through intermediate consumption of the respective activities (after considering the pro-rata of non-deductibility). Having said this, it should be considered that, for **own-account construction of dwellings** and own-account major repairs by households, all their expenditure on materials and services used for the construction should

correction on the input side is calculated on the entirety of their intermediate consumption (and GFCF), as VAT payable on all these inputs is non-deductible.

be treated as subject to non-deductible VAT (as households are not acting as businesses here and cannot deduct input VAT). This treatment is not ensured by applying the pro-rata of non-deductibility (that is based on the exempt output share) to the intermediate consumption in the construction activity of the S.14 sector, so an explicit adjustment is needed there (or in the GFCF)³⁵.

93. The adjustment due to **exempt small firms** is just as relevant for GFCF as it is for intermediate consumption: investment by these units is fully non-deductible. The calculation of the adjustment is the same as for intermediate consumption. This being said, responses to the questionnaire reveal that this adjustment is often not made in the practice of WAR calculations.
94. GFCF data reflect acquisitions less disposals of fixed assets. Inclusion of disposals causes some distortion to the VAT base³⁶. Although it is not possible to fully eliminate these distortions, some countries limit them by identifying products for which disposals are higher than acquisitions and **setting the negative GFCF values to zero** for those products in the WAR calculations. From the GNIG sub-group's questionnaire, it is apparent that this practice is also followed by around a third of the Member States in the calculation of theoretical VAT.

Other categories

95. Other categories of expenditure relevant for the calculation of theoretical VAT, and included in the WAR calculations, comprise social transfers in kind, valuables and building land. These categories were briefly discussed in Section 5.2. It is important to accurately determine the scope of these transactions that are subject to non-deductible VAT. For **social transfers in kind**, only those products that are purchased from market producers are to be covered under a separate category (the ones produced by the general government and NPISH being already covered in the category of 'Intermediate consumption of S.13/S.15). In the case of **building land**, only transactions between taxable persons as sellers and non-taxable persons (households) or exempt taxable persons that cannot deduct input VAT as buyers should be considered. For **valuables**, it is recommended to consult the fiscal authorities to understand and correctly reflect the taxation in place, especially in cases where there is a special margin scheme for taxation of second-hand goods, works of art, collectors' items, antiques, etc.

5.5 Calculating the amounts of theoretical VAT; treatment of VAT evaded with complicity

96. After taking into account all the nuances of the calculation discussed above, there is still one important aspect that has to be considered in calculating the amounts of theoretical VAT. It has to do with the fact that in national accounts, the purchaser's price of transactions subject to VAT fraud with complicity of the customer should not include the thus-evaded VAT³⁷ and that this should be properly taken into account when deriving the VAT from the purchaser's price.
97. In the WAR scheme, the expenditure data at purchaser's prices for the year n-2 are first cleared of VAT at the VAT rates applicable in the year n-2. While clearing the VAT, countries make sure that no tax is removed for **the transactions that are already recorded without VAT in national accounts**. This concerns first and foremost illegal activities (for which explicit estimates are

⁽³⁵⁾ In the WAR calculations, this adjustment is usually made in the GFCF data, by taking aside only this part of the estimate of the own-account construction by households that does not relate to materials and services used in the construction process.

⁽³⁶⁾ The same is the case for the data on valuables.

⁽³⁷⁾ In practice, depending on the sources used for the use categories in national accounts, at the initial stage of compilation the purchaser's price may include some VAT evaded with complicity, and explicit adjustments must be made to remove it. See comments further down in this section.

available in national accounts). On top of illegal activities, also other transactions that are subject to VAT fraud with complicity of the buyer should be recorded without VAT. Therefore, if a breakdown of VAT fraud with complicity by product is available for the year n-2, clearing of VAT in the WAR should take this information into account. After this step, the net figures are allocated to the VAT rates applicable in the year n, and the amounts of theoretical VAT can be calculated by multiplying the net values of individual transactions (by product) by the applicable VAT rate.

