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VAT in the Digital Age

FINAL REPORT

VOLUME 1

DIGITAL REPORTING REQUIREMENTS

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EUROPEAN COMMISSION

VAT in the digital age

Final Report

Volume 1
Digital Reporting Requirements

Directorate-General for Taxation and Customs Union

2022

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Abbreviations and acronyms

API	Application Programming Interface
B2B	Business-to-Business
B2C	Business-to-Consumer
B2G	Business-to-Government
BAU	Business-As-Usual
BRG	Better Regulation Guidelines
CJEU	Court of Justice of the European Union
CTC	Continuous Transaction Control
DG REFORM	Directorate-General for Structural Reform Support
DG TAXUD	Directorate General for Taxation and Customs Union
DRR	Digital Reporting Requirement
EC	European Commission
ERP	Enterprise Resource Planning
EU	European Union
GDP	Gross domestic product
GST	Goods and Services Tax
IA	Impact Assessment
IO	Information Obligations
IOSS	Import-One-Stop Shop
IT	Information technology
JPK	*Jednolity Plik Kontrolny*
MNCs	Multinational Companies
MS	Member States
MTIC	Missing Trader Intra-Community
NACE	Nomenclature Statistique Des Activités Économiques Dans La Communauté Européenne
OECD	Organization for Economic Co-operation and Development
PTC	Periodic Transactional Control
SAF-T	Standard Audit File for Tax
SCM	Standard Cost Model
SDI	*Sistema di Interscambio*
SII	*Suministro Inmediato de Informacion*
SME	Small and Medium-sized Enterprise(s)
SUT	Supply and Use Tables
SWD	Staff Working Document
TA	Tax Authorities
TC	Targeted Consultation
VAT	Value-Added Tax
VIES	VAT Information Exchange System
WAR	Weighted Average Rate

Abstract

This part of the Study covers 'Digital Reporting Requirements', that is any obligation for VAT taxable persons to periodically or continuously submit data in a digital way on all (most of) their transactions, including by means of mandatory e-invoicing, to the tax authority.

As of September 2021, **12 EU Member States have introduced a Digital Reporting Requirement**, with positive net impacts, as the additional VAT revenue exceeds the costs for setting up the system and complying with the requirements. However, the existing rules (or lack thereof) on Digital Reporting Requirements generate two main problems: (i) a **fragmented regulatory framework**, and (ii) an **insufficient degree of fight against VAT fraud**, for intra-EU transactions, as well as at a domestic level.

The analysis of impacts of possible policy options shows that **the best policy choice results from the introduction of an EU Digital Reporting Requirement.** As for the type of requirement, the comparison suggests that **an e-invoicing solution ranks first across the various scenarios.**

Zusammenfassung

Dieser Teil der Studie befasst sich mit "digitalen Berichterstattungspflichten", das bedeutet die Verpflichtung für Mehrwertsteuerpflichtige, regelmäßig oder kontinuierlich Daten über alle (die meisten) ihrer Umsätze auf digitalem Wege an die Steuerbehörde zu übermitteln, auch mittels obligatorischer elektronischer Rechnungsstellung.

Bis September 2021 **haben 12 EU-Mitgliedstaaten eine digitale Meldepflicht eingeführt**, mit positiven Nettoauswirkungen, da die zusätzlichen Mehrwertsteuereinnahmen die Kosten für die Einrichtung des Systems und die Einhaltung der Anforderungen übersteigen. Die bestehenden Vorschriften (oder das Fehlen solcher Vorschriften) für die digitale Berichterstattungspflichten führen jedoch zu zwei Hauptproblemen: (i) ein **fragmentierter Rechtsrahmen** und (ii) eine **unzureichende Bekämpfung des Mehrwertsteuerbetrugs**, sowohl bei Umsätzen innerhalb der EU als auch auf nationaler Ebene.

Die Analyse der Auswirkungen möglicher politischer Optionen zeigt, dass **die Einführung einer digitalen Berichterstattungspflicht auf EU-Ebene die beste politische Entscheidung darstellt**. Was die Art der Berichterstattungspflicht betrifft, so zeigt der Vergleich, dass **eine Lösung in Form elektronischer Rechnungsstellung unter den verschiedenen Szenarien an erster Stelle steht**.

Résumé

Cette partie de l'étude porte sur les *obligations en matière de déclaration numérique*, c'est-à-dire toute obligation pour les assujettis à la TVA de soumettre périodiquement ou continuellement à l'autorité fiscale compétente des données sous forme numérique sur toutes (ou la plupart) de leurs opérations y compris au moyen de la facturation électronique obligatoire.

En septembre 2021, **12 États membres de l'UE ont instauré une obligation de déclaration numérique**, avec des impacts nets positifs, puisque les recettes de TVA supplémentaires dépassent les coûts de mise en place du système et de mise en conformité avec la réglementation. Cependant, les règles existantes (ou l'absence de règles) en matière de déclaration numérique génèrent deux problèmes majeurs : (i) un **cadre réglementaire fragmenté**, et (ii) une réponse insuffisante à la fraude dans le domaine de la TVA, tant pour les transactions intra-UE qu'au niveau national.

L'analyse d'impact des différentes options stratégiques possibles montre que **le meilleur choix politique résulterait de l'instauration d'une obligation de déclaration numérique au niveau européen**. En ce qui concerne la nature de cette obligation, selon l'analyse, une **solution de facturation électronique se classerait au premier rang** des différents scénarios.

1. INTRODUCTION

1.1. Purpose of the Assignment

This Draft Final Report (the Report) was prepared within the framework of the study on **VAT in the Digital Age**.[1] It is submitted to the European Commission, Directorate General for Taxation and Customs Union (DG TAXUD), by a grouping of consulting firms and research institutions led by Economisti Associati Srl and including Oxford Research AB, the Center for Social and Economic Research (CASE), Wavestone S.A., Mazars N.V., Hedeos société d'avocats, Desmeyere Services and Università di Urbino. The Report was prepared based on the indications provided in the Terms of Reference for the Assignment, supplemented by the Technical Proposal.

The Report covers three distinct but interrelated areas of VAT policy:

1) **Digital Reporting Requirements (DRRs)** (in the present Volume);
2) **The VAT Treatment of the Platform Economy** (in Volume 2); and
3) **The Single Place of VAT Registration and Import One Stop Shop (IOSS)** (in Volume 3).

The above volumes are then complemented by Volume 4, providing a summary of consultation activities.

The purpose of the Report is two-fold: (i) **to assess the current situation** with regard to the three domains listed above; and (ii) **to assess the impacts of a number of possible policy initiatives in these areas**. The Report is then intended to feed into the preparation of an Impact Assessment (IA) by the European Commission to accompany possible legislative or non-legislative initiatives.

A draft version of this Report was discussed with the Client at the Final Meeting on 13 October 2021; its findings have also been presented to the members of the VAT Expert Group and the Group on the Future of VAT, and to selected stakeholders at a Fiscalis Event on 27-29 October 2021. The Report has been revised to take account of the feedback received. The Study will be completed by a final version of Volume 4, due in Spring 2022, which will include the synopsis report of the forthcoming Public Consultation.

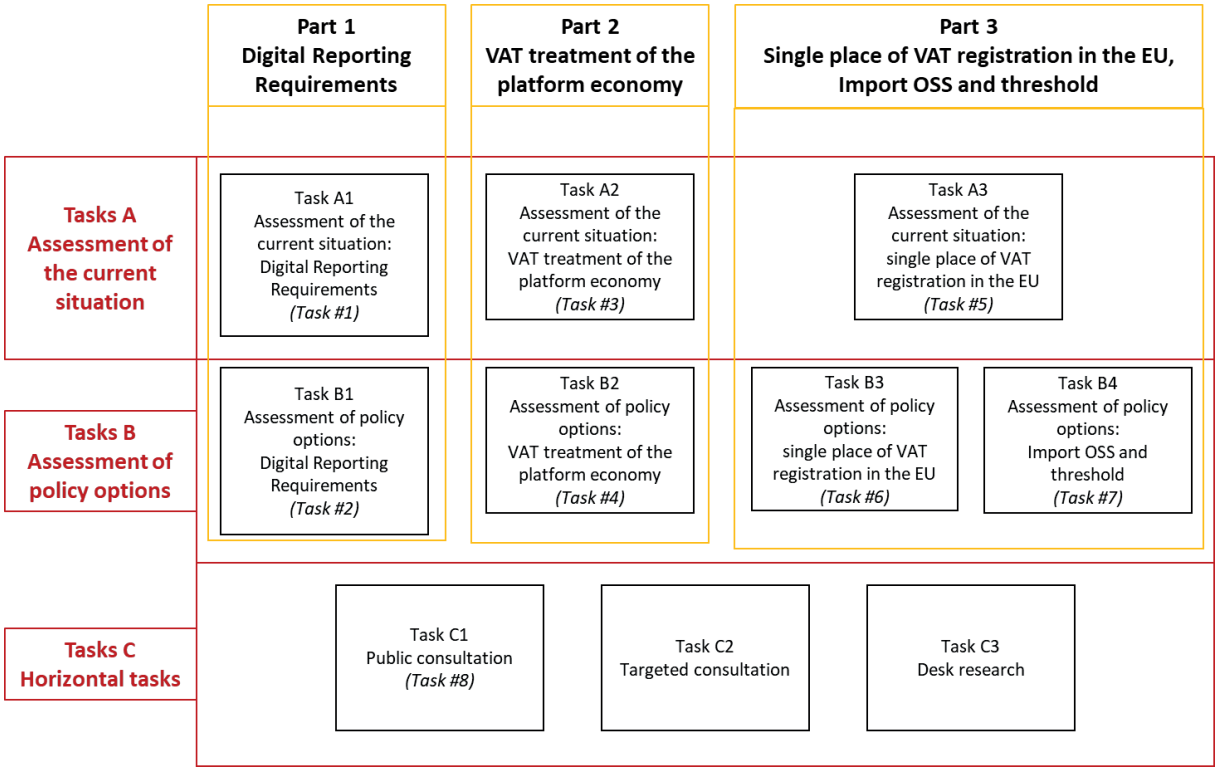
1.2. Recap of the tasks and methodology

As mentioned above, the Assignment requires an **assessment of the current situation** and the **likely impacts of a number of policy options** with regard to three topics related to VAT and evolving technologies, digitalisation and innovative business models, i.e. DRRs, the platform economy, and VAT registration and the IOSS. To consistently complete the tasks required by the Terms of Reference, a matrix approach, per topic and per type of tasks, has been followed, as represented in Figure 1 below. The columns identify the various Parts of the Study, while the rows identify the three types of tasks, namely:

1) Tasks A, i.e. the **assessment of the current situation**;
2) Tasks B, i.e. the **assessment of the policy options and their impacts**; and
3) Tasks C, i.e. **the horizontal tasks for data collection and retrieval of information.**

[1] Based on the contract No. TAXUD/2020/DE/317 signed on October 2020.

Figure 1 Overview of the services requested



Note. In brackets: task numbering as per the Terms of Reference. Source. Authors' own elaboration.

The findings from Tasks A have been compiled in a policy-oriented '**problem definition**', in which the problems, together with their drivers and consequences, have been identified and assessed, whenever possible also providing a quantitative estimation of their magnitude. This section also includes a problem tree through which the causal relations between problems, drivers and consequences are graphically depicted.

Subsequently, the **policy objectives** of the initiatives are presented, together with a list of **policy options** to reach them (including those discarded at an early stage). The policy options have been defined in agreement with the Client and considering the feedback received from the Group on the Future of VAT and the VAT Expert Group, including their joint Sub-group 'VAT aspects of the platform economy'. This is then followed by the **analysis of the impacts** generated by the retained policy options (Tasks B).

The methodologies used for the various tasks are tailored to the issues at hand, and involved the use of techniques, analyses and data processing targeted to each Part of the Study. This goes especially for Tasks A, while a more closely-knit approach has been used for the identification of the relevant impacts and the comparison of options carried out within Tasks B. More details on the methodology employed are provided in each Volume.

Finally, given the nature of the Assignment, data collection and information retrieval activities have been carried out horizontally across the three tasks, in particular the public and targeted consultations (see Volume 4).

1.3. Structure of Volume 1 – Digital Reporting Requirements

Volume 1 is structured as follows:

- Part A includes the findings from the assessment of the current situation, and namely:

  - In Chapter 2, the existing legal framework for DRRs is presented, describing the current and forthcoming national mechanisms;
  - In Chapter 3 to 5 the costs and benefits generated by the existing DRRs are estimated, for Member States authorities, domestic operators and multinational companies;
  - Chapter 6 concludes by providing a cost-benefit analysis of the current situation.

- Part B presents the results of the analysis of possible interventions, and namely the problem definition (in Chapter 7), the definition of policy objectives and options (in Chapter 8), and the analysis of impacts and comparison of options (in Chapter 9).

The Report is then complemented by a series of Annexes: (A) the country factsheets for DRRs; (B) the administrative costs and burdens of recapitulative statements; (C) the econometric model; (D) the experience of non-EU countries with CTC systems; (e) considerations on the use of blockchain for DRRs; (F) the parameters, assumptions, and calculations for the analysis of impacts; (G) the detailed costs and benefits of the analysis of impacts; (H) the scenarios about the future adoption of DRRs; and (I) the detailed views of stakeholders on DRRs.

PART A

ASSESSMENT OF THE CURRENT SITUATION

2. THE CURRENT LEGAL FRAMEWORK

2.1. Digital Reporting Requirements: the scope of the analysis

This part of the Study covers '**Digital Reporting Requirements' (DRRs),** that is any **obligation for VAT taxable persons to periodically or continuously submit data in a digital way on all (most of) their transactions, including by means of mandatory e-invoicing,**[2] **to the tax authority.**

The stress here is on the transactional dimension. Other VAT reporting obligations – such as VAT returns and declarations, or listing of suppliers and customers – require the submission of aggregated VAT data per taxpayer, i.e. not specific to each transaction. While these are relevant to the analysis, and the applicable legal framework is summarised here below, these obligations are not considered DRRs. Similarly, the obligations covered do not include those arising in the course of audits, even when they must be carried out by digital means.

2.2. The current legal framework

The main rules concerning DRRs, e-invoicing and other VAT reporting obligations are described below.

VAT return

According to the VAT Directive, each taxable person must "submit a **VAT return** setting out all the information needed to calculate the [VAT] that has become chargeable and the deductions to be made".[3] This information includes, at least, the taxable amount, the applicable VAT rate(s) and the VAT due (i.e. charged to customers), as well as the input VAT to be deducted. Further to these basic pieces of information, Member States are free to determine the data requested in the VAT return, or VAT declaration. The number of data requested varies widely, from about ten to several hundreds. Indeed, some Member States use VAT returns also to collect additional information that can be used to reduce non-compliance and fight VAT fraud.[4]

Member States are free to set the frequency of VAT return filings on a monthly, quarterly, or annual basis. A lower frequency can be granted to micro and very small companies, i.e. to VAT traders with a limited turnover.[5] In certain Member States, a summary annual VAT return must also be submitted in addition to the periodic return. **Member States should allow and may require VAT returns to be submitted electronically**. In practice, in most countries, taxable persons are required in principle to submit them electronically,[6] and this is by far the dominant method of submission.

---

[2] This term covers: any mandatory requirement to use structured e-invoices, which are then transmitted – either in full or in part, either directly or indirectly – to the tax authority. This means that (i) optional e-invoicing regimes are excluded; (ii) the use of unstructured e-invoices is not allowed; and (iii) regimes which only apply to B2G transactions (possible under Directive 2014/55/EU) are not covered, given that they are aimed at the administrative and payment processes by public authorities, rather than at the collection of transactional data for VAT purposes. The latter aspect is discussed more in detail below in this section.

[3] Article 250(1) of the VAT Directive.

[4] Cf. Commission Staff Working Document, Impact Assessment accompanying the document "Proposal for a Council Directive amending Directive 2006/112/EC on the common system of value added tax as regards a standard VAT return", SWD(2013)427, 23.10.2013. The VAT Directive mandates that certain items are to be reported, including (i) total amount of intra-EU supplies of goods; (ii) total amount of certain supplies of goods with transport carried out within the territory of another Member State; (ii) total amount of intra-EU acquisitions; and (iv) total amount of supplies of goods for which the taxable person was designated as tax representative (Article 251).

[5] Annacondia, F., "EU VAT Compass 2020/2021", IBFD, 2020, at §11.3.1.

[6] This implies that the taxpayer may request in exceptional circumstances to submit it on paper. The countries in which there is no explicit requirement in this respect are Bulgaria, Estonia, Lithuania, Malta, and Sweden.

Digital Reporting Requirements

By virtue of Article 273 of the VAT Directive, Member States may impose other obligations to ensure the correct collection of VAT and to prevent VAT fraud, provided that (i) they do not interfere with the fundamental principles of the VAT system;[7] (ii) they do not discriminate between domestic and cross-border transactions; (iii) they do not give rise to border formalities, and (iv) they do not impose additional invoicing obligations compared to those set down in Chapter 3 of the Directive.[8] **This article allows Member States to introduce various types of DRRs**, consisting in the transmission of reports of business transactions, extracts of invoices, submission of tax and accounting data or VAT records. These requirements are additional to the submission of VAT returns, to which they are often joined.[9]

e-Invoicing: VAT

There is no explicit option available for Member States to introduce mandatory e-invoicing requirements as a means to ensure the correct collection of VAT and to prevent VAT fraud. The VAT Directive makes the use of e-invoices subject to their acceptance by the recipient, in Article 232; this provision cannot be derogated via Article 273, which, as described above, allows Member States to introduce other obligations on taxpayers to ensure the correct collection of VAT and to prevent VAT fraud. Hence, if a Member State wishes to introduce mandatory e-invoicing requirements, it must do so by requesting a derogation from the Directive under Article 395, which is subject to the unanimous agreement of the Council based on a proposal from the Commission.

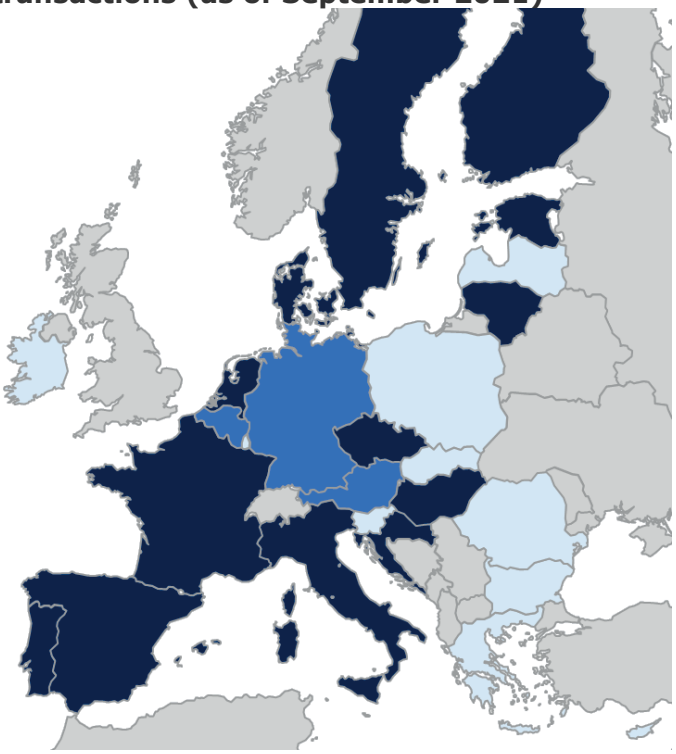
e-Invoicing: Public Procurement

As for **B2G transactions**, according to the e-Invoicing Directive,[10] **Member States must require public administrations to accept structured e-invoices** compliant with the European standard. A previous assessment of the EU invoicing legal framework proved that this requirement was instrumental in fostering the use of structured e-invoices among economic operators in several Member States.[11] Furthermore, the IT platform used to handle B2G transactions is often leveraged by the tax authorities for handling and reporting B2B transactions. This is what happened in Italy and what is going to happen in France over the near future; also in Romania, the B2G platform will be used to handle B2B e-invoices on a voluntary basis.[12]

Though not explicitly provided by the Directive, the Member States may voluntarily impose a domestic obligation to use structured e-invoices for B2G transactions.[13] Currently, 13 Member States require all B2G invoices to be issued and transmitted as structured e-invoices over a specific platform, and three more have a partial obligation in place for certain levels of government. The updated situation is shown in Figure 2 below.

[7] Cf. CJEU judgment of 2 December 2016, *Plöckl*, C-24/15.
[8] VAT Guide, at §18.8.1.
[9] For instance, in Poland, according to a recent amendment to the VAT Act, the VAT return and the reporting requirements have been merged into one single submission, i.e. the JPK_VAT files (for more information see Country Factsheets in Annex A).
[10] Directive 2014/55/EU of the European Parliament and of the Council of 16 April 2014 on electronic invoicing in public procurement, Brussels, 6.5.2014.
[11] Economisti Associati, CASE and Mazars (2019), Report for the European Commission, "Study on the evaluation of invoicing rules of Directive 2006/112/EC", Final Report. Hereinafter: 'EA 2019'.
[12] Cf. Sections 2.3 below.
[13] Cf. Recital 35 of Directive 2014/55/EU.

Figure 2. Obligation for suppliers to use structured e-invoices for B2G transactions (as of September 2021)



Legend:

	Mandatory structured e-invoicing for all B2G transactions (HR, CZ, DK, EE, FI, FR, HU, IT, LT, NL, PT, ES, SE)
	Mandatory structured e-invoicing for some B2G transactions (AT, BE, DE)
	Optional structured e-invoicing for B2G transactions (BG, CY, IE, EL, LV, LU, MT, PL, RO SK, SI)
	Non-EU countries

Notes. Austria: mandatory for invoices to the federal domain. Belgium: mandatory for invoices to the regional governments of Flanders and Brussels. Germany: mandatory for invoices to the federal authorities. Source. Connecting Europe Facility.[14]

Recapitulative statements

While DRRs are determined by national rules, **recapitulative statements are regulated by Articles 262 to 271 of the Directive**. According to these provisions, every VAT registered trader must submit a recapitulative statement detailing the taxable persons to whom it has performed intra-Community supplies of goods and cross-border supplies of services subject to a reverse charge under Article 196 of the Directive. Following a 2018 amendment to the Directive,[15] taking effect on 1 January 2020, transactions in goods dispatched or transported under call-off stock arrangements must also be reported.[16] Article 268 allows Member States to also require taxable persons to include intra-Community acquisitions of goods in the statements;[17] the reporting of services received from suppliers established in other Member States is not explicitly mentioned in the Directive, but it is required in a number of Member States.[18]

Article 264 of the VAT Directive specifies the pieces of information to be provided, that include the VAT identification number of the persons to whom supplies are effected, as well as, for each customer, the total value of the supplies. Therefore, transactional data,

[14] SOVOS, "VAT Trends: Toward Continuous Transaction Controls", 12th edition, 2021 (hereinafter 'SOVOS 2021').
[15] Council Directive 2018/1910/EU of 4 December 2018 amending Directive 2006/112/EC as regards the harmonisation and simplification of certain rules in the value added tax system for the taxation of trade between Member States, Brussels, 7.12.2018.
[16] Cf. Article 262(2); Guide to the VAT Directive, at § 18.7. This is also a condition for the exemption under Art. 138 to apply, see Art 138.1a of the VAT Directive.
[17] This is the case in nine Member States. In two more, the obligation applies only when acquisitions are higher than a certain threshold. Annacondia, F., "EU VAT Compass 2020/2021", IBFD, 2020, at §11.4.4.
[18] This is the case in eight Member States; *ibid.*

i.e. **detailed information on each transaction (including VAT taxable amount, applicable rate, VAT due) is not to be provided**.

According to Article 263, the recapitulative statement is to be supplied every month, though Member States may allow quarterly submission, e.g. (i) when the amount of supplies of goods is lower than EUR 50 000, and (ii) for supplies of services.[19] Annual submission is possible for certain micro taxpayers whose intra-Community supplies of goods are not greater than EUR 15 000, subject to a Council derogation which can be granted based on Articles 269 and 270.[20] As for VAT returns, **Member States may allow or can require the statement to be filled in electronically, and most of them require it for most taxpayers**. Electronic submission is by far the most common method for complying with this obligation. The data on intra-Community supplies resulting from the recapitulative statements submitted by taxable persons are exchanged and can be consulted by Member States' authorities via the VAT Information Exchange System (VIES).

2.3. Mapping of existing requirements

Since reporting requirements can be introduced and defined at national level, **DRRs existing in the EU are heterogeneous and differ over several dimensions, such as the frequency and modality of reporting**. Still, a few groups can be identified. This section provides a classification of the existing DRRs in the EU (in subsection 2.1); then, the various national systems are described and their main features are compared (in subsection 2.3.2), with country factsheets provided in Annex A. Finally, sub-section 2.3.4 provides information on the forthcoming proposals in a number of Member States.

2.3.1. Classification of requirements

Time and Modality of Compliance. Both the existing literature and the stakeholders consulted point out the lack of a common terminology to define the different DRRs. Still, two types of systems can be distinguished based on the **time** at which information is to be submitted (represented in Figure 3 below):

- **Periodic Transaction Controls (PTCs)**, in which transactional data are reported to tax authorities at regular intervals;
- **Continuous Transaction Controls (CTCs)**, in which transactional data are submitted electronically to tax authorities just before, during or shortly after the actual exchange of such data between the parties, <u>also including e-invoicing requirements.</u>

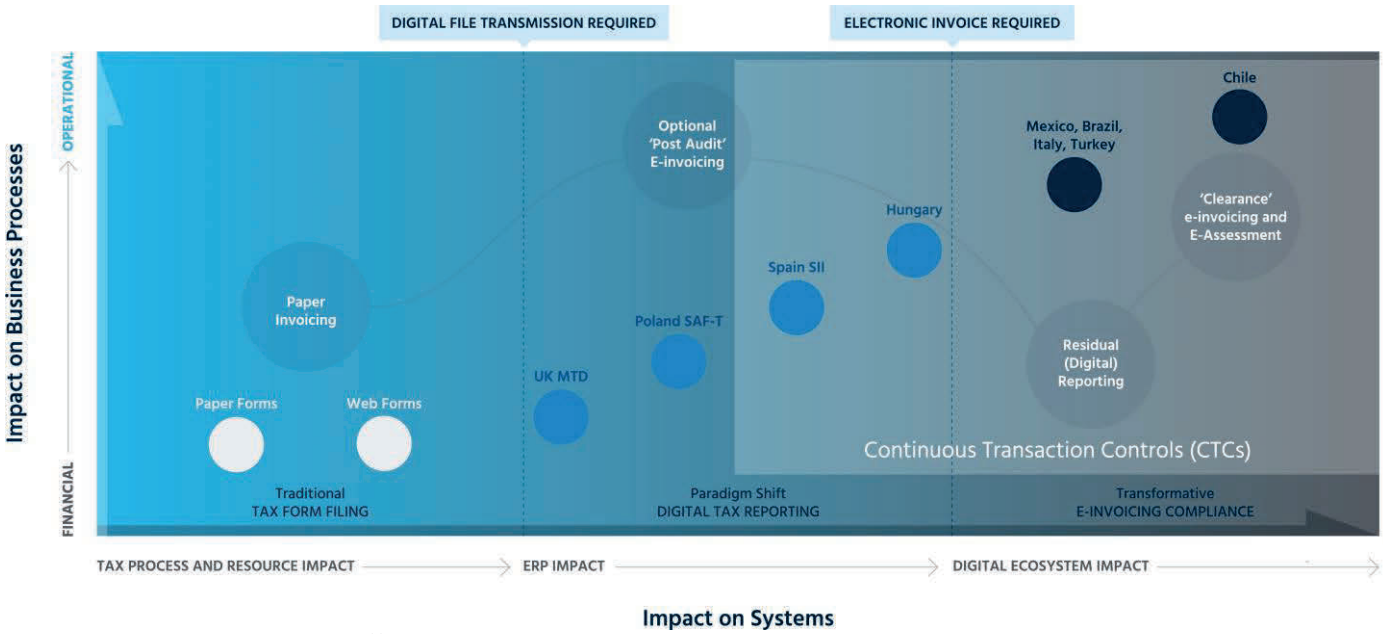
'Periodic vs. continuous' transaction controls represents one of the main policy choices when introducing a DRR system. The impact of these two types of DRRs is regarded as significantly different due to a number of reasons, such as:

- the degree of integration with pre-existing VAT compliance obligations. PTCs can complement or be joined to the existing VAT return, while CTCs are radically different from the reporting requirements envisaged in the VAT Directive;
- whether IT systems are to be set up for compliance, which in turn depends on whether automatic data exchange between the taxpayer and the authority is possible or required. CTCs typically require (or foster) more automation, and thus the setup of the appropriate IT environment;
- the possibility for taxpayers to consolidate and amend the data before submission, which is more complex or even not possible when CTCs set short reporting time constraints.

[19] Quarterly submission is not possible in 12 Member States. *Ibid.* at §11.4.2.
[20] In four Member States, *ibid.*

Also, this distinction captures the current trends in which EU Member States and non-EU jurisdictions are introducing CTCs or upgrading existing PTCs, even though adopting very different modalities of compliance (quasi-real-time vs. real-time, real-time with accounting data, e-invoicing with clearance, e-invoicing without clearance etc.).[21]

Figure 3. Continuous transaction control systems and other reporting obligations



Source. SOVOS 2021.[22]

A further distinction can be introduced based on the **modality of compliance** with the reporting obligations. This distinction more neatly captures the various types of requirements that exist across the EU Member States:

- within PTCs, one could distinguish between **VAT listing** and **SAF-T** requirements. The former requires the periodic transmission of transactional data according to a nationally-defined format, while the latter relies on the national specification of an OECD standard, i.e. the Standard Audit File for Tax[23];
- within CTCs, the main difference is between **real-time** and **e-invoicing** systems. Under a real-time system, the taxpayer should submit certain data shortly after carrying out a transaction but does not need to mandatorily use and share e-invoices with the tax administration. Under an e-invoicing system, the taxable person is mandated to use a structured e-invoice according to a pre-determined format, which is then shared with the tax administration.

Scope of data. Considering the systems currently in place in the EU, relevant differences also appear as regards the scope of the data required. In particular, Member States may require businesses to provide:

[21] For the purpose of this analysis, clearance is defined in terms of the role of the central IT platforms set up by the tax authority. In a no-clearance e-invoicing system, the supplier is able to send the e-invoice directly to its customer without having to request any token from the tax authority. In a clearance system, the supplier is required to either (i) obtain a verification token from the tax authority as a pre-condition to send the invoice, or (ii) send the draft e-invoice to a central IT platform, which in turns delivers (or issues and delivers) the e-invoice to the customer.
[22] SOVOS 2021.
[23] https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/technologies/45045602.pdf (last accessed in April 2021).

- only certain or all **VAT data** among those which can be retrieved from an invoice, such as the VAT taxable amount, the VAT payable and the applicable rate, including the e-invoice as a whole (or a subset of data from it); or
- **both VAT and other data** on other taxes or accounting information, such as stock data on inventories or depreciation, or payments.

Groups of requirements. Based on the reporting frequency, the modality of compliance and the data required, all systems existing in the EU can be classified into one of four groups listed in Table 1,[24] whose distinctive features can be summarised as follows:

- **VAT listing** is the obligation imposed on taxpayers to submit VAT transactional data according to a national format. Transactional data usually consist of a list of transactions (hence the term 'listing') with information on their values and counterparts, as well as other VAT relevant data among those which are to be included in the invoice. The data are submitted on a periodic basis (typically monthly or quarterly), often jointly with the VAT return.[25] Other data – accounting, other taxes – are not required.

- **SAF-T reporting** is a specific form of DRRs based on the OECD's standard. The standard was developed for tax audit purposes and can encompass information on direct and indirect taxes as well as accounting data; it can be tailored to single countries via national specifications. A number of Member States adapted and then mandated a SAF-T standard as the format through which tax and audit information, including on VAT transactions, is to be submitted to tax authorities on a periodic basis.[26]

- **Real-time reporting** is the obligation on taxpayers to transmit transactional data shortly after issuance of the invoice. The data required can be extracted from the invoice, but the invoice itself does not need be transmitted to the tax authority. The taxpayers must comply with the requirement within a short time-limit (the same day, or within a few days).[27]

- **e-Invoicing** is a compliance system requiring taxpayers to issue a structured e-invoice for VAT purposes. 'Structured' means that the e-invoice must conform to a machine-readable standard, so that it can be automatically processed. The e-invoice as a whole, or a set of data therefrom, must then be transmitted to the tax authority, prior to its issuance, as it takes place, or shortly thereafter. The taxpayer may be able to send the e-invoice directly to its customers while sharing it with the tax authority (**no-clearance e-invoicing**). Alternatively, the taxpayer may be required to go through the tax authority first, either to obtain

[24] In a very limited number of Member States, the reporting mechanism in place may fall under more than one category (as, for instance, in Portugal, where invoice data can be summited by the taxpayers either on a monthly basis or in real-time). In these exceptional cases, the national system has been classified in one group based on a prevalence principle. For instance, the Portuguese system is classified as SAF-T reporting, as, according to information provided by the Tax Authority, about two thirds of taxpayers submit the information monthly based on SAF-T.
[25] For the purpose of the Study, a listing which does not provide data at transactional level, but only the values of sales or purchases per customer or supplier, is considered a 'listing of suppliers and customers' and thus not included in this category. This is for example the case of the Belgian or Romanian annual listings (in Romania, it should soon be replaced by SAF-T). Cf. SOVOS 2021.
[26] In some Member States, while no reporting obligation has been introduced, accounting and tax data in SAF-T format can be requested by tax authorities in the case of audits. This is for instance the case in Austria, France, and Luxembourg. These on-demand requests linked to audits are not considered as DRRs.
[27] In the latter case, such systems can be defined as 'quasi-real-time' reporting; here the label 'real-time' is used whenever the data per each transaction are to be provided immediately, within the same day, or within few days, to distinguish them from periodic obligations, in which the reporting period is typically on a monthly or quarterly basis. Cf. SOVOS 2021.

a preliminary authorisation, or by using a central IT platform, which, in turn, delivers the e-invoice to the customer (**clearance e-invoicing**).[28]

Table 1. Groups of Digital Reporting Requirements

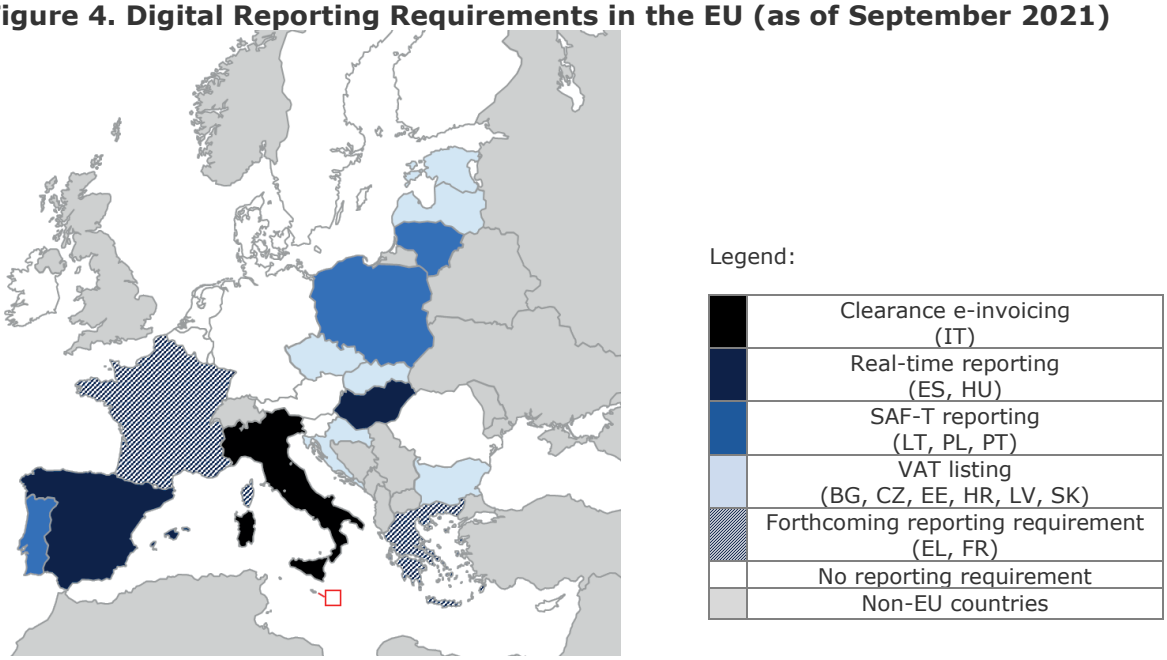
	Digital Reporting Requirements (DRRs)			
Frequency of the obligation	Periodic Transaction Controls (PTCs)		Continuous Transaction Controls (CTCs)	
Group	VAT listing	SAF-T	Real-time	E-invoicing

Source. Authors' own elaboration.

2.3.2. Existing reporting requirements in the EU

Figure 4 below classifies the DRRs existing in the EU Member States as of September 2021, according to the groups described above, based on desk research and the targeted consultation as validated by the tax authorities.

Figure 4. Digital Reporting Requirements in the EU (as of September 2021)



Notes. In AT, FR and LU, SAF-T files can be requested by the tax authority, usually prior to audits. In IT, VAT listing for cross-border transactions is required until June 2022, unless the relevant e-invoices are uploaded in the clearance system. In SI, a periodic transaction control has to be filed for supplies subject to Articles 199 and 199a (domestic reverse charge).
Source. Authors' own elaboration based on (i) "Study on the evaluation of the invoicing rules of Directive 2006/112/EC", Annex D, January 2019; (ii) SOVOS 2021; and (iii) targeted consultation validated by tax authorities.

Currently, **12 Member States have introduced a DRR.** Periodic obligations are the most widespread and have been introduced in nine Member States, in six of them as VAT listing and in three as SAF-T. Only three countries have introduced a CTC system, namely Spain and Hungary, as real-time, and Italy, which is the only Member State with a mandatory e-invoicing requirement. Two more – France and Greece – have already planned the introduction of DRRs:

- France will introduce an e-invoicing system for domestic transactions complemented by a VAT listing for non-domestic transactions;

[28] Currently, in the EU, only one country adopted mandatory e-invoicing, that is Italy, which opted for a clearance-based model. In France, this obligation is forthcoming, and will be based on a no clearance model, with the possibility of using a clearance central platform.

- Greece will introduce a real-time system, which however could also be complied with on a periodic basis.

Discussions are also ongoing in a number of other Member States, but no formal act has been proposed or approved in this respect.

DRR requirements show a very specific regional pattern and are **almost ubiquitous in Central-Eastern Europe, a significant and growing presence in Southern Europe, and still absent in North-Western Europe**:

- in Central-Eastern Europe, all countries apart from Slovenia and Romania have introduced DRRs; even in these two countries, some form of reporting obligations exist which do not amount to a full DRR.[29] In most cases – except for Hungary and, soon, Poland – the obligation is periodic;
- in Southern Europe, Portugal has introduced SAF-T, Spain and Italy have CTCs in place, and Greece will be joining soon with its own real-time/periodic system;
- in North-Western Europe, no country has any DRR in place at the moment, though France will introduce e-invoicing by 2023.[30]

All DRRs were introduced in the decade from 2010, except in Latvia and Bulgaria.[31] Typically, PTCs were introduced earlier: in addition to these two early adopters, six more countries introduced PTCs between 2013 and 2016 (Portugal, Lithuania, Poland, Slovakia, Czechia, and Estonia). CTC requirements only came into force relatively later, between 2017 and 2019, in Spain, Hungary and Italy.

Here below, DRRs are compared over a number of dimensions in which they can differ, namely:

1) frequency;
2) scope – taxpayers covered;
3) scope – transactions covered;
4) data content and format (i.e. the semantic and the syntax).[32]

1. Frequency. The main distinction, as already encapsulated into the categorisation described above, is between **periodic** and **real-time** reporting. Other differences exist on the exact frequency of periodic obligations as well as to "how real-time" real-time requirements are:

- VAT listings are typically submitted together with VAT returns, i.e. typically on a monthly basis, with quarterly (or longer) submission periods possible for smaller taxable persons. The same applies in Poland and Lithuania, where a SAF-T system is in place. The joint submission of the two reports allows, on the one hand, to reduce compliance costs for taxpayers and, on the other, to perform an

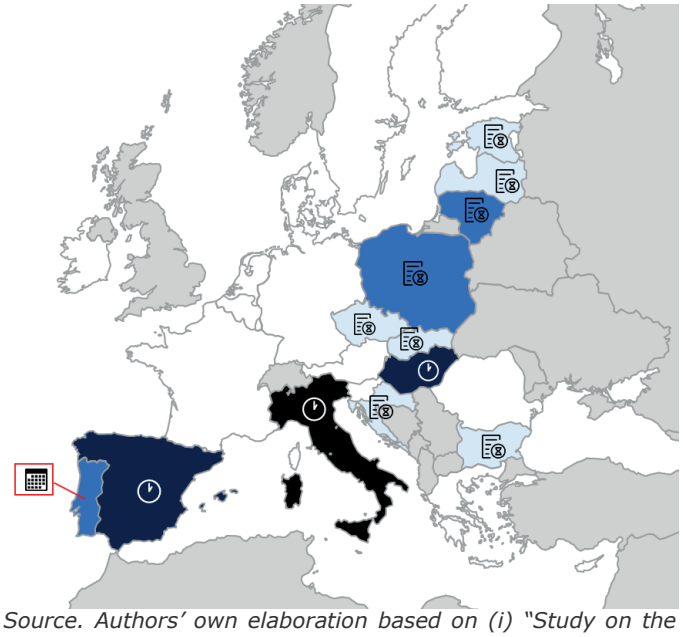
[29] In Slovenia, reporting obligations apply to transactions subject to domestic reverse charge; in Romania, taxpayers must file an annual sales and invoice register, though transactions are aggregated per supplier / customer. This is soon to be replaced by a SAF-T system.
[30] In Belgium, an annual sales listing should be submitted; data are not recorded on a transactional basis. In Austria, Luxembourg, and France, certain companies must keep a number of records in the SAF-T format, which need to be presented to the tax authorities in case of audits; data are not submitted on a regular basis. France has recently deferred the introduction to 2024.
[31] In Latvia and Bulgaria, periodic requirements were adopted back in 2001 and 2006, respectively; electronic submission was already possible since then and became mandatory in January 2011 and 2018, respectively.
[32] These aspects are addressed by the European standard on e-invoicing. Cf. EN 16931, Electronic invoicing - Part 1: Semantic data model of the core elements of an electronic invoice.

immediate crosscheck. The only exception is Portugal, where the frequency of the SAF-T obligation is monthly, regardless of the VAT return deadlines.[33]

- As for CTC systems, in Spain data must be submitted within four days following the date of issuance of the invoice, while in Hungary the maximum delay is 24 hours. In Italy, the draft invoice is submitted to the exchange platform before its issuance.

[33] In Portugal, taxpayers can also opt for reporting transactional data through webservice integration in real-time rather than periodically, but only a very small minority (about 8%) of taxpayers has chosen to do so.

Figure 5. Digital Reporting Requirements: Reporting frequency



Legend:

	Clearance e-invoicing (IT)
	Real-time reporting (ES, HU)
	SAF-T reporting (LT, PL, PT)
	VAT listing (BG, CZ, EE, HR, LV, SK)
	No reporting requirement up to September 2021
	Non-EU countries
	Jointly with VAT return (BG, CZ, EE, HR, LT, LV, PL, SK)
	Real-time (ES, HU, IT)
	Monthly (PT)

Source. Authors' own elaboration based on (i) "Study on the evaluation of the invoicing rules of Directive 2006/112/EC", Annex D, January 2019; (ii) SOVOS 2021; and (iii) targeted consultation validated by tax authorities.

2. Scope – Taxpayers. With regard to the taxpayers covered by the reporting requirements, national rules may include a turnover **threshold** below which VAT-registered taxable persons are not subject to certain reporting obligations. The exclusion can also be defined in terms of **sectors** or **specific VAT regimes**. Furthermore, **requirements can be different depending on whether a company is established in the country or not**, i.e. they can apply to all VAT taxable persons registered in a country (including, for instance, VAT registrations of foreign established companies), or only to companies resident or established therein.

In several Member States, micro taxpayers benefiting from the SME exemption scheme are also exempt from mandatory VAT registration (which remains voluntary or required in case of certain intra-EU or domestic transactions). Non-registered micro taxpayers are excluded from all or most VAT compliance obligations, including reporting requirements. The threshold, therefore, only applies to VAT-registered taxpayers. For instance, in Lithuania registration is compulsory above a turnover of EUR 45 000. In practice, these registration thresholds, where existing, exclude the smallest taxpayers regardless of whether a turnover threshold is explicitly foreseen in the DRR provisions.

Periodic obligations – both VAT listing and SAF-T – are the most inclusive. In all nine Member States, no turnover threshold or sectoral exemptions are foreseen.[34] In addition, in all these countries except Portugal, the obligations apply to both resident and non-resident companies with a local VAT registration.[35]

The situation is more diverse in Member States with CTCs:

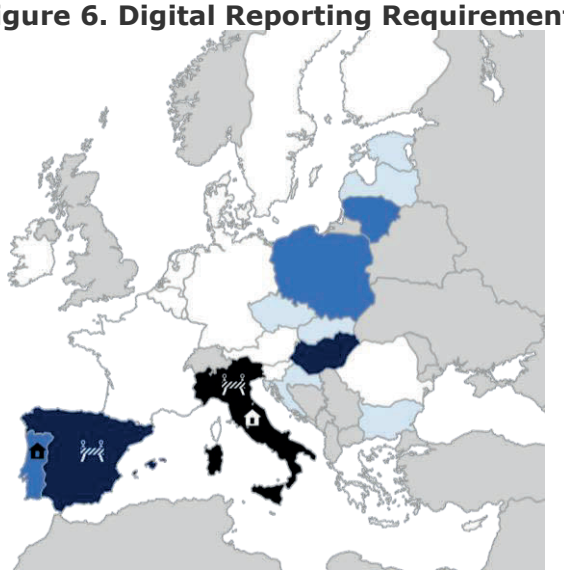
- in Spain, the SII (*Suministro Inmediato de Informacion)* is mandatory for companies with a turnover greater than EUR 6 million per year; the obligation also applies to non-resident companies with a local VAT registration, when the taxable amount is higher than the same threshold, as well as to local VAT groups;

[34] Provided that they carried out transactions subject to VAT in the given period.
[35] Thresholds were used, at first, in Poland (SAF-T), starting with larger companies and then involving SMEs, micro companies and self-employed based on declining turnover thresholds; the introduction was made in three steps over two years and was completed in 2018.

- in Hungary, the requirement applies to all companies – either resident/established or not – which issue invoices the place of transaction of which is Hungary; and

- in Italy, taxpayers with an annual turnover lower than EUR 65 000 may opt out of the e-invoicing requirements.[36] The e-invoicing requirements only apply to transactions carried out by locally established companies; thus, non-established entities are not covered.

Figure 6. Digital Reporting Requirements: Taxpayers covered



Legend:

	Clearance e-invoicing (IT)
	Real-time reporting (ES, HU)
	SAF-T reporting (LT, PL, PT)
	VAT listing (BG, CZ, EE, HR, LV, SK)
	No reporting requirement up to September 2021
	Non-EU countries
	Threshold (ES, IT)
	Resident / established companies only (IT, PT)

Source. Authors' own elaboration based on (i) "Study on the evaluation of the invoicing rules of Directive 2006/112/EC", Annex D, January 2019; (ii) SOVOS 2021; and (iii) targeted consultation validated by tax authorities.

3. Scope – Transactions. With regard to the transactions covered by the requirements, DRRs may differ along the following dimensions:

- whether all transactions or only those with a value higher than a certain **threshold** are covered;
- whether the obligation covers both **purchase and sale transactions**, or only just sales or just purchases;
- the **geographical scope**, i.e. whether the requirement applies to domestic, intra-EU or extra-EU transactions;
- depending on the nature of the customers, whether the requirement applies to **B2B, B2G or B2C transactions**.

Across all Member States, **transactions of any value should be reported via the DRR**. In other words, there are no value-based thresholds. Still, in most VAT listing systems (Estonia, Latvia, Slovakia, and Czechia), transactions below a certain value can be reported in aggregate form.[37]

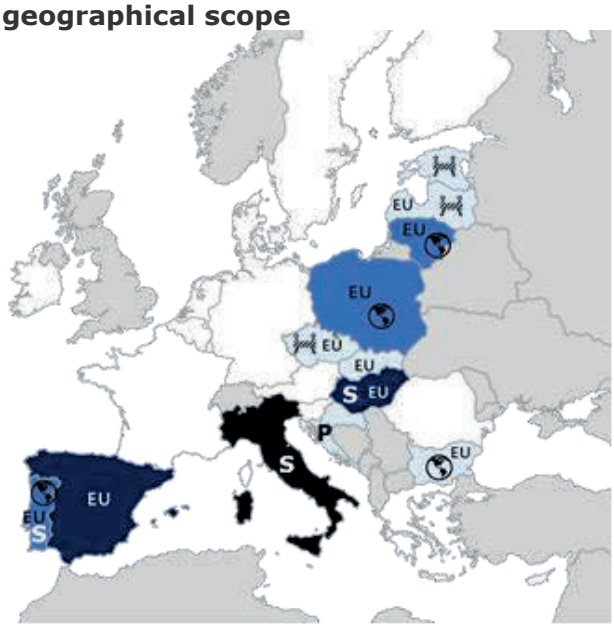
As for the type of transaction, i.e. sales and/or purchases, **VAT listing and SAF-T systems typically cover both sales and purchases**. The exceptions are Croatia –

[36] More precisely, the exemption applies to VAT taxable persons subject to any of the following VAT SME schemes: *regime dei minimi*, *forfettario* or *di vantaggio.* In practice, most taxable persons whose turnover is below EUR 65 000 can opt for such scheme. The exemption also applies to small agricultural producers, amateur sport associations and providers of health-related goods or services (but only if the invoice contains sensitive personal data about an individual's health).
[37] Transactions can be reported in aggregated form in the following countries: (i) Estonia (trading relationships whose value is less than EUR 1 000 per period); (ii) Latvia and Czechia (low-value transactions below EUR and EUR 150 respectively); and (iii) Slovakia (transactions covered by simplified invoices). In Hungary, only transactions with a value higher than HUF 100 000 (about EUR 300) had to be reported; the threshold was later removed.

only purchase invoices – and Portugal – only sales invoices.[38] **CTC systems do not necessarily cover both sides of the transaction**. Spain requires the transmission of real-time data for both sales and purchases – again in line with its overall approach which require taxable persons to keep VAT e-ledgers through the tax authority IT system. Differently, the Italian and Hungarian systems only encompass sales.[39]

Finally, **the variability increases when it comes to the geographical scope**. As for VAT listing, Croatia and Estonia only cover domestic transactions, while both domestic and intra-EU transactions (or at least acquisitions) are to be reported in Czechia, Latvia and Slovakia. Extra-EU transactions are covered only in Bulgaria. The SAF-T are the most comprehensive systems, covering all transactions regardless of their geographical origin or destination.[40] Real-time requirements (as in Spain and Hungary) apply to both domestic and intra-EU transactions; at the moment, the Italian e-invoicing system is mandatory for domestic transactions and optional (until July 2022) for all others.

Figure 7. Digital Reporting Requirements: Type of transactions and geographical scope



Legend:

	Clearance e-invoicing (IT)
	Real-time reporting (ES, HU)
	SAF-T reporting (LT, PL, PT)
	VAT listing (BG, CZ, EE, HR, LV, SK)
	No reporting requirement up to September 2021
	Non-EU countries
S	Only sales (HU, IT, PT)
P	Only purchases (HR)
	Threshold for aggregating low-value transactions (CZ, EE, LV, SK)
EU	Intra-EU (BG, CZ, ES, HU, LT, LV, PL, PT, SK)
	Extra-EU (BG, LT, PL, PT)

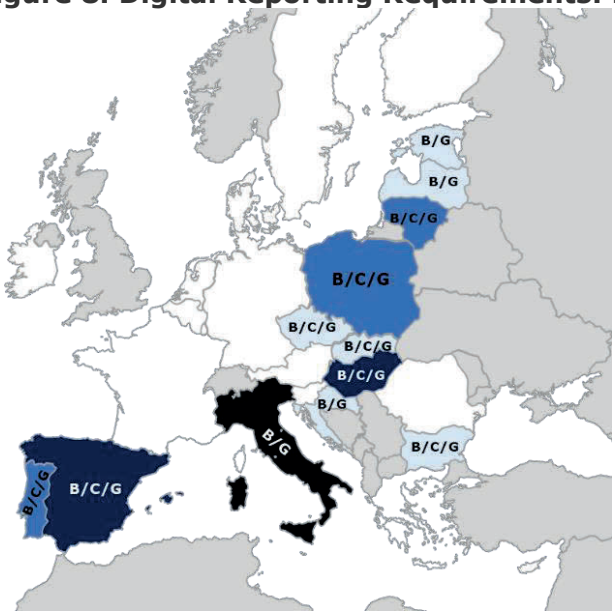
Notes. In Hungary, intra-EU transactions are covered as of 2021. In Italy, intra-EU and extra-EU transactions can be reported on a voluntary basis; this will become mandatory as of 2022. In Latvia and Czechia only intra-EU acquisitions are covered. In Slovakia, transactions for which simplified invoices are issued can be reported on an aggregate basis.
Source. Authors' own elaboration based on (i) "Study on the evaluation of the invoicing rules of Directive 2006/112/EC", Annex D, January 2019; (ii) SOVOS 2021; and (iii) targeted consultation validated by tax authorities.

Finally, **in terms of market segments**, the choice is whether to cover only B2B and B2G or also include B2C transactions.[41] In the majority of Member States, the existing systems cover all three market segments (eight countries); B2C are excluded from reporting in Estonia, Croatia, Latvia and Italy. In no Member State the reporting mechanism only applies to B2B transactions i.e. excluding B2G (which are covered in all Member States based on the provisions of the e-Invoicing Directive, though in 11 Member States there is no obligation for taxpayers in this respect). In Italy, B2C transactions are subject to a different complementary DRR (*trasmissione telematica dei*

[38] Covering both purchase and sale transactions allows for cross-checking the data reported by the counterparts, while obviously increasing the amount of data reported. However, this may not be a material complication, since both purchase and sale transactions are to be annotated in VAT ledgers and used to calculate the data for the VAT return.
[39] In Italy, the customer does not need to verify or accept the incoming e-invoice (except for invoices received by public authorities in the context of B2G transactions).
[40] SAF-T also requires the submission of accounting data, which must reflect all transactions.
[41] In no Member State the reporting mechanism only applies to B2B transactions ie excluding B2G.

corrispettivi). As for groups, SAF-T systems cover all transactions – again, this is likely linked to the different scope of this reporting obligation; the same applies for the real-time systems in Spain and Hungary. Among VAT listings, Member States adopted different approaches, with a majority of countries also requiring data on B2C transactions.

Figure 8. Digital Reporting Requirements: Market segments



Legend:

	Clearance e-invoicing (IT)
	Real-time reporting (ES, HU)
	SAF-T reporting (LT, PL, PT)
	VAT listing (BG, CZ, EE, HR, LV, SK)
	No reporting requirement up to September 2021
	Non-EU countries
B	B2B transactions (BG, CZ, EE, ES, IT, HR, HU, LT, LV, PL, PT, SK)
C	B2C transactions (BG, CZ, ES, HU, PL, PT, SK)
G	B2G transactions (BG, CZ, EE, ES, IT, HR, HU, LT, LV, PL, PT, SK)

Notes. In Italy, B2C transactions for which an invoice is required by law or demanded by customers are included; other B2C transactions are subject to a different DRR.
Source. Authors' own elaboration based on (i) "Study on the evaluation of the invoicing rules of Directive 2006/112/EC", Annex D, January 2019; (ii) SOVOS 2021; and (iii) targeted consultation validated by tax authorities.

4. Data content and format. The various systems differ in terms of the amount of data extracted from taxpayers. In Italy, the e-invoicing system requires that the e-invoice as a whole is put at the disposal of the tax authority; however, the latter can store and automatically process only those data which are required for automatic controls, excluding commercially sensitive or personal information (e.g. the description of the goods and services traded).

The other groups of DRRs collect a similar amount of VAT data. In the 11 Member States – thus excluding Italy – the following data are required:

1) the identification of the trading partner, usually via the VAT number.[42] This can be complemented by the trading partner name (in eight countries) or other details such as its address (only in Hungary);
2) information on the value of the transaction, by providing at least two data items from among the taxable amount, the total amount and the VAT payable amount.[43] This can be complemented by the applicable VAT rate, required in nine countries;
3) the invoice number, required in all Member States; and
4) the type of transaction (e.g. whether in goods or services), required in nine Member States.

In the countries with SAF-T systems, VAT data are complemented with other accounting data that can be used to estimate other information about the company's financials, that, in turn, can also be used to calculate other taxes (e.g. on profits and revenues). The exact scope of the data required depends on the national specifications and lies

[42] The registry number is used in Estonia.
[43] The missing information can be calculated using the two data items provided.

outside the VAT reporting requirement. SAF-T modules may also require additional VAT-related information; this is the case for instance in Poland, where the taxpayer must also provide information on the application of the split payment scheme and the nature of the goods and services provided.

As to the format of submission, the dominant filetype is XML, used in ten countries including Italy; in Bulgaria, the file is to be submitted in TXT format, while in Latvia in PDF. The submission typically takes place via the tax authority's online portal, through which files can be uploaded or data transmitted machine-to-machine via an Application Programming Interface (API). In some countries, dedicated software can be used, provided by the tax authority or private software houses. Files can usually be submitted directly by the taxpayer, or via an intermediary or a third-party service provider.

While the general architecture is relatively similar, **the communication architecture and the format specifications vary from country to country**. The latter can concern, for instance, the certification of private/commercial software used to transmit the data (required in Portugal), the communication protocol (SOAP 1.1 in Spain), specific transmission requirements (without manual intervention in Hungary) or networks (as the Data Boxes information system in Czechia).

Finally, in Italy B2B e-invoices must be submitted according to the *FatturaPA* format, which is an XML standard; B2G e-invoices can also be submitted according to the European Standard EN 16931 (UBL/CII filetype). E-invoices must be exchanged only via the SDI (*Sistema d'Interscambio*) public platform, either via an intermediary or by the taxable person directly connected to the platform.

2.3.3. Summing up: Existing Digital Reporting Requirements in the EU.

Twelve EU Member States have introduced DRRs, opting for very different solutions, ranging from VAT listing to e-invoicing. However, in terms of basic choices and system architectures, **certain commonalities can be identified**:

- **VAT listings are to be submitted jointly with the VAT return and cover all VAT registered taxpayers**, both resident and non-resident, and with any level of turnover. In terms of transactions, **they tend to cover both sales and purchases**; B2B and B2G transactions; and domestic and intra-EU transactions (but B2C and extra-EU transactions can also be included). The listings include data about the trading counterparty, the value and type of the transaction, and the invoice number; the forms are commonly submitted as XML files via online portals or machine-to-machine API.

- The typical features of a **SAF-T** system are similar, except that it tends to be **more inclusive**, i.e. involving all transactions carried out by a taxable person, over any market segment or geographic destination/origin. Furthermore, given the nature of SAF-T, these mechanisms include (or are associated with) the collection of other tax and accounting data.

Given the fewer number of countries having introduced them**, identifying regularities among CTC requirements is more difficult.** Compared to periodic reporting, they are obviously different in terms of reporting frequency, and, for e-invoicing, the scope of the data collected. Other than that, they are more likely to provide for a turnover (Spain and Italy) or transaction value threshold (Hungary in the first phase). Indeed, these systems are likely to be costlier to introduce and maintain for taxpayers and therefore smaller businesses may be granted an exception. Box 1 provides a snapshot of the various national systems; the country factsheets are included in Annex A.

Box 1. National Digital Reporting Requirements (as of September, 2021)

Periodic – VAT Listing

Bulgaria. Bulgaria introduced the obligation to submit sales and purchases registers jointly with VAT returns (i.e. monthly) in 2006. Since January 2018, these registers (and the VAT return) have to be submitted electronically. The provisions apply to all taxable persons registered in Bulgaria for VAT, including non-resident businesses. The scope of the DRR includes all transactions (no value threshold; sales and purchases; B2B, B2G and B2C; domestic, intra-EU and extra-EU transactions). Data are to be submitted in TXT format through the tax authority's online portal.

Croatia. The obligation to electronically submit the register of purchase invoices (called U-RA form) in conjunction with the VAT return was introduced as of January 2019. All taxable persons which are VAT-registered in the country, including non-resident businesses, are subject to this reporting requirement on a monthly or quarterly basis, depending on the frequency of the VAT return. Only domestic purchases concerning B2B and B2G transactions must be reported. Data must be submitted using the XML format through the tax authority's online portal.

Czechia. Since January 2016, all taxable persons which are VAT-registered in the country must submit the VAT Control Statement on a monthly basis, except for natural persons submitting it with their VAT return (i.e. monthly or quarterly). All domestic sales and purchases must be reported, whether B2B, B2G or B2C, as well as intra-EU acquisitions. Information must be reported on a transaction-by-transaction basis, with the exception of transactions below CZK 10 000 (EUR 380), which must be reported on a per customer basis. Data must be submitted using the XML format, either through the tax portal using the EPO web application[44] or through a third-party interface via secure network of Data Boxes.

Estonia. Estonia introduced the obligation to report VAT transactional data by filling in the appendix to the VAT return (the KMD INF form) as of November 2014; the frequency is the same as the VAT return (monthly or quarterly). This obligation applies to all VAT taxable persons which are registered in Estonia, including non-resident businesses. The reporting requirement covers domestic B2B and B2G sales and purchases. All transactions are to be reported; however, when the value of the transactions with a trading partner in the taxable period is less than EUR 1 000, these transactions can be reported on an aggregated (per customer) basis. Data can be submitted: (i) by entering data manually or uploading files in the XML or CSV format on the tax authority's portal; (ii) via X-Road by means of a machine-to-machine interface; and (iii) exceptionally, on paper.

Latvia. In Latvia, VAT listing was introduced in 2001 on domestic transactions and, in 2004, on intra-community transactions (acquisitions and supplies). These detailed transactional data (referred to as National Recapitulative Statements) are submitted as an appendix to the VAT return, on a monthly or quarterly basis. Latvia introduced the obligation to electronically comply with reporting requirements as of January 2011. The obligation applies to all VAT taxable persons registered in Latvia, including non-resident businesses. The scope of the mechanism includes both purchases and sales in the B2B and B2G system. Transactions with a value lower than EUR 150 must be reported in an aggregated way. Data must be submitted using the PDF format, through the Electronic Declaration System.

Slovakia. Slovakia introduced the obligation to submit electronically detailed transactional data (VAT Control Statement) jointly with the VAT returns, i.e. monthly or quarterly, as of January 2014. The obligation applies to all VAT taxable persons registered in Slovakia, including non-resident businesses. The mechanism covers all domestic and intra-EU transactions (both sales and purchases; B2B, B2C and B2G). Transactions for which a simplified invoice was issued can be reported on an aggregate basis. Data must be submitted using the XML format, either through the tax authority's portal or using the downloadable form-filling program (eDane) distributed by the tax authority.

Periodic - SAF-T reporting

Lithuania. Lithuania introduced the obligation to submit transactional data through i.SAF as of October 2016. i.SAF is a SAF-T component of a larger system, called i.MAS. The frequency of

[44] EPO (Electronic submissions for the Financial Administration) is a web application provided by tax administration for free that allows e-filing of tax returns and sending other documents electronically. Through the EPO application, it is possible to (i) send file without certified electronic signature, (ii) send it with verified identity of the subscriber in a way used to log-in to Data box, and (iii) eventually, save it for sending to the tax Data box.

the obligation is aligned with the VAT return, i.e. monthly and biannual (for natural persons). The obligation to submit i.SAF applies to all taxable persons which are registered for VAT in Lithuania, including non-resident businesses, with the exception of non-resident VAT-registered non-taxable persons that are registered only because of intra-Community acquisitions and do not carry out any other economic activity in the country. The scope of the DRR includes all transactions (no value threshold; sales and purchases; B2B, B2G and B2C; domestic, intra-EU and extra-EU transactions). Data must be submitted using the XML format, through direct entry into the tax authority's portal, by uploading the XML file or through a web service.

Poland. Poland introduced the obligation to submit a SAF-T report (called JPK_VAT) as of July 2016. The JPK_VAT was introduced in stages: first for large companies, then for SMEs in 2017 and for micro enterprises in 2018. Prior to October 2020, the JPK_VAT required the submission of the VAT ledger only; since October 2020, a new SAF-T JPK_VAT file version has been introduced which encompasses both the VAT ledger and the VAT return. The frequency of submission is that of the VAT return (monthly; quarterly for smaller taxpayers). The obligation to submit the JPK_VAT applies to all VAT taxable persons active in Poland, including non-resident ones. The scope of the DRR includes all transactions (no value threshold; sales and purchases; B2B, B2G and B2C; domestic, intra-EU and extra-EU transactions). Data must be submitted using the XML format, through the free tools provided by the Ministry of Finance (such as the *e-microfirma* application, the interactive form and the JPK_WEB Client) or other applications available on the market.

Portugal. Since January 2013, on a monthly basis and by the 12th day after the end of each month, all resident taxpayers must send to the Portuguese tax administration, the data of all invoices issued (B2B, B2C or B2G; domestic, intra-EU or extra-EU transactions; including simplified invoices, debit notes and credit notes). Invoice data are submitted through a structured (XML) file based on the SAF-T(PT)[45]. Alternatively, data may be submitted in real time via web-services. In this case, the software used by taxpayers must be certified by the tax authority. For micro businesses, the option of direct insertion of invoice data in the tax administration's web portal is also available.

CTCs – Real time

Hungary. The Real-Time Information Reporting (RTIR) system was introduced as of January 2016 and applies to all businesses registered in Hungary for VAT purposes. Initially, only invoice data of B2B and B2G domestic sales above HUF 100 000 (about EUR 300) had to be reported. Over time, however, the RTIR scope has been widened: first, the threshold on domestic transactions was removed starting from July 2020; then, from January 2021 invoice data for intra-Community transactions, exports and B2C transactions must also be submitted. Before the introduction of the RTIR, a periodic VAT reporting obligation applied to the submission of the domestic transaction statements jointly with the VAT return. This reporting requirement only covered high value transactions, with a value of the invoice of at least EUR 6 500. In 2015 the threshold was lowered to EUR 3 250 and the requirement was then replaced by the RTIR. Information must be reported on a transaction-by-transaction basis, when the invoice is issued (or within 24 hours at the latest). Data must be submitted using the XML format through the tax authority's portal. Submissions must be fully automated over the internet from accounting, ERP or billing systems, without manual intervention.

Spain. DRRs are part of a broader modernization of the VAT management system that came into effect in July 2017, the so-called SII. In practice, the SII is a book-keeping system maintained directly in the electronic office of the tax authority. In order to register the invoices on the VAT registers, taxpayers must send the invoicing details to the tax authority, for both issued and received invoices, within four working days. The SII is mandatory for (i) businesses registered in Spain with an annual turnover above EUR 6 million; (ii) businesses registered in the monthly refund scheme (REDEME); and (iii) businesses belonging to VAT groups (joint VAT registration) registered in Spain. Other VAT taxpayers can enrol on a voluntary basis. All domestic and intra-EU transactions (sales and purchases), regardless of their value. All B2B, B2G and B2C, transactions are covered. Taxpayers enrolled in the SII are exempt from other reporting obligations, namely the domestic recapitulative statements, the statement of operations with third parties and the annual VAT return. Data are transmitted electronically, usually through web services based on the exchange of XML messages. For smaller taxpayers or for the rectification of one invoice, a web form is completed.

[45] Since 2008, taxpayers are required to generate a SAF-T file, to which they export the data of the issued invoices and accounting. The SAF-T file was mandatory, on request, for audit purposes.

Italy. On January 1st, 2019, Italy introduced an obligation to use structured e-invoices for all transactions for which an invoice is required. These e-invoices have to be compliant with the *FatturaPA* format (XML) and are to be exchanged via the *Sistema di Interscambio* (SDI) public platform. The obligation applies to all transactions carried out by VAT taxable persons resident in Italy or with a fixed establishment therein, thus excluding non-resident businesses. The obligation does not apply to VAT taxable persons subject to the SME exemption scheme, i.e. with a turnover not higher than EUR 65 000 per year. The obligation to use structured e-invoices compliant with local requirements applies to all B2B and B2G transactions and B2C transactions, when an invoice is required by law or demanded by the customer. The obligation applies to domestic supplies; intra-EU and extra-EU supplies can be submitted to the SDI on a voluntary basis (and mandatorily from January 2022). The Italian system is clearance-based: e-invoices must be sent, possibly via an intermediary, to the SDI and are considered as a lawfully issued invoice when the e-invoice is delivered by the SDI to the counterpart. The tax authority cannot store all invoice data, but only those required to perform automatic controls (e.g. the description of the goods and services is not stored).

2.3.4. Forthcoming Digital Reporting Requirements and future evolution

In two countries, France and Greece, the governments have officially adopted a decision to introduce some form of DRRs. France opted for an e-invoicing system for B2B and B2G domestic transactions, coupled with a VAT listing for other transactions. Greece opted for a DRR, which is devised as real-time, with the possibility of periodic reporting for smaller companies.

France. In France, with the *Loi de finances pour 2020,*[46] the government proposed, and it was subsequently adopted by the Parliament, to overhaul the French approach to VAT reporting and e-invoicing. Based on the adopted measures,[47] between 2023 and 2025, the use of e-invoicing will be mandatory for B2B transactions (established businesses only), next to the existing B2G obligation. As in the Italian case, the system will be built on the existing platform used for B2G e-invoicing (Chorus Pro). This requirement will be coupled with an e-reporting system covering B2C transactions, as well as non-domestic transactions (both intra- and extra-EU).[48]

The e-invoicing system will combine a clearance and no-clearance approach, since the taxpayer will be able either to use the public platform to deliver the invoice to the counterpart, or to send the invoice to the counterpart by means of certified private intermediaries, which would in turn send the e-invoice to the public administration via Chorus Pro. The platform will extract the invoice data from the e-invoice, and only store those which are regarded as necessary for tax control activities (i.e. excluding commercially sensitive information such as the description of the goods or services exchanged). Next to those data, payment data will also have to be provided by the seller and the buyer.

Technical details, including the semantic and the syntax of the system are yet to be finalised. The platform will accept different formats, while making sure that companies are slowly nudged into using native structured formats. Similarly, there will be several modes of connection, via an online portal, Electronic Data Interchange, or an API.

[46] Article 153.
[47] Including Article 195 of the *loi de finances pour 2021*, which gave the government the power to require data for transactions not covered by an e-invoice. The introduction has been deferred to 2024 – 2026 – see point 48 below.
[48] Cf. *Ministère de l'Économie, des Finances et de la Relance*, Report of the *Direction Générale des Finances publiques,* "La TVA à l'ère du digital en France", October 2020; "*Présentation de la plateforme publique de facturation électronique B2B et* d'*e-reporting"*, presented by the *Agence pour l'informatique financière de l'État* on 26 March 2021; "GT entreprises" presented by the *Direction générale des Finances publiques* on 26 March 2021; *Ordonnance n° 2021-1190 du 15 septembre 2021 relative à la généralisation de la facturation électronique dans les transactions entre assujettis à la taxe sur la valeur ajoutée et à la transmission des données de transaction*.

The entry into effect of the new obligations will be made in steps. The issuance of e-invoices will be made mandatory in July 2024 for large companies, in 2025 for *entreprises de taille intermédiaire*,[49] and from 2026 all other companies and taxable persons. From July 2024, a general obligation to receive e-invoices will be introduced.

Greece. In Greece, companies that are subject to local accounting requirements will have to provide VAT, other tax, and accounting information to the myDATA[50] public platform. The entry into force of this new requirement was expected in 2019, but then postponed for various reasons, including, last year, the COVID-19 pandemic. Its entry into force started in November 2021 and is completed in steps until 31st of March 2022.[51]

The myDATA system is an e-accounting system which also includes reporting obligations, to be fulfilled either periodically or on a real-time basis. It requires companies to provide a set of data, which cover both VAT, as well as other taxes and accounting information, to a public platform, which are then used to maintain online tax ledgers. In a way, such hybrid solution incorporates elements of the SAF-T approach, covering holistically the fiscal and accounting life of a company, as well as of the Spanish real-time SII.

The data can be provided periodically by taxpayers through a software or special data forms. Alternatively, taxpayers can opt for issuing e-invoices via licensed providers, which would in turn report the data to the tax authority. In the latter case, data are transmitted in real-time. The use of e-invoices (and thus the provision of real-time data) will remain optional for taxpayers.

This DRR will cover all transactions, over B2B, B2G and B2C segments, and both domestic and international transactions. All companies resident in Greece (or in any event subject to local accounting requirements) will have to comply with the system, with no threshold foreseen. The taxable person with a turnover of less than EUR 50 000 or issuing less than 50 invoices per year will be able to use a special data entry form, which allows them to manually upload invoice data on the myDATA web portal.

Other developments. During the targeted consultation and via secondary sources, a number of countries are reportedly considering the introduction of DRRs. Most of the attention being currently focused on the introduction of e-invoicing requirements, in many cases to replace existing DRRs or from scratch (with phased implementation).

