Equal Focus on Inequality? Approaches to Distributional Impact Assessment in the National Budget Process Across the EU

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Abstract

After four decades of increasing within-country income inequality in many EU Member States, this study first aims to understand to what extent and how EU Member States make use of distributional impact assessments (DIAs) for budgetary measures. The second aim is to understand the factors that constrain the use of DIA, leading us to propose strategies for how it could be used more widely. To these ends, we perform a desk-based study of the documents produced in the national budgeting process, which is then followed up with structured key informant interviews with those responsible for producing key budgetary documents in each of the 27 Member States of the EU. We then detail the constraints to performing more DIAs and potential solutions involving actions at both the country and EU levels. This study constitutes the first comprehensive analysis of DIA practices across the EU.

Keywords: budgetary process; distributional impact assessment; EU Member States; inequality

Introduction

Since the 2008 financial crisis and the 2011 sovereign debt crisis, equity has taken centre stage in the public debate as income inequality has worsened (Alvaredo et al. 2018; Atkinson et al. 2011; Cantó et al. 2022; European Commission 2019, 2020; Jenkins et al. 2013). The resulting political and social pressures have posed harsh new challenges for governments and created a pressing demand for reliable data and a far-reaching request for policy-makers to provide solutions. Tackling inequalities is important not only for social cohesion (Vergolini 2011) but also for economic reasons, as they can hamper economic growth, affect capital versus labour shares (Fiorio et al. 2020) and jeopardise macroeconomic stability (European Commission 2019). Addressing inequality is relevant also because it directly affects equality of opportunity for the next generation (Atkinson 2015).

According to the Eurobarometer survey, a vast majority of Europeans feel that income inequalities are too great and that governments should address them, while fewer than half believe that equality of opportunity and their social status has improved over time (Kantar 2018).

Many drivers may increase or reduce inequality. One major potential driver is the national budgeting process. All European Union (EU) Member States (MSs) engage in some degree of redistribution through the tax and benefit system, and the budgeting process is where the extent and effectiveness of redistribution can be analysed and addressed. Since 2011, in the aftermath of the 2008 economic crisis, EU MSs engage in an annual

budgeting cycle with an intense political co-operation between the EU institutions and the 27 MSs, which includes the European Semester and the National Semester, introduced to increase the co-ordination of both fiscal and structural economic policies of MSs from ex-post to ex-ante co-ordination (see Appendix for a brief description of the EU MS' budgeting process).

The European Commission (EC) encourages the extensive use of distributional impact assessment (DIA) in the budgeting process. A recent instance of this is the EC Communication COM(2022)494 (European Commission 2022a), which stressed the use of DIA and the possibility of understanding how policy choices affect different groups within the population.[1] DIA refers to the evaluation of the impact of policies on income distribution in a country by analysing their impact on poverty and income inequality indicators.[2] Here, we focus on fiscal policies (i.e., involving tax and benefits paid by or to individual taxpayers and households).

In this paper, we investigate, first, the extent to which EU MSs use DIA in their budget preparation process and, second, what limits the use of DIA, which leads us to concrete suggestions about how the use of DIA could be increased. To answer these questions, we use the available official documentation related to the budget, as well as information retrieved from interviews with officials from the respective ministries of each of the 27 MSs. To date, a systematic analysis of DIA practices across EU MSs has never been conducted.

I. Research Design and Methodology

We focus on the period 2015–2020, comprising five recent years since the approval of the EU Regulation No 473/2013, and measure the use and nature of DIA in the budget preparation process in all EU MSs over this period implementing a methodology based on three different steps. The first step is the systematic review of the main budget documents: Draft Budgetary Plans (DBPs), Stability and Convergence Programmes (SCPs) and National Reform Programmes (NRPs). We thoroughly read these documents searching for any DIA occurrences. The second step has been the use of a text-mining algorithm to detect the presence of DIA in the DBPs, SCPs and NRPs. More precisely, the text-mining algorithm performs an automatic analysis of these documents with the idea of complementing the systematic review as a means of double-check. The algorithm exploits the use of regular expressions to locate the DIA occurrences in these documents (see Table S1 in the Appendix for the expressions used). The results of the first steps are compared to minimise the probability of missing any DIA occurrence. The last step of our analysis consists of the interviews of ministry officials of all EU27 countries relying on a face-to-face structured questionnaire administered online by us or our collaborators.