98. It should be noted that, for the year n-2 data used in the WAR, it can be expected that the purchaser's price is correctly recorded without the VAT evaded with complicity. This is the case because even if there are cases where the sources/methods used to calculate HFCE and other expenditure categories include VAT evaded with complicity, this would be addressed through explicit adjustments for VAT fraud that are made after determining the VAT gap³⁸.
99. This cannot be taken for granted when theoretical VAT is derived in SUT, as the use data that are confronted with supply have not yet undergone adjustments for VAT fraud (which are made only after balancing, once the VAT gap is determined – see Section 6). Therefore, for further considerations it might be useful to distinguish two scenarios: the first scenario where the sources/methods for the use categories *do not* include VAT evaded with complicity and the second scenario where the sources/methods for the use categories *do* include VAT evaded with complicity³⁹.
100. The first scenario will be relevant for the direct estimation methods (i.e. methods based on expenditure surveys), which are in principle not expected to record the VAT evaded with complicity. The reason for this is that surveys value the transactions according to the payers' perception of the price paid and thus exclude the element of VAT evaded with complicity that the payer is aware of. The second scenario will relate to the indirect methods – such as commodity flow or quantity*price methods – that may not make it possible to distinguish between the base and the concealed tax.
101. When calculating theoretical VAT in SUT (when bringing the valuation of the supply and use sides to the same basis), the VAT amounts are derived directly from the purchaser's price⁴⁰ by applying a formula. If we assume that VAT fraud with complicity does not occur at all, then, for example, if HFCE on car repairs is valued 150 at purchaser's prices and rated at 20%, the implicit VAT behind this transaction would be estimated as $150/1.2*0.2=25$. This assumption is rather unrealistic, which leads us to the discussion of the two scenarios above.
102. If we take the first scenario, we should bear in mind that the use side does not include the value of fraud evaded with complicity in the purchaser's price. So when calculating theoretical VAT on the supply side, one should take care not to include the VAT evaded with complicity in order not to create an imbalance in the scope of VAT on both sides. This means that, for example, if it is known that the value of the above-mentioned car-repair services subject to VAT fraud with complicity embedded in HFCE is 30 (and it is known under this scenario that the related evaded VAT is not included in the total of 150), then for the reconciliation of the valuation of supply and use and the subsequent SUT balancing, one should calculate the value of the VAT embedded in the purchaser's price as: $(150-30)/1.2*0.2=20$. The net value of 'regular' transactions and transactions subject to VAT fraud without complicity, on which the VAT was captured in the purchaser's price, would be 100; the related VAT included in the purchaser's price would be 20; the value of transactions subject to VAT fraud with complicity would be 30; and VAT with complicity included in the purchaser's price would be 0.
103. Obviously, the question arises as to how to determine the value of transactions subject to VAT fraud with complicity (30) within the total (150). This issue is dealt with in Section 6.
104. As discussed in Section 4, the initial estimate of theoretical VAT undergoes SUT balancing and a new estimate based on balanced SUT data results from an automated calculation of VAT embedded in balancing adjustments. The proper treatment of VAT evaded with complicity as

⁽³⁸⁾ See Section 6 for more details.

⁽³⁹⁾ In both scenarios, the value of the fraudulent transaction itself would still be covered.

⁽⁴⁰⁾ As the intermediate step of clearing VAT at the rates of the year n-2 (made in the WAR) is not applicable.

- outlined above would ensure that the (theoretical) amounts of VAT entering the balancing process on the supply and use sides would – conceptually – be consistent.
105. However, one should keep in mind that **theoretical VAT is also due on the transactions where fraud with complicity occurred**. Therefore, in scenario 1 where no theoretical VAT attached to fraud with complicity has been taken into account thus far, one has to add to theoretical VAT after balancing the VAT payable on the fraudulent transactions with complicity **in order to arrive at the (almost) final value of the theoretical VAT**. In the example above, the VAT evaded with complicity would amount to $30 \times 0.2 = 6$. The ultimate value of theoretical VAT would amount to $20 + 6 = 26$.
106. The latter step should preferably be done outside the SUT, so as not to cause an imbalance in the already balanced system⁴¹. It is also outside the SUT that one should add to the theoretical VAT non-deductible VAT on **building land** (that is a category not appearing in SUT). After considering the relevant amounts of VAT payable on building land, **the theoretical VAT estimate can be considered ultimate**.
107. In the second scenario, the VAT evaded with complicity is included in the purchaser's price through indirect methods for the use side. In principle, effort should be made to: (i) identify these amounts of evaded VAT; (ii) remove them from the use side; and then (iii) follow the steps described above for scenario 1. If, for some reason, the identification of the amounts in question was not feasible, the hypothetical consequences of their retaining for the calculation of the theoretical VAT would be as set out in the paragraphs below.
108. Firstly, application of the basic formula for deriving the VAT embedded in the purchaser's price would result in implicit coverage of VAT evaded with complicity in the VAT estimate on the supply side. Balancing would thus occur with the fraud evaded with complicity included on both sides. The resulting estimate of theoretical VAT based on the balanced SUT data would include VAT payable on fraudulent transactions with complicity (as well as without complicity) and could be considered almost final⁴². The ultimate estimate of theoretical VAT would be obtained after adding, outside SUT, non-deductible VAT payable on building land.
109. This being said, it is recommended to identify to the extent possible: (i) the transactions subject to VAT fraud with complicity; (ii) the value of these transactions; and if relevant (iii) the amounts of VAT evaded with complicity embedded in the purchaser's price. It is also recommended to make sure that VAT evaded with complicity is not included on either the supply side or the use side before balancing GDP in SUT. Apart from ensuring an accurate calculation of theoretical VAT, this solution avoids possible distortion to balancing stemming from the inclusion of VAT evaded with complicity in the SUT data. The next section sheds light on how this can be approached.