A number of countries in which DRRs are in place have announced or are considering the possibility to switch to e-invoicing. This includes **Slovakia**, which opened a consultation on the introduction of mandatory e-invoicing requirements, through a system that will provide the tax authority invoice data at or before invoice issuance, via business accounting software or a free public platform.[52] A similar development emerged in **Spain**, where a draft law on the introduction of mandatory e-invoicing to promote digitalisation and fight late payments has been put out for consultation; interestingly, the explanatory memorandum also foresee the possibility of using the resources of the National Plan for Recovery and Resilience to support costs borne by companies to setup

[49] This is a class of companies which, according to the EU definition, is classified as large. *Entreprises de taille intermédiaire* include companies (i) with 250 to 5 000 employees and a turnover not greater than EUR 1.5 bn, or assets not greater than EUR 2 bn; (ii) with less than 250 employees, but a turnover higher than EUR 50 mn or assets higher than EUR 43 mn.
[50] The acronym stands for My Digital Accounting and Tax Application.
[51] Cf. article 15A of Law 4174/2013 and Joint Decision of The Minister of Finance and Governor of IAPR, A.1138/2020. Cf. https://edicomgroup.com/blog/e-tax-compliance-in-greece-mydata; Or: https://sovos.com/vat/tax-rules/mydata-greece/ (last accessed on February, 2022).
[52] Information on the consultation process available at https://www.mfsr.sk/sk/media/tlacove-spravy/nova-web-stranka-4.html (last accessed in April 2021).

an e-invoicing system.[53] A public consultation to the same purpose has also been announced in Bulgaria.[54] Finally, also Croatia signaled that it is planning to introduce e-invoicing.[55]

At a more advanced stage, **Poland** announced its plans to introduce mandatory B2B e-invoicing as from 2023 (with the possibility of voluntary adoption by January 2022), building upon its existing infrastructure for B2G. The system will be clearance-based, with the public platform KSeF receiving the draft e-invoice from the sender; the e-invoice will be identified with a unique number and a time stamp will be applied, before it is delivered to the receiver.[56]

In **Hungary**, e-invoices have not been made mandatory, but since 2021 the XML file submitted to comply with the real-time reporting obligations can be delivered by the tax authority to the customer and used as an e-invoice. To this end, the issuers must indicate that it is an e-invoice, generate a hash value from the invoice data and insert it into the XML file. In addition to the data mandatory for RTIR, all data required for invoices must be included into the XML file.[57]

Romania has a system of sales and purchasing listings (the so-called D394 form) in place but has announced that the country will move towards SAF-T reporting from January 2022 (form D406). The obligation will first come into effect for large taxpayers and then for medium (during 2022) and smaller (2023) taxpayers. The obligation will also include foreign entities that are registered in Romania for VAT purposes. The frequency of the SAF-T reporting will be in line with the timing of VAT returns, which are filed monthly or quarterly. In addition to transaction data, the taxpayer is to submit data on fixed assets (annually) and inventories (on demand).[58] At the same time, Romania is launching a voluntary e-invoicing programme called *e-Factura*, inspired to the Italian model and based on the existing B2G platform.[59]

Finally, while no proposal has yet been announced or tabled, **Finland** has launched a study, with the support of the European Commission, on the potential for the introduction of DRR. This study suggests a phased approach, first by including transactional data into VAT returns, and then requiring the real-time submission of data from e-invoices.[60]

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[53] Information available at: https://portal.mineco.gob.es/es-es/ministerio/participacionpublica/audienciapublica/Paginas/Anteproyecto_Ley_Creaci%c3%b3n_y_Crecimiento_Empresarial.aspx; https://www.pagero.com/compliance/world-map/spain/#136788 (last accessed in September 2021).

[54] Information available at https://www.pagero.com/compliance/world-map/bulgaria/#118053 (last accessed in April 2021).

[55] Targeted consultation.

[56] Cf. Targeted consultation and https://www.avalara.com/vatlive/en/vat-news/poland-launches-b2b-e-invoice-consultation.html (last accessed in April 2021).

[57] Cf. Targeted consultation and https://blog.seeburger.com/when-will-real-time-invoice-reporting-rtir-become-real-time-e-invoicing-in-hungary/ (last accessed on April 2021).

[58] Information available at: https://innovatetax.com/saf-t-coming-to-romania-all-the-crucial-questions-answered/; https://sovos.com/blog/vat/romania-saf-t-updated-guidance-released/?utm_source=linkedin&utm_medium=social&utm_campaign=blog&utm_term=vat-emea&utm_content=social-image (last accessed in August 2021).

[59] Information available at: https://sovos.com/blog/vat/e-factura-romanias-new-e-invoicing-system/?utm_source=linkedin&utm_medium=social&utm_campaign=blog&utm_term=vat-emea&utm_content=social-image (last accessed in November, 2021).

[60] European Commission, Finnish Tax Administration and the World Bank, "Report Describing the Proposed New Tailor-made VAT Reporting Model", output C1 of the "Project Support for design and implementation of a new VAT reporting model in Finland", September 2020.

3. ASSESSMENT OF THE CURRENT SITUATION: MEMBER STATES

This section provides **an assessment of costs and benefits generated by DRRs for public authorities.** First, the implementation costs incurred by the public authorities for both setting up and managing these DRRs are reviewed. Then, the outcomes generated by DRRs requirements in terms of improved fraud detection, thanks to more effective and efficient tax control are described. Finally, the estimated impact in terms of increased VAT revenues and improved VAT compliance is presented.

Data sources and Methodology. This section is based on both information from the targeted consultation of public authorities, as well as information from secondary sources and VAT revenue statistics. The consultation of tax authorities covered all 27 Member States, including those 12 Member States in which a DRR is in place.

The quantification of the direct outcomes triggered by DRRs on tax control activities and fraud detection is based on the comparison of data before and after the introduction of these requirements, complemented with relevant information and qualifications provided by the tax authorities on the causation channels and the relative importance of reporting requirements compared to other policy measures. The assessment of changes to VAT revenues has been done by means of an econometric analysis based on panel-data, to determine whether and to what extent the existing DRRs have resulted in a decrease in VAT non-compliance in the adopting Member States. The econometric analysis covers ten Member States with DRRs.[61]

3.1. Implementation costs

The targeted consultation shows that substantial one-off costs were incurred by public authorities for setting up and/or adapting their IT systems for the introduction of DRRs. This investment was, in some cases, associated with the introduction of dedicated or new risk-analysis and control systems. All tax authorities assessed up-front investment costs as significant; these costs include expenses for software, hardware as well as the acquisition of consulting services, including for the development of data management systems. About half of relevant respondents provided a quantitative indication of the magnitude of these investments. The review of these data points to major differences across different categories of DRRs, depending on the degree of IT sophistication and the volume of data received and processed.

Investment costs reported by Members States implementing PTC systems consistently fall in the EUR 1.5 – 3 million range, irrespective of the number of transactions and the semantic format used (i.e. whether SAF-T or not). A majority of respondents also assessed the costs of revising and setting up risk analysis systems as significant. However, these costs were either impossible to disentangle from those of the entire tax control system[62] or already included in the above range.

In the case of CTC requirements, investment costs are a multiple of the above. Their value significantly varies across relevant Members States, depending on the IT development approach adopted (in-house or outsourced), the range of functions and services included, and, in case of e-invoicing systems, the possibility of exploiting platforms already set up to support e-invoicing in public procurement. Based on the information provided by the tax authorities of relevant Member States summarized in

[61] Bulgaria and Latvia were excluded from the quantitative analysis, as their DRRs were introduced more than 20 years ago, and, even though electronic compliance became mandatory at a later stage (in 2011 for Latvia and 2018 for Bulgaria), it was not possible to retrieve information on the costs of implementation as well as on a number of before / after impacts.

[62] The cost of setting up the horizontal taxpayers' control subsystem (i.KON) are set at EUR 1.4 million. However, this system is used by the Lithuanian tax authorities to periodically cross-check information received by different subsystems of the smart tax administration system (i.MAS), not only from i.SAF.

Box 2, all in all, investment costs for tax administrations setting up real-time reporting and e-invoicing requirements can be set in the order of **EUR 6 – 70 million**.[63]

Box 2. Investment costs for setting up CTCs

In Spain, the tax agency entrusted the IT Directorate with providing in-house solutions rather than using commercial off-the-shelf software and services[64], which allowed to keep investment costs down. Nonetheless, the annual value of IT investments recorded a major increase in connection with the introduction of the SII, from EUR 8.5 million in 2016 to EUR 22.3 million and EUR 11.2 million in 2017 and 2018, respectively. While these incremental amounts cannot be entirely attributed to the introduction of the SII, the setup of this new system accounted for a major share.

In the case of Hungary, where IT development was outsourced and several components have been set-up or enhanced, including, among others, a new online invoicing system, a mobile application for economic operators to issue invoices and the development of both the risk analysis system and the data warehouse of the tax administration, the size of the initial investment has been much larger, i.e. about EUR 70 million.

In the case of Croatia, the set-up costs of the whole digital reporting system, which also includes e-invoicing platform for B2B transactions (even though, at present, the obligation is not yet in place) amounted to EUR 20 million.

Finally, investment costs to set up the e-invoicing platform in Italy were rather moderate, also thanks to the fact that part of these costs had been already borne when introducing the centralized system for B2G e-invoicing, i.e. the *Sistema di Interscambio* (SdI). According to the information provided by the tax authority, between 2016 and 2018, the average investment to extend the existing platform to B2B transactions amounted to about EUR 2 million per year[65], for a total value of the adaptation costs of EUR 6 million.

Other one-off costs, such as training personnel about the requirements of the new systems or conducting awareness campaigns to inform taxpayers, **were invariably assessed as marginal, if any**.

As for **ongoing costs**, tax authorities were asked to provide an estimate of the expenditures incurred for (i) the maintenance of the IT systems; and (ii) the secure storage of the reported data.[66] In certain cases – e.g. for the Italian e-invoicing system – only aggregated ongoing costs were available.

Consistently, maintenance costs of the IT systems have been assessed as the major recurrent costs, being regarded as 'significant' by the majority of the respondents. In line with the above analysis, in the case of PTC systems, these costs tend to be smaller, falling in the range of EUR 300 000 – 500 000 per annum (with average ratios between capital expenditure and maintenance costs in the order of 10% to 20%). In the case of real-time requirements, recurrent expenditure is larger, even if it accounts for a smaller share of the investment costs, i.e. about 5%. For instance, the annual costs of IT support and maintenance of the Hungarian system has been around EUR 2.5 million during the first three years of implementation.

In some cases, **sizable expenditure is also incurred by the public authority for storing and securing the data gathered**. This is specifically the case of the Italian

[63] The large range can be explained by various drivers, including (i) the design of the CTC systems, which can be very different; (ii) the extent to which the central platform leverages on the existing B2G platform; and (iii) the amount of transactions / e-invoices to be handled.
[64] The SII has been developed internally by a team of six people, who coordinated the adaptation of other tax administration systems to the SII needs and the re-engineering of other tax control processes.
[65] EUR 2.5 million were initially invested to set up the platform for B2G transactions.
[66] Information was also sought on the costs for processing and verifying the reported data, but this activity does not usually result in substantial additional IT ongoing costs.

e-invoicing clearance model, whose total running costs – including IT maintenance and system capacity management, secure data storage, invoice regulatory filing, back up and disaster recovery - amounted to EUR 24 million in the last year, against an initial estimate of EUR 9.9 million per year.[67] This amount can be safely regarded on the high side, given the large number of invoices annually cleared and stored in the system (some 2 billion). Indeed, in the case of Croatia, the size of these annual costs has been set at EUR 1 million. Also, a share of the costs may be linked to the clearance architecture, which however is only one of the possible architectures of an e-invoicing system; nevertheless, evidence on the impact of this choice on the costs for the tax authorities is limited. From research no Member State reported that the management of the new regimes involved an important increment in the cost of human resources entrusted with processing and verifying transactional data, as well as internal and external supporting services.

Table 2 provides an estimate of the range of costs incurred by public authorities to implement different types of DRRs, including both setup and recurrent costs.[68] For PTCs, the **costs are negligible when compared to total VAT revenue,** since they represent less than 0.001% of the latter. Costs are higher, but still marginal, for CTCs, representing between 0.01% and 0.03% of total VAT revenue.

Table 2. Range of implementation costs for public authorities (in EUR mn, per Member State)

	Setup costs	Recurring costs	Annualised implementation costs
SAF-T / VAT listing	1.5 - 3	0.3 – 0.5	0.6 – 1.1
Real-time	15 – 70	1.5 – 2.5	4.5 – 16.5
E-invoicing	6	24	25

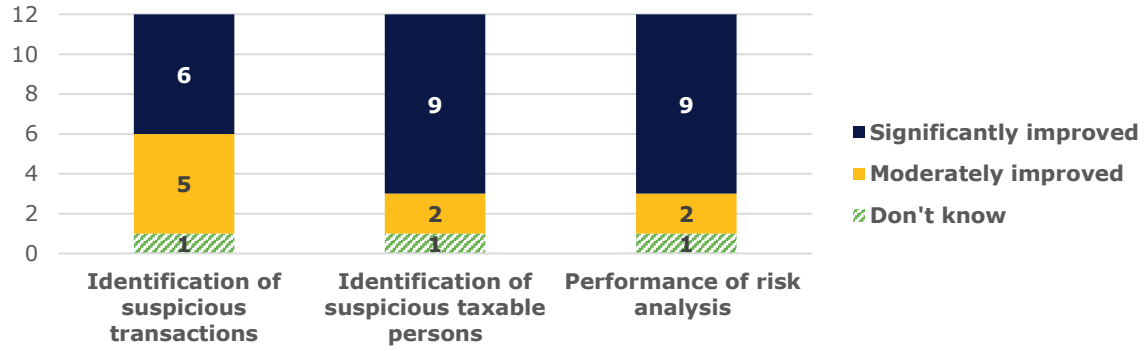
Source. Authors' elaboration on targeted consultation of TA (countries with DRRs)

3.2. Benefits: Effectiveness and efficiency of tax control

Irrespective of the type of DRRs introduced, all Member States implementing similar obligations maintained that they have improved risk analysis, i.e. the identification of fraudsters and suspicious transactions (see Figure 9 below). Improvements to risk analysis were achieved via the automatic data cross-checking, as well as by matching information between trading partners and, in some cases, with other sources available to the tax authority. This allowed tax authorities to directly identify mismatches in reporting the same transaction, such as divergences in tax accrual, under declaration of VAT, and inflated deductions, and to spot suspicious transaction chains. The improvements of some risk analysis systems following the implementation of different types of DRRs, as reported by public authorities via the targeted consultation[69] and in secondary sources, are illustrated in Box 3. The findings from the consultation of tax authorities on the improved effectiveness of tax controls are consistent with the quantitative evidence on the improvement of VAT revenue collection, presented later in this Section.

[67] Law No 2015 of 27 December 2017, "Bilancio di previsione dello Stato per l'anno finanziario 2018 e bilancio pluriennale per il triennio 2018-2020", in *Gazzetta Ufficiale Serie Generale* No 302 of 29 December 2017.
[68] Annualised costs result from the amortization of setup costs over five years, which is a normal depreciation period of IT equipment.
[69] All tax authorities were consulted via interviews. The replies in this section only concern the tax authorities from Member States in which DRRs are in place (as of September 2021).

Figure 9. Impact of Digital Reporting Requirements on tax control: views from tax authorities



Source. Authors' elaboration on targeted consultation of TAs in Member States with DRRs.

Box 3. Improvements of risk-analysis tools and tax control prompted by different types of Digital Reporting Requirements

Periodic VAT Listings (Czechia). According to the Czech tax authority, risk analysis methods and detection of fraudulent behaviour in the area of VAT have changed significantly since periodic VAT listing became effective. The focus shifted from single taxpayers to VAT fraud chains; the time-to-detection reduced from months to a few days. Besides, Czech DRRs, which also cover intra-EU acquisitions, allow better tackling intra-EU fraud. The analysis of data gathered from the VAT Control Statement, together with those from recapitulative statements and VIES data from other countries, reportedly permits a faster detection of missing trader frauds before the fraudulent company quickly disappears without having paid the VAT due.

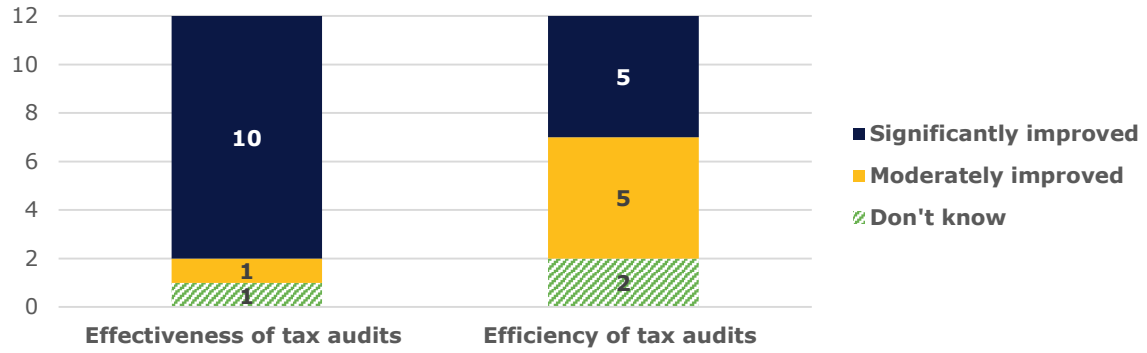
Periodic SAF-T (Portugal). Transactional data gathered monthly through the SAF-T file (or submitted in real time via web-services) feed into an automated risk-analysis system, which also processes other taxpayers' data (e.g. transport documents, annual inventories) and third party information (e.g. payments by credit and debit cards, as reported by financial institutions). For domestic transactions, this risk-analysis system matches the sales invoice data and links them to the taxpayers through the VAT identification number of the purchaser and the seller, and automatically detects cases where the invoice issuer does not declare the VAT or declares it but does not pay it. As soon as non-conformities are detected, the system proceeds by opening an administrative verification procedure in an automated manner. Taxpayers can regularize the situation by submitting the missing or revised declarations, or by paying the VAT due. If the taxpayer does not correct the irregularity and the nonconformity persists, the system automatically issues a standardized draft audit report.

Real-time Reporting (Spain). The Spanish real-time reporting system allows the administration to obtain on a timely basis and compare the information submitted by the VAT payers subject to the SII (which includes all invoices issued and received and information related to the single administrative document for imports), and to cross-check it with third parties' information also registered to the system. This enables a prompt detection of divergences and possible fraud. Besides, a new risk analysis and profiling system has been developed (called HERMES) to make an efficient use of the mass of data gathered by the SII. The system aims at improving control activities and better focusing on non-compliant taxpayers and risky activities. This tool compares all information contained in the SII that might be relevant for tax purposes, enabling the tax agency to define profiles (risk groups) and perform the most adequate control activity for each defined profile (e.g. preventive measures, extensive or intensive control).

Consistently, all three Member States maintained that the introduction of DRRs significantly improved both the identification of suspicious taxable persons and the performance of risk-analysis systems. The same, very positive improvement was also reported by two Member States on the identification of suspicious transactions, while, in Spain, only a slightly less positive impact (a moderate improvement) was reported.

Consistently, according to public authorities, the implementation of DRRs also led to an increase in the effectiveness and, to a lesser extent, the efficiency of tax audits (see Figure 10 below). The more accurate identification of cases for controls illustrated above and the larger amount of preliminary information available to tax administrations have increased audit targeting, thus increasing the share of cases in which tax audits lead to detection of irregularities or foregone revenue and reducing the number of audit activities carried out. Some tax authorities also reported efficiency improvements following the introduction of digital reporting requirements, due to either a decrease in the duration of audits or less personnel being required, who can then perform other types of tax controls.

Figure 10. Impact of Digital Reporting Requirements on audits: views from tax authorities



Source. Authors' elaboration on targeted consultation of TA.

The comparison of data before and after the introduction of DRRs broadly substantiates the above findings on the increased effectiveness of tax control activities. However, the results of this quantitative analysis should be considered with caution due to several reasons. First, some systems, and in particular CTCs, have been only recently introduced and data for year 2020 are yet partial and, in any case, affected by the pandemic situation. Second, the definition of a tax audit varies among countries.[70] Finally, there is a time lag between the moment of fraud detection and when the additional tax liabilities identified are recovered (i.e. the audit yield), which inevitably affects the comparison of the two variables for a given year. Thirdly, the available data on audits and fraud cases are only available for a sub-set of the Member States and are not always recorded consistently across countries.

The effects of DRRs on the effectiveness and efficiency of tax control have been assessed as follows.

- The effectiveness of tax controls has been measured via the following indicators: (i) the average value per fraud case detected per year, and (ii) the average value of fraud detected per audit.

- The efficiency of tax controls has been measured via the following indicators: (i) the number of audits carried out annually, (ii) their average duration, and (iii) the ratio between the number of fraud cases detected and the number of audits in a given year.

The findings are consistent with an improved effectiveness of tax control activities, i.e with an increase in the number or value of VAT frauds detected in almost all Member States that have introduced a DRR for which data are available. This is matched by a decline in both the number and the duration of audits in a majority of the Member States

[70] For instance, some public authorities do not distinguish between 'compliance' audits, to prevent and remedy errors in the documents submitted by the taxpayers, from 'fully-fledged' audits. Likewise, some Members States distinguish between desk audits and field audits, while others classify both types as audits.

concerned, suggesting that audits have been more efficiently targeted on fraudsters and large fraudsters. This is also reflected in an increase in the number of frauds detected per each audit, which increased in a majority of the Member States, and remained stable in the others. Details on the magnitude of the changes and the number of countries reporting positive changes are provided in Table 3 below.

Table 3. Impact of Digital Reporting Requirements on tax control effectiveness and efficiency

Indicators	Available data points	Change recorded by Member States	Range
Tax control effectiveness			
Average value of fraud detected per year	4 Member States	The value increased in all 4 Member States	+8% / +42%
Average value of fraud detected per audit	5 Member States	The value increased in 4 Member States and declined in 1	-56% / +57%
Tax control efficiency			
Annual number of audits carried out	9 Member States	The number declined in 6 Member States, increased in 2 and remained stable in 1	+11% / - 57%*
Average audit duration	3 Member States	Duration declined in 2 Member States and increased in 1	+2% / -41%*
Number of frauds detected per audits carried out	5 Member States	The ratio improved in 3 Member States and remained stable in 2	0 p.p. / +29 p.p.

*Note. *: negative figures indicate improvement. Source. Authors' elaboration on targeted consultation of TA (countries with DRRs).*

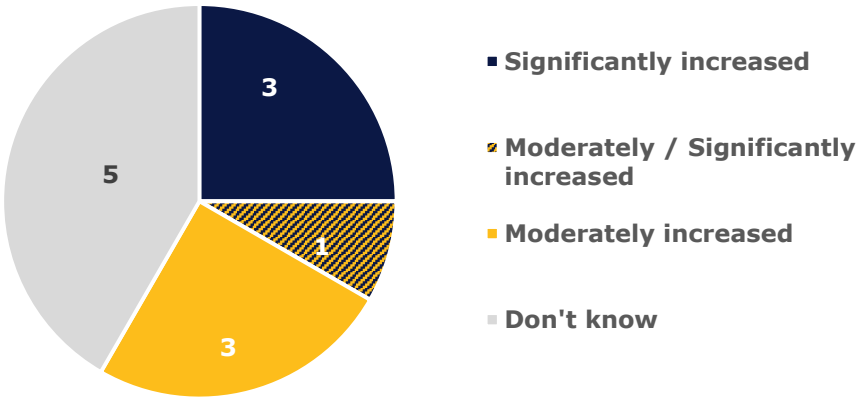
Box 4. Other benefits produced by reporting requirements for the Public Authorities

In addition to the above-illustrated positive effects on the effectiveness and efficiency of tax control, a handful of Member States implementing real-time reporting, e-invoicing and SAF-T requirements reported sharing the mass of data gathered through these DRRs with other governmental bodies to perform statistical and economic analyses for different purposes, such as budget control and design and management of financial support schemes. For instance, in the case of Italy, the elaboration of e-invoice data proved instrumental for the provision of various fiscal measures aimed at supporting the economy during the COVID-19 pandemic, such as the cancellation and reduction of taxes or the provision of incentives and non-refundable grants as well as the design of sector-specific measures.

3.3. Benefits: VAT revenue

The majority of Member States maintained that DRRs contribute to an increase in VAT revenue thanks to both the improvements to tax control and the deterrent effect on voluntary compliance (see Figure 11). Still, over one third of respondents preferred to not express a firm position of the impact on VAT revenue often because of the timing of introduction of reporting requirements (too early in some countries, but also too distant introduction in Bulgaria or Latvia), coupled with the fact that recent trends are significantly affected by the COVID-19 pandemic. Furthermore, in some countries, such as Poland, it is very difficult to provide such an assessment, given that the DRR is part of a comprehensive anti-fraud package, making it difficult to isolate the specific role played only by the former.

Figure 11. Impact of Digital Reporting Requirements on VAT revenue: views from tax authorities



Source. Authors' elaboration on targeted consultation of tax authorities.

To estimate whether DRRs improved VAT compliance, thus reducing the VAT Gap and increasing VAT revenues, an econometric analysis is performed.[71] The effects of DRRs are estimated on two dependent variables: the **VAT Gap** and **C-efficiency**. The VAT Gap model relies on annual data, while the C-efficiency model on quarterly data. The dependent variables and their models are briefly illustrated in Box 5 below. The full details of the model specifications and the results are available in Annex C.

Box 5. A summary presentation of the VAT Gap and C-efficiency concepts

The **VAT Gap** is defined as the difference between the expected VAT revenue (i.e. the VAT Total Tax Liability, VTTL) and the amount of VAT actually collected over the same period. It includes aspects that are directly influenced by the introduction of reporting obligations, such as VAT fraud and evasion, as well as elements which are not impacted (e.g. insolvencies, bankruptcies, legal tax optimisation). The VAT Gap directly links with the level of VAT compliance in a country.[72]

C-efficiency is the ratio of the actual VAT revenue to the theoretical revenue derived from the product of the VAT standard rate and the aggregate final consumption. Thus, it measures the departure of a country's actual VAT system from a perfectly enforced tax levied at a single rate on all consumption. This ratio takes a value lower than one for various reasons: the application of VAT reduced rates and exemptions, as well as less-than-perfect compliance. In other words, the C-efficiency is an intensive measure, i.e. expressed in relation to the tax base, of both the level of VAT compliance as well as VAT policy choices, such as the adoption of differentiated rates and exemptions.[73]

The choice among the two variables above is mainly done on technical grounds. While the VAT Gap more directly links with VAT compliance, the available data are less conducive to the kind of analysis that is necessary in this Study. In particular, the VAT Gap data is available on a yearly basis. This limitation affects the granularity of the analysis (e.g. in terms of various types and features of DRRs). Furthermore, it hinders the assessment of the dynamic effects of the introduction of DRRs, and in particular whether they have a pre-emptive or delayed impact.

[71] The analysis is carried out on 25 Member States, excluding Malta and Luxembourg as outliers (their economy is too small and very much concentrated in VAT exempt sectors, such as the financial industry).
[72] For the latest edition of the Commission VAT Gap study see: European Commission (2021), "VAT Gap in the EU: Report 2021". Hereinafter: 'VAT Gap Study 2021'.
Previous: European Commission (2020), "Study and Reports on the VAT Gap in the EU 28 Member States: 2019 Final Report", TAXUD/2015/CC/131. Hereinafter: 'VAT Gap Study 2020'.
[73] Cf. Ebrill, L. et al. (2001), The Modern VAT, International Monetary Fund; Keen, M. (2013), The Anatomy of the VAT, IMF Working Paper, WP/13/111.

For both the C-efficiency and the VAT Gap, several model specifications have been tested. Results across the various analyses consistently point to a **statistically significant, positive effect of DRRs on VAT compliance, and thus revenues**. More in detail:

- The introduction of DRRs increases VAT revenue by 1.9% of the theoretical revenue[74] (range: 1.5 – 2.6%), under different specifications of the C-efficiency model.

- Consistent estimates have also been achieved under the VAT Gap model, according to which introducing DRRs decreases the VAT Gap by 2.6 percentage points (range: 2.4 – 2.6 percentage points) and thus increases the VAT revenue by 2.6 percentage points of VTTL (range: 2.4 – 2.6 percentage points).

The results only provide a partial support to the hypothesis that PTCs and CTCs have a different impact on VAT revenue. Under the C-efficiency model, the analysis shows that there is no statistically significant difference between the impacts of PTCs and CTCs on VAT revenue. However, under the alternative VAT Gap model, there is a statistically significant difference (at 5% and 10% level), and the impact of CTCs is considerably larger: CTCs reduce the VAT Gap by 5.1 percentage points vs. 2.0 percentage points for PTCs.[75]

This uncertainty is largely due to the few data currently available to feed the models on the impact of CTCs, which have been introduced as from 2017 and only in three Member States. Indeed, statistically different impacts emerged in the VAT Gap model only when the 2020 data became available. This result should therefore only be considered preliminary, and additional analyses should be performed in the coming years, when more data become available on the impact of CTC systems on the VAT gap. Still, though some evidence of a possible higher impact of CTCs exists, this cannot yet be confirmed with sufficient certainty. Therefore, both in the assessment of the current situation and in the analysis of impacts, it is considered that PTCs and CTCs have the same impact on VAT revenue. Whenever possible and appropriate, a sensitivity analysis is performed, accounting for the possible higher impacts of the latter.

Finally, the existence and magnitude of dynamic effects was also studied, to determine whether DRRs affect VAT compliance before their introduction (since taxpayers know that their transaction data will soon be available to tax authorities) or only after a certain period of time has elapsed after they come into force (in the case that fraudulent taxpayers realise after some time that evasion has become riskier). In fact, **neither the lagged nor the forward-looking impacts differ in magnitude from the contemporary ones**, and the significance of the dynamic variables disappear when controlling for both current and future / past effects.[76]

The coefficients estimated under different specifications for both the C-efficiency and the VAT Gap models have been used to monetize the benefits for public authorities following the introduction of digital reporting requirements, i.e. to measure the incremental amount of VAT revenue collected.[77] **The total amount of additional VAT**

[74] I.e. the liability that would be obtained if all consumption was taxed at a standard rate.
[75] The analysis tested the hypothesis that the impact of PTCs on VAT revenue / VAT gap was not statistically different from the impact of CTCs (the null hypothesis). Under the C-efficiency model, the null hypothesis could not be rejected at 10% significance level; under the VAT gap model, the null hypothesis could be rejected at 5% or 10% significance level, depending on the specification.
[76] This also proves that there is no reverse causality, i.e. that the change in the VAT Gap is not major reason for implementing DRRs.
[77] The monetization was based on the following key assumptions: (i) benefits start materializing in the same year in which the reporting requirement entered into force, if this occurred in the first semester, otherwise in the following year; (ii) since then, the annual impact remains constant, i.e. a higher tax collection occurs every year compared to the situation before the introduction of

revenues from 2014 to 2019 is estimated at EUR 28.4 billion, based on the coefficient calculated under the C-efficiency model. A smaller value – i.e. EUR 19.3 billion - is estimated based on the VAT Gap model. As shown in Table 4, in relative terms, under the C-efficiency model specification, the annual incremental share of VAT revenue ranges between +2.7% and +5.3% across the Member States. Under the VAT Gap model specification, a smaller range of variation across countries has been detected, with the annual percentage increase of VAT revenue ranging between +2.6% and 3.5%.[78] The overall impact of DRRs on VAT revenue is estimated at between +3.0% (VAT Gap) and +4.4% (C-efficiency). This corresponds to an equivalent increase of the VAT rate by 0.6 and 0.8 percentage points, respectively.

Table 4. Impact of Digital Reporting Requirements on VAT revenue (2014-19)

Econometric Model	VAT revenue increase (EUR billion)*	Revenue increase as % of VAT revenues (range by country)	Revenue increase as % of VAT revenues (overall sample)	Equivalent effective VAT rate increase (percentage points)**
C-efficiency	28.4	2.7 / 5.3%	4.4%	0.82
VAT Gap	19.3	2.6 / 3.5%	3.0%	0.56

*Note. *: Total 2014-19 for all Member States having implemented a DRR after 2014. **: The ratio of revenue to household final consumption net of VAT was used as a proxy of the effective VAT rate. Member States covered: CZ, HR, EE, HU, IT, LT, PL, PT, SK, ES.*
Source. Authors' estimate based on the results of the econometric analysis.

Estimates presented in Table 4 are largely corroborated by secondary sources, as shown in Box 6 below.

Box 6. Estimates on the impact of DRRs on VAT revenue from secondary sources

Available secondary sources to validate the achieved estimates of the impact of reporting requirements on VAT revenues are extremely limited. Still, whenever available, the comparison with the estimates provided by other sources largely supports the above results. In the case of Czechia, in a press release published by the Ministry of Finance in 2017, the impact of the VAT listing on VAT collection was conservatively estimated at CZK 10-12 billion (i.e. about between 2.8% and 3.4% of VAT revenues collected in 2016).[79] Recently, this value has been confirmed by an academic study, which, based on an econometric analysis, concluded that the VAT control statement brought to the public budgets an additional CZK 2.5 billion on a quarterly basis, basically the same amount reported in governmental assessment.[80] In Italy, according to the ex-ante assessment carried out by the government, the introduction of e-invoicing requirements was expected to bring an additional EUR 2.05 billion revenues on an annual basis, representing a yearly increase of +1.8%.[81] Finally, in a study recently carried out to inform the design of reporting requirements to be adopted in Finland, the annual impact on tax revenue has been assumed between +0.2% and +2.3%, depending on the evolution of the VAT Gap and the type of reporting requirement introduced.[82]

the reporting requirements, and (iii) the same coefficients have been applied to all Member States, irrespective of the type of DRR implemented.

[78] While impacts are significant, consistent, and positive across the two models, those estimated via the C-efficiency gap results in higher monetary estimates. This may be because this model, which is based on quarterly data, better captures the timing of the impact since it is more granular, thus leading to a larger estimated impact of reporting obligations on VAT revenue.

[79] http://www.mfcr.cz/cs/aktualne/tiskove-zpravy/2017/stat-v-roce-2016-hospodaril-s-rekordnim-27109 (last accessed on April 2021).

[80] M. Arltová, J. Pavel, Jana Tepperová, and H. Zídková (2020), What are Effective Measures against VAT Evasion? Evidence from Czechia, paper published in Slovak Economic Papers, available at: https://www.sav.sk/journals/uploads/0325111802_%2020%20Zidkova%20+%20SR.pdf (last accessed on April 2021).

[81] Law No 2015 of 27 December 2017, "*Bilancio di previsione dello Stato per l'anno finanziario 2018 e bilancio pluriennale per il triennio 2018-2020*", of 29 December 2017.

[82] European Commission, Finnish Tax Administration and the World Bank, "Report Describing the Proposed New Tailor-made VAT Reporting Model", output C1 of the "Project Support for design and implementation of a new VAT reporting model in Finland", September 2020.

3.4. Conclusions

According to the tax authorities of the Member States with a domestic DRR, its introduction has **improved tax control activities, in particular by increasing the accuracy and effectiveness of risk analysis**, i.e. the identification of suspicious taxpayers and chains of transactions. This was achieved through the automatic cross-checking of the data provided, in particular by matching the data among trading partners or with other databases. Consistently the implementation of DRRs also increased the effectiveness and, to a lesser extent, efficiency of audit activities. This emerges clearly from the qualitative views, and it is further substantiated by the limited data available.

The improvements in tax control activities, together with the push on taxpayers' compliance and the reduction of mistakes and omissions, led to a **significant positive effect of DRRs on VAT revenue.** Under the various econometric models and specifications, **the increase of VAT revenue during the 2014-2019 period was estimated between EUR 19 and EUR 28 billion** in the Member States which have introduced a DRR in this period. This corresponds to an annual increase of VAT revenue of between 2.6% and 3.5%, and to an equivalent increase of the VAT rates by 0.6 to 0.8 percentage points.

The additional costs for tax authorities were a fraction of the benefits achieved. Annualised implementation costs were estimated at EUR 0.6 – 1.1 million for VAT listing and SAF-T systems, EUR 4.5 – 16.5 million for real time requirements, and EUR 25 million for invoicing. Most of the costs consisted in IT setup costs, with ongoing costs representing between 5% and 20% of total capital expenditure.

4. ASSESSMENT OF THE CURRENT SITUATION: DOMESTIC TAXPAYERS

This section provides an **assessment of the costs to comply with DRRs for domestic economic operators**,[83] and notably the **administrative burdens for businesses.** In addition, **different benefits** associated with the introduction of DRRs are reviewed, and, whenever possible, quantified.

The Section consists of two separate analyses due to the different cost structure and benefits generated. In Section 4.1, the following reporting mechanisms are assessed: VAT Listing, SAF-T and real-time requirements; in Section 4.2, mandatory e-invoicing is considered.

4.1. VAT listing, SAF-T and real-time reporting requirements

4.1.1. Introduction

Data sources and methodology. The analysis is based on primary data collected during targeted consultation activities with economic operators, VAT practitioners, and service providers from or active in Czechia (VAT listing)[84], Portugal and Poland (SAF-T); and Spain and Hungary (real-time). This was then complemented with secondary sources and studies at national levels. The sample consists of 55 respondents.[85]

Mode of compliance. The methods to comply with DRRs depend on various factors, including the company size, and the in-house IT and human resources:

- Medium and large companies tend to invest in internal/in-house IT systems, which include either simple bookkeeping packages or more advanced and multi-functional Enterprise Resource Planning (ERP) systems.[86] These systems can have embedded functionalities for reporting obligations, or third-party solutions can be added to it.

- Micro and small companies rarely have the financial capabilities to invest in such IT systems. For these reasons, they tend to either outsource fully/partially the VAT reporting tasks to a tax advisor or buy a ready-made solution (e.g. an online service). In most Member States, small and micro companies can also submit the data via the online tax authority portal, but this option is less commonly used.

[83] The analysis in this section focuses on domestic operators only, hence excluding burdens borne by foreign establishments of multi-national companies which are quantified in Section 5.
[84] The original sample included businesses from Estonia complying with the VAT listing. However, it was not possible to complete the expected interviews with Estonian economic operators. Contacted stakeholders have shared several reasons for declining the invitations for interviews, including: hesitation in sharing tax and financial information; lack of expertise of the studied issues; and unavailability given the busy period of time in closing the fiscal year. The Study team attempted to supplement these resources by relying on its own contacts, as well as by demanding support from other stakeholders in neighbouring countries. However, these subsequent attempts were also unsuccessful. Therefore, the analysis of administrative costs presented in this section does not cover economic operators from Estonia. As a result, for the VAT listing reporting, the analysis of administrative burdens relies only on information provided by economic operators from Czechia. However, based on the information provided by VAT practitioners and e-service providers, limited variation of costs for this group of DRR is to be expected.
[85] Of which 31 businesses (large enterprises and SMEs), 15 VAT practitioners, and 9 service providers.
[86] The ERP is a software or cloud-based system used by companies to collect, store, and manage data from their various business processes. It integrates data from several company functions, including fiscal and accounting data, as well as purchase and sale orders, business resources and payrolls. It is typically used by large and medium companies, and less often by smaller ones.

Another determinant of the mode of compliance is the timing of the data reporting: whether real-time (e.g. immediate, same day), or longer (quasi-real time, or periodic). When data are to be reported within few days (as in Spain) or periodically, the process automation is not strictly necessary. Therefore, smaller taxpayers with a limited number of transactions can still opt for simpler solutions (e.g. using a spreadsheet). When the information is to be reported in real-time (as in Hungary), the data submission is more likely to require an automated solution, because there is no time to verify the data before submission.

4.1.2. Issues with the existing Digital Reporting Requirements

Prior to analysing the costs and benefits of DRRs, this section provides an overview of the main compliance issues emerging from the targeted consultations of businesses.

As a general finding, reported by both economic operators and VAT practitioners, **the frequent changes and updates in national requirements** (e.g. thresholds, data fields, additional information) represent an important source of costs for enterprises. Any modification and additional data requests from tax authorities in respect of the DRR implies the adaptation of the IT system (or, sometimes, the replacement of the whole IT solution), additional training for employees, and additional fees to external VAT practitioners. The frequent changes cause uncertainty on businesses, for both smaller companies with limited access to information and means, and for large businesses that need to programme their compliance strategy over a longer period, and negatively impact regulatory costs. Nevertheless, within all countries, interviewees reported the onboarding practices and cooperative attitude of tax authorities when interacting with businesses (i.e. several iterations and dialogue before considering penalties).

Other observed issues tend to be DRR-specific. Businesses and VAT practitioners in Spain (real-time) reported that the mandatory submission of data within four days imposed by the SII is more demanding than the pre-existing monthly form 340 (now withdrawn for SII filers), due to the limited time given to adapt to the new requirements.

With regard to SAF-T, economic operators typically pointed out the difficulty to edit or correct reports once submitted. In fact, as reported by interviewees from Portugal and Poland, when a mistake is identified, it is impossible to correct the invoices that had previously been submitted (e.g. by directly contacting the customer and asking him to ignore the incorrect document). In such cases, the only solution is to cancel the invoice via a credit note and issue a new invoice. In Poland, a peculiar issue consists in the specific data that are required for certain transactions, involving goods or services considered 'risky' by the domestic legislation. In these cases, the taxpayer must provide information on the goods and services exchanged, by using the appropriate codes which have been defined by the Polish legislator (as opposed to internationally recognised codes), as well as on the application of the domestic split payment.[87]

Based on information shared by interviewees in Czechia, problems with VAT listing are more limited compared to the other types of DRRs. For instance, issues arise in determining the VAT chargeability date, which is sometimes mistaken for the invoice date, have been mentioned.[88] In case of discrepancies or errors, the online portal provided by the Tax Authority is not adapted to then proceed to the reconciliation of data and the reconciliation process is considered burdensome by taxpayers (especially for those with a large number of transactions).

[87] This was reportedly a significant issue for implementation, since it may prevent full automation of the process, and require companies to introduce workarounds to identify the goods and services required, or to do manual adaptations.
[88] Since VAT become due on the date of chargeability, this information should be embedded in the company's accounting system. However, this issue is more likely to be encountered by economic operators in the Member States in which controls on these specific aspects are frequent.

4.1.3. Administrative burdens

The administrative burdens[89] generated by DRRs come from two types of costs:

1) **Implementation costs**, i.e. the cost of acquiring the physical and intangible capital, including know-how, external services and expertise, to comply with the DRRs;

2) **Ongoing costs**, i.e. the cost of personnel time to supervise the DRRs and correct discrepancies.

Reflecting the high (and growing) level of automation, most of the costs of DRRs fall in the former category.

Implementation costs

Implementation costs include, first and foremost, the IT costs, and namely the costs of equipment, new or updated software, IT personnel and outsourced IT services. These costs can be one-off, due to investment in physical equipment or purchase of software, or as salaries for the employees setting up the system.[90] In other cases, IT costs can also result in recurring costs, e.g. for accessing online platforms or updating and maintaining software services. Furthermore, these costs include the costs of the internal know-how, which represents the time spent for familiarising with the new obligation and training the personnel.

The implementation costs tend to be higher for larger companies. This can be explained by a larger and more diverse number of transactions to report and the higher complexity of internal accounting and IT systems. In particular, medium, and large companies are more often equipped with ERP systems, which require more significant upfront adaption costs.

Across all company classes, the implementation costs are the lowest for VAT listing systems. A micro / small company can expect an annualised implementation cost of about EUR 100 – 200; for medium and large companies, costs can be up to EUR 500 – 1 500.[91]

Costs tend to increase for both SAF-T and real-time DRRs. For micro companies, the estimates remain similar, and annual costs are estimated at below EUR 200. However, when more complex systems are used, most likely for the largest entities among small companies, costs tend to grow, up to the EUR 600-800 range.

Differences are more marked for large companies:

- For SAF-T, annual setup costs range between EUR 1 000 and 2 000. In Portugal, where large companies may opt for automated real-time data exchange, costs can reach EUR 6 200.

[89] All the costs borne to comply with DRRs originate from the legal provisions (i.e. companies would not setup reporting systems if they were not required to). Therefore, the BAU factor is 0 and administrative burdens coincide with total costs.
[90] One-off costs are annualised over a three-year amortisation period for both physical and intangible investments (5-year for Portugal and Czechia where the system is older and relatively more stable).
[91] These estimates are largely in line with a study carried out when the Czech VAT listing became mandatory. In the implementation phase, the Fiscalis VAT listing report (2015 data) estimated the IT costs for Czech economic operators to adapt their IT systems at around EUR 370 for an SME and between EUR 740 to EUR 3 000 for a large enterprise. Costs reported today are lower, possibly incorporating the familiarisation of both businesses and service providers. Cf. European Commission, DG TAXUD, Report from the Fiscalis Project Group 074, "VAT listings – implementation in EU Member States", January 2017.

- For real-time systems, costs are lower in Hungary, in the range EUR 500 – 2 400, and significantly higher in Spain for SII (EUR 3 000 up to EUR 15 000). In this respect, Hungary appears to be an exception as confirmed by both local businesses and service providers.[92] Reportedly, SMEs in Hungary willing to invest in an invoicing platform with limited features may be able to keep their spend to about EUR 120 per year.[93]

Table 5. Implementation costs borne by EU economic operators according to company size and type of reporting mechanism (EUR/year, annualised)

	Implementation Costs	
	Micro/Small	**Medium/Large**
VAT listing	110 / 210	520 / 1 480
SAF-T	130 / 620	1 060 / 1 900*
Real-time	170 / 760	530 (HU); 2 960 (ES) / 2 400 (HU); 15 730 (ES)

*Notes. *: In Portugal, large companies may opt for providing data in real-time, with consequently higher costs (EUR 6 200).*
Source. Targeted consultation of businesses, VAT practitioners, and service providers.

Ongoing costs

As anticipated, ongoing costs are comparatively lower than implementation costs. In simpler systems, i.e. VAT listing or SAF-T, micro-companies can expect to spend one to two hours per submission, to verify the accuracy of the information or deal with any discrepancies.[94]

With regard to SAF-T, one large company in Portugal reported spending about half a person day per month; five SMEs reported that the reporting obligations absorbed between 0.1% and 4% of a FTE equivalent, i.e. in between a few hours and a couple of days per year.

Costs are higher in countries with real-time requirements e.g. Spain, due to the increased rigidity and frequency of the system. The average number of working days spent on fulfilling reporting requirements via SII by Spanish medium or large enterprises can reach up to 5 FTE days per month.

Total administrative burdens per company

Table 6 below shows the estimates of the annual administrative burdens per company, resulting from the sum of the annualised implementation costs presented in Table 7 and the ongoing costs. Total burdens closely reflect the complexity of the DRRs: costs are higher for real-time requirements, and lower for VAT listing, with SAF-T systems in between.

[92] Two reasons were identified to possibly explain the differences. (i) Spain and Hungary have very different systems, though both real-time. In particular, the Spanish SII is a more comprehensive system, based on keeping e-ledgers by the tax authority rather than only reporting transactions, which need to be populated with additional data. (ii) Since in Hungary all companies, including small and micro, are subject to the obligation, a vaster market for cheaper IT and online solutions emerged.
[93] Targeted consultation.
[94] In Czechia, a study conducted by the local chamber of commerce reported that for about 20% of companies it takes less than one hour to fill one listing and between one hour and one day for 55% of businesses. Cf. Chamber of Commerce of Czechia (2016), "Summary survey results regarding the experience of entrepreneurs with meeting the new obligation to submit control statements".

Table 6. Annual administrative burdens borne by EU economic operators, per company size and type of reporting mechanism (EUR/year annualised)

	Micro / Small			Medium/Large		
	Implementation costs	Ongoing costs	Total burdens	Implementation costs	Ongoing costs	Total burdens
VAT listing	110 / 210	40 /240	150 / 450	520 / 1 480	240 / 470	760 / 1 950
SAF-T	130 / 620	80 / 290	230 / 870	1 060 / 1 900*	250 / 570	1 350 / 2 470*
Real-time	170 / 760	410 / 1 750	580 / 2 510	530 (HU) 2 960 (ES) / 2 400 (HU); 15 730 (ES)	820 / 5 250	1 350 / 4 870 (HU) 4 710 / 20 980 (ES)

Note. The range for total burdens may be different from the sum of the minima/maxima of its components.
**: In Portugal, large companies may opt for providing data in real-time, with consequently higher implementation costs (EUR 6 200) and total burdens (EUR 6 680).*
Source. Targeted consultation of businesses, VAT practitioners, and service providers.

Total administrative burdens

Business population. As mentioned above in Section 2.3, among the sampled Member States, only Spain has a turnover threshold (EUR 6 million) below which taxable persons are not subject to the DRR (even though voluntary enrolling for smaller businesses is allowed). For the other countries in the sample, the DRRs affect most taxable persons (typically excluding only those covered by the VAT SME scheme or which do not need to obtain a VAT registration). The number of taxable persons covered by the obligation was retrieved from the targeted consultation of tax authorities.[95]

Table 7. Business population in the sampled Member States

	Total	Micro	Small	Medium	Large
CZ	557 000	534 500	17 500	3 800	900
ES	65 000	-	45 008	16 700	3 600
HU	513 000	484 100	24 000	3 900	800
PL	1 700 000	1 611 900	71 700	13 400	2 900
PT	1 444 000	1 374 200	59 000	9 300	1 500

Source. Authors' elaboration on targeted consultation and Eurostat.

Aggregated burdens. Based on the typical costs per company size and the population retrieved from tax authorities and segmented based on Eurostat's data, Table 8 below provides an assessment of total annual administrative burdens.[96] The data are presented per group of DRRs and company size. The assessment is based on the five countries for which primary data were collected via the fieldwork and then extrapolated to estimate total burdens in the remaining countries with a DRR currently in place.[97]

The calculation of total burdens is provided as the basis for the cost-benefit analysis carried out in Section 6 below. However, the figures presented below are not a relative assessment of the burdensomeness of the various types of DRRs, since the total burdens depend on the business population covered. For this reason, these data are presented

[95] A split by company size was also requested, but no consistent data were available. Therefore, to split the population into micro, small, medium, and large enterprises, weights were retrieved from the distribution of enterprises per size class provided by Eurostat Structural Business Statistics database (2019 data).
[96] For the quantification, low ends of the range have been used for respectively micro and medium companies, and high ends for small and large.
[97] For VAT listing systems, both the requirements and the associated costs are reportedly similar across the various systems. Therefore, costs have been extrapolated from the value of Czechia. The extrapolation is made based on two parameters: the business population (provided by the Tax Authority) and the price level (proxied by purchasing power price GDP parities). For Lithuania, the extrapolation is based on the cost per occurrence of a bordering country with SAF-T (Poland).

next to the annual administrative burdens per companies, as already presented in Table 6 above.

Total burdens in the 11 EU Member States with DRR requirements in place other than e-invoicing were up to EUR 1.7 billion. Total burdens are the lowest for the Member States with VAT listing (six countries covering about 1.4 million taxable persons) due to its lower complexity. In real-time countries, Hungary and Spain, they reach about EUR 580 million over about 575 000 taxpayers. Total costs for real-time countries are lower than for SAF-T systems, which cover a large amount of taxpayers. Costs are estimated at about EUR 880 million for SAF-T countries, in which about 3 250 000 taxpayers are subject to reporting requirements.[98]

Table 8. Total administrative burdens per type of Digital Reporting Requirement and per Member State (annual values)

Type	Member States	Taxpayers covered	Annual burdens per company (EUR/year)		Total burdens (EUR mn/year)		
			Micro / Small	Medium / Large	Micro / Small	Medium / Large	Total
VAT listing	**CZ,** *BG, HR, EE, LV, SK*	1 421 731	150 / 450	760 / 1 950	213	13	225
SAF-T	**PL, PT,** *LT*	3 238 087	230 / 870	1 350 / 2 470	828	53	881
Real-time	**HU, ES**	578 108	580 / 2 510	1 350 / 4 870 (HU) 4 710 / 20 980 (ES)	418	163	581
	Total	5 237 926	-	-	1 458	229	1 687

Notes. Bold = Sampled Member States. Italics = Extrapolated Member States.
Source. Authors' own elaboration.

4.1.4. Other regulatory costs: penalties and fines

The economic operators can be subject to penalties and fines for non-compliance with DRRs. However, this happens rarely or very rarely, independently of the type of DRR implemented. This reflects the tax authorities' cooperation (i.e. on-boarding and pedagogic approach), especially in the first implementation period, as well as the IT systems features generating error messages or automated warnings in the case of erroneous data.

Tax authorities were asked to provide data on the penalties and fines imposed for non-compliance with DRRs in 2020; data are available for five Member States. As emerging from Table 9 below, chances of receiving a penalty are negligible in Spain, Hungary and Poland, and low in Estonia and Czechia, where between 2% and 5% of taxpayers were sanctioned in 2020. Average sanctions are more significant in Spain and Hungary, where they amount to about EUR 3 000, while in the other countries fall between EUR 100 and 300 per fine. Finally, the average value per taxpayer has been calculated, as a measure of the financial risk (and hence cost) for the normal VAT taxable persons. In all countries, this risk is very low, at EUR 10 in Czechia, and EUR 5 or less in the other five Member States.

[98] For fieldwork Member States, total burdens are estimated by multiplying the punctual estimates per country and size and companies (otherwise presented as ranges) by the relevant business population. Extrapolation for VAT listing countries not covered by the fieldwork is based on the Czech estimates, weighted for the GDP deflator and the relative size of the business population covered. Extrapolation for Lithuania (SAF-T) is done based on the local business population and the cost per occurrence in Poland.

Table 9. Fines and penalties for non-compliance with Digital Reporting Requirements (2020)

	Taxpayers sanctioned	Value of sanctions (EUR)	Average value (EUR)	% Taxpayers sanctioned	Average value per taxpayer (EUR)
CZ	25 100	5 595 078	223	4.5%	10
EE	2 296	418 905	182	2.2%	4
ES	108	331 037	3 065	0.2%	5
HU	258	750 000	2 907	0.1%	1
PL	8 202	844 378	103	0.5%	0.5

Source. Targeted consultation of tax authorities.

This finding was largely echoed by private stakeholders, which were asked to report the number of penalties for non-compliance with DRRs (e.g. for no or late reporting, wrong or incorrect information). As a general assessment, economic operators and VAT practitioners confirmed that the **number of penalties received by enterprises was very low or negligible** regardless of the reporting requirements in place.[99] Therefore, penalties and fines are perceived as a minor problem.

4.1.5. Benefits

Five categories of benefits have been assessed and, when possible, quantified:

1) more targeted **audits or requests for information**;
2) removal of **prior obligations**;
3) **pre-filling** of VAT returns;
4) faster **VAT reimbursements**;
5) increased use of **structured e-invoices**, which is a factor conducive to the automation of invoicing and other business processes.

1. More targeted audits or requests for information

In the case of audits by tax authorities, business operators must prove the accuracy of the documentation and the compliance of their VAT practices. The requests for information refer to less structured interactions, by which tax authorities can ask taxpayers to verify certain data (e.g. in the context of an audit of a supplier or customer). By relying on DRRs, the number of audits and requests for information could either increase – because the DRRs help identify more cases of non-compliance – or decrease – because they become more targeted.

The data reported by tax authorities show that the numbers of audits declined in four out of the six countries considered (see Section 3.2 above). While it is unclear to what extent this can be attributed to DRRs, and accounting also for the impact of the COVID-19 pandemic on audit activities over the last year, the data shared by tax authorities provide a more comprehensive overview than the evidence obtained from the sample of companies and VAT practitioners.[100]

The consulted businesses found **no relation between the introduction of DRRs and the frequency or the costs of audits**. Regular audits were still carried out by competent tax authorities over the last 5 years for economic operators subject to DRRs. Economic operators from Portugal (SAF-PT) reported a high frequency of audits carried out yearly by competent tax authorities and this has not changed following the

[99] Only one large company based in Portugal (SAF-PT) reported having received a penalty, but the amount was not considered significant; no penalties were reported by economic operators registered in Czechia. A respondent from Spain informed that few penalties were imposed at the early stages of DRR implementation.
[100] See Section 3.2.

introduction of SAF-PT, as confirmed by the Tax Authority.[101] The evidence on the frequency and costs of audits are reported in Box 7 below.

Box 7. Evidence from the targeted consultation

Regarding **VAT audits carried out by competent tax authorities** over the past 5 years, for economic operators complying with real-time reporting, 2 large enterprises based in Spain reported being subject to audits once (2018) and more than once (every year) in respect of their taxable operations in Spain. Remarkably, one respondent representing a large enterprise in Spain reported an associated cost of EUR 20 000. Another interviewee from Spain flagged that tax authorities may request information from time to time, but proper VAT audits are rare. When it comes to the duration of the audits, the Spanish large enterprises reported an estimated duration of approximately 1 month. For Hungary, 2 SMEs reported being audited only once (2018 and 2020 respectively) over the past 5 years with an estimated time of less than 1 month to conduct the audit. For economic operators complying with SAF-T, in Portugal, 3 large enterprises went through an audit more than once, 1 SME more than once and 1 SME only once. The duration of the audit varied between less than 1 month to 12 months. In Poland, only 1 SME reported being subject to an audit over the last 5 years, which lasted less than 1 month. Among the economic operators complying with VAT listing, in Czechia only 1 large enterprise reported being audited only once (2018). In this case the respondent reported the total amount of EUR 6 500 related to external fees.

When it comes to **requests for information,** there is no agreed definition of what a request for information is, and few tax authorities keep track of these interactions at the central level. From the evidence provided, in Portugal, the requests for information that went through the VAT Central services doubled between 2012 and 2020 (from about 5 000 to more than 10 000), and this was indeed linked to the availability of new online systems to process the reporting data and submit such requests. In Czechia, the number of requests dropped by about 30% between 2015 and 2019, and this was attributed to the fact that transactional data are directly available to the Tax Authority, so there are more limited needs to ask for information from other traders.

As for the consulted businesses, the economic operators subject to real-time reporting registered a similar number of requests prior to and after the introduction of DRRs. The number of requests remained almost equal for the economic operators subject to SAF-T while for those subject to VAT listing the only respondent who received such requests reported an increase. The evidence on the frequency and costs of requests for information are reported in Box 8.

Box 8. Evidence from the targeted consultation

The questionnaire also included questions on the number of **requests for information related to VAT received from the tax authorities** in order to identify an increase or decrease in the number of requests prior to and after the introduction of DRRs. For instance, in Spain and Hungary, 2 SMEs reported a 100% decrease in the requests received from tax authorities (from 10 to 0 and from 3 to 0 respectively between 2017 and 2019). These reductions represent a time saving of respectively 6 days per year and 2.5 days per year. Additionally, 2 large companies in Spain stated having a constant number of requests from the Tax Authority. For Portugal and Poland, companies reported unchanged requests received from tax authorities. Finally, for Czechia, there was a significant increase for 1 large enterprise reporting that requests for information increased from 1 to 5 back in 2015 to 24 requests in 2020 and another large enterprise reporting an increase from 0 to 3 during the same period of time. This was confirmed by the VAT practitioners from Czechia.

[101] Following the analysis of SAF-PT data, the system automatically opens an administrative verification procedure; if the taxpayer does not regularise the situation, a standard draft audit report is issued automatically. Cf. Box 1. National

2. Removal of other obligations

Consistently with information on different DRR systems gathered as part of the mapping exercise and validated by the tax authorities,[102] only in the two Member States implementing real-time requirements (i.e. Spain and Hungary) economic operators reported that **certain duplicative obligations were removed** following the introduction of DRRs for domestic transactions.

Interviewees from Spain highlighted the elimination of the listings to be submitted via forms 340 and 347 as a major positive impact. Large and small Spanish enterprises reported spending between 1 and 5 working days per month on these forms, depending on the company size. As these forms are not required anymore for companies covered by the SII, the savings amount to about EUR 2 000 to 4 500 per year. In the case of Hungary, economic operators are no longer required to fill out a summary declaration which required an effort of about 0.5 days per month (for a small company) and 1 day monthly (for a medium company). This resulted in a cost-saving from EUR 400 to 800 per year.

Table 10 below provides the estimates of the savings in countries with real-time reporting requirements. They are about EUR 200 million in Spain, and more than 200 million EUR in Hungary, for about EUR 410 million in total.

Table 10. Savings from the removal of other obligations (annual values)

	Micro & Small		Medium & Large		Savings (EUR mn)		
	Working days	EUR	Working days	EUR	Micro & Small	Medium & Large	Total
Real-time	6 - 12	410 – 1 750	12 - 30	820 – 4 370	318	93	411

Note. Number of working days estimated for the 'normally efficient firm', based on the evidence from the targeted consultation. Source. Authors' elaboration on targeted consultation.

3. Pre-filling VAT return

A pre-filled VAT return is a pre-populated form including transaction data already reported to competent tax authorities via DRRs, to facilitate compliance with the VAT return obligation. It requires that the information for the DRRs is submitted before the deadline for the VAT return (either real-time, or, for PTCs, at an earlier date).[103]

As of 2021, this additional service for taxpayers has been introduced only in two Member States so far, Spain and Portugal (its introduction is expected soon in Hungary and Italy). In the other Member States, the information for the DRRs must be submitted jointly with the VAT return, which prevents the introduction of pre-filled VAT return.

VAT practitioners in these two countries declared that this represents a minor to moderate benefit, and mostly for small companies. However, when aggregated across the total business population, savings become consistent. Based on the data reported by economic operators, the typical savings are estimated at two hours per submission (quarterly), i.e. one working day, for micro and small companies,[104] half a day and one day per submission (monthly) respectively for medium and large companies.

Total savings per year ranged between EUR 100 for micro and small companies to EUR 1 000 – 1 800 for large companies. Total savings are relatively limited in Spain, where the number of companies subject to SII is lower, at about EUR 23 million, and higher in

[102] See also country factsheets in Annex A.
[103] Pre-filling is possible both in countries where data concern both sales and purchases, as well as in countries where only sales data are to be submitted.
[104] Not applicable to Spain given the SII threshold.

Portugal, where the simplification currently applies to about 270 000 taxpayers, and represents a saving of about EUR 33 million.

Table 11. Savings from the pre-filling of VAT returns (annual values)

	Micro & Small		Medium & Large		Savings (EUR mn)		
	Working days	EUR	Working days	EUR	Micro & Small	Medium & Large	Total
Real-time (ES)	-	-	6 – 12	870 – 1 750	-	23	23
SAF-T (PT)	1.5	100		500 – 1 000	26	7	33

Note. Number of working days estimated for the 'normally efficient firm', based the evidence from the targeted consultation. Source. Authors' elaboration on targeted consultation.

4. VAT reimbursements

Interviewees were asked if there was any **change in the time required to obtain VAT reimbursements**[105] since the introduction of DRRs for domestic transactions. The findings suggest that there were **none or minor changes in the time required to obtain VAT reimbursement claims.**[106] However, given the low likelihood that businesses participating in the targeted consultation had a thorough experience with domestic VAT refunds, data were requested from the tax authorities in fieldwork Member States. In three countries, an improvement before and after the introduction of DRRs could be identified, for which the new DRRs were at least partly instrumental.

- In Estonia, VAT refunds are extremely quick. Following the introduction of the VAT listing, they went from an average of 1.88 days to 1.12 days. The reporting requirement has likely contributed to this result.[107]

- In Spain, the average time for a refund went from 63 to 19 days; the introduction of the SII had a moderate impact on this reduction,[108] which was also determined by a re-engineering of the refund process, especially for non-risky taxpayers. Total VAT refund in 2019 amounted to EUR 19.7 billion.

- In Portugal, there are different refund times, for various categories of taxpayers. Category A includes taxpayers that pay VAT monthly (i.e. larger taxpayers); Category B includes exporters and taxpayers mostly operating under the reverse charge regime; Category C includes other taxpayers. For each category, the refund time between 2012 and 2020 improved as follows: (i) category A, from 36 to 20 days; (ii) category B, from 32 to 20 days; and (iii) category C, from 70 to 64 days. The introduction of DRRs had a moderate effect on this reduction. Total VAT refunds in 2020 amounted to EUR 5.3 billion.

To estimate the savings for the companies involved, the opportunity cost of delays in obtaining a VAT refund is calculated: in case of delays, taxable persons bear an opportunity cost equal to the interest rate on the receivable amount. A reduction of the delay results in a reduction of such cost. To measure this benefit, the interest rate on

[105] Here, reference is made to domestic VAT refund, i.e. when a company has a VAT credit at the end of the taxable period or year, and not to cross-border VAT refund for non-registered companies.
[106] The majority of respondents declared that there was no or moderate changes or that they never received a VAT reimbursement. Conversely, two service providers operating in Spain and Portugal stated that DRRs brought at least moderate benefits by reducing the time for VAT refund.
[107] There is no information on the total amount of VAT reimbursement; therefore, the quantification of benefits that is possible for Spain and Portugal is not possible. However, given the very small improvement (slightly more than half a day), monetary benefits are negligible.
[108] The taxpayers now covered by SII were previously covered by the REDEME system, through which similar information had to be reported jointly with the VAT return and not on a real-time basis; this may explain why the SII only had a moderate impact in the reduction of the time for VAT reimbursement.

loans to a non-financial corporation is used.[109] Given the current level of interest rates, benefits are relatively small compared to the amount of VAT reimbursed: EUR 36 million in Spain and EUR 2 million in Portugal. However, since current interest rates are well below the historical average, savings could become more significant in the future.

5. Increased use of structured e-invoicing

The use of structured e-invoices is beneficial for companies, since it is conducive to the automation of a number of business processes. First and foremost, the issuance, reception and storage of invoices; secondly, other business processes connected to invoicing, such as the order-to-payment procurement cycle, as well as certain accounting process.

There is limited evidence on the impact that DRRs had on the use of structured e-invoicing. The only case in which the tax authority reported a significant impact on the diffusion of e-invoicing is Hungary, where the data transmission is machine-to-machine, and several compliance solutions require or nudge taxpayers to use structured e-invoices. Also, the requirement to use SII in Spain may lead to a higher degree of data automation and foster companies to use e-invoices. Three large enterprises participating in the consultation indeed reported to have started using structured e-invoices around the date of entry into force of SII (between 2017 and 2019). However, according to a Spanish service provider, the level of invoice details requested by SII does not require economic operators to adopt an e-invoicing solution and thus no benefit can be attributed to this real-time reporting requirement.

Evidence of an impact in this respect is more limited in SAF-T countries, and significantly so in VAT listing systems. A number of Portuguese operators (4) reported to use structured e-invoices, but their introduction took place between 2017 and 2020, i.e. much later than the entry into force of SAF-T. In Czechia, there is no evidence of correlation between the entry into force of the VAT listing requirements and the use of e-invoices, which is seemingly more spurred by the B2G obligations (which entered into force in 2016). All economic operators based in Czechia indeed declared that the introduction of DRRs did not influence their company's decision to use structured e-invoicing. The Czech VAT practitioners in general perceive the introduction of DRRs as having no or moderate influence in fostering the use of structured e-invoices.

4.2. Mandatory e-invoicing

4.2.1. Introduction

This section presents **an analysis of costs and benefits for Italian operators generated by the introduction of mandatory clearance e-invoicing**.

Within the EU, Italy is the sole country which obtained the derogation ex art. 395 of the VAT Directive for implementing mandatory clearance e-invoicing (hereinafter referred to as 'mandatory e-invoicing' or 'e-invoicing'). According to this solution, the e-invoice should be issued in a pre-determined, automatically-processable format – in this case, compliant with the *FatturaPA* format (XML) – and should be transmitted via a platform managed by the Tax Authority – the *Sistema di Interscambio* (SDI) – either through an intermediary or by the taxable person directly connected to the platform. Thanks to this system, real-time transmission of transaction data to the tax authority is ensured.[110] The obligation is in place as from January 1st, 2019, and applies to all operations between resident entities for which an invoice is required, that is, all B2B and B2G

[109] ECB, Interest rates on new euro-denominated loans to euro area non-financial corporations, Composite cost of borrowing indicator.
[110] For more information on the functioning of the system, please refer to Section 2.3.2.

transactions, as well as B2C transactions when an invoice is required by law or demanded by the customer.[111]

Data sources. The information presented in this section has been retrieved from 62 businesses. Most of them were contacted via a business survey of 53 enterprises which relied on the network of the Italian business federation Confindustria. This survey was then complemented by interviews with micro companies and self-employed workers, as well as with two very large Italian companies, to fill gaps in the population segments. In addition to company data, the estimates were refined with the information provided by VAT practitioners and business federations, as well as with data from secondary sources (i.e. Eurostat data on annual earnings by occupation; data from the national statistical institute and the Tax Authority on businesses subject to e-invoicing provisions).

Business population. The business population subject to e-invoicing requirements include VAT taxable persons resident in Italy, or with a fixed establishment therein.[112] Businesses with a turnover lower than EUR 65 000 opting for the VAT SME scheme are excluded from the obligation.[113] The population covered by the requirement consists in 3.5 million businesses, out of 5.5 million taxable persons.

To proceed with the analysis, the business population has been divided into three size-classes, according to the number of invoices issued[114] and based on national data on the number of enterprises per size class: [115]

- Micro-sized enterprises: issuing between 0 and 300 invoices;
- Small-sized enterprises: issuing between 301 and 3 000 invoices;
- Medium-sized enterprises: issuing more than 3 000 invoices.

The business population is reported in Table 12 below.

Table 12. Business population by size class

	Estimated population	#invoices issued
Micro-sized	3 350 000	0 – 300
Small-sized	122 000	301 – 3 000
Medium-sized	15 000	> 3 000
Large-sized	2 500	

Source. Authors' elaboration on data from the tax authorities, Istat.

The invoicing process and mode of compliance. Invoicing is an information obligation through which companies provide information to their trading partner and the tax authority.[116] The issuance of an invoice requires three main activities:

[111] Transactions with non-resident entities (intra-EU, extra-EU) can be reported to the SDI on a voluntary basis; in this case, the SDI does not transmit the e-invoice to the counterpart, to whom the invoice has to be transmitted via other means.
[112] This results from the scope of the obligation, that is defined in terms of the transactions covered, as all transactions between taxable persons resident in Italy.
[113] Namely, VAT taxable persons subject to an SME exemption scheme (i.e. *regime dei minimi*, *forfettario* or *di vantaggio)* mostly with a turnover equal to or lower than EUR 65 000 per year.
[114] This indicator was preferred to other variables (e.g. turnover) for segmenting the population based on the cost data retrieved, since companies are likely choosing their mode of compliance, and therefore bear different costs, primarily considering the volume of invoices to be exchanged. Data on the number of invoices issued have been retrieved through the business survey and the targeted consultation.
[115] Istat data series on enterprises, added value, employees, and fixed investments by macro-sector of economic activity and class of employees ("*Imprese, valore aggiunto, addetti e investimenti fissi per macrosettore di attività economica e classe di addetti"*).
[116] Economisti Associati, CASE and Mazars (2019), Report for the European Commission, "Study on the evaluation of invoicing rules of Directive 2006/112/EC", Final Report ('EA 2019').

1) **Collection of customer and transaction data.** An e-invoice includes two sets of data: (i) the customer data, e.g. his/her name, address, VAT number as well as the SDI code;[117] and (ii) the transaction data, e.g. the description of the goods/services provided, the taxable amount, the applicable VAT rate, exemption, or regime, the clauses that need to be mentioned, and the VAT due. Customer data may already be in the possession of the company or may need to be retrieved from the customer. The transaction data can already be known to the issuer, or can be retrieved internally. Both customer and transaction data can be retrieved either automatically, e.g. if the company has an ERP system that draws from the company's internal databases, or manually.

2) **Drafting the e-invoice**. This activity consists in inputting the data collected into the invoice. It can be carried out manually on an online platform (including the free portal provided by the Italian Tax Authority) or in a software; or automatically, by means of an e-invoicing solution or an ERP module. Almost all the participants to the Targeted Consultation reported to take care of the drafting of the e-invoice in-house; only two micro-firms declared outsourcing this task.

3) **Delivering the e-invoice**. The e-invoice is then transmitted to the SDI. The transmission can take place trough different e-invoicing solutions, e.g. either via a self-standing software or an online platform - this was the case for the majority of respondents, or through a module integrated in the ERP - this was the case for the minority of respondents. The taxpayer can also draft and directly transmit the invoice through the SDI public platform.[118] Once the e-invoice is received by the SDI, the Tax Authority checks if all the mandatory fields have been filled properly (e.g. name and VAT number of the VAT taxable person issuing the e-invoice; date of issuance) and if the information provided is formally correct (e.g. in terms of the counterpart's VAT number, or the indication of the taxable amount and VAT payable). If there are no irregularities, the SDI forwards the e-invoice to the recipient and the e-invoice is considered as lawfully issued. The SDI notifies the issuer for both successful and unsuccessful deliveries of the e-invoice. If anomalies are spotted in the e-invoice, it is considered as not issued for tax purposes and the SDI sends to the issuer a rejection message. The issuer is then required to issue a new e-invoice.

4.2.2. Issues with e-invoicing requirements

Participants in the Targeted Consultation were asked to report on features of the e-invoicing system perceived to be unclear or which are generating problems. Overall, few respondents are experiencing issues with the e-invoicing provisions. Some of them relate to **technical matters**, such as unclear components of the XML format; or uncertainty about technical rules regulating the invoice text and format (e.g. which special characters can be used in the description of the goods). Other issues were linked to the **frequent changes in the technical rules**, and in particular in the specifications of the XML format. Furthermore, the need to have specific guidelines on how to draft different types of e-invoices (e.g. for certain less common transactions, such as sales via agents) as well as having some prior guidance on the rejection rules were also underlined.