[1]COM(2022) 494 is closely related to this study through the accompanying Staff Working Document SWD(2022) 323 (European Commission 2022b), which in turn is based on the 'Study on Distributional Impact Assessment - VT/2020/ 002' European Commission et al. (2022), which is the foundation for this article.
[2]For clarity, this study focuses on income inequality, which is the most widely considered aspect of inequality. It is worth noting that multiple dimensions of inequality can be addressed. For example, Goal 10 of the United Nations Sustainable Development Goals is "Reduce inequality within and among countries", which is defined broadly to incorporate *inter alia* "social, economic and political inclusion" across "age, sex, disability, race, ethnicity, origin, religion, economic, or other status'" (see https://sdgs.un.org/2030agenda).

The officials interviewed are all involved in the budget preparation process and the DIA analysis during the budgeting process.[3]

The questionnaire includes both close- and open-ended questions and has three main aims. First, we used it to ask for confirmation of the DIA occurrences we detected in the previous two steps. To allow for a careful check, we sent in advance the questionnaire to the interviewees and a document that summarised the main findings coming from the systematic review and the text-mining analysis. Moreover, we exploited these interviews to gather information about the DIA use also in other budget documents (e.g., the National Growth Strategy, the Progress Toward the EU2020 Indicators, national documents introducing expenditure and/or revenue measures etc.), which could not be detected without a thorough knowledge of the national context, the local language and ministerial practices. Second, the interviews enabled us to identify what prevents the use of DIA in the budget preparation process and the degree of similarity between the EU27 countries concerning their approaches to using DIA. Finally, we used the interviews to discuss the relevance envisaged by respondents of DIA for policy-making.

II. The Frequency of Distributional Impact Assessment

To understand the current practice, we analysed 10 official budget-related documents across all EU MSs observing how many included at least one DIA occurrence in the years 2019 and 2020. In detail, for each MS, we analysed the Draft Budgetary Plan, the Stability/Convergence Programmes, the National Reform Programmes, the National Growth Strategy, the Progress towards EU2020 indicators, the Progress Report in implementing Country-Specific recommendations, the national documents introducing expenditure measures, the national documents introducing revenue measures, the documents with an ex-ante evaluation of an adopted budgetary measure and the documents with an ex-post evaluation of past budgetary measures. Our count of DIA occurrences includes not only detailed DIA analyses but also simple discussion or comment on the results of DIA analyses on the adopted policies, taken as sufficient evidence that some analysis had been performed. The results are presented in Figure 1, and country-level details are provided in Table S2 in the Appendix, showing a clear picture of the low use of DIA exercises in the budget process of EU MSs. Only seven countries (Estonia, Finland, France, Greece, Ireland, Lithuania and the Netherlands) out of the nineteen Euro Area countries, the EU MSs to which the EU Regulation No 473/2013 applies, feature at least one DIA occurrence in their DBPs. Concerning SCPs, only Croatia exhibits DIA, although results are only commented not presenting details of the analysis; while five countries (Belgium, Croatia, Italy, Malta and Portugal) include DIA in the NRP document. Four countries (Austria, Denmark, Slovenia and Sweden) perform at least one DIA occurrence in the National Growth Strategy document, while eight countries (Austria, Denmark, France, Latvia, Malta, Portugal, Slovenia and Spain) present at least one DIA occurrence in progress towards EU2020 indicators documents, and the same countries, with the exception of Slovenia and Spain, provide DIA analysis in progress in implementing country-specific recommendations documents. The other analysed documents show a higher presence of DIA. For example, more than half of EU MSs exhibit DIA occurrences in national

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[3]The study was undertaken as part of an EC project, and the officials interviewed were fully aware of this.