⁽⁴¹⁾ No adjustments due to VAT evaded with complicity would be needed after the reconciliation of the VAT gap, as VAT evaded with complicity would not have been included on either side of the SUT – see Section 6.

⁽⁴²⁾ Adjustments due to VAT evaded with complicity would be needed after the reconciliation of the VAT gap, as VAT evaded with complicity would have been included on both sides in the SUT – see Section 6.

6

Adjustments to national accounts due to non-collected VAT; moving from theoretical VAT to actual VAT in SUT

110. The steps discussed above lead to the ultimate estimate of theoretical VAT based on the balanced SUT data. However, as mentioned in Section 4, **the final figures for non-deductible VAT in the supply table should be constrained to the VAT amounts actually collected** by the government (on an accrual basis). Therefore, once the theoretical VAT has been determined, it should subsequently be (re-)analysed for VAT not collected (due to fraud and insolvencies) and the respective corrections should be made to taxes on products and to the other categories. As could be seen in the previous section, parts of such an analysis (relating to VAT evaded with complicity) are also beneficial for the calculation of the theoretical VAT itself and can be performed already at an earlier stage.
111. It is worth referring once again to Commission Decision 98/527/EC on the treatment for national accounts purposes of VAT fraud, and in particular to its annex, which addresses this issue.
112. In brief, the analysis starts with confronting the value of theoretical VAT receipts with the actual VAT receipts. After the settlement of any time differences between the treasury data and the national accounts data (if the former are cashed-based and not accrual)⁴³, the remaining VAT gap is analysed to determine to what extent it is caused by: (i) evasion involving the buyers' connivance (with complicity); (ii) evasion not involving the buyers' connivance (without complicity); and (iii) insolvencies.
113. The Decision recommends estimating the evasion with complicity first, and stipulates that '(...) in order to calculate the value of evasion with complicity, only those activities should be taken into account in respect of which an adjustment for undeclared work (non-recording in statistical files of economically active units) has been made'⁴⁴.
114. By using this method, applying the adjustments for undeclared work previously made to the output of branches of economic activity and multiplying the corresponding amounts for additional sales (undeclared sales) by the appropriate rates of VAT, it is possible to estimate the value of 'missing' VAT receipts which the tax authorities have been denied because of VAT evasion with complicity'.
115. The amounts of VAT evaded without complicity and VAT non-collected because of insolvencies may be then derived as a residual.
116. The Decision does not explicitly mention if and how the theoretical VAT payable on transactions in building land should be considered for the calculation of the VAT gap. However, because it can be expected that the VAT amounts in question are included in actual VAT receipts, the theoretical VAT to be used for calculating the VAT gap should be the ultimate estimate, after addition of VAT due on building land.

⁽⁴³⁾ In principle, timing differences should not be a cause of discrepancies, since in *ESA 2010* all taxes are to be recorded on an accrual basis.

⁽⁴⁴⁾ The proposal for updating Commission Decision 98/527/EC that is currently being discussed in the GNI Expert Group uses the following wording: 'The value of VAT evaded 'with complicity' may be calculated, by convention, taking into account activities in respect of which an adjustment for undeclared work has been made'.