[117] The SDI code is a unique identifier used to deliver the invoice; it is different than the VAT number. It can be replaced by the indication of a certified e-mail, but the latter is used for only about 2.5% of invoices (Politecnico di Milano, Osservatorio Digital B2b, data for 2019).

[118] This solution is however used very seldom, for about 1% of the e-invoices exchanged. The limited use of the online platform provided for free by the Tax Authority can be attributed, according to a VAT practitioner, to the impossibility of connecting the platform to the company's accounting system, which makes it fit only for taxpayers issuing a very low number of e-invoices. Furthermore, a number of cheap e-invoicing solutions appeared on the market, sometimes providing additional services compared to the public portal. Cf. Politecnico di Milano, Osservatorio Digital B2B, data for 2019.

4.2.3. Administrative costs and burdens

Businesses established in Italy incur certain administrative costs and burdens to comply with e-invoicing requirements. An e-invoicing system generates **implementation costs**, that are the costs needed to setup the business environment for issuing and receiving e-invoices in line with the Italian requirements. On the contrary, since taxable persons have to issue an invoice anyhow, they do not generate ongoing costs, that are the costs of issuing e-invoices once the system is in place. Rather, the question is whether they generate additional costs or savings compared to the previous situation; **ongoing savings** did indeed occur, at least for medium and large enterprises.

Implementation costs

Implementation costs include:

1) **One-off costs: IT**, and namely the costs of equipment, software - for both purchasing new systems and updating pre-existing ones, IT personnel and outsourced IT services. The median micro taxpayer invested about EUR 1 300, with wide variation. In particular, the first quartile, which better capture self-employed and firms with 1 or 2 employees, report a cost of EUR 240. A similar median cost was estimated for small companies (about EUR 1 400), while setup costs increase for more complex organisations, i.e. medium (EUR 3 500) and large (EUR 15 000) enterprises.

2) **One-off costs: familiarization and training** Familiarisation costs represent between half and two thirds of IT costs across the various business size classes. When expressed in terms of personnel time, the costs for familiarising with the new obligations, acquiring the necessary know-how and training the personnel amounted to about 3 working days for micro entities (EUR 600) and 5 working days for small companies (about EUR 900). The effort grew progressively with the firm size at about 10 working days (EUR 1 700) and more than 20 (EUR 4 000) respectively. Finally, in some cases, respondents reported that they did not bear any extra costs because, for example, training was provided for free by trade associations or, because it was considered as a part of the periodic update of fiscal requirements.

3) **Recurring costs** include the annual costs paid to software providers or for the periodic update of software, as well as the costs incurred for accessing online platforms and services for drafting and delivering the e-invoices.[119] Recurring costs are typically low for micro-companies, with a central estimate of EUR 300 in a range of between EUR 170 – 500. However, these costs grow markedly across size classes, at EUR 1 500 to 1 700 for small companies, and up to EUR 10 000 for large enterprises. Importantly, annualised implementation costs below are inversely proportional to the IT setup costs.[120]

Total annual implementation costs can be calculated as the sum of setup costs, amortised over three years, and recurring costs and are shown in

Table **13** below.[121] The median annual administrative burdens amount to EUR 500 for a micro company, and to about EUR 600 for a small enterprise. Costs increase markedly for medium sized entities (about EUR 3 400) and large companies (about EUR 16 300).

[119] Recurring costs do not cover personnel costs for issuing e-invoices, discussed separately below.
[120] There is an inverse relation between one-off and recurring implementation costs, so that companies that invest more upfront have lower recurring expenses, and vice versa. Hence, the median of total implementation costs is lower than the median of one-off and recurring costs.
[121] Setup costs also include IT equipment, which is normally depreciated over a longer period (5 years). The choice to select a lower depreciation period incorporates the higher risk that IT investment and knowhow is made (partly) obsolete by changes in the legal framework or the technical regulation.

Table 13. Typical total burdens for setting up a compliance system (EUR/year)

	Micro	Small	Medium	Large
Median	500	600	3 400	16 300
First quartile	220	210	2 550	4 100
Third quartile	910	2 200	5 500	26 000

Source. Authors' elaboration on targeted consultation and Business Survey.

Ongoing costs/savings: invoice issuance

Issuing an invoice generates administrative costs and burdens on businesses. However, these costs and burdens cannot be attributed to the introduction of an e-invoicing requirement. Indeed, it did not introduce a new obligation for Italian taxpayers; rather, it only changed the modality through which invoices are issued and submitted. Therefore, to calculate the administrative costs and burdens, the difference between the situation prior and after their introduction is considered.

As shown in Table 14 below, variations are pretty small for micro and small entities. For micro companies, the median is 0% and the average increase is 1%; for small entities, the increase is somehow larger, at 5% and 7%. Such small variations are likely to result from a combination of a slightly quicker issuance time, as well as more time needed to deal with rejections, errors and credit / debit notes. As for the former factor, simpler e-invoicing solutions which require data to be filled-in manually generate no particular time savings compared to previous modalities (e.g. the usage of a word processor or spreadsheet). As for the latter, small and micro companies used to deal with invoice mistakes 'informally' with their clients under the previous rules; with the SDI, they now need to correct the mistake formally (e.g. by sending a credit note, or issuing a new invoice in case of rejections). Over time, a reduction of the error rates is likely, and this would tend to smoothen out any increase. All in all, the e-invoicing obligations lead to no or very limited increases of ongoing costs for the smaller companies.[122]

For large and medium sized companies, the median variation is again 0%, but the average points to a significant saving (-11%). This likely result from a combination of most companies whose invoice system was already automated before 2018, and few companies that did automate their process following the new requirement and thus experienced very large savings. Considering an average time for invoice issuance of 2 minutes, savings can be estimated at about EUR 10 million, respectively EUR 4 million for medium companies and EUR 6 million for large enterprises.

Table 14. Variation of the time needed to e-invoice issuance compared to 2018

	Micro	Small	Medium and Large
Median	0%	5%	0%
Average	1%	7%	-11%

Source. Authors' elaboration on targeted consultation and Business Survey.

[122] This is confirmed by the results of a survey on a representative sample of Italian business population, which mostly consist of small and micro entities, which reported a mixed view on the direct benefits on the costs for issuing an invoice. The sample was split among those who perceived an improvement or worsening of the active cycle (about 30% of respondents each). The main benefits consisted in a saving of time and costs, while the negative effects resulted from the rigidity of the format and transmission mode, as well as from the complexity introduced by the clearance system. Cf. Osservatorio Digital B2b, Politecnico di Milano, '*Digitalizzare per (r)esistere',* June 2020.

Total administrative burdens

Total annual administrative burdens result from the sum of the implementation costs and, for large and medium companies, the savings due to quicker issuance time. To calculate the former, the median value of a company's annual burdens is multiplied by the business population for each size-class. Results are shown in Table 15 below.

Table 15. Administrative burdens: Italian e-invoicing requirement (annual values)

	Implementation costs per company (EUR)	Estimated population	Total implementation costs (EUR mn)	Ongoing burden savings (EUR mn)	Total administrative burdens (EUR mn)
Micro	500	3 350 000	1 670	-	1 670
Small	600	122 000	70	-	70
Medium	3 400	15 000	50	4	46
Large	16 300	2 500	40	6	34
Total	-	3 489 500	1 830	-	1 820

Note. Figures rounded at EUR 5 million.
Source. Authors' elaboration based on targeted consultation and Business Survey.

Overall, in Italy the total implementation costs due to the introduction of the e-invoicing requirements amounted to EUR 1.8 billion, of which about EUR 1.7 billion borne by micro-sized companies and self-employed, about EUR 70 million by small-sized companies and about EUR 90 million by medium and large-sized enterprises. Micro entities and self-employed bear about 90% the costs, since they represent 96% of the taxable persons subject to the requirements.

Box 9. Spontaneous compliance by companies under the VAT SME scheme

While very small taxable persons under EUR 65 000 turnover are not required to issue e-invoices, a share of these micro companies have opted into the system. Such voluntary compliance can be explained by various drivers: (i) efficient or cheap e-invoicing solutions that deliver e-invoices via the SDI appeared into the market and attracted micro entities which would otherwise be exempt; (ii) these micro entities have been requested to use the SDI by their clients, and (iii) exempt entities active in the B2G market are required to use the SDI platform.

According to the tax authority's data, about 2 million taxable persons fall under the SME exemption schemes. Of these 2 million, about 600 000 decided to issue e-invoices. These taxable persons voluntarily complying with the e-invoicing requirements are not included in the above calculations.

Total costs for this segment are shown in the table below and amount to EUR 132 million. Such costs are calculated considering the first quartile of the implementation costs, since these are all entities with a very small turnover (in most cases, lower than EUR 65 000) even compared to micro-entities (which include companies up to EUR 2 million turnover). Differently from the figures in Table 15 above, these costs cannot be considered as burdens, because they do not depend on the VAT or e-invoicing legal framework.

Table 16. Total costs for 'voluntary compliance' (annual values)

	Implementation costs per company (EUR)	Estimated population	Total implementation costs (EUR mn)
Micro with 'voluntary compliance'	220	600 000	132

Source. Authors' elaboration based on targeted consultation and Business Survey.

4.2.4. Other costs: fines

The vast majority of businesses reported to have never paid penalties for non-compliance with e-invoicing obligations, including for no or late reporting or for incorrect information. Only six respondents out of 58 declared to have incurred penalties 'once' or 'more than once', but without reporting the amount of the fines; therefore, it can be assumed that these were likely negligible. This was also confirmed by VAT practitioners and business federations, which reported that sanctions were very seldom levied.[123] If anything, the switch to e-invoicing reduced sanctions for formal non-compliance with invoicing or reporting obligations.

The above findings seem to be in line also with the replies provided by businesses when asked if they ever received any automatic warning or error message on data reported. This happened to about one third of the respondents. Among those who received error messages, the attitude is positive, i.e. these messages are useful as they allow to promptly detect and correct inaccuracies. Only two respondents underlined that getting these messages were burdensome.

4.2.5. Benefits

The introduction of mandatory e-invoicing led to the materialization of certain benefits for businesses. In the words of a business federation, "*the introduction of mandatory e-invoicing in Italy represented a step forward in terms of business digitalisation, as it forced a number of actors, especially the very small taxable persons, to adopt a new mode of dealing with VAT compliance"*. These benefits include:

1) Savings of **postal and printing costs;**
2) Increased **business automation;**
3) More efficient **audits** and requests for information;
4) The removal of **other reporting obligations.**

1. Postal and printing costs

The switch to e-invoicing eliminated the need to print invoices and send them via post. This was a common way to deliver invoices prior to the obligation. According to the Commission Study on invoicing rules,[124] prior to the introduction of e-invoicing requirements, paper invoices represented about half of invoices issued by micro, small and medium enterprises, and about 40% for large companies. A significant and sometimes preponderant share of paper invoice was then sent via post.[125]

Printing costs had been estimated at EUR 0.02 per invoice.[126] Considering that about 2 billion invoices are exchanged over the SDI[127] and the share of paper invoices, total savings in printing costs amount to about EUR 18 million. Savings are more considerable for postage costs, because of the cost of stamps:[128] they reach about EUR 80 million.[129]

[123] Additional data have been requested to the tax authorities and could be included in the next version of the analysis.
[124] Cf. *supra note* 116.
[125] Detailed data and cost parameters are presented in Annex F.
[126] *Ibid.*
[127] Information from the tax authority and Osservatorio Digital B2b, Politecnico di Milano, '*Digitalizzare per (r)esistere',* Giugno 2020.
[128] Cost of stamp for regular letter is EUR 1.10; for large volume deliveries, the tariff is EUR 0.28. The former tariff is used for micro entities, the latter SMEs and large enterprises.
[129] The quantification accounts for a bulk delivery factor, i.e. the likelihood that, for medium and large enterprises, a single postal delivery could be used for multiple invoices.

Table 17. Printing and postal savings (annual values)

Size	Savings: printing (EUR mn)	Savings: postal costs (EUR mn)
Micro	4	33
Small	2	16
Medium	2	9
Large	10	21
Total	18	79

Source. Authors' elaboration on targeted consultation, EA 2019, Osservatorio Digital B2b.

2. Business automation

According to most VAT practitioners and e-invoicing experts, **the bulk of savings can be obtained from a more efficient management of the invoices received** (the so-called passive cycle, or accounts receivable). One large company reported that savings could represent at least 40% of the overall cost for receiving and recording invoices, and up to 90% if incoming invoices are automatically matched with the other parts of the business' audit trails. Secondary sources estimate that savings can reach up to 60-70% of total costs, with a study considering estimated savings to be at EUR 5.5 / 9 for each received invoice. The targeted consultation (discussed in Box 10 below) report savings of 5 to 8 person/days per year for two small enterprises, and much larger for large companies (70 working days per year). **For archiving, savings due to dematerialisation can reach up to 60% of storage for micro companies, and 25% for large enterprises**.[130] If these savings materialised for the whole Italian business population, the e-invoicing obligation would have generated net administrative savings.[131]

However, it is too early to tell, as the available evidence is inconclusive since it mostly concerns a small minority of large companies. First of all, those benefits would directly accrue to companies keeping accounting activities in house. However, more than 90% of micro companies and more than 80% of small companies outsource this activity to an external tax advisor.[132] Secondly, the savings strictly depend on the degree of automation of a company's accounting system. From the targeted consultation, there is evidence that some companies, especially among the largest and most technology-savvy ones, are enjoying these kinds of benefits. Still, these benefits are likely to begin accruing to a broader and more significant proportion of the business population only in the medium-term.

Box 10. Other burden savings – evidence from the Targeted Consultation and Business Survey

As far as the cost of posting is concerned, the electronic submission of the invoice led to savings of about 11 person/days per year for a large enterprise that were previously devoted to posting invoices. E-invoicing also allowed to improve the filing and storage of tax data, which translated into average savings of 5 to 20 person/days per year for two small enterprises. Furthermore, as pointed out by a VAT Practitioner, more structured companies linked the e-invoicing system with the warehouse management, with benefits on the accounting process. Some businesses also reported the elimination of general 'administrative' requirements like, for example, posting revenue stamps on invoices, when needed, or indicating the date of receipt on invoices for the purposes of deducting VAT on purchases which, overall, translated into savings of about 30

[130] Quoted in Economisti Associati, CASE and Mazars (2019), Report for the European Commission, "Study on the evaluation of invoicing rules of Directive 2006/112/EC", Final Report ('EA 2019').
[131] *Ibid.*
[132] Source: targeted consultation. Whether the obligation led to a reduction in tax advisors' fees for these activities remains an open question, also considering that taxpayers usually pay periodic fees that include all various accounting and fiscal services, and it is impossible to single out the component linked to these activities. Furthermore, tax advisors had at the same time to undergo the costs for adapting to the e-invoicing system, therefore it would not be possible to measure the total impacts.

person/days for a large enterprise and 5 person/days for a small company. A large business reported a general simplification of the activity flow, which allowed it to save 30% of the working time of one employee, i.e. about 70 working days. Finally, other benefits mentioned by businesses relate to the standardisation of both invoicing submission to customers and the process of handling invoices received.

3. Audits and requests for information

There is no univocal opinion among Italian business federations and VAT practitioners about the positive effects on audits. Most respondents declared that mandatory e-invoicing did not bring to any benefits in terms of number or duration of audits; only one VAT Practitioner did recognize that the 'real-time' availability of the data within the Tax Authority generated 'moderate benefits' in terms of quicker audits.

This is fully expected. The obligation came into force in 2019. In 2020-21, a large part of audit activities was suspended because of the COVID-19 pandemic and is only now slowly restarting. Furthermore, audits tend to focus on the periods close to the end of the period of prescription, which in Italy last 5 years for many irregularities. This means that the years in which e-invoices was mandatory have not yet been audited for the most part, and therefore it is not possible to discuss such impacts. Furthermore, the current e-invoicing requirements do not provide the tax authority all the information needed to assess the VAT position of a taxpayer. As a minimum, there may be transactions outside the scope of SDI (B2C, intra-EU and extra-EU transactions), the e-invoice does not always allow determining the deductibility of VAT, and timing discrepancies may occur so that the e-invoice may not be sufficient in determining whether VAT was paid and deducted at the correct chargeability date.

The same considerations largely apply to requests for information. Only three companies in the sample received a request for information, and the evidence suggests that a number of these requests may no longer take place following the introduction of the e-invoicing requirements. Still, savings are marginal: one to two working days for medium companies, 20 working days for a very large one. The opinion of the business federations and VAT practitioners interviewed is that, in general, mandatory e-invoicing has not yet produced significant benefits in terms of less requests for information.

Box 11. Audits and requests for information: evidence from the Targeted Consultation and Business Survey

Among the surveyed businesses, six respondents declared to have been subject to VAT audits in the last five years, but only three of them provided some additional information. The time spent by the personnel involved was on average 35 working days per audit; as for the external fees paid, they vary considerably, with two medium-large size enterprises spending, respectively, around EUR 3 500 and EUR 100 000, and one small-size company spending around EUR 1 000. The data collected do not allow for a comparison between the situation prior and after the entry into force of mandatory e-invoicing. However, five out of six of the businesses subject to VAT audit did so before 2019, which means that only one surveyed company was involved in audits related to VAT after the obligation was introduced. As for requests for information, two medium companies reported to have received one request each; the associated costs were about 1 to 2 working days, and in one case an external fee of EUR 500 was paid. One large company reported that, before the introduction of e-invoicing, regular requests for information on specific transactions were received; this no longer takes place after 2019. Benefits are very small compared to the size of the company (which used to receive about 20 requests over 52 entities, with a turnover of several billions EUR).

4. Removal of other obligations, pre-filling and VAT reimbursements

In Italy, after the introduction of mandatory e-invoicing, one obligation has been removed, and another will be removed soon:

- the previously existing domestic VAT listing, the '*Spesometro'*, was eliminated;
- the foreign VAT listing, the '*Esterometro'*, is still in place for the transactions that the taxable persons do not upload to the SDI (on a voluntary basis). It will be removed as of July 2022, when intra-EU and extra-EU supplies will also have to be reported on the SDI.

As far as the *Spesometro* is concerned, based on the data on resources needed for compliance, the removal of this obligation generated about 4 person/days savings for two medium enterprises, and to higher savings of about 5 person/days and about 10 person/days for two large enterprises. Additionally, another micro-company reported to have previously spent around 200 EUR in external fees to conform to the requirement.

The above findings, in terms of benefits for businesses, have also been confirmed by an Italian business federation representing micro and small-sized enterprises, which declared that the *Spesometro* could have been very costly. One VAT Practitioner reported that "*the* Spesometro *was an aggravating work […] and the fees required to handle this obligation by an external tax consultant could be up to 1 200 EUR per year depending on the company size. A micro or small company could be expected to spend between EUR 50 and 200 per year*."

Savings from the elimination of the *Spesometro* are thus substantial, considering that this was an obligation that concerned all VAT taxable persons in Italy, and approximated almost EUR 375 million per year, of which EUR 335 million was incurred by micro companies and self-employed.

Table 18. Removal of other obligations: burden savings

	Savings		Total savings (EUR mn)
	Fees (EUR/year)	Person/days	
Micro	100	-	335
Small	200	-	24
Medium	-	4	11
Large	-	7.5	4

Source. Authors' elaboration on targeted consultation and Business Survey.

With respect to the pre-filling of VAT returns, this service is not yet in place but envisaged as of 2022. The surveyed businesses did not report any prevalent feelings about its future implementation. The business federations and VAT practitioners interviewed consider that the pre-filling of VAT returns, though helpful, will not necessarily translate into major simplifications for businesses. Specifically, the prefilled VAT return issued by the Tax Authority will still need to be checked by the taxpayer (or its advisor), and this would probably reduce the simplification potential.

Finally, concerning VAT reimbursements,[133] only two respondents out of 14 noted a significant reduction in the time required to obtain a VAT reimbursement after the introduction of mandatory e-invoicing. Only one business federation reported that there have been 'moderate benefits' in terms of quicker VAT reimbursement time, but "*it is difficult to say if these are related to a more efficient data flow or to higher available resources within the tax administration*". The limited effect of mandatory e-invoicing in that respect was also acknowledged by the tax authority. The average time only slightly

[133] Here, reference is made to domestic VAT refund, i.e. when a company has a VAT credit at the end of the taxable period or year.

varied from 75 to 72 days between 2018 and 2020, and the role played by the e-invoicing system is, at best, limited.

4.3. Conclusions

The most visible impacts of DRRs on domestic taxpayers result from increases in compliance costs. They mostly consist in setup costs for setting up or updating the necessary IT systems, as well as to purchase reporting and e-invoicing software and e-invoicing platforms. Other costs include those for familiarisation and training, as well as the ongoing personnel costs to submit the required information and operate the IT solutions.

The annual costs per company are summarised in Table 19. Expectedly, **costs increase in proportion to the complexity of the DRRs**, as well with company size. In particular, costs for micro entities are estimated near or below EUR 200 per year when it comes to VAT listings, SAF-T and real-time requirements; they can however increase to EUR 500 per year with e-invoicing. However, the smallest among micro companies, and in particular self-employed, are likely to bear a lower cost, at near or below EUR 200 per year. Differences are more marked for large companies, which would spend about EUR 2 000 to 3 000 per year under the simpler systems, while compliance costs of more than EUR 15 000 can be expected in Spain (real-time) and Italy (e-invoicing).

Table 19. Administrative burdens borne by EU economic operators according to company size and type of DRR (EUR/year annualised)

	Implementation Costs	
	Micro/Small	**Medium/Large**
VAT listing	150 / 450	760 / 1 950
SAF-T	230 / 870	1 350 / 2 470
Real-time	580 / 2 510	1 350 / 4 870 (HU) 4 710 / 20 980 (ES)
e-Invoicing	500 / 600	3 400 / 16 300

Source. Targeted consultation of businesses, VAT practitioners, and service providers.

As for benefits, the main ones emerging from the analysis consist in the **removal of other information provision obligations**, which is typically associated with CTCs. Among the sampled Member States, this indeed occurred in Hungary, Spain and Italy. Another benefit consists in the **provision of pre-filled VAT returns**, which are already operational in Portugal (SAF-T) and Spain (real-time) and envisioned in Hungary and Italy. Some additional savings were identified in Italy, concerning the **dematerialisation of e-invoices**, and the consequent savings in printing and postal costs, as well as from **business automation**. The latter benefit is likely to be very significant, should the improvements to the handling of invoicing, business and accounting processes allowed by the use of structured e-invoices become widespread among the business population. However, it is yet too early to tell, and the available evidence concerns a minority of companies, mostly large entities.

Finally, some evidence could be identified in a few Member States about faster VAT reimbursements following the introduction of DRRs, though this also required a revamping of the reimbursement procedures, so to use the newly available data. Limited evidence could be identified on the positive effects of DRRs on audit activities from the point of view of private stakeholders, as well on fines for non-compliance with the new rules.

5. COSTS AND BENEFITS FOR MULTINATIONAL COMPANIES

The lack of harmonisation of DRRs across the EU generates additional administrative costs for certain businesses operating cross-border, which have to comply with diverse local requirements. In this situation, a company incurs in terms of compliance costs both in its country of main establishment, but also in other countries, depending on the number of countries in which it operates or is established. In principle, these compliance costs are not different from the ones that domestic operators incur; still, due to the cross-border nature of the activities, they are duplicated across multiple jurisdictions. In this analysis, these are termed '**costs of fragmentation'**.

This section assesses the above-mentioned costs. First, the data sources and the business population are described. Then, the business population concerned and the mode of compliance are illustrated, by presenting the strategies deployed and the activities carried out to comply with these requirements. Finally, the costs – in particular administrative burdens – and benefits for the operators concerned are assessed and, where possible, quantified.

5.1. Introduction

Data sources. Information in this section mostly comes from the targeted consultation of Multinational Companies (MNCs), complemented as needed with information from tax authorities, VAT practitioners and e-service providers as well as secondary sources. All in all, 33 MNCs provided information on the themes relevant to DRRs, of which 15 headquarters and 18 subsidiaries operating in Italy, Spain, Hungary, Poland, and Czechia.

Business population. The businesses affected by the duplication of DRR costs are a sub-set of those operating cross-border. The population of MNCs concerned by multiple compliance includes **companies with foreign establishments in a Member State where local DRR apply** as well as, in certain cases, **companies with a VAT registration** in these Member States. *A contrario*, companies only supplying towards other Member States are largely excluded from DRRs in the destination country, unless they need to VAT register therein.

Eurostat[134] estimates that about 210 000 MNCs are registered in the EU, of which about 150 000 with an EU decision centre (i.e. headquarter) and the rest controlled by foreign entities.[135] The vast majority of them (85%) have a subsidiary in one or two Member States; about one in ten operate in three to five Member States other than that of establishment, and less than 4% in more than six Member States.[136] In nine out of ten cases, MNCs include less than 10 legal units, with about 1% of MNCs having more than 50 legal units.

Typical MNCs. Based on Eurostat's data and the findings from the targeted consultation, two typical MNCs can be identified depending on their size. Although all MNCs are very large companies by the usual accounts (i.e. number of employees or turnover), one could distinguish between large-scale and small-scale ones:

[134] Eurostat, Structure of multinational enterprise groups in the EU, available at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Structure_of_multinational_enterprise_groups_in_the_EU#MNE_groups_operating_in_the_EU (last accessed on April 2021).
[135] MNCs are defined as "an enterprise group comprising at least two enterprises or legal units located in different countries. Cf. Eurostat, Statistics explained, EuroGroup register, available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EuroGroups_register (last accessed on April 2021).
[136] Data include both EU and EFTA Member States.

- small-scale MNCs have local operations in up to 5 Member States and are likely to represent about 90% of the business population, based on Eurostat data. The targeted consultation shows that their turnover varies considerably but is typically lower than EUR 10 billion;

- large-scale MNCs operate in more than 5 Member States (up to more than 20 for the largest) and have a turnover in the excess of EUR 10 billion; they are estimated to represent about 10% of the MNC business population.

Mode of compliance. The MNCs that participated in the TCs have different strategies to handle compliance with DRRs, depending on their size, their internal structure, their IT capacity, their outsourcing strategies, the market segments and countries in which they operate, and the availability of e-service providers that could fulfil their needs. Here below, the main features of the mode of compliance by MNCs are described.

All MNCs have an ERP, which is highly tailored to their needs. Only in a very few cases is a single ERP used across all business entities and most MNCs have several ERPs in operation across the group. This is mainly due to legacy issues (i.e. the need to migrate acquisitions from existing ERPs), but also to business specialties (i.e. some units need a different ERP). The larger the size of the MNC, the higher the chance that multiple ERPs are in operation.

MNCs may handle compliance with DRRs **at central or local level, or in a combination thereof** (i.e. some activities are dealt with at central level and other at local level). Among the surveyed companies, there is no prevalence of any of these strategies. Handling compliance at central level may result in economies of scale. Handling compliance at local level reduces familiarization costs and can leverage on the knowledge of the local tax function and external consultants about existing requirements and changes thereto.

A number of companies have outsourced compliance with DRRs to service providers.[137] In this case, the MNC would not be concerned with most of the compliance activities. The outsourcing can also take place within the MNC group perimeter, when VAT obligations are handled by a group shared service centre that provides compliance services to the whole group. Outsourcing is less likely when it comes to e-invoicing obligations, because invoices are central to company activities, being part of the sales cycle. However, certain activities, such as the conversion or creation of e-invoices into the prescribed format and their transmission to the public platform can be outsourced. Furthermore, it is more difficult to outsource real-time and e-invoicing requirements compared to periodic reporting, because external companies or service providers need to directly link their software module to the internal ERP system.

The rationale for outsourcing consists in the economies of scale that third-party providers can achieve by providing the same VAT compliance services for a number of clients, especially in terms of IT and familiarization costs. As for the latter aspect, several MNCs mentioned that one of the benefits of outsourcing is that there is no apparent need to keep up with changes in the legal framework for DRRs.

Both when compliance is done in house and when it is (partly) outsourced, the MNC has to extract the necessary data from its internal system(s) and deliver them to a third party for consolidation, reconciliation, identification of errors, preparation of the various forms and files, and submission to the tax authorities.

Finally, in a number of cases, compliance with DRRs is ensured via an **e-service provider**. This is usually contracted at local level, i.e. provide their services to

[137] This includes MNCs which have outsourced in full their accounting activities and personnel (including the invoicing active and passive cycle), typically to a large consulting business.

subsidiaries established in countries with more complex reporting mechanisms. Less often, e-service providers are contracted at group level. The latter case is more frequent among small-scale MNCs, due to their simpler structure and the fact that they operate in a lower number of jurisdictions.[138]

When a new DRR is introduced, this usually prompts the MNC to set up an **implementation project**, consisting of tax and accounting experts (from the headquarter, local subsidiaries, and external consultants), and IT experts. For e-invoicing, the project team may span over a larger number of company functions, including sales and purchases. In many cases, the tax team needs to secure the internal budget and resources for the project well in advance of the time when the requirement enters into force. The necessary resources include the IT personnel for development, testing, implementation, ERP revisions. When internal IT resources are not available, they need to be sought from external consultants (usually at a higher cost). If the budget is not secured, the MNC and its local subsidiary might risk being non-compliant, at least in the very early phase(s) of implementation of the new DRR.

5.2. Issues with Digital Reporting Requirements

Before discussing the costs and benefits of DRRs, findings on how MNCs perceive compliance with these provisions are summarized below, providing a useful sketch of what the current problems are.

In terms of the problems emerging from the targeted consultation, the MNCs fall into two groups. **A majority of companies is confronted with specific issues that vary across countries.** In general, VAT listing is considered much easier to comply with compared to real-time and e-invoicing requirements, with periodic SAF-T solutions receiving a mixed assessment. Problems with real-time and e-invoicing requirements are often linked to:

1) higher costs and difficulties in building the connection between the billing or ERP systems and the tax authority's platform;

2) more frequent errors and more complex corrections: due to their high frequency, real-time and e-invoicing systems significantly reduce the time for taxpayers to reconcile, consolidate and correct data before they are transmitted to the Tax Authority.

Then, a minority of companies consider that issues are not necessarily linked to specific requirements. To them, **the problem consists in the need to implement <u>any</u> DRR, requiring significant adaptation of their ERP and IT systems**, often at significant cost. In the word of one of the respondents, "*any change that we need to do to our ERP and IT system following the introduction of a DRR is invasive; even if the change is small, it requires a lot of work and testing to make sure that our IT and ERP system continues to run smoothly".* Once the system is up and running, costs and issues of compliance are considered limited. As a consequence, the problem consists in:

1) the short lead time in the introduction of DRRs ("*their introduction is announced one to two years in advance, but then technical rules are only published few months before the obligation comes into force"*) and the frequent changes to the legislation or technical rules;
2) the diversity of DRRs, preventing scalability of the solutions already implemented in other countries ("*there is no requirement like one another; even SAF-T is not standard across Member States*").

[138] Reportedly, large-scale MNCs find it more difficult to identify a single e-service provider that can cover all the jurisdictions in which they operate, including all European (and sometimes even non-European) countries.

Furthermore, company-specific factors also affect ease of compliance. For instance, the difficulty with the Polish SAF-T system depends on whether the data required were already stored in the ERP or could be easily reconstructed or not; for real-time requirements, compliance is more complex for MNCs with multiple ERPs, due to the lack of time for a proper data reconciliation.

5.3. Administrative costs and burdens generated by the diversity of requirements

Table 20 provides an estimate of the typical costs incurred by small-scale and large-scale MNCs to implement DRRs. In line with the estimates for domestic operators, the **different systems impose different costs, with e-invoicing and real-time requirements being the costliest to implement**.

The difference is especially marked for large-scale MNCs, which would need to invest hundreds of thousands of EUR in Spain or Hungary and between EUR 300 000 and in rare cases up to EUR 1 000 000 in Italy[139], with most information pointing to a typical cost in the EUR 300 000 to 500 000 range. For SAF-T, implementation costs would amount to several tens of thousands of EUR, mostly due to the need to adapt the ERP system to provide and consolidate the data required. The setup costs of VAT listing are much lower, in the area of a few thousand euros, but periodic costs are typically higher because they are not necessarily associated with fully automated processes.

For small-scale MNCs, total implementation costs are obviously lower, namely less than one tenth in the case of e-invoicing and real-time requirements. This may also be linked with small-scale MNCs using less complex and thus cheaper ERP solutions, and a lower recourse to external consultants. Recurring costs, however, are relatively higher, since small-scale MNCs are more likely to outsource compliance (in full or in part) or to resort to service providers. Analogously to large-scale MNCs, costs decrease for SAF-T and, especially, for VAT listing, even though the differences are less remarkable.

The costs per company of small-scale MNCs are either in line or somewhat higher (around +20%) compared with domestic large companies.[140] This reflects the higher complexity of MNC company structures and IT systems.

Table 20. Typical implementation costs for MNCs (in EUR '000)

	Small scale			Large Scale		
	One-off costs	Recurring costs	Implementation costs	One-off costs	Recurring costs	Implementation costs
	(EUR '000)	(EUR '000/year)		(EUR '000)	(EUR '000/year)	
VAT listing	1	5	5	2	8	9
SAF-T	10	6	9	50	-	17
Real-time	25	5	13	200	15	82
e-Invoicing	60	12	32	400	-	133

Source. Authors' elaboration on targeted consultation.

In the targeted consultation, data were also requested on the number of personnel devoted to periodic (daily or monthly) compliance with DRRs. For real-time, SAF-T and VAT listing, all respondents reported less than 1 FTE, with a typical value of 0.5 FTE. For e-invoicing, a typical estimate cannot be provided because the personnel needed is strongly correlated with the number of invoices issued. However, it is reasonable to assume that the personnel dealing with e-invoices would work a similar amount of time

[139] Costs in the high range were reported by either extremely large players, or companies with multiple ERPs (which is a factor increasing implementation costs).
[140] Cf. Section 4 above.

even if the obligation to use the SDI was not in force, because the company would still need to issue invoices;[141] therefore, this cost does not create an additional administrative burden.

The estimates of the administrative burdens for the typical MNCs are provided in Table 21 below. The BAU factor for implementation costs was set at 0 – MNCs in jurisdictions without DRRs would not undertake the investment.

Table 21. Typical administrative burdens for MNCs (in EUR '000 per year, annualised)

	Small scale			Large Scale		
	Implementation costs	Ongoing costs	Admin. burdens per company	Implementation costs	Ongoing compliance	Admin. burdens per company
VAT listing	5	8	13	9	8	17
SAF-T	9	8	17	17	8	25
Real-time	13	15	28	82	15	97
E-invoicing	32	-	32	133	-	133

Source. Authors' elaboration on targeted consultation.

To estimate aggregated costs, the population is assessed based on Eurostat's estimates for MNCs established in the EU Member States. Data are available for eight out of twelve Member States in which DRRs are in place; for the missing countries,[142] data are extrapolated based on the relative size of the countries' GDP.[143] For each country, the aim is to account for the number of legal units of MNCs whose headquarter is in another EU Member State or third country. This allows to measure the **additional burdens** generated by the diversity of DRRs. In other words, the estimates reflect that all MNCs would still incur in compliance costs in their country of establishment, while the additional costs that are incurred in other Member States result from the diversity of these requirements.

The calculation is presented in Table 22. In the EU Member States where DRRs are in place, **total additional burdens borne by MNCs amount to about EUR 1.6 billion per year, of which EUR 1.2 billion are borne by small-scale and about EUR 400 million by large-scale MNCs.**

Table 22. Costs of fragmentation: Administrative burdens generated by the diversity of Digital Reporting Requirements (annual values)

	Small scale			Large scale			Total
	Administrative burdens per company (EUR '000)	Estimated population	Total administrative burdens (EUR mn)	Administrative burdens per company (EUR '000)	Estimated population	Total administrative burdens (EUR mn)	
VAT listing	13	14 337	186	17	1 592	27	213
SAF-T	17	21 676	368	25	2 409	60	428
Real-time	28	12 225	342	97	1 358	132	474
E-invoicing	32	10 031	321	133	1 115	148	469
MS with DRRs	-	58 269	1 217	-	6 474	367	1 584

Source. Authors' elaboration on targeted consultation.

The above figures only represent costs for foreign establishments of MNCs, and only partially include those for foreign VAT registrations. Namely, two cases can occur:

[141] This assumption was discussed with key compliance experts.
[142] Hungary, Czechia, and Slovakia.
[143] Eurostat's GDP and main components (output, expenditure and income), 2020 data.

1) A MNC group has both a local establishment and one or multiple VAT registrations of other group entities;[144] in this case, costs are already included in the above, since the data provided via the targeted consultation concern all costs incurred in a certain country;

2) A MNC group does not have a local establishment, but only one or multiple VAT registrations in a Member State in which DRRs apply to non-resident companies.[145] This population is not captured in the above table.

Unfortunately, there is no possibility to segment the number of foreign VAT registrations in other Member States. The vast majority of MNCs participating in the targeted consultation had both a local establishment and one or more VAT registration; however, the number of interviewees is not large enough to draw an inference for the whole population. Therefore, it is not possible to quantify total administrative burdens on this additional segment of the business population.

Summing-up. The above estimates represent that the costs of fragmentation are significant, at more than EUR 1.6 billion per year. This should be considered as a low-end estimate, because it does not include all costs linked to entities which are VAT-registered but not established in another Member State.

5.4. Other costs and benefits for Multinational Companies

Via the targeted consultation, MNCs were also asked to provide data on other costs and benefits generated – or that could be generated – by DRR and e-invoicing rules.

Other costs: fines

With a single exception, **fines/penalties are considered a negligible or minor problem by MNCs**. They reported that, shortly after the introduction of DRRs, fines for non-compliance with the new rules may occur. Still, the amount is usually negligible and tax authorities have been reportedly flexible during the first period of implementation. Only in one case, a MNC mentioned that the 'technical penalty' for non-compliance with the local real-time requirements was very high (about EUR 140 per invoice) and that this represents a significant risk given the number of invoices issued.

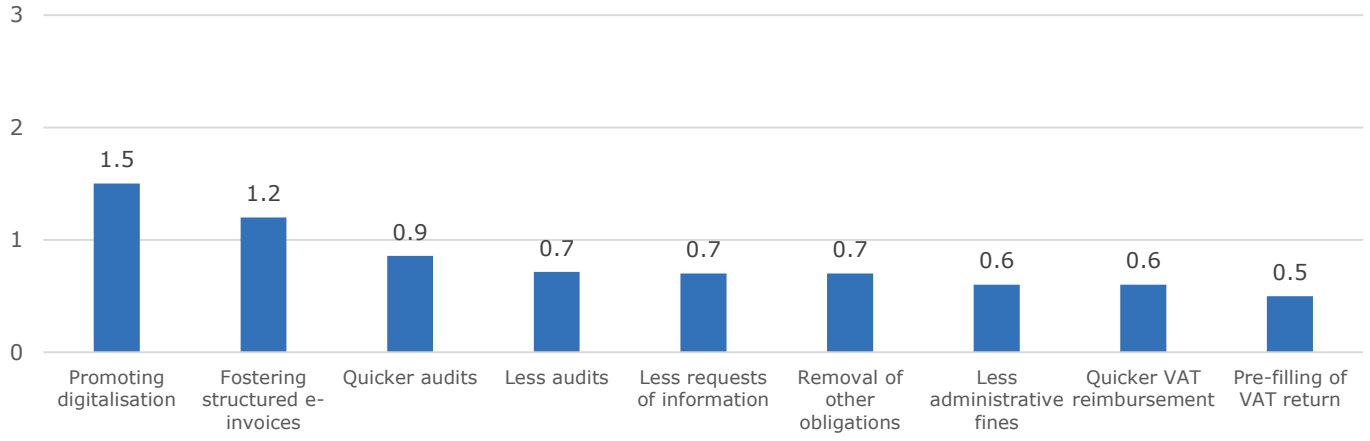
Benefits: general view

Only a minority of MNCs reported benefits from the introduction of DRRs, mostly concentrated in those jurisdictions in which the system is more advanced and based on e-invoicing and real-time requirements. While some improvements took place – e.g. in the area of audits, removal of other obligations and VAT reimbursements – the situation remains sketchy. In particular, notable benefits are only perceived by a minority of companies. On the other hand, MNCs did consider that DRRs have pushed companies towards digitalisation and a more widespread use of e-invoices; clearly, those benefits concern less MNCs themselves, as digital processes are a necessity for them, and more their smaller suppliers and customers.

Figure 12 below presents an overview of the benefits generated by DRRs. This is then followed by a discussion of the various types of benefits surveyed. A comparison of costs and benefits is then carried out for e-invoicing and real-time reporting requirements for those countries in which more benefits emerged, and for which quantitative data are available.

[144] The same entity cannot have both a local establishment and a VAT registration in the same county; however, entities part of the MNC other than the parent company of the local establishment can.
[145] Namely all, but Italy and Portugal; in Spain, only VAT registrations with a turnover higher than EUR 6 mn are subject to SII, in line with the threshold for domestic companies.

Figure 12. Benefits of Digital Reporting Requirements: view from multinationals



Notes. Average answer to the question "please indicate the extent to which the following outcomes have materialised following the introduction of reporting / e-invoicing requirements". Scale is as follows: 0 – Not at all; 1 – Minor benefit; 2 – Moderate benefit; 3 – Large benefit.
Source. Authors' elaboration on targeted consultation of MNCs.

Benefits: audits and requests for information

In the majority of cases, **it is too early to provide a definitive assessment of whether DRRs are conducive to less or quicker audits**. In a number of countries, their introduction is too recent and has not fully impacted on recent audits, especially considering that they may still concern years in which DRRs were not in place. Also, the COVID-19 pandemic slowed or halted new audit activities in a number of Member States. The surveyed MNCs did not see a reduction in the number of audits. Still, there are some anecdotal indications that audits could have become more efficient. For instance, in countries where DRRs are in place, MNCs can more easily provide the data in the format required by the tax authority, which corresponds to that used for the DRRs ("*we shared all the information in our reporting system, the tax authority was very happy and did not have other questions*"). The saving in terms of personnel's time or external fees, however, was not material. Rather, the potential benefit lies in the reduction of the financial risk associated with audits, which MNCs are very keen on reducing.

As for requests of information from public authorities other than audits, views were mixed. Some companies reported a lower number of questions concerning VAT following the introduction of DRRs, while others reported an increase. This also depends on the type of DRR considered. For instance, in countries, such as Spain, where tax authorities get real-time information on all transactions and can cross-check the companies' VAT ledgers, the rate of detection of mismatches increased and this resulted in more requests for information. Some MNCs reported that the number of requests for information on their transactions decreased, but this was compensated by an increase in the number of requests about their suppliers, possibly resulting from the identification of mismatches. Again, the burden is not material, though there is an irritation component when requests concern very small mismatches.

A clear case of reduction of these requests was made by a large-scale Italian MNC. Before the introduction of e-invoicing, regular requests were received to cross-check the information provided during audits by their suppliers or customers. This has disappeared after the introduction of e-invoicing. Again, benefits are very small compared to the size of the company (which used to receive about 20 requests per year over 52 entities).

Benefits: other obligations, pre-filling, and VAT reimbursement

As indicated above, **other obligations were removed only in a few Member States (i.e. Italy, Spain and Hungary) and this was short of providing significant benefits to MNCs.** The obligations removed in Spain would translate to about 20 person/days of savings for a small-scale MNC, while in Italy a large MNC estimated that the *Spesometro* required 70-80 person/days. While such a level of savings can be material for SMEs, for MNCs these are not decisive compared to their overall compliance burdens.

As for pre-filled VAT returns, **companies appreciate the potential simplification but, MNCs would still need to undertake a significant amount of work in reviewing the document provided by the tax authority, given the complexity of their organisations.** Given the type of information currently transmitted via DRRs, a pre-filled VAT return cannot be 100% accurate, in particular because it cannot incorporate, at the moment, the proportion of VAT that cannot be deducted in full or only in part.[146]

With respect to VAT reimbursements, some improvements were noted in Spain, with respect to both the speed of the process and the amount of additional data that are to be provided. Still, it was pointed out that the process did not become quicker in other DRR jurisdictions (e.g. Italy or Poland) and, most importantly, that the process is not, on average, quicker in these jurisdictions compared to other countries where no DRR is in place (e.g. Germany, France).

5.5. Conclusions

The lack of harmonisation of DRRs across the EU generates additional administrative costs for multinational companies operating in multiple Member States, having to comply with diverse local requirements. In this situation, a company incurs compliance costs not just once (i.e. in its country of main establishment), but several times, depending on the number of countries in which it is established or registered for VAT purposes. These costs are called the **'costs of fragmentation'.**

In line with the estimates for domestic operators, the **different systems impose different costs for multinational companies, with e-invoicing and real-time requirements being the costliest to implement**. As shown in Table 23 below, a small-scale MNC can be expected to invest about EUR 10 000 for SAF-T requirements, EUR 25 000 for real-time requirements and more than EUR 50 000 in case of e-invoicing. For a large scale MNC, costs can be up to EUR 50 000 for SAF-T requirements, EUR 200 000 for real-time requirements and EUR 500 000 for e-invoicing. Once aggregated over the overall MNC population, and accounting for the number of countries with secondary establishments, **total fragmentation costs were estimated at up to EUR 1.6 billion per year.**

Table 23. Costs of fragmentation: Administrative burdens generated by the diversity of Digital Reporting Requirements (annual values)

	Small scale			Large scale			Total
	Administrative burdens per company (EUR '000)	Estimated population	Total administrative burdens (EUR mn)	Administrative burdens per company (EUR '000)	Estimated population	Total administrative burdens (EUR mn)	
VAT listing	13	14 337	186	17	1 592	27	213
SAF-T	17	21 676	368	25	2 409	60	428
Real-time	28	12 225	342	97	1 358	132	474
E-invoicing	32	10 031	321	133	1 115	148	469
Member States with DRRs	-	58 269	1 217	-	6 474	367	1 584

[146] Member States can limit the deduction of input VAT, for instance to avoid that the expenditure (with VAT) unduly reflects private compared to commercial use. This is e.g. the case for VAT on vehicles that can also be used by employees and mobile communication. Cf. EU VAT Compass.

Source. Authors' elaboration on targeted consultation.

As for other costs and benefits, findings are largely in line with those emerging from domestic operators. This is for example the case of fines, which have not been an issue so far, as well as audits and VAT reimbursements, for which limited positive effects from the introduction of DRRs were noted so far. For other positive effects, i.e. the removal of other information obligations and the pre-filling of VAT returns, benefits are there, but they are too small to be significant for large MNCs.

6. ASSESSMENT OF THE CURRENT SITUATION: COST-BENEFIT ANALYSIS

Based on the evidence described in the previous sections, **the Cost-Benefit Analysis (CBA) of the existing DRRs** is summarized below. The CBA allows to evaluate the costs imposed on economic operators and tax authorities, while accounting for the improvements introduced in the VAT system, in terms of tax control, additional VAT revenue (and thus fight against VAT fraud) and simplification. This analysis can thus assess the current net impacts of DRRs and lay the ground for the evaluation of the policy options. Importantly, the costs and benefits assessed below cannot be ascribed to the VAT Directive, as they depend on national policies and legislation.

First, the costs and benefits for public authorities are summarized in subsection 6.1; subsequently, the costs and benefits for private stakeholders are analyzed in subsections 6.2 and 6.3. Subsection 6.4 presents the overall CBA. The analysis is carried out for the EU Member States with a DRR, and per type of DRRs when possible.

6.1. Public authorities

In Table 24 below, a comparison of costs and benefits for public authorities is provided for different DRRs. The costs broadly reflect actual differences among the different type of systems. Differently, in the case of benefits, only limited evidence supports the hypothesis that CTCs generate higher VAT revenue, and thus the analysis accounts for the same impact across the four types of DRRs. Thus, the below estimates for the benefits from CTCs could be considered as conservative estimate, given the lack of sufficient data from the EU Member States.[147]

Once compared with the implementation costs, **the results of the analysis clearly show that the annual costs incurred by public authorities to set and implement DRRs represent a marginal share of the benefits achieved**.[148]

Table 24. Public Authorities: Cost-Benefit Analysis (annual values, EUR mn)

	Member States	Taxpayers covered	Implementation costs	VAT revenue (C-efficiency)
VAT listing	BG, CZ, EE, HR, LV, SK	1 421 731	5	900
SAF-T	LT, PL, PT	3 238 087	3	2 200
Real-time	ES, HU	578 108	21	3 800
E-invoicing	IT	3 489 500	25	5 300

Note. Figures in this table result from the sum of national values for the 12 Member States in which a DRR is in place (both fieldwork countries and extrapolated estimates). Source. Authors' elaboration on targeted consultation of tax authorities (countries with DRRs).

6.2. Domestic taxpayers

Table 25 below summarises the costs and benefits for private stakeholders deriving from DRRs, as resulting from the analysis carried out in Section 4 above. In total, i.e. in the 12 Member States with DRRs, **about 9 million taxpayers are subject to a domestic DRR**. **The yearly compliance costs are estimated at about EUR 3.5 billion and the yearly benefits at about EUR 1 billion.**[149] Aggregated costs and benefits depend on both the features of the domestic reporting requirements, as well as on the business population covered thereby.

[147] Cf. Section 0 above, as further detailed in Annex C.
[148] This remains valid if the lower VAT revenue estimates from the VAT Gap model are used.
[149] The estimate results from the primary data collected in the five sampled Member States and the extrapolation for the remaining six.

Across all types, **DRRs result in net costs for economic operators**. Besides, the DRRs differ as to how they are capable of generating savings for private stakeholders, which become significant for real-time and e-invoicing systems. As for the former, in Spain and Hungary the benefits compensate about 80% of the costs while in Italy about 20% of the costs. In the case of SAF-T, savings have been reported in Portugal, where they likely represent some 10% of the estimated costs, but not in Poland.

All in all, **the average net costs per taxpayer are rather similar across the DRRs other than e-invoicing, hovering around EUR 200 per year.** VAT listings remain the least costly, with net costs of EUR 160 per taxpayer per year; real-time requirements are in between (EUR 190), thanks to the savings generated, while SAF-T are currently the costliest (EUR 260). **Net costs are higher for e-invoicing, estimated at slightly less than EUR 400 per taxpayer per year**. Importantly, in the below analysis, the benefits from business automation could not be quantified; they could be significant – possibly more than compensating compliance costs – for e-invoicing systems.

Table 25. Cost-Benefit Analysis for private stakeholders in Member States with Digital Reporting Requirements (annual values, EUR mn)

	Member States	Taxpayers covered	Costs	Savings					Net costs	
			Administrative burdens	Other obligations	Pre-filling	VAT reimbur-sement	e-Invoicing	Total	Total	Per taxpayer (EUR)
VAT listing	**CZ,** *BG, HR, EE, LV, SK*	1 421 731	225	-	-	-	-	0	225	160
SAF-T	**PL, PT,** *LT*	3 238 087	880	-	33	2	-	40	840	260
Real-time	**HU, ES**	578 108	580	411	23	33	-	470	110	190
e-Invoicing	**IT**	3 489 500	1 830	374	-	-	107	480	1 350	390
Total (MS with DRRs)		8 727 426	3 520	790	60	40	110	990	2 530	290

Note. In bold: fieldwork Member States. Figures in this table result from the sum of national values for the 12 Member States in which a DRR is in place (both fieldwork countries and extrapolated estimates). Totals are rounded up to the tens of million.
Source. Authors' elaboration based on targeted consultation.

6.3. Multinational Companies

As shown in Section 5 above, MNCs bear additional costs due to DRRs because of the need to comply with different requirements across the Member States in which they operate or have secondary establishments – the so-called costs of fragmentation.

All in all, the current diversity of DRRs generates **annual costs of fragmentation for MNCs of about EUR 1.6 billion,** of which EUR 1.2 billion for small-scale MNCs and about EUR 400 million for large-scale MNCs (see Table 26 below). Though CTC systems are costlier on a per-company basis, the different population (i.e. the number of subsidiaries) makes it such that e-invoicing, real-time and SAF-T all generate about EUR 400 to 500 million of fragmentation costs, while VAT listings about EUR 200 million.

Table 26. Costs of fragmentation due to Digital Reporting Requirements (annual values)

	Small scale			Large scale			Total
	Administrative burdens per MNC (EUR '000)	Estimated population	Total administrative burdens (EUR mn)	Administrative burdens per MNC (EUR '000)	Estimated population	Total administrative burdens (EUR mn)	
VAT listing	14	14 337	186	17	1 592	27	213
SAF-T	17	21 676	368	25	2 409	60	428
Real-time	27	12 225	342	96	1 358	132	474
e-Invoicing	32	10 031	321	133	1 115	148	469
EU countries with DRRs	-	58 269	1 217	-	6 474	367	1 600

Source. Authors' own elaboration.

Net costs for MNCs. In Table 27 and Table 28 below, a comparison of costs and benefits for MNCs is provided for Italy (e-invoicing) and Spain (real-time requirements). The assessment is based on the monetisation of the benefits which resulted in a reduction of VAT compliance costs, i.e. the removal of other obligations (in both countries), and the reduction in the numbers of requests for information (in Italy).

In no case do the savings compensate the costs imposed by the reporting requirements; however, for small-scale MNCs, the relief is clear, up to one third of total burdens in Italy. In line with the qualitative findings from the interviews, advantages are relatively minor for large-scale MNCs. These results are in line with the narrative provided by most respondents, who did acknowledge that DRRs generate, or can generate, certain savings for MNCs, which, however, are lower than the costs of implementation.

Table 27. Net administrative burdens in Italy and Spain – Small-scale MNCs (EUR / year)

	Administrative burdens	Savings		Net costs
		Removal of other obligations	Less requests for information	
Spain (real-time)	27 000	3 000	-	24 000
Italy (e-invoicing)	32 000	7 000	4 000	21 000

Source. Authors' elaboration of targeted consultation.

Table 28. Net administrative burdens in Italy and Spain – Large-scale MNCs (EUR / year)

	Administrative burdens	Savings		Net costs
		Removal of other obligations	Less requests for information	
Spain (real-time)	96 000	6 000	-	90 000
Italy (e-invoicing)	133 000	14 000	8 000	111 000

Source. Authors' elaboration of targeted consultation.

6.4. Conclusions

Table 29 below sums up all costs and benefits estimated across the four groups of DRRs, presented on an annual basis. The main conclusions can be summarised as follows:

1) **For all types of DRRs, net impacts are positive**. In a nutshell, the additional VAT revenue exceeds the costs for setting up the system and handling the requirements. This is true even by not considering higher revenue effects for CTC systems, given the lack of conclusive data.

2) The VAT revenue recouped point out that DRRs have a **positive impact on the fight against VAT fraud**. This result in direct, but important, benefits for honest businesses, due to an improved fraud detection, which helps ensure a level-playing field, fairer competition, and reduces the risk of joint and several VAT liabilities for honest trading partners.

3) Considering all EU Member States in which a DRR has been implemented, the **net annual benefits to businesses and Member States can be estimated at about EUR 8 billion**. These result from about EUR 5 billion of costs for taxpayers, about EUR 12 billion of additional VAT revenue and about EUR 1 billion of savings from simplifications for taxpayers.

   The **net impacts on taxpayers** (i.e. the difference between the administrative burdens and the savings generated by the reporting requirements) **remain negative across all types of DRRs**, though the quantitative analysis cannot account for the benefits due to business automation, which are especially significant for e-invoicing.

Table 29. Digital reporting requirements: Cost-Benefit Analysis (annual values, EUR mn)

		VAT listing	SAF-T	Real-time	e-Invoicing	All DRRs
Member States		BG, CZ, EE, HR, LV, SK	LT, PL, PT	ES, HU	IT	
Taxpayers covered		1 421 731	3 238 087	578 108	3 489 500	8 727 426
Costs	Administrative burdens for businesses	225	880	580	1 830	3 500
	Costs of fragmentation for MNCs	213	428	474	469	1 600
	Costs of implementation for tax authorities	5	3	21	25	50
	Total costs	**400**	**1 300**	**1 100**	**2 300**	**5 200**
Benefits	Administrative burden and financial cost savings for businesses	0	35	460	480	1 000
	Invoice issuance	-	-	-	107	110
	Removal of other obligations	-	-	411	374	790
	Pre-filling of VAT returns	-	33	23	-	60
	VAT reimbursement	-	2	33	-	40
	VAT revenue	900	2 200	3 800	5 300	12 200
	Total Benefits	**900**	**2 300**	**4 300**	**5 800**	**13 200**
Net benefits		**500**	**1 000**	**3 200**	**3 400**	**8 000**

Notes. All DRRs, Total costs, VAT revenue, total benefits and net benefits are rounded to the tens or hundreds of million.
Source. Authors' elaboration on targeted consultation and desk research.

PART B

ANALYSIS OF POSSIBLE INTERVENTIONS

7. PROBLEM DEFINITION

In the past decade, a growing number of Member States introduced different DRRs, as explicitly allowed by the VAT Directive, taking full advantage of new technologies and IT solutions, to ensure a more effective collection of VAT and to prevent VAT fraud. However, as a result of the broad margin of manoeuvre provided for by Article 273 and the lack of EU guidance for the introduction of harmonized requirements (e.g. common definitions, best practices, technical standards), Member States have adopted dissimilar DRRs in an uncoordinated manner. Besides, by discouraging the adoption of mandatory e-invoicing requirements because of the need to obtain an explicit derogation ex Article 395 (compulsory acceptance of e-invoices), the VAT Directive has also influenced both the adoption and the design of national DRRs.

The **fragmented regulatory framework** that has emerged results in legal uncertainty and additional costs for companies operating in multiple Members States and for providers of VAT e-services. This results in **barriers to trade within the Internal Market, which in turn generate inefficiencies in its functioning**.

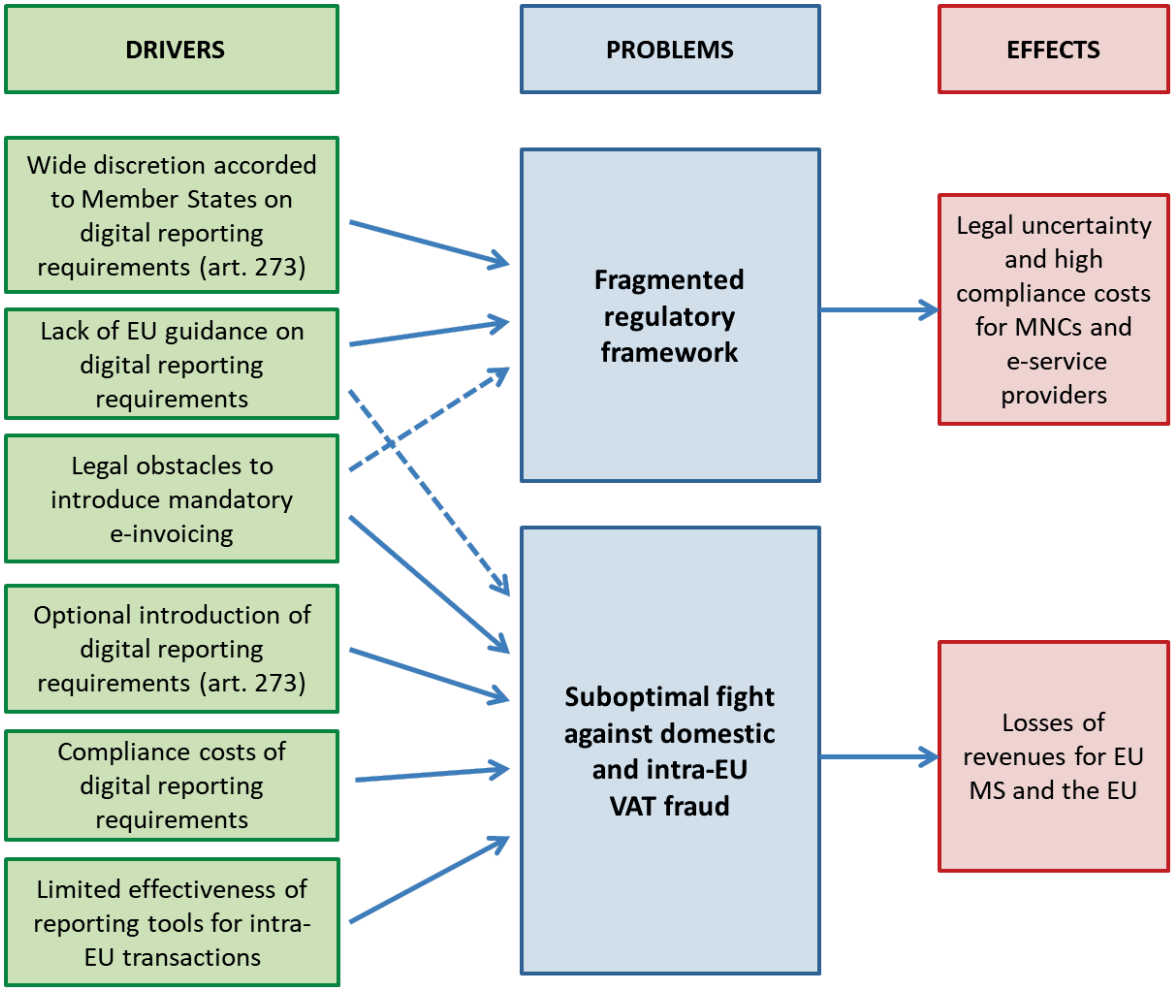
On the other hand, **DRRs bring significant benefits to public authorities by increasing VAT compliance, improving risk analysis and tax control activities, and supporting the fight against VAT fraud.** Nonetheless, the optional adoption of reporting requirements, as allowed by Article 273, the compliance costs of these additional obligations for economic operators as well as the above-mentioned obstacle towards the introduction of mandatory e-invoicing translated into a partial adoption of reporting requirements across the EU. The fact that the majority of the Member States did not introduce reporting requirements **represents a missed opportunity to better tackle VAT fraud and reduce the EU VAT Gap**.

Importantly, even where adopted, **domestic DRRs are not an effective tool to fight intra-EU VAT frauds**. Considering that intra-EU VAT is estimated to represent about 40% of VAT total ,the total VAT Gap[150] the emerging gap is significant. This is due to two factors. First, a number of domestic DRRs do not cover at all intra-EU transactions. Secondly, even when they are covered, data are not exchanged with foreign tax authorities on an automatic basis, and hence no risk analysis or automatic identification of discrepancies can be performed. In most cases, data could not be exchanged at all, given their different scope and format. This problem is made even more severe by the outdated tool for reporting intra-Community trade flows, i.e. recapitulative statements, which do not allow to effectively tackle Intra-Community VAT fraud.

The problem tree which summarises the above findings is presented in Figure 13 overleaf, where drivers, problems and their consequences are presented. These findings are then expanded on in the rest of this section.

[150] For more details, cf. Section 9.6 below.

Figure 13. Digital Reporting Requirements: Problem tree



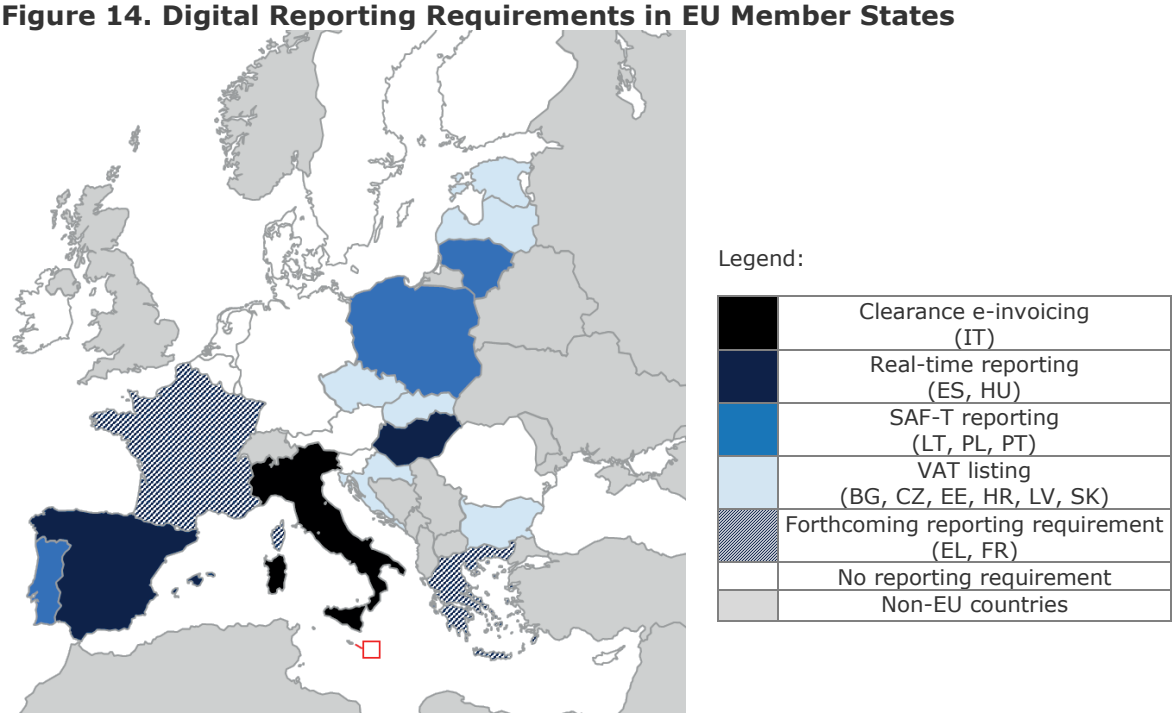
Notes. A blue arrow means a strong link; a blue dashed arrow means a weaker relation.
Source. Authors own elaboration.

7.1. Fragmented regulatory framework

Overview of problem and consequences

As illustrated in detail in Section 2 above, four different types of reporting requirements are currently in place in 12 EU Member States, including periodic obligations - i.e. VAT listing (in six Member States) and SAF-T reporting (in three Member States) - and, in a smaller number of cases, CTCs – i.e. real-time reporting (in Spain and Hungary) and mandatory e-invoicing (in Italy). This categorization is already an indication of the variety of requirements implemented across the EU, as shown in Figure 14 below.

Figure 14. Digital Reporting Requirements in EU Member States



Notes. In AT, FR and LU, SAF-T files can be requested by the tax authority, usually prior to audits. In IT, VAT listing for cross-border transactions is required until July 2022, unless the relevant e-invoices are uploaded in the clearance system. In SI, a periodic transaction control has to be filed for supplies subject to Articles 199 and 199a (domestic reverse charge).
Source. Authors own elaboration based on (i) "Study on the evaluation of the invoicing rules of Directive 2006/112/EC", Annex D, January 2019; (ii) SOVOS 2021; and (iii) targeted consultation validated by tax authorities.

The existing reporting requirements differ over several dimensions, including:

- **Frequency.** The main distinction is between periodic and real-time reporting. This can be further differentiated according to the exact frequency (either jointly with VAT return or monthly), and "how real-time" real-time requirements are (within four days in Spain, daily in Hungary and before the invoice is issued in Italy).

- **Scope – Taxpayers**. National rules can include a turnover threshold below which VAT-registered taxable persons are not subject to the reporting obligations and can exclude certain sectors or specific VAT regimes. Furthermore, requirements can apply to established entities only or to all registered taxable persons.

- **Scope – Transactions.** In a number of countries, only transactions above a certain value threshold are to be reported in detail. Besides, the reporting systems can differ in whether they cover (i) purchase and/or sale transactions; (ii) domestic, intra-EU or extra-EU transactions; and (iii) B2B, B2G or B2C transactions.

- **Data content and format**. The various systems differ in terms of the type and amount of data extracted from taxpayers, the format of submission as well as the communication architecture.

This lack of harmonisation of reporting requirements across the EU results in legal uncertainty and additional burdens for companies with fixed establishments or VAT registrations in different Member States. In particular, the short lead time in the introduction of reporting requirements and the frequent changes to the legislation or technical rules are regarded as particularly burdensome by these economic operators, considering that even minor changes involve substantial

work to adapt their internal IT and ERP systems. Besides, the diversity of national DRRs prevents the scalability of the solutions already implemented in other Member States.

Magnitude of the problem

Based on Eurostat estimates, there are about 210,000 MNCs in the EU, 85% of which with a local headquarter and the rest controlled by foreign entities. **For them, the costs of fragmentation are significant, estimated at about EUR 1.6 billion per year, EU-wide**,[151] of which 1.2 billion are borne by small-scale and 0.4 billion by large-scale MNCs.[152] These mainly result from significant setup costs, especially in countries with more complex DRRs. For compliance, a small-scale MNC can be expected to invest about EUR 10 000 for SAF-T requirements, EUR 25 000 for real-time requirements and more than EUR 50 000 in case of e-invoicing. For a large scale MNC, costs can be up to EUR 50 000 for SAF-T requirements, EUR 200 000 for real-time requirements and EUR 500 000 for e-invoicing.

Problem drivers

The above-depicted fragmented regulatory framework is the result of a **regulatory failure** due, in particular, to the following drivers:

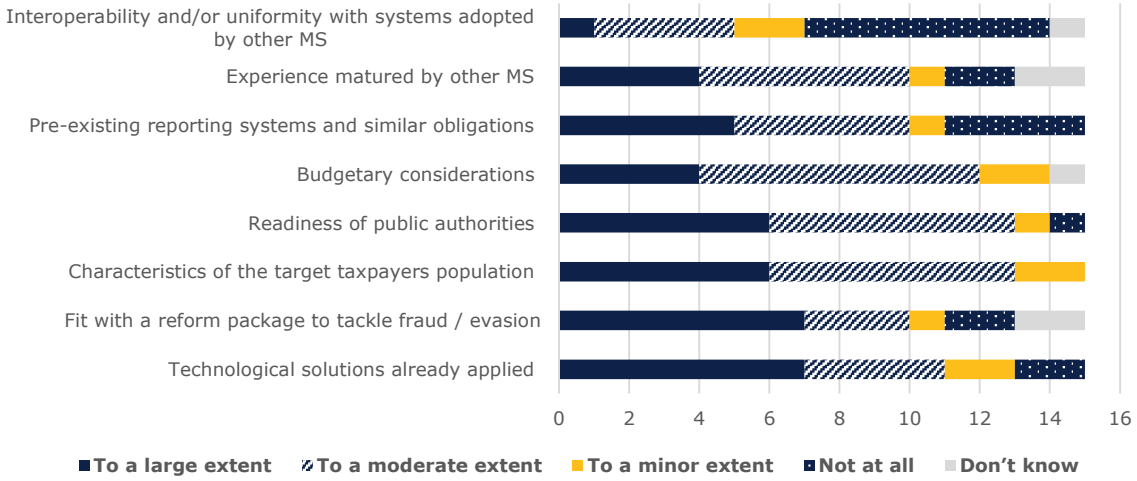
1) the wide discretion accorded to Member States by Article 273 of the VAT Directive;
2) the lack of EU guidance on the introduction and design of VAT reporting requirements; and
3) the need to obtain an explicit derogation ex Article 395 to introduce mandatory e-invoicing.

1. The wide discretion accorded to Member States by Article 273. The VAT Directive does not provide any indication on key features of DRRs, e.g. content, scope and frequency. Given the variety of country-specific factors influencing the design of reporting requirements, such a broad margin of manoeuvre granted to Member States inevitably translated into the fragmented regulatory framework described above.

As illustrated in Figure 15 below, the need to ensure consistency with the IT solutions already used by tax administrations[153] and with wider anti-fraud reform packages largely influenced the design of DRRs. Besides, the IT readiness of the taxpayer population and the tax administration, together with budgetary considerations, also influenced the choice made by the majority of Member States as to whether and how to introduce digital reporting requirements. In particular considerations about the importance of ensuring interoperability with systems adopted by other countries were rarely made and, albeit experience from other Member States was often taken into account during the conception of the system, solutions were invariably adapted to local conditions.

[151] This should be considered as a low-end estimate, because it covers costs for fixed establishments but may underestimate costs linked to entities with a foreign VAT registration, with no establishment.
[152] Typical small-scale MNCs are defined as having local operations in up to 5 Member States and a turnover lower than EUR 10 bn; they represent about 90% of the MNC population, based on Eurostat data. Large-scale MNCs are defined as operating in more than 5 Member States (up to more than 20 for the largest) and having a turnover in excess of EUR 10 bn; they are estimated to represent about 10% of the MNC population.
[153] For instance, in the case of Italy and France, the e-invoicing system has been based on the existing platform for B2G transactions. In Hungary, the real-time reporting system builds on a prior legal provision stating that the invoicing software should have a data export function, enabling the tax authority to retrieve invoice data electronically in a pre-defined format in case of control of the taxable person.

Figure 15. Factors influencing the design of Digital Reporting Requirements: views from tax authorities (number of respondents)



Note. Question submitted to Member States with a DRR in place or planned. Source. Authors' elaboration on targeted consultation of tax authorities.

2. Lack of EU guidance on the introduction and design of reporting requirements. The lack of a consistent legal and technological EU framework on reporting obligations encouraged the adoption of an uncoordinated approach by Member States, as for both technical solutions and legal obligations:

- the lack of recommendations towards the application of common standards[154] encouraged Member States to devise their own technical solutions, based on separate national standards, which are unlikely interoperable. This, in turn, increased the degree of fragmentation, limited the possibility of data exchange between Member States, and raised costs incurred by MNCs and e-invoicing service providers.

- the lack of (i) established common principles (e.g. proportionality between tax controls and the business process and interoperability among jurisdictions); (ii) best practices; and (iii) guidance on different DRRs[155] promoted the adoption of DRRs with different legal designs across the Member States.

Finally, the lack of a definite – either binding or non-binding – EU framework also limited or delayed the adoption of DRRs by some Member States. First, because an EU factor would have been a push factor and provided a focal point for the design of domestic DRRs. Furthermore, some Member States may have been unwilling to adopt DRRs. which may need to be soon modified to comply with an upcoming EU intervention.