Figure 1: Number of European Union Member States With at Least One DIA Occurrence in 10 Official Budget-Related Documents, 2019–2020. [Colour figure can be viewed at wileyonlinelibrary.com]
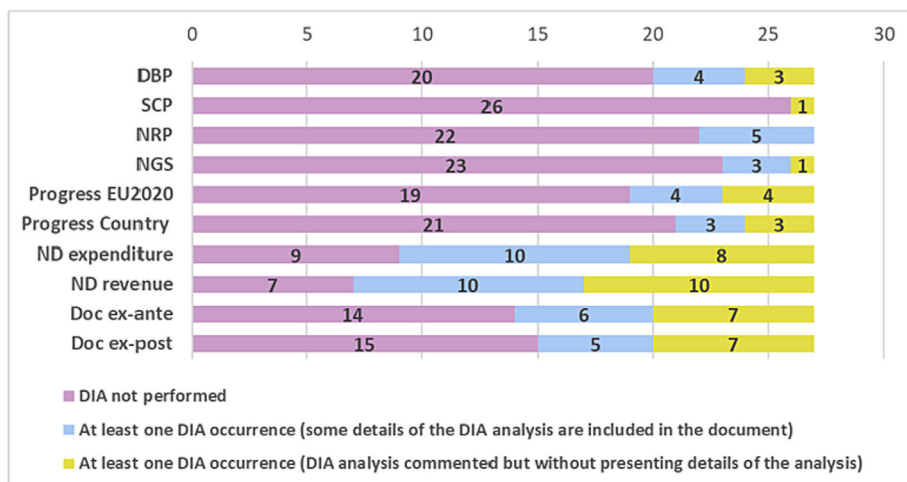
Notes: Member States are counted only once per category (N=27). Official documents analysed refer to the 2019–2020 fiscal years.

Abbreviations: DBP, Draft Budgetary Plan; Doc ex-ante, Document with an ex-ante evaluation of an adopted budgetary measure; Doc ex-post, Document with an ex-post evaluation of past budgetary measures; ND expenditure, National document introducing expenditure measures; ND revenue, National document introducing revenue measures; NGS, National Growth Strategy; NRP, National Reform Programmes; Progress Country, Progress in implementing Country-Specific recommendations; Progress EU2020, Progress towards EU2020 indicators; SCP, Stability and Convergence Programmes.

documents that introduce either expenditure (18 out of 27) or revenue (20 out of 27) measures. Finally, about half of EU MSs had had at least one DIA occurrence in national documents with an ex-ante (13 out of 27) and an ex-post (12 out of 27) evaluation of an adopted budgetary measure.

The findings emerging from this examination show that, across the EU, some DIA is usually performed in the policy-making process. While only Cyprus, Luxembourg and Romania do not perform any DIA, there is a high variability among the MSs and much room for improvement concerning the frequency of DIA use.

III. The Methodology of Distributional Impact Assessment

Turning to the question of how DIA is performed in the MSs, Figure 2 shows the models used to perform DIA. Two Europe-wide models, EUROMOD and QUEST, are featured prominently in the responses. EUROMOD is a static tax-benefit microsimulation model available for all EU MSs. It enables researchers and policy analysts to simulate various policy scenarios, such as changes in tax rates, benefit levels, eligibility criteria and other policy parameters. The results allow researchers and policy-makers to assess the potential impacts of different policies, including the budgetary and distributional implications by