117. Once all this is done, the amounts of VAT recorded in the national accounts should be adjusted for the VAT not collected so that they correspond to the actual VAT receipts. At the same time, adjustment should be made to value added (output and/or intermediate consumption) reflecting the non-collected VAT due to evasion without complicity and due to insolvencies. Around half of the countries that responded to the GNIG sub-group's questionnaire confirmed that this is their practice. Some other countries consider that allowances for VAT evasion without complicity (and possibly for insolvencies) are already implicitly accounted for in the value added through more general exhaustiveness adjustments, not targeting specifically the non-collected VAT⁴⁵.
118. If we now evoke the scenarios discussed in the previous section, then the method outlined above can already be considered before balancing to identify parts of consumption ('additional sales') that are subject to VAT fraud with complicity. This means that the method can be applied before balancing in order to make sure that the VAT evaded with complicity is not included on either the supply side or the use side.
119. Then, for scenario 1, no adjustments due to VAT evaded with complicity would be needed after the reconciliation of the VAT gap, as it would not have been included on either side of the SUT. The VAT gap (defined as the difference between the ultimate theoretical VAT and the actual VAT) would cover VAT evaded without complicity and not collected due to insolvencies (included in SUT data), as well as VAT fraud with complicity (added after SUT), but the latter would not require any adjustment, as stated above. The adjustment to value added for fraud without complicity and insolvencies would not cause any imbalance, because it would be fully offset within the supply side by the conversion of theoretical VAT to actual VAT.
120. For scenario 2, if, for some reason the VAT evaded with complicity had been retained in the purchaser's price and also reflected in the theoretical VAT on the supply side (and balancing occurred with that VAT evaded with complicity on both sides), then adjustments due to VAT evaded with complicity would be needed after the reconciliation of the VAT gap. The VAT gap would be attributable to both VAT fraud without complicity and insolvencies as well as to VAT fraud with complicity. Apart from the adjustment to value added to account for VAT fraud without complicity and insolvencies, an adjustment for removing VAT evaded with complicity would have to be made on the use side. These adjustments, together with the move from theoretical VAT to actual VAT on the supply side, would lead to a balanced decrease of both supply and use.

⁽⁴⁵⁾ This possibility is recognised in Commission Decision 98/527/EC, which stipulates that Member States may use any equivalent method which provides comparable results as far as the GDP level is concerned.

7

GDP validation using theoretical VAT

121. Apart from being used in estimating exhaustiveness adjustments for non-collected VAT in the compilation of GDP, as could be seen above, theoretical VAT also plays a role in validating GDP estimates or its parts.
122. Two main checks in this regard can be distinguished, as confirmed in the GNIG sub-group's questionnaire on theoretical VAT. The first one is a simple comparison of the total theoretical VAT receipts with total actual (accrual) VAT. Should the theoretical VAT turn out to be lower than actual VAT, this would indicate possible underestimation of GDP. According to the results of the questionnaire, around two thirds of the Member States apply this check.
123. The second check is somewhat more sophisticated and it consists in relating the amounts of evaded VAT to the relevant, underlying exhaustiveness adjustments. In order to perform this check, one has to determine first which exhaustiveness adjustments underlie the VAT fraud (with and without complicity). This will be first and foremost the relevant adjustments of the type N6 (for misreporting)⁴⁶, but also of the type N1 (underground producers) and possibly also N2 (illegal activities), if these are considered taxable. Once the amounts of misreported output underlying VAT fraud are determined, a ratio of VAT fraud to misreported output can be calculated. This rate can be compared with the standard VAT applicable in the country. If the implied rate is higher than the standard VAT rate this would signify that the numerator (i.e. VAT fraud) is overestimated or that the denominator (misreporting underlying the VAT fraud) is underestimated. These conclusions would then call for a review of the respective exhaustiveness and/or evaded VAT estimates. Five countries indicated in the questionnaire that they perform this second type of check.

⁽⁴⁶⁾ N1-N7 types of non-exhaustiveness is a typology established by the 'Eurostat Tabular Approach to Exhaustiveness'.

8

Summary and recommendations

124. Given the variety of approaches to the national accounts-based calculation of theoretical VAT in EU countries, this paper has been drawn up with the aim of proposing practical guidelines for enhanced comparability in this regard. In the quest for good practices to be considered in this calculation, it explored the advantages offered by the framework used until recently to calculate the Weighted Average Rate (WAR) for the purpose of the VAT own resource.
125. This paper: (i) puts forward a definition of ‘theoretical VAT receipts’; (ii) describes the general framework for the national accounts-based calculation of theoretical VAT; and (iii) discusses the process for deriving theoretical VAT within the Supply and Use Tables (SUT) and the possible links between that process and the calculations made in the WAR scheme. The paper then takes a closer look at the individual aspects of calculating theoretical VAT and discusses the related good practices identified in the WAR scheme. Subsequently, it discusses the derivation of the final estimate of the theoretical VAT amounts based on the balanced SUT data and its fine-tuning for VAT evaded with complicity and other relevant transactions not covered by the SUT. Finally, on top of the considerations on theoretical VAT itself, the paper discusses the adjustments that are to be made to national accounts due to non-collected VAT and the issue of moving from theoretical VAT to actual VAT in SUT. Last but not least, the paper briefly describes the use of theoretical VAT for validating GDP estimates.
126. **The key recommendations of this paper are that for the sake of enhanced comparability, reliability, and exhaustiveness of national accounts, the SUT compilers may consider:**
- **taking into account the elements of good practice offered by the detailed, comprehensive and well-tested WAR scheme (as defined in the VAT OR legal framework in place until 2021) when designing the model for calculating theoretical VAT;**
 - **integrating the theoretical VAT receipts resulting from that model into SUT before balancing supply and use by product;**
 - **recalculating the estimate of theoretical VAT after SUT balancing;**
 - **fine-tuning the resulting estimate by adding theoretical VAT behind transactions not covered in SUT (such as building land), and – assuming its correct treatment in SUT – VAT evaded with complicity (while the VAT evaded without complicity and VAT non-collected because of insolvencies would already be included in the preceding stages)⁴⁷.**
127. The aforementioned elements of good practice offered by the WAR framework are discussed in detail in the paper. Because the circumstances and approaches taken by the countries to calculate the national-accounts-based theoretical VAT are different, the extent to which these good practices are applicable in the individual countries may also vary. This being said, it is hoped that **the SUT compilers will find these good practices useful and will consider integrating them in their theoretical VAT compilation practice where appropriate.**