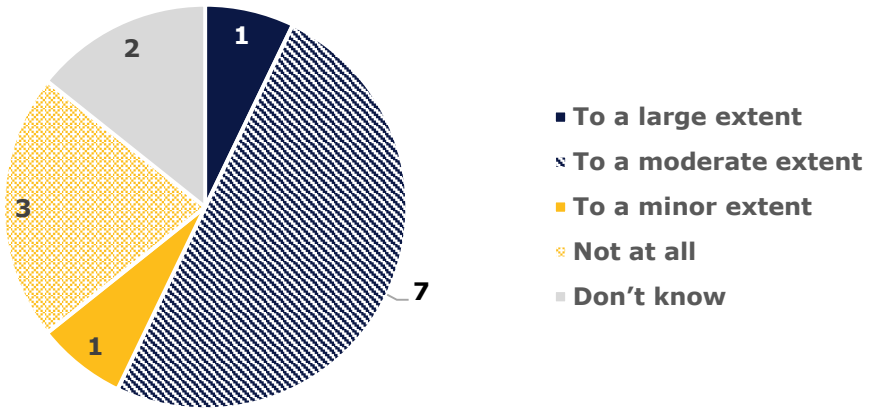
3. The need to obtain an explicit derogation ex Article 395 to introduce mandatory e-invoicing. EU Member States are progressively aligning to the global trend, moving from traditional VAT compliance (i.e. filing forms with periodic aggregate data) towards real-time sharing of data with the tax administration. Out of the 12 DRRs in place in the EU, those adopted or reviewed over the past four years consist, without exception, in different forms of CTCs, including, in one case, e-invoicing. The same applies to the two upcoming DRRs, to be soon introduced in France and Greece, as well as the forthcoming revisions announced or discussed in Poland, Bulgaria, Slovakia, Croatia, and Spain. CTCs enable a more marked automation of the VAT compliance process and can more often be associated with the provision of additional services to

[154] Despite their existence, as those developed by, inter alia, Connecting Europe Facilities or PEPPOL and the standardised EU format for e-invoicing developed for B2G e-invoicing.
[155] Including, for instance, minimum technical requirements as well as factual information on their compliance and implementation costs, and the benefits achievable

taxpayers, such as the removal of other VAT reporting obligations (which become redundant) and the issuance by the tax administration of pre-filled VAT returns.

Within this context, the derogation represents a significant barrier towards the adoption of e-invoicing requirements. Among tax authorities with a DRR in place or planned, only four of them assessed the influence of the derogation on the design of their systems as null or minor. In most cases, the null or limited relevance concerned countries which had not (yet) considered the introduction of mandatory e-invoicing, or where the system adopted was conducive to e-invoicing without an explicit obligation.

Figure 16. Influence of the need to obtain a derogation on the introduction of e-invoicing: views from tax authorities



Note. Question submitted to Member States with a DRR in place or planned. Source. Authors' elaboration on targeted consultation of tax authorities.

Hence, the provisions of the VAT Directive, on the one hand, supported the introduction of some peculiar forms of CTCs, with "entangled forms" of e-invoicing, which limited the implementation of mandatory e-invoicing requirements. Besides, in light of the clear trend towards automation, the fact that some Member States are taking intermediate steps towards the CTCs is regrettable also from the point of view of economic operators, which, as indicated above, are severely penalized by the need to repeatedly introduce structural changes to adapt to evolving regimes.

7.2. Suboptimal fight against domestic and intra-EU VAT fraud

Overview of problem and consequences

The evidence gathered from public authorities that have adopted DRRs clearly points to **improvements in risk analysis, tax controls and a consequent increase of VAT revenue** following the introduction of these regimes, which provide better exploitable, targeted, and timely data to tax administrations.

This is confirmed by the econometric analysis, which identifies **a significant positive effect of DRRs on VAT compliance and thus revenue.** Over the 2014-2019 period, the total additional VAT revenue is estimated at between EUR 19 and 28 billion in the Member States with a domestic DRR. This corresponds to an increase in VAT revenue of 3.0% to 4.4%, or to an equivalent increase in the average VAT rate by 0.6 to 0.8 percentage points.

The increase in VAT revenue results from various factors, including higher spontaneous compliance, the reduction of mistakes and omissions, but surely also from a more effective fight against VAT fraud. Hence, the fact that the majority of Member States did not introduce reporting requirements led to an **insufficient fight against domestic**

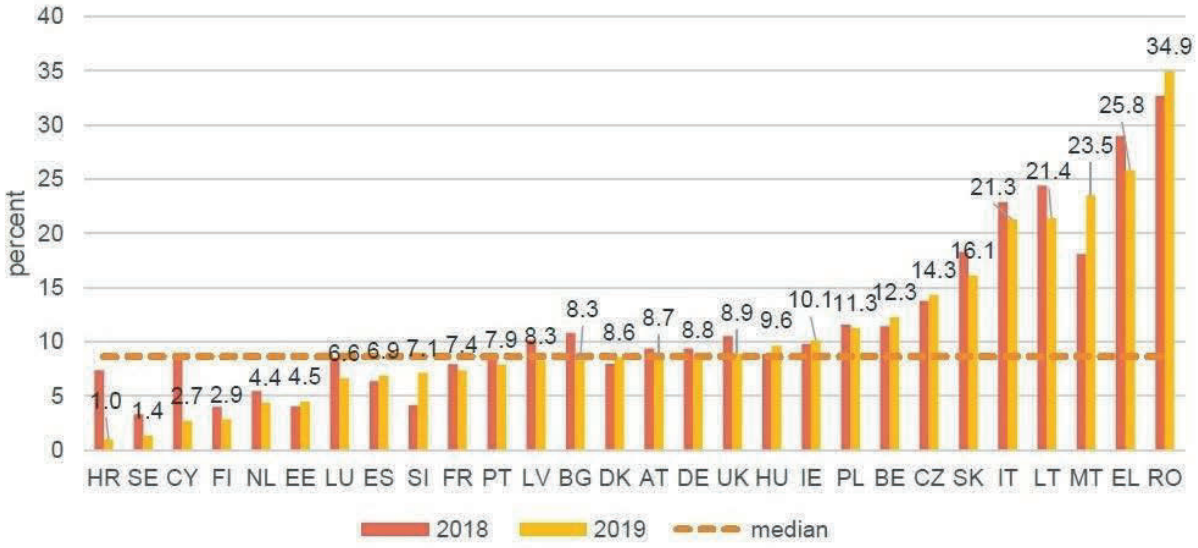
fraud. Furthermore, and importantly from the point of view of any EU intervention, the benefits of DRRs, and in particular the possibility to match transactional data among trading partners and improve risk analysis, are only limited to domestic transactions. On the contrary, the DRR information chain is broken when a foreign party is involved, and therefore the DRR does not limit the possibilities of intra-EU fraud. Therefore, in the current situation, **domestic DRRs are not, and could not be, an effective tool against intra-EU VAT fraud**.

As for the existing tools for reporting intra-Community transactions, **the recapitulative statements are not considered adequate or effective.** In particular, as they only collect data aggregated per trading partner, they do not allow for the cross-border exchange of transactional data, which could be better used to monitor the correct application of VAT on cross-border transactions. The lack of granular data also limits the potential of the common tool recently introduced by the EU to fight intra-EU VAT fraud, i.e. the Transactional Network Analysis (TNA). This automated data mining tool interconnects Member States' tax IT platforms with the aim of improving the efficiency and effectiveness of Eurofisc's interventions,[156] by accelerating information exchange and the detection of fraudsters and providing a better visualization of carousel fraud chains and trends.

Magnitude of the problem

Even though in 2019 (the last year for which data are available), the EU VAT Gap declined in both relative and nominal terms, its economic impact remains extremely significant, accounting for not less than 8% of total VAT revenue in 16 Member States, including large economies such as Germany and Italy. Importantly, the VAT Gap affects not only the Member States' budgets, but also the EU, since about 0.3%[157] of VAT collected at domestic level is then transferred to the EU as own resources. In addition, VAT fraud distorts competition and negatively affects compliant businesses, because fraudsters can sell goods or services below market price.

Figure 17. VAT Gap across EU MS (% of the VTTL)



Source. 2021 VAT Gap Study.

[156] Eurofisc was established by Council Regulation 904/2010 of 7 October 2010 with the objective to promote and facilitate multilateral cooperation in the fight against VAT fraud.
[157] Except Germany, Sweden and the Netherlands, whose contribution is 0.15%.

Following the same approach adopted in Section 3 to monetize the additional VAT revenue generated by the introduction of DRRs, **the potential VAT revenue losses attributed to the non-introduction of DRRs by 15 Member States have been cumulatively estimated** at **between EUR 22 and 27 billion per year**.[158] Based on the share of intra-EU VAT over total VAT liabilities, **this would correspond to EUR 9 to 11 billion of VAT revenue lost on intra-EU transactions**.

Even though the actual size remains uncertain, intra-EU VAT fraud is invariably regarded as the core component of the VAT Gap. In a recent impact assessment, the Commission put the value of MTIC fraud at between EUR 45 and 53 billion per year, or 24% of the existing VAT Gap.[159] Accurate estimates for MTIC fraud are unavailable for the vast majority of Member States, but for example the Belgian Court of Auditors assessed that MTIC fraud amounted to EUR 28 million in 2011.[160] The estimate of MTIC fraud in 2013 in Poland amounts to 11% of the VAT Gap, which in monetary terms is equal to more than EUR 1 billion.[161] At any rate, no estimate of the share of MTIC fraud which is not detected as a result of the limited effectiveness of recapitulative statements is available.

Problem drivers

Three main drivers have been identified that explain the suboptimal fight against VAT fraud:

1) the VAT Directive (in Article 273) allows but does not require Member States to adopt any reporting requirements;
2) the compliance costs due to reporting requirements; and
3) the limited effectiveness of recapitulative statements.

1&2. The optional nature of Article 273 of the VAT Directive and compliance costs. So far, most EU Member States have decided not to introduce reporting requirements, as allowed by the VAT Directive. This decision has been largely affected by cross-country differences in terms of VAT fraud and efficiency of collection. None of the Member States that have implemented DRRs had recorded a VAT Gap lower than 10% prior to their introduction, with the exception of Spain (where the VAT Gap was 6.5% in 2016).[162]

It therefore emerges clearly that the size of the VAT gap is a factor in the decision to implement domestic DRRs, and that countries with a lower VAT gap have been more reluctant to impose further reporting requirements. One of the reasons for such a reluctance consists in the compliance costs for businesses (and tax authorities) generated by their introduction, which may be hardly justified if the gains, i.e. the reduction of the VAT gap, are too small. Indeed, the expected increase in compliance costs for businesses, the business resistance to changes to VAT compliance rules and

[158] Depending on the estimation model and using data for the year 2019. These estimates only include net VAT revenues and should not be regarded as net impacts, which would need to take into account compliance costs for taxpayers and implementation costs for tax authorities.
[159] Commission Staff Working Document, Impact Assessment Accompanying the document Proposal for a Council Directive amending Directive 2006/112/EC as regards harmonising and simplifying certain rules in the value added tax system and introducing the definitive system for the taxation of trade between MS, SWD(2017)325, at p.22.
[160] *Cour des Comptes (Belgique), Fraude intracommunautaire à la TVA. Audit de suivi réalisé en collaboration avec les cours des comptes des Pays Bas et d'Allemagne*, submitted to the Belgian House of representatives in September 2012.
[161] Poniatowski, G. & Neneman, J. & Michalik, T. (2016), VAT non-compliance in Poland under scrutiny (*Problem niesciagalnosci VAT w Polsce pod lupa*), mBank - CASE Seminar Proceedings 0142, CASE-Center for Social and Economic Research.
[162] Croatia, with a recorded VAT Gap of 3.5% in 2018, represents a peculiar case, as it recently introduced periodic reporting as part of a broader plan towards introducing B2B e-invoicing.

the lack of readiness of public authorities are the most frequent motivations cited by tax authorities not to adopt DRRs.

As shown in Table 30 below, **the compliance costs for taxpayers generated by DRRs systems can indeed be significant**. All in all, the annual burdens in the 12 Member States in which a reporting mechanism is in place are estimated at about EUR 3.5 billion over about 9 million taxable persons.

VAT listing requirements generate a burden of about EUR 225 million over about 1.5 million taxable persons, real-time systems less than EUR 600 million over about 600 000 taxable persons, and SAF-T about EUR 880 million over 3.2 million taxable persons. In Italy, the e-invoicing requirement imposed burdens of about EUR 1.8 billion over around 3.4 million taxable persons.

Compliance costs are partly offset by the benefits generated by certain DRRs, namely SAF-T and, to a larger extent, real-time and e-invoicing requirements. All in all, these savings, in the Member States in which certain simplifications have been introduced subsequently to DRRs, reach about EUR 1 billion. The main benefits consist in (i) the removal of other VAT compliance obligations (as in Italy, Spain and Hungary); and (ii) the pre-filling of the VAT returns. The latter possibility is available in Spain and Portugal, and will soon be operational also in Italy and Hungary. Limited benefits also arise from the reduction of the time to receive a VAT reimbursement, though it is unclear to what extent these can be fully attributed to the introduction of DRRs. In countries with real-time reporting requirements, those benefits can offset up to 80% of total costs, in Portugal (SAF-T) about 10% and in Italy about a quarter (and significantly more, once pre-filled VAT returns are made available).

In any case, **DRRs generate a net cost for taxable persons**. For VAT listing, costs are significantly lower, at about EUR 160 per taxable person per year, but this mechanism is not conducive to the introduction of related simplifications or other services for taxpayers. Costs grow with SAF-T systems (EUR 260 per taxable person per year), while they are slightly lower for real-time requirements (EUR 210), due to the savings from pre-filled VAT returns. Net costs are the highest for e-invoicing (EUR 390); however, the quantitative analysis could not account for the benefits from business automation, even though the limited evidence shows that, once widespread, they could more than compensate total e-invoicing implementation and maintenance costs.

In addition to compliance costs, the introduction of DRRs also generates costs for tax authorities, mainly because of the need to set up an appropriate IT infrastructure. Total implementation costs are low for VAT listing and SAF-T systems (EUR 3 to 5 million per year respectively) and significantly higher for more demanding CTCs (around EUR 21 million). Implementation costs are the highest for e-invoicing (EUR 25 million).

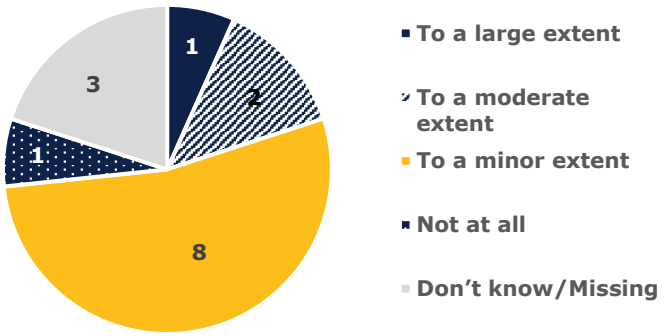
Table 30. Compliance costs and benefits for private and public stakeholders (annual values)

	VAT listing	SAF-T	Real-time	e-Invoicing	All DRRs
Member States	BG, CZ, EE, HR, LV, SK	LT, PL, PT	ES, HU	IT	
Taxpayers covered	1 421 731	3 238 087	578 108	3 489 500	8 727 426
Administrative burdens for businesses (EUR mn)	225	880	580	1 830	3 500
Savings in administrative burdens and financial costs for businesses (EUR mn)	0	35	460	480	1 000
Cost of implementation for tax authorities (EUR mn)	5	3	21	25	50
Net costs for businesses (EUR mn/year)	225	845	120	1 350	2 540

Source. Authors' elaboration on targeted consultation and desk research.

3. The limited effectiveness of recapitulative statements to tackle intra-EU VAT fraud. Recapitulative statements, which are meant to provide aggregated information to national tax administrations in other Member States in order to help fight intra-EU fraud, are regarded as rather ineffective by the majority of Member States interviewed on this subject. Out of 15 tax authorities that were interviewed during the fieldwork, nine provided a negative assessment of this tool to tackle intra-EU VAT fraud (see Figure 18).

Figure 18. Effectiveness of recapitulative statements to tackle intra-EU VAT fraud: views from tax authorities



Source. Authors' elaboration on targeted consultation of tax authorities.

The reasons for such a widely shared negative assessment are largely coherent across Member States, which unanimously criticize: (i) the lack of data granularity, since data are not available at transaction level; (ii) the inadequate timeframe of data exchange, further amplified by time reporting differences across Member States;[163] (iii) the partial scope of the tool, which mandatorily covers only intra-Community supplies (data on acquisitions are not automatically exchanged);[164] and (iv) the poor quality of the data reported.[165] As a result, crosschecks of Intra-Community trade data and VAT anti-fraud controls carried out by Eurofisc by transaction are not as comprehensive and as real-time as they should be to decrease the VAT Gap. Feedbacks provided by tax authorities are summarized in Box 12 below.

Box 12. Issues limiting the effectiveness of recapitulative statements: views from the Public Authorities

MS#1. Problem causes include: (i) exemptions from the monthly reporting obligation, with quarterly or once a year reporting; (ii) retroactive amendments to VAT ID numbers in different Member States; (iii) update of database sometimes too slow (e.g. changes in names or addresses); and (iv) sometimes minor differences in the way the name or address is written, e.g. if a "," is missing).

MS#2. Time delays in data are frequent as a result of the existing system of thresholds for intra-Community supplies of goods and possibilities of different reporting periods for intra-Community services. As a result, complete Intra-Community data are available quarterly (not monthly)!

[163] Data from recapitulative statements may be available to tax authorities in other Member States too late, not only because of the filing frequency, but also because of the time it takes for local tax authorities to upload data on the VIES.
[164] Reporting of intra-Community acquisitions is not required by the VAT Directive and less than half Member States have introduced this obligation.
[165] On the limits of the current system, cf. European Court of Auditors (2015), Special Report No 24/2015, "Tackling intra-Community VAT fraud: More action needed".

MS#3. The system is outdated and the information flow is too slow. The fact that information cannot be cross-checked is also a problem, as currently information is only available from the seller. The system does not work well.

MS#4. Data available are often fragmented, as the reporting period varies from country to country (e.g. even though the minimum reporting requirement is quarterly according to the VAT Directive, some Member States apply monthly reporting, which is more favourable for tackling fraud). In addition, technical issues exist with the VIES system and only sales are reported.

MS#5. The timeframe of data exchange, the depth of the data (just a summary), and the mandatory inclusion at EU level (only) of supplies and not acquisitions are obstacles to using the IC recapitulative statements efficiently in case there are suspicions of evasion or avoidance.

MS#6. Recapitulative statements are characterized by several shortfalls: (i) the quality of the recapitulative data is relatively low because of at least three fundamental factors: (a) unintentional failures to declare caused by the lack of expertise (like the buyer's incorrect VAT number and unreported supplies); (b) intentional misleading data (like identity fraud with regard to the buyer's VAT number); and (c) intentionally unreported supplies, generating business in the shadows; (ii) the frequency to declare recapitulative data is partly too long and no exemptions should be granted to a one-month reporting period (in some Member States data can be released in quarterly intervals).

MS#7. The periods for reporting EC sale listings in the Member States are different. In addition, mismatches are numerous due to the poor quality of the data provided.

MS#8. The system used to work very well, but nowadays many fraud traders do not send any recap statements or abusively use VAT numbers in them. This delays and hinders the discovery of VAT fraud.

MS#9. First, the information provided is not the same in all Member States, with some countries obtaining more information from taxpayers. This makes the information heterogeneous and does not allow for adequate control. Second, information is obtained much later than the moment when the transaction is carried out and this does not allow reacting to the fraud in an adequate way. Third, when the information submitted by a Member State needs to be confirmed, the procedure is slow, with countries that do not answer to the requests and a very high minimum amount for the confirmation.

MS#10. The information is not granular enough, and the periodicity and time-lag reduce the quality, making it hard to use it, for example, to detect fraud, because the reporting comes in too late.

7.3. Evolution of the problem without action at EU level

Regulatory fragmentation is expected to further worsen in the coming years, given the increasing number of Member States which have already adopted, or announced their intention to adopt or modify, domestic DRRs in an uncoordinated manner. As indicated in Section 2.3 above, Greece has introduced a DRR starting in November 2021 and France has already officially adopted the decision to introduce a DRR starting from 2024,[166] and another handful of Member States are also considering the introduction of VAT reporting mechanisms.

The VAT Gap and intra-EU VAT fraud are not likely to disappear, but their dimension may become lower. First, in Member States where DRRs were recently introduced or will be adopted soon, positive effects in terms of VAT Gap reduction are expected to materialise, similarly to what happened in other Member States. Second,

[166] Cf. on Greece: https://sovos.com/vat/tax-rules/mydata-greece/; on France: https://www.avalara.com/vatlive/en/vat-news/french-ministerial-conference-on-e-Invoicing.html; (last accessed in February 2022).

other initiatives recently adopted by the EU to tackle intra-EU fraud may produce some positive results. This is specifically the case of the TNA tool.

The quantitative analysis of the evolution of the current situation is presented in section 9.3, where the impacts of the status quo option (the dynamic baseline scenario) are presented.

8. POLICY OBJECTIVES AND OPTIONS

8.1. Objectives

The objectives have been elaborated based on DG TAXUD input. The **general objectives**, common to the various parts of the Study, are as follows:

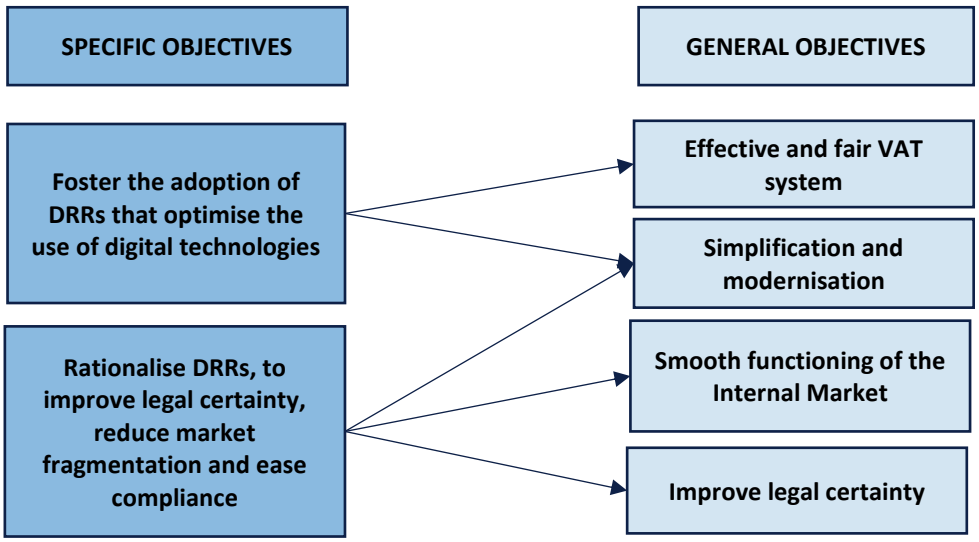
1) the need to ensure an **effective and fair VAT system**, by fighting against VAT fraud, and especially intra-Community fraud, and by ensuring a fair and effective taxation of the digital economy;
2) the smooth functioning of the **Internal Market;**
3) the **simplification and modernisation** of VAT rules to bring them in line with digitalisation and ease compliance with tax obligations; and
4) the need to enhance **legal certainty** for stakeholders.

The specific objectives relevant to this part of the Study would be the following:

1) **foster the adoption of DRRs** that optimise the use of digital technologies, to fight VAT fraud, and in particular MTIC fraud;[167] and
2) **rationalise Digital Reporting Requirements,** to improve legal certainty, reduce market fragmentation and ease compliance.

The former specific objective is expected to contribute to an effective and fair VAT system, by reducing VAT fraud, and to simplify and modernize the existing VAT rules, by allowing tax authorities to provide additional services to taxpayers and to remove other VAT compliance obligations. The latter specific objective is expected to contribute to the simplification and modernisation of VAT rules and the smooth functioning of the Internal Market, by reducing regulatory fragmentation, and to increase legal certainty, by reducing the multiplicity of the existing national frameworks. The relation between the specific and the general objectives is depicted in Figure 19 below.

Figure 19. General and specific objectives – Part 1



Source. Authors' own elaboration.

[167] With reference to reporting requirements for intra-Community transactions, this is also expected to improve the exchange of information between Member States and enhance the tools for risk analysis including the possibilities of common tools (such as Eurofisc / TNA). However, this can be better framed as an operational objective.

8.2. Refined list of policy options

The design of the policy options, as informed by the Better Regulation criteria, is grounded on the problem definition[168] and the underlying evidence[169]. The options selected and the analysis of the impacts are informed also by the following policymaking principles that the Commission has (recently) affirmed:

1) **One in, one out**. Any DRR is going to generate costs for taxpayers; the analysis assesses how complementary measures (e.g. the pre-filling of the VAT return, removal of other obligations) can generate savings and the extent to which these savings compensate for the new burdens.

2) **Digital-by-default**. For the most part, VAT reporting obligations are already digital.[170] Hence, the application of this principle in this case does not consist in promoting the digitalisation of existing paper procedures. Rather, the design of the DRRs should take into account how the collection and transmission of transactional data can be best done by automated means. While this is likely to generate higher one-off costs, in the long-term this may foster company digitalisation, and maximise the potential benefits for tax control purposes.

3) **Fit for the future.** DRRs are in a state of flux, given the number of Member States introducing or revamping them, as well as their technological developments. Therefore, the analysis needs to take into account the extent to which the various options are not going to be obsolete in the near future, based on the current trends and the foreseeable technological evolution.[171] This is particularly important considering that, in between the adoption of the Proposal by the European Commission, its approval by the Council of the EU and the implementation period for Member States and stakeholders, any policy option selected today is likely to 'go live' in no less than three to five years.

8.2.1. Approaches discarded at an early stage

Based on the Study Team's analysis, the stakeholders' feedback and in agreement with the Client, two approaches have been discarded at early stage because of their unfeasibility or their clearly inferior impacts. The two discarded approaches are:

1) **Adopting different designs for EU and domestic transactions.** It would be inappropriate to design a different DRR for domestic and intra-EU transactions. From the analysis, no evidence emerged suggesting that domestic and intra-EU transactions require a different reporting mechanism, and this choice would duplicate costs without any significant benefit for either tax authorities or taxpayers.

2) **Harmonising existing DRRs in the short-term.** Any policy proposal on an EU DRR does not work on a *tabula rasa*, given that national mechanisms have been introduced or adopted in a majority of Member States. Therefore, any proposal needs to incorporate a strategy for dealing with the existing requirements. Expecting to immediately retrofit all these systems into a new EU system would be politically very complex, and, most importantly, would generate duplicated

[168] Section 7 above.
[169] Sections 3 to 6 above.
[170] Even when the transmission on paper is still allowed, this modality is used by a very limited amount of taxpayers.
[171] The Study Team did a deep dive assessment of whether technologies based on distributed ledgers (e.g. blockchain) are mature enough to represent a feasible solution, and their likely pros and cons. The results are discussed under option 3 and Box 14 below.

burdens, since the investment in IT solutions and know-how borne by tax authorities and taxpayers in these Member States would become sunk costs.[172]

8.2.2. The relation between an EU DRR and the existing systems

Since the short-term harmonisation of the existing DRRs is considered unfeasible, an issue remains concerning how to make sure that the current regulatory fragmentation is reduced, and thus the associated costs are eliminated. This is tackled by including in the policy options 4a and 4b – the following elements: **in the short-term, interoperability of domestic DRRs, in the medium-term, convergence**. More in detail:

1) **Short-term interoperability**. If an EU DRR is introduced, any Member State which currently has no DRR should conform to it. The DRRs already in place (or legislated) at a cut-off date[173] may remain in place via a standstill clause, provided that they ensure the interoperability with the new EU system. Interoperability is defined differently, depending on whether the EU DRR is based on e-invoicing or not.

    a. If the EU DRR is based on mandatory e-invoicing, the national e-invoicing systems can remain in place. However, tax authorities should also accept e-invoices issued based on the hEN standard[174] adopted in the context of the B2G e-invoicing Directive (as integrated by the available national specifications)[175] and transmitted via a common infrastructure and communication protocol, such as Peppol, linked, if so necessary, to the national e-invoicing platform.

    b. For other types of EU DRRs, interoperability is defined as the capacity to extract and exchange among Member States a pre-defined set of basic transactional data in a common format.

2) **Medium-term mandatory convergence**. In a second phase (e.g. in five to ten years), all domestic systems will have to converge with the EU DRR. The transitional phase would mitigate duplicated costs, considering that, over such a period, the existing mechanisms would evolve anyhow and the related investment would be depreciated. If the EU DRR is not based on e-invoicing, the convergence would effectively mean that all domestic systems will have to align with the EU one. This would also result in Member States with more complex requirements having to adopt simpler ones; the feasibility of such an option and possible mitigating measures are discussed in Box 13 below. If the EU opts for an e-invoicing system, then this is not strictly required, provided that taxpayers in each country can opt for using the EU e-invoicing system. In this case, domestic taxpayers would not incur any additional costs, while MNCs could fully enjoy the benefits of harmonisation.

[172] Any option that, in full or in part, protects the investment already done would be less costly for domestic stakeholders *ceteris paribus*.
[173] E.g. at the date of the submission of the Proposal, to avoid that Member States rush to implement their own system before the Proposal is adopted.
[174] EN 16931, Electronic invoicing - Part 1: Semantic data model of the core elements of an electronic invoice.
[175] I.e. the Core Invoice Usage Specifications, that are submitted to and verified by the the CEF eInvoicing Advisory Group. Cf. https://ec.europa.eu/cefdigital/wiki/display/EINVCOMMUNITY/Registry+of+CIUS+%28Core+Invoice+Usage+Specifications%29+and+Extensions (last accessed in December, 2021).

Box 13. The 'ladder' of Digital Reporting Requirements

Under policy options 4a and 4b, domestic systems are required to converge with the EU DRR in the medium-term. If the EU chooses a PTC-based DRR, such as VAT listing and SAF-T, this could mean that Member States which had introduced a CTC systems would 'go back down the DRR ladder', i.e. would be required to adopt a simpler reporting mechanism. One could wonder whether it is realistic that Member States would go back down the DRR ladder and reinstate a PTC system, which was removed when the CTC system was introduced. This aspect could be addressed by changing the interoperability rule, i.e. by considering that countries with CTC systems need not to converge to an EU PTC, provided that they are able to share the same data in the same format with other tax authorities. However, such a version of the interoperability rule would increase fragmentation costs, because Member States with a CTC would maintain a different system for domestic transactions.

8.2.3. List of policy options

Based on the problems identified in the current situation and their drivers, the policy objectives of the intervention, and taking into account the stakeholders' feedback,[176] **four main policy options and a number of sub-options are retained for further analysis**.[177]

The policy options broadly belong to two categories: those which foresee the introduction of EU DRRs (Options 4a and 4b), and those which contemplate no or narrower interventions at EU level (Options 1 to 3). The policy options proposed are as follows:

1) **Status quo.** No measure to harmonise the DRRs is introduced at EU level. A number of Member States are likely to introduce DRRs depending on their VAT Gap and the adoption of similar requirements in other Member States. The introduction of mandatory e-invoicing remains subject to a derogation, and recapitulative statements are not modified.

2) **Recommendation & Removal** Under this option, the introduction of DRRs remains optional for Member States; their introduction is encouraged for those Member States with a significant VAT Gap or evidence of VAT fraud (possibly via the European Semester), and supported by the Commission (e.g. via DG REFORM programmes), provided that the new system conforms to the EU design. The core elements of the EU design which Member States are invited to consider are described in a non-binding recommendation. The core design elements include: (i) the scope (type of transactions, taxpayers covered, and geographical scope); (ii) the frequency; (iii) the data collected; and (iv) the data format and transmission mechanism. In parallel, the derogation currently needed to introduce mandatory e-invoicing is removed. Member States can thus choose any reporting mechanism as they deem fit. Recapitulative statements are not modified. Given the current policy developments at Member State level, it is assumed that the recommendation will elaborate on the design of both a reporting mechanism not based on e-invoicing, as well of an e-invoicing system. Otherwise, this option would fail to bring any harmonisation benefits to the Member States which are currently considering mandatory e-invoicing, and even more so considering the concomitant removal of the derogation.

3) **Keep data with the taxpayers.** Under this option, no EU DRR is imposed; rather, a new provision would be included in the VAT Directive requiring taxpayers to record transactional data according to a pre-determined format.

[176] Reported in Annex F.
[177] The proposed list includes both the status quo and a non-legislative measure, in line with the Better Regulation best practices.

The tax authority could then access such records upon request.[178] Member States remain free to maintain (or introduce) national DRRs. For Member States which introduced a DRR, it is assumed that compliance with the reporting mechanism would also ensure compliance with the new obligation. This assumption avoids that duplicated requirements are in place, i.e. that the taxpayer has to both keep records for access upon request, and submit them periodically to comply with the DRR.[179] This option is defined in technology-neutral terms, though the use of distributed ledgers (e.g. blockchain) could be conceived. A blockchain-based implementation of Option 3 would in principle, provide tax authorities with certain signals of VAT fraud even though data remain with the taxpayers. Furthermore, a blockchain system would ensure the integrity and authenticity of the transactional data, which would in turn reduce the capacity of fraudsters of setting up fraudulent invoice trails. However, at this stage, such a technology is not considered likely to fit the policy objectives. This aspect is further discussed in Box 14 and Annex E.

Box 14. The distributed ledger technologies and DRRs

Distributed Ledger Technologies (DLTs), including blockchain-based technologies, have become more and more popular over recent years, due to their suitability to be used in many distributed application scenarios. A blockchain is a specific implementation of a DLT, in which data are organized as a sequence of blocks. Each block contains a set of transactions, and it is only possible to add novel blocks in it.

The application of blockchain to tax law in general and to VAT reporting purposes in particular could be beneficial, because of its transparency, immutability and decentralization. While these aspects are certainly true, a main issue remains open, which is related to the benefits and the costs (including the environmental costs linked to energy consumption) of an effective and scalable blockchain deployment and utilization.

As a rule of thumb, blockchain technologies are useful when:

1. a number of parties wants to get access to a shared ledger,
2. the number of involved parties is higher than two (i.e., there is a multitude of writers),
3. there is no trust among parties.

An important aspect to determine whether blockchain is useful for tax purposes is thus related to the level of trust with respect to the existing VAT data handler, i.e. the tax authority. If the tax authority is secure and trustable enough, data traceability and integrity can be ensured by this entity, directly, without the need to involve other entities across a DLT.

Importantly, it is also questionable whether the first criterion – i.e. that multiple parties want to have access to a shared ledger – is relevant in the case of VAT reporting. Only the tax authority and the taxpayer concerned have an interest in accessing the ledger. Other entities should not have such access, and possibly should also be barred from storing tax-related data (even if secured and encrypted) on their private systems.

Finally, scalability, in layman's terms the possibility for the blockchain to process a sufficient number of transactions, could be an issue. For example, many statistics show that several blockchains are not able to reach the throughput provided by the credit card systems. While solutions have been implemented to overcome scalability and throughput limitations, no large-scale performance evaluation studies applied to VAT reporting are available in the literature. Only one developer provides information on the performance of its reporting system, and, based on their data, the estimated number of transactions that could be handled by the system would be roughly in line with the number of invoices exchanged in the EU, leaving no significant

[178] This solution mimics the approach recently introduced for certain transactions facilitated by platforms. Cf. Article 242a of the VAT Directive, further discussed in Volume 2.
[179] This may require certain adaptations to domestic DRR systems to conform with the data and format required by the EU-wide recordkeeping obligation.

margin of safety.[180] Importantly, no evidence is available on the expected energy consumption for operating such a blockchain, and thus on its environmental costs.

In the context of the policy intervention at stake, the use of blockchain technologies is heralded by a small minority of stakeholders as a means to ensure data confidentiality, while providing tax authorities sufficient means to detect VAT fraud. However, it is a different tool, with different objectives, than a DRR.[181] In particular, the blockchain would ensure the integrity and authenticity of the invoice data, but would not allow tax authorities to perform a risk analysis based on the full universe of transactions. The claim that, with a blockchain-based system, risk analysis would no longer be needed to ensure tax compliance could not be proven true based on the available evidence. Furthermore, it could hardly be proven true, considering that any blockchain-based system remains only experimental, and that the details of its implementation are still vague. Similarly, the gains in terms of data confidentiality also remains merely theoretical, considering that no occurrence of data leakages or significant safety accidents occurred with respect to the existing DRRs. Therefore, while it remains too early to throw a final judgment on the relevance and usefulness of blockchain as a means to replace / implement DRRs, there is no sufficient ground to include it as a full-fledged policy option at this stage, and for this reason Option 3 above is presented in a technology-neutral form.

This is not to say that DLTs, including blockchain, are not a possible means to be added to the toolbox available against VAT fraud. Surely, as anticipated above, they could be a means to ensure the integrity and authenticity of e-invoices, as required by Article 233 of the VAT Directive. Besides, as the technology will evolve and its constraints and benefits will become clearer, it might be interesting to revisit in the future how the DLT can be used. This would be particularly the case for situations in which: (i) a number of parties want to get access to a shared ledger; (ii) there is a multitude of writers; and (iii) no central trusted counterparts exist.

4) **Introduction of an EU DRR**

a. **Option 4a. Partial harmonisation**. A DRR is introduced for intra-EU transactions and the recapitulative statements are abolished. The introduction of a DRR for domestic transactions remains optional for Member States. Member States wishing to introduce such a mechanism should conform to the system used for intra-EU transactions. For Member States where a DRR for domestic transactions is already in place, interoperability is required in the short-term, and national DRRs are required to converge to the EU system in the medium-term.

b. **Option 4b. Full harmonisation**. A DRR is introduced for intra-EU and domestic transactions alike, and the recapitulative statements are abolished. For Member States where DRR for domestic transactions are already in place, interoperability is required in the short-term, and national DRRs are required to converge to the EU system in the medium-term.

Box 15. The monitoring of call-off stock arrangements

As defined in Article 17a of the VAT Directive, a call-off stock arrangement concerns cases in which goods are transported by a taxable person (or on his/her behalf) to another Member State with a view to be supplied, at a later stage, to another taxable person. The initial intra-EU transfer is not considered a supply of goods for VAT purposes provided that: (i) the supplier is not established and has no fixed establishment in the Member State of destination; (ii) the customer is identified for VAT purposes in the Member State of destination; and (iii) the supplier knows the identify and VAT identifiers of the customer and keeps a record of the transaction.

[180] Summitto, "Scalability of TX++: 2021 update", 14 October 2021, available at https://blog.summitto.com/posts/scalability_of_tx++_2021_update/ (last accessed on December, 2021). Therein, it is stated that their solution is able to handle about 40 billion invoices per year, or 1,255 per second. This throughput comes closer to the order of magnitude estimated for the total number of e-invoices in the EU.

[181] Cf. Group on the Future of VAT, Minutes of the 37th meeting, 9 Feburary 2022, taxud.c.1(2022)1573509.

To ensure compliance, the customer's identity must be reported via recapitulative statements, as required by Article 262(2) of the VAT Directive.

It follows that, if recapitulative statements were eliminated, call-off stock arrangements could no longer be monitored in the same way. Instead, the envisaged EU DRR would need to include a specific requirement for this purpose, mandating any supplier availing itself to the call-off stock arrangements to provide data about their transactions and customers – even though the transfer does not constitute a supply of goods – via the new reporting mechanism. Alternatively, one could consider requiring an invoice for such transactions (which is not currently the case); the latter approach could be especially pertinent if the EU DRR is implemented via an e-invoicing system.

Finally, similar considerations could concern intra-EU transfers of own goods in situations where the call-off stock arrangements do not apply. Discussed more in detail in Part 3 of this Study, these transactions are currently neither subject to invoice requirements in most Member States nor monitored via recapitulative statements. Requiring an (e-)invoice for such transactions or tracking them via the EU DRR could provide for the necessary monitoring, thus potentially contributing to the fight against intra-EU VAT fraud; however, this would also entail an additional administrative burden for the companies concerned.

Design of the DRR system. For options 4a and 4b, the impacts depend on the exact design of the systems. The impact analysis thus considers a number of different configurations.

The main features of interest are the following:

1) **Frequency**, i.e. whether the requirement is periodic or continuous and whether the frequency is to be specified at EU level or be left to the Member States.

2) **Type of requirement,** assessing the impacts resulting from the introduction of the following types of DRRs: VAT listing, SAF-T, real-time, e-invoicing.

3) **Role of the customer,** considering different systems in which data are reported only by the supplier, by both the supplier and the customer, or only by the supplier with acceptance / verification of data by the customer.

4) **Clearance vs. no-clearance** (for e-invoicing solutions). For the purpose of this analysis, clearance is defined in terms of the role of the central IT platforms set up by the tax authority. In a no-clearance e-invoicing system, the supplier is able to send the e-invoice directly to its customer[182] without having to request any token from the tax authority. In a clearance system, the supplier is required to either (i) obtain a verification token from the tax authority as a pre-condition to sending the invoice, or (ii) send the draft e-invoice to a central IT platform, which in turns delivers (or issues and delivers) the e-invoice to the customer.[183]

Furthermore, other design aspects have been considered, to the extent to which they may have a significant impact on the costs and benefits generated by the various policies:

5) **Scope – taxpayers,** i.e. the variation of costs and benefits linked to the introduction of a turnover threshold for stakeholders excluded from the scope of the obligation.

[182] Possibly by means of an intermediary (e.g. e-invoicing platforms).
[183] Both in a clearance and no-clearance systems, automatic checks can be implemented; this may consist in consistency checks (e.g. verifying that the information on the taxable amount, the VAT rate and the VAT due is coherent), and well as in formal checks (e.g. that the invoice has a unique non-duplicated numbering, or that the VAT number of the addressee is valid).

6) **Scope – transactions**, considering the impacts of covering only some or all market segments (B2B, B2G and B2C).

7) **Additional services.** The provision of additional services would reduce the compliance costs for taxpayers; at the same time, they result from the choices made in terms of type of requirement and frequency of submission. Depending on the above choices, the analysis identifies the possible additional services, and estimates the associated savings.

Additional considerations. The options above represent a sufficient and diverse set of legislative options that facilitate the exploration of the main choices with which the EU legislator is confronted. In particular, they range from very minimal adjustments to very broad and deep interventions, including the introduction of a fully harmonised DRR covering all transactions. Therefore, such an analysis would provide policymakers information on costs and benefits of the most salient policy options, as well as the minimum and maximum effects of possible interventions.

The removal of the derogation could be, in principle, combined with policy options 3 and 4. However, under option 3, this seems illogical, given that the option is designed as an alternative to DRRs, including e-invoicing systems. Under option 4, the decision to remove the derogation would depend on the design of the policy measure. If the DRR is based on e-invoicing, the derogation should be removed as its rationale is expunged; if the DRR is based on other technologies, the derogation could remain in place to ensure convergence of domestic systems in the medium-term.

8.3. The intervention logic of proposed options

To conclude this section, the intervention logic diagram shows and summarises how the proposed policy options connect to the problems and drivers, and the specific objectives they pursue. Figure 20 below is structured around the correspondence between the two main **policy problems** and the **proposed options** identified here.

Option 2 (Recommendation & Removal) will primarily support the rationalisation of reporting obligations across the EU, by introducing a consistent administrative and technological framework, although optional, which is currently lacking. The option could thus reduce fragmentation, and the costs incurred by MNCs and e-service providers. It would also remove the legal obstacles to introduce mandatory e-invoicing, thus removing a significant barrier to its adoption. It is unclear whether this would result in a better fight against intra-EU and domestic VAT fraud, considering that Member States would remain free not to adopt any reporting mechanism, as in the current situation.

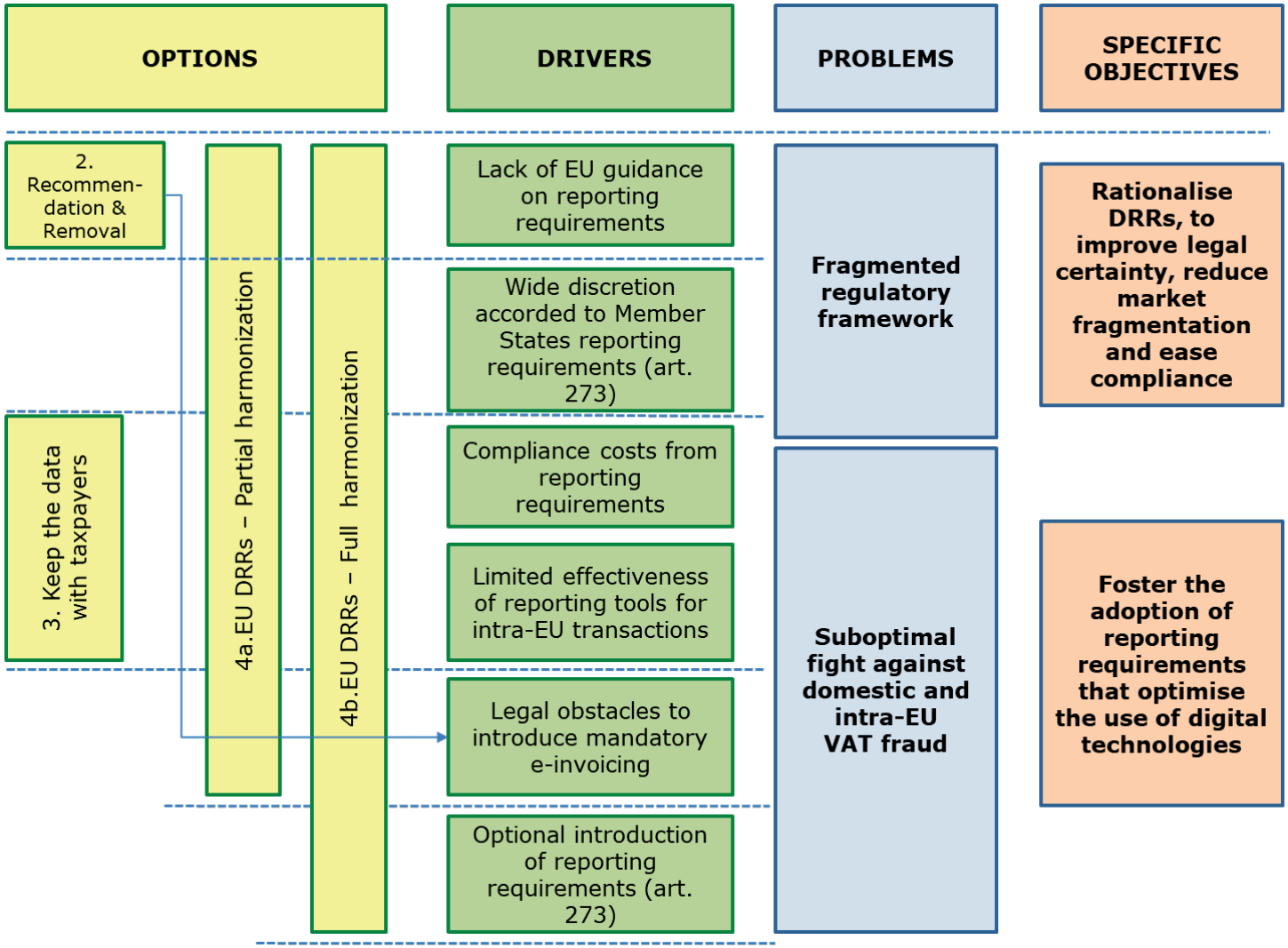
As for **Option 3** (Keep the data with the taxpayers), its scope is more minimal, as it does not provide guidance to the Member states on their reporting requirements and does not reduce their discretion in the introduction of new and possibly different systems. Still, **it may result in lower compliance costs compared to a full-fledged reporting mechanism**, and could partially address the limited effectiveness of the existing reporting tools for intra-EU transactions, by making sure that the tax authorities could, upon request, have access to a consistent and complete set of transactional data.

The Option 4a (EU DRR – Partial Harmonisation) will contribute to pursue both specific objectives. The introduction of an EU DRR for intra-EU transactions will first address the inefficiencies of the recapitulative statements. This would address the limitations of the current system and support the fight against intra-EU VAT fraud. At the same time, an EU DRR is likely to spur adoption also at domestic level, contributing to fighting VAT fraud also for domestic transactions. At the same time, the need to ensure that domestic DRRs are in line and converge with the EU system will reduce the Member States discretion (thus favouring the rationalisation of the current fragmentation). Depending on the specific design of the DRR, and in particular on

whether the system is based on an e-invoicing solution, this option could also lead to removing the legal obstacles to the introduction of mandatory e-invoicing.

Finally, the Option 4b (EU DRR – Full Harmonisation) addresses all drivers of both policy problems. On the one hand, this option would improve the fight against VAT fraud, both at domestic and intra-EU level. On the other hand, by ensuring the convergence of all DRRs in the medium-term, this option would eliminate most of the regulatory fragmentation in this respect, ensuring that the EU DRR is operational in all Member States.

Figure 20. The intervention logic of proposed options



Source. Authors' own elaboration.

9. ANALYSIS OF IMPACTS

9.1. Introduction

This chapter presents the analysis of the impacts of the policy options that have been retained for in-depth analysis, and namely:

1) **Option 1 – Status quo**. No action is taken at EU level.
2) **Option 2 – Recommendation and Removal**. A non-binding recommendation on DRRs is adopted and the derogation required for mandatory e-invoicing is removed.
3) **Option 3 – Keep the data with the taxpayers**. No DRR is introduced; taxpayers are required to store transactional data that can be accessed by the tax authority upon request.
4) **Option 4 – Introduction of an EU DRR**, and namely
    a. **Option 4a – Partial harmonisation**. A DRR is introduced for intra-EU transactions; Member States can also apply it to domestic transactions.
    b. **Option 4b – Full harmonisation**. A DRR is introduced for intra-EU and domestic transactions alike.

Whenever relevant, sub-options are also considered, e.g. in terms of the type of DRR under Options 4.

For each option, all relevant impacts – as emerging from the assessment of the current situation – are assessed via a **partial CBA.** For the impacts that can be monetised, a CBA is performed, resulting in the estimation of net benefits. This is then complemented by the assessment of the impacts which could not be monetised, i.e.: (i) impacts for which no conclusive evidence exists; (ii) impacts for which no quantification is possible; and (iii) second-order effects, i.e. macroeconomic impacts.[184] The list of impacts and the methodology applied is detailed in Table 31 below.

For Options 2 to 4, the calculation of net impacts is carried out against the status quo, i.e. as the difference between the impacts under each option and those estimated under Option 1, i.e. the dynamic baseline scenario. The net impacts are presented both in absolute and discounted value (the so-called Net Present Value), with a discount factor of 4%.[185]

Table 31. Overview of impacts considered

Impact type	Overview and means of assessment	CBA
Costs		
Administrative burdens for businesses	The introduction of DRRs generates administrative burdens for economic operators, due to the need to invest in new IT solutions and because of the routine costs of compliance. Burdens vary depending on the type of DRR selected. These are quantified via the SCM based on the findings from the current situation and represent the largest impacts for businesses.	Yes
Implementation costs for tax authorities	The introduction of DRRs requires setting up / upgrading the IT systems of TAs as well as providing human resources for their operation. These costs vary according to the DRR introduced and, except for e-invoicing solutions, mostly consist of investment costs. These costs are estimated based on the findings from the current situation and represent a small share of total costs.	Yes

[184] More details on the calculations are provided in Annex G.
[185] I.e. the social discount rate recommended by the Better Regulation methodology. Cf. Better Regulation Toolbox, Tool #61.

Impact type	Overview and means of assessment	CBA
Costs of fragmentation for businesses (MNCs)	The costs due to the diversity of the DRRs in place are borne by MNCs with multiple establishments across EU Member States. They increase the more (and more diverse) DRRs are introduced at national level and decrease by harmonising policy interventions. These are quantified via the SCM based on the findings from the current situation.	Yes
Benefits		
VAT revenue	This is the largest impact generated by the introduction of DRRs. It consists in the increase in the VAT revenue / decrease in the VAT Gap. These are measured via the econometric model, including a sensitivity analysis depending on the type of model used.[186]	Yes *same impacts for both PTCs and CTCs.*
Administrative burden savings for businesses	The introduction of DRRs can reduce administrative burdens because of: • the pre-filling of VAT return; • the removal of recapitulative statements; • the removal of other domestic obligations (e.g. annual sales listings); and • e-invoicing benefits, i.e. those linked to the dematerialisation of paper invoices (savings in printing and postage costs, quicker issuance, invoice integrity and security, etc.). All these benefits are quantified via the SCM based on the findings from the current situation (except for the removal of other domestic information obligations, for which estimates are country-specific and results cannot be extrapolated from fieldwork Member States).	Yes *except for the removal of other domestic obligations.*
Environmental benefits	The introduction of mandatory e-invoicing implies the dematerialisation of paper invoices, thus reducing consumption of paper and transport services (for postage) while increasing the costs for IT infrastructure (energy consumption). These net savings are converted into CO2 savings per invoice and monetised by considering the price of EU emission allowances.	Yes
Tax control efficiency for tax authorities	DRRs are likely to impact both the effectiveness and the efficiency of the tax control process: • in most cases, impacts on effectiveness (e.g. fraud detected, audit yield) are already captured within the increase in VAT revenue; • as for impacts on efficiency, the qualitative evidence suggests that DRRs improve the quality and targeting of audits, in particular by greatly improving the ex-ante risk analysis. No conclusive evidence exists, however, as to whether this has resulted in fewer or quicker tax audits, also due to the intervening COVID-19 pandemic.	No

[186] Given the legislation in the scope of the IA, the analysis does not consider other tax revenue impacts. Nonetheless, increasing the VAT tax base is likely to have positive impacts also on other tax revenues (e.g. corporate income tax for companies or personal income tax for self-employed). The inclusion of such other impacts, however, would not alter the findings of the analysis in terms of net impacts. Furthermore, it is not expected to affect the ranking of the policy options and sub-options, given that the increase in other tax incomes can be assumed proportional to the additional VAT revenue and invariant on the type of DRR selected. The only exception could be SAF-T requirements, which has a wider scope and thus a more direct benefit for other taxes.

Impact type	Overview and means of assessment	CBA
Tax control efficiency for businesses	Two other efficiency impacts are considered in the analysis: • better / fewer audits and requests for information; and • quicker VAT reimbursements. In both cases, however, no conclusive evidence exists on whether DRRs have been conducive to better / fewer audits (also due to the intervening COVID-19 pandemic) or quicker VAT reimbursements, since positive impacts were identified only in a few Member States or by a too limited number of interviewees.	No
Benefits from business automation	Significant savings can be obtained from business process automation and the automated handling of the invoices received. However, the available evidence from fieldwork is inconclusive, especially considering that in the EU only Italy recently introduced mandatory e-invoicing. Furthermore, whether these benefits will accrue to micro and small companies outsourcing such activity to tax advisors is unclear.	No
Data confidentiality	Data confidentiality is defined as the protection against the disclosure of information – in this case the taxpayers' transactional data – by ensuring that access to the data is limited only to those authorised. Confidentiality can be ensured in various ways (e.g. by limiting data collection or transmission, by securing data with cryptography, by securing the data storage system). Data confidentiality is assessed based on risk variation (increase, decrease), since no IT system is 'confidential' (or secure) in absolute terms.[187]	No
Second order-impacts		
Macroeconomic impacts	Effects on GDP are estimated applying the appropriate multiplier to changes in VAT revenue. Non-negligible macroeconomic impacts arise only for the options which generate a significant amount of additional VAT revenue, i.e. Options 4a and 4b. In this case, direct and non-direct effects on prices are also considered.	No

Source. Authors' own elaboration.

The remainder of this chapter analyses the different policy options. Before doing so, however, Section 9.2 describes the scenarios of the likely path of adoption of DRRs under the various options – most of which leave them optional. Then, in each section, from 9.3 to 9.6, the impacts of the various policy options are assessed in line with Table 31 above. The assessment starts from the quantitative analysis, which is concluded by the CBA, and continues with the qualitative impacts and the assessment of sub-options. Finally, in Section 9.7, the conclusions of the analysis are provided, based on the comparison of the policy options assessed.

9.2. Scenarios about the future adoption of Digital Reporting Requirements

Several of the policy options considered leave Member States free to decide whether to adopt DRRs and, if so, which one. Therefore, **the analysis needs to forecast the likely path of adoption of DRRs** based on:

- **the available information** on policy developments (forthcoming or likely) in the short-term, i.e. within the next five years;
- **probabilistic scenarios** of adoption in the medium-term, i.e. from five-years onwards;

[187] Cf. US National Information Technology Laboratory, Special Publication 800-13, Telecommunications Security Guidelines for Telecommunications Management Network.

- **the EU policy push factor**, i.e. how the policy options considered are likely to foster or reduce adoption of DRRs.

Importantly, these scenarios should not be conceived as an accurate forecast that Country X will adopt that DRR in year Y; rather, they should provide a reasonable macro-picture of the number of countries adopting DRRs in the medium-term. Given the rapid evolution of the current situation, the information provided below may no longer be accurate at the time of the publication of the Study. Anyhow, the analysis of impacts would remain solid, provided that the main trends (i.e. that more countries will adopt DRRs and that more countries will opt for e-invoicing solutions) are confirmed. Whether different countries will adopt different DRRs in different years would only marginally affect the subsequent assessment of policy options.

The scenarios cover 10 years following any policy intervention at EU level (or lack thereof). For all options, the period of analysis is assumed to start from 2023.[188] While the scenarios take into account the likely evolution of domestic policies, the Study Team opted not to introduce time variations of the main economic parameters used for the analysis (e.g. VAT revenue, inflation, salaries, number of taxable persons).[189]

Available information on policy developments. The main aspects to be taken into consideration are:

- **the likelihood that DRRs are introduced** by countries which have not done so yet; and
- **the evolution of existing DRRs** (e.g. from PTCs to CTCs).

The available information, sufficient to reasonably estimate the policy development at national level in the next five years, is as follows (as of September 2021):

- DRRs have been introduced in 12 Member States (Bulgaria, Croatia, Czechia, Estonia, Hungary, Italy, Latvia, Lithuania, Poland, Portugal, Slovak Republic, and Spain);
- between 2022 and 2024, Greece and France will also start operating their own DRRs;
- public acts were adopted or official announcements[190] were made by the government towards the adoption of DRRs in Romania (SAF-T);
- public acts were adopted or official announcements were made in Bulgaria, Croatia, Hungary, Poland, Spain, and the Slovak Republic towards the introduction of mandatory e-invoicing;
- a study has been launched in Finland on the possible adoption of DRRs, but no public act has been adopted by the government;

[188] While 2023 could be considered a reasonable timing for certain policy options (i.e. the 'doing nothing' or the adoption of a non-binding recommendation), it is unrealistic that any EU legislative intervention, as in Options 3 and 4, becomes operational by then. Still, postponing the commencement date would need even more uncertain predictions on more distant policy choices, and would also require forecasting the length of the legislative process and the transposition period granted in the Directive. At the same time, using different periods for different options would create an undue advantage in the analysis for those options which require no legislative review, running contrary to the IA methodology. Therefore, for all options, the period of analysis covers the decade between 2023 and 2032; this choice is neutral to the results, as costs and benefits are measured for all options for 10 years following their implementation.
[189] The introduction of time trends for these variables would not alter the results of the analysis (net impacts are robust to such variations). Therefore, this approach reduces the uncertainty associated with the introduction of long-term forecasts, while not affecting the accuracy of the policy assessment.
[190] Such as publication of draft laws or documents for consultation.

- for the other Member States, given the amount of time necessary to deploy the national systems after the first public decisions are communicated, they are unlikely to be able to adopt their own DRRs within the next five years.[191]

Probabilistic scenarios. The above information provides a sufficient degree of certainty for the short-term, i.e. the next five years, about the countries which are likely to adopt or update domestic DRRs, as well as of those which are not. In the medium-term, however, the available information is not sufficient to identify with a reasonable degree of certainty the likely evolution; thus, probabilistic scenarios need to be built. These scenarios vary across the options considered, depending on how the policy adopted is likely to influence the future domestic choices; they are described in detail in Annex H.

Certain common principles are adopted to forecast such scenarios:

1) a key question is **what kind of DRR new adopters will introduce**. So far, EU Member States have always started from some kind of VAT listing; those introducing a CTC have done so as an 'upgrade' to pre-existing mechanisms. At the same time, the EU and global trends are, at the moment, geared towards CTCs and mandatory e-invoicing. Based on the past evidence, the scenarios assume that new adopters opt for VAT listing.[192] The findings of the analysis would remain unaltered to changes in this assumption (i.e. that new adopters opt for real-time or e-invoicing);[193]

2) countries which have undertaken official steps towards the adoption of mandatory e-invoicing are assumed to either be granted the **derogation** or design a reporting system in which e-invoicing remains optional but greatly simplifies compliance, thus resulting in its near-full adoption.[194]

The forecasts beyond 5 years thus result from the combination of the changes described above, as well as the weighted average of the probabilistic scenarios. For each policy option, different scenarios are designed, depending on, for each one, how EU policy push factor operates, as described in Table 32 below.

Table 32. Impact of policy options on the adoption of Digital Reporting Requirements

Option 2 – Recommendation and removal	Option 3 – Keep the data with the taxpayers	Option 4a – Partial harmonisation	Option 4b – Full harmonisation
• DRRs are adopted in MS with a VAT Gap higher than the EU median. • Mandatory e-invoicing is adopted more widely following the removal of the derogation. • MS adopting / updating their DRR will conform to the EU guidelines.	• Compared to the baseline scenario, TAs can access transactional data upon request. • Therefore, a lower number of Member States will introduce a DRR. • In particular, MS with SAF-T on	• The existence of a common EU DRR will speed up the adoption of national systems compared to the status quo. • The adoption of DRRs for domestic transactions by MS which do not currently have one remains optional, and thus probabilistic.	• An EU DRR is introduced for both intra-EU and domestic transactions alike. No choice is left to Member States in this respect. • Existing DRRs will converge in the

[191] This is not accounting for the possibility that Member States might start preparatory works internally beforehand and/or copy an existing system, which could allow for quicker adoption.
[192] The only exceptions are Austria and Luxembourg which would leverage on their existing SAF-T on demand requirements (except for Option 2, in which, in case of adoption, they are assumed to conform to the Commission's recommendation).
[193] In particular, the alternative assumption would increase the costs under the status quo scenario, and, as a consequence, increase the net benefits for the other options, in particular Options 4a and 4b.
[194] Both cases are labelled 'mandatory e-invoicing', as impacts are considered to be largely the same under both legal solutions.

• Existing systems will not conform to the EU guidelines.	demand (AT, LU) will not opt for a DRR.	• Existing DRRs will converge in the medium-term (5+ years)	medium-term (5+ years)

Source. Authors' own elaboration.

Based on the above information and scenarios, the path of adoption under the policy options considered is shown in Table 33 overleaf. The forecasts are available for three periods (i) 2023-2024, when the DRRs already introduced are expected to become operational; (ii) 2025-2027, when the DRRs announced or under preparation are expected to also become operational; and (iii) 2028-2032 (medium-term), when the likely developments depend on both the information currently available and the probabilistic scenarios.

Table 33. Path of adoption of Digital Reporting Requirements

Year	Type of DRR	Option 1 - Status quo	Option 2 - Recommendation and Removal	Option 3 - Keep data with taxpayers	Option 4a - Partial Harmonisation	Option 4b - Full Harmonisation
2023-2024	# Adopters	14	14	14	14 (domestic) 27 (intra-EU)	27
	VAT listing	BG, CZ, EE, HR, LV, SK	BG, CZ, EE, HR, LV, SK	BG, CZ, EE, HR, LV, SK	BG, CZ, EE, HR, LV, SK	BG, CZ, EE, HR, LV, SK
	SAF-T	LT, PL, PT	LT, PL, PT	LT, PL, PT	LT, PL, PT	LT, PL, PT
	Real-time	ES, EL, HU	ES, EL, HU	ES, EL, HU	ES, EL, HU	ES, EL, HU
	E-invoicing	IT, FR	IT, FR	IT, FR	IT, FR	IT, FR
	EU DRR	-	-	-	AT, BE, CY, DE, DK, FI, IE, LU, MT, NL, RO, SE, SI (at least intra-EU transactions)	AT, BE, CY, DE, DK, FI, IE, LU, MT, NL, RO, SE, SI
2025-2027	# Adopters	15	15	15	20* (domestic) 27 (intra-EU)	27
	VAT listing	CZ, EE, LV	CZ, EE, LV	CZ, EE, LV	BG, CZ, EE, HR, LV, SK	BG, CZ, EE, HR, LV, SK
	SAF-T	LT, PT, **RO**	LT, PT, **RO**	LT, PT, **RO**	LT, PL, PT	LT, PL, PT
	Real-time	EL	EL	EL	ES, EL, HU	ES, EL, HU
	E-invoicing	**BG, ES, HR**, HU, IT, FR, **PL, SK**	**BG§, ES§, HR§, HU§,** IT, FR, **PL§, SK§**	**BG, ES, HR, HU,** IT, FR, **PL, SK**	IT, FR	IT, FR
	EU DRR	**-**	**-**	**-**	AT, BE, CY, DE, DK, FI, IE, LU, MT, NL, RO, SE, SI (at least intra-EU transactions)	AT, BE, CY, DE, DK, FI, IE, LU, MT, NL, RO, SE, SI
2028-2032	# Adopters	20*	21*	18*	20* (domestic) 27 (intra-EU)	27
	VAT listing	***BE, CY, DE, DK,*** EE, **FI, *IE,*** LV, ***MT, NL, SE, SI***	***AT§, BE§, CY§, DE§,*** EE, ***IE§, LU§,*** LV, ***MT§, NL§, SI§***	***BE, CY,*** EE, **FI,** LV, ***MT, SI***	**-**	**-**
	SAF-T	***AT,*** LT, ***LU,*** PT, RO	LT, PT, RO	LT, PT, RO	-	-
	Real-time	EL	EL	EL	-	-
	E-invoicing	BG, **CZ,** ES, HR, HU, IT, FR, PL, SK	BG§, **CZ§,** ES§, ***DK§,*** **FI§,** HR§, HU§, IT, FR, PL§, ***SE§,*** SK§	BG, **CZ,** ES, HR, HU, IT, FR, PL, SK	-	-
	EU DRR	-	-	-	**All Member States (at least intra-EU transactions)**	**All Member States**

*Notes. In bold: changes. In bold and italic: possible changes based on the scenario analysis. *: weighted average across scenarios. §: the domestic DRR conforms to the EU recommendation. Source. Authors' own elaboration.*

9.3. Option 1: Status quo

As required by the Better Regulation Guidelines, the analysis of impacts should assess the *status quo* option, i.e. the likely impacts in case the EU takes no action. For the present Study, this analysis is even more important, considering that, even if no action is taken at EU level, existing DRRs continue generating costs and benefits, and more Member States are likely to introduce domestic DRRs.

Under the status quo scenario, policies are expected to evolve as follows:

1) no measure, either binding or not, is taken at EU level to introduce or harmonise DRRs;
2) the introduction of mandatory e-invoicing remains subject to the derogation;
3) recapitulative statements are not modified.

Cost-benefit analysis

Both costs and benefits are expected to grow in the dynamic baseline scenario due to the expected more widespread diffusion of DRRs. Since more and more Member States are likely to adopt DRRs, the number of taxable persons covered is expected to increase. Furthermore, there is a trend towards updating existing reporting systems toward CTCs, and in particular e-invoicing. This is going to increase the compliance costs per company. As a whole, administrative burdens for businesses are thus expected to increase due to both the increase in the costs per occurrence and the business population covered; the same applies to the implementation costs for tax authorities. This is not compensated by any reduction in fragmentation costs, since no soft or hard harmonisation measures will be introduced.

On the benefits side, **the more widespread diffusion of DRRs will lead to a reduction of the VAT Gap, and, consequently, to additional VAT revenue**. In line with the analysis of the current situation, the additional VAT revenue is estimated to be larger than the compliance costs; thus, in the dynamic baseline scenario, **net benefits over the decade are positive**, both in the base scenario and under the sensitivity analysis. This is further compounded by additional burden savings resulting from the recourse to pre-filled VAT returns and the larger use of e-invoicing.

More in detail:

1) On the cost side, the introduction of DRRs in additional Member States and the adoption of e-invoicing progressively increase **administrative burdens for businesses** as well as **implementation costs for tax authorities**. The former grow from EUR 6 billion in 2023 to EUR 8.5 billion in 2032 (+36%); the latter from EUR 80 to 210 million.

2) Since no harmonisation measure is introduced, **fragmentation costs are not reduced or eliminated**. Rather, they grow as more and more complex DRRs are introduced, from EUR 3 billion in 2023 to EUR 4 billion in 2032 (+33%).[195]

3) On the benefit side, **VAT revenue** also grows given the more widespread adoption of DRRs. The VAT revenue generated by the introduction of DRRs is estimated at EUR 30 billion in 2023 and grows to EUR 37 billion in 2032 (+23%).

[195] The sharp increase in fragmentation costs in the 2023-24 period, compared to the current situation, is due to the coming into force of new DRRs in additional Member States, and in particular in France, which is estimated to host the second largest population of MNC subsidiaries after Germany.

Under the sensitivity analysis, trends remain the same, although the magnitude is lower (EUR 14 billion in 2023, EUR 18 billion in 2032, +29%).[196]

4) As for **burden savings for businesses**, the benefits of pre-filled VAT returns (significant mostly for micro and small businesses) more than double, following the adoption of CTC solutions. From about EUR 2 billion in 4 countries in 2023, savings are expected to increase to about EUR 4 billion in 11 countries in 2032. The same goes for other savings related to the adoption of e-invoicing (from EUR 380 million in 2023 to EUR 610 million in 2032, that is +61%) and environmental benefits (from EUR 2 to 4 million).[197]

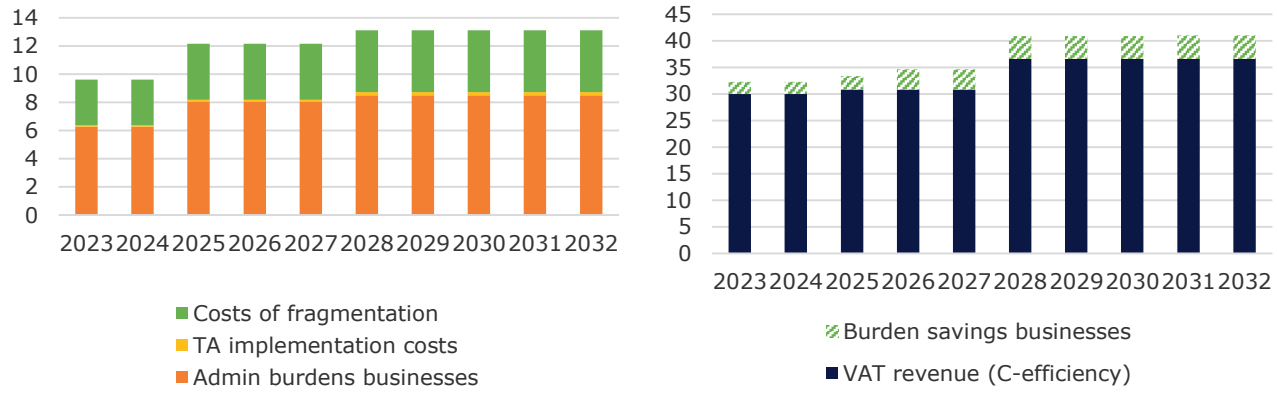
Table 34 below shows the estimated costs, benefits and net impacts for the decade 2023-2032. The values reported in Table 34 will be used to compare the other options (i.e. the net benefits will be measured as a difference compared to those that would be generated under the dynamic baseline scenario). Finally, Figure 21 provides disaggregated data for costs and benefits.[198]

Table 34. Option 1 – Status quo: Costs, benefits and net impacts 2023-2032 (EUR billion)

	Total 2023 – 2032
Costs	121
Benefits	371
Net impacts	**251**
Net impacts (sensitivity)	*78*

Source. Authors' own elaboration.

Figure 21. Option 1: Costs and benefits per type (EUR billion)



Note. Environmental benefits too small to be visible in the graph. For details see Annex G.
Source. Authors' own elaboration.

Impacts not covered by the cost-benefit analysis

From the point of view of tax authorities, **the efficiency of tax control is expected to increase** with the more widespread diffusion of DRRs, though to a limited extent. In particular, tax authorities could better target audits thanks to a more granular risk analysis, fed by the newly available transactional data. However, the improvement would not concern intra-EU transactions, for which new transactional reporting is

[196] The sensitivity analysis considers the results of the econometric model based on VAT gap data. Under this model, the impacts on VAT revenue are smaller. Cf. Section 3 above.
[197] Environmental benefits estimated here and for other options below concern the net reduction of CO2 and do not account for possible CO2 emissions from digitalisation (e.g. CO2 footprint of server farms).
[198] Full tables are provided in Annex G.

introduced; also, any improvement would be limited to the countries in which DRRs are actually introduced.

Though this may not result in fewer or quicker **audits for businesses**, controls are expected to be concentrated on suspicious and fraudulent taxpayers, rather than on the overall business population, with consequent benefits for compliant businesses. The same applies to less formal requests for information. Also, the actual carrying out of the audit may be improved, since (i) the taxpayers would not need to provide data which are already in the possession of tax authorities; and (ii) data would be already stored in a pre-agreed format. However, the occurrence of such benefits depends on the actual practices of audit activities, which vary from country to country and are not necessarily linked to the existence of DRRs.