Figure 2: Microsimulation Models and Macroeconomic Models Used to Perform DIA. [Colour figure can be viewed at wileyonlinelibrary.com]
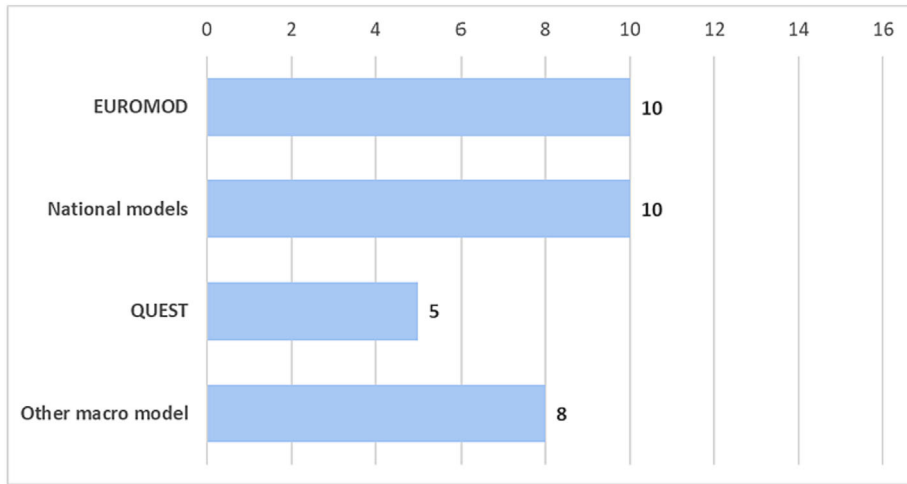
Notes: The analysis is based on 24 Member States and it counts how many Member States use the different models to perform DIA. It does not include Cyprus, Romania and Luxembourg since no DIA is carried out in these European Union Member States. Respondents are allowed to choose multiple answers. The national models mentioned in the chart are micro-simulation models. Reference to the most recent fiscal years (2019 and/or 2020).

population groups. The model is in constant development and updated yearly to account for changes in the tax-benefit systems. To achieve this, there is a EUROMOD country team responsible for each of the 27 MSs. The model is an open source since 2020,[4] and regular trainings is available to further facilitate the broad adoption of the model.[5]

Conversely, QUEST is a structural macroeconomic model in the New-Keynesian tradition. The model is built on robust microeconomic foundations, encompassing frictions in goods, labour and financial markets. As a macro-model, it has far fewer details in terms of distributional impacts, though it can be used for DIA analysis at a more general level. For example, QUEST is used to assess the impacts of policy changes on employment or on the wages of workers with different types of labour market skills. It continues to be used and developed by the Directorate General for Economic and Financial Affairs of the European Commission. It is not open access, though MSs can request access.[6]

In the responses, national microsimulation models and EUROMOD prove to be the most frequently used, which are used by 10 countries each (national microsimulation models used by Belgium, Croatia, Czechia, Estonia, Greece, Lithuania, Malta, Romania, Slovakia and Slovenia; and EUROMOD by Austria, Czechia, Finland, France, Ireland, Italy, Poland, Slovenia, Spain and Sweden). Macroeconomic models are also employed for DIA analysis, though such models only facilitate a broad-brush

[4]Access to the input microdata, EU-SILC data, must be granted by Eurostat.
[5]For more details on the EUROMOD project, see Sutherland and Figari (2013) and https://euromod-web.jrc.ec.europa.eu/.
[6]Further information and links to publications using QUEST can be found at https://economy-finance.ec.europa.eu/economic-research-and-databases/economic-research/macroeconomic-models_en.

distributional analysis. The most common macroeconomic model was QUEST, used by five countries, with eight countries reporting the use of a different macroeconomic model.

An interesting finding regarding the data used to perform DIA is that, across the EU, it is common to use both surveys and administrative data. Each of them has pros and cons. Administrative data are relatively inexpensive as they are routinely collected by public administrations. They help minimize measurement errors, eliminate recall errors, provide full coverage of the population and can capture the top tail of the income distribution. However, they often have a limited coverage of the bottom tail and can make identifying families and households difficult, if not unfeasible. On the other hand, survey data allow for the inclusion of ad hoc questions and typically provide good coverage of households, their composition and individual characteristics. However, they can be costly, suffer from low response rates and have limited coverage of high-income individuals. Figure 3 shows the various types of data sources used for performing DIA in EU MSs. Tax data, followed by data from the EU-SILC, the Labour Force Survey and the social security data, are the most frequently used data sources for DIA. The large use of administrative data during the budget process is not surprising as they tend to have less noise than survey data and tend to be easily accessible to ministry officials. The data for DIA are usually provided without difficulties upon specific request, and the procedures can differ between survey and administrative data. Survey data are provided by Eurostat or by National Statistical Institutes, while administrative data are requested within the public administration. Regarding the timeliness of the data, administrative data tend to be more up-to-date than survey data, as administrative data on taxes and taxable income could be available with a time lag of 1