⁽⁴⁷⁾ The subsequent constraining of the figures for non-deductible VAT in the supply table to the VAT amounts actually collected by the government (on an accrual basis) and the adjustments due to non-collected VAT to be performed in national accounts are not discussed here anymore.

Annex

Questionnaire on the theoretical VAT and possible interlinkages between the theoretical VAT calculated on the basis of Supply and Use Tables and Weighted Average Rate framework developed for VAT own resource purposes

1. Definition of theoretical VAT

Commission Decision 98/527 provides in the Annex this definition: 'The theoretical VAT receipts are the amounts of VAT which would be collected if all units subject to VAT were to pay it as required by law.'

	Answers	Ratio
A: Agree with the current definition	25	92.59%
B: Broadly agree with the definition and would make the following comments/additions/suggestions:	2	7.41%
C: No Answer	0	0%

Selected comments of the respondents⁽¹⁾:

- 'Maybe it would be better to quote more precisely the end of the sentence, suggestion: »as required by prescribed VAT legislation« instead of » as required by law«. The reasoning is that by law there can also be allowed tax reliefs (VAT amounts not finally paid) because of bad economic situation of firms, etc.'
- 'The current practice for estimation slightly differs from the given definition.'

2. Please indicate the institutions responsible for carrying out the calculation of:

theoretical VAT for SUT:

In all cases: National Statistical Authority (national accounts compiler).

Selected comments of MS:

- ‘Theoretical VAT not always the one from definition.’
- ‘Balancing procedure with amount of VAT collected by S13, VAT fraud without complicity and non-collected VAT due to insolvency are calculated independently and included in value added.’

WAR for the VAT own resource:

<i>Institution</i>	<i>Number of MS</i>
Ministry of Finance	10
NSI	10
mixed (NSI+MF)	6
n/a	1

3. Please indicate the level of detail (number of products) and product classification used in the calculation of:

theoretical VAT for SUT:

WAR for the VAT own resource:

Various levels of detail in the MS (from 64 to 2 440 products).

4. Deriving theoretical VAT based on the Supply and Use Tables (SUT) and possible interlinkages with the Weighted Average Rate (WAR) calculation scheme developed for VAT own resource purposes

Compilation of SUT requires an (initial) estimation of theoretical VAT to bridge the valuation of supply (at basic prices) and use (at purchaser’s prices), before SUT balancing is made. How would you characterise the approach used to estimate the amounts of theoretical VAT in that process?

	Answers	Ratio
A: SUT integrate the results of the WAR calculations for the year in question (year n); the WAR scheme – modified where appropriate – is filled with the relevant unbalanced use data for the year n; the level of detail of the WAR calculations is retained	5	18.52%
B: SUT integrate the results of the WAR-like calculations for the year in question (year n); the WAR framework is used, but at a more aggregated level, without considering all the details of the WAR calculations	5	18.52%
C: Estimation of theoretical VAT based on SUT is made by the national accountants independently of the WAR calculation framework; the calculation uses a different, less comprehensive scheme	8	29.63%
D: Estimation of theoretical VAT based on SUT is made by the national accountants independently of the WAR calculation framework; the calculation uses a different scheme; details of the WAR scheme are not known to the national accountants	6	22.22%
E: Estimation of theoretical VAT for SUT is not made by the national accountants; it is based on other, non-statistical approaches (fiscal analyses, econometric models, etc.)	3	11.11%
F: No answer	0	0%

Selected comments of the respondents⁽¹⁾:

- ‘Sometimes chosen the case that reflected best the practice.’
- ‘Details of the WAR calculations are retained. However, the SUT is more detailed.’
- ‘VAT in SUT has to be the same as in GDP.’
- ‘Calculation for SUT and of WAR are aligned.’
- ‘Independent/autonomous calculation.’
- ‘Theoretical VAT not necessary for SUT. Average VAT rates and payers vs non-payers ratios taken from WAR scheme into SUT before balancing.’
- ‘Different deadlines for the data transmission (WAR, NA).’