The more widespread availability of transactional data may also **speed up the clearing time for domestic VAT reimbursement** requests, if the introduction of a DRR is accompanied by a revision of the reimbursement process, to integrate the newly available data. Furthermore, one should also make sure that all the data needed for the reimbursement procedures are available via the DRR, something which is not always the case with the existing DRRs.

In terms of data confidentiality, the more widespread diffusion of DRRs would mean that more transactional data are collected, stored, and exchanged by taxpayers and tax authorities. Therefore, the **risk to data confidentiality increases** and would need to be managed by appropriate cryptography techniques and secure IT environments for data storage.

Finally, the current trend by which a significant number of Member States have announced or are considering the introduction of mandatory e-invoicing (under a derogation) would also **increase business process automation**, nudging or forcing a number of enterprises to revamp the management of accounts receivables and payables. This would generate efficiency gains in the processing and archiving of invoices received and issued. However, the fact that the derogation is not removed and the lack of any push at EU level towards mandatory e-invoicing is going to limit these potential benefits.

Overall assessment

In the dynamic baseline, **overall positive net impacts are expected**, especially due to higher VAT revenue stemming from the adoption of national DRRs which more than compensate the additional compliance costs for businesses. Similarly, **positive, though limited, impacts are expected in terms of tax control and business automation**. Risks to data confidentiality would increase following the more widespread adoption of DRRs, while **macro-economic impacts are negligible**. Table 35 below summarises the impacts under option 1; please note that no synthetic scoring (+/-) is provided, as the status quo serves as the comparator for the other options.

Table 35. Option 1 – Status Quo: Summary of impacts

	Cost-benefit analysis	Tax control	Benefits from business automation	Data confidentiality	Macro-economic impacts
#1 Status Quo	More MS are going to adopt national DRRs over the next decade. This will result in overall positive net impacts, due to the higher VAT revenues more than compensating additional costs for companies	Tax control efficiency and effectiveness is expected to increase with the diffusion of DRRs. No improvement against intra-EU fraud.	The current trend of MS considering the introduction of mandatory e-invoicing would spur further business process automation	The diffusion of DRRs would mean that more transactional data are exchanged; this increases confidentiality risks	Net impacts too small to generate significant macro-economic impacts

Source. Authors' own elaboration.

9.4. Option 2: Recommendation and removal of the derogation

In this section, the impacts of a combination of non-binding and binding interventions are considered. First, **the Commission would issue a recommendation on the design of an EU DRR system**, with the aim of having Member States converging towards a set of common principles. This would both promote the adoption of DRRs as well as reduce fragmentation among existing and future mechanisms. Secondly, the VAT Directive will be amended explicitly allowing the introduction by Member States of DRR (currently, Member States are obliged to obtain a derogation from the VAT directive in order to introduce mandatory e-invoicing).

Cost-benefit analysis

Under policy option 2, the costs and benefits are limitedly different from the dynamic baseline scenario and so are net impacts, which over the decade are positive for about EUR 13 billion. Compared to the status quo, the publication of the Commission guidelines is expected to spur additional Member States to introduce DRRs; furthermore, more Member States are likely to opt for e-invoicing rather than PTCs or real-time requirements, given that its adoption is no longer subject to the derogation mechanisms. Accordingly, the number of taxable persons covered by DRRs in general, and by e-invoicing systems specifically, will increase, together with the compliance costs per company, resulting in **higher total administrative burdens**. Implementation costs for tax authorities are expected to follow the same trend. However, the non-binding nature of these provisions does neither lead to the adoption of reporting mechanisms for intra-EU transactions, nor to their general use for domestic transactions, at least in the Member States which have a limited incentive to do so (e.g. because of a low or comparatively lower VAT gap).

On the benefit side, the **additional VAT revenue is marginally higher than in the baseline scenario** following the greater diffusion of DRRs. The more widespread use of e-invoicing is not expected to generate additional benefits in this respect compared to the baseline, since the econometric analysis could not (yet) prove any additional impact from more advanced reporting requirements. However, e-invoicing systems are expected to increase other, more minor, benefits, such as the savings from pre-filled VAT returns, and the lower costs for companies and the environment following the dematerialisation of invoices. **Fragmentation costs are also expected to decrease,** albeit **to a limited extent**, as the harmonisation remains partial, given the non-binding nature of the initiative.

More in detail:

1) On the cost side, **total estimated costs are higher than in the baseline scenario** due to the more widespread introduction of DRRs following the publication of the recommendation, and the monitoring and support actions by the European Commission. Furthermore, the removal of the derogation for e-invoicing also spurs more countries to mandate this solution. Therefore, **administrative burdens for businesses** progressively increase, from about EUR 6 billion in 2023 to about EUR 9 billion in 2032. The same goes for **implementation costs for tax authorities**, growing from EUR 80 million in 2023 to EUR 230 million in 2032.

2) The recommendation has a positive effect on **fragmentation costs**. Nevertheless, as the measure is non-binding, the new DRRs adopted may still display a large degree of divergence,[199] while existing DRRs are unlikely to

[199] In the countries which conform to the EU recommendation, annual fragmentation costs borne by subsidiaries of foreign companies are assumed to be reduced by half.

converge. Costs are thus only marginally lower than in the baseline scenario (by about EUR 400 million in 2032).

3) On the benefit side, **VAT revenue** also grows, given the more widespread adoption of DRRs. The additional VAT revenue is estimated at EUR 30 billion in 2023 and grows to EUR 39.5 billion in 2032 (+32%). Over ten years, VAT revenue is thus 4% higher than in the baseline scenario. Under the sensitivity analysis, trends remain the same, although the magnitude is lower.[200]

4) As for **burden savings for businesses**, the benefits of the pre-filled VAT returns grow significantly as a result of the considerable increase in countries opting for mandatory e-invoicing. From about EUR 2 billion in 4 countries in 2023, savings are expected to increase to over EUR 4 billion in 14 countries in 2032. The same goes for savings from e-invoicing (due to quicker issuance and the reduction in postage and printing costs), increasing from EUR 380 million in 2023 to EUR 670 million in 2032 (+78%), while environmental benefits grow from EUR 2 to 4 million.

Table 36 below shows aggregated costs, benefits, and net impacts for the 2023-2032 period. Under this option, the **net benefits compared to the baseline amount to about EUR 17 billion, i.e. EUR 13 billion considering their net present value**. The analysis is robust to the sensitivity analysis: if lower VAT revenue impact estimates are used, net additional impacts remain positive, though lower (about EUR 9 billion over the decade, with a net present value of EUR 7 billion). The trends in costs and benefits per category are shown in Figure 22.

Table 36. Option 2: Costs, benefits and net impacts 2023-2032 (EUR billion)

	Total 2023 – 2032	NPV 4%
Costs	119	-
Benefits	387	-
Net impacts	267	-
Net impacts compared to the baseline	**17**	**13**
Net impacts compared to the baseline (sensitivity)	*9*	*7*

Source. Authors' own elaboration.

Figure 22. Option 2: Costs and benefits per type (EUR billion)

Note. Environmental benefits too small to be visible in the graph. For details see Annex G.
Source. Authors' own elaboration.

[200] I.e. EUR 14 billion in 2023, EUR 19 billion in 2032, i.e. +34% over 10 years; additional revenue of 4% compared to the baseline scenario.

Impacts not covered by the cost-benefit analysis

Impacts in terms of tax control efficiency and data confidentiality are largely similar to those assessed for the dynamic baseline scenario, given the only marginally higher diffusion of DRRs. In terms of tax control efficiency, positive impacts are expected to materialize for both tax authorities and businesses. Given the more widespread introduction of DRRs, these would be slightly larger compared to the baseline scenario. However, no significant improvements would be achieved for intra-EU transactions and the fight against intra-EU VAT fraud. Also in this case, audits could focus more on risky taxpayers, thanks to the increased availability of transactional data for risk analysis purposes in Member States adopting DRRs. Hence, the audits are likely to become more effective and efficient. Compliant taxpayers would thus benefit from the better targeting of tax control activities, while audits would become quicker given the amount of data already possessed by the tax authorities. Regarding data confidentiality, the more widespread diffusion of DRRs would lead to greater risks than under the baseline scenario. Finally, net impacts are too small to generate significant macroeconomic effects.

All in all, **the main difference compared to the baseline scenario concerns the somewhat larger benefits from business automation, due to the wider and quicker adoption of e-invoicing mandates**. The removal of the derogation and, to a lesser extent, the recommendation on the design of an e-invoicing system are likely to facilitate the adoption of this solution across more Member States. This would have additional benefits in terms of business digitalisation, and in particular the automation of invoicing and other business and accounting processes, generating efficiency gains (i.e. burden savings) additional to those quantified above.

Overall assessment

Option 2 has small but positive impacts across most of the categories considered. Net benefits are estimated at around EUR 13 billion over the decade (in net present value), driven by higher VAT revenue, which more than compensates the additional costs for businesses. The more widespread adoption of DRRs also has positive impacts on tax control and business automation, but – obviously – only in the countries which opt to introduce them. The same goes for the additional risk to data confidentiality. The impacts of Option 2 and how it scores against the baseline scenario are shown in Table 37 below.

Table 37. Option 2: Summary of impacts, scored against baseline scenario

	CBA: Net impacts (EUR bn, 2023-2032)	Tax control	Benefits from business automation	Data confidentiality	Macro-economic impacts
#2 Recommendation and Removal	13	+	+/++	-	0
	Costs and benefits slightly higher than under #1, due to more widespread diffusion of DRRs	More widespread adoption of DRRs compared to status quo leads to better risk analysis, and improves audit effectiveness and efficiency. No improvement against intra-EU fraud	Removal of the derogation facilitates adoption of mandatory e-invoicing, spurring more companies to automate (parts) of invoicing, accounting processes, depending on MS choices	More widespread adoption of DRRs compared to status quo increases the risks of malicious attacks on companies' data	Net impacts too small to generate significant macro-economic impacts

Source. Authors' own elaboration.

9.5. Option 3: Keep the data with the taxpayer

This policy option does not foresee any intervention – binding or non-binding – aimed at introducing, favouring or harmonising DRRs. Rather, it relies on a different approach: a **new provision of the VAT Directive that would require taxpayers to collect and store transactional data, which tax authorities could then access upon request**.

The new recordkeeping obligation would fulfil similar objectives compared to a DRR, i.e. to make sure that tax authorities can get access to a set of VAT transactional data, even though only on an *ad hoc* basis. For this reason, it is assumed that, where a DRR is in place, there would be no new additional recordkeeping obligation for companies. Or, in other words, that the data submitted via a DRR can also be stored for authority's inspection at a later stage. Therefore, no additional compliance efforts are required from companies established in countries in which a DRR is in place.

The different chains of impacts of Option 3 calls for adjusting the methodology deployed. Details are provided in Box 16.

Box 16. The analysis of impacts of Option 3

Compared to the other options discussed in this section, Option 3 generates specific impacts on administrative burdens and VAT revenue, which in turn calls for a specific sensitivity analysis:

- **Administrative burdens.** Under this option, the taxpayers are required to store and archive transactional data (unless a domestic DRR is implemented by the Member State), while saving the costs linked to the transmission of these data.[201] Transmission costs typically consist of the one-off costs related to the connection of the company or intermediary system to the tax authority API, and in marginal operating costs, mostly related to monitoring the integration and updating the connection in case of changes on the tax authority side.[202] All in all, **transmission costs represent a low to very low share of total costs.** Based on the findings from the mini-panel, the costs of transmissions are assumed to account for 15%[203] of the administrative burdens generated by VAT listing systems.[204] Given the uncertainty around this parameter, sensitivity values are tested at 10% and 25%.

- **VAT revenue.** The new requirement to keep data with the taxpayer can increase VAT revenue via two mechanisms:

  - **Increasing the effectiveness of tax controls**. Upon request, the tax authority can access all taxpayers' transactional data in an electronic, pre-defined format. Even though electronic access to company's data is already the standard in many countries and for many audits (at least for medium and large companies), the new

[201] To estimate the share of costs saved, a mini-panel of experts, providers of VAT services and companies has been consulted. Their views are consistent, and, in some cases, quantitative estimations could be provided based on their experience with the costs of IT systems for VAT reporting. The costs of retrieving and compiling the data requested according to the pre-defined format represent the bulk of the costs considered. E.g. the development costs for finding the data in the company system, compiling the data together (often from different formats and possibly for different systems), creating the required format, and following-up the format changes and implementing them. The costs of storing the data are very low to negligible considering the constant evolution of technology in this area and the decline in the storage 'cost per byte'. On a similar note, cf. the effect of Article 242a on platforms, imposing a very similar requirement (discussed in Volume 2 of the Study).
[202] Still, operating costs may grow in case the data transmitted are not valid; this, however, is typically due to problems with data retrieval, compilation, and formatting.
[203] When asked to quantify those costs, respondents reported that they are 'lower than 10% of total costs', 'no more than 15%' or 'between 20% and 30%', mostly depending on the underlying requirements and the technical solutions chosen.
[204] For sensitivity purposes, estimates are also provided based on the adoption of a SAF-T solution.

standard recordkeeping obligations is likely to increase the effectiveness of the audit procedures. However, since no data are transmitted to the tax authorities, the new provision will not improve risk analyses.[205] Therefore, the effect is lower compared to the introduction of DRRs. Based on the assessment of the current situation, the mid-point estimate of the increase in the average value of frauds detected is used (+25%) to estimate the improved yield from tax audits and the resulting impacts on VAT revenue.[206]

- **Inducing spontaneous compliance.** The new requirement could generate a spontaneous reduction of inaccuracies, mistakes, omissions or fraud.[207] On the one side, one could say that the effect is likely to be negligible, considering that, already today, tax authorities have access to transactional data upon request (i.e. VAT registers and invoices), even though not in a standard electronic format. On the other side, the measure under consideration is likely to increase the likelihood that, if data are accessed, errors or frauds can be identified. Also, the new obligation may make this risk more salient to taxpayers. Therefore, based on the above considerations, the impacts on VAT revenue due to spontaneous compliance are estimated at 20% - i.e. a low but non-negligible share - of those generated by the EU DRR; a sensitivity analysis is performed at 5% (negligible effect) and 33% (moderate effect) values.

Cost-benefit analysis

Under policy option 3, two contrasting trends emerge. On the one side, **the new information requirement generates additional costs for companies and VAT revenue for Member States.** On the other side, the new information requirement reduces the incentives for Member States to go one step further and introduce DRRs, the diffusion of which is thus lower compared to the baseline scenario**. The more limited diffusion of DRRs results in overall lower costs for companies and tax authorities, but also in a lower potential in the fight against VAT fraud,** and thus in recouped VAT revenue. Indeed, while some additional revenue emerges in the short term, because of the new recordkeeping obligation, the effect is much lower at the end of the decade, when the more limited diffusion of DRRs weighs in.

Compared to the other policy options, there is greater uncertainty in the estimates of both costs and benefits, given that the analysis could not rely on the data on the current costs and benefits of domestic DRRs. Accordingly, a specific sensitivity analysis has been carried out, as reported below. Only unrealistic assumptions with regard to the effectiveness of the new recordkeeping obligation against VAT fraud compared to DRRs would significantly alter the policy analysis. **Under reasonable changes to the analytical parameters, the analysis is robust, confirming that net benefits under policy option 3 are positive, but lower compared to the introduction of an EU DRR**, as discussed under Options 4a and 4b.

More in detail:

1) **Administrative burdens are higher compared to the baseline scenario, because of the costs of the new information requirement**; the differential

[205] This assumption could be considered over optimistic, considering that the improvement in the average value of frauds detected is also likely to partly result from the improved risk analysis techniques. However, disentangling the reciprocal effects of these two factors is impossible and the resulting benefits are in any case limited compared to the overall analysis.
[206] Cf. Section 3.2 above.
[207] Since a similar obligation is already in place in a number of Member States (Austria, France, and Luxembourg), the Study Team performed an econometric analysis to estimate its impacts on VAT revenue. However, the results are contradictory, in terms of both magnitude and significance of the coefficients, across the various model specifications. In particular, in the VAT Gap model the impacts are not statistically significant (i.e. different than zero), while under the C-efficiency model the impacts are positive and significant. The inconsistent results may be likely due to the limited number of Member States included in the analysis (also considering that Luxembourg had to be removed because of the very small size and particular specialisation of its economy).

is estimated at about EUR 800 million in 2023. The cost differential declines to about EUR 500 million in 2032, due to the fact that more Member States would have introduced a DRR over the decade. Administrative burdens over the decade thus grow slightly, from about EUR 7 billion in 2023 to about to EUR 9 billion in 2032.

2) At the end of the period, **implementation costs for tax authorities** are slightly lower than in the baseline scenario (by EUR 10 million), at EUR 200 million. The same goes for **fragmentation costs**, which at the end of the period reach about EUR 4 billion (about EUR 200 million lower compared to the baseline scenario).

3) On the benefit side, the **additional VAT revenue** generated by the new requirement, as well as by the existing and forthcoming DRRs, is rather stable across the period, growing from EUR 36 billion in 2023 to EUR 37 billion in 2032 (+4%). Compared to the baseline scenario, the introduction of the new requirement generates about EUR 6 billion in additional VAT revenue in the early period of the analysis; in 2032, the additional revenue declines to about EUR 800 million. This trend results from the immediate positive effect of the new provision and, in the long-term, the negative effect due to the more limited introduction of DRRs.

4) Given that this option does not impact on the likelihood of adoption of CTC systems (and in particular e-invoicing), **burden savings** from the pre-filled VAT return and other e-invoicing benefits (i.e. issuance time, printing and postage costs), as well as **environmental benefits** remain constant compared to the baseline.

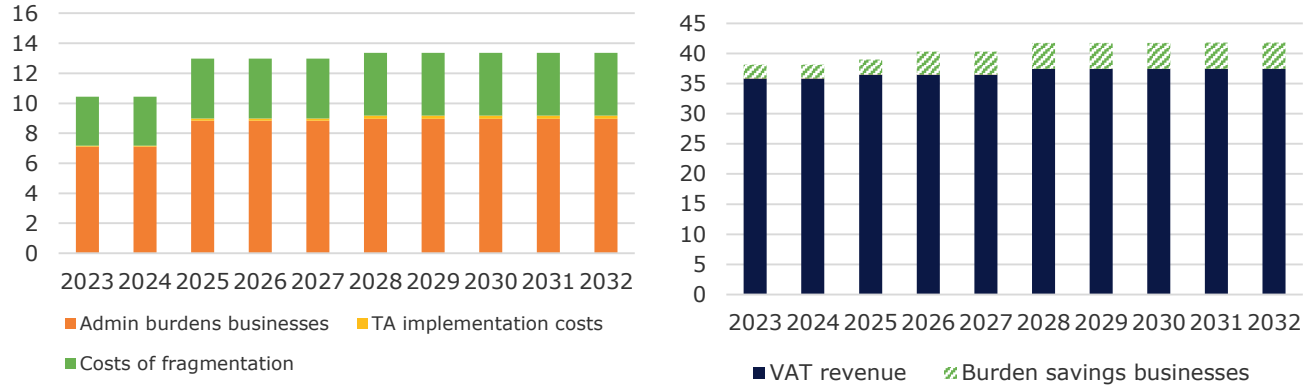
Table 38 below presents the total costs, benefits, and net impacts for Option 3 for the years 2023 until 2032. Across the decade, **the net impacts compared to the baseline are positive, though declining** (from EUR 4 billion in 2023 to EUR 400 million in 2032). Over the period, total net additional impacts amount to EUR 28 billion (EUR 25 billion in net present value). The impacts remain positive, though lower, even under the sensitivity analysis based on the VAT Gap estimates for the VAT revenue impacts.

Table 38. Option 3: Costs, benefits and net impacts 2023-2032 (EUR billion)

	Total 2023 – 2032	NPV 4%
Costs	127	-
Benefits	405	-
Net impacts	278	-
Net impacts compared to the baseline	**28**	**25**
Net impacts compared to the baseline (sensitivity)	*14*	*12*

Source. Authors' own elaboration.

Figure 23. Option 3: Costs and benefits per type (EUR billion)



Note. Environmental benefits too small to be visible in the graph. For details see Annex G.
Source. Authors' own elaboration.

Sensitivity analysis for Option 3. As discussed above, a number of parameters to estimate the impacts of this option remain uncertain. To account for this uncertainty, a specific sensitivity analysis has been devised for Option 3. This is described in Table 39 below. The analysis shows that the analysis of impacts has a negligible to limited sensitivity to changes in the cost parameters; changes of the estimated VAT revenue impacts have a more profound effect. However, **under a range of reasonable assumptions on such parameters, the comparison of option remains unaffected by such uncertainty.**

Table 39. Option 3: Parameters for sensitivity analysis

Scenarios:	Base	SAF-T	Low transmission costs	High transmission costs	Low VAT revenue	High VAT revenue
Cost per occurrence	Based on VAT listing	**Based on SAF-T**	Based on VAT listing	Based on VAT listing	Based on VAT listing	Based on VAT listing
Costs of transmission as a share of total cost per occurrence	20%	20%	**10%**	**25%**	20%	20%
Impact of the new requirement on additional VAT revenue	Low (20%)	Low (20%)	Low (20%)	Low (20%)	**Negligible (5%)**	**Moderate (33%)**

Source. Authors' own elaboration.

In Table 40, estimated costs, benefits and net impacts under the various scenarios are provided. The analysis is very robust to changes in cost parameters. Namely, variations in the share of transmission costs over total costs have a marginal impact on net benefits (between -1.5% and +3.3%). The variation is larger if the recordkeeping requirement were to be based on the SAFT standard; in this case, net benefits would decrease by more than 12%.

Variations in the estimated impacts on VAT revenue have a larger impact on total benefits. If the impact of the new requirement is assumed to be negligible, Option 3 generates negative impacts compared to the baseline scenario. If the impact is assumed

to be moderate, the net benefits almost double. However, this uncertainty, though significant, does not affect the overall ranking of policy options.[208]

Table 40. Option 3: Sensitivity analysis (EUR billion and % of the baseline scenario)

	Base	SAF-T		Low transmission costs		High transmission costs		Low VAT revenue		High VAT revenue	
Total costs	127	130	2.8%	127	0.4%	126	-0.6%	127	-	127	-
Total benefits	405	405	-	405	-	405	-	370	-8.7%	435	7.5%
Net impacts compared to the baseline	28	24	-12.7%	27	-1.5%	28	3.3%	-8	n.a.	58	110%

Source. Authors' own elaboration.

Impacts not covered by the cost-benefit analysis

In terms of tax control, **the main drawback of this approach is that data remain with the taxpayers and are thus not available to tax authorities for risk analysis purposes**. Therefore, while audits are likely to become more effective and efficient because inaccuracies, mistakes and frauds could be detected more easily by accessing the electronic transactional data, they are unlikely to become more targeted.

The main benefit of this option concerns increased data confidentiality. No additional taxpayer data are disclosed to the tax authority on a continuous or periodical basis, but only upon request. This implies that, unless requested by the tax authorities, the data remain with the owner, without a central database or exchange system that could represent a single point of failure. This thus offers a reduced attack surface for malicious users. At the same time, the data could still be maliciously accessed at the company's premises. Though this would require an action against single taxpayers, it may still represent a risk, especially for micro and small companies that are unlikely to possess sufficient IT protection.

Furthermore, by requiring all data to be compiled and stored electronically, this option can have a **positive impact in terms of business automation**. This is likely less so for micro and small companies, a larger share of which would outsource compliance to their tax advisors, with more limited, if any, effects on internal operations. At the same time, however, other benefits from business automation more closely linked with the adoption of e-invoicing solutions would fail to materialise. Finally, because of the limited net impacts compared to the baseline scenario, **the macroeconomic effects remain negligible**.

Overall assessment

Option 3 is expected to have neutral or small positive impacts across all categories considered. Despite a more limited impact on VAT revenue, **the net benefits would be around EUR 25 billion over the ten years.** Due to the possibility for accessing to electronic transactional data for tax authorities, **some positive effects on tax control would manifes**t, though this option does not improve the risk analysis. Even though benefits from e-invoicing do not materialise, businesses are still expected to increase their business automation thanks to the electronic handling of transactional data. With

[208] Anticipating some of the results discussed in the following sections, for net impacts to reach the level of the next option (Option 4a – e invoicing) the new requirement should generate additional revenue for about 71% of that generated by a DRR. This value is extremely high, considering that this policy option does not generate what tax authorities perceive as the main benefit of DRRs for tax control purposes: the availability of data for risk analysis. Similarly, such a high value would hardly explain why one of the countries in which this requirement is currently in place has introduced an e-invoicing requirement, which is significantly more costly for taxpayers.

regards to data confidentiality, this option scores the highest, as the attack surface is more limited and the lack of a single point of failure. Table 41 provides a summary of the impacts under option 3 and of how it scores in comparison to the baseline scenario.

Table 41. Option 3: Summary of impacts, scored against baseline scenario

	CBA: Net impacts (EUR bn, 2023-2032)	Tax control	Benefits from business automation	Data confidentiality	Macro-economic impacts
#3 Keep the data with the taxpayers	25	0/+	+	+	0
	Compared to DRRs, some savings in administrative burdens; more limited effect on VAT revenue	Audits would become more effective, efficient; no improvements to risk analysis possible. No improvement against intra-EU fraud	Electronic handling of transactional data may increase automation; benefits from e-invoicing fail to materialise	No data transmitted to the TA reduces the surface attack for malicious users; risk of accessing data on the company's premises (especially SMEs) remains	Net impacts too small to generate significant macro-economic impacts

Source. Authors' own elaboration.

9.6. Option 4: Introduction of an EU Digital Reporting Requirement

In this section, the most far-reaching policy options considered in this exercise are analysed. They consist in the decision by the European Commission **to introduce an EU DRR in the VAT Directive**. Such a decision could be mandated for intra-EU transactions only, as under Option 4a – Partial Harmonisation, or apply to both intra-EU and domestic transactions, as under Option 4b – Full Harmonisation:

- Under Option 4a, the EU DRR applies to intra-EU transactions, replacing the recapitulative statements. Member States are free to also apply it to domestic transactions; if they opt in, they should use the EU DRR. For existing DRRs, in the short-term interoperability must be ensured.[209] In the medium-term (five to ten years), existing national systems must converge to the EU DRR.[210]
- Under Option 4b, the EU DRR is mandatory for both intra-EU and domestic transactions, replacing the recapitulative statements in all Member States. As for existing DRRs, the same considerations apply: interoperability must be ensured in the short-term, and convergence is required in five to ten years.

The assessment is performed via a partial CBA, accounting for both quantified and non-quantified impacts. Quantitative results are presented in a range, depending on the possible specific feature of the sub-option (e.g. the type of DRR).

Further to the options above, **four sub-options are analysed, based on the type of DRR**: VAT listing, SAF-T, real-time, and e-invoicing. The sub-options are assessed based on a multi-criteria analysis, since the quantitative differences in net impacts are too limited to support sound policy conclusions.

Finally, **an analysis is also carried with respect to other possible features of an EU DRR system**, providing quantitative insights when possible, and namely:

- the role of the customer within the DRR;
- for e-invoicing, the introduction of a clearance system;
- the scope of the DRR (both in terms of taxpayers and transactions covered); and
- the provision of additional services to taxpayers.

[209] For DRRs other than e invoicing, this implies that existing DRRs must be able to retrieve from taxpayers and automatically exchange with other tax authorities a certain set of data in a pre-determined format. However, the interface with the taxpayers (and thus the methods for complying with the domestic DRR) would remain different from country to country. For e-invoicing systems, interoperability should be ensured by accepting invoices issued according to the European e-invoicing standard via a common protocol (such as Peppol).
[210] For the quantitative analysis, convergence is assumed to take place within five years.

9.6.1. Option 4a – Partial harmonisation

Cost-benefit analysis

Under policy option 4a, **two main factors** determine the expected costs and benefits over the next decade:

- **the additional VAT revenue** recouped following the introduction of an EU DRR for intra-EU transactions and its voluntary introduction for domestic transactions, which is expected to increase compared to the baseline scenario due to the 'focal role' played by the EU system;

- the **consequent increase in the number of businesses subject to the obligation**, and thus of total administrative costs for both economic operators and tax administrations.

The administrative costs depend on the type of DRR chosen, being lower for simpler PTC requirements and higher for more complex CTC systems. To the contrary, the impact on VAT revenue is estimated to be the same for all DRRs, lacking conclusive evidence to the contrary from the analysis of the current situation. In any case, under all types of DRRs considered, **net benefits remain large and positive**, since the additional VAT revenue is estimated as higher than business costs in all scenarios.

As for the other benefits, **fragmentation costs are eliminated in the medium-term**, i.e. after the end of the transitional period in which Member States can maintain their own domestic systems. With regards to business savings from pre-filled VAT return and e-invoicing, as well as environmental benefits, they grow compared to the baseline scenario only if the EU DRR is based on a CTC system. Here below, each category of quantified costs and benefits is described in more detail.

Costs. Under Option 4a, the following categories of costs can be quantified:

- **Administrative burdens** arise for:

    a. taxable persons engaged in intra-EU trade, which now need to comply with the intra-EU DRR.[211] About 9% of taxable persons would be covered by this obligation;[212]

    b. taxable persons in Member States which will decide to introduce the EU DRR also to domestic transactions; and

    c. taxable persons in Member States which have already introduced a DRR;[213] the analysis cannot account for the costs of ensuring interoperability, which are described in Box 17 below.

  In line with the findings from the analysis of the current situation, administrative burdens for businesses depend on the type of DRR chosen, with **a yearly average ranging from EUR 4 billion to 9 billion**.

[211] Given the interoperability clause, in countries with existing DRRs obligations are assumed not to be duplicated. In other words, the taxable person can comply with its own domestic DRR and the TA then extracts the data needed to comply with the EU DRR for intra-EU transactions. The duplication of DRRs would imply about EUR 200 million per year of additional costs at EU level.
[212] The corresponding burden savings from the removal of the recapitulative statements are accounted for under item 5 below.
[213] In these countries, in the first five years, the administrative burdens are the same as in the baseline scenario.

- The **implementation costs for tax authorities** due to the introduction of a DRR for intra-EU transactions could, in principle, be lower than those necessary to apply the requirements to both intra-EU and domestic transactions. This may be especially true for operating costs, which are more closely linked to the number of transactions processed, but less so for investment costs. Estimated implementation costs range between **an annual average of EUR 57 million and 390 million, i.e. a small share of total costs, between 1% and 4%.**

- The **costs of fragmentation** for multinational companies are eliminated from 2028 onwards, i.e. when all existing systems are to converge towards the new EU system. Between 2023 and 2027, the yearly costs of fragmentation range **between EUR 600 million and 1.6 billion**.

Total costs. The total costs for Option 4a – Partial Harmonisation over a decade fall in the range EUR 42 to EUR 90 billion.

Box 17. The impacts of non-convergence

In the short-term, i.e. within the first five years, Member States that already have in place a DRR should ensure its interoperability. For e-invoicing systems, this consists in making sure that the taxpayers can either use the domestic format and transmission protocol, or an EU-wide format and protocol. For other DRRs, the interoperability clause requires that tax authorities are able to exchange a pre-agreed dataset in a pre-agreed format.

It is in principle possible to impose an EU DRR for intra-EU transactions without requiring convergence. The EU system would co-exist with different domestic systems, with no harmonisation of the current legal framework as a result. However, such a policy option is not going to meet two of the specific objectives the initiative is supposed to achieve, that are the smooth functioning of the Internal Market and the simplification of the VAT system.

This would result in some different impacts compared to those generated by Option 4a:

- First and foremost, fragmentation costs would not be eliminated. Rather, they would grow, following the introduction of additional domestic DRRs. If all MS adopted their own DRRs, fragmentation costs at the end of the decade would reach EUR 5.5 billion, with an increase of 26% compared to the dynamic scenario. If convergence is required, as under Options 4a and 4b, they will decline to 0.

- Ensuring interoperability would likely result in additional implementation costs for tax authorities, which will have to make their systems compatible with the EU DRR. This would consist in updating their e-invoice protocol and transmission formats and/or converting their existing data into the new specifications, and ensuring that all required data are available in their databases. If convergence is not required, tax authorities will not bear these costs.

- Similarly, interoperability may generate some additional costs for domestic businesses. This is not the case with a DRR based on e-invoicing, since domestic taxpayers could continue issuing and transmitting e-invoices according to their pre-existing methods. However, under other types of DRRs, interoperability may require changes to the nature, quantity, frequency or format of the data requested, with consequent adaption costs for businesses.

Benefits. Under Option 4a, the following categories of benefits can be quantified:

- **Additional VAT revenue** compared to the baseline scenario is generated by:

  a. the mandatory application of the EU DRRs to intra-EU transactions; and
  b. the quicker introduction of a DRR for domestic transactions across Member States, due to the model-role played by the EU DRR.

To calculate the impacts of a requirement for intra-EU transactions, the corresponding share of VAT revenue has been calculated; this is estimated at 40% of the VTTL.[214] Over the decade, **VAT revenue under this option amounts to, on average, EUR 45 billion per year**, compared to EUR 34 billion under the baseline scenario.

- The removal of recapitulative statements leads to **administrative burden savings** of about EUR 1 billion per year.[215] Additional savings for businesses are generated due to the pre-filling of VAT returns and the more widespread use of e-invoicing (due to quicker issuance and the reduction in postage and printing costs). The yearly average savings can be estimated to reach up to EUR 4 billion and EUR 800 million, respectively.

- **Environmental benefits,** i.e. the monetary value of the CO2 saved, amounts to between about EUR 10 million and EUR 45 million, over the entire decade.

Total benefits. Over 10 years, the benefits generated by Option 4a can be estimated in between EUR 473 and EUR 500 billion.[216]

Net impacts. Table 42 below shows the aggregated costs, benefits and net impacts estimated for the decade 2023 – 2032. **The net impacts against the baseline are positive under option 4a and range between** EUR 127 and 143 billion in net present value. The sensitivity analysis confirms the main findings of the assessment, i.e. positive and significant net benefits compared to the baseline scenario. The estimated net benefits under the sensitivity analysis are however lower, due to the lower estimated impacts on VAT revenue measured by the VAT Gap-based econometric model.

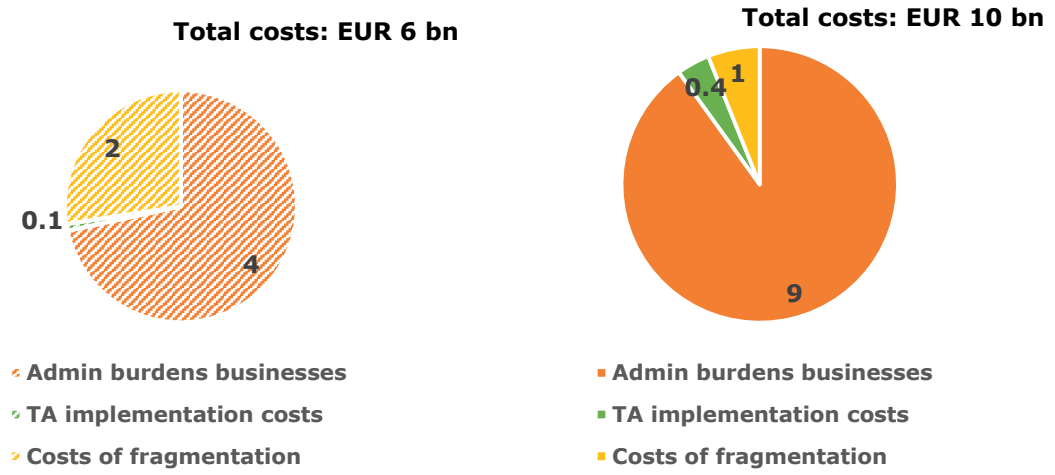
Table 42. Option 4a: Costs, benefits and net impacts (EUR billion)[217]

	Total 2023 – 2032		**NPV 4%**	
	Lower end	*Higher end*	*Lower end*	*Higher end*
Costs	59	100	/	/
Benefits	473	500	/	/
Net impacts	400	423	/	/
Net impacts compared to the baseline	**149**	**173**	**127**	**143**
Net impacts compared to the baseline (sensitivity)	*94*	*118*	*80*	*96*

Source. Authors' own elaboration.

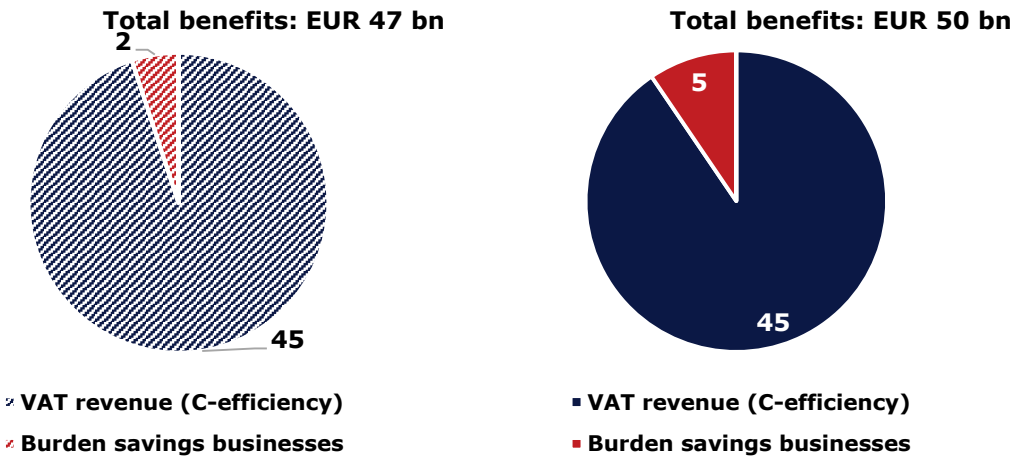
[214] Cf. Annex F for more details on the calculation.
[215] Limited additional burdens would arise in case call-off stock arrangements or movements of own goods are to be invoiced or monitored via the EU DRR. Cf. Box 17 above.
[216] The more range of benefits compared to costs is due to the fact that the additional VAT revenue represents the bulk of the benefits generated and this is estimated to remain the same across the various types of DRRs.
[217] The range for net impacts does not necessarily result from the sum of the ranges of costs and benefits, since the scenario with minimum or maximum costs does not necessarily correspond to that with minimum or maximum benefits.

Figure 24. Option 4a: type of costs, low-end (left) and high-end (right) (EUR billion, yearly average over the 2023-2032 period)



Note. The size of the pie is proportional to total costs. For details see Annex G. Source. Authors' own elaboration.

Figure 25. Option 4a: type of benefits, low-end (left) and high-end (right) (EUR billion, yearly average over the 2023-2032 period)



Notes. The size of the pie is proportional to total benefits. Environmental benefits are too small to be visible in the graph. For details see Annex G. Source. Authors' own elaboration.

Impacts not covered by the cost-benefit analysis

- **Tax control**. The introduction of DRRs under Option 4a – mandatory for intra-EU transactions and optional for domestic ones – is expected to bring **positive impacts on the efficiency and effectiveness of tax control activities**. This is a key advantage in comparison to option 3 and the effects are assumed to be more significant than under option 2, due the larger number of VAT transactions and taxpayers covered by the system. The adoption of an EU DRR for intra-EU transactions combined with the increased diffusion of DRRs for domestic transactions would allow for a more modern and better targeted audit system, concentrating resources on the most suspicious chains of transactions and taxpayers. This would mainly result from the **improvement of the risk analysis systems,** which is the main positive impact acknowledged by tax authorities. In particular, DRRs improve risk analysis because of the use of automatic cross-checking techniques, by matching data provided by the trading partners and, in some cases, also with other sources available to the tax authority. This allows the direct identification of mismatches in reporting the same transaction, such as divergences in tax accrual, under-declaration of VAT

and inflated deduction. Under Option 4a, **full benefits in this respect could be reaped with respect to intra-EU transactions, thus contributing to fighting MTIC and other intra-Community VAT fraud.** In particular, it will be more difficult for fraudsters to operate, since the good faith trading partner in the chain will disclose (possibly in real-time) the transactions to the authorities; this presupposes an effective exchange of relevant transactional data across Member States. However, as the coverage of domestic transactions would remain optional, the positive impacts on the fight against VAT fraud would be more limited than under option 4b. Regarding improvements for businesses due to increased tax control efficiency, the evidence of possible positive impacts is more limited, due to the fact that for most companies, except large and very large entities, audits are an exceptional event. It may therefore be difficult to perceive changes in the frequency and conduct of audits. Still, positive though more limited benefits are also likely for compliant businesses.[218] This could, for instance, consist in more limited risks of objections to input VAT deduction, to the extent that it concerns transaction the invoices or data of which have already been transmitted to the tax authority.

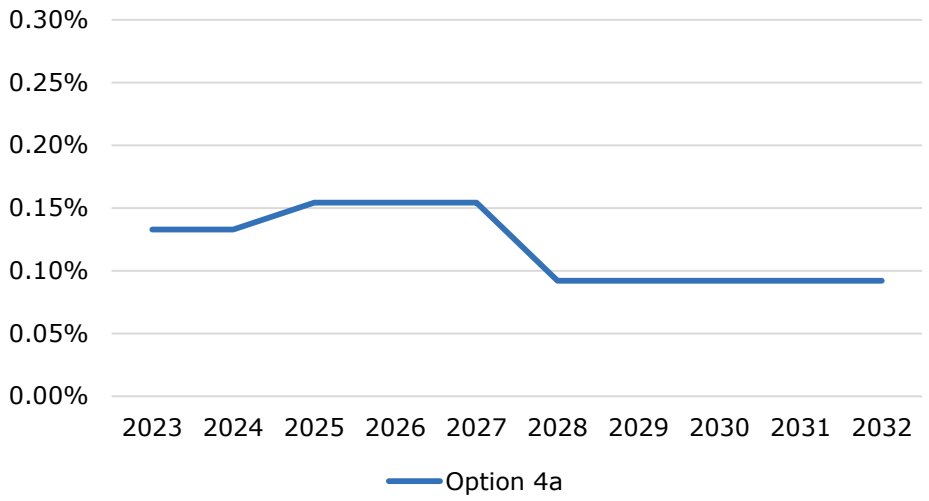
- **Benefits from business automation.** An important benefit of option 4a not covered by the CBA is the automation of business processes driven by the introduction of DRRs, due to the electronic handling of transactional data. However, the significance of such benefits varies according to the type of DRR chosen and the size of businesses. Importantly**, the benefits from business automation only reach their full potential under an e-invoicing solution**, which allows the full automation of the processing of incoming and outgoing invoices, including their issuance, reception, and storage, and of the associated business and payment processes (e.g. the order-to-payment cycle) and accounting procedures. Still, the evidence of widespread benefits in this respect remains limited, and mostly concentrated on a small number of large players which pro-actively invested in accounting automation. However, this is also likely due to the fact that e-invoicing was only recently introduced in one EU Member State only, and benefits may materialise at a later stage, following an early period of adaptation to the new obligation. In any case, **larger, more structured, business entities are likely to obtain more savings**, first of all because of the larger scale of their invoicing and accounting processes. Secondly, because they possess the necessary resources and know-how to invest in business automation, and because they are more likely to carry out accounting activities in house, thus directly enjoying the savings. Benefits for micro and small companies are likely lower, and possibly not always worth the necessary investment. Nonetheless, smaller entities could benefit through local trade associations, which could train them to a more widespread use of digital solutions for business processes.

- **Data confidentiality.** Introducing a DRR for intra-EU transaction means that more fiscal data concerning those transactions will be collected, stored, and exchanged. As a consequence, **the risks to data confidentiality would increase under option 4a in comparison to the baseline**. The extent to which the described risks might manifest would likely differ according to the type of DRR introduced and the scope of data required. With that being said, under all types of DRR the risks would be higher than under the baseline scenario, also because an EU-wide DRR entails the sharing of data among Member States. Therefore, additional attention should be provided to securing the data transmission and the environment in which they are stored under option 4a.

[218] E.g. a company subject to the DRR receiving an audit reported that the process went smoother, since the authority already possessed most of the data previously required.

- **Macro-economic impacts.** Macroeconomic effects are likely to become significant with the adoption of option 4a. The positive impacts would be driven primarily by the additional VAT revenue against the baseline, which is expected to amount to EUR 6-11 billion per year, with a declining trajectory.[219] Based on the multiplier chosen for the analysis, discussed in Box 18 below, the additional revenue would translate into an annual average increase of the EU GDP of about EUR 16 billion, i.e. **about +0.1% of the EU GDP**. Figure 26 below illustrates the yearly impacts. Finally, option 4a is unlikely to have a direct effect on price, since the administrative costs per company, however not-negligible, are too small to be significantly passed-on downstream.[220] If the additional VAT revenue were recycled by Member States by lowering the weighted average VAT rate, the introduction of DRRs could have a direct impact on price. In this case, the price level could decrease by a few tenths of a percentage point.[221] However, such an effect would be uneven across the economy, depending on the pre-existing levels of VAT compliance and evasion. Prices could eventually increase in the sectors which are currently more at risk of tax evasion, because of the more effective compliance mechanisms.

Figure 26. Option 4a: Effects on EU GDP



Source. Authors' own elaboration.

Box 18. Estimation of macroeconomic effects

The policy intervention at stake is likely to generate significant additional VAT revenue, in the order of magnitude of tens of EUR billion per year. While significant, these amounts remain small when compared to the EU GDP. Hence, any impact thereon is going to be limited. For this reason, macroeconomic impacts are not estimated via a full-fledged macroeconomic modelling. Rather, their estimation relies on the application of the most suitable 'output multipliers', based on the state-of-the-art macroeconomic literature. An output multiplier is the coefficient transforming variations in a specific variable related to income and expenditure, such as higher or lower public expenditure or taxation, into an expected variation of GDP.

The main revenue impacts following the introduction of DRRs are related to the increase in VAT revenue thanks to the reduction of VAT fraud. To determine the most appropriate multiplier, the

[219] The additional VAT revenue is estimated to decline after five years due to the expected spontaneous adoption of DRRs under the no policy change scenario.
[220] Also considering that, for the most part, additional costs are one-off rather than ongoing, and thus less likely to result in a direct pass-on.
[221] In the current situation, the additional VAT revenue generated by DRRs is estimated to correspond to between 0.6 and 0.8 percentage point of the weighted average VAT rate. The impact of option 4a would be lower than such a potential, since a number of Member States would not implement a DRR. Cf. Section 3.2 above.

most likely recycling scenario should be considered, i.e. how the additional VAT revenue will be used by the government. Two scenarios could be contemplated:

1. an increase in VAT efficiency will lead to a decrease in the tax burden; this would call for using the tax rate/reform multipliers to assess the impact on GDP; or
2. an increase in VAT efficiency will lead to an increase in government spending; this would call for using government spending multipliers.

The first scenario is preferred for two reasons. First of all, it assumes the neutrality of fiscal policy, so that any gain in the collection of VAT revenue is compensated by an equivalent reduction in the fiscal burden. Secondly, it does not necessitate of any assumption on how money will be spent, which would determine the impacts under the second scenario. Finally, the variation in tax rate multipliers in the literature seems to be lower, with some solid, evidence provided by the European Commission Joint Research Centre. In this scenario, the applicable cumulative multiplier of the impact on output for a tax rate decrease would be 1.43.

Overall assessment

Option 4a has significant positive impacts across most categories considered. Despite considerable costs for both tax authorities and businesses, **the net benefits range approximately between EUR 127 and EUR 143 billion in net present value**. The benefits are driven mostly by higher VAT revenue, but the savings for businesses due to reduced burdens and improved business automation also contribute to the positive impacts. The net benefits are expected to increase GDP by 0.1% on an annual basis. **The introduction of an EU DRR and the wider use of DRR for domestic transactions will also positively impact tax controls and business automation**, especially if an e-invoicing solution is adopted, while the increased storage and exchange of fiscal data **increases risks to data confidentiality**. Table 43 below summarises the impacts of option 4a and its scores against the baseline scenario.

Table 43. Option 4a: Summary of impacts, scored against baseline scenario

	CBA: Net impacts (EUR bn, 2023-2032)	Tax control	Benefits from business automation	Data confidentiality	Macro-economic impacts
#4A EU DRR - Partial Harmonisation	127 – 143	++	+	--	+0.1% GDP
	Costs and benefits increase following the introduction of an EU DRR for intra-EU transactions and a growing adoption for domestic transactions	Adoption of an EU DRR and wider diffusion for domestic transactions lead to better risk analysis, and improves audit effectiveness and efficiency	Electronic handling of transactional data may increase automation; significant benefits (+++) only from the e-invoicing sub-option	Risks to data confidentiality increase significantly the more fiscal data are stored and exchanged	

Source. Authors' own elaboration.

9.6.2. Option 4b – Full harmonisation: Cost-benefit analysis

Under Option 4b, the EU DRR applies to both intra-EU and domestic transactions. It is immediately introduced in the Member States which do not have a domestic DRR, while in the Member States that already have domestic DRR the existing systems must converge in the medium-term (five to ten years).[222]

[222] The possibility that existing DRRs converge with the EU system before has not been modelled. If this was the case, the main impact of such a policy development would be a quicker reduction of fragmentation costs. This would only marginally alter the net impacts and would not affect the ranking of policy options.

Cost-benefit analysis

Under policy option 4b, the factors determining the expected costs and benefits over the next decade are the same as under option 4a: **additional VAT revenue from the introduction of EU DRR, and an increase in the costs for businesses,** given the higher number of taxable persons subject to DRRs. However, **the magnitude of both factors is larger**, since an EU DRR becomes mandatory for both intra-EU and domestic transactions alike, in all Member States.

In terms of net benefits, they grow compared to Option 4a, since the additional VAT revenue from the introduction of an EU DRR for all VAT transactions more than compensates the additional compliance costs. Total costs, both for business and tax administrations, depend on the choice of DRRs – lower for simpler PTCs, higher for more complex CTCs; additional VAT revenue are considered not to vary, based on the results of the econometric analysis of the current situation.

As for other benefits, **fragmentation costs are eliminated in the medium-term**, i.e. when domestic systems have to converge with the EU DRR. With regards to business savings from pre-filled VAT return and e-invoicing, as well as environmental benefits, they grow compared to the baseline scenario only if the EU DRR is based on a CTC system. Here below, each category of quantified costs and benefits is described in more detail.

Costs. The following categories of costs can be quantified for option 4b:

- **Administrative burdens** for businesses are larger and grow quicker than under Option 4a, because the EU DRR is applied also to domestic transactions. **Average annual burdens range between EUR 5 and EUR 12 billion**. As under Option 4a, the approach cannot account for the costs of ensuring interoperability in the countries which already operate a domestic DRR.[223]

- As under Option 4a, the **implementation costs for tax authorities** vary with the type of DRR. The costs are estimated to be ranging **from EUR 55 to EUR 520 million**. In any case, the implementation costs remain a very small share of total costs, **between 1% and 4% of total costs**.

- The **costs of fragmentation** follow the same path as under Option 4a and are fully eliminated from 2028 onwards, i.e. when the domestic systems should converge to the EU DRR. In the preceding five years, they amount to between **EUR 600 million and EUR 1.6 billion**.

Total costs. Total costs under Option 4b are higher compared to Option 4a, by about 12% – 37%, mostly because of the higher administrative burdens. The other cost components show a limited variation. Over 10 years, total costs fall in the range EUR 66 – 134 billion.

Benefits. For option 4b, the following categories of benefits can be quantified:

- The additional **VAT revenue** under Option 4b is the largest, it being the only option foreseeing the mandatory, immediate and full application of a DRR to both intra-EU and domestic transactions. For the period 2023 until 2032, **the annual additional VAT revenue from DRRs under this option is estimated at about EUR 56 billion,** against EUR 34 billion in the baseline scenario;

- As under Option 4a, the removal of recapitulative statements saves EU businesses operating cross-border about EUR 1 billion per year in administrative

[223] Described in Box 17 above.

burdens.[224] Other **burden savings** from pre-filled VAT returns reach up to EUR 4 billion per year, and EUR 2 billion per year due to additional benefits from e-invoicing (due to quicker issuance and the reduction in postage and printing costs);

- Estimated **environmental benefits** amount to EUR 10 – 60 million for the entire decade.

Total benefits. The total benefits for Option 4b are larger compared to Option 4a, and this is largely due to the higher additional VAT revenue accruing to the public budget thanks to the larger scope of the EU DRR. **The total benefits are between 22% and 25% larger than under Option 4a,** and range between about EUR 579 and EUR 626 billion over 10 years.

Net impacts. Table 44 below shows the aggregated costs, benefits and net impacts estimated for the 10 years between 2023 and 2032. **The net impacts against the baseline are positive and range between about EUR 203 billion and EUR 231 billion** in net present value. The sensitivity analysis confirms the main policy-relevant findings, i.e. that net impacts are positive even when the impact on VAT revenue is considerably lower. Impacts at national level are discussed in Box 19 below.

Box 19. Impacts at national level

The impacts generated by Options 4a and 4b remain positive across all Member States (with the only exception of Malta under sub-option 4b – e-invoicing, for which marginally negative impacts are estimated under the VAT Gap model). This analysis is robust to the sensitivity analysis, i.e. impacts remain positive both under the C-efficiency and VAT Gap estimates. This result is consistent with the assessment of the current situation, showing that in all DRR countries additional VAT revenue is higher than compliance costs for businesses.

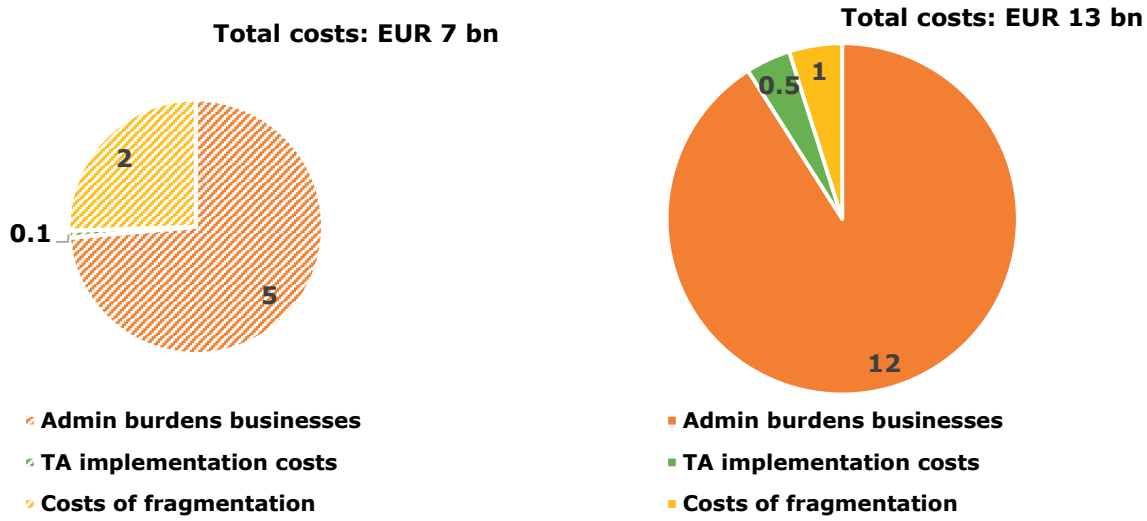
Table 44. Option 4b: Costs, benefits and net impacts (EUR billion)[225]

	Total 2023 – 2032		NPV 4%	
	Lower end	*Higher end*	*Lower end*	*Higher end*
Costs	66	134	/	/
Benefits	580	626	/	/
Net impacts	492	528	/	/
Net impacts compared to the baseline	**241**	**277**	**203**	**231**
Net impacts compared to the baseline (sensitivity)	*136*	*173*	*114*	*142*

Source. Authors' own elaboration.

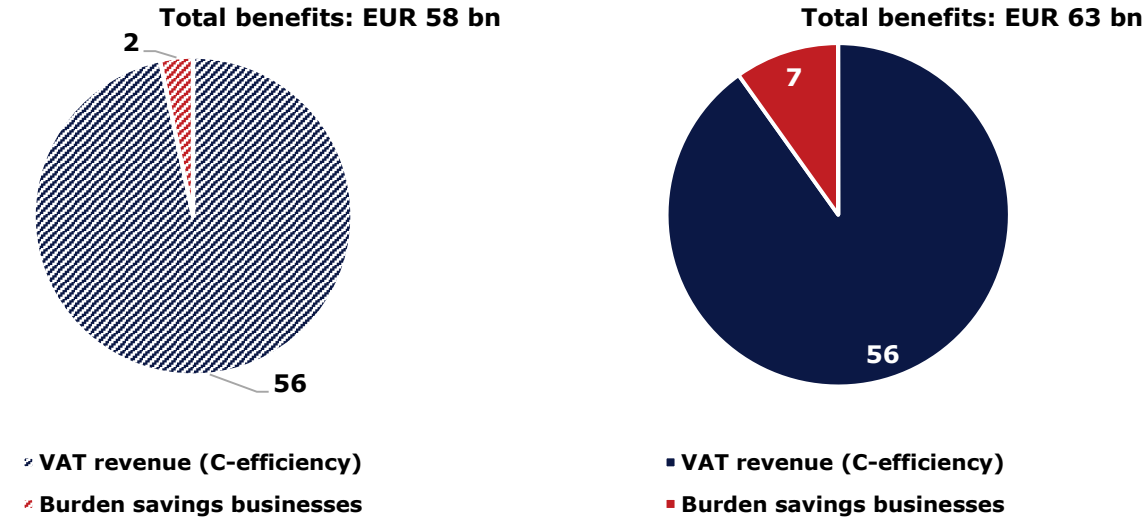
[224] Limited additional burdens would arise in case call-off stock arrangements or movements of own goods are to be invoiced or monitored via the EU DRR. Cf. Box 17 above.
[225] The range for net impacts does not necessarily result from the algebraic sum of the ranges of costs and benefits, since the scenario with minimum or maximum costs does not necessarily correspond to that with minimum or maximum benefits.

Figure 27. Option 4b: type of costs, low-end (left) and high-end (right) (EUR billion, yearly average over the 2023-2032 period)



Note. The size of the pie is proportional to total costs. For details see Annex G. Source. Authors' own elaboration.

Figure 28. Option 4b: type of benefits, low-end (left) and high-end (right) (EUR billion, yearly average over the 2023-2032 period)



Notes. The size of the pie is proportional to total benefits. Environmental benefits are too small to be visible in the graph. For details see Annex G.
Source. Authors' own elaboration.

Impacts not covered by the cost-benefit analysis

- **Tax control**. From the point of view of tax authorities, **the improvement to tax control activities, and in particular to risk analysis, is the main benefit from the introduction of DRR.** Given its wider scope, the introduction of DRRs for both intra-EU and domestic transactions under option 4b is expected to bring the most significant positive impacts on tax control out of all identified options. The availability of data on both types of transactions allows for the better cross-checking and matching of data, bringing maximum improvements to the risk analysis. The benefits would not only be limited to the fight against intra-EU VAT fraud, but would also be available for domestic enforcement actions. In particular, it will be more difficult for fraudsters to set up malicious transaction flows, since the good faith trading partner in the chain will disclose (possibly in

real-time) the transactions to the authorities. The effectiveness of tax audits is likely to increase in this scenario, as more data would be available to authorities before carrying out the audit. This would make it more likely that irregularities are detected during an audit and that less audits must be carried out to collect foregone revenue, thus increasing their average yield. Furthermore, the efficiency of tax control would be increased as well, because an improved data situation would facilitate shortened audit processes and a better audit-fraud detection ratio. As under Option 4a, the evidence for possible positive impacts on businesses is less extensive, also because changes in the frequency and conduct of audits might be difficult to perceive for most entities. Nonetheless, positive effects for businesses under 0ption 4b are likely, at least because more efficient tax audit procedures would alleviate some burdens for compliant taxpayers. Furthermore, via the DRRs, the tax authority would periodically receive in real-time all data concerning the input VAT deducted by taxable persons, possibly identifying inaccuracies, mistakes or suspicious activities at an earlier stage. This could reduce the risk of later objections to input VAT deduction (e.g. during audits).

- **Benefits from business automation.** The automation of business processes is a key benefit for businesses under Option 4b that could not be covered by the CBA. However, while the electronic handling of both intra-EU and domestic transactional data is expected to increase automation regardless of the type of DRR chosen, **only an e-invoicing solution allows full automation and would thus bring significant benefits.** As under Option 4a, it is likely that larger business entities would obtain greater savings under this option. This is likely to be reinforced under option 4b, because larger companies that operate across many Member States would be able not only to automate, but also to further harmonise their business, payment, and accounting processes.

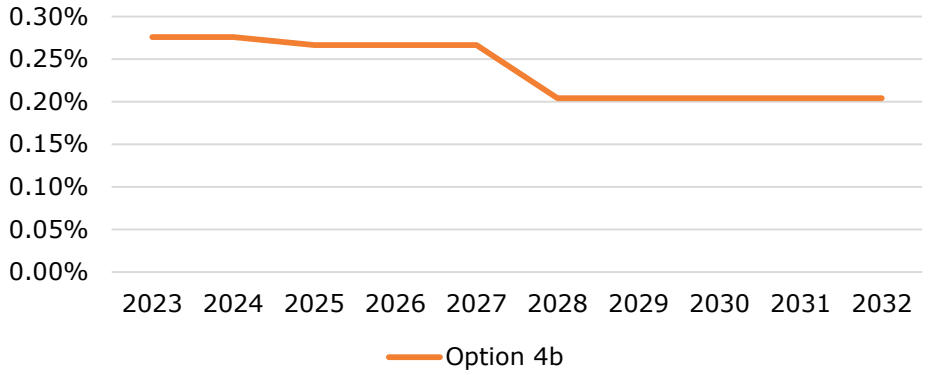
- **Data confidentiality.** Under option 4b the amount of transactional data collected, stored, transmitted, and exchanged – partly also across Member States – would be the largest. Consequently, **the risks to data confidentiality increase the most against the baseline.** The chosen type of DRR would likely determine the precise extent of risks, but the increased collection and conveyance of data would lead to a heightened danger to data confidentiality in any case. As under option 4a, special attention should be paid to data security and the IT environment for data storage.

- **Macro-economic impacts.** The macroeconomic effects of option 4b are expected to be the largest. The additional VAT revenue in comparison to the baseline scenario, estimated to be about EUR 22 billion annually, are the main driver for such impacts, and would result in an annual average increase of the EU GDP worth about EUR 32 billion, based on the multiplier chosen for the analysis as discussed in Box 18 above. These impacts stated correspond to an **annual increase of +0.2% of the EU GDP,** as shown in Figure 29 below. Finally, option 4b is also unlikely to have a direct effect on price, since the administrative costs per company are too small to affect downstream prices. Indirect impacts on prices could arise if Member States recycled the additional VAT revenue by lowering the weighted average VAT rate. In the current situation, the average effect of the existing DRRs is estimated as equivalent to 0.6 to 0.8 of the weighted average VAT rate;[226] thus, a corresponding decrease in the average level of prices could be possible, depending on the amount of revenue which is actually recycled. As for Option 4a, the impact on prices would likely be uneven across the economy. Sectors which are more at risk of VAT evasion could

[226] Cf. Section 3.2 above.

see their prices rise, because of the enhanced compliance and control mechanisms.

Figure 29. Option 4b: Effects on GDP



Source. Authors' own elaboration.

Overall assessment

Option 4b has the largest positive impacts across most of the categories considered. The net benefits, mainly carried by the increased VAT revenue, are estimated to range between **EUR 203 billion and EUR 231 billion** in net present value. Though lower than the additional VAT revenue, the burden savings for businesses also factor into the net benefits. Overall, net benefits are estimated to increase EU GDP by 0.2% per year. Tax **controls would likely be more effective and efficient** under option 4b. Due to more data being collected, stored, and exchanged under this option, the **risks to data confidentiality are expected to increase significantly**; at the same time, the digitalisation of transactional data, especially if implemented by means of an e-invoicing solution, is going to **improve business automation**, hence generating efficiency savings for businesses. The impacts of Option 4b and the scores against the baseline scenario are summarised in Table 45 below.

Table 45. Option 4b: Summary of impacts, scored against baseline scenario

	CBA: Net impacts (EUR bn, 2023-2032)	Tax control	Benefits from business automation	Data confidentiality	Macro-economic impacts
#4B EU DRR – Full Harmonisation	203 – 231	+++	+	---	+0.2% GDP
	Costs and benefits increase the most following the application of an EU DRR to intra-EU and domestic transactions	Maximum improvements of risk analysis and audits due to the coverage of both intra-EU and domestic transactions in all MS	Electronic handling of transactional data may increase automation; significant benefits (+++) only from the e-invoicing sub-option	Risks to data confidentiality increase the most since transactional data are stored and exchanged in all MS	/

Source. Authors' own elaboration.

9.6.3. Sub-options: Type of Digital Reporting Requirements

The choice on the type of EU DRR has a limited impact on net benefits. This result is due, in particular, to the results of the econometric analysis, which provided no conclusive evidence on a differential impact on VAT revenue between PTCs and CTCs. For this reason, the assessment needs to carefully consider all impacts, including those which could not be quantified. To do so, a **multi-criteria analysis** of the various types of DRRs is carried out.

In line with the Better Regulation Toolbox, a multi-criteria analysis is used.[227] While the CBA could not quantify all relevant dimensions and the results were too close to call a policy ranking, the multi-criteria analysis provides a qualitative comparison of the different DRRs and thus strengthens the assessment of key aspects for both tax authorities and businesses, such as the impacts on tax control, business automation and the fitness for the future.

In the multi-criteria analysis, the four types of DRRs – VAT Listing, SAF-T, Real-time, e-Invoicing – have been scored against **ten criteria**:

1. Costs of compliance (administrative burdens, implementation costs);
2. Fragmentation costs;
3. VAT revenue;
4. Tax control;
5. Additional services to taxpayers (e.g. pre-filled VAT return);
6. Administrative burden savings;
7. Environmental benefits;
8. Business automation;
9. Data confidentiality;
10. Fitness for the future.

The main findings concerning the impacts of the types of DRR are as follows:

- **Costs of compliance** grow with the complexity of the DRR, for both businesses and tax administrations.[228] Still, the exact costs depend not only on the type of DRR chosen, but also on its specific features, which are unknown at the moment, generating a significant uncertainty preventing any detailed quantification.[229] More in detail:

  - As for **administrative burdens for businesses**, they mostly consist of IT set up costs; these are the lowest for VAT Listing, higher and similar for SAF-T and real-time, and the highest for e-invoicing. Overall, VAT listing creates the lowest burdens for businesses and an e-invoicing solution the highest (the latter is discussed more in detail in Box 20 below).

  - **Implementation costs for tax authorities** have a similar trajectory. The costs of setting up or adapting, and maintaining IT systems are significantly higher for CTCs – i.e. real-time or e-invoicing – in comparison to PTCs.

Box 20. The compliance costs for e-invoicing

The calculation of the costs of an e-invoicing system is based on the only mechanism existing in the EU, i.e. the Italian system. The data emerging from the fieldwork there, which covered more than 60 companies, provide solid evidence that e-invoicing remains the costliest solution. This is true even considering that companies, by issuing an e-invoicing, can at the same fulfil both their invoicing and reporting obligations under the VAT Directive.

The fact that e-invoicing solutions, and also structured e-invoicing, were already widespread among the business population did not result in lower adoption costs, since companies had to anyhow invest in the know-how and IT systems necessary to comply with the prescribed the new rules. Also, the analysis accounts for the fact that similar obligations were already in place for B2G transactions. However, the number of businesses that were previously covered (300,000 against 3.5 million) and the volume of invoices (2 million vs. 2 billion) was too small to make a significant difference in the adaptation costs. This is especially true for small companies with occasional B2G supplies, which had previously typically outsourced such invoices to their tax advisors.

[227] Better Regulation Toolbox Tool #63.
[228] These impacts are taken into consideration jointly, considering their parallel evolution.
[229] For instance, compliance costs were estimated as significantly different between Spain and Hungary, though both adopted a real-time system.

- **Costs of fragmentation** might differ in the short-term depending on the DRR, with VAT listings generating slightly lower fragmentation costs than the other types of DRRs, due to their overall lower costs for businesses. In the medium term, however, fragmentation costs are eliminated regardless of the DRR chosen, once domestic systems converge towards the EU DRR.

- There is no conclusive evidence demonstrating that the impacts on **VAT revenue** vary between PTCs and CTCs. Therefore, in the baseline analysis, these are estimated positive and similar across the various types of DRR. However, a sensitivity analysis is also performed, assuming that CTCs generate more VAT revenue than PTCs.

- Also, there is limited evidence on a differential impact on **tax control**. Simpler systems (e.g. VAT listing) significantly improve risk analysis and allow to automatically tackle inconsistencies, which is the main benefit sought by tax authorities. Also, more complex CTC systems have been in place for too few years to fully estimate their impacts on audits, which tend to concentrate on older periods.[230] Furthermore, even in countries in which data are collected in real-time, tax authorities' systems and processes do not yet necessarily perform tax control activities in real-time.

- The potential simplification from **additional services** is larger for CTC systems, which allow the pre-filling of VAT return. This is possible, in theory, also under a VAT listing or SAF-T requirement, but only if this obligation is complied with before the submission of the VAT return.[231]

- A number of benefits only occur with an e-invoicing system. These include the **administrative burden savings** (i.e. quicker issuance time, postage and printing costs), the **environmental benefits** due to the dematerialisation of invoices and, most prominently, the **benefits from business automation**. e-Invoicing is indeed the only system requiring, or at least strongly pushing, companies into automating the invoicing process and the business processes associated with it (such as certain accounting procedures and the management of the order-to-payment cycle). Real-time reporting requirements could also generate some lower benefits from business automation. Savings are significant especially with respect to the automated management of incoming invoices, which typically comes together with the automated handling of customers and suppliers. While these benefits could be large at aggregate level, they are likely concentrated among large and medium enterprises. For micro and small players, the potential savings are likely to be too small to justify the investment in automation.

[230] Because of the local statute of limitations.
[231] Among countries with a periodic requirement, so far, only in Portugal such a service has been implemented.

Box 21. The impact of e-invoicing on business automation: evidence from Italy

The evidence from Italy shows that business automation benefits linked to the introduction of e-invoicing did start to materialise, though they mostly fall on larger, more structured entities. This occurs for two reasons. First, by being larger, these entities can obtain more significant savings from the automation of business processes, invest the necessary resources and are more likely to possess the necessary know-how. Secondly, the larger an entity, the more likely it is to carry out accounting activities in house rather than to resort to a tax advisor, so that it can directly enjoy the benefits of automation. For smaller entities, the local trade associations are reportedly playing a role to support and train the smallest players towards a more widespread and better use of e-invoicing as a tool for digitalising business processes, but the evidence in this respect is much more limited. Still, even though concentrated on a smaller number of players, the anecdotal evidence about these benefits shows a very large potential. Savings in excess of 40% of the overall cost for receiving and recording invoices are suggested by one large company. In case of automatic matching the incoming invoices with other parts of the business trail, these savings could reach up to 90% of the current invoicing costs. From secondary sources, savings are estimated up to 60-70% of total costs, or EUR 5.5 – 9 per received invoice. These benefits, once realised, would more than compensate the additional costs of e-invoicing. Still, the evidence of their widespread occurrence among the business population is not conclusive to date.

- The e-invoicing sub-option also stands out negatively with respect to the risks to **data confidentiality**. In such a system, the risk of data leakage is typically higher, given the larger amount of data shared and stored. The full invoice needs to be exchanged and transmitted over the IT infrastructure, possibly via intermediaries. Furthermore, and more often so in a clearance system, the full invoice may also need to be transmitted to the tax authority, which can then decide whether to store it in full or extract a sub-set of data therefrom. As a result, the risks linked to data storage depend on the specific system design, since, also with e-invoicing, the tax authority could opt for storing only a sub-set of data.

- As for whether the various types of DRRs are **fit-for-the-future**, the current trend, both in the EU and in other world areas, is to move from reporting mechanisms to e-invoicing. As for private businesses, structured e-invoices are more and more used, and widespread among medium and large businesses. As a consequence, other types of EU DRRs could be more attractive from the perspective of the minimisation of the impacts for businesses. Still, based on the current evolution, such a decision risks becoming quickly outdated and requiring a revision, and thus additional adaption costs for businesses, shortly after it becomes operational.

Table 46. Type of Digital Reporting Requirements: Multi-Criteria Analysis

	VAT Listing	SAF-T	Real-time	e-Invoicing
Compliance Costs	-	-	--	---
Fragmentation costs	++	++	++	++
VAT revenue	++	++	++*	++*
Tax control	++	++	++	++
Additional services	+	+	++	++
Administrative burden savings	0	0	0	++
Environmental benefits	0	0	0	+
Business automation	0	0	+	+++
Data confidentiality	-	-	-	--
Fit-for-the-future	0	0	0	+++

Note.: +++ in the sensitivity analysis. Source. Author's own elaboration.*

9.6.4. Other policy choices

The role of customers

A reporting mechanism can be designed to extract data from only one side of a transaction (typically, the supplier) or from both sides, thus involving the customer too. The customer can be asked to provide transactional data on his/her purchases or could play a different role, as he/she could be asked to confirm or formally accept the data shared or the e-invoice transmitted by the supplier.