Figure 3: Data Used for Producing DIA Analysis. [Colour figure can be viewed at wileyonlinelibrary.com]
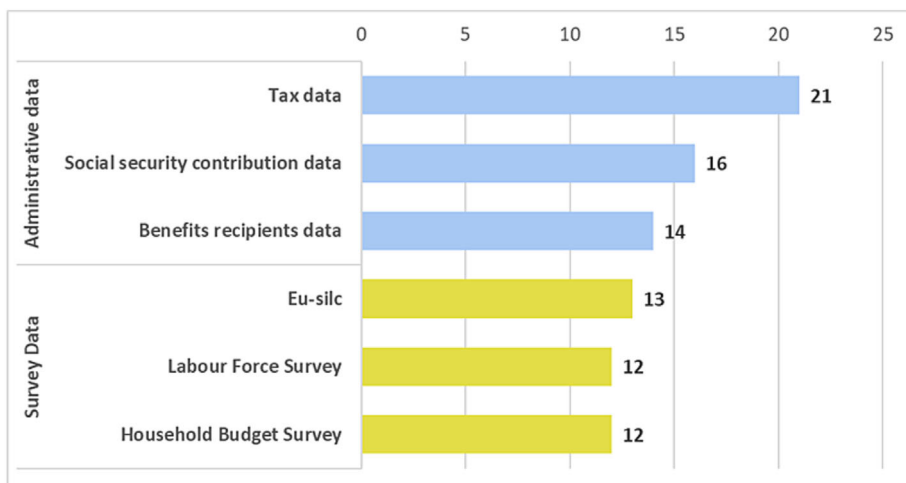
Notes: The analysis is based on 24 Member States and it counts how many Member States use the different data to perform DIA. It does not include Cyprus, Romania and Luxembourg since no DIA is carried out in these European Union Member States. Respondents are allowed to choose multiple answers.
Reference to the most recent fiscal years (2019 and/or 2020).

year only and data on transfers with an even shorter time lag, while survey data for DIA (e.g., EU-SILC) are often available with at least a 2-year delay.

Another relevant aspect concerning the data dimension regards the quality of the data used. In the interviews, all the MSs officials declared that they were fully aware of the limitations (e.g., the timing, the lack of some variables etc.) of the data used. Furthermore, some MSs expressed that they would like to have more detailed and timely information to be able to carry out a more systematic and thorough DIA. For example, officials from Austria, Greece and Lithuania pointed out that, because of time lags, the data available for DIA would not be informative enough due to the current pandemic crisis. To overcome this problem, Lithuania, which relies only on survey data, is working in collaboration with the JRC on a project aimed at adjusting the microsimulation model to run on administrative data. The same methodology of complementing Euromod with administration is also being applied, through collaboration with the JRC, in Greece, Romania, Slovakia, Latvia and Spain,[7] while the Federal Social Security of Belgium has produced such a model independently of JRC.[8]

Additionally, France and Finland complained about the lack of information in available data that would enable them to perform DIA for more policies. In the French case, income data are only available on a yearly basis, while monthly information would be useful for performing DIA on some specific social benefits. Household budget surveys are key datasets to assess the impact of indirect taxation, also because currently, there is no alternative administrative data source on individual and household consumption. However, budget surveys suffer similar limitations to income surveys related to their correct representativeness of the underlying population and the limited information collected. Moreover, they do not record important consumption items. For instance, in Finland, the survey data on consumption lack variables about the consumption of alcohol and tobacco.

## IV. Main Findings: Factors That Ease or Obstruct the Use of Distributional Impact Assessment

The interviews conducted with the officials allow us to identify the factors that could help to expand DIA. To categorise the potential factors, we produced a set of 15 (pre-defined) factors that were proposed during the interviews with the degree of importance of each graded by the interviewee on a standard five-level Likert scale. The potential factors included issues such as changing the timing of the budget process, increasing the political awareness and human resources dedicated to DIA, as well as various possibilities for EC interventions (such as providing web interface for DIA software, offering training, providing guidance, discussing DIA at Economic and Financial Affairs Council (ECOFIN), providing clarification on the use and need of DIA in the DBP, and providing a template).[9]

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[7]For Spain, the project is at an early stage of collaboration with a team from the University of Valencia.
[8]Further details of JRC collaborations are available here: https://euromod-web.jrc.ec.europa.eu/research/projects/use-euromod-administrative-data. For the Belgium model here: https://www.microsimulation.ac.uk/euromod/models/belmod/.
[9]There was also space for interviewees to introduce their own factors.