5. Fine-tuning of theoretical VAT through balancing SUT

After determining the amounts of theoretical non-deductible VAT in the previous step, supply and use are balanced in SUT. At that stage:

	Answers	Ratio
A: The non-deductible VAT behind the relevant balancing adjustments is derived automatically in an IT balancing tool; the final theoretical VAT, based on balanced SUT data is thus determined simultaneously with balancing	14	51.85%
B: The final theoretical VAT, based on balanced SUT data, is determined in a different way	5	18.52%
C: The amounts of non-deductible VAT determined in the previous step (i.e. based on unbalanced data) are not modified	8	29.63%
D: No Answer	0	0%

Selected comments of the respondents⁽¹⁾:

- ‘No answer fits exactly.’
- ‘VAT rates are applied to balanced SUT data. No fine-tuning is needed.’
- ‘Balancing adjustments are carried out taking into account the actual VAT in SUT.’
- ‘The estimation of theoretical VAT is carried out using the SUT framework but it is not part of the SUT balancing process.’
- ‘VAT in the supply and use system needs to be constrained to cash collected estimate of actual VAT.’
- ‘In the final balancing step, the VAT percentages are adjusted to ensure that the total VAT revenue from GFS is reached.’

6. Please state the main data sources used to determine the amounts of non-deductible VAT for the individual products (by applying the correct VAT rates to relevant transactions) in the process of estimation of the theoretical VAT in national accounts.

A mixture of several data sources provided:

- 'National accounts data'
- 'VAT legislation'
- 'Household Budget Survey'
- 'Structural Business Statistics'
- 'Structure/ratios of intermediate consumption from last available years'
- 'Import/Export data'
- 'Administrative sources for individual consumption of government, NPISH'

7. Frequency and timeliness of the estimates of theoretical VAT

Please state how frequently the theoretical VAT is estimated in your national accounts and what is the timeliness of this estimation.

	Answers	Ratio
A: Annually	23	85.19%
B: Less frequently (please define):	4	14.81%
C: No Answer	0	0%

If annually: 6, 9, 17, 18, 21, 24, 26, 30, 32 or 36 months after the reference year.

If less frequently: 'ad hoc', 'every 5 years'.

Selected comments of the respondents(!):

- 'Linked to SUT estimation.'
- 'Annually based on unbalanced SUT data.'
- 'Final, semi-final and provisional version.'
- 'Also more frequently as annually (quarterly).'

8. Most recent estimation of the theoretical VAT.

Please state the reference year of the last estimation:

Most recent year	Number of MS
2013	1
2015	2
2017	10
2018	7
2019	7

9. Use categories considered in the calculation of theoretical VAT

Please indicate which of the following use categories (for the part subject to non-deductible VAT) are considered in the calculation of the theoretical VAT:

	Answers	Ratio
A: HFCE domestic concept	25	92.59%
B: HFCE national concept	5	18.52%
C: Intermediate consumption of S.13 (after applying pro-rata of non-deductibility)	25	92.59%
D: Intermediate consumption of S.15 (after applying pro-rata of non-deductibility)	25	92.59%
E: Intermediate consumption of S.11, S.12 and S.14 (after applying pro-rata of non-deductibility)	23	85.19%
F: Intermediate consumption of S.1 – no distinction between sectors possible (after applying pro-rata of non-deductibility)	6	22.22%
G: Social transfers in kind purchased by S.13 (as part of FCE)	24	88.89%
H: Social transfers in kind purchased by S.15 (as part of FCE)	15	55.56%
I: GFCF of S.13 (after applying pro-rata of non-deductibility)	24	88.89%
J: GFCF of S.15 (after applying pro-rata of non-deductibility)	24	88.89%
K: GFCF of S.11, S.12 and S.14 (after applying pro-rata of non-deductibility)	23	85.19%
L: GFCF of S.1 – no distinction between sectors possible (after applying pro-rata of non-deductibility)	7	25.93%
M: Valuables	12	44.44%
N: Other categories	3	11.11%

Selected comments of the respondents⁽¹⁾:

- 'Valuables considered marginal.'
- 'Social transfers in kind in some cases missing.'
- 'Non-deductibility calculation for intermediate consumption takes the different sectors into account. The resulting non-deductibility rate is only available on S.1 level.'

- 'Pro-rata not applicable for certain categories.'

Indicated other categories: intermediate consumption of flat-rate farmers; land; business cars/fuels; purchase of intermediate goods directly sold without transformation.