Currently, the EU Member States in which a domestic DRR is in place opt for different solutions. In most countries, the taxpayers must submit transactional data about both sales and purchases, except in Hungary, Portugal, Italy and Croatia. The main benefit of reporting both sales and purchases is the possibility to immediately cross-check submissions, spot discrepancies and thus ask the taxpayer to verify his/her submission. It also reduces the scope for taxpayers to deduct VAT from false invoices, as well as not to register sales invoices. While this increases the accuracy of the information reported, and thus the usefulness of the data so obtained, no evidence exists that this is conducive to significant improvements in terms of VAT revenue recouped.[232] Furthermore, this may generate additional burdens, because of the need to correct inaccuracies, which in certain cases may be menial. According to certain stakeholders, this risk would be multiplied if such a system was applied to cross-border transactions, for instance because of differences in when the transaction is reported (i.e. at the time of the transaction, at the time VAT becomes chargeable, at the time the invoice is issued, or at the time the transaction is entered into the VAT ledger) and of the adjustments and corrections that typically take place near the end of the reporting period.[233]

On the cost side, no evidence exists that the systems requiring the submission of both sales and purchases data are more costly to setup and operate compared to those that only require the transmission of sales data.[234] This is thus **a policy choice for which existing evidence does not allow to draw a clear conclusion**.

With regard to other roles that could be played by customers, a distinction should be drawn between e-invoicing and the other types of DRRs.

- For DRRs, asking the customer to verify or accept the data received from his/her suppliers would be more cumbersome than asking him/her to directly submit data on its purchases. If both parties submit data about a transaction, the check should rather be carried out via automated means by the tax authority rather than delegated to the customer.

- In the case of e-invoicing, the e-invoice is typically transmitted only by the seller (otherwise, the same e-invoice would be reported twice, to no avail). In certain jurisdictions, e.g. Brazil or Chile, customers are required to confirm and accept

[232] While there is no evidence at this time pointing at additional VAT revenue, it is possible that the additional reporting (also from the customer side) presented here bring a significant improvement to the fraud detection analysis, at least for intra-Community transactions, which are insufficiently addressed in recapitulative statements.
[233] There are at least three factors that could give rise to minor discrepancies in the reporting of intra-EU transactions: (i) rules on VAT chargeability show some discrepancies across countries, especially when it comes to specific transactions (e.g. payment on accounts); (ii) companies follow practical approaches for invoicing / registering and thus reporting transactions, which may be sometimes divergent with the applicable rules (e.g. concerning receipts from business travels that span across different reporting periods); (iii) mistaken and late invoice registrations often occur, and more often so concerning intra-EU transactions; (iv) issues with rounding differences. The adoption of an e-invoicing solution would partly address the above issues, eliminating the discrepancies in the timing for reporting transactions.
[234] Tax authorities should put in place systems for automatic cross checking, including the automated sending of error / warning messages to the taxpayers, but this was not identified as a material source of additional implementation costs.

the invoice. Such a requirement can increase the legal certainty of the issued invoices, e.g. in case of legal disputes or if the e-invoice is discounted is used to obtain trade finance. Similarly, it poses limited additional burdens to the counterpart – a buyer would anyhow check the accuracy of incoming invoices, either manually or automatically, by matching the invoice received with the purchase order or other business documents. The burdens could be further limited by introducing a 'silent is consent rule', so that if the taxpayer does not contest its validity within some days, the e-invoice is considered as accepted. The main drawback of introducing such a requirement is its possible abuse. Customers could refuse or delay the acceptance of the incoming e-invoice for no founded reasons, thus delaying the payment process, which in most cases starts once the invoicing process is completed. This could be especially a risk if the customer has market power over the buyer (e.g. in the case of a large company buying from a smaller entity).

Clearance vs. no-clearance (e-invoicing)

In case the EU DRR is implemented by means of mandatory e-invoicing, **the EU policymakers will have to decide whether the system should be clearance-based or not, or whether to leave the choice to Member States.** For the purpose of our analysis, clearance is defined in terms of the role of the central IT platforms set up by the tax authority. In a no-clearance e-invoicing system, the supplier is able to send the e-invoice directly to its customer without having to request any token from the tax authority. In a clearance system, the supplier is required to either (i) obtain a verification token from the tax authority as a pre-condition to send the invoice; or (ii)(a) send the draft e-invoice to a central IT platform, which in turns issues and delivers the e-invoice to the customer; (ii)(b) issue and send the e-invoice to a central IT platform, which in turns delivers the e-invoice to the customer. In a nutshell, in a clearance system, the taxpayer must communicate to / via the tax authority before / rather than sending the invoice to its customer.

First, **the choice to leave the matter in the hands of the Member States is assessed.** Such a choice would mean that the VAT Directive would not prevent the setup of domestic clearance e-invoicing systems, provided that in all Member States e-invoices sent according to the EU DRR format and architecture are also accepted. This approach would not harmonise compliance across the EU, but at the same time it would eliminate fragmentation costs, since companies operating cross-border would have an EU-wide system at their disposal. This solution would ensure the freedom of Member States to adapt the system to the local conditions and leverage on their existing B2G e-invoicing architectures, as well as the possibility to have an alternative EU-wide harmonised modality for compliance (a so-called '28th regime'[235]).

As for whether the EU e-invoicing architecture should be based on a clearance or no-clearance approach, the evidence is not conclusive. The main negative impacts of a clearance system (both with a token or via an IT platform) would be two:

1) for tax authorities, a clearance system could increase implementation costs, because of higher complexity, the higher reliability needed, and the handling of a larger number of messages (e.g. delivery and rejection messages) which would otherwise be exchanged directly by the trading partners or their intermediaries;

2) for businesses, a clearance system adds another layer of complexity to the invoicing process, depriving them of full control over the issuance and delivery of a key commercial document and potentially increasing the compliance costs due to the need to interface with the public clearance platform.

[235] I.e. an EU e-invoicing system next to the domestic ones and used optionally by the taxpayer.

On the first aspect, **the additional implementation costs are unlikely to alter the overall cost and benefit balance of the policy at stake**. True, clearance-based systems are more costly for the tax authorities to implement; still, these costs represent a fraction of the overall costs generated by mandatory e-invoicing. Even if the maximum estimate for the public costs of an e-invoicing system is used, i.e. annualised costs of EUR 70 million per country – which is a clear overestimation especially for smaller Member States – the increase in implementation costs would be of about EUR 100 million per year, i.e. between 9% of total costs for Option 4b and 12% for Option 4a. Though this is not a negligible amount, even under this dramatic assumption the net impacts of the policy choices would remain largely positive. The question would rather be how to support the implementation of a more costly system across Member States, which could call for the use of the resources available under e.g. the Fiscalis programme.

On the second aspect, the assessment of the current situation suggests that the **risks for businesses often mentioned in the targeted consultation cannot be substantiated** based on the experience in Italy (i.e. the only Member State with mandatory e-invoicing). Italian and multinational businesses, service providers and trade associations could not point out any significant detrimental effect that had materialised due to the choice of a clearance-based model (e.g. lack of business continuity, severe issues or delays with the invoicing process). The vast majority of the taxpayers access the platform via an intermediary and would likely use an intermediary even in a no-clearance system, so that they are not directly exposed to technical issues and connection difficulties. Only the largest taxpayers connect directly to the clearance platform, and they also reported no significant concerns in this respect, at least following the initial period in which connections had to be set up and tested.

As far as **data confidentiality** is concerned, an e-invoicing system requires exchanging more data than other DRR solutions, e.g. on the description of the goods and services exchanged, the unit price and the discounts granted, which are necessary invoice elements. Still, not all these data need to be stored by the public repository, regardless of whether the system is clearance or no-clearance based. In Italy, only a subset of data is stored, and namely those required for automatic controls, while more sensitive commercial data are not. True, in a clearance-based model, the full e-invoice is to be transmitted to the tax authority or exchanged via the central platform, while in a non-clearance model only a subset of data is ever accessed by the tax authority. Therefore, a clearance-based model increases the risk of breaching data confidentiality during transmission, but not necessarily so during data storage, depending on what is actually stored on the tax authority databases.

Finally, another concern could be that, with a clearance model, **innovation** in the e-invoicing market would risk freezing, as it would be injected into the system only via updates to the public platform, rather than by means of spontaneous initiatives by service providers. Still, no evidence on this lack of innovation occurring in the EU or non-EU jurisdictions adopting a clearance system could be found. Additionally, other applications of e-document exchange, outside the regulation sphere of tax authorities, might still allow for innovation in the market.

Though the evidence about negative impacts for both public and private stakeholders seems limited, the question remains about what the advantages of a clearance-based platform would be. Here as well, **the evidence shows limited positive effects**. Under both models, the tax authority has a full view over the transactions carried out in an economy, either because it verifies / delivers the e-invoices or because it retrieves the necessary data from the e-invoices exchanged by private parties. For the taxpayers, the fact that the e-invoice is issued, verified or delivered by a public platform has a limited added value. One could argue that, once verified / issued by a public platform, the validity of an invoice is easier to prove and this could, for example, be conducive to an easier use in trade financing. This aspect has been, for instance, leveraged in Italy for B2G transactions, by allowing the certification and thus use the e-invoices to obtain

bank financing.[236] However, no similar system exists for B2B e-invoices (where the certification system should involve the private customer). At the same time, France, where a considerable emphasis is put on the link between e-invoicing and the reduction of payment delays, opted for a no-clearance model. As a result, the choice of the architecture seems not decisive in this respect either.

All in all, **the evidence suggests that clearance and no-clearance e-invoicing systems would generate only marginally different costs and benefits for both public and private stakeholders.** While the benefits of a clearance system are limited, also the common criticisms could not be substantiated based on the fieldwork in Italy and the review of the evidence available about non-EU countries. In the targeted consultation, the criticisms to a clearance architecture were rather limited among the businesses and service providers – both domestic and multinational – which are experienced in complying with the Italian system. Rather, such a choice would deserve a discussion on the technical merits of the two systems, considering the clearance vs. no-clearance choice as a piece of the overall architecture, to be possibly settled by means of secondary legislation or technical specifications rather than in the VAT Directive itself, or even left to Member States discretion (provided that they also accept e-invoices delivered via a common EU architecture).

Frequency of CTCs (real-time)

When it comes to real-time requirements, there are variations about how much 'real' the real-time data submission is, i.e. about the delay between the transaction actually taking place[237] and the delivery of the data. At least three models can be envisaged:

1) **Immediate real-time:** data are submitted as the invoice is issued;
2) **Daily real-time:** data are submitted on a daily basis; and
3) **Quasi real-time**: data are submitted every few days.

In general, **the shorter the delay, the more data are to be transmitted in an automated way and the higher the compliance costs**. In particular, an immediate real-time requirement *de facto* **imposes the use of e-invoices**, from which data can be automatically extracted and forwarded to tax authorities, to all taxpayers except the very small ones.[238]

If immediate real-time is considered unnecessary or unduly burdensome, the choice would be whether the requirement should be imposed on a daily basis or whether the authorities could accept a few days delay. In most cases, the benefits of accessing transactional data on the very same day are limited. The main benefit would be the increased possibility to carry out targeted physical controls on the supplies of goods during their transportation, something similar to the systems currently in place in Hungary or Brazil. To check goods when transported, timeliness of data is of essence. Anyhow, this would require integrating fiscal and transport data, since the latter are usually not included in the invoice. However, including in the reporting systems data other than those required in the invoice can be very cumbersome for businesses, especially large ones which may store different types of data in different systems.

By contrast, a delay of few days (as in Spain) reduces the need for process automation. If data can be transmitted within few days, a large number of small taxpayers can opt for simpler compliance solutions (e.g. a spreadsheet). Also, a longer

[236] Ministerio dell'Economia e delle Finanze, "Pagamenti delle pubbliche amministrazioni", December 2018, available at: https://www.mef.gov.it/focus/Pagamenti-delle-pubbliche-amministrazioni/ (last accessed in September 2021).
[237] Or the issuance of the invoice, which in a number of cases can happen before (e.g. advance payment) or after (e.g. provision of services) the actual timing of the transaction. Hereinafter, the timing of the transaction is considered for the sake of simplicity.
[238] For taxpayers with very few transactions (e.g. few per month), manual compliance would still be a realistic option.

delay allows for more time to manually verify and reconcile transactional data, again reducing compliance costs.

From the perspective of harmonisation, ensuring that the same frequency is imposed across all Member States is not strictly needed. Once the content (data requested), the format and the modality of the transmission are harmonised, it could be left to Member States to decide how often data should be transmitted, without significant additional burdens for companies operating across borders. Only for the reporting of intra-EU transactions the same frequency may be necessary to improve the accuracy of the automatic cross-checking of data that should be performed by tax authorities.

Scope of the Digital Reporting Requirement – Taxable persons

A few Member States provide for a specific turnover threshold in their DRR legislation (e.g. Spain). In the other countries, the DRR applies, in principle, to all VAT registered taxable persons. However, in practice, in most Member States, **about a third of taxable persons are not subject to the DRR**. This can be explained by various reasons. First and foremost, taxable persons covered by the VAT SME scheme, or which do not have to VAT register for other reasons are typically not coved by DRRs. Then, other taxable persons may not be covered, e.g. those (i) engaging only in exempt transactions; (ii) active only in the B2C market (in Member States where this is not covered by the DRR); or (iii) inactive in a given year.

The CBA estimates presented in this section on the costs of an EU DRR system are based on the same coverage, i.e. they assume that about one third of the EU taxable persons (i.e. micro entities) would be excluded from the requirement. This implies that **the estimates are based on the assumption that the taxable persons covered by the VAT SME scheme, or which are not registered for VAT purposes are not covered by the EU DRR.** Below, the additional costs of covering all taxable persons, including those under the VAT SME scheme, are quantified.

If the EU DRR were extended to all VAT taxable persons, including those covered by the VAT SME scheme, this choice would bring additional 15 million micro businesses and self-employed within the system, i.e. 71% more compared to the base scenario. **The additional costs would be substantial, i.e. between EUR 21 and 53 billion more over a decade,** as shown in Table XX below. The additional costs would grow with the complexity of the EU DRR selected, being the highest for an e-invoicing solution. **These costs would mostly fall on very micro entities, with an average annual burden ranging from EUR 150 to EUR 410.**

Table 47. Cost comparison: scope of the DRRs (EUR billion over a decade)

Policy option	Current scope (taxable persons under the VAT SME scheme included)	Full scope (taxable persons under the VAT SME scheme included)
Option 4a – Partial harmonisation	59 – 100	80 – 139
Option 4b – Full harmonisaton	66 – 134	90 – 187

Source. Authors' own elaboration.

The main advantage of extending the scope of the DRR to all taxpayers would consist in the tax authorities having full visibility of each and every transaction, and thus being able to do a full cross-check. Furthermore, the full coverage would mean that fraudsters could not remain below a certain turnover to escape the system. Still, three considerations are worth making against such an approach:

1) most of the additional taxpayers covered have a very limited turnover;

2) many of the additional taxpayers covered do not charge or deduct VAT, e.g. because of the VAT SME scheme, and hence their inclusion would not significantly enlarge the tax base covered.
3) the extension would result in more data to be handled, processed and analysed, resulting in additional noise in the risk analysis and increasing the costs of implementation.

The extension would thus result in a very small additional VAT revenue, higher implementation costs, and possibly lower impacts in terms of quality of tax control. Therefore, increasing the scope of the EU DRR to all taxable persons, including those covered by the VAT SME scheme, would result in lower net benefits (between -30% and -60% compared to the estimates provided in this section).

Finally, the policymakers could consider whether the new reporting requirements should be introduced in steps or not, by targeting first the largest businesses and then extending the application to smaller entities. If the EU DRR does not foresee mandatory e-invoicing, introducing the DRR in steps could be a workable solution, allowing the tax authorities to test the system with a much more limited number of taxpayers, while granting the smallest players more time to adapt. For e-invoicing, a progressive introduction has more limited benefits: once large companies start being required to issue structured e-invoices, their smaller trading counterparts may soon be required (or pushed) to use the same format and infrastructure, regardless of any legal obligations. However, a staged introduction of e-invoicing solutions would give tax authorities some time for scaling up and testing the IT systems at a progressively increasing scale.

Box 22. Experience in the EU with the staged introduction of e-invoicing

As for the EU experience with the staged introduction of e-invoicing, in Italy the e-invoicing obligation was introduced for all taxpayers (other than those covered by the SME scheme) at once.[239] In France, a staged implementation is foreseen, although companies would still be legally required to accept e-invoices in the mandated format from the start of the implementation. In Spain, a staged introduction is proposed in the draft law for consultation, with an explicit provision for which the sender should make sure that the receiver can access, read, print and archive the invoice without having to setup any dedicated e-invoicing system.

Scope of the Digital Reporting Requirement – Type of transactions

In respect of the type of transactions covered, **the EU policymakers are called to decide whether the EU DRR is to cover only B2B and B2G, or B2C transactions as well.** The choice partly depends on the type of DRR chosen. In particular, SAF-T-based systems, which aim at matching VAT and accounting data, are more likely to cover all transactions to make sure that the value of the supplies covered matches with the accounting data on turnover. For other systems, the choice on whether to include B2C transactions remains more open.

So far, B2C transactions are covered in slightly more than half of the EU Member States in which a DRR is operational.[240] In Italy, B2C transactions for which VAT invoices are not issued are to be reported electronically, via a different mechanism. **The benefits of the inclusion of B2C transactions consist in a significant extension of the taxable basis and the VAT due covered by the DRR, with potential benefits in terms of VAT revenue recovered**. At the same time, **this would also generate larger costs for those taxable persons solely active in the B2C segment**,[241] which typically features a larger share of micro and very small companies. The cost increase

[239] Except for suppliers of fuel products, for which the obligation entered into force six months in advance.
[240] I.e. Bulgaria, Czechia, Spain, Hungary, Poland, Portugal and Slovakia. See Figure 7 above.
[241] No quantification of the additional costs and VAT revenue is possible, given the lack of data on the share of VAT taxable persons only active in the B2C segment.

would be especially significant if a CTC mechanism is introduced, given its larger setup costs.

The available data are not sufficient to perform a quantitative comparison of such a choice. In such a situation, **a gradual approach could be considered, in which B2C transactions are, at first, excluded from the EU DRR system, with the commitment to consider and assess its extension within a given timeframe.** At that point, one could usefully evaluate whether the best option is to extend the then existing EU DRR (as already done by a number of Member States) to B2C transactions, to opt for a simpler and lighter mechanism, or to maintain the status quo because an extension is not necessary at all.

Additional services

The provision of additional services to taxpayers becomes crucial to compensate the compliance costs incurred, especially under a CTC system. In particular, the most widespread service would be the pre-filling of a VAT return. Such a service is not a panacea, especially considering that pre-filled VAT returns always require verification, and in some cases completion, by the taxpayer. Also, the savings are likely to amount to few hours or man-days per submission. Still, while these savings are immaterial for a large company, they may be significant for micro enterprises. In the 12 Member States in which a DRR is in place, about 60 to 70% of micro enterprises are typically covered by the requirement and could thus benefit from pre-filled VAT returns.[242] Once this very large population to which the simplification would apply is considered, the aggregate savings are significant.

Based on the experience of the EU Member States in which pre-filling is already operational, the CBA above considers that such a service is provided after three years of implementation of a CTC system. **If these services are not provided, and thus if the resulting savings do not materialise, the ranking of the sub-options is affected.** In particular, this would worsen the assessment of a real-time DRR, as well of an e-invoicing solution, albeit in the latter case other additional benefits are generated, both as burden savings and from business automation. This evidence would call for the provision of such service to be an explicit mandatory element in the design of any EU CTC.

Other additional services could be provided, especially if more advanced CTC systems are used. For instance, checks could be implemented to verify the formal accuracy of the data transmitted, e.g. whether the invoice numbering is duplicated, the tax base, rate and VAT due match, or the customers data match those included in the tax authority database. These services are considered useful by taxpayers in the Member States which have implemented them. The additional burdens due to the notification and correction of inaccuracies may not be negligible, especially in the early phase of the implementation, but, overall, this helps to increase the accuracy of the invoicing process, with more limited problems at a later stage (e.g. if inaccuracies trigger requests for information or in case of audits).

Other services built upon the data collected via the DRR could also be conceived, e.g. **the data submitted could be used for statistical purposes**. On the one side, this could allow public authorities to monitor the economic situation in quasi real-time, with possible positive impact on the policymaking process. This for example happened in Italy, which used e-invoice data to tailor certain support measures during the COVID-19 pandemic. From the point of view of businesses operating cross-border,[243] the new EU DRR could replace the recapitulative statements and also be an optional means to

[242] Micro companies can include entities with up to EUR 2 million turnover, thus significantly higher than the domestic thresholds for the application of the VAT SME scheme.
[243] Estimated at about 9% of taxable persons.

comply with the Intrastat statistical reporting obligations on intra-EU trade.[244] In principle, coordination between the Intrastat and VAT systems is already taken into account to ensure the accuracy of the statistical data. Since an e-invoice already includes most of the information required for Intrastat purposes, only an adjustment to the existing e-invoice standards would be needed in this respect (e.g. the mentioning of the product statistical nomenclature next to the description of the goods or services exchanged). Such a coordination would result in savings of administrative burdens. Furthermore, it would also eliminate a duplicated reporting obligation, in line with the principle that 'data should be provided only once' by the taxpayer. At the same time, it would be advisable to leave taxpayers free to choose whether to provide data only once or twice. In this case, if, for certain very large entities, the databases used for complying with DRRs and Intrastat obligations were too difficult to merge, the taxpayers could still comply under the 'normal' separate rules. In the short-term, finding a solution to this issue may prove problematic, due to possible difficulties in permitting the use of mass fiscal data for statistical purposes, but, once an EU DRR is implemented, this could be an additional aspect that could be considered for lowering the 'bill' for compliant taxpayers.

9.7. Conclusions

In this section, the conclusions on the analysis of impacts are provided, first by comparing the policy options via a partial CBA, accounting for the quantitative and qualitative considerations described above in Section 9.3 to 9.6. This is then followed by the results of the ranking of sub-options on the type of DRR based on the multi-criteria analysis and on the other feature of the EU DRRs, in Section 9.7.2 to 9.7.3. Sections 9.7.4 to 9.7.6 provides additional specific information on how the interventions at stake meet certain overarching Commission policy principle on SMEs, policy fitness for the future, and the minimisation of administrative burdens. Finally, Section 9.7.7 sums up the main policy results of the analysis.

9.7.1. Comparison of policy options

Table 48 below provides the assessment of the policy options retained for the analysis of impacts. The net benefits are quantified as the difference compared to the dynamic baseline scenario and include the following impacts: administrative burdens and burden savings for businesses, fragmentation costs for MNCs, implementation costs for tax authorities and environmental impacts. The other impacts, assessed in qualitative terms, are also scored against the dynamic baseline scenario.

[244] The Intrastat system is defined by the European Commission as 'the data collection system for compiling statistics on international trade in goods between the European Union (EU) Member States. [...] [It] can be characterised as follows: data are directly collected from intra-EU trade operators once a month; it is closely interlinked with the VAT system relating to intra-EU trade to ensure the completeness and quality of the statistical data; and a system of thresholds is established to simplify data provision and reduce the overall burden on traders, particularly small ones.' Cf. Regulation (EU) 2019/2152 of the European Parliament and of the Council on European business statistics, repealing 10 legal acts in the field of business statistics.

Table 48. Summary of the impacts

	CBA: Net impacts (EUR bn, 2023-2032)	Tax control	Benefits from business automation	Data confidentiality	Macro-economic impacts
#1 Status quo	More MS are going to adopt national DRRs over the next decade. This will result in overall positive net impacts, due to the higher VAT revenues more than compensating additional costs for companies	Tax control efficiency and effectiveness is expected to increase with the diffusion of DRRs. No improvement against intra-EU fraud.	The current trend of MS considering the introduction of mandatory e-invoicing would spur further business process automation	The diffusion of DRRs would mean that more transactional data are exchanged; this increases confidentiality risks	Net impacts too small to generate significant macro-economic impacts
#2 Recommendation and Removal	13	+	+/++	-	0
	Costs and benefits slightly higher than under #1, due to more widespread diffusion of DRRs	More widespread adoption of DRRs compared to status quo leads to better risk analysis, and improves audit effectiveness and efficiency. No improvement against intra-EU fraud	Removal of the derogation facilitates adoption of mandatory e-invoicing, spurring more companies to automate (parts) of invoicing, accounting processes, depending on MS choices	More widespread adoption of DRRs compared to status quo increases the risks of malicious attacks on companies' data	Net impacts too small to generate significant macro-economic impacts
#3 Keep the data with the taxpayers	25	0/+	+	+	0
	Compared to DRRs, some savings in administrative burdens; more limited effect on VAT revenue	Audits would become more effective, efficient; no improvements to risk analysis possible. No improvement against intra-EU fraud	Electronic handling of transactional data may increase automation; benefits from e-invoicing fail to materialise	No data transmitted to the TA reduces the surface attack for malicious users; risk of accessing data on the company's premises (especially SMEs) remains	Net impacts too small to generate significant macro-economic impacts
#4A EU DRR - Partial Harmonisation	127-143	++	+	--	+
	Costs and benefits increase following the introduction of an EU DRR for intra-EU transactions and a growing adoption for domestic transactions	Adoption of an EU DRR and wider diffusion for domestic transactions lead to better risk analysis, and improves audit effectiveness and efficiency	Electronic handling of transactional data may increase automation; significant benefits (+++) only from the e-invoicing sub-option	Risks to data confidentiality increase significantly the more fiscal data are stored and exchanged	+0.1% GDP (annual yearly average 2023-2032)
#4B EU DRR - Full Harmonisation	203-231	+++	+	---	++
	Costs and benefits increase the most following the application of an EU DRR to intra-EU and domestic transactions	Maximum improvements of risk analysis and audits due to the coverage of both intra-EU and domestic transactions in all MS	Electronic handling of transactional data may increase automation; significant benefits (+++) only from the e-invoicing sub-option	Risks to data confidentiality increase the most since transactional data are stored and exchanged in all MS	+0.2% GDP (annual yearly average 2023-2032)

Source. Authors' own elaboration.

The main policy takeaways from the analysis can be summed up as follows:

- **The main driver of both costs and benefits is the extent to which DRRs are adopted.** This is more limited under Options 1 and 3, and more widespread under Options 2, 4a and 4b.

- **Net benefits grow with the more widespread adoption of DRRs** and the larger scope of transactions covered, since the VAT revenue recouped overcomes the costs for businesses.

- **Only one impact runs contrary to the above logic, i.e. data confidentiality:** the more fiscal data are retrieved and then exchanged with tax authorities, the higher the risks in this respect.

- **Fragmentation costs are only tackled by the options requiring some convergence of national systems (Options 4a and 4b)** or at least trying to coordinate their design (Option 2). On the contrary, they grow if DRRs become more widespread without any form of coordination (as under Option 1).

- Macroeconomic effects are negligible under Options 1 to 3 and positive (though limited) for **Options 4a and 4b, with an expected impact on GDP of +0.1% and +0.2% respectively**;

- The results of the analysis show that net impacts are positive across all options, though with large differences. **Still, the introduction of an EU DRR generates the largest net impacts.** Options 2 and 3, which do not lead to the introduction of an EU DRR, generate positive but limited net benefits. The net benefits grow significantly for Option 4a and even more so for Option 4b, in which the EU DRR becomes mandatory for both intra-EU and domestic transactions.

9.7.2. Comparison of sub-options: Type of DRRs

The quantitative analysis does not provide solid findings on the impact of the choice of the type of DRR. This result is due, in particular, to the fact that the econometric analysis provides no conclusive evidence on a differential impact on VAT revenue between PTCs and CTCs.[245] Therefore, **the analysis of the choice among different DRRs has been performed by means of a qualitative analysis**, replicated in Table 49 below.

Table 49. Type of Digital Reporting Requirements: Multi-Criteria Analysis

	VAT Listing	SAF-T	Real-time	e-Invoicing
Compliance Costs	-	-	--	---
Fragmentation costs	++	++	++	++
VAT revenue	++	++	++*	++*
Tax control	++	++	++	++
Additional services	+	+	++	++
Administrative burden savings	0	0	0	++
Environmental benefits	0	0	0	+
Business automation	0	0	+	+++
Data confidentiality	-	-	-	--
Fit-for-the-future	0	0	0	+++

Note.: +++ in the sensitivity analysis. Source. Author's own elaboration*

[245] In the EU, the introduction of CTCs took place only recently and in three Member States.

The resulting comparison and ranking of the various DRRs has been performed based on the Better Regulation methodology, as developed by the Joint Research Centre.[246] A statistical analysis has been done of all possible rankings of DRRs,[247] based on three different weighting systems, as well as accounting for the possibility that CTCs have a more positive impact on VAT revenue (discussed more in detail in Box 23 below).

The results, in Table 50 below, show that **an e-invoicing solution ranks first across the various scenarios.** Albeit generating higher compliance costs and risks to data confidentiality, it scores better than all or most other sub-options in terms of additional services that can be provided to taxpayers, administrative cost reductions, and environmental benefits. Most importantly, it is the only sub-option generating significant positive benefits in terms of business automation, as well as being more fit-for-the-future, given that the current trends at global and EU level would risk making the other sub-options soon outdated.

Table 50. Type of Digital Reporting Requirements: Ranking of sub-options

Base scenario	Experts' weights	Nested weights	Different VAT revenue
E-invoicing	E-invoicing	E-invoicing	E-invoicing
Real-time	SAF-T and VAT listing	Real-time	Real-time
SAF-T and VAT listing	Real-time	SAF-T and VAT listing	SAF-T and VAT listing

Source. Authors' own elaboration.

Box 23. The ranking of sub-options

The comparison of policy options based on the results of a multi-criteria analysis is straightforward when one of them is superior or equal to the other across all criteria considered. This is however not the case in the analysis at stake, where some sub-options generate more costs or risks to data confidentiality, while at the same time also more and diverse benefits. Therefore, a non-linear non-compensatory approach was used to identify the optimal ranking of sub-options.

First, a system of weights has been assigned to each criterion. Three weighting systems are proposed: (i) a base scenario with equal weights; (ii) experts' weights, based on the Study Team's analysis; and (iii) nested equal weights, i.e. splitting the criteria into private and public impacts, and then assigning equal weights (i.e. 0.5) to each category, and equal weight to each impact within each category. The weights adopted are shown in the table below.

Table 51. Weighting systems across categories

	Equal weights	Experts' weights	Nested equal weights
Compliance Costs	0.10	0.20	0.07
Fragmentation costs	0.10	0.10	0.07
VAT revenue	0.10	0.20	0.17
Tax control	0.10	0.05	0.17
Additional services	0.10	0.10	0.07
Administrative burden savings	0.10	0.05	0.07
Environmental benefits	0.10	0.05	0.17
Business automation	0.10	0.10	0.07
Data confidentiality	0.10	0.05	0.07
Fit-for-the-future	0.10	0.10	0.07
Total	1	1	1

Source. Authors' own elaboration.

[246] Cf. Better Regulation Toolbox – November 2021 edition, Tool #62;
And: BR Toolbox 2017, Tool #63.
[247] With four types of DRRs, there are 24 (i.e. 4!) possible different rankings.

Then, the results of the multi-criteria analysis have been summarised in an outranking matrix, in which, for any given pair of sub-options, the weights for each criterion in which one option scores better than the second are summed up. Subsequently, for any different policy ranking, and the resulting ranking of each pair of sub-options within, the values from the outranking matrix are summed up. The optimal ranking is the one obtaining the highest score from the sum of the assessments in the outranking matrix, as shown in Table 50 above.

9.7.3. Design features of the EU Digital Reporting Requirement

When it comes to other features of the design of the EU DRR, the main conclusions of the analysis are as follows:

- **Taxpayers covered.** It is suggested to exclude from the scope of the EU DRR those taxable persons covered by the VAT special scheme for small enterprises or otherwise not identified for VAT purposes. Their inclusion would significantly increase compliance costs, with limited positive effect on VAT revenue and the fight against VAT fraud, due to their very small dimension.

- **Transactions covered.** At least in its early phase, the EU DRR should focus on B2B and B2G transactions.[248] While excluding a non-trivial amount of VAT transactions, this choice avoids imposing larger costs for those taxable persons only active in the B2C segment, which mostly consist of very small players. At a later stage, it may be appropriate to assess the extension of the EU DRR to the B2C segment and what costs would be generated, whether a different reporting system should be introduced, or whether the existing reporting mechanism proved sufficient.

- **Role of the customer.** The existing evidence shows that the role of the customer is not decisive. Asking customers to verify or confirm transactional data does generate additional burdens, and these tasks could be performed more efficiently by the tax authorities, via automated means. Similarly, there seems to be no significant advantage when requiring the customer to accept and confirm the e-invoices received. This could increase the 'certainty' of the fiscal document, also when used to obtain trade financing, but could also expose suppliers to abusive commercial behaviours. In any case, it is suggested that, if the customer is required to accept or confirm the e-invoice or data received, this is implemented via a silent-is-consent mechanism.

- **Clearance vs. no-clearance.** The limited available evidence on the pros and cons of the clearance system for e-invoicing shows, at present, no clear advantage for clearance. Benefits seem limited, although the costs and negative impacts due to clearance choice in Italy also appeared negligible. Once a common EU e-invoicing architecture is set up, which companies can use 'next to' any local platform, one could consider leaving Member States free to opt for a clearance or no-clearance model for domestic transactions.

- **Frequency of CTCs.** The evidence points out that requiring submission within a few days from the transaction has limited drawbacks for tax authorities compared to immediate reporting However, a delayed reporting reduces complexity and costs, especially for the smallest taxpayers.

- **Additional services and other obligations.** The analysis strongly points out to the beneficial effects of additional services that can be provided to taxpayers following the introduction of any EU DRR, particularly the pre-filling of VAT returns and the removal of the recapitulative statements, which can partly compensate the compliance costs for businesses.

[248] Accordingly, the quantitative analysis shown in Table 48 above is based on this assumption.

9.7.4. SME test

The introduction of a DRR generates administrative burdens for businesses. These are more significant for medium or larger enterprises; however, **they risk impacting disproportionately micro and small entities, given their smaller size.** This is true even considering that the smallest micro entities, and in particular those covered by the VAT SME scheme, are outside of the scope of the EU DRR.

Furthermore, **micro and small entities are also the ones which are likely to enjoy less benefits**, due to the more limited potential for business automation, both for the investment needed in this respect and for the gains achievable. For these reasons, an additional analysis on the impacts on SMEs is carried out for Options 4a and 4b, i.e. those foreseeing the introduction of a DRR at EU level.

Table 52 below provides the range of net impacts generated by the introduction of an EU DRR. The analysis assumes that additional services, and in particular pre-filled VAT returns, are provided by tax authorities under CTC systems. The estimates are elaborated based on the results of the assessment of the current situation, for the administrative burdens, and the analysis of impacts, for the savings. They consider both the case of taxpayers which do not engage in cross-border transactions (and thus do not benefit from the removal of the recapitulative statements) and those which do so. Importantly, the analysis does not account for the benefits from business automation, which are however estimated to be more significant for medium and large companies.

The results show that **companies engaged in cross-border transactions get a net benefit from the introduction of a DRR**. These are smaller for micro and small entities, but still positive. This is due to the removal of the recapitulative statements, which come on top the other benefits generated by the DRR, and in particular the pre-filled VAT returns.

On the contrary, **the analysis shows mixed findings for companies not active cross-border, which represent the vast majority of micro and small entities.** For purely domestic micro and small enterprises, net benefits may be negative. In line with the overall cost analysis, the costs are higher if more complex types of DRRs are selected, such as e-invoicing. In any case, the minimisation of net impacts strictly depends on the provision of pre-filled VAT returns by the tax authorities.

Table 52. Net impacts on businesses.

	Non-active cross-border		**Active cross-border**	
	Micro/Small	Medium/Large	Micro/Small	Medium/Large
	Per company (EUR/year)		Per company (EUR/year)	
Administrative Burdens	100 / 500	600 / 4 400	100 / 500	600 / 4 400
Administrative burdens savings	0 / 300	0 / 16 700	500 / 700	4 900 / 21 600
Net impacts for businesses	- 200 / 100	- 1 400 / 12 300	300 / 600	3 600 / 17 200

Note. Estimates based on the compliance costs and savings experienced by companies in the current situation. Burdens include the implementation costs and ongoing compliance costs related to the DRRs. Savings include those due to the pre-filling of VAT returns, e-invoicing benefits (quicker issuance, and printing and postage cost savings) and the removal of the recapitulative statements.
Source. Authors' own elaboration.

The SME test thus suggests two caveats:

- in line with the above analysis, **the use of the transactional data retrieved for other purposes, and in particular the pre-filling of the VAT return, is necessary** to minimise the negative impacts on businesses; and

- if more complex requirements are considered, namely e-invoicing, net impacts for domestic businesses could be negative. Therefore, **appropriate support measures for undertaking the necessary investment in e-invoicing services or systems should be considered,** to make sure that the net costs for taxpayers are lowered or fully compensated.

9.7.5. One-in-one-out principle

Under the one-in-one-out principle, the Commission committed to offset new burdens from legislative proposals by reducing existing burdens in the same policy area, so that negative impacts for businesses are limited. This principle should also prompt policymakers to focus attention on the practicalities of implementing policies.[249] Importantly, the compensation concerns administrative burdens and not necessarily adjustment costs (e.g. the investment needed to 'upgrading production lines, reducing damage to the environment, improving public health or raising the level of consumer or worker protection'[250]).

The compliance costs generated by the introduction of an EU DRR are all classified as administrative burdens. The investments in IT components which are made by businesses are also useful to improve business processes, but they likely fail to meet the above definition of adjustment costs.

As already discussed in this Section (and shown in Table 52), the introduction of a DRR could generate net costs for businesses, and more likely so for those operating purely domestically. These could be only partly compensated by the introduction of additional services, such as the pre-filling of VAT return, as well as by the removal of recapitulative statements, which only benefit cross-border companies. To fully compensate the remaining costs, possible solutions would be:

- **introducing or promoting the introduction of support measures for investments in IT systems,** such as support to the purchase of e-services for complying with the new requirement. This could for instance be done as a support to business digitalisation within the National Plans for Resilience and Recovery, as already anticipated by Spain to support the switch to mandatory e-invoicing; and/or

- **introducing other simplification measures** in the legislative proposal. For instance, once the tax authority receives all transactional data from the DRR, it may consider that VAT returns are no longer necessary. Therefore, in the medium- to long-term, VAT returns could become an optional obligation, at least for Member States which have implemented a DRR for all transactions. While there remain obstacles that need to be tackled by submitting more data or having the taxpayer input corrections (e.g. on limited deductibility for certain

[249] Communication from the Commission on Better Regulation: Joining forces to make better laws, COM(2021) 219 final, 29.4.2021.
[250] Ibidem, at p. 10.

purchases),[251] such a choice would more than compensate the burdens generated by the new reporting mechanisms.[252]

9.7.6. Fit-for-the-future and digital-proof

In the area of VAT reporting obligations, the vast majority of taxpayers already provide information to the tax authority in an electronic form. Even where the national legislation allows for paper submission of VAT return and listing (typically under justified circumstances), this choice concerns, at most, a residual number of businesses. The issue at stake here is not how to make these requirements digital, but rather how to make sure that the potential gains for digitalisation are exploited and that the new measures are as future-proof as possible.

On the benefits of digitalisation, two considerations are worth making:

- DRRs require medium and large companies to digitalise their outgoing invoicing processes, with potential beneficial cascade effects on other business processes, and, in particular, on the management of incoming invoices, the accounting system and the order-to-payment cycle. Still, they do not force micro and small entities to digitalise. Therefore, careful consideration should be given about how **to make sure that the system chosen is conducive to business automation**, possibly coupled with support in this respect for smaller entities.

- On the receiving end of the data flow, **DRRs generate benefits in terms of fight against VAT fraud and an improvement of the tax control process only if tax authorities have the IT systems, procedures, and human resources in place** to use the data collected. The risk of them 'sitting on the data received' should be avoided, or the benefits generated would be lower than those estimated. This calls for matching the introduction of any DRR with a number of internal reforms of how the tax administration works, to make sure that the data received can be exploited, e.g. in terms of automatic data matching and error notification systems, and risk analysis, as well as to review existing audit procedures to avoid that taxpayers need to re-submit data which the tax authority already possesses.

On future-proofing, **the current trend, both in the EU and in other jurisdictions, is to move from reporting mechanisms, both periodic and real-time, to e-invoicing**. A number of non-EU jurisdictions already have full e-invoicing solutions in place, and many more are considering this choice, both in South America and Asia. Also within the EU, two Member States have already included in their legislation the obligation to use structured e-invoicing, and several more are considering such a choice, with more requests for derogations expected in the coming months or years. As for private businesses, structured e-invoices are already widespread, at least among the largest operators.[253]

In conclusion, **if the EU DRR is not based on e-invoicing, it risks becoming quickly outdated and requiring a revision shortly after it became operational**. This appears clearly from the current trends, both among EU Member States and at global

[251] A solution in this respect could consist in requiring taxpayers to submit periodical (e.g. quarterly, yearly) revisions of the VAT return to account for the limited deductibility of VAT on certain purchase transactions (e.g. the purchase of motor vehicles), followed by a payment of the additional VAT due. The same could apply to taxpayers subject to the *pro rata* regime, which could apply the deduction percentage of the previous year, and then submit *ex post* the new estimate for the taxable period.
[252] The Commission estimated that the submission of the VAT return generates about EUR 19 billion of burdens per year, more than the total burdens of the costliest option (4b e-invoicing).
[253] EA 2019 study estimates that structured e-invoices represent 15-20% of invoices issued by small and medium companies, and more than a third in the case of large enterprises. These figures (which do not incorporate the Italian obligation) have likely increased since then.

level, with more and more countries announcing or considering the introduction of e-invoicing. The decision to introduce another type of DRRs could still be appropriate in the short-term, e.g. since it reduces impacts for businesses and avoid difficulties in implementation and compliance, but seems unfit for the medium- to long-term.

9.7.7. Summing up

The impact analysis suggests **that the best policy choice results from the introduction of an EU DRR**. Net benefits are large and positive if the EU DRR is mandated for intra-EU transactions, and even more so if the obligation encompasses domestic transactions too. The main driver of such a finding is the fact that the additional VAT revenue more than compensates the costs imposed for businesses. Still in a number of scenarios and especially for purely domestic taxpayers, the introduction of a DRR can result in net costs for businesses. These need to be minimised by jointly removing other reporting obligations, providing pre-filled VAT return, supporting the investment in business automation (especially for SMEs), and considering public support to the adoption of the IT compliance systems.

The other policy options, foreseeing no or more limited policy interventions, result in significantly lower net impacts. The difference in the estimated net impacts implies that the analysis remains robust to changes in the assumptions, differences in the future evolution of domestic policies, or when accounting for the impacts that could not be quantified.

When it comes to the specific type of DRR, the analysis was performed in qualitative terms. Across the ten impact criteria considered, **the best choice seemingly consists in the introduction of an e-invoicing solution**. While it is costlier for businesses and it generates higher risks to data confidentiality, it scores better than the other types of DRRs on a number of criteria, and in particular when it comes to business automation and fitness for the future. Other DRRs could represent cheaper short-term solutions, but they are likely to fall short of meeting two key Commission's policymaking principle, i.e. the promotion of digital-by-default solutions and the adoption of fit-for-the-future policies.

As for **specific features of the EU DRRs**, the analysis provides solid evidence on certain choices, and namely to exclude non-registered taxable persons and those covered by the SME VAT scheme, to cover only B2B and B2G transactions (at least in the short-term), and to use the data obtained to provide pre-filled VAT returns. The evidence on the need to involve the customer in the provision or acceptance of data suggests that this may result in additional burdens to the customer, with limited benefits. If customer's acceptance is introduced in a e-invoicing system, it is suggested to apply a silent-is-content rule. Finally, the analysis suggests that the frequency of data submission for CTCs and the choice to adopt a clearance or no-clearance e-invoicing solution could be left to Member States. In the case of e-invoicing, Member States would remain free to opt for their preferred domestic solution, possibly leveraging on their existing B2G platform, provided that they accept e-invoices issued and transmitted based on an EU-wide common protocol and format.

ANNEXES

ANNEX A – COUNTRY FACTSHEETS FOR DIGITAL REPORTING REQUIREMENTS

A.1. VAT LISTING

BULGARIA

Rules on reporting requirements and year of introduction

- Bulgaria has introduced the obligation to submit sales and purchase registers jointly with VAT returns by article 125 of the VAT Act, enacted in 2006.
- Since January 2018, the sales and purchase registers (and the VAT return) shall be submitted electronically. Apart from the method of data transmission, no other changes have been introduced to this VAT reporting requirement.

Reporting entities

- The obligation to submit sales and purchase registers apply to all taxable persons registered in Bulgaria for VAT, including non-resident businesses.

Scope of requirements

- All transactions regardless of their value (i.e. there is no threshold).
- B2B, B2G and B2C.
- Sales and purchases.
- Domestic, intra-EU and extra-EU transactions.

Reporting frequency

- The reporting frequency is monthly.

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis.
- Invoice information to be submitted include the following:
    - Invoice date
    - Invoice number
    - Type of transaction
    - Tax rate
    - Taxable amount
    - VAT amount payable
    - Trading partner name (this field can also be left blank)
    - Trading partner VAT number

Reporting format (Syntax) and embedded system

- Data must be submitted using the TXT format, through the tax authority portal.

CROATIA

Rules on reporting requirements and year of introduction

- According to Article 165 of the Ordinance on Value Added Tax, Croatia has introduced the obligation to submit electronically the register of purchase invoices (called U-RA form) in conjunction with the VAT return, as of January 2019.
- Before its introduction, there was no other reporting requirement in place.

Reporting entities

- The obligation to submit the U-RA form applies to all taxable person registered in Croatia for VAT, including non-resident businesses.

Scope of requirements

- All transactions regardless of their value (i.e. there is no threshold).
- B2B and B2G.
- Only purchases.
- Domestic transactions.

Reporting frequency

- The reporting frequency is monthly or quarterly, depending on the frequency of the VAT return (which is associated with annual turnover).

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis.
- Invoice information to be submitted include the following:
    - Invoice date
    - Invoice number
    - Tax rate
    - Taxable amount
    - Total amount
    - VAT amount payable
    - Trading partner name
    - Trading partner VAT number

Reporting format (Syntax) and embedded system

- Data must be submitted using the XML format, using the tax authority's online portal.

CZECHIA

Rules on reporting requirements and year of introduction

- The reporting obligations for Czechia are stated in Articles 101c-101i of Act n° 235/2004 Coll, on VAT as part of the VAT Act.
- Czechia has introduced the obligation to submit electronically an appendix of the VAT return with detailed transactional data (called '*Kontrolní hlášení DPH*' or VAT Control Statement) as of January 2016.
- The VAT Control Statement is separated e-form with detailed transactions of "summary key lines" of VAT return.
- Before its introduction, there was no other reporting requirement in place in Czechia.

Reporting entities

- The obligation to submit the VAT Control Statement applies to all taxable person registered in Czechia for VAT, including non-resident businesses.

Scope of requirements

- All transactions regardless of their value (i.e. there is no threshold). However, transactions below CZK 10 000 (about EUR 380) must be reported on a per customer basis.
- B2B, B2G and B2C.
- Sales and purchases.
- Domestic transactions and Intra-EU acquisitions.

Reporting frequency

- The reporting frequency is monthly (except for natural persons submitting it with their VAT return, i.e. monthly or quarterly).

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis, with the exception of transactions in normal VAT regime below CZK 10 000 (about EUR 380 which must be reported via an overall summary. Transactions in reverse charge regime must be reported in detail, regardless the threshold.
- Invoice information submitted include the following:
    - Invoice date (i.e. the date of obligation to declare the tax)
    - Invoice number
    - Type of transaction
    - Tax rate
    - Taxable amount
    - VAT amount payable
    - Trading partner name

Reporting format (Syntax) and embedded system

- Data must be submitted using the XML format, either through the Tax Portal using the EPO web application[254] or through a third-party interface via secure network of Data boxes.

[254] EPO (Electronic submissions for the Financial Administration) is a web application provided by tax administration for free that allows e-filing of tax returns and sending other documents electronically. Through the EPO application, it is possible to (i) send file without certified electronic signature, (ii) send it with verified identity of the subscriber in a way used to log-in to Data box, and (iii) eventually, save it for sending to the tax Data box.

ESTONIA

Rules on reporting requirements and year of introduction

- Estonia has introduced the obligation to report VAT transactional data by filling in the appendix to the VAT return (the KMD INF form) as of November 2014.
- Before its introduction, there was no other reporting requirement in place.

Reporting entities

- The obligation to submit the appendix to the VAT return applies to all taxable person registered in Estonia for VAT, including non-resident businesses.

Scope of requirements

- Transactions subject to standard or reduced VAT (except invoices issued under the special scheme), when the total amount of invoices per transaction partner in the taxable period is at least EUR 1 000, exclusive of VAT.
- B2B and B2G.
- Sales and purchases.
- Domestic transactions.

Reporting frequency

- The reporting frequency is monthly or quarterly (i.e. the frequency of the VAT return).

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis since January 2016. Before, it was aggregated per transaction partner.
- Invoice information to be submitted include the following:
    - Invoice date
    - Invoice number
    - Tax rate
    - Taxable amount
    - Total amount (in purchases list only)
    - VAT amount payable (in purchases list only)
    - Trading partner name

Reporting format (Syntax) and embedded system

- Data can be submitted: (i) by entering data manually or uploading files in the XML or CVS format on the tax authority portal; (ii) via X-Road by means of machine-to-machine interface; and (iii) exceptionally, on paper.

LATVIA

Rules on reporting requirements and year of introduction

- Latvia has introduced the obligation to electronically submit an appendix to the VAT return with detailed transactional data (referred to as National Recapitulative Statement) as of January 2011.
- Before its introduction, there was no other reporting requirement in place.

Reporting entities

- The obligation to submit the National Recapitulative Statement applies to all taxable person registered in Latvia for VAT, including non-resident businesses.

Scope of requirements

- All transactions regardless of their value (i.e. there is no threshold). However, transactions below EUR 150 must be reported in an aggregated way.
- B2B and B2G.
- Sales and purchases.
- Domestic transactions and Intra-EU acquisitions.

Reporting frequency

- The reporting frequency is monthly or quarterly (i.e. the frequency of the VAT return).

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis, with the exception of transactions below EUR 150, which must be reported in an aggregated way (the threshold, previously set at EUR 1 430, was lowered since 2018).
- Invoice information to be submitted include the following:
    - Invoice date
    - Invoice number
    - Type of transaction
    - Taxable amount
    - VAT amount payable
    - Trading partner name
    - Trading partner VAT number

Reporting format (Syntax) and embedded system

- Data must be submitted using the PDF format, through the Electronic Declaration System.

SLOVAKIA

Rules on reporting requirements and year of introduction

- Slovakia has introduced the obligation to submit electronically detailed transactional data (VAT Control Statement) jointly with the VAT return as of January 2014.
- Before its introduction, there was no other reporting requirement in place.

Reporting entities

- The obligation to submit the VAT Control Statement applies to all taxable person registered in Slovakia for VAT, including non-resident businesses.

Scope of requirements

- All transactions regardless of their value (i.e. there is no threshold). However, simplified invoices received with a total amount of tax deductions lower than EUR 3 000 must be reported in an aggregated form.
- B2B, B2G and B2C.
- Sales and purchases.
- Domestic and Intra-EU transactions.

Reporting frequency

- The reporting frequency is monthly or quarterly (i.e. the frequency of the VAT return).

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis, with the exception of simplified invoices received, which must be reported in an aggregated form if the total amount of tax deductions from these invoices is below EUR 3 000 per reporting period.
- Invoice information to be submitted include the following:
    - Invoice date
    - Invoice number
    - Type of transaction
    - Tax rate
    - Total amount
    - VAT amount payable
    - Trading partner VAT number

Reporting format (Syntax) and embedded system

- Data must be submitted using the XML format, either through the tax authority's portal or using the downloadable form-filling program (eDane) distributed by the tax authority.

A.2 SAF-T

LITHUANIA

Rules on reporting requirements and year of introduction

- Lithuania has introduced the obligation of submit transactional data through i.SAF as of October 2016. i.SAF is a component of a larger system, called i.MAS, which also include a SAF-T component.
- Before introduction of i.SAF, there was no other reporting requirement in place. However, the tax authority could require certain taxpayers to submit registers of issued and received invoices upon demand.

Reporting entities and threshold

- The obligation to submit i.SAF applies to all entities VAT-registered in Lithuania, including non-resident businesses, with the exception of VAT-registered non-taxable persons that are registered only because of Intra-Community acquisitions and do not carry out any other economic activity in the country.

Scope of requirements

- All transactions regardless of their value, i.e. there is no threshold.
- B2B, B2G and B2C.
- Sales and purchases.
- Domestic, intra-EU and extra-EU transactions.

Reporting frequency

- The reporting frequency is monthly, with the exclusion of natural persons whose tax period is six months, which are obliged to submit i.SAF twice a year (i.e. by the 20 July for the period of January-June and by the 20 January for the period of July-December).

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis.
- Key transactional data to be reported include the following:
    - Invoice date
    - Invoice number
    - Type of transaction (based on a special coding system, which allows to identify whether the supply is exempted and the reason for that, whether reverse charge is used, etc.)
    - Tax rate
    - Taxable amount
    - VAT amount payable
    - Trading partner VAT number

Reporting format (Syntax) and embedded system

- Data must be submitted using the XML format, through direct entry into the tax authority's portal, uploading of XML file, or through a web service.

POLAND

Rules on reporting requirements and year of introduction

- Poland has introduced the obligation of submit a SAFT-T report (called JPK_VAT) as of July 2016.
- JPK_VAT has been introduced in stages: starting with large companies, then SME in 2017, and micro enterprises in 2018.
- Prior to October 2020, JPK_VAT required the submission of the VAT ledger only. In addition to the JPK_VAT, taxpayers were also required to provide additional SAF-T (JPK) data upon request, which covered seven structures, including VAT invoices.
- Since October 2020, a new SAF-T JPK_VAT file version has been introduced, which encompasses both the VAT ledger and the VAT return; there are still seven SAF-T structures to be provided upon request.

Reporting entities and threshold

- The obligation to submit JPK_VAT applies to all VAT-active registered entities in Poland, including non-resident ones.

Scope of requirements

- All transactions regardless of their value, i.e. there is no threshold.
- B2B, B2G and B2C.
- Sales and purchases.
- Domestic, intra-EU and extra-EU transactions.

Reporting frequency

- The reporting frequency is monthly.

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis (except for B2C transactions, where aggregated data are provided).
- Key transactional data to be reported include the following:
    - Invoice date
    - Invoice number
    - Type of transaction
    - Tax rate
    - Taxable amount
    - VAT amount payable
    - Trading partner name
    - Trading partner VAT number

Reporting format (Syntax) and embedded system

- Data must be submitted using the XML format, using free tools provided by the Ministry of Finance, such as e-microfirma application, interactive form and the JPK_WEB Client, or other applications available on the market.

PORTUGAL

Rules on reporting requirements and year of introduction

- Since January 2013, Portugal has introduced the obligation of submit transactional data through a structured file based on the SAF-T(PT) or by direct insert on the tax administration web portal. Alternatively, data may be submitted in real time via web-services.
- Since 2008, taxpayers are required to generate a SAF-T file, to which they export the data of the issued invoices and accounting. The SAF-T file was mandatory, on request, for audit purposes.

Reporting entities and threshold

- The obligation to submit transactional data applies to all VAT-registered entities with a permanent establishment in Portugal.

Scope of requirements

- All transactions regardless of their value, i.e. there is no threshold.
- B2B, B2G and B2C.
- Only sales.
- Domestic, intra-EU and extra-EU transactions.

Reporting frequency

- The reporting frequency is monthly, until the 12th day after the end of each month.
- Alternatively, taxpayers can report data through webservice integration in real-time.

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis.
- Key transactional data to be reported include the following:
    - Invoice date
    - Invoice number
    - Taxable amount
    - Total amount
    - VAT amount payable
    - Trading partner VAT number

Reporting format (Syntax) and embedded system

- Data must be submitted either via web services (real-time), via a structured file (XML) based on SAF-T or directly collecting the invoice data through an option on the tax authority website.
- In case of data real-time submission, the software used by taxpayers must be certified by the tax authority.

A.3 REAL-TIME REPORTING

HUNGARY

Rules on reporting requirements and year of introduction

- Hungary has introduced a real-time information reporting (RTIR) system as of July 2018.
- Before the introduction of RTIR, there was the periodic VAT reporting obligation of submitting the domestic transaction statement jointly with the VAT return. This reporting requirement only covered high value transactions, with a value of the invoice of at least EUR 6 500. Since 2015, threshold was lowered to EUR 3 250, and then the requirement was replaced by RTIR.

Reporting entities and threshold

- The obligation to comply with RTIR applies to all businesses registered in Hungary for VAT purposes, including non-resident ones, for transactions whose place of supply is Hungary.

Scope of requirements

- All transactions regardless of their value - i.e. no threshold – since July 2020. Beforehand, transactions below HUF 100 000 (about 300 EUR) were excluded.
- Initially, B2B and B2G. B2C transactions are covered as from 4th of January 2021.
- Only sales (there is still an obligation to provide data on purchases as well with the VAT return. But, based on IT solutions, the taxable person purchaser is able to see the data of the invoices issued to him, and simply pull from this database the data needed to comply with the obligation to provide information on purchases).
- Initially, only domestic transactions. Intra-EU transactions have been covered as from 4th of January 2021, but for these transactions there was a penalty free period until end of March 2021.

Reporting frequency

- The reporting frequency is in real-time (or within 24 hours at the latest).

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis.
- Information submitted and incorporated to the online books include the following:
  - Invoice date
  - Invoice number
  - Type of transaction
  - Tax rate
  - Taxable amount
  - Total amount
  - VAT amount payable
  - Trading partner name
  - Trading partner address
  - Trading partner VAT number

Reporting format (Syntax) and embedded system

- Data must be submitted using the XML format through the tax authority portal. Submissions must be fully automated over the internet from accounting, ERP or billing systems, without manual intervention.

Additional information

- In 2021, the RTIR system is being updated, allowing businesses to use the reported XML files as e-invoices. To this end, invoice issuers must indicate that it is an e-invoice, generate a hash value from the invoice data and insert it into the XML file. In addition to the data mandatory for RTIR, all data included in the invoices must be inserted into the XML file.

SPAIN

Rules on reporting requirements and year of introduction

- In 2016, the Spanish Government approved the Royal Decree 596/2016 for the modernisation, improvement and promotion of the use of electronic means in the management of VAT and introduced the *Suministro Immediato de Información*, known as the SII, which entered into force since July 2017.
- The SII is a VAT management system, whereby VAT Books - i.e. Register Book of issued invoices, Register Book of received invoices, Register Book of investment goods, and Register Book of specific Intra-Community operations - must be kept online directly by the electronic office of the Spanish Tax Agency, i.e. the *Agencia Estatal de Administración Tributari*a (AEAT). In order to register the invoices on the VAT Books, taxpayers must send the invoicing details to the tax authority.
- Businesses required to comply with the SII are exempted from other periodic reporting obligations, including the submission of the third-party transactions form (347), record books (340) and the annual VAT return (390).

Reporting entities and threshold

- The SII is compulsory for (i) resident and non-resident businesses which are VAT-registered in Spain, with an annual turnover above EUR 6 010 121.04, (ii) businesses registered in the Monthly Refund Register (REDEME scheme), and (iii) businesses belonging to VAT groups (joint VAT registration) registered in Spain.
- The SII can be applied by any VAT payer who chooses to opt in voluntarily.

Scope of requirements

- All transactions regardless of their value, i.e. there is no threshold.
- B2B, B2G and B2C.
- Sales and purchases.
- Domestic and intra-EU transactions.

Reporting frequency

- The reporting frequency is quasi real-time: taxpayers must submit invoice data within four working days following the date of the invoice issuance[255].

Reporting information (Semantic)

- Information must be reported on a transaction-by-transaction basis.
- Information submitted and incorporated to the online books include the following:
  - Invoice date
  - Invoice number
  - Type of transaction

[255] In case of some transactions, the following specific indications apply:

- for received invoices, data have to be sent within four calendar days of the accounting record of the invoice and, in any event, before the 16th of the month following the settlement period in which the corresponding transactions are included (term in which the VAT borne is deducted). The accounting record of the invoice is understood to have taken place on the date of entry into the accounting system, regardless of the date shown on the accounting entry;
- in the case of imports, the four calendar days apply from when the document stating the customs VAT settlement is recorded for accounting purposes, and, in any event, before the 16th of the month following the settlement period in which the corresponding transactions are included (term in which the VAT borne is deducted);
- in the case of transactions subject to the special cash accounting regime, the four calendar days apply from when the collection or payment is made.

Finally, in cases where, for technical reasons beyond the taxpayer's control, it is not possible to submit the required data during the period established by regulations for each invoicing record, or when the data submission cannot be completed as it is not possible to consult the invoicing files previously submitted, data can be submitted during four calendar days following the end of said period. For these purposes, there must be evidence of such technical issues.

- Tax rate
- Taxable amount
- Total amount
- VAT amount payable
- Trading partner name
- Trading partner VAT number (only in case of an intra-community transaction)

Reporting format (Syntax) and embedded system

- Data must be submitted to the Spanish Tax Agency using the XML format, via web services with SOAP1.1. Applications that send information to web services must be authenticated with an electronic certificate accepted by the tax authority.
- For smaller taxpayers or for rectification of one invoice, it is also possible to use a web form.

A.4 E-INVOICING

Italy

Rules on reporting requirements and year of introduction

- On January 1st, 2019, Italy introduced an obligation to use structured e-invoices for all transactions for which an invoice is required. These e-invoices have to be compliant with *FatturaPA* format and are to be exchanged via the *Sistema di Interscambio* (SDI) public platform.
- This obligation had entered into force in July 2018 for suppliers of fuel products and sub-contractors in public procurement.
- The use of structured e-invoices was already mandatory for B2G transactions since April 2015.

Reporting entities and threshold

- The obligation applies to all VAT taxable persons resident in Italy or with a fixed establishment therein.
- Transactions carried out by non-resident and non-established taxable persons are excluded, even when the place of supply is Italy.
- The obligation does not apply to: i) VAT taxable persons subject to SME exemption schemes, with a turnover not higher than EUR 65 000 per year;[256] ii) small agricultural producers and amateur sport associations; and iii) supply of health services which can provide information on the health conditions of individuals.[257]

Scope of requirements

- The obligation to use structured e-invoices compliant with local requirements apply to i) all B2B transactions; ii) all B2G transactions; iii) B2C transactions when an invoice is required by law or demanded by the customer.[258]
- The obligation applies to domestic supplies. Intra-EU and extra-EU supplies can be submitted to the SDI on a voluntary basis (if so, the taxable person is not to comply with other reporting obligations on these transactions). From January 1st 2022, the obligation will extend to these supplies.[259]

Reporting frequency

- The invoice is put at the disposal of the tax authority by its issuance. The Italian system is clearance based: e-invoices must be sent, possibly via an intermediary, to the SDI. When the e-invoice is delivered by the SDI to the counterpart, this is considered as a lawfully issued invoice.

Reporting information (Semantic)

- The whole invoice is transmitted to the SDI. It thus includes all information which would be present in an invoice, including both mandatory and commercial elements.
- The tax authority cannot store all invoice data, but only those required to perform automatic controls (e.g., the description of the goods and services is not stored).[260]

[256] I.e. VAT taxable persons opting for any of the following regimes: *forfettario, dei minimi, di vantaggio.*
[257] Supply of health services from which no information on individuals' health can be inferred are subject to the obligation.
[258] B2C transactions for which no invoice is issued are subject to another obligation, that is the electronic daily submission of the transactions effected *(trasmissione telematica dei corrispettivi)*. The obligation is in place since January 1st 2020 for suppliers with an annual turnover higher than EUR 400,000 and since January 1st 2021.
[259] E-invoices for intra-EU and extra-EU supplies submitted to the SDI are not delivered to the counterpart; the taxable person remains responsible to deliver them according to local rules (when applicable) or commercial practices.
[260] Cf. Art. 14 of. Law 124/2019.

Reporting format (Syntax) and embedded system

- B2B and B2C e-invoices shall be submitted according to the *FatturaPA* format (xml).
- B2G e-invoices can be submitted according to either the *FatturaPA* or EN 16931 (UBL/CII) format.
- E-invoices must be exchanged only via the SDI, either via an intermediary or by the taxable person directly connected to the platform.

ANNEX B – ADMINISTRATIVE BURDENS GENERATED BY RECAPITULATIVE STATEMENTS

The administrative costs and burdens due to the submission of recapitulative statements are not due to DRR; accordingly, they do not enter the CBA carried out in Section 6 of the main text and in the problem definition.[261] Nevertheless, they are assessed here below to provide a reference point that can be used to measure the impact of possible changes to these rules in the IA. Because of such different analytical need, the underlying data were not retrieved directly from companies during the targeted consultation, but are based on two representative secondary sources, and namely two studies carried out for the European Commission:[262]

1) Capgemini's measurement of administrative burdens in the area of Tax Law;[263]

2) PWC's study on recapitulative statements.[264]

The findings from these studies are helpful in defining a cost per occurrence. Capgemini's study estimates that the costs per occurrence are as follows

- For companies complying with this IO in-house, annual administrative costs are estimated at EUR 240 for companies submitting the statements every three months, and EUR 960 for those submitting them every month;

- For companies outsourcing compliance, annual administrative costs are estimated at EUR 400 for companies submitting the statements every three months, and EUR 1 200 for those submitting them every month.

This assessment does not include any familiarisation and software cost associated with recapitulative statements;[265] no segmentation based on company size is provided.

PWC's study provide a separate estimate of setup and recurring costs for different company segments:

- For SMEs, median setup costs are estimated at around EUR 180 and recurring costs at around EUR 1 200;[266]

- For large companies, median setup costs amount to about EUR 180 and recurring costs at about EUR 8 000.

No information is available on difference between insourcing and outsourcing population segments.

[261] See Section 7 of Volume 1 - Main Text.
[262] As a consequence, the Study cannot account for local differences in the implementation of recapitulative statements, such as different frequencies and scope of transactions. However, the data for the two studies originate from companies located in 14 different Member States, thus ensuring that the costs reported are representative of the various local conditions.
[263] Capgemini (2009), "EU Project on Baseline Measurement and Reduction of Administrative Costs, Final Report, Measurement data and analysis as specified in the specific contract 5&6 on Modules 3&4", Report on the Tax Law (VAT) Priority Area.
[264] PwC (2011), "Expert study on the issues arising from a reduced time frame and the options allowed for submitting recapitulative statements - Application of Article 263(1) of Directive 2006/112/EC (amended by Directive 2008/117/EC)", Final Report.
[265] Which are separately recorded under the generic IOs "VAT training" and "Software cost".
[266] Results presented in the Study are significantly higher, due to the presence of an outlier which has a significant impact on the sample, consisting of 5 SMEs. In this study, it has been preferred to remove the outlier, since data were not compatible with the information retrieved during the targeted consultation.

Based on the above, the following costs per occurrence are estimated:

- Setup costs are very low or negligible: once properly annualised over three or five years, depending on whether they relate to physical or intangible investments, they would result in few tens of euros per year. This was confirmed by the discussions with VAT practitioners, suggesting that in most cases no additional investment compared to the 'normal' VAT setup are required for the provision of the recapitulative statements. Therefore, setup costs are assumed to be nil.

- In terms of annual recurring costs, the studies provide rather consistent data for SMEs. In particular, Capgemini estimates for the insourcing companies[267] with monthly submission almost coincide with PWC data for SMEs. Therefore, in this case, the annual costs are assumed to be EUR 400 or 1 200, depending on whether they are required to submit the statements quarterly or monthly.

- For large companies, PWC estimates can be used, with annual costs of EUR 8 000.

In terms of business population, two dimensions are to be considered: company size, and the likelihood that companies engage in cross-border trade (since this IO only applies to companies engaged in certain intra-EU transactions). The size of the company also impacts on the likely amount of cross-border trade, which in turn affects the frequency of submission:

- On company size, data are taken from a recent Commission study on the VAT schemes[268]. Based on data from national tax authorities, the number of VAT taxable persons in the EU is estimated at about 37.5 million, 36.5 million of which are micro entities with a turnover lower than EUR 2 million. Of the about 900 000 companies with a turnover higher than EUR 2 million, the distribution in small, medium and large companies is extrapolated based on Eurostat's data.[269]

- As for the likelihood of engaging in cross-border trade, the same study estimates that 15% of SMEs trade cross-border. While this estimate seems appropriate for small and medium companies, the Study also suggested that micro-entities may have a lower propensity, in the area of 5%[270]. For large companies, no estimate could be retrieved it is therefore assumed that the share of large companies in transactions that need to be reported the recapitulative statements is treble than the SME segment, in line with the ratio between SMEs and micro companies.

[267] A majority of SMEs, and a large majority of small and micro in particular, is likely to delegate this IO to an external provider.
[268] Deloitte (2017), Special scheme for small enterprises under the VAT Directive 2006/112/EC - Options for review, Final Report, Annex D.
[269] Eurostat Structural Business Statistics. Data on VAT taxable persons are not directly compatible with Eurostat's data on enterprises for at least two reasons. First, not all taxable persons are enterprises (they could include, for instance, self-employed individuals or VAT registrations of non-established companies). Secondly, data on taxable persons are segmented on a turnover basis, while data on companies are segmented based on the number of employees. For instance, it is possible that an entity with a turnover of less than 2 million is not a micro company if it has more than 10 employees; or that an entity with 9 employees is not a micro company if it has a turnover higher than EUR 2 million. Therefore, the following procedure is applied: first, the relative weight of small, medium and large enterprises are calculated based on Eurostat's data; then, these weights are applied to the number of VAT taxable persons with a turnover higher than EUR 2 million.
[270] Deloitte (2017), Special scheme for small enterprises under the VAT Directive 2006/112/EC - Options for review, Final Report, Annex I.

- Based on the different turnover, medium and large companies are associated with monthly frequency, while small and micro companies with quarterly submission.

Finally, costs per occurrence reported in the previous studies need to be updated to account for changes in the average earnings.[271] The BAU factor is assumed to be 0% (i.e. all administrative costs are burdens) in line with the previous analyses.

Table B.1 below summarises the main assumptions about the business population, the frequency, and the annual costs per company, and provides the estimates for total burdens across the EU. In total, administrative burdens from recapitulative statements amount to about EUR 1 100 million. About 80% of the burdens are borne by microenterprise, given that they represent 98% of the overall business population on the EU and 93% of the companies subject to this IO.[272]

Table B.1. Administrative burdens from recapitulative statements

	Share of taxable person active in cross-border trade	Business population subject to IO	Frequency	Annual burden per company	Total burdens (EUR mn)
Micro	5%	1 827 800	Quarterly	470	859
Small	15%	106 882	Quarterly	470	50
Medium	15%	21 228	Monthly	1 410	30
Large	45%	16 754	Monthly	9 400	157
Total	9%	*1 972 664*	-	-	*1 096*

Source. Authors' elaboration on Capgemini (2009), PWC (2011) and Deloitte (2017).

[271] Eurostat, Mean annual earnings by sex, age and occupation - NACE Rev. 2, B-S excluding O.
[272] The results are higher than those provided by the Capgemini study for three reasons: (i) the Study included no specific segmentation for large companies, that have higher costs; (ii) the Study assumed, for VAT obligations in general, that 50% of micro, small and medium companies would insource compliance; this is however not realistic for this specific IO, which most companies would need to outsource; and (iii) the mean earning of clerical workers increased by 17%.

ANNEX C – ECONOMETRIC MODEL

This Section describes the econometric models that are used to assess how various DRR systems impact on VAT compliance and overall efficiency, and thus affect VAT revenues. The econometric estimation aims at both assessing the impacts of DRRs on VAT revenues in the current situation, as well as at providing inputs to the IA exercise, by enabling to compare the effects of various alternative arrangements.

Background

As different types of DRRs are already in place in some Member States, their effectiveness could be verified by looking at actual figures on VAT non-compliance and using appropriate econometric methods. Using such methods means assessing how an independent variable, in this case the presence of DRRs and their features, impact on VAT non-compliance[273] while controlling other factors which may also explain changes in non-compliance (i.e. a country's tax policy or economic structure) across analysed time horizon.

This note discusses initial choices that were made with respect to the data and methods used. Section C.1 presents a general formula that formalizes the link between VAT efficiency, compliance, and revenue. Section C.2 explains the choice of the dependent variables – the VAT Gap measure. Section C.3 presents two alternative econometric approaches and econometric tests that are performed and discusses exogenous variables and methods for their imputation. Section C.4 presents preliminary results, discusses their implications and the next steps.

C.1. General formula for measuring impacts on VAT revenue

The value of actual tax revenue for all *ad valorem* taxes can be decomposed into three basic components, which are helpful to understand its underlying sources of their evolution. Since revenue is a product of the theoretical liability and the compliance ratio, tax collection could be expressed as:

Actual Revenue = Theoretical Liability × Compliance Ratio

where Compliance Ratio is: 1 – *Tax Gap* (%).

As for all ad valorem taxes the Theoretical Liability is a product of the base and the average rate (WAR, Weighted Average Rate), the actual revenue could be further decomposed and expressed as:

Actual Revenue = Net Base × WAR × Compliance Ratio

where the WAR is the ratio of the Theoretical Liability to the Net Base.

Expressed as relative changes, the equation could be rewritten as:

$$\left(1+\frac{\Delta Actual\ Revenue}{Actual\ Revenue}\right)=\left(1+\frac{\Delta Compliance\ Ratio}{Compliance\ Ratio}\right)\times\left(1+\frac{\Delta Net\ Base}{Net\ Base}\right)\times\left(1+\frac{\Delta WAR}{WAR}\right)$$

[273] VAT non-compliance is a broad term that stands for VAT foregone not only due to fraud and evasion but also due to insolvencies, bankruptcies, administrative errors, and legal tax optimisation.