Figure 4: Factors That Could Help to Increase the use of DIA in the Budgeting Process. [Colour figure can be viewed at wileyonlinelibrary.com]
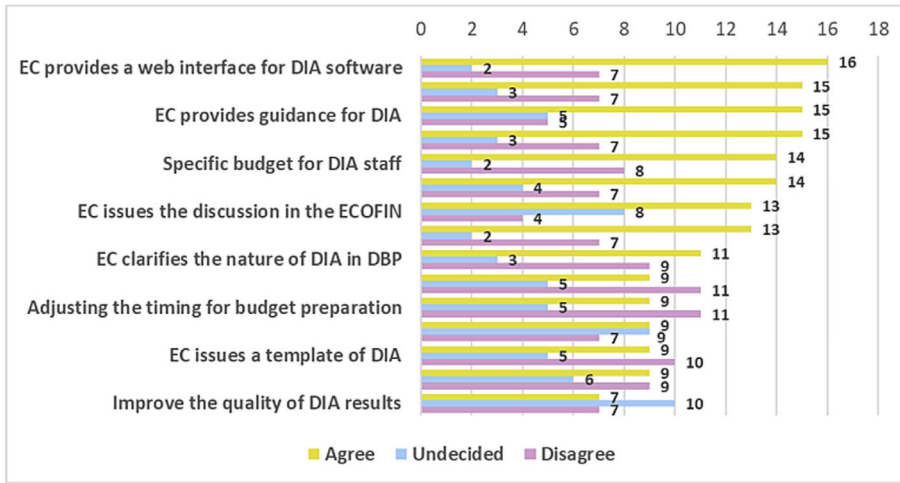
Notes: The analysis is based on 24 Member States. It does not include Cyprus, Romania and Luxembourg since no DIA is carried out in these European Union Member States. The sum of bars does not always equal to 24, because of missing answers. "Strongly disagree" and "Disagree" from one side and "Strongly agree" and "Agree" from the other side are considered jointly under the labels "Disagree" and "Agree".

The results, presented in Figure 4, clearly show a role for EC interventions.[10] The main enabling factors support the idea of direct action from the EC in terms of methodological guidance for conducting DIA by offering specific training on DIA and by providing a web interface to access DIA-dedicated software (Figure 4). These requests come mostly from those countries without a long and autonomous tradition of DIA.

There are some enabling factors, involving both organisational and political issues, that show some polarised results as the number of officials agreeing on this issue is slightly lower than those who are undecided or in disagreement. Some of the interviewed officers pointed out that increased availability of data and an adjustment in the timing of the budget process would surely help in expanding the DIA use (though some countries felt the timing issue was not relevant). Officers of some MSs highlighted the complexity of the approval process within their ministry. They also stressed that an increase in the political will at the national level, together with a specific budget (i.e., receiving additional funds), would encourage a wider development of DIA and its use during the budgetary process.[11]

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[10]As mentioned in footnote 3, the interviewees were aware that they were participating in an EC process. This may have indirectly encouraged them to highlight EC solutions.
[11]In addition to political will, we investigated whether the political *ideology* of the governing party might influence the intensity of DIA use. This was done using the Chapel Hill Expert Survey data (Jolly et al. 2022). However, no clear relationship emerged.

Looking specifically at the DBPs, for some officers, a direct request from the EC to include DIA in DBPs would be helpful. It is also interesting to stress that some factors are, overall, considered less important to help increase DIA use. For example, few interviewees consider that the EC should clarify the nature, extent and scope of the DIA to be included in the DBP or that the EC provides a DIA template for the DBP. This is not in contradiction to the wide-ranging request for more guidance from the EC. MSs are asking for guidance on how to implement DIA but would like to remain autonomous so they can decide how to present their results without being forced to use a predetermined common template that might not fit their specific needs.