10. Extent to which some good practices of the WAR calculations are reflected in the estimation of theoretical VAT

Below are listed some good practices typically followed in the WAR calculations for VAT own resource purposes. Please indicate if you consider them in your estimation of theoretical VAT (even if the WAR framework as such is not directly used in the estimation)

	Answers	Ratio
A: Consideration of all relevant changes in VAT legislation (e.g. in terms of VAT rates applicable to individual products) in the calculation	27	100%
B: Calculation of pro-rata of non-deductibility (to identify the portions of intermediate consumption and GFCF subject to non-deductible VAT) for sectors S.13 and S.15 and for the individual activities of sectors S.11, S.12 and S.14, based on the shares of exempt and out-of-scope output in total output	25	92.59%
C: Inclusion of concealed activities and those illegal activities considered taxable (even if not taxed in practice)	21	77.78%
D: Specific calculations for on-farm consumption and direct sales of the flat-rate farmers, to correctly identify the non-deductible VAT	13	48.15%
E: Specific calculations for products under any other special VAT regime (e.g. margin scheme for tour operators, other similar schemes) to correctly identify the non-deductible VAT	16	59.26%
F: Exclusion from HFCE of purchases from VAT-exempt small firms and inclusion of their intermediate consumption and GFCF in the respective categories	14	51.85%
G: Specific calculations for products with the restriction in the right to deduct input VAT (e.g. business cars, fuel, etc. as appropriate) to correctly identify the non-deductible VAT	14	51.85%
H: Exclusion of own-account HFCE and own-account GFCF	23	85.19%
I: Inclusion of improved and unimproved building land	11	40.74%
J: Setting the negative figures for GFCF and valuables to zero (to limit the distortion caused by inclusion of disposals in the GFCF and valuables data)	9	33.33%
K: Treatment of income in kind and tips in line with the VAT legislation	16	59.26%
L: Exclusion of tax-free purchases in duty-free shops	6	22.22%
M: Other good practices	0	0%
N: None of the above	0	0%

Selected comments of the respondents⁽¹⁾:

Specific issues commented or clarified.

11. Modifying the WAR scheme used for the VAT own resource to calculate theoretical VAT for SUT: Some elements of the WAR calculation for VAT own resource purposes are not relevant in the calculation of the theoretical VAT in the year n. If the WAR scheme is used for the calculation of theoretical VAT in national accounts, please confirm that you make the following modifications in order to adjust the WAR scheme to the calculation of theoretical VAT to be used in SUT. If not, please explain why you do not make them.

	Answers	Ratio
A: Netting out of VAT from the national accounts data of the year n-2 is not needed, as data of the year n are to be used in the estimation of theoretical VAT of the year n	10	37.04%
B: Application of the time-lag for collection of VAT is not needed, as the calculation of theoretical VAT is based on the accrual accounting principle (whereas the WAR calculation applies time-lag to bring the data to the cash-accounting basis)	9	33.33%
C: Other	0	0%
D: Not applicable	16	59.26%

Selected comments of the respondents(!):

- 'WAR scheme not used for calculation of the theoretical VAT'

12. Do you see advantages of integrating the elements of WAR calculations into the estimation of theoretical VAT for SUT in your country?

	Answers	Ratio
A: Yes	17	62.96%
B: No	9	33.33%
No answer	1	3.7%

Selected comments of the respondents(!):

If 'Yes':

- 'Benefits of synergies.'
- 'Some elements of WAR used for more precise estimation of the theoretical VAT'
- 'Consistency.'

If 'No':

- 'WAR scheme not used.'
- 'Causality is reversed (SUT ≠ WAR).'
- 'Somehow circular.'

- ‘Deadlines, different vintages.’

13. Main practical difficulties in estimation of theoretical VAT

Please describe the main practical difficulties, limitations, or country-specific constrains in the current estimation of the theoretical VAT:

- ‘No particular practical difficulties.’ (5 MS)
- ‘Data availability, time consuming, IT support needed.’
- ‘Many VAT rates, exempted activities, exceptions.’
- ‘To accurately follow frequent changes.’
- ‘Unclear about VAT paid by non-residents.’
- ‘Subjectivity in fraud with/without complicity.’
- ‘Specific VAT regimes, quantity of regimes, exceptions.’
- ‘Lack of data from Structural Business Statistics, need to rely on national accounts.’
- ‘To work simultaneously with balancing.’
- ‘Estimation of the base for the theoretical VAT.’
- ‘Getting consumption data at a sufficiently detailed level to apply VAT rates to the correct bases i.e. HFCE, inputs to GFCF.’
- ‘Linking different classifications, data come more aggregated.’