As the impacts of additional reporting obligations are expected to come predominantly via change in VAT compliance the overarching formula for measuring impacts on tax compliance takes the form:[274]

$$\Delta Actual\ Revenue \cong \frac{\Delta Compliance\ Ratio}{Compliance\ Ratio} \times Actual\ Revenue$$

C.2. Non-compliance measure

Due to unavailability of figures for certain components of the VAT Gap, the most precise indication of the evolution of non-compliance across countries with a sufficiently long time period is the overall VAT Gap measure.[275] The VAT Gap accounts for the difference between the expected and actual VAT revenues; still, it represents more than just fraud and evasion. The VAT Gap also covers VAT lost due to, for example, insolvencies, bankruptcies, administrative errors, and legal tax optimization, whose scale could only to a limited extent be affected by the reporting obligations. Despite this fact, the use of VAT Gap as the endogenous variable for assessing the impact of reporting obligations has an advantage as it directly links with the compliance ratio (as presented overleaf). The use of the VAT Gap figures also has also a clear advantage over using VAT revenue as an explanatory variable because VAT revenue is also affected by other components, e.g. changes in policy structure and tax base. For this reason, the use of VAT revenue as the endogenous variable would not allow to disentangling the direct effect of reporting obligations on VAT compliance.

The VAT Gap measure which is used in the analysis comes from the most up-to-date Study published by the European Commission. The Study contains 532 panel observations from all past vintages of the Study transformed using so called backcasting method. The backcasting method allows the Study Team to minimise the problem of structural breaks between vintages of the Study. After running the procedure, the figures rely on the magnitude of values for a period of 5 years covered by the most recent estimates (2019 Study). At the same time, the dynamics, i.e. year-over-year changes in percentage points, for the years not covered by the full estimates, are based on older Studies, as more recent editions did not cover the relevant period of time. Overall, the VAT Gap observations (of country i in year t) cover 27 EU Member States and the UK for the 2000-2018 period initially derived for seven European Commission's VAT Gap Studies (i.e. the 2013, 2014, 2015, 2016, 2017, 2018, and 2019 Studies).

The VAT Gap, which is the most accurate measure that could be used for the modelling of the impacts of reporting obligations on VAT compliance, is available only as yearly series. Unavailability of a more granular series poses two important limitations. Firstly, compared to quarterly data, yearly series reduce markedly the degrees of freedom of the model. As a result, the model lacks data points and their variability may prevent the inclusion of additional explanatory variables. Secondly, yearly series limit the possibility of observing dynamic effects of introducing additional reporting obligations. This is an important drawback as some countries introduced their measures in phases and often in the course of the year. Moreover, it may be expected that some of the measures may have some pre-emptive and/or delayed impact.

An alternative measure that could be used as a proxy of VAT-compliance in the situation when tax rules remain stable is C-efficiency[276] and its changes over time. C-efficiency is expressed as:

[274] In other words, it is assumed that $\Delta Net\ Base = 0$ and $\Delta WAR = 0$.
[275] Proxies of certain components of the VAT Gap, i.e. fraud in intra-Community transactions, are available. However, as they likely contain a measurement error they can only serve as right-hand side variables in the model.
[276] Also known as VAT revenue ratio, see: Ebrill, L. Et al. (2001), *The Modern VAT*, International Monetary Fund, ISBN:9781589060265.

$$CE = \frac{VR}{tC}$$

where, VR stands for VAT revenue, t for statutory standard rate and C for final consumption.

C-efficiency could be regarded as an indicator of the departure of the VAT from a perfectly enforced tax levied at a uniform rate on all consumption.[277] In other words, it is an intensive measure, i.e. expressed in relation to the tax base proxy, of both Compliance and Policy Gap.[278] C-efficiency can be computed on a quarterly basis, based on revenue and national accounts data from Eurostat. Thus, it allows addressing limitations of VAT Gap indicated above.

C.3. Econometric methods

The approach to the econometric modelling implements two methods: (1) the base approach that uses quarterly C-efficiency data, and (2) the alternative approach that uses annual VAT Gap data. Two different methods were implemented to ensure the robustness of econometric estimates and to verify that the results do not depend on the choice of the dependent variable or data frequency.

The **base approach** uses the econometric setup of fixed-effects estimation for modelling determinants of quarterly C-efficiency. Such an approach could be regarded as a specific form of the difference-in-difference estimator in a panel data setting. The main advantage of the fixed effects estimator is that it can isolate the impact of reporting requirements from non-observed time and country-specific factors.

The model of the quarterly C-efficiency includes variables expected to determine the level of non-compliance but also controlling for factors behind *C-efficiency*. The base model could be expressed as:

$$CE_{it} = \alpha_1 TAV_{it} + \alpha_2 MV_{it} + \alpha_3 ESV_{it} + \alpha_4 RO_{it} + \alpha_5 FR_{it} + \alpha_6 SEC_{it} + a_t + a_i + u_{it} \quad (1)$$

where the endogenous variable is C-efficiency for country *i* in year *t*, CE_{it}, which might be explained by the variables related directly to the actions taken by tax administrations (TAV_{it}), control variables describing the current macroeconomic situation (MV_{it}), control variables describing the characteristics of specific Member States (economic structure variables - ESV_{it}). Those control variables are detailed in Table C.3 below. RO_{it} stands for the vector of variables describing reporting obligations. FR_{it} stands for fraud proxies (e.g. shadow economy) and the SEC_{it} for the sectoral shares in the economy (e.g. share of agriculture in the total value added). Apart from these variables, country fixed effects (a_i) and time fixed effects (a_t) are included to control for the non-observed time and country-specific factors. Finally, u_{it} is the error term with the classical statistical properties.

As shown in Table C.3, the dependent variable (CE_{it}) and some of the explanatory variables (e.g. RO_{it}, MV_{it}, SEC_{it}) are available at quarterly frequency whereas the remaining explanatory variables (e.g. TAV_{it}, FR_{it}) are available only at annual frequency. Since all the variables should be aligned in terms of frequency, an interpolation technique to break the annual data into quarterly series was necessary. We employed linear interpolation to construct new data points within the range of a discrete set of known data points. The linear interpolation is a data imputation method that assumes a linear relationship between missing and non-missing values.[279] The gains of such approach are threefold; (i) the number of observations and degrees of freedom is

[277] See: Keen, M. (2013), *The Anatomy of the VAT*, IMF Working Paper, WP/13/111.
[278] Policy Gap is an indicator of tax preferences. It grasps the additional VAT revenue that could theoretically (i.e. under the assumption of perfect tax compliance) be generated if a uniform VAT rate is applied to the final domestic use of all goods and services.
[279] The linear interpolation technique is used also to impute the values of the missing variables.

substantially higher; (ii) addressing possible problem of omitted variable bias; and (iii) more granular series that enable us to estimate the dynamic effect of introducing reporting obligations in the base approach.

The **alternative approach** uses the econometric setup of fixed-effects estimation for modelling yearly VAT Gap series. This approach limits degrees of freedom and hinders the introduction of lead and lags but may prove better if the effective rate, which is one of the revenue components, cannot be accurately controlled for.

The structure of the model takes the form:

$$VG_{it} = \alpha_1 TAV_{it} + \alpha_2 MV_{it} + \alpha_3 ESV_{it} + \alpha_4 RO_{it} + \alpha_5 FR_{it} + \alpha_6 SEC_{it} + a_t + a_i + u_{it} \qquad (2)$$

As mentioned above, the endogenous variable is the VAT Gap for country *i* in year *t*, VG_{it}. The variables related directly to the actions taken by tax administrations (TAV_{it}), control variables describing the current macroeconomic situation (MV_{it}), control variables describing the characteristics of specific Member States (economic structure variables - ESV_{it}) are enumerated in Table C.3 below.

As shown in Table C.1, the explanatory variables are often available for only a subset of observations even at annual frequency. The nature of the missing data varies across variables. Some data sources cover only specific Member States (e.g. OECD), other are available for most recent years only (Surveillance database) or were discontinued (e.g. Verification actions). However, there is one important similarity: data is not missing at random in most of the instances.

The problem of unavailability of observations decreases markedly the number of degrees of freedom in the models with numerous right-hand side variables. This creates a trade-off between two econometric problems – i.e. omitted variables and insufficient degrees of freedom.

To reduce the scale of the problem the values of the missing variables were imputed for the alternative approach as well. The Study Team decided to use a simple and intuitive method that partially controls the bias created by the non-random character of missing data.[280] The procedure for missing predictors in regression analysis that has been used is called dummy variable adjustment or missing indicator method. In this approach if X is an incompletely observed predictor in a regression model, then a binary response indicator for X is created (RX = 1, if the value in X is missing; RX = 0, if the corresponding value in X is present) and included in the regression model together with Missing values in X are set to the same value, i.e., any constant value c.

Reporting obligation proxies and control variables. The treatment dummies, i.e. indicator variables that capture the timing and location of the existing reporting requirements, are introduced in the model as independent variables. Proxies include dummy variables standing for countries in which were introduced (grouped by type, i.e. VAT listing, SAF-T, Real-time, e-invoicing).

In addition to reporting obligation proxies, the model specification includes variables from multiple sources, i.e. Eurostat, World Bank, the VAT Gap Study. The full list of variables, their sources along with coverage periods and frequencies, and number of observations are included in Table C.1 below.

[280] See: Allison, P.D. (2001), *Missing Data*, Sage, Thousand Oaks.

Table C.1. Variables and Descriptive Statistics

	Source	Coverage	Frequency	Number of Observations
Dependent (Endogenous) Variables				
C-Efficiency	Own elaboration	2007-2021	Quarterly	1 334
VAT Gap	VAT Gap reports, EC	2007-2019	Annual	273
Macroeconomic Variables				
Real GDP growth	EUROSTAT	2007-2021	Quarterly	1 334
Deficit to GDP Ratio	EUROSTAT	2007-2021	Quarterly	1 334
Debt to GDP Ratio	EUROSTAT	2007-2021	Quarterly	1 334
Unemployment	EUROSTAT	2007-2021	Quarterly	1 334
Tax administration variables				
Standardized fiscal rules index	EC	2007-2019	Annual	273
Number of staff	OECD	2011, 2013-2017	Annual	123
Verification actions	OECD	2007-2015	Annual	162
VAT electronic filing rate %	OECD	2009, 2011, 2013-2015	Annual	92
IT expenditure as a share of total costs	OECD	2007-2017	Annual	168
Shadow Economy				
Size of the shadow economy	IMF	2007-2019	Annual	273
Fraud Proxies				
Intra-EU Import at risk	Own calculation	2007-2019	Annual	273
Trade-at-risk	Own calculation	2007-2017	Annual	231
Economic Structure and Institutional Variables				
Population at risk of poverty	EUROSTAT	2007-2019	Annual	273
Share of companies with no employees	EUROSTAT	2007-2018	Annual	195
Share of companies with over 10 employees	EUROSTAT	2007-2018	Annual	195
Gini Index	World Bank	2007-2018	Annual	236
Economic Risk Rating	ICRG	2007-2015	Annual	189
Political Risk Rating	ICRG	2007-2015	Annual	189
The Worldwide Governance Indicators: Rule of Law	World Bank	2007-2014, 2018-2019	Annual	189
The Worldwide Governance Indicators: Control of Corruption	World Bank	2007-2014, 2018-2019	Annual	189
Sector Shares				
Agriculture, forestry and fishing	EUROSTAT	2007-2021	Quarterly	1 334
Industry	EUROSTAT	2007-2021	Quarterly	1 334
Wholesale and retail trade, transport, accommodation and food service activities	EUROSTAT	2007-2021	Quarterly	1 334
Information and communication	EUROSTAT	2007-2021	Quarterly	1 334
Financial and insurance activities	EUROSTAT	2007-2021	Quarterly	1 334
Real estate activities	EUROSTAT	2007-2021	Quarterly	1 334
Professional, scientific and technical activities; administrative and support service activities	EUROSTAT	2007-2021	Quarterly	1 334

Source. Author's elaboration based on 'VAT Gap Study 2020'.

C.4. Results

Baseline model

Base approach (C-efficiency quarterly data). The baseline econometric estimates using quarterly data and C-efficiency as dependent variable are presented in Table C.2, where RO_{it} stand for a dummy variable that takes value 1 for country *i* if any type of DRRs is being implemented in country *i* at time *t* and zero otherwise. The simplest model, the baseline specification, is described in column (1) and the sample covers periods from 2007q1 to 2021q2. The econometric estimates include all EU-27 states except Bulgaria, Latvia, Luxembourg, and Malta.[281]

As can be seen in Table C.2, the estimated coefficients of the reporting obligations are statistically significant at 1 percent level. The other explanatory variables are statistically significant as well with GDP growth at 5 percent and general government surplus (deficit), and unemployment rate at 1 percent levels. According to the estimation results of the baseline specification, introducing reporting obligations lifts VAT revenue by 1.9 percent of the theoretical liability (liability that would be obtained if all consumption was taxed at standard rate).

The alternative specifications (columns (2) to (6)) show that the estimated coefficient of reporting obligations is statistically significant regardless of additional exogenous variables introduced. The value of the parameter itself is relatively stable as it varies between 1.5 and 2.6 basis points. In summary, **the results from the base model show that the countries that introduced DRRs have experienced increase in their VAT revenue and this positive impact is found to be robust under different specifications.**

Alternative approach (VAT Gap yearly data). The results of the regressions from the alternative set of models using annual data are shown in Table C.3. Similar to the base model, RO_{it} in Equation 2 is a dummy variable that takes value 1 for country *i* if any type of reporting obligation is being implemented in country *i* at time *t* and zero otherwise. The dependent variable is VG_{it}, VAT Gap for country *i* in year *t*. The simplest model, the baseline specification, is described in column (1) and contains the same explanatory variables of the baseline specification of the base approach except unemployment rate. The estimated coefficients of the reporting obligations and GDP growth are statistically significant at 1 and 10 percent levels, respectively, whereas general government surplus are not statistically significant at the p=0.1 level. According to the estimation results of the baseline specification, introducing reporting obligations decreases VAT Gap by 2.6 percentage point and thus the revenue increase by 2.6 percent of VTTL.

The alternative specifications (columns (2) to (5)) show that the estimated coefficient of the reporting obligations is statistically significant in all specifications at the 1 percent level and the estimated values vary between 2.4 to 2.6 basis points.

The results from the base model estimated on annual data confirm that the countries that introduced DRRs have experienced decrease in their VAT Gap and this positive impact of reporting obligations on VAT Gap is found to be robust under different specifications.

Moreover, and importantly, **the magnitude of the reporting obligation coefficient estimated through annual data is similar to the coefficient estimated through**

[281] Bulgaria and Latvia are excluded because VAT listing obligation was introduced long ago (back in 2001), while only digital compliance balance mandatory in 2011. Luxembourg and Malta are excluded due to their small size compared to the other EU-27 Member States which may pose a risk of heteroscedasticity in the residuals.

quarterly data given in column (1) of Table C.2, as discussed in the following paragraph.

In order to compare the results from both modelling approaches, the relation between C-efficiency and the VAT Gap needs to be established. Using the equation presented in Section C.2, the result is:

$$dVAT_{revenue} \approx -dVG \times \frac{VTTL}{VR} \approx dCE \times \frac{tC}{VR}$$

As $VTTL \approx (1 - Policy\ Gap) \times tC$:

$$\frac{dCE}{dVG} = Policy\ Gap - 1$$

The average Policy Gap in the EU was estimated at 44 percent in 2018.[282] Hence, one can expect that when the coefficient of reporting obligation is equal to -2.6 basis points when the dependent variable is VAT GAP, the same coefficient should be equal to 1.5 basis points when the dependent variable is C-efficiency based on the above formula. However, even though close, this does not hold perfectly in our regressions and the coefficient is equal to 1.9 basis points in the model with C-efficiency. The difference could be explained by considering that the quarterly data may better capture the timing of the impact since data are more granular, thus leading to a larger estimated impact of reporting obligations on VAT revenue and by different periods between quarterly and yearly data.

Econometric tests. All model specifications were thoroughly tested. Among others, the Study Team conducted a collinearity test for the exogenous variables to minimize the risk of multicollinearity. As this test proved, there was no case of Variance Inflation Factor with value above 10 in the specifications presented.[283] Since the model contains time series, the Study Team verified that the model does not suffer from the issue of spurious regression. For this purpose, unit root tests were performed – Levin-Lin-Chu (2002), Harris-Tzavalis (1999), and Im-Pesaran-Shin (2003). All tests indicated that the C-efficiency and explanatory variables included in the specifications are stationary. The tests showed that debt-to-GDP is non-stationary and cannot be included in levels in the base model equation.

[282] European Commission (2020), Study and Reports on the VAT Gap in the EU-28 Member States: 2019 Final Report, TAXUD/2015/CC/131.
[283] The Variance Inflation Factor measure the correlation among independent variables. In general, factor above 10 indicates high correlation and is cause for concern (Dodge, Y., 2008).

Table C.2. Baseline approach model estimates: C-efficiency quarterly data

	(1) Baseline	(2) Fraud	(3) Shadow Economy	(4) Economic Structure	(5) Tax Administration	(6) Sectors
Reporting Obligations	0.019***	0.015***	0.017***	0.016***	0.026***	0.020***
	(5.47)	(4.36)	(5.07)	(4.30)	(7.25)	(5.71)
GDP growth	0.122**	0.129**	0.095*	0.121**	0.120**	0.145***
	(2.15)	(2.33)	(1.70)	(2.11)	(2.17)	(2.63)
Government surplus(deficit)	0.136***	0.119***	0.107***	0.138***	0.150***	0.131***
	(6.26)	(5.63)	(4.90)	(6.30)	(7.07)	(6.21)
Unemployment rate	-0.465***	-0.493***	-0.533***	-0.537***	-0.427***	-0.248***
	(-9.22)	(-9.93)	(-10.45)	(-10.35)	(-8.42)	(-3.80)
Intra-EU import at risk		-0.190				
		(-0.87)				
Trade at risk		-0.287***				
		(-8.57)				
Shadow economy size			-0.011***			
			(-6.06)			
Poverty Index				0.505***		
				(5.44)		
Small size companies				0.006		
				(0.35)		
Large size companies				0.225**		
				(2.23)		
Standardised fiscal rules					-0.013***	
					(-7.37)	
Number of staff					-0.738**	
					(-2.42)	
Number of verifications					-0.006***	
					(-3.90)	
Electronic filling					22.208	
					(0.62)	
IT expenditure					0.003	
					(0.30)	
Agriculture share						-0.207
						(-0.85)
Industry share						-0.102
						(-1.07)
Retailers share						-0.137
						(-1.09)
Communication share						-0.568***
						(-3.83)
Finance share						-0.756***
						(-4.14)
Real estate share						0.125
						(0.78)
Scientific share						-0.572***
						(-2.80)
Constant	0.558***	0.574***	0.823***	0.499***	0.573***	0.647***
	(81.60)	(78.89)	(18.64)	(26.23)	(59.87)	(7.99)
Observations	1334	1334	1334	1276	1334	1334
R-sq overall	0.1850	0.0477	0.0000	0.1236	0.3132	0.0307
Number of countries	23	23	23	22	23	23

*Source. Authors' own elaboration. t-statistics in parentheses. Linear interpolation method is implemented to adjust for the missing variables. * p<0.1, ** p<0.05, *** p<0.01*

Table C.3. Alternative approach model estimates: VAT Gap annual data

	(1) Baseline	(2) Fraud	(3) Shadow Economy	(4) Economic structure	(5) Tax Administration
Reporting Obligations	-0.026***	-0.025***	-0.026***	-0.024***	-0.026***
	(-3.66)	(-3.38)	(-3.61)	(-3.17)	(-3.66)
GDP growth	-0.138*	-0.156**	-0.137*	-0.146*	-0.142*
	(-1.84)	(-2.08)	(-1.82)	(-1.94)	(-1.91)
Government surplus(deficit)	0.019	0.050	0.022	0.003	0.004
	(0.25)	(0.65)	(0.28)	(0.04)	(0.05)
Trade at risk		0.261**			
		(2.00)			
Intra-EU import at risk		-0.315			
		(-0.74)			
Shadow Economy			0.001		
			(0.12)		
Gini (Unequality) Index				-0.000	
				(-0.18)	
Poverty Index				-0.253	
				(-1.11)	
Small size companies				-0.039	
				(-1.02)	
Large size companies				-0.295	
				(-1.49)	
Standardised fiscal rules					0.000
					(0.02)
Verification Actions					0.000**
					(2.21)
Constant	0.142***	0.136***	0.131	0.215***	0.136***
	(19.72)	(13.95)	(1.36)	(3.63)	(18.24)
Observations	273	273	273	273	273
R-sq within	0.4439	0.4543	0.4440	0.4559	0.4600
Number of countries	21	21	21	21	21

*Source. Authors' own elaboration. t-statistics in parentheses. Dummy adjustment method is implemented to adjust for the missing variables. * p<0.1, ** p<0.05, *** p<0.01*

Periodic and Continuous Transaction Control systems

The baseline models group different reporting requirements into one variable and does not allow to answer the question of whether different types of reporting requirements have different impact on VAT revenues. In order to answer this question, the four types of reporting requirements are grouped into two categories; VAT listing and SAF-T requirements are classified as periodic whereas real-time and e-invoicing are both named as continuous (Continuous Transaction Controls – CTCs). The reporting obligations variable is dropped and these two categories of reporting obligations, periodic and continuous, are included in the base approach and the base model is estimated with the same specifications of C.2 and C.3.[284] In this extended model, RO_{it} contains two different dummy variables with each corresponding to a specific reporting requirement group, e.g. periodic dummy takes value 1 for country *i* if VAT listing and/or SAF-T is being implemented in country *i* at time *t* and zero otherwise.

Base approach (C-efficiency quarterly data). As can be seen in column (1) of Table C.4, the coefficients of the periodic and CTC categories are statistically significant at the 1 percent significance level. According to the estimation results of the baseline specification, introducing periodic reporting, e.g. VAT listing or SAF-T, increases VAT revenue by 1.9 percent of the theoretical liability (liability that would be obtained if all consumption was taxed at standard rate) whereas the additional VAT revenue after introducing CTCs, would be equal to the 1.8 percent of the theoretical liability.

The alternative specifications (columns (2) to (6)) show that the estimated coefficient of the periodic reporting is statistically significant in all specifications at 1 percent significance level whereas the magnitude of the impact varies between 1.5 to 2.9. CTCs continue to be statistically significant at 1 percent level in columns (2), (3), and (5). The coefficient of the CTCs becomes significant at 5 percent level in columns (4) and (6) when the economic structure or sectoral share variables are incorporated into baseline specification. The magnitude varies between 1.2-1.9 basis points and the positive sign implies positive impact of CTCs on VAT revenue.

We conduct F-tests with null hypothesis that the estimated coefficients of periodic and CTCs are equal under two specifications, baseline and specification (5), to test whether the different reporting requirement categories have different impact on C-efficiency.[285] The p-value of the F-test under baseline specification is 0.84 and specification (5) is 0.17. These results suggest that we cannot reject the null hypothesis at 10 percent significance level. Hence, the impact of periodic and CTCs on C-efficiency are not statistically different.

Alternative approach (VAT Gap yearly data). Similar to Table C.4 based on quarterly data, two types of reporting requirements were introduced; periodic and continuous, into the alternative approach and estimate the alternative model with the same specifications of Table C.3.

As can be seen in the baseline specification, column (1) of Table C.5, periodic and continuous reporting are statistically significant at the 5 and 1 percent significance levels, respectively. According to the estimation results of the baseline specification, introducing periodic requirement, VAT listing or SAF-T, decreases VAT Gap by 2.0 percent of the VTTL whereas introducing CTCs, real-time or e-invoicing, decreases VAT Gap by 5.1 percent of the VTTL.

[284] E-invoicing was not included among the families tested, because it is started being implemented in the first quarter of 2019 which does not give enough number of observations to estimate its impact.
[285] We choose specification(5) since it has the highest overall R-sq among alternative specifications.

The alternative specifications (columns (2) to (4)) show that the estimated coefficient of the VAT listing is statistically significant at 5 percent level and at 1 percent level in tax administration specification in column (5) and the magnitude varies between negative 1.7 to 2.1 basis points. The estimated coefficient of the CTCs is statistically significant in all specifications at the 1 percent level and the magnitude varies between negative 4.7 to 5.1 basis points.

The p-values of an F-test with null hypothesis that the estimated coefficients of periodic and CTCs are equal under baseline and tax administration specification in column (5) are equal to 0.04 and 0.09, respectively. These results imply that we can reject the null hypothesis at 5 and 10 percent significance levels, respectively, suggesting that the impact of periodic and CTCs on VAT Gap are statistically different.

Conclusions. The results from the base model with distinguished reporting obligations show that the periodic requirements, i.e. VAT listing and SAF-T requirements, have the largest positive impact on VAT revenue among the analysed reporting obligations. On the contrary, the results from the alternative model with distinguished reporting obligations show that CTC systems have the largest positive impact on VAT Gap.

These conflicting results should be interpreted with caution since the implementation time of specific types of reporting obligations are different. For example, the first implementation date of VAT listing is in the first quarter of 2011 whereas the first implementation date of CTCs is in the third quarter of 2017. This translates into smaller treatment sample for the CTCs, real-time and/or e-invoicing requirements, which may result in worse statistical power and statistically significant coefficients at larger significance levels. In particular, in the alternative approach data sample there are only six observations where CTC is implemented whereas the same number is 42 for periodic requirements. Hence, there might be a concern of inflated impact size estimation related to the CTCs due to the small sample size.

Table C.4. Baseline approach model estimates with distinguished types of reporting obligations: C-efficiency quarterly data

	(1) Baseline	(2) Fraud	(3) Shadow Economy	(4) Economic Structure	(5) Tax Administration	(6) Sectors
Periodic	0.019***	0.015***	0.017***	0.017***	0.029***	0.016***
	(5.04)	(3.89)	(4.54)	(4.15)	(7.03)	(4.36)
CTCs	0.018***	0.015***	0.018***	0.012**	0.019***	0.012**
	(2.93)	(2.58)	(2.98)	(1.99)	(3.22)	(2.03)
GDP growth	0.122**	0.128**	0.095*	0.120**	0.119**	0.174***
	(2.15)	(2.33)	(1.70)	(2.10)	(2.16)	(3.12)
Government surplus(deficit)	0.136***	0.119***	0.107***	0.138***	0.151***	0.141***
	(6.25)	(5.63)	(4.90)	(6.28)	(7.08)	(6.63)
Unemployment rate	-0.465***	-0.493***	-0.534***	-0.535***	-0.423***	-0.364***
	(-9.17)	(-9.91)	(-10.42)	(-10.30)	(-8.34)	(-5.77)
Intra-EU import at risk		-0.189				
		(-0.85)				
Trade at risk		-0.288***				
		(-8.56)				
Shadow economy size			-0.011***			
			(-6.06)			
Poverty Index				0.512***		
				(5.48)		
Small size companies				0.004		
				(0.25)		
Large size companies				0.233**		
				(2.30)		
Standardised fiscal rules					-0.014***	
					(-7.50)	
Number of staff					-0.769**	
					(-2.51)	
Number of verifications					-0.006***	
					(-3.95)	
Electronic filling					12.059	
					(0.33)	
IT expenditure					0.000	
					(0.01)	
agriculture_share						-0.152
						(-0.61)
industry_share						-0.444***
						(-5.76)
sellers_share						-0.534***
						(-4.94)
communication_share						-0.896***
						(-6.33)
finance_share						-1.286***
						(-7.95)
real_estate_share						-0.216
						(-1.42)
scientific_share						-1.033***
						(-5.38)
Constant	0.558***	0.574***	0.823***	0.499***	0.574***	0.976***
	(81.52)	(78.85)	(18.61)	(26.20)	(59.78)	(16.21)
Observations	1334	1334	1334	1276	1334	1334
R-sq overall	0.1857	0.0476	0.0000	0.1271	0.3136	0.0187
Number of countries	23	23	23	22	23	23

*Source. Own elaboration. t-statistics in parentheses. Linear interpolation method is implemented to adjust for the missing variables. * p<0.1, ** p<0.05, *** p<0.01*

Table C.5. Alternative approach model estimates with distinguished types of reporting obligations

	(1) Baseline	(2) Fraud	(3) Shadow Economy	(4) Economic structure	(5) Tax Administration
Periodic	-0.020**	-0.017**	-0.019**	-0.018**	-0.021***
	(-2.53)	(-2.08)	(-2.50)	(-2.23)	(-2.67)
CTCs	-0.051***	-0.051***	-0.051***	-0.047***	-0.047***
	(-3.72)	(-3.78)	(-3.70)	(-3.27)	(-3.35)
GDP growth	-0.128*	-0.149**	-0.128*	-0.137*	-0.133*
	(-1.73)	(-2.00)	(-1.70)	(-1.81)	(-1.79)
Government surplus(deficit)	0.015	0.047	0.017	0.002	0.002
	(0.19)	(0.61)	(0.21)	(0.02)	(0.02)
Trade at risk		0.257**			
		(1.99)			
Intra-EU import at risk		-0.500			
		(-1.17)			
Shadow Economy			0.000		
			(0.08)		
Gini (Unequality) Index				-0.000	
				(-0.26)	
Poverty Index				-0.225	
				(-0.99)	
Small size companies				-0.033	
				(-0.85)	
Large size companies				-0.220	
				(-1.10)	
Standardised fiscal rules					-0.000
					(-0.04)
Verification Actions					0.000*
					(1.78)
Constant	0.142***	0.137***	0.134	0.207***	0.137***
	(19.79)	(14.21)	(1.39)	(3.51)	(18.35)
Observations	273	273	273	273	273
R-sq within	0.4543	0.4663	0.4543	0.4639	0.4668
Number of countries	21	21	21	21	21

*Source. Authors' own elaboration. t-statistics in parentheses. Dummy adjustment method is implemented to adjust for the missing variables. * p<0.1, ** p<0.05, *** p<0.01*

Lagged and forward-looking effects

In the baseline estimations, the reporting obligations were allowed to have only contemporaneous impact on the VAT revenue (through C-efficiency). However, the impact of reporting obligations on VAT revenue may be 'dynamic'. It could be expected that it may take some time to reach full impact, and some of the impact might also be seen already before the introduction (e.g. if taxpayers adjust their behaviours by anticipating the forthcoming obligations). For this purpose, the Study Team rerun the baseline estimation six different times and at each time RO_{it} was replaced with one or four quarter of the lagged or lead values of RO_{it}.

Base approach (C-efficiency quarterly data). The results of the base estimations are shown in the columns (2)-(5) of Table C.6. In the very last two columns, the Study Team rerun the baseline estimation with RO_{it} and it's one quarter lagged and lead value, separately.[286]

As can be seen in column (2) of Table C.6, the estimated coefficient of one quarter lagged reporting obligations (L.RO) is statistically significant at 1 significance percent level and its magnitude is similar to the coefficient of current reporting obligations (RO) given in column (1). The same holds for one and four quarter lagged reported as (L.RO) in column (2) and as (L4.RO) in column (4), respectively, and one lead reporting obligations reported as (F.RO) in column (3). When current and one quarter lagged values of reporting obligations are included in the explanatory variable vector, only current value coefficient becomes significant in column (6). Even though the coefficient of current is larger relative to the baseline estimation, its sum with the coefficient of the lagged reporting obligations gives the same magnitude as given in column (1). Finally, the coefficients of the current and lead values become insignificant in column (7) when both of them are used as explanatory variable. Even though both coefficients are statistically not different than zero, the magnitudes of reporting obligations given in column (1) and the sum of lead and current ROs are equal.

All in all, the regressions with lead and lag values for introducing reporting obligations show that the impact of introducing reporting obligations does not vary significantly over time. The forward-looking impact, if any, appeared to be not larger relative to the lagged or contemporaneous impact. This proves that there is no reversed causality in the model.[287]

[286] The analysis could not be replicated with the alternative approach due to the different time granularity of the dependent variable.
[287] Reversed causality would mean that the change in the VAT Gap is a major reason for implementing reporting obligations rather than on the contrary.

Table C.6. Baseline approach model estimates with lags and leads: C-efficiency quarterly data

	(1) Current	(2) One Quarter Lag	(3) One Quarter Lead	(4) Four Quarter Lag	(5) Four Quarter Lead	(6) One Quarter Lag and Current	(7) One Quarter Lead and Current
Reporting Obligations	0.019***					0.022**	0.006
	(5.47)					(2.25)	(0.60)
L.Reporting Obligations		0.018***				-0.003	
		(5.22)				(-0.30)	
L4.Reporting Obligations				0.018***			
				(5.18)			
F.Reporting Obligations			0.019***				0.013
			(5.52)				(1.34)
F4.Reporting Obligations					0.015***		
					(4.32)		
GDP growth	0.122**	0.112**	0.125**	0.118**	0.189***	0.113**	0.125**
	(2.15)	(1.98)	(2.19)	(2.11)	(2.94)	(1.98)	(2.19)
Government surplus(deficit)	0.136***	0.132***	0.134***	0.135***	0.123***	0.133***	0.134***
	(6.26)	(6.08)	(6.13)	(6.27)	(5.60)	(6.11)	(6.13)
Unemployment rate	-0.465***	-0.442***	-0.469***	-0.380***	-0.503***	-0.436***	-0.468***
	(-9.22)	(-8.60)	(-9.24)	(-7.18)	(-10.02)	(-8.48)	(-9.21)
Constant	0.558***	0.533***	0.558***	0.530***	0.559***	0.532***	0.558***
	(81.60)	(72.37)	(81.36)	(73.45)	(82.95)	(72.28)	(81.31)
Observations	1334	1311	1311	1242	1242	1311	1311
R-sq overall	0.1850	0.1792	0.1838	0.1689	0.1847	0.1787	0.1837
Number of countries	23	23	23	23	23	23	23

Source. Authors' own elaboration

The analysis with lagged and lead values is also carried out for the distinguished types of reporting obligations; periodic and CTCs. Results are not different from the general analysis: for PTCs, coefficients of lagged and led variables are of the same order of magnitude and their significance disappears when controlling for current variables. For CTCs, results are more spurious, likely because of the data limitations discussed above. When controlling for both lagged and current variables, both coefficients are statistically significant (at least at 5 percent level), and the analysis would point out that only the lagged variable has a positive effect on VAT revenue. However, caution is needed in that respect, since, in the EU, the implementation of CTCs took place in countries where already obligations were already in place. Therefore, it is not possible to argue whether the lagged effect is due to the introduction of CTCs or to the pre-existing PTC system.

Table C.7. Baseline approach model estimates with lags and leads of distinguished types of reporting obligations: C-efficiency quarterly data

	(1) Current	(2) One Quarter Lag	(3) One Quarter Lead	(4) Four Quarter Lag	(5) Four Quarter Lead	(6) One Quarter Lag and Current	(7) One Quarter Lead and Current
Periodic	0.019***					0.012	0.010
	(5.04)					(0.97)	(0.84)
L.Periodic		0.019***				0.009	
		(5.06)				(0.74)	
L4.Periodic				0.018***			
				(4.78)			
F.Periodic			0.019***				0.010
			(4.99)				(0.80)
F4.Periodic					0.015***		
					(3.90)		
CTCs	0.018***					0.048***	-0.004
	(2.93)					(2.68)	(-0.19)
L.CTCs		0.014**				-0.032*	
		(2.28)				(-1.74)	
L4.CTCs				0.019***			
				(2.73)			
F.CTCs			0.019***				0.023
			(3.14)				(1.25)
F4.CTCs					0.015**		
					(2.43)		
GDP growth	0.122**	0.112**	0.125**	0.118**	0.189***	0.113**	0.125**
	(2.15)	(1.98)	(2.18)	(2.11)	(2.93)	(1.99)	(2.18)
Government surplus(deficit)	0.136***	0.132***	0.134***	0.135***	0.123***	0.133***	0.134***
	(6.25)	(6.06)	(6.13)	(6.26)	(5.60)	(6.12)	(6.12)
Unemployment rate	-0.465***	-0.439***	-0.469***	-0.380***	-0.503***	-0.435***	-0.468***
	(-9.17)	(-8.53)	(-9.21)	(-7.17)	(-9.95)	(-8.46)	(-9.17)
Constant	0.558***	0.533***	0.558***	0.530***	0.559***	0.533***	0.558***
	(81.52)	(72.36)	(81.28)	(73.37)	(82.86)	(72.34)	(81.22)
Observations	1334	1311	1311	1242	1242	1311	1311
R-sq overall	0.1857	0.1818	0.1837	0.1688	0.1849	0.1796	0.1834
Number of countries	23	23	23	23	23	23	23

Source. Authors' own elaboration

C.5. Takeaways

The results of the econometric analysis point to some important conclusions:

- the impact of introducing reporting obligations on VAT compliance and overall efficiency, and thus on VAT revenue, is positive with a central estimate of +1.9 basis points for C-efficiency (range: 1.5-2.6 basis points) and -2.6 basis points for VAT Gap (range: 2.4-2.6 basis points)
- Such results are highly significant and robust across two approaches and various model specifications. The magnitude of the impact is similar, albeit slightly larger for VAT Gap.
- The results on any differential impact of PTCs and CTCs are conflicting and non-conclusive, and this likely depends on the very short period and limited number of Member States which implemented the latter. In a nutshell, as far as the impact of CTCs in the EU Member States, it is yet too early to tell.
- When considering lagged or forward-looking effects, the impacts of DRRs do not vary significantly across times and, consequently, the non-dynamic variables well capture the impacts on VAT revenue.

Although both methods used in this analysis have pros and cons, the analysis looking at C-efficiency and using quarterly data appears to be better-suited for the purpose. The quarterly data provide larger number of observations and degrees of freedom that increase the statistical power of the estimations. Moreover, quarterly data allows to inspect the dynamic effects of the reporting requirements.

ANNEX D – EXPERIENCE WITH CTC IN NON-EU COUNTRIES

In the last two decades, governments across the world have increasingly turned towards systems of Continuous Transaction Controls (CTCs) in order to utilize digital processes to combat tax evasion and close the VAT Gap more effectively. The underlying technical idea behind CTC systems is the electronic submission of transaction and taxation data to the tax authorities, which allows them to gather and monitor such information more accurately and timely. CTCs often use clearance-based models, which further fosters the possibility for real-time or near real-time controls by the government.

Latin America has been the leading region in the field of CTCs, but other regions have followed suit and caught up in recent years. However, the raise of CTC systems has been far from uniform and resulted in a heterogenous global picture. In order to illustrate how CTC works in practice and the different designs such systems can have, four examples are presented in brief below, namely Brazil, Chile, Mexico, and Turkey. The four countries were selected either due to their long-standing experience with CTC or due to certain prominent features in their system. While Brazil and Chile are among the early pioneers in the field of CTCs, Mexico has one of the most advanced systems, and Turkey presents a different direction of CTC with the state authorities essentially owning the exchange platform.[288] Following this, the existing literature on impacts of CTC on tax revenues and compliance costs is reviewed.

Brazil

Starting from 2005, Brazil has gradually implemented a CTC system based on mandatory clearance-based e-invoicing. The mandatory e-invoicing requirement covers essentially all businesses. The Brazilian system of taxation is widely considered as highly complex and there are different types of e-invoices, depending on both the taxed transaction and the governance level. For example, the NFS-e (*Nota Fiscal de Serviços Eletrônica*) is the e-invoice for services, and it is governed on the municipal level, meaning that the exact process of electronic signature and clearance differ between municipalities. The NF-e (*Nota Fiscal Eletrônica*), on the other side, covers the transactions of goods and is uniform across the country, as these transactions are taxed by the Brazilian state. When issuing such an e-invoice, the seller must electronically sign the invoice and submit it to the authorities for authorization. Once it is cleared by the relevant authority, the seller can transmit the e-invoice to the buyer. Depending on the type of supply and supplier, the shipment must be accompanied with specific auxiliary documents. Transactions under a NF-e generally require at least a DANF-e to accompany the goods, which is a simplified paper version of the e-invoice, including the authorization barcode of the tax authority. Through the DANF-e, authorities can exercise physical real-time controls over the shipment. Once received, the buyer is also required to get in touch with the tax authority to validate the e-invoice. Both the seller and the buyer are legally required to store the e-invoice for a certain period.[289]

[288] SOVOS 2021.
[289] SOVOS 2021;
EDICOM, "Electronic Invoicing in Brazil: NF-e, NFS-e and CT-e", October 2018, available at: https://www.edicomgroup.com/en_US/news/5891-electronic-invoicing-in-brazil-nf-e-nfs-e-and-ct-e.html;
KPMG International, "Brazil – Indirect Tax Guide", available at: https://home.kpmg/xx/en/home/insights/2018/10/brazil-indirect-tax-guide.html;
Ortevo Deutschland, "Overview Brazil", available at: https://www.ortevo.de/insight/overview-brazil/?lang=en;
Onken, G. – Seeburger AG, "Brazil's Clearance Model for Electronic Invoicing", January 2021, available at: https://blog.seeburger.com/brazils-clearance-model-for-electronic-invoicing/ (Links last accessed in August 2021).

Chile

After introducing e-invoicing in the country through a voluntary system in the early 2000s, Chile has moved towards mandatory e-invoicing between 2014 and 2018. Since 2018, e-invoicing is mandatory for all suppliers[290] and since January 2021 this requirement is combined with an obligation to also issue electronic receipts. The e-invoice in Chile is the *Documento Tributario Electrónico (*DTE). In order to issue such an electronic taxation document, a supplier must first register with the Chilean authorities (*Servicio de Impuestos Internos* – SII) to receive the necessary authorization to electronically sign e-invoices. The system is clearance-based. A DTE must be sent to the SII for authorization and, once it has been validated, the supplier can issue the invoice to the buyer either on paper or electronically. All entities that issue e-invoices must also accept incoming e-invoices. The submission of the DTE to the SII must be accompanied with further dispatch documents. Upon receipt of the e-invoice, the recipient has 8 days to report back to the SII and reject the invoice, otherwise it is considered as accepted (silent consent rule). Chile has a monthly obligation for tax returns, but, since 2017, the SII is preparing pre-filled reports for taxpayers, based upon the data generated from the CTC system.[291]

Mexico

Mexico established a mandatory clearance-based e-invoicing system in 2011 and extended it to all businesses in 2014. Approval from the tax authority (*Servicio de Administración Tributaria* – SAT) is necessary before being allowed to issue co-called *Comprobante Fiscal Digital por Internet* (CFDI) e-invoices. Suppliers are required to resort to a government authorised intermediary (*Proveedor Autorizado de Certificación* – PAC) in order to issue a CFDI. An e-invoice must be submitted to the PAC, which validates and stamps it before passing it on to the SAT. The PAC does not only validate e-invoices, but it is also required to store them. Once the CFDI is validated, the issuer can send it to the buyer. The buyer's involvement is required for cancelling an e-invoice, in which case the supplier has to send a request via the PAC and the buyer has to either accept or reject the request for cancellation within 72 hours. Mexico has recently extended the mandatory e-invoicing for export transactions to the United States and Canada.

The Mexican CTC system has certain other unique features, such as a system for the real-time control of salary slips. Furthermore, the country has established an e-mailbox allowing transparent storage of communication between taxpayers and authorities, and the government conducts e-audits, which increase transparency and ease the process of auditing for businesses.[292]

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[290] Rare exceptions are in place upon request for certain businesses, primarily targeted at suppliers based in geographical areas without data coverage or electricity supply. See: PricewaterhouseCoopers, "A guide to VAT/GST/SUT in the Americas 2020", 2020.

[291] PricewaterhouseCoopers, "A guide to VAT/GST/SUT in the Americas 2020", 2020;
SOVOS 2021;
Sovos Trustweaver, "Chile DTE eInvoicing 101", 2019;
Fonoa, "Country Guides/Chile. Chile tax guide for businesses", available at: https://www.fonoa.com/countries/chile;
Hispanic Entrepreneurs, "How electronic invoicing works in Chile", October 2020, available at: https://hispanosemprendedores.com/en/como-funciona-la-facturacion-electronica-en-chile/;
Pagero Group, "Chile B2C mandate postponed until 2021", August 2020, available at: https://www.pagero.com/compliance/world-map/chile/;
Ortevo Deutschland, "Overview Chile", available at https://www.ortevo.de/insight/overview-chile/?lang=en (Links last accessed in August 2021).

[292] SOVOS 2021;
Sovos Trustweaver, "A Guide to the E-invoicing Universe in Mexico", available at: https://sovos.com/content-library/vat/a-guide-to-the-e-invoicing-universe-in-mexico/;

Turkey

Since 2014, Turkey has gradually expanded mandatory e-invoicing for businesses, which now covers all companies with yearly gross sales revenue of more than 5 million Turkish Liras (TL – roughly EUR 500 000), and all businesses in certain sectors.[293] In addition, if a single invoice is valued TL 5 000 or higher or if the daily invoice volume exceeds TL 30 000, then the invoices must be done in an electronic format as well. Companies that have to (or voluntarily use) e-invoice have to register with the Turkish Revenue Administration (TRA). The Turkish e-invoicing system uses two types of formats, either e-Fatura or e-Arşiv. The former covers transactions between two entities registered with the TRA and the latter covers e-invoices issued to buyers that are not registered with the TRA. The TRA functions as an obligatory intermediary in the Turkish system, meaning that e-invoices have to be submitted to the TRA, which then delivers them to the buyer. In this respect, the TRA plays a central function, even though it does not stamp or authorise the e-invoices as in the Latin American systems described above. Alternatively, companies can also integrate their software system with the authority's system or use an authorized third-party provider with such a system. For commercial invoices, the buyer can accept or reject the invoice within a certain period, while basic e-invoices do not foresee any such involvement from the buyer. 10-year storage of any invoice is mandatory for both parties. Finally, Turkey has other electronic reporting requirements for certain taxpayers in place, such as special e-delivery notes (e-waybills), e-ledgers, or daily fiscal reports from cash registers.[294]

Impacts of CTC – Compliance costs and tax revenues

CTC systems are generally assumed to bring two key advantages to the taxation system of a country, namely an increase in tax revenues and an easing of administrative burdens for businesses. While certain studies on the former impact are available for the four countries under consideration and for e-invoicing systems more generally, reports other than anecdotal evidence are scarce for the latter.
The underlying assumptions behind an expected increase in tax revenues are naturally related to the heightened efficiency and possibility of control for the tax authorities. Despite the costs and challenges in setting up and maintaining a CTC-system, the increase in available data to the authorities paired with the greater accuracy and timeliness of those data, can be expected to allow a reduction of the VAT Gap and an

Avalara, "Mexico e-invoicing and live reporting – CFDI", available at: https://www.avalara.com/vatlive/en/country-guides/north-america/mexico/mexican-e-invoices.html;
Edicom, "Mexican e-Invoicing | CFDI", available at: https://www.edicomgroup.com/en_US/solutions/einvoicing/LATAM_einvoicing/mexican_einvoicing.html (Links last accessed in August 2021).

[293] For example, companies licensed by the Turkish Energy Market Regulatory Authority or online service providers facilitating online trade. See: Ring, S. A. – Sovos, "Turkey's Digital Transformation and E-Invoicing Landscape", March 2020, available at: https://sovos.com/blog/vat/turkeys-digital-transformation-and-e-invoicing-landscape/ (last accessed in August 2021).

[294] SOVOS 2021;
Melasoft Information Technologies, "e-Invoice for Turkey", available at: https://einvoiceturkey.com/e-document-for-turkey/;
Fonoa, "Turkey: E-invoicing Rules and Regulations", April 2021, available at: https://www.fonoa.com/blog/turkey-e-invoicing-rules-and-regulations;
Edicom, "How to Electronically Invoice in Turkey", May 2021, available at: https://www.edicomgroup.com/en_US/news/12981-how-to-electronically-invoice-in-turkey.html;
Liegl, P. – Ecosio, "Overcoming the Complexities of e-Invoicing in Turkey", March 2021, available at: https://ecosio.com/en/blog/overcoming-the-complexities-of-e-invoicing-in-turkey/;
Ring, S. A. – Sovos, "Turkey's Digital Transformation and E-Invoicing Landscape", March 2020, available at: https://sovos.com/blog/vat/turkeys-digital-transformation-and-e-invoicing-landscape/ (Links last accessed in August 2021).

increase in revenues. Studies covering different aspects of such a system – discussed below - support the assumptions behind this impact. Tax revenues might increase as a response to a CTC system either due to effects on the tax rate – for example by preventing improper deductions – or on the tax base. The latter impact is supported by five studies conducted across Latin America, the data in which suggest an increase in the sales and earnings reported by companies, which in turn increases the tax revenue for the state.[295] Even though the studies point towards increased compliance due to e-invoicing, the authors caution that a direct impact is difficult to prove and that the effects appear to weaken over time and are uneven across economic sectors.[296]

Regarding concrete numbers on tax revenues, Billentis speaks of an increase of USD 58 billion in overall tax revenues for Brazil thanks to the automation of taxation processes.[297] Along similar lines, the report finds that Chile and Mexico have been able to close their VAT Gap by up to 50%.[298] More detailed studies have been conducted in specific Brazilian regions that had introduced e-invoicing. Vieira et al. found that in the Brazilian state of Goiás, e-invoicing has led to increased tax revenues coming from those sectors that were required to issue e-invoices.[299] According to the authors, these results are in line with older publications analysing other regions of the country. This is also the case for Mexico with an increase in tax revenues and a decrease in tax evasion, but the respective reports do not conduct the same scientific analysis to isolate the impact of e-invoicing.[300] Within the above-mentioned IADB report, the authors cite the results of a study that reports an increase of in VAT revenues as a percentage of GDP from 3.4% to 3.9% in Mexico following CTC introduction. Following this line of reasoning, roughly 13% of the VAT revenue increase could be estimated to have occurred in response to the introduction of the CTC system. Spread over the five years of analysis (from the introduction in 2011 until 2015), this would correspond to about 2.6% per year.

As mentioned above, there is little evidence regarding the impact of a CTC system on the compliance costs of businesses. Anecdotal evidence is regularly discussed in the literature and generally relates to the assumption that mandatory e-invoicing would reduce the operating costs for companies, after a necessary initial investment. It is believed that the digitalization and automatization of invoicing and archiving processes lessen the financial burden in comparison to paper invoices. A concrete example of such an impact would be the Chilean system of pre-filled VAT returns, which are made possible due to the mandatory clearance-based e-invoicing system. Almost 94% of taxpayers use such returns and it is assumed that the purchase and sales registry can be completed 70% faster, presenting a significantly reduced burden.[301] A more general

[295] The five studies are summarized in: Barreix, A., Zambrano, R. (2018), *Electronic Invoicing in Latin America. English Summary of the Spanish Document*, published by Inter-American Development Bank and Inter-American Center of Tax Administrations, available at: https://publications.iadb.org/publications/english/document/Electronic-Invoicing-in-Latin-America.pdf (last accessed in July 2021) (hereinafter: IADB report).
[296] Cf. Ibid, p. 48.
[297] Koch, B. – Billentis (2019), *The e-invoicing journey 2019-2025. Fourth Edition*, September 2019 (hereinafter: Billentis Report 2019).
[298] Ibid.
[299] Vieira, P. A., Pimenta, D. P., da Cruz, A. F., de Souza, E. M. S. (2018), *Effects of the electronic invoice program on the increase of state collection*, Journal of Public Administration 53(2), 481-491.
[300] Better Than Cash Alliance (2020), *Tax Digitalization in Mexico: Success Factors and Pathways Forward*, available at: https://btca-production-site.s3.amazonaws.com/documents/506/english_attachments/Tax_Digitalization_in_Mexico_Success_Factors_and_Pathways_Forward.pdf?1606765708 (last accessed in July 2021). Levun, H., Neuman, S. (2017), *Invoicing, Accounting, and Tax Compliance in Mexico. How Mexico has embraced technology to combat tax evasion and corruption,* available at: https://www.treasuryandrisk.com/2017/06/08/invoicing-accounting-and-tax-compliance-in-mexico/?slreturn=20210629061921 (last accessed in July 2021).
[301] Inter-American Center of Tax Administrations – CIAT, *ICT in the tac administration. Webinar Series*, available at:

assumption of reduced compliance costs due to clearance-based e-invoicing models is being taken by Billentis. Based on a study published by the World Bank Group, Billentis suggests that such a model can reduce compliance costs by 37-39% for corporate businesses and 8-56% for individual businesses[302].[303]

Overall and more generally speaking, a look at the *Doing Business* data by the World Bank illustrates that a CTC system alone does not guarantee low compliance costs for paying taxes.[304] Out of the four countries discussed above, only Turkey ranks within the top 50 countries for paying taxes, a ranking that includes among other things the hours needed per year to pay taxes. Out of 190 ranked countries, Chile and Mexico are situated in the higher and lower midfield respectively, while Brazil is close to the bottom with one of the most burdensome taxation systems.

Finally, during the COVID-19 pandemic, a new possible advantage of CTC systems has been discussed, and namely the possibility to utilize the information gathered through a system of CTC to better analyse the economy using real-time (or near real-time) data and effectively react to economic impacts. As an example, they are portraying how Brazil has been able to use such data to analyse economic performances in certain sectors and intervene promptly where possible.[305]

https://onedrive.live.com/?authkey=%21AO1Tsfbv5Ac32ks&cid=0408FA05B2D2C9A6&id=408FA05B2D2C9A6%2117159&parId=408FA05B2D2C9A6%2117157&o=OneUp (last accessed in July 2021).

[302] Private, not-incorporated businesses.

[303] Billentis Report 2019, p. 25. Based on: Lee, H. C. (2016), *Can Electronic Tax Invoicing Improve Tax Compliance? A Case Study of the Republic of Korea's Electronic Tax Invoicing for Value-Added Tax*, World Bank Group, Policy Research Working Paper 7592, available at: https://openknowledge.worldbank.org/bitstream/handle/10986/23931/Can0electronic00for0value0added0tax.pdf?sequence=1&isAllowed=y (last accessed in July 2021).

[304] World Bank Group (2020), *Doing Business 2020. Comparing Business Regulation in 190 Economies*, available at: https://openknowledge.worldbank.org/bitstream/handle/10986/32436/9781464814402.pdf; Or view the data at: https://www.doingbusiness.org/en/data/exploretopics/paying-taxes (last accessed in July 2021).

[305] Cf. https://sovos.com/blog/vat/e-invoice-data-reveals-the-impact-of-covid-19-on-brazils-economy/; cf. also https://www.fintechdirect.net/2020/10/28/the-rising-tide-of-continuous-transaction-controls/ (last accessed in July 2021).

ANNEX E – CONSIDERATIONS ON THE USE OF BLOCKCHAIN FOR DIGITAL REPORTING REQUIREMENTS

A brief introduction to blockchains

Distributed ledgers and blockchain-based technologies have become more and more popular over these years, due to their suitability to be used in many distributed application scenarios. Traceability, auditing, attestation-as-a-service, pseudo-anonymity, and cooperation are just a few examples, other than the traditional decentralized fintech applications (such as cryptocurrencies), that made these technologies famous. Their main interesting aspect is that they move trust from a central human/digital intermediary managing an interaction between two parties, to a decentralized computation protocol. The distributed ledger ensures the immutable persistence of data, thus providing untampered data to applications when necessary.[306]

To reach this goal, Distributed Ledger Technologies (DLTs) have the following characteristics:

1. A copy of ledger is replicated at all the hosts of a distributed system, in a peer-to-peer fashion.
2. Updates to the ledger are made possible through a consensus protocol.
3. Data are inserted into the ledger through some cryptographic techniques, aimed at making impossible (or rather, very difficult) to modify data once inserted into the ledger. In other words, the ledger allows you to append only novel data into it.

A blockchain is a specific implementation of a DLT, in which data are organized as a sequence of blocks. Each block contains a set of transactions, and it is only possible to add novel blocks in it. Hereinafter, the terms blockchain and DLT will be used interchangeably.

There are different implementations of DLTs. First, they can be subdivided in two main categories (though more detailed taxonomies are possible):

1. **permissionless**: anyone can have access to the ledger;
2. **permissioned**: access is limited to a specific set of participants.

Another main distinction lies in the possibility of running smart contracts, i.e. specific programmes whose code and data are stored into the blockchain. Every time a user wants to interact with a smart contract, he/she issues a transaction to the smart contract. This corresponds to a distributed computation, meaning that all the nodes in the distributed system run the same code so as to update their copy of the ledger.

[306] Zichichi, M., Ferretti, S., D'Angelo, G. (2020), "A Framework based on Distributed Ledger Technologies for Data Management and Services in Intelligent Transportation Systems'', IEEE Access, IEEE, Volume 8, Pag. 100384-100402.

Considerations for VAT applications

The application of Blockchain to tax law in general and to VAT reporting purposes in particular is rather under-explored at the moment. In some papers and documents (mainly position papers, without real implementations and evaluations yet),[307] it is claimed that the use of blockchain can be beneficial, because of its transparency, immutability and decentralization. While these aspects are certainly true, a main issue remains open, which is related to the benefits and the costs of an effective and scalable blockchain deployment and utilization. In fact, in terms of decentralization, blockchain is not the unique solution. As far as transparency and immutability are concerned, there are some issues and aspects that need to be clarified.

As a rule of thumb, blockchain technologies are useful when:

1. a number of parties wants to get access to a shared ledger,
2. the number of involved parties is higher than two (i.e., we have a multitude of writers)
3. there is no trust among parties.

From this preliminary consideration, it should be clear that an important aspect to determine whether blockchain is useful for tax purposes is related to the level of trust with respect to the existing VAT data handler, i.e. the tax administration authority. If the tax administration authority is secure and trustable enough (see below), data traceability and integrity can be ensured by this entity, directly, without the need for other entities across a DLT.

Importantly, it is also questionable whether the first criterion – i.e. that multiple parties want to have access to a shared ledger – is relevant in the case of VAT reporting. Only the tax authority and the specific taxpayer have an interest in accessing the ledger. Other entities should not have such access, and possibly should also be barred from storing tax-related data (even if secured and encrypted) on their systems.

Rather, it might be interesting to explore the usage of a decentralized ledger (such as a blockchain) in a scenario where multiple tax authorities need to interact, for traceability purposes, so as to handle cross-border transactions. In this case there is a need to combine certain data managed by different tax authorities. Therefore, here there are a number of parties that want to get access to a shared ledger (e.g. on suspicious intra-EU transactions), the data of which can be written by multiple tax

[307] See: Ainsworth, R.T., Alwohaibi M. (2017), "Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example", Boston Univ. School of Law, Law and Economics Research Paper No. 17-05, available at https://ssrn.com/abstract=2919056 or http://dx.doi.org/10.2139/ssrn.2919056; Bock, G. (2017), "How Blockchain Could Help Fight—Or Even End—VAT Fraud", available at https://blog.kpmg.lu/how-blockchain-could-help-fight-or-even-end-vat-fraud/; Faccia, A. and Moșteanu N. R. (2019), "Tax Evasion, Information Systems and Blockchain", Journal of Information Systems and Operations Management 13 (2019): 65-74; Saragih, S.M.F. and Setyowati, M. S. (2019), "E-Readiness of Blockchain Technology in Modernization of Tax Administration in Indonesia", Proc. of the 1st International Symposium on Indonesian Politics, ISIP EAI DOI: 10.4108/eai.25-6-2019.2288017; Alkhodre, A., Ali, T., Jan, S., Alsaawy, Y., Khusro, S., Yasar, M. (2019), "A Blockchain-based Value Added Tax (VAT) System: Saudi Arabia as a Use-Case", International Journal of Advanced Computer Science and Applications (IJACSA), 10(5), 2019 available at http://dx.doi.org/10.14569/IJACSA.2019.0100588; Setyowati, M.S., Utami, N. D., Saragih, A. H., Hendrawan, A. (2020), "Blockchain Technology Application for Value-Added Tax Systems", Journal of Open Innovation: Technology, Market, and Complexity, MPDI; PwC (2020), "How blockchain technology could improve the tax system", minutes, available at https://www.pwc.co.uk/issues/futuretax/assets/documents/how-blockchain-could-improve-the-tax-system.pdf; D'Agostino Panebianco, M. (2020), "A Blockchain to reinforce Tax-Compliance", May 2020, available at https://www.rivistadirittotributario.it/2020/05/01/blockchain-to-reinforce-tax-compliance/.

authorities, and no central trusted counterparts (since national tax authorities cooperate on a reciprocal and not hierarchical basis). Therefore, a permissioned blockchain could be imagined where multiple actors write their data from different countries. Clearly enough, this vision imposes the use of viable cryptographic schemes enabling access to specific data to the involved parties only. Still, a question mark remains on whether this would represent a meaningful application of the DLT. An in-depth analysis of the authorities' needs, the possible technical solutions, and the data to be recorded in such a ledger (e.g. all intra-EU transactions, suspicious intra-EU transactions, an audit log) would be needed to determine if the DLT is a suitable solution.

In the following sections, some specific aspects related to trustworthiness and performance of a system are described, since they are important to outline the possible benefits on the use of a blockchain, the related cons and then outline some trade-off considerations.

On the security and trust of (distributed) systems

In the Information and Communication Technologies (ICT) domain, a system is never 100% secure. Usually, vulnerabilities are associated with a system only "ex-post", i.e. when these are found and identified. Thus, ensuring an adequate level of security means finding the set of actions that an organization must take in order to reduce security risks to an acceptable level. Such an "acceptable level" depends on the value at risk and the consequences (impacts) if the risk is realized.

In this specific context of application, this concept applies to the "trustfulness" of the tax authority. From a theoretical perspective, it might be assumed that this entity is completely trustful, i.e. it has no incentives to act maliciously and deviate from its proper "functioning". However, indeed some level of insecurity is due to possible threats this entity can be subject to, such as the probability of presence of malicious employees, the probability of human errors, the presence of cyber-security breaches in the system, the provided level of fault-tolerance.

These considerations should be taken carefully into consideration, so as to determine if, given such mentioned fault probabilities, the system is secure and trustable, or rather there is a non-negligible probability that something bad can happen. However, from the fieldwork done during the course of this project, no failures of VAT reporting systems have been reported by stakeholders in the EU Member States in which they are in place. In such a case, having the opportunity to perform some auditing becomes relevant. Blockchain technologies have been recognized as a powerful tool for auditing. However, this possibility should be traded-off against the need to replicate the data, as required in blockchain-based systems.

Scalability and throughput

Other important aspects to consider are the level of scalability and the throughput provided by the technologies used in VAT systems. It is possible to assume that, if adequately implemented, structured and deployed, traditional distributed (database) systems can provide viable performance to support the workload associated with digital VAT reporting.

As concerns blockchain technologies, in the past years their level of scalability was widely debated.[308] For example, many statistics show that several blockchains are not able to reach the throughput provided by the credit card systems. While solutions have been implemented to overcome scalability and throughput limitations, no large-scale performance evaluation studies applied to VAT administration are available in literature.

[308] Kaur, G. and Gandhi, C. (2020), "Chapter 15 - Scalability in Blockchain: Challenges and Solutions", in Handbook of Research on Blockchain Technology, Academic Press, ISBN 9780128198162.

To the best of our knowledge, only Summitto provides some performance measurements on their blockchain-based invoice reporting system. They state that their solution is "able to handle ~1,255 invoices per second. This throughput comes closer to the order of magnitude estimated for the total number of e-invoices in the EU.[309]

The requirement of scalability and performance, in terms of throughput, strongly depends also on how the blockchain is used to register the data related to the invoices and the associated documents. Are data to be written to the ledger in real-time, or rather, some batch-processing is sufficient? Is the blockchain used as the ledger where all data is stored, or should it rather contain data digests only, for the sake of traceability and verifiability? These are some of the questions that should be answered, depending on the specific use case, that would probably drive the design of an adequate distributed system for VAT reporting.

Possible pros on the use of a blockchain

Starting from the discussion above, here some advantages are discussed on the use of a blockchain based solution for VAT reporting. These advantages must be traded-off against possible disadvantages to understand which technical solution is more viable in the considered scenario.

Transparency and Verifiability. D'Agostino Panebianco[310] states that "*if enabled to store the whole process, the use of a blockchain might make evident that the financial statements are reported in accordance with financial reporting standards. In fact, it would be possible to register invoices, shipping documents, customers orders, confirmation requests*". In addition, other statements refer to the fact that having a transactions management system implemented through smart contracts might help in guaranteeing a tamper-proof and transparent transaction process, thus limiting the risks of fraud and mistakes. This scenario is viable as long as all the transactions pass through the blockchain. This would require a complete revolution on how to trace and manage payments and transactions. Yet, it is true that similar benefits can be accomplished as well by resorting to a completely digital payment system based on a centralized institutional database system, i.e. without DLTs.

Another common claim is that blockchain makes frauds and errors far easier to detect, because the system provides clear and transparent information about transactions and items in the network. To this aim, it must be assumed that multiple auditors have access authorization to data, otherwise there are no probable benefits. This again possibly conflicts with the current very strict access rules to fiscal data.

Auditing. If the possibility that the tax administration authority can fail or behave erroneously (for different reasons, as discussed already) is to be coped with, then the blockchain might be of help, since it can act as a sort of "*flight data recorder*" that immutably logs all transactions, accesses and operations. It might thus be an important tool to understand, in case of failure, what went wrong and why.

Cross-border invoice administration. A possible benefit on the use of blockchain can be in the cooperation among different countries, for instance to contrast intra-community missing trader frauds.[311] This might be useful when different tax administrations are involved in the process. If they decide to use some accessible and

[309] Summitto, "Scalability of TX++: 2021 update", 14 October 2021, available at https://blog.summitto.com/posts/scalability_of_tx++_2021_update/ (last accessed on December, 2021).
[310] D'Agostino Panebianco, M. (2020), "A Blockchain to reinforce Tax-Compliance", May 2020, available at https://www.rivistadirittotributario.it/2020/05/01/blockchain-to-reinforce-tax-compliance/.
[311] Ainsworth, R.T., Alwohaibi M. (2017), "Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example", Boston Univ. School of Law, Law and Economics Research Paper No. 17-05, available at https://ssrn.com/abstract=2919056 or http://dx.doi.org/10.2139/ssrn.2919056.

shared ledger, there is room to make controls and automatic checks. Still, automatic checks are also possible without resorting to a blockchain, as already happening in a number of EU Member States in which digital reporting requirements are already in place.

Possible cons on the use of a blockchain

Data Governance and Sensitive Data. As data processors, Tax and Customs Administration have access to a huge amount of citizens' personal data. Thus, they take appropriate measures to prevent misuse, loss, unauthorised access, undesirable disclosure and unauthorised alteration of data. Until sensitive data remains securely stored in their own databases, this should not represent a problem. However, if a blockchain is set up, then data would be replicated over multiple distributed nodes/entities (otherwise it would not be a blockchain). This might raise some concerns in terms of privacy and GDPR compliance. It thus becomes important to understand: i) which entities participate in the blockchain, ii) what types of data are stored in it. In this respect, a permissioned blockchain seems to be a proper choice (rather than a public blockchain).

Furthermore, some common data management practices must be adopted, such as storing in the blockchain encrypted data only, or even data digests. This way, an entity that maintains a replica of the ledger would not be able to read the data in plain text.

Deployment. The effective implementation of blockchain for fiscal purposes would probably require not to be limited to VAT reporting, but to include many areas of governmental activity.[312] While this possible scenario might be beneficial (by revamping and improving a series of fiscal-related public services), from a more pragmatic point of view, it might represent a barrier for a real deployment.

Performance. While some of the papers state that "*blockchain can speed up the performance of the system*",[313] at the current stage, system performance evaluation studies (in different application domains) revealed that blockchain technologies do not offer guarantees that might fully support fast-paced real-time distributed applications.[314] Thus, it is not completely clear if they can offer those scalability guarantees that are required for a VAT reporting system. Probably, some kind of first or second layer solutions must be enacted, that employ off-chain interactions to speed up the processes.

Trade-off table

in Table E.1. below, the main points discussed in this document are summarised, showing the trade-offs that must be considered for the selection of the most opportune system configuration. In all cases, it remains important to carefully decide what type of data to store in the ledger (e.g., encrypted invoices, data digests, etc.) depending on the application purposes.

[312] Deloitte (2017), "Blockchain technology and its potential in taxes", available at https://www2.deloitte.com/content/dam/Deloitte/pl/Documents/Reports/pl_Blockchain-technology-and-its-potential-in-taxes-2017-EN.PDF

[313] Alkhodre, A., Ali, T., Jan, S., Alsaawy, Y., Khusro, S., Yasar, M. (2019), "A Blockchain-based Value Added Tax (VAT) System: Saudi Arabia as a Use-Case", International Journal of Advanced Computer Science and Applications (IJACSA), 10(5), 2019 available at http://dx.doi.org/10.14569/IJACSA.2019.0100588.

[314] Cf. *supra note* 1.

Table E.1. Pros and cons of using DLTs for VAT reporting purposes

Possible objectives	The price to pay
Need for audit How much can you trust your tax authorization? Is a sort of "flight data recorder" necessary, to check all the steps performed not only by the taxpayer but even by the tax authorization service?	**You need to decentralize the ledger (via blockchain)** This means that multiple (permissioned) entities must maintain a replicated version of the ledger. This might raise some concerns in terms of GDPR-compliance (solutions can be introduced to address this problem). **You need to cope with scalability** Current solutions are unlikely to provide sufficient scalability and throughput capacity to handle the existing VAT transactions
Tax authorities cooperation Cross-border administrative cooperation for tax purposes needs to be performed? If yes, having a decentralized, shared ledger might be of help. To be discussed with an in-depth analysis of the needs and solutions available.	**Sensitive data related issues** You need to carefully organize data using accurate data governance techniques to govern data access. **You need to cope with scalability** The number of cross-border transactions is significantly lower than domestic ones.

ANNEX F – PARAMETERS, ASSUMPTIONS AND CALCULATIONS FOR THE IMPACT ASSESSMENT

To ease the readability of the Section on Impact Assessment, a number of parameters and methods for calculation are described in this Annex, and referred to when necessary in the main text.

Parameters

1. Currency Conversion

All monetary values in this Report are expressed in EUR. Values in other currencies were converted into EUR based on ECB annual average exchange rate, retrievable at: https://sdw.ecb.europa.eu/browse.do?node=9691296.

2. Annual administrative burdens per company

The monetary equivalent of personnel time was calculated based on Eurostat statistics on earning by occupation: Mean annual earnings by sex, age, and occupation - NACE Rev. 2, B-S excluding O.

In line with the SCM standard, 25% overheads were added to the annual earning. For IT personnel, the earning of 'technicians and associate professionals' was used; for familiarization costs, 'professionals'; and for training and ongoing costs, 'clerical support workers'.

3. Annual administrative burdens per company

The annual administrative burdens per company are estimated based on the assessment of the current situation and result from the average of the values estimated for the Member States with existing DRRs. They are estimated per company size and type of DRR.

Table F.1. Annual administrative burdens per company (EUR/year)

	Micro	Small	Medium	Large
VAT listing	150	450	760	1 950
SAF-T	230	870	1 350	2 470
Real-time	170	760	1 350 (HU) / 4 710 (ES)	4 870 (HU) / 20 980 (ES)
E-invoicing	500	600	3 400	16 300

Source. Assessment of the current situation.

4. Implementation costs for tax authorities

The annual implementation costs for tax authorities result from the annualised investment costs and the annual operating costs. They are estimated based on the assessment of the current situation and result from the average of the values estimated for the Member States with existing DRRs. The estimation is provided per type of DRR.

For most types of DRRs, the existing costs are predominantly one-off (investment). They are therefore not expected to vary whether the investment is done for both EU and domestic transactions or only for the former (i.e. under Option 4a). Only for e-invoicing, the operational costs are significant. In that case, the operational implementation costs for the tax authority are assumed to be 60% lower (in line with the estimate of VAT revenues from intra-EU transactions).

Table F.2. Implementation costs for tax authorities

	EUR million / year
VAT listing	0.85
SAF-T	0.85
Real-time	10.5
E-invoicing	25
E-invoicing (intra-EU transactions only)	10.60

Source. Assessment of the current situation.

5. Impact on VAT revenue

The impact of the introduction of DRRs on VAT revenue is estimated based on the results of the econometric model (see Annex C). The coefficients for the baseline specifications are used. More in detail, the introduction of DRRs is estimated to increase C-efficiency by **1.9 percentage points**, based on the C-efficiency (quarterly data) model. For sensitivity analysis, the results from the VAT Gap (annual data) model are used, with the introduction of DRRs estimated to reduce the VAT Gap by **2.6 percentage points.**

6. Share of intra-EU VAT

Due to unavailability of detailed revenue figures, the share of VAT revenue from intra-EU transactions on the overall net VAT revenue was estimated on the basis of estimated VAT liabilities. The VAT liability on the intra-Community acquisition of goods and services was estimated by multiplying intra-EU importation figures (in basic prices, broken by two-digit Classification of Products by Activity codes) multiplied by their respective weighted average rates.[315] As the Supply and Use Tables were unavailable for most of Member States for 2018 onwards, the calculations are based on a sample of 23 EU Member States in 2017.[316] Then, the import VAT liability in intra-Community acquisition for all countries in the sample was divided by their overall VTTL for 2017 reported in the 2020 VAT Gap Study.

The calculation does not account for 're-export'. As a result, the figures could be slightly overestimated to the fact that import figures partially involve the importation in transit procedures, in which the VAT payments are suspended. To account for the risk of over estimation, the EU estimate is set at 40%, slightly lower than the results of the calculation. Smaller Member States (more exposed to intra-EU trade) tend to have a higher share, while larger Member States a lower one.

7. Companies active in intra-EU trade, administrative burdens from recapitulative statements

See Annex B above for details on the methodology.

Table F.3. Share of companies active in intra-EU trade and annual burden from recapitulative statements

	Companies active in cross-border trade	Annual burden per company (EUR/year)
Micro	5%	470
Small	15%	470
Medium	15%	1 410
Large	45%	9 400

Source. Authors' elaboration on Capgemini (2009), PWC (2011) and Deloitte (2017).

[315] Source: intra-EU Acquisition - Eurostat SUT, weighted average rates - VAT Gap Study 2020.
[316] The 2017 SUT was not available for BG, CY, LU, MT. The UK was excluded from the calculation.

8. Burden savings from pre-filled VAT return

The administrative burdens saved per company due to the availability of pre-filled VAT return are estimated based on the number of person/days saved on this obligation, per company size. This is retrieved from the assessment of the current situations in countries where this simplification is already operational (Spain, Portugal).

Table F.4. Burden savings from pre-filled VAT return

	Person/days per year
Micro	1.5
Small	1.5
Medium	6
Large	12

Source. Assessment of the current situation.

9. Number of invoices issued in the EU

The number of invoices – in total, paper, and electronic – issued in the EU is estimated based on 'EA 2019', per company size. Electronic invoices include both structured and unstructured (e.g. PDF) format. It is then apportioned across Member States proportionally to the number of taxable persons.

Table F.5. Number of invoices issued in the EU (million per year)

	Total	Electronic	Paper
	Million per year	%	%
Micro	1953	50%	50%
Small	1451	50%	50%
Medium	1310	50%	50%
Large	4553	58%	42%
Total	9266	54%	46%

Source. EA 2019.

10. Burden savings from e-invoicing

The calculation of burden savings from switching to paper to e-invoicing are based on the parameters estimated for 'EA 2019'.

Table F.6. Parameters to estimate the benefits from e-invoicing (per e-invoice issued)

	Share of paper invoices sent via post	Number of invoices sent per postage	Postage costs	Printing costs (EUR per invoice)	E-invoice issuance saving (minute per invoice)
Micro	15%	1	1.1	0.02	0
Small	50%	1	0.28	0.02	0
Medium	80%	3	0.28	0.02	0.22
Large	80%	5	0.28	0.02	0.22

Sources. EA 2019; Deutsche Post 2021 for postage costs; Assessment of current situation for invoice issuance savings.

11. Environmental benefits

When an invoice is issued electronically rather than on paper, it is estimated that 27 grams of CO2 are saved.[317] To monetise the amount of CO2 saved, a price of 30 EUR/tonne of CO2 is used, based on 2020 market trends for EU Emission Allowances.

[317] Endresen, L. – Pagero, "Sustainable business: E-invoicing, your company and the environment", January 2021, available at: https://www.pagero.de/blog/sustainable-business/ (last accessed in September 2021);

12. Exchange rates

Yearly average 2020 exchange rates for non-Euro countries are retrieved from the European Central Banks.

13. VAT revenue and compliance

VAT receipts (in national currency and EUR), VTTL, the VAT Gap are taken from the latest EU VAT Gap Study (2021). C-efficiency and total liability are authors' own calculation, based on Eurostat's national account data. Latest available data are used.

14. Number of taxable persons

The number of taxable persons per country is retrieved from Deloitte (2017), which provide data on VAT taxable persons below EUR 2 million revenue (micro-enterprises) and above. The latter are then segment into small, medium, and large enterprises based on Eurostat Structural Business Statistics.

15. Share of taxable persons covered by DRRs

In EU Member States with a domestic DRR, the number of taxable persons within its scope is invariably lower than the number of taxable persons. This is due for various reasons, including (i) the existence of a threshold within the DRR; (ii) the application of the VAT SME scheme which may foresee such a simplification for micro taxable persons; (iii) inactive VAT persons; or (iv) persons carrying out only VAT exempt transactions. Currently, in all Member States with a DRR, excluding Spain with a very high threshold in place, the share of taxable persons covered by the DRR is **67%**.

Administrative burdens are calculated on the number of **taxable persons covered by the DRR.** It is assumed that 100% of small, medium and large companies are covered by the DRR, while the non-covered taxable persons are assumed to be micro entities.

Tables F.8.1/8.2 and F.9.1/9.2 at the end of the section provides the details on the estimated amount of taxable persons potentially covered by the EU DRR in each Member State, in the case of its application to intra-EU transactions or also domestic transactions.

16. Deflator

A cost deflator per each Member States is calculated based on Eurostat national accounts data.

17. Number of subsidiaries of multinational companies

The number of subsidiaries of MNCs established in another Member State or in a third country is estimated based on Eurostat, Structure of multinational enterprise groups in the EU. Missing data are extrapolated proportionally to nominal GDP (from Eurostat national accounts).

18. Annual administrative burdens for multinational companies

The annual administrative burdens per each subsidiary of a MNC company are estimated based on the assessment of the current situation and result from the average of the values estimated for the Member States with existing DRRs. They are estimated per small- and large-scale MNC, and per type of DRR.

Moberg, A., Borggren, C., Finnveden, G., Tyskeng, S. (2021), *Effects of a total change from paper invoicing to electronic invoicing in Sweden*, Report from the KTH Centre for Sustainable Communications (Royal Institute of Technology, Stockholm).

Table F.7. Annual administrative burdens per multinational subsidiary (EUR/year)

	Small-scale	Large-scale
VAT listing	13 000	17 000
SAF-T	17 000	25 000
Real-time	28 000	97 000
E-invoicing	32 000	133 000

Source. Assessment of the current situation.

19. Salaries

Salaries for the various typologies of workers across the EU Member States are taken from Eurostat's national mean annual earning by occupation (2018). In line with the SCM standard, 25% overheads were added to the earning.

Table F.8.1.Estimated amount of taxable persons potentially covered by the EU DRR – domestic + intra-EU transactions (Part I)

	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU
Micro	668 049	526 660	208 676	39 640	534 500	1 881 299	476 031	97 300	624 238	2 908 257	391 344	5 297 992	145 123	484 100
Small	17 350	20 407	4 044	982	17 500	42 083	10 286	7 700	14 960	42 122	8 043	91 036	2 550	24 000
Medium	13 032	16 244	3 803	563	3 800	30 842	10 071	1 500	9 527	30 385	6 944	71 721	1 967	3 900
Large	886	1 177	198	32	900	1 943	589	200	355	1 727	457	5 243	143	800
Total	**699 317**	**564 488**	**216 721**	**41 217**	**556 700**	**1 956 167**	**496 977**	**106 700**	**649 080**	**2 982 491**	**406 788**	**5 465 992**	**149 783**	**512 800**

Source. Assessment of the current situation.

Table F.8.2. Estimated amount of taxable persons potentially covered by the EU DRR – domestic + intra-EU transactions (Part II)

	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	EU
Micro	271 331	3 350 000	147 241	31 368	82 350	32 715	1 230 440	1 611 900	1 374 200	374 718	841 749	130 792	468 284	24 230 297
Small	7 325	122 000	4 522	6 695	1 842	889	29 426	71 700	59 000	7 614	18 361	2 749	4 527	639 713
Medium	6 470	15 000	4 231	6 102	1 594	797	28 278	13 400	9 300	6 832	16 172	2 233	4 441	319 149
Large	395	2 500	237	509	73	51	1 977	2 900	1 500	465	1 249	159	386	27 051
Total	**285 521**	**3 489 500**	**156 231**	**44 674**	**85 859**	**34 452**	**1 290 121**	**1 699 900**	**1 444 000**	**389 629**	**877 531**	**135 933**	**477 638**	**25 216 210**

Source. Assessment of the current situation.

Table F.9.1. Estimated amount of taxable persons potentially covered by the EU DRR – intra-EU transactions only (Part I)

	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU
Micro	50 892	40 450	15 854	3 013	42 549	142 987	36 231	6 287	47 445	220 003	29 741	401 600	11 002	44 378
Small	2 603	3 061	607	147	2 625	6 312	1 543	1 155	2 244	6 318	1 206	13 655	383	3 600
Medium	1 955	2 437	570	84	570	4 626	1 511	225	1 429	4 558	1 042	10 758	295	585
Large	399	530	89	14	405	874	265	90	160	777	206	2 359	64	360
Total	**55 848**	**46 478**	**17 120**	**3 259**	**46 149**	**154 800**	**39 549**	**7 757**	**51 278**	**231 656**	**32 194**	**428 373**	**11 744**	**48 923**

Source. Assessment of the current situation.

Table F.9.2. Estimated amount of taxable persons potentially covered by the EU DRR – intra-EU transactions only (Part II)

	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	EU
Micro	20 707	258 308	11 269	2 686	6 265	2 497	93 787	153 324	50 700	28 480	64 034	9 939	35 360	1 829 787
Small	1 099	18 300	678	1 004	276	133	4 414	10 755	8 850	1 142	2 754	412	679	95 957
Medium	971	2 250	635	915	239	120	4 242	2 010	1 395	1 025	2 426	335	666	47 872
Large	178	1 125	107	229	33	23	890	1 305	675	209	562	72	174	12 173
Total	**22 954**	**279 983**	**12 689**	**4 834**	**6 813**	**2 773**	**103 332**	**167 394**	**61 620**	**30 856**	**69 776**	**10 758**	**36 879**	**1 985 789**

Source. Assessment of the current situation.

Calculations

1. Total administrative burdens

Total administrative burdens for economic operators are calculated based on annual administrative burdens per company (the cost per occurrence) and the number of taxable persons covered by the DRR (the population). Calculations are run separately per company size and type of DRR.

Total administrative burdens under options 4a due to the introduction of a DRR for intra-EU transactions are calculated based on the population of companies engaged in intra-EU trade only. Calculations are run separately per company size and type of DRR.

In both cases, the costs per occurrence are adjusted for the different price level across EU Member States based on the GDP deflator.

2. Costs of fragmentation

Costs of fragmentation are calculated based on the number of subsidiaries in multinational companies per each Member States, 90% of which are assumed to be small-scale and 10% large-scale. Calculations are run for each type of DRR. Fragmentation cost savings arise when a country introduce (or is so required to introduce) a uniform EU DRR. The costs per occurrence are adjusted for the different price levels across EU Member States based on the GDP deflator.

3. VAT revenue

Impact on VAT revenue due to the introduction of a domestic DRR are calculated applying the changes in percentage points to total liability (C-efficiency model) and VTTL (VAT Gap model).

Impact on VAT revenue under options 4a due to the introduction of a DRR for intra-EU transactions are calculated as follows

1) For Member States for which no sufficient data on intra-EU trade flows is available (Bulgaria, Ireland, Luxembourg, and Malta), impacts are estimated at 40% of impacts from the application of a DRR to domestic transactions, in line with the EU estimate of the value of VAT revenue from intra-EU transactions.

2) For the other Member States, EU VAT revenues from intra-EU transactions are allocated based on both the relative size of VAT revenue as well as the intensity of intra-EU trade flows.

4. Burden savings from pre-filled VAT return

Pre-filled VAT return can be implemented in countries adopting CTCs (real-time or e-invoicing).[318] Considering the lag experience in EU Member States between the introduction of CTCs and pre-filled VAT return, benefits are accounted as from the fourth year after the introduction of a CTC. They are calculated by multiplying the person/days saved by the local salary of a clerk (the cost per occurrence) and the taxable persons covered by the DRR (the population).

[318] This is currently the case also in Portugal, where the local PTC is to be complied with earlier than the VAT return obligation. It is however the only PTC country in which this is possible. The benefits for Portuguese taxable persons are taken into account in the calculation.

5. Burden savings from e-invoicing

Burden savings from e-invoicing are calculated as follows

1) **Printing**. Printing savings are generated by each paper invoice which is converted into electronic following the introduction of the e-invoicing requirement, based on printing cost (assuming that each invoice is printed on an A4 sheet).

2) **Post**. Post savings are generated by the share of paper invoices which are converted into electronic following the introduction of the e-invoicing requirements and which were previously sent via post, considering the cost of postage and the likelihood that a single delivery includes multiple invoices.

3) **Invoice issuances.** For large and medium companies, a saving of 0.22 minute per each issued invoice is multiplied by the number of invoices issued.

6. Environmental benefits

Environmental benefits are generated by the introduction of e-invoicing requirements, due to the mandatory switch from paper invoices. They are calculated based on the number of paper invoices issued, the CO2 emission factor per each invoice, and the 2020 trend price of the EU emission allowances.

ANNEX G – ANALYSIS OF IMPACTS: DETAILED COSTS AND BENEFITS

This annex provides details on the IA presented in Section 9 of the main text, and namely the breakdown of costs and benefits into their individual components for each of the four policy options. The following tables outline the categories of costs and of benefits which could be quantified (of which burden savings for business is composed of three sub-categories), as well as the total costs and benefits and the net impacts. However, they do not include other important costs and benefits which could not be quantified, such as business automation, tax control improvements, and data confidentiality, which are considered in the fuller analysis of impacts in the main text.

The graphic representation of the costs and benefits can be found in the main text. For each of the options, two tables are presented. Firstly, a table with the VAT revenues calculated via the C-efficiency econometric model, and secondly, a sensitivity analysis table with VAT revenues calculated via the VAT Gap econometric model. Options 4a and 4b on partial and full harmonisation are broken down based on the type of DRR chosen: VAT listing, SAF-T, Real-time, and e-Invoicing.

G.1. OPTION 1: STATUS QUO

Table G.1. Option 1: Costs and benefits (EUR million)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total
Administrative burdens businesses	6 270	6 270	8 016	8 016	8 016	8 499	8 499	8 499	8 499	8 499	79 086
Implementation costs tax authorities	81	81	165	165	165	214	214	214	214	214	1 726
Costs of fragmentation	3 250	3 250	3 976	3 976	3 976	4 395	4 395	4 395	4 395	4 395	40 405
Costs (total)	**9 601**	**9 601**	**12 158**	**12 158**	**12 158**	**13 108**	**13 108**	**13 108**	**13 108**	**13 108**	**121 217**
VAT revenue (C-efficiency)	29 957	29 957	30 823	30 823	30 823	36 634	36 634	36 634	36 634	36 634	335 556
Burden savings businesses	2 296	2 296	2 503	3 811	3 811	4 275	4 275	4 275	4 342	4 342	36 226
Of which: Recapitulative statements	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
VAT return	*1 918*	*1 918*	*1 918*	*3 226*	*3 226*	*3 663*	*3 663*	*3 663*	*3 731*	*3 731*	*30 659*
E-invoicing benefits	*378*	*378*	*585*	*585*	*585*	*611*	*611*	*611*	*611*	*611*	*5 568*
Environmental benefits	2	2	4	4	4	4	4	4	4	4	34
Benefits (total)	**32 256**	**32 256**	**33 330**	**34 637**	**34 637**	**40 913**	**40 913**	**40 913**	**40 980**	**40 980**	**371 817**
Net Impacts	**22 655**	**22 655**	**21 173**	**22 480**	**22 480**	**27 804**	**27 804**	**27 804**	**27 872**	**27 872**	**250 599**

Source. Authors' own elaboration.

Table G.2. Option 1: Costs and benefits – Sensitivity analysis (EUR million)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total
Administrative burdens businesses	6 270	6 270	8 016	8 016	8 016	8 499	8 499	8 499	8 499	8 499	79 086
Implementation costs tax authorities	81	81	165	165	165	214	214	214	214	214	1 726
Costs of fragmentation	3 250	3 250	3 976	3 976	3 976	4 395	4 395	4 395	4 395	4 395	40 405
Costs (total)	**9 601**	**9 601**	**12 158**	**12 158**	**12 158**	**13 108**	**13 108**	**13 108**	**13 108**	**13 108**	**121 217**
VAT revenue (VAT Gap)	14 410	14 410	14 898	14 898	14 898	17 925	17 925	17 925	17 925	17 925	163 135
Burden savings businesses	2 296	2 296	2 503	3 811	3 811	4 275	4 275	4 275	4 342	4 342	36 226
Of which: Recapitulative statements	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
VAT return	*1 918*	*1 918*	*1 918*	*3 226*	*3 226*	*3 663*	*3 663*	*3 663*	*3 731*	*3 731*	*30 659*
E-invoicing benefits	*378*	*378*	*585*	*585*	*585*	*611*	*611*	*611*	*611*	*611*	*5 568*
Environmental benefits	2	2	4	4	4	4	4	4	4	4	34
Benefits (total)	**16 709**	**16 709**	**17 405**	**18 712**	**18 712**	**22 203**	**22 203**	**22 203**	**22 271**	**22 271**	**199 396**
Net Impacts	**7 108**	**7 108**	**5 247**	**6 554**	**6 554**	**9 095**	**9 095**	**9 095**	**9 162**	**9 162**	**78 179**

Source. Authors' own elaboration.

G.2. OPTION 2: RECOMMENDATION AND REMOVAL

Table G.3. Option 2: Costs and benefits (EUR million)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total
Administrative burdens businesses	6 270	6 270	8 016	8 016	8 016	9 067	9 067	9 067	9 067	9 067	81 927
Implementation costs tax authorities	81	81	165	165	165	233	233	233	233	233	1 823
Costs of fragmentation	3 250	3 250	3 221	3 221	3 221	3 964	3 964	3 964	3 964	3 964	35 982
Costs (total)	**9 601**	**9 601**	**11 402**	**11 402**	**11 402**	**13 265**	**13 265**	**13 265**	**13 265**	**13 265**	**119 731**
VAT revenue (C-efficiency)	29 957	29 957	30 823	30 823	30 823	39 449	39 449	39 449	39 449	39 449	349 631
Burden savings businesses	2 296	2 296	2 503	3 811	3 811	4 329	4 329	4 329	4 721	4 721	37 148
Of which: Recapitulative statements	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
VAT return	*1 918*	*1 918*	*1 918*	*3 226*	*3 226*	*3 663*	*3 663*	*3 663*	*4 056*	*4 056*	*31 309*
E-invoicing benefits	*378*	*378*	*585*	*585*	*585*	*665*	*665*	*665*	*665*	*665*	*5 839*
Environmental benefits	2	2	4	*4*	4	*4*	4	4	*4*	4	36
Benefits (total)	**32 256**	**32 256**	**33 330**	**34 637**	**34 637**	**43 782**	**43 782**	**43 782**	**44 175**	**44 175**	**386 814**
Net Impacts	22 655	22 655	21 928	23 235	23 235	30 518	30 518	30 518	30 911	30 911	267 083
Net impacts against baseline	**0**	**0**	**800**	**800**	**800**	**2 700**	**2 700**	**2 700**	**3 000**	**3 000**	**16 500**

Source. Authors' own elaboration.

Table G.4. Option 2: Costs and benefits – Sensitivity analysis (EUR million)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total
Administrative burdens businesses	6 270	6 270	8 016	8 016	8 016	9 067	9 067	9 067	9 067	9 067	81 927
Implementation costs tax authorities	81	81	165	165	165	233	233	233	233	233	1 823
Costs of fragmentation	3 250	3 250	3 221	3 221	3 221	3 964	3 964	3 964	3 964	3 964	35 982
Costs (total)	**9 601**	**9 601**	**11 402**	**11 402**	**11 402**	**13 265**	**13 265**	**13 265**	**13 265**	**13 265**	**119 731**
VAT revenue (VAT Gap)	14 410	14 410	14 898	14 898	14 898	19 332	19 332	19 332	19 332	19 332	170 172
Burden savings businesses	2 296	2 296	2 503	3 811	3 811	4 329	4 329	4 329	4 721	4 721	37 148
Of which: Recapitulative statements	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
VAT return	*1 918*	*1 918*	*1 918*	*3 226*	*3 226*	*3 663*	*3 663*	*3 663*	*4 056*	*4 056*	*31 309*
E-invoicing benefits	*378*	*378*	*585*	*585*	*585*	*665*	*665*	*665*	*665*	*665*	*5 839*
Environmental benefits	2	2	4	*4*	4	*4*	4	4	*4*	4	36
Benefits (total)	**16 709**	**16 709**	**17 405**	**18 712**	**18 712**	**23 665**	**23 665**	**23 665**	**24 057**	**24 057**	**207 356**
Net Impacts	7 108	7 108	6 003	7 310	7 310	10 400	10 400	10 400	10 793	10 793	87 625
Net impacts against baseline	**0**	**0**	**800**	**800**	**800**	**1 300**	**1 300**	**1 300**	**1 600**	**1 600**	**9 400**

Source. Authors' own elaboration.

G.3. OPTION 3: KEEP THE DATA WITH THE TAXPAYER

Table G.5. Option 3: Costs and benefits (EUR million)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total
Administrative burdens businesses	7 102	7 102	8 827	8 827	8 827	8 974	8 974	8 974	8 974	8 974	85 558
Implementation costs tax authorities	81	81	165	165	165	204	204	204	204	204	1 679
Costs of fragmentation	3 250	3 250	3 976	3 976	3 976	4 173	4 173	4 173	4 173	4 173	39 294
Costs (total)	**10 433**	**10 433**	**12 969**	**12 969**	**12 969**	**13 352**	**13 352**	**13 352**	**13 352**	**13 352**	**126 531**
VAT revenue (C-efficiency)	35 822	35 822	36 495	36 495	36 495	37 446	37 446	37 446	37 446	37 446	368 360
Burden savings businesses	2 296	2 296	2 503	3 811	3 811	4 275	4 275	4 275	4 342	4 342	36 226
Of which: Recapitulative statements	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
VAT return	*1 918*	*1 918*	*1 918*	*3 226*	*3 226*	*3 663*	*3 663*	*3 663*	*3 731*	*3 731*	*30 659*
E-invoicing benefits	*378*	*378*	*585*	*585*	*585*	*611*	*611*	*611*	*611*	*611*	*5 568*
Environmental benefits	*2*	2	*4*	*4*	4	*4*	4	4	*4*	4	34
Benefits (total)	**38 121**	**38 121**	**39 002**	**40 310**	**40 310**	**41 725**	**41 725**	**41 725**	**41 792**	**41 792**	**404621**
Net Impacts	27 688	27 688	26 034	27 341	27 341	28 373	28 373	28 373	28 440	28 440	278 090
Net impacts against baseline	**5 000**	**5 000**	**4 900**	**4 900**	**4 900**	**600**	**600**	**600**	**600**	**600**	**27 500**

Source. Authors' own elaboration.

Table G.6. Option 3: Costs and benefits – Sensitivity analysis (EUR million)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total
Administrative burdens businesses	7 102	7 102	8 827	8 827	8 827	8 974	8 974	8 974	8 974	8 974	85 558
Implementation costs tax authorities	81	81	165	165	165	204	204	204	204	204	1 679
Costs of fragmentation	3 250	3 250	3 976	3 976	3 976	4 173	4 173	4 173	4 173	4 173	39 294
Costs (total)	**10 433**	**10 433**	**12 969**	**12 969**	**12 969**	**13 352**	**13 352**	**13 352**	**13 352**	**13 352**	**126 531**
VAT revenue (VAT Gap)	17 837	17 837	18 207	18 207	18 207	18 345	18 345	18 345	18 345	18 345	182 021
Burden savings businesses	2 296	2 296	2 503	3 811	3 811	4 275	4 275	4 275	4 342	4 342	36 226
Of which: Recapitulative statements	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
VAT return	*1 918*	*1 918*	*1 918*	*3 226*	*3 226*	*3 663*	*3 663*	*3 663*	*3 731*	*3 731*	*30 659*
E-invoicing benefits	*378*	*378*	*585*	*585*	*585*	*611*	*611*	*611*	*611*	*611*	*5 568*
Environmental benefits	*2*	2	*4*	*4*	4	*4*	4	4	*4*	4	34
Benefits (total)	**20 135**	**20 135**	**20 714**	**22 022**	**22 022**	**22 624**	**22 624**	**22 624**	**22 691**	**22 691**	**218 282**
Net Impacts	4 897	4 897	3 721	5 029	5 029	5 033	5 033	5 033	5 101	5 101	48 874
Net impacts against baseline	**2 600**	**2 600**	**2 500**	**2 500**	**2 500**	**200**	**200**	**200**	**200**	**200**	**13 600**

Source. Authors' own elaboration.

G.4. OPTION 4A: INTRODUCTION OF AN EU DIGITAL REPORTING REQUIREMENT – PARTIAL HARMONISATION

Table G.7. Option 4a: Costs and benefits (EUR million)

	2023		2024		2025		2026		2027		2028		2029		2030		2031		2032		Total	
	Low	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Administrative burdens businesses	6 351	6 699	6 351	6 699	6 622	7 984	6 622	7 984	6 622	7 984	1 970	10 607	1 970	10 607	1 970	10 607	1 970	10 607	1 970	10 607	42 420	90 387
Implementation costs tax authorities	93	226	93	226	93	313	93	313	93	313	21	498	21	498	21	498	21	498	21	498	567	3 878
Costs of fragmentation	1 221	3 250	1 221	3 250	1 221	3 250	1 221	3 250	1 221	3 250	0	0	0	0	0	0	0	0	0	0	6 105	16 250
Costs (total)	**8 146**	**9 917**	**8 146**	**9 917**	**9 518**	**10 386**	**9 518**	**10 386**	**9 518**	**10 386**	**1 991**	**11 105**	**1 991**	**11 105**	**1 991**	**11 105**	**1 991**	**11 105**	**1 991**	**11 105**	**59 237**	**100 370**
VAT revenue (C-efficiency)	42 357	42 357	42 357	42 357	45 228	45 228	45 228	45 228	45 228	45 228	45 228	45 228	45 228	45 228	45 228	45 228	45 228	45 228	45 228	45 228	446 536	446 536
Burden savings businesses	3 392	3 392	3 392	3 392	4 888	5 145	4 888	5 145	4 888	5 145	1 096	6 027	1 096	6 027	1 096	6 027	1 096	6 570	1 096	6 570	26 930	53 442
Of which: Recapitulative statements	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*10 960*	*10 960*
VAT return	*1 918*	*1 918*	*1 918*	*1 918*	*3 414*	*3 414*	*3 414*	*3 414*	*3 414*	*3 414*	*0*	*3 962*	*0*	*3 962*	*0*	*3 962*	*0*	*4 505*	*0*	*4 505*	*14 080*	*34 974*
E-invoicing benefits	*378*	*378*	*378*	*378*	*378*	*635*	*378*	*635*	*378*	*635*	*0*	*970*	*0*	*970*	*0*	*970*	*0*	*970*	*0*	*970*	*1 891*	*7 508*
Environmental benefits	2	2	2	2	2	4	2	4	2	4	0	6	0	6	0	6	0	6	0	6	11	45
Benefits (total)	**45 752**	**45 752**	**45 752**	**45 752**	**50 118**	**50 376**	**50 118**	**50 376**	**50 118**	**50 376**	**46 324**	**51 261**	**46 324**	**51 261**	**46 324**	**51 261**	**46 324**	**51 804**	**46 324**	**51 804**	**473 477**	**500 023**
Net Impacts	35 834	37 606	35 834	37 606	39 732	40 858	39 732	40 858	39 732	40 858	40 156	46 236	40 156	46 236	40 156	46 236	40 699	46 780	40 699	46 780	399 653	423 133
Net impacts against baseline	**13 200**	**15 000**	**13 200**	**15 000**	**18 600**	**19 700**	**17 300**	**18 400**	**17 300**	**18 400**	**12 400**	**18 400**	**12 400**	**18 400**	**12 400**	**18 400**	**12 800**	**18 900**	**12 800**	**18 900**	**149 100**	**172 500**

Note. Costs in 2028 decline due to the convergence of more complex, costly DRRs to the chosen EU DRR.
Source. Authors' own elaboration.

Table G.8. Option 4a: Costs and benefits – Sensitivity analysis (EUR million)

	2023		2024		2025		2026		2027		2028		2029		2030		2031		2032		Total	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Administrative burdens businesses	6 351	6 699	6 351	6 699	6 622	7 984	6 622	7 984	6 622	7 984	1 970	10 607	1 970	10 607	1 970	10 607	1 970	10 607	1 970	10 607	42 420	90 387
Implementation costs tax authorities	93	226	93	226	93	313	93	313	93	313	21	498	21	498	21	498	21	498	21	498	567	3 878
Costs of fragmentation	1 221	3 250	1 221	3 250	1 221	3 250	1 221	3 250	1 221	3 250	0	0	0	0	0	0	0	0	0	0	6 105	16 250
Costs (total)	**8 146**	**9 917**	**8 146**	**9 917**	**9 518**	**10 386**	**9 518**	**10 386**	**9 518**	**10 386**	**1 991**	**11 105**	**1 991**	**11 105**	**1 991**	**11 105**	**1 991**	**11 105**	**1 991**	**11 105**	**59 237**	**100 370**
VAT revenue (VAT Gap)	20 656	20 656	20 656	20 656	22 248	22 248	22 248	22 248	22 248	22 248	22 248	22 248	22 248	22 248	22 248	22 248	22 248	22 248	22 248	22 248	219 300	219 300
Burden savings businesses	3 392	3 392	3 392	3 392	4 888	5 145	4 888	5 145	4 888	5 145	1 096	6 027	1 096	6 027	1 096	6 027	1 096	6 570	1 096	6 570	26 930	53 442
Of which: Recapitulative statements	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*10 960*	*10 960*
VAT return	*1 918*	*1 918*	*1 918*	*1 918*	*3 414*	*3 414*	*3 414*	*3 414*	*3 414*	*3 414*	*0*	*3 962*	*0*	*3 962*	*0*	*3 962*	*0*	*4 505*	*0*	*4 505*	*14 080*	*34 974*
E-invoicing benefits	*378*	*378*	*378*	*378*	*378*	*635*	*378*	*635*	*378*	*635*	*0*	*970*	*0*	*970*	*0*	*970*	*0*	*970*	*0*	*970*	*1 891*	*7 508*
Environmental benefits	2	2	2	2	2	4	2	4	2	4	0	6	0	6	0	6	0	6	0	6	11	45
Benefits (total)	**45 752**	**45 752**	**45 752**	**45 752**	**50 118**	**50 376**	**50 118**	**50 376**	**50 118**	**50 376**	**46 324**	**51 261**	**46 324**	**51 261**	**46 324**	**51 261**	**46 324**	**51 804**	**46 324**	**51 804**	**473 477**	**500 023**
Net Impacts	14 131	15 905	14 131	15 905	16 751	17 879	16 751	17 879	16 751	17 879	17 177	23 257	17 177	23 257	17 177	23 257	17 720	23 800	17 720	23 800	172 417	195 887
Net impacts against baseline	**7 000**	**8 800**	**7 000**	**8 800**	**11 500**	**12 600**	**10 200**	**11 300**	**10 200**	**11 300**	**8 100**	**14 200**	**8 100**	**14 200**	**8 100**	**14 200**	**8 600**	**14 600**	**8 600**	**14 600**	**94 200**	**117 700**

Note. Costs in 2028 decline due to the convergence of more complex, costly DRRs to the chosen EU DRR.
Source. Authors' own elaboration.

G.5. OPTION 4B: INTRODUCTION OF AN EU DIGITAL REPORTING REQUIREMENT – FULL HARMONISATION

Table G.9. Option 4b: Costs and benefits (EUR million)

	2023		2024		2025		2026		2027		2028		2029		2030		2031		2032		Total	
	Low	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Administrative burdens businesses	7 249	10 947	7 249	10 947	7 249	10 947	7 249	10 947	7 249	10 947	2 597	13 570	2 597	13 570	2 597	13 570	2 597	13 570	2 597	13 570	49 228	122 584
Implementation costs tax authorities	93	423	93	423	93	423	93	423	93	423	21	608	21	608	21	608	21	608	21	608	567	5 154
Costs of fragmentation	1 221	3 250	1 221	3 250	1 221	3 250	1 221	3 250	1 221	3 250	0	0	0	0	0	0	0	0	0	0	6 105	16 250
Costs (total)	**10 591**	**12 591**	**10 591**	**12 591**	**10 591**	**12 591**	**10 591**	**12 591**	**10 591**	**12 591**	**2 618**	**14 178**	**2 618**	**14 178**	**2 618**	**14 178**	**2 618**	**14 178**	**2 618**	**14 178**	**66 045**	**133 842**
VAT revenue (C-efficiency)	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	55 695	556 947	556 947
Burden savings businesses	3 392	3 835	3 392	3 835	3 392	3 835	3 392	6 479	3 392	6 479	1 096	6 801	1 096	6 801	1 096	6 801	1 096	11 945	1 096	11 945	22 442	68 753
Of which: Recapitulative statements	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*10 960*	*10 960*
VAT return	*1 918*	*1 918*	*1 918*	*1 918*	*1 918*	*1 918*	*1 918*	*4 562*	*1 918*	*4 562*	*0*	*4 562*	*0*	*4 562*	*0*	*4 562*	*0*	*4 562*	*0*	*4 562*	*9 592*	*37 690*
E-invoicing benefits	*378*	*820*	*378*	*820*	*378*	*820*	*378*	*820*	*378*	*820*	*0*	*1 142*	*0*	*1 142*	*0*	*1 142*	*0*	*6 287*	*0*	*6 287*	*1 891*	*20 103*
Environmental benefits	2	5	2	5	2	5	2	5	2	5	0	7	0	7	0	7	0	7	0	7	11	57
Benefits (total)	**59 089**	**59 534**	**59 089**	**59 534**	**59 089**	**59 534**	***59 089***	**62 178**	***59 089***	**62 178**	**56 791**	**62 502**	**56 791**	**62 502**	**56 791**	**62 502**	**56 791**	**67 646**	**56 791**	**67 646**	**579 400**	**625 757**
Net Impacts	46 943	48 498	46 943	48 498	46 943	48 498	48 041	50 273	48 041	50 273	48 325	56 230	48 325	56 230	48 325	56 230	52 630	57 955	52 630	57 955	491 915	528 033
Net impacts against baseline	**24 300**	**25 800**	**24 300**	**25 800**	**25 800**	**27 300**	**25 600**	**27 800**	**25 600**	**27 800**	**20 500**	**28 400**	**20 500**	**28 400**	**20 500**	**28 400**	**24 800**	**30 100**	**24 800**	**30 100**	**241 300**	**277 400**

Note. Costs in 2028 decline due to the convergence of more complex, costly DRRs to the chosen EU DRR.
Source. Authors' own elaboration.

Table G.10. Option 4b: Costs and benefits – Sensitivity analysis (EUR million)

	2023		2024		2025		2026		2027		2028		2029		2030		2031		2032		Total	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Administrative burdens businesses	7 249	10 947	7 249	10 947	7 249	10 947	7 249	10 947	7 249	10 947	2 597	13 570	2 597	13 570	2 597	13 570	2 597	13 570	2 597	13 570	49 228	122 584
Implementation costs tax authorities	93	423	93	423	93	423	93	423	93	423	21	608	21	608	21	608	21	608	21	608	567	5 154
Costs of fragmentation	1 221	3 250	1 221	3 250	1 221	3 250	1 221	3 250	1 221	3 250	0	0	0	0	0	0	0	0	0	0	6 105	16 250
Costs (total)	**10 591**	**12 591**	**10 591**	**12 591**	**10 591**	**12 591**	**10 591**	**12 591**	**10 591**	**12 591**	**2 618**	**14 178**	**2 618**	**14 178**	**2 618**	**14 178**	**2 618**	**14 178**	**2 618**	**14 178**	**66 045**	**133 842**
VAT revenue (VAT Gap)	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	27 956	279 560	279 560
Burden savings businesses	3 392	3 835	3 392	3 835	3 392	3 835	3 392	6 479	3 392	6 479	1 096	6 801	1 096	6 801	1 096	6 801	1 096	11 945	1 096	11 945	22 442	68 753
Of which: Recapitulative statements	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*1 096*	*10 960*	*10 960*
VAT return	*1 918*	*1 918*	*1 918*	*1 918*	*1 918*	*1 918*	*1 918*	*4 562*	*1 918*	*4 562*	*0*	*4 562*	*0*	*4 562*	*0*	*4 562*	*0*	*4 562*	*0*	*4 562*	*9 592*	*37 690*
E-invoicing benefits	*378*	*820*	*378*	*820*	*378*	*820*	*378*	*820*	*378*	*820*	*0*	*1 142*	*0*	*1 142*	*0*	*1 142*	*0*	*6 287*	*0*	*6 287*	*1 891*	*20 103*
Environmental benefits	2	5	2	5	2	5	2	5	2	5	0	7	0	7	0	7	0	7	0	7	11	57
Benefits (total)	**31 351**	**31 795**	**31 351**	**31 795**	**31 351**	**31 795**	**31 351**	**34 439**	**31 351**	**34 439**	**29 052**	**34 764**	**29 052**	**34 764**	**29 052**	**34 764**	**29 052**	**39 908**	**29 052**	**39 908**	**302 013**	**348 370**
Net Impacts	19 205	20 759	19 205	20 759	19 205	20 759	20 302	22 534	20 302	22 534	20 586	28 491	20 586	28 491	20 586	28 491	24 891	30 216	24 891	30 216	214 528	250 646
Net impacts against baseline	**12 100**	**13 700**	**12 100**	**13 700**	**14 000**	**15 500**	**13 700**	**16 000**	**13 700**	**16 000**	**11 500**	**19 400**	**11 500**	**19 400**	**11 500**	**19 400**	**15 700**	**21 100**	**15 700**	**21 100**	**136 300**	**172 500**

Note. Costs in 2028 decline due to the convergence of more complex, costly DRRs to the chosen EU DRR.
Source. Authors' own elaboration.

G.6. INTRODUCTION OF AN EU DRR: ADMINISTRATIVE BURDENS AND BURDEN SAVINGS PER COMPANY SIZE

Table G.10. Administrative burdens: EU DRRs for both intra-EU and domestic transactions

	Total (EUR mn per year)		Per company (EUR per year)	
	Min	Max	Min	Max
Micro	2 267	11 632	90	500
Small	119	416	200	650
Medium	167	1 089	500	3 400
Large	38	433	1 400	16 000

Note. Estimates assuming all MS introduced the EU DRR for domestic transactions.
Source. Authors' own elaboration.

Table G.11. Administrative burdens: EU DRRs for intra-EU transactions

	Total (EUR mn per year)		Per company (EUR per year)	
	Min	Max	Min	Max
Micro	201	915	110	500
Small	19	67	200	700
Medium	25	163	500	3 400
Large	18	203	1 500	16 700

Source. Authors' own elaboration.

Table G.12. Burden savings: Recapitulative statements

	Total (EUR mn per year)	Per company (EUR per year)
Micro / Small	909	470
Medium / Large	187	3 110

Source. Authors' own elaboration.

Table G.13. Burden savings: e-Invoicing (e-invoice issuance, postage and printing)

	Total (EUR mn per year)	Per company (EUR per year)
Micro / Small	369	10
Medium / Large	5 388	15 560

Note. Estimates assuming all MS introduced an e-invoicing EU DRR for domestic transactions.
Source. Authors' own elaboration.

ANNEX H – SCENARIOS ABOUT THE FUTURE ADOPTION OF DIGITAL REPORTING REQUIREMENTS

Several among the policy options considered leave Member States free to decide whether to adopt DRRs and, if so, which one. Therefore, the analysis needs to introduce a number of scenarios that capture the likely policy developments. The scenarios proposed in this section attempt to forecast future trends of adoption, based on: (i) the available information on policy developments (forthcoming or likely); and (ii) how the policy option considered is likely to spur or reduce adoption. Importantly, these scenarios should not be conceived as an accurate forecast that Country X will adopt that DRR in year Y; rather, they should provide a reasonable macro-picture of the number of countries adopting DRRs in the medium-term.

The scenarios cover 10 years following any policy intervention at EU level (or lack thereof). For all options, the period of analysis is assumed to start from 2023. While 2023 could be considered a reasonable timing for certain policy options (i.e. the 'doing nothing' option or the adoption of a non-binding recommendation), it is unrealistic that any EU legislative intervention, as in Options 3 and 4, becomes operational by then. Still, postponing the commencement date would need even more uncertain predictions on more distant policy choices, and would also require forecasting the length of the legislative process and the transposition period granted in the Directive. At the same time, using different periods for different options would create an unduly advantage for those options which require no legislative review, running contrary to the IA methodology. Therefore, for all options, the period of analysis covers the decade between 2023 and 2032; this choice is neutral to the results, as costs and benefits are to be measured for all options for 10 years following their implementation.

While the scenarios take into account the likely evolution of domestic policies, the Study Team opted not to introduce diachronic variations into the main parameters used to calculate costs and benefits, in particular on the evolution of VAT revenue, inflation and salary levels (which would influence the costs per occurrence and thus administrative burdens), and the number of VAT taxable persons covered by the reporting obligation (the population). This choice is made for the sake of simplicity: introducing such variations would increase the accuracy of the total estimates of costs and benefits, but would not alter the sign and magnitude of the net impacts and thus the relative ranking of the policy options. Therefore, this approach reduces the uncertainty associated with the analysis, while not affecting the accuracy of the policy considerations.

Option 1 – Status quo. In line with the BRG, **the status quo is defined dynamically**, to account for the likely evolution of the current situation. In this respect, the main aspects to be taken into consideration are:

- **the likelihood that DRRs are introduced** by countries which have not done so yet; and
- **the evolution of existing DRRs** (e.g. from PTCs from CTCs).

The available information can be summarised as follows:

- as of September 2021, DRRs had been introduced in 12 Member States (Bulgaria, Croatia, Czechia, Estonia, Hungary, Italy, Latvia, Lithuania, Poland, Portugal, Slovak Republic and Spain);
- between 2021 and 2023, Greece and France will also start operating their own DRRs;

- public acts were adopted or official announcements[319] were made by the government towards the adoption of DRRs in Romania (SAF-T);
- public acts were adopted or official announcements were made in Bulgaria, Croatia, Hungary, Poland, Spain and the Slovak Republic towards the introduction of mandatory e-invoicing;
- a study has been launched in Finland on the possible adoption of DRRs, but no public act has been adopted by the government;
- given the amount of time necessary to deploy the national systems after the first public decisions are communicated, countries that have not taken steps in that direction so far are unlikely to be able to adopt their own DRRs within the next five years.

The above information provides a sufficient degree of certainty for the short-term, i.e. the next five years, in terms of the countries which are likely to adopt or update domestic DRRs, as well as of those which are not. In the medium-term, however, the available information is not sufficient to identify with a reasonable degree of certainty the likely evolution; thus, reasoned probabilistic scenarios need to be built. These scenarios are designed as incremental (i.e. each subsequent step incorporates the adoptions foreseen in the previous steps) and are described in Table below, together with their likelihood.

Table H.1. Option 1: Medium-term adoption scenarios

Scenario	Description	New adopters	Likelihood
No adoption	The adoption of national DRRs has reached its peak and the remaining countries do not adopt any national reporting mechanism, except for Finland where preparatory work has already started. Czechia opts for e-invoicing, in line with its neighbouring countries.	Finland	10%
Central-Eastern	Slovenia, the only Central-Eastern Member State without a DRR, adopts one.	Finland, Slovenia	20%
Evolution of existing obligations	Belgium, Austria and Luxembourg, which already have annual listing or SAF-T on demand systems, adopt a DRR.	Austria, Belgium, Finland, Luxembourg, Slovenia	40%
Southern	Malta and Cyprus, the only Southern Member States without a DRR, adopt one.	Austria, Belgium, Cyprus, Finland, Luxembourg, Malta, Slovenia	20%
All	National DRRs are adopted in all Member States	Austria, Belgium, Cyprus, Denmark, Finland, Germany, Ireland, Luxembourg, Malta, the Netherlands, Slovenia, Sweden	10%

Source. Authors' own elaboration.

[319] Such as publication of draft laws or documents for consultation.

Based on the available information and the above scenarios, the dynamic status quo is described in Table below. Please note the following:

3) as anticipated, **the description below is a simplification aiming at providing a robust comparator for estimating impacts, and not the exact description of the future path of adoption of DRRs** and domestic policy decisions;[320]

4) in line with the path of adoption followed so far by the other EU Member States, new adopters are assumed to opt for VAT listing, except for Austria and Luxembourg which would leverage on their existing SAF-T on demand requirements;

5) countries which have undertaken official steps towards the adoption of mandatory e-invoicing are assumed to either be granted the derogation or design a reporting system in which e-invoicing remains an option but greatly simplifies compliance, thus resulting in its near-full adoption (as it could be the case in Hungary). For the sake of simplicity, both cases are termed 'mandatory e-invoicing', as impacts are considered to be largely the same under both legal solutions;

6) the status quo in the long-term results from both deterministic changes – i.e. specific Member States adopting or updating their national DRRs – as well as the probabilistic synthesis of the scenarios described above.

Table H.2. Option 1: Adoption of Digital Reporting Requirements (2023 – 2032)

Year	Time for the analysis	Number of Member States with DRR	Type of DRR	Adopters
2023	T_0	14	VAT listing	BG, CZ, EE, HR, LV, SK
			SAF-T	LT, PL, PT
			Real-time	ES, EL, HU
			E-invoicing	IT, FR
2025	T_2	15	VAT listing	CZ, EE, LV
			SAF-T	LT, PT, **RO**
			Real-time	EL
			E-invoicing	**BG, ES, HR, HU,** IT, FR, **PL, SK**
2028	T_5	20.1*	VAT listing	***BE, CY, DE, DK,*** EE, **FI, *IE,*** LV, ***MT, NL, SE, SI***
			SAF-T	***AT,*** LT, ***LU,*** PT, RO
			Real-time	EL
			E-invoicing	BG, **CZ,** ES, HR, HU, IT, FR, PL, SK

*Notes. In bold: changes. In bold and italic: possible changes based on the scenario analysis. *: weighted average across scenarios.*
Source. Authors' own elaboration.

[320] For instance, in France the obligation will be introduced from 2023 onwards; in Poland, e-invoicing is likely to become mandatory before 2025. In any case, the dates below refer to the moment in time when the DRR becomes operational (i.e. not that when the measure is adopted).

Option 2 – Recommendation and Removal. Under this policy option, the European Commission will:

1) propose an amendment to the VAT Directive as to remove the need for Member States intending to introduce mandatory e-invoicing to ask for a derogation; the derogation currently needed to introduce mandatory e-invoicing is removed;

2) draft a non-binding recommendation to describe the design of the core elements of a common DRR system, including the design of a system based on periodical VAT listing or on mandatory e-invoicing; and

3) monitor the adoption of reporting mechanisms to fight against VAT frauds within the European Semester and actively support the introduction of a DRR system in those countries with a high VAT Gap.

As for Option 1, for the short-term the estimated path of adoption of DRRs results from the policy announcements already made by Member States; for the second half of the 10-year reference period, it results from the combination of the likely policy choices and a number of probabilistic scenarios. Differently from Option 1, the scenarios start from the following assumptions:

1) **DRRs are adopted in countries with a VAT Gap higher than the EU median**,[321] following the support provided by the European Commission and push via the European Semester;

2) **mandatory e-invoicing is adopted more widely** following the removal of the derogation and the publication of the recommendation; in the scenario below, Nordic countries are assumed to adopt it in line with their Nordic Smart Government strategy[322] and Czechia would also opt for mandatory e-invoicing in line with its neighbours;[323]

3) DRRs are adopted by all Member States (i.e. a **maximum scenario** with low probability);

4) **countries adopting or updating their DRR system after the introduction of the recommendation would conform, at least in part, to the EU guidelines**; this does not apply for countries adopting a SAF-T system;[324] and

5) **existing systems will not converge** to the systems designed in the EU recommendation due to path dependency and the investment borne by public and private operators.

[321] VAT Gap Study 2020.
[322] For further details, see the official website: https://nordicsmartgovernment.org/ (last accessed in September 2021).
[323] The choice of countries adopting mandatory e-invoicing is only exemplificative and the results of the analysis would not change significantly if a similar number of adopting Member States were considered.
[324] I.e. Romania, which already announced its adoption; Austria and Luxembourg, which would leverage on their existing SAF-T on request requirement.

Table H.3. Option 2: Medium-term adoption scenarios

Scenario	Description	New adopters	Likelihood
VAT Gap	Member States with a VAT Gap higher than EU median introduce a DRR	Belgium, Ireland, Malta	50%
E-invoicing diffusion	Nordic countries and Czechia mandate e-invoicing based on the EU recommendation	Belgium, Denmark, Finland, Ireland, Malta, Sweden	30%
All	National DRRs are adopted in all Member States	Austria, Belgium, Cyprus, Finland, Germany, Ireland, Luxembourg, Malta, the Netherlands, Slovenia	20%

Source. Authors' own elaboration.

Based on the combination of the information on future policies already available and the scenarios described above, the path of adoption of DRRs following the publication by the Commission of a non-binding recommendation on the design of DRRs and the removal of the e-invoicing derogation is described in Table below.

Table H.4. Option 2: Adoption of Digital Reporting Requirements (2023-2032)

Year	Time for the analysis	Number of Member States with DRR	Type of DRR	Adopters
2023	T_0	14	VAT listing	BG, CZ, EE, HR, LV, SK
			SAF-T	LT, PL, PT
			Real-time	ES, EL, HU
			E-invoicing	IT, FR
2025	T_2	15	VAT listing	CZ, EE, LV
			SAF-T	LT, PT, **RO**
			Real-time	EL
			E-invoicing	**BG§, ES§, HR§, HU§,** IT, FR, **PL§, SK§**
2028	T_5	20.7*	VAT listing	***AT§, BE§, CY§, DE§,*** EE, ***IE§, LU§,*** LV, ***MT§, NL§, SI§***
			SAF-T	LT, PT, RO
			Real-time	EL
			E-invoicing	BG§, **CZ§,** ES§, ***DK§,*** **FI§,** HR§, HU§, IT, FR, PL§, ***SE§,*** SK§

*Notes. In bold: changes. In bold and italic: possible changes based on the scenario analysis. *: weighted average across scenarios. §: the domestic DRR conforms with the recommendation.*
Source. Authors' own elaboration.

Option 3 – Keep the data with the taxpayers. Under this policy option, the VAT Directive would be amended to require taxpayers to file and store transactional data, that should be made available upon request from tax authorities. Member States would remain free to maintain or introduce a domestic DRR.

Compared to the baseline scenario, Option 3 offers an alternative tool to provide tax authorities with transactional data. In such a situation, the adoption of a DRR would be less likely. This would result in medium-term adoption scenarios in which a lower number of Member States are assumed to introduce an 'active' reporting duty, as shown in Table below. In particular, those countries which already have an on-demand system (Austria and Luxembourg) are unlikely to change it and the path of adoption will probably not extend to the whole EU. Rather, only countries in which preparatory work has started, where listing obligations already exist or whose neighbours have already largely introduced a DRR would still be considering its introduction.

Table H.5. Option 3: Medium-term adoption scenarios

Scenario	Description	New adopters	Likelihood
No adoption	Following the requirement to keep data with the taxpayers, no more Member States introduce a DRR, except for Finland in which preparatory work has already started. Czechia opts for e-invoicing, in line with its neighbouring countries.	Finland	20%
Central-Eastern	Slovenia, the only Central-Eastern Member State without a DRR, adopts one.	Finland, Slovenia	30%
Evolution of annual sales listing	Belgium, already having an annual requirement, adopts a DRR.	Belgium, Finland, Slovenia	30%
Southern	Malta and Cyprus, the only Southern Member States without a DRR, adopt one.	Belgium, Cyprus, Finland, Malta, Slovenia	20%

Source. Authors' own elaboration.

The likely path of adoption under Option 3 is shown in Table below. In the Member States which do not introduce a DRR, the duty to keep the data with the taxpayer would be in force.

Table H.6. Option 3: Adoption of Digital Reporting Requirements (2023-2032)

Year	Time for the analysis	Number of Member States with DRR	Type of DRR	Adopters
2023	T_0	14	VAT listing	BG, CZ, EE, HR, LV, SK
			SAF-T	LT, PL, PT
			Real-time	ES, EL, HU
			E-invoicing	IT, FR
2025	T_2	15	VAT listing	CZ, EE, LV
			SAF-T	LT, PT, **RO**
			Real-time	EL
			E-invoicing	**BG, ES, HR, HU,** IT, FR, **PL, SK**
2028	T_5	17.7*	VAT listing	***BE, CY,*** EE, **FI,** LV, ***MT, SI***
			SAF-T	LT, PT, RO
			Real-time	EL
			E-invoicing	BG, **CZ,** ES, HR, HU, IT, FR, PL, SK

*Notes. In bold: changes. In bold and italic: possible changes based on the scenario analysis. *: weighted average across scenarios.*
Source. Authors' own elaboration.

Option 4a – Introduction of an EU Digital Reporting Requirements: Partial Harmonisation.

Under option 4a, a DRR is introduced for intra-EU transactions and Member States remain free to apply it to domestic transactions. The existence of a common standard is likely to encourage and anticipate the adoption of national systems; therefore, the scenarios foreseen for 2028 in the baseline option are assumed to take place in 2025. Still, in line with the optional nature of the measure introduced and the previous

analysis, the adoption of DRRs by countries which do not currently have one remains only probabilistic.

Existing domestic systems would remain as they are, provided that interoperability is ensured. In the short-term, existing domestic systems are thus 'frozen' in their current form, as, for example, countries with a VAT listing could not opt to introduce another requirement different than the EU system. In the medium-term – which is assumed within 5 years – national systems will need to converge to the EU system.

Table H.7. Option 4a: Adoption of Digital Reporting Requirements (2023-2032)

Year	Time for the analysis	Number of Member States with DRR	Type of DRR	Adopters
2023	T_0	14 (Domestic) 27 (intra-EU)	VAT listing	BG, CZ, EE, HR, LV, SK
			SAF-T	LT, PL, PT
			Real-time	ES, EL, HU
			E-invoicing	IT, FR
2025	T_2	20.1* (Domestic) 27 (intra-EU)	VAT listing	BG, CZ, EE, HR, LV, SK
			SAF-T	LT, PL, PT
			Real-time	ES, EL, HU
			E-invoicing	IT, FR
			EU DRR	**AT, BE, CY, DE, DK, FI, IE, LU, MT, NL, RO, SE, SI**
2028	T_5	20.1* (Domestic) 27(intra-EU)	EU DRR	**All Member States**

*Notes. In bold changes. *: weighted average across scenarios.*
Source. Authors' own elaboration.

Option 4b – Introduction of an EU Digital Reporting Requirement – Full harmonisation.

Under option 4b, a DRR is introduced for both intra-EU and domestic transactions alike. Therefore, no discretionary choice is left to Member States in this respect. For existing domestic systems, current DRRs can be maintained provided that interoperability is ensured. In the short-term, thus, the existing systems maintain their current characteristics and no evolution is possible. In the medium-term - which is again assumed within 5 years - national systems must converge to the EU system.

Table H.8. Option 4b: Adoption of Digital Reporting Requirements (2023-2032)

Year	Time for the analysis	Number of Member States with DRR	Type of DRR	Adopters
2023	T_0	27	VAT listing	BG, CZ, EE, HR, LV, SK
			SAF-T	LT, PL, PT
			Real-time	ES, EL, HU
			E-invoicing	IT, FR
			EU DRR	**AT, BE, CY, DE, DK, FI, IE, LU, MT, NL, RO, SE, SI**
2028	T_5	27	EU DRR	**All Member States**

Notes. In bold: changes.
Source. Authors' own elaboration.

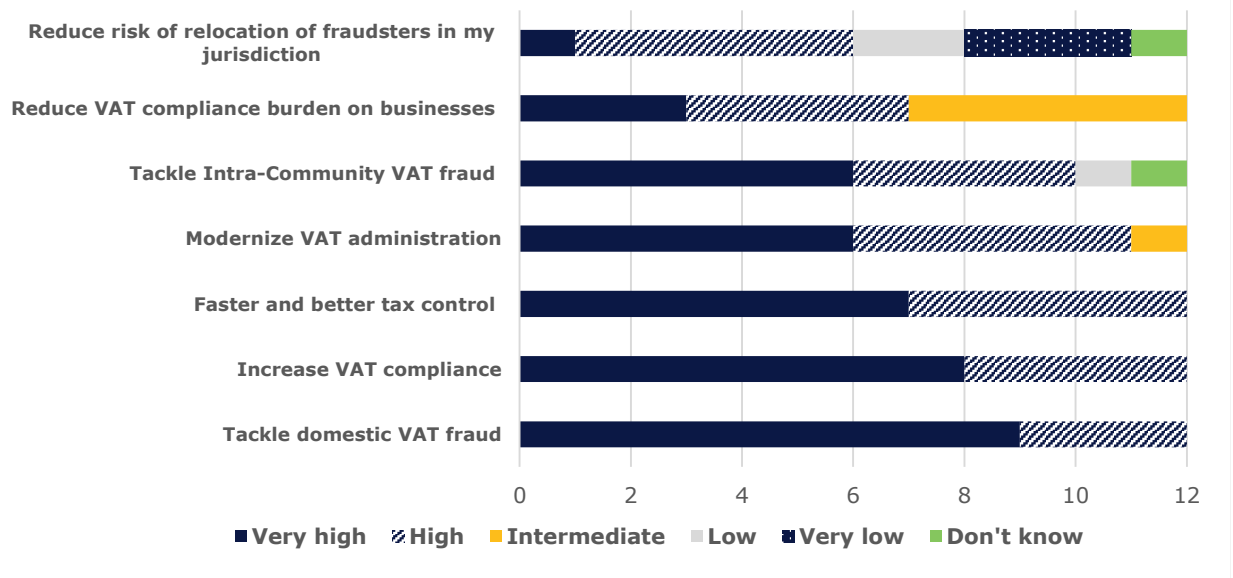
ANNEX I – STAKEHOLDERS VIEWS ON DIGITAL REPORTING REQUIREMENTS

I.1. THE RATIONALE FOR INTRODUCTION DIGITAL REPORTING REQUIREMENTS

Based on the feedback provided by the tax authorities, and coherently with the provisions of Article 273 of the VAT Directive, **all DRRs have been introduced, first and foremost, to better tackle domestic VAT fraud and improve VAT compliance**, typically through an improvement of tax audit and control procedures (see Figure I.1 below). Still, the modernization of the VAT system is also indicated as a major goal by the vast majority of respondents, including all Members States that implemented SAF-T reporting requirements. A comparatively smaller importance is attributed to the increased ability to fight Intra-Community VAT fraud, coherently with the existing limitations of the reporting tool for intra-Community transactions. Finally, the prevention of cross-border spill-over effects[325] is placed in last place of the objectives pursued.

Simplification or digitalisation of VAT compliance for taxpayers and improved collaboration between the tax administration and taxpayers play a critical role towards the adoption of CTCs. This bears no negligible consequences on the range and measurement of benefits they have generated for public authorities. On the one hand, some benefits associated to these groups, such as the removal of prior reporting obligations, the fostering of structured e-invoicing uptake and the issuance of pre-filled VAT returns, are measured in Section 3 of the main text, presenting the cost and benefits for economic operators and MNCs. On the other hand, while all reporting requirements are accredited a preventive effect as taxpayers become aware that data reported by them will be crosschecked with those reported by their trading partners, the strength of this effect is higher for CTCs due to the immediacy of data verifications. Consistently, the increase of voluntary compliance has been indicated as a major goal by the tax authorities. However, no data exist on the impact of DRR on spontaneous compliance and could be retrieved from the public authorities. Hence, this impact has been assessed indirectly, by measuring changes to the VAT gap in the Member States adopting reporting requirements using an econometric analysis.

Figure I.1. Relevance of various objectives of Digital Reporting Requirements: views from tax authorities (number of tax authorities)



Source. Authors' elaboration on targeted consultation of TA (countries with DRRs).

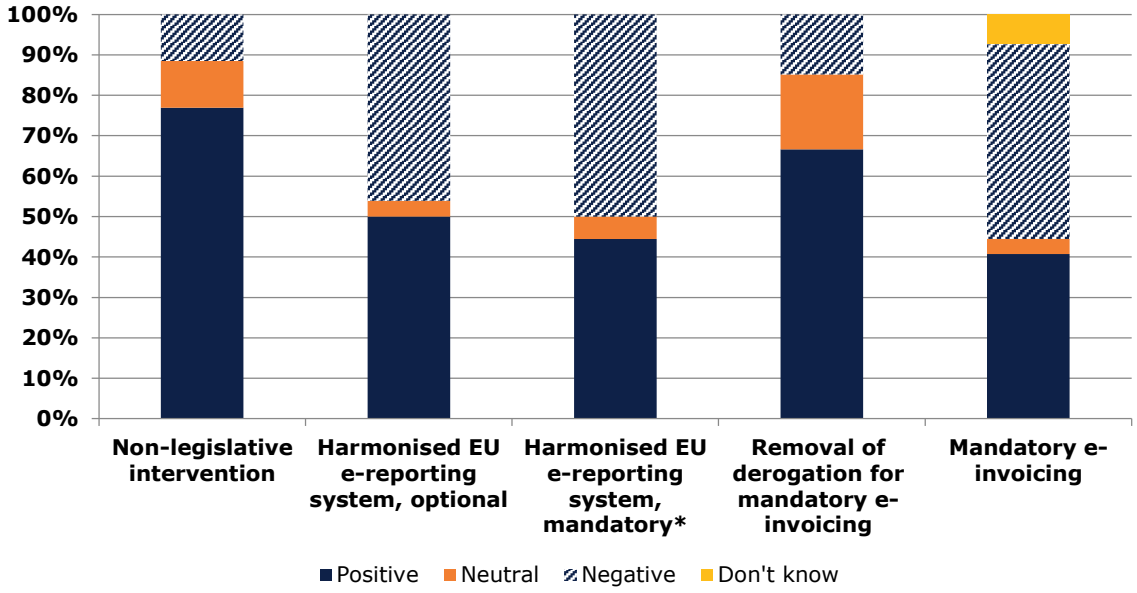
[325] Spillover effects could arise if, following the introduction of reporting mechanisms in other EU Member States, fraudsters would consider relocating to jurisdictions with less control.

I.1. VIEWS ON POLICY OPTIONS

In this section, the feedback received from stakeholders on possible revisions to the reporting framework for domestic and intra-EU transactions is summarised. The list of potential policy revisions was submitted to tax authorities, and their views were collected via structured questions, which are analysed quantitatively in the remainder of the section. Policy revisions were also discussed with private stakeholders with an in-depth knowledge of different reporting systems in place across the EU (and elsewhere), and especially service providers and companies with experience in more than one jurisdiction. Stakeholders could also point out to additional revisions which they would like to consider, but no consensus emerged on alternative options, thus confirming the comprehensiveness of the proposed review.

Feedback from public authorities: DRRs for domestic transactions. As for domestic DRRs, **there is a strong support on non-legislative interventions,** involving the provision of a recommendation to Member States on various key design areas (e.g. definition of common principles, minimum requirements to be met, and technical standards to be applied). Only a couple of tax authorities expressed moderate disagreement. With reference to the optional adoption of a harmonised DRR, views are more split, but still a majority of respondents look at this option favourably. Differently, the rate of approval is sensibly reduced if the adoption of this regime is made mandatory, especially across Member States where DRRs are not yet in place or upcoming. **Also with reference to e-invoicing solutions, public authorities favour a 'soft' revision**: over two-thirds of the Member States agree with the removal of the need to obtain the derogation, thus increasing their autonomy to choose the CTC mechanism they deem more appropriate. Differently, only a minority of respondents (about 40%) consider the introduction of mandatory e-invoicing as a desirable option.

Figure I.2. Revisions of DRRs for domestic transactions: Tax authorities' views



*Note. * Valid responses on this option were gathered from a smaller sample of Member States (16).*
Source. Targeted consultation.

As regards the **key features** of the EU DRRs for domestic transactions, the feedback from tax authorities can be summarized as follows:

- only a handful of respondents indicates the key elements that should be harmonised, providing largely different indications;

- only a minority of respondents is in favour of using SAF-T, including some countries where this kind of reporting is already in place, either on demand (Austria) or for periodic reporting (Poland and Portugal);

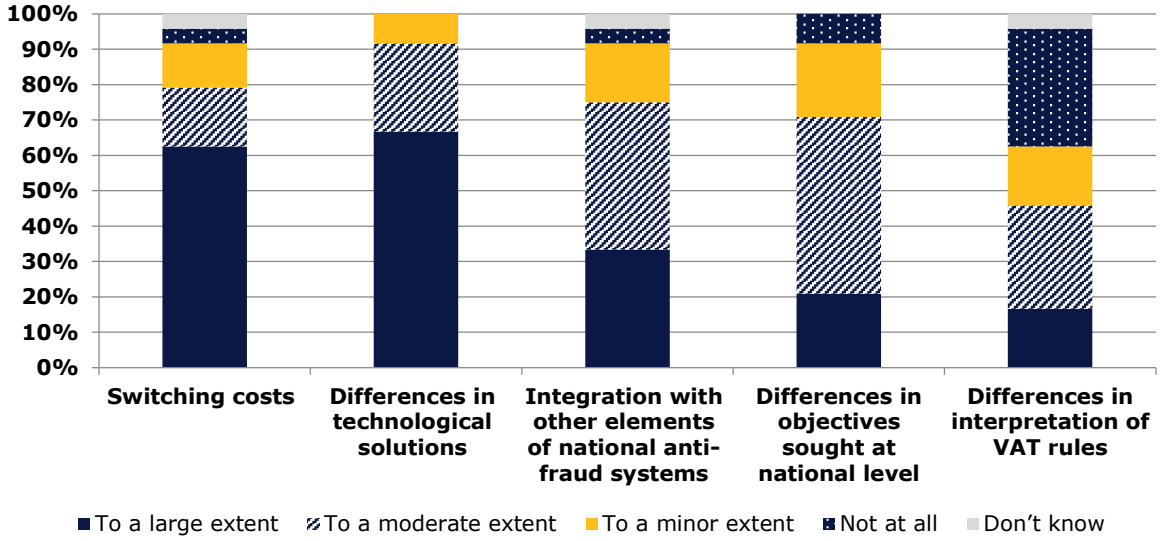
- views are rather evenly split as for the reporting frequency, with about half of respondents in favour of periodic reporting and the remaining ones supporting a real-time solution;

- a consensus emerges with reference to the scope of the EU DRR which should be broad. Namely, it should cover (i) all VAT-registered taxable persons (only two respondents suggest applying a turnover threshold), (ii) all market segments (even though a few respondents suggest adopting a phased approach, initially focusing B2B and B2G transactions, to later include the B2C segment), and (iii) both purchase and sale transactions (only for one respondent suggests covering only sales);

- likewise, there is full agreement on the information storage approach, with all but one respondent advising to store data into national database with subsequent exchanges among tax authorities.

The **major obstacles** envisaged by the public authorities towards the introduction of an EU DRR for domestic transactions primarily concern the switching costs from the existing national systems and the differences in the technological solutions (e.g. standards, IT architecture) already adopted by Member States. Differently, other issues are regarded as major impediments only by a minority of respondents.

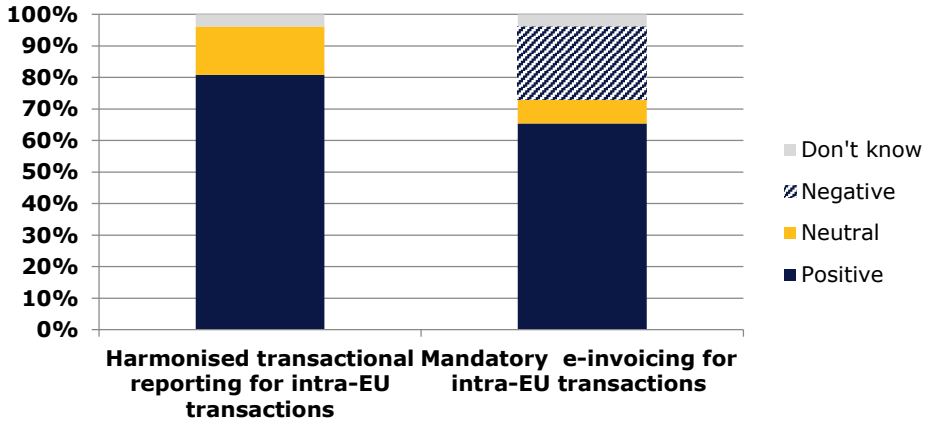
Figure I.3. Obstacles to the introduction of an EU DRR: Tax authorities' views



Source. Targeted consultation.

Feedback from public authorities: DRRs for intra-EU transactions. Consistently with the negative assessment of the existing recapitulative statements held by the public authorities, the vast majority of the respondents would appreciate its revision. Among the two envisaged options, a higher approval rate is recorded by its replacement with a harmonised periodic DRR (over 80%). However, almost two-thirds of respondents would also positively consider the mandatory introduction of structured e-invoicing for all intra-EU transactions.

Figure I.4. Revisions of reporting requirements for intra-EU transactions: Tax authorities' views

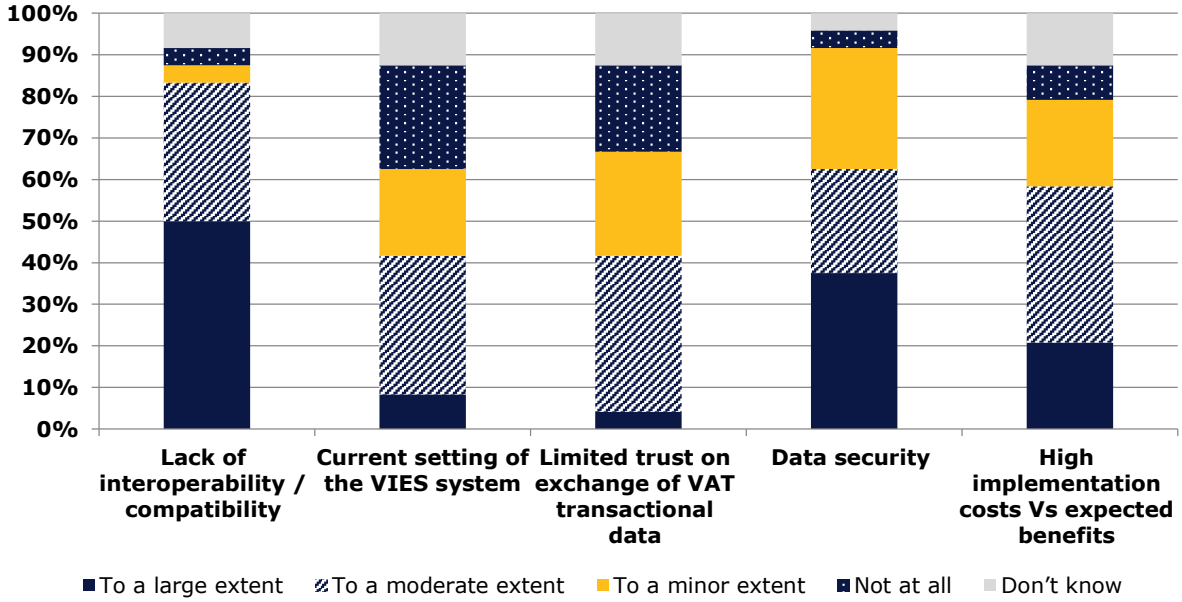


Source. Targeted consultation.

The **key features** of a harmonised DRR for intra-EU transactions are largely similar to those illustrated above for domestic transactions, with only few differences. As for reporting frequency, a couple of respondents suggest giving special consideration to SMEs, to whom the possibility for a less frequent reporting could be granted. There is agreement on the broad scope of this mechanism in terms of types of transactions to be included. However, a couple of public authorities of Member States where the existing VAT listing already includes intra-EU acquisitions suggest covering sale transactions only.

Analogously for the EU DRR for domestic transactions, the most **severe obstacles** envisaged by the public authorities concern technical issues connected to the information exchange across Member States. The lack of interoperability among the systems adopted by different Member States is regarded as an obstacle of at least moderate severity by over 80% of the respondents (and a serious issue by 50%). Data security and privacy concerns come in second place.

Figure I.5. Obstacles to the introduction of a harmonised DRR for intra-EU transactions: Tax authorities' views



Source. Targeted consultation.

Feedback from private stakeholders. The views of **e-services providers** on policy revisions are broadly coherent in three respects. First, the introduction of some minimum requirements, based on careful balancing between how much can be fixed (common to all Member States) and how much has to be flexible (detailed at country level), is strongly supported in order to foster harmonization. In particular, key elements to be harmonized (or, better, standardized) across the EU are the format standard and the communication protocol. Second, the usefulness of some form of EU guidance on DRRs, and especially CTCs, was stressed. To this end, the principles for the implementation of CTCs recently published by the International Chamber of Commerce can be regarded as a useful source of inspiration[326]. Third, e-services providers largely advocate the removal of the derogation to foster the uptake of structured e-invoicing across the EU.

As expected, **companies operating in multiple jurisdictions** are in favour of options involving the maximum degree of harmonization: two-thirds of respondents supported the introduction of a DRR for both intra-EU and domestic transactions. The introduction of mandatory e-invoicing only for intra-EU transactions was strongly opposed by the majority of respondents; while views on the replacement of the recapitulative statements with a DRR are more mixed. About half respondents supported this option, stressing its potential benefits in terms of increased simplification and automation of the process and standardization across the EU, at a limited cost ("*data are available at transactional data anyhow*"). Opposite views were held by remainder of the respondents, whose resistance to change is largely explained by the relatively straightforward compliance with the existing tool and the issues expected from higher granularity of reported data, likely to increase the number of mismatches that require investigation.

[326] International Chamber of Commerce (ICC), Practice Principles for Implementation of Continuous Transaction Controls (CTCs), June 2020. (available at https://iccwbo.org/publication/icc-continuous-transaction-control-ctcs-practice-principles/)

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