14. Does any other institution apart from the national statistics institute estimate the theoretical VAT in your country?

	Answers	Ratio
A: Yes	6	22.22%
B: No	14	51.85%
C: Don't know	7	25.93%
D: No Answer	0	0%

If ‘Yes’:

- ‘Ministry of Finance.’
- ‘Tax authorities.’
- ‘Research institutes.’
- ‘Estimates not based or partly based on NA.’

15. Adjustments due to non-collected VAT after determination of the theoretical VAT; moving from theoretical VAT to actual VAT in SUT

After the theoretical VAT has been determined in SUT, it should subsequently be analysed to account for non-collected VAT (due to fraud, insolvencies, etc.). As a result, the final figures for non-deductible VAT in SUT should correspond to the VAT amounts actually paid (on an accrual basis), as recorded elsewhere in the national-accounts system. In this context, please confirm if in your practice:

	Answers	Ratio
A: Theoretical VAT used to determine the VAT gap is the one discussed in point 5 above (i.e. based on balanced SUT data)	14	51.85%
B: The VAT gap identified in this process is further analysed with a view to determine VAT non-collected due to fraud without complicity, due to insolvencies and due to fraud with complicity	15	55.56%
C: Following that analysis, adjustments to output and/or intermediate consumption are made to account for the VAT fraud without complicity and, if relevant, due to insolvencies or missing trader VAT fraud	13	48.15%
D: Following that analysis, the following adjustments are made to the use-side components:	5	18.52%
E: Not applicable	7	25.93%
F: No Answer	0	0%

Selected comments of the respondents(!):

Country-specific procedures explained for given practices.

16. GDP validation using the theoretical VAT estimates

Apart from being used in the estimation of exhaustiveness adjustments for non-collected VAT, the theoretical VAT also plays a role in validating the GDP estimates. Please indicate which of the following validation checks is performed in your practice

	Answers	Ratio
A: Comparing total theoretical VAT receipts with total actual (accrual-based) VAT (theoretical VAT lower than actual VAT would indicate possible underestimation of GDP)	18	66.67%
B: Relating the amounts of non-collected VAT to the relevant underlying exhaustiveness adjustments (the resulting implied VAT rate being higher than the standard VAT rate might indicate underestimation of the non-observed economy)	5	18.52%
C: Other validation checks	2	7.41%
D: Not applicable	7	25.93%
E: No answer	0	0%

Selected comments of the respondents(!):

If 'Not applicable':

- ‘The theoretical VAT is used only for preparing data on actual VAT for SUT purposes. It is not used for the regular GDP balancing process because detailed SUT are compiled after the final GDP publication.’
- ‘Theoretical VAT figures are usually not comparable with accrual VAT given high VAT fraud amounts.’
- ‘Currently the process of balancing is on the level of sources. For the future, we are considering the use of the theoretical VAT for the balancing process.’

(1) The respondents to the questionnaire were the members of the GNI Expert Group.

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Guide on theoretical VAT - Practical guidelines for enhanced comparability across countries

'Theoretical VAT', defined as the amounts of VAT which would be collected if all units subject to VAT were to pay it as required by law, is a concept of great interest for economic and fiscal analyses. In the domain of national accounts, estimation of theoretical VAT receipts is a crucial first step for estimating exhaustiveness adjustments for non-collected VAT. Theoretical VAT also plays an important role in validating GDP estimates.

Given the variety of approaches to the national accounts-based calculation of theoretical VAT in EU countries, this paper has been drawn up to propose practical guidelines for enhanced comparability in this regard. In the quest for good practices to be considered in this calculation, it explored the advantages offered by the framework used until recently to calculate the so-called 'Weighted Average Rate' (WAR) for the purpose of the VAT own resource of the EU budget.

This paper: (i) puts forward a definition of 'theoretical VAT receipts'; (ii) describes the general framework for the national accounts-based calculation of theoretical VAT; and (iii) discusses the process for deriving theoretical VAT within the Supply and Use Tables (SUT) and the possible links between that process and the calculations made in the WAR scheme. The paper then takes a closer look at the individual aspects of calculating theoretical VAT and discusses the related good practices identified in the WAR scheme. Subsequently, it discusses the derivation of the final estimate of the theoretical VAT amounts based on the balanced SUT data and its fine-tuning for VAT evaded with complicity and other relevant transactions not covered by the SUT. Finally, on top of the considerations on theoretical VAT itself, the paper discusses the adjustments that are to be made to national accounts due to non-collected VAT and the issue of moving from theoretical VAT to actual VAT in SUT. Last but not least, the paper briefly describes the use of theoretical VAT for validating GDP estimates.

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