Figure 5 ranks MSs by the intensity of DIA use. This is defined as the number of official documents where DIA analysis is included or performed in the period 2018–2020. While other proxy measures could be considered, we consider this as clear and precise and highly related to the production of DIA in each country. Across the EU, a diverse range of practices are observed ranging from zero documents incorporating DIA to a maximum of 11.

It is worth noting that Austria, Denmark, Croatia and Latvia belong to the group of countries that make frequent use of DIA only when considering all the distributional analyses carried out within the ministry during the process of preparing the national budget, regardless of whether they later appear in specific documents. If one were to consider only what has been published, the countries that use DIA most intensively are Sweden, the Netherlands, Ireland and France. The group of countries with a more moderate DIA use is larger, including Poland, Hungary, Bulgaria and Germany, which only show DIA performed but not published in any official documents.

The intensity of DIA use can be compared with other characteristics of the DIA environment in the countries such as the number of barriers (obstacles) that an MS may face in

Figure 5: Ranking of EU Member States According to Intensity of DIA Use, by Major Type of Documents. [Colour figure can be viewed at wileyonlinelibrary.com]
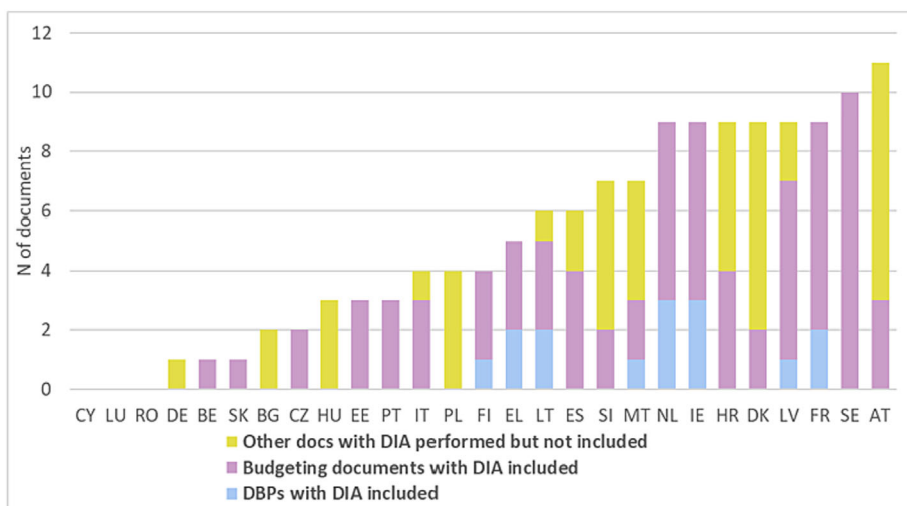
Note: The analysis refers to the 2018–2020 fiscal years.

implementing DIA (based on the sum of reasons that impede the inclusion of DIA based on a predefined list of items presented in Tables S3 and S4 in the Appendix) and the degree to which EU MSs would be more open to change regarding the intensity of DIA use.

Table 1 presents some descriptive statistics of the variable used in Figures 6 and 7. Figure 6 is limited to those EU MSs that do not include DIA systematically and shows that there is a negative correlation between more intensive use of DIAs and the number of barriers to using DIA. Specifically, the relationship between the two variables is strong ($R^2 = 0.38$) and negative as the linear coefficient suggests.

Table 1: Descriptive Statistics of the Relevant Variables

|	*No. of obs*	*Mean*	*SD*	*Min*	*Max*
Intensity of DIA use	27	5	3.5	0	11
Number of barriers to DIA use	15	5.2	2.0	1	7.5
Degree of openness to change	25	47.6	14.2	15	68

Note: The number of barriers to DIA use is missing or not applicable in BG, CY, DK, EL, FI, FR, HU, IE, LT, NL, RO and SE. The degree of openness to change is missing in CY and LU.

Figure 6: Relationship Between the Intensity of DIA Use (*x*-axis) and Barriers to DIA Use (*y*-axis). [Colour figure can be viewed at wileyonlinelibrary.com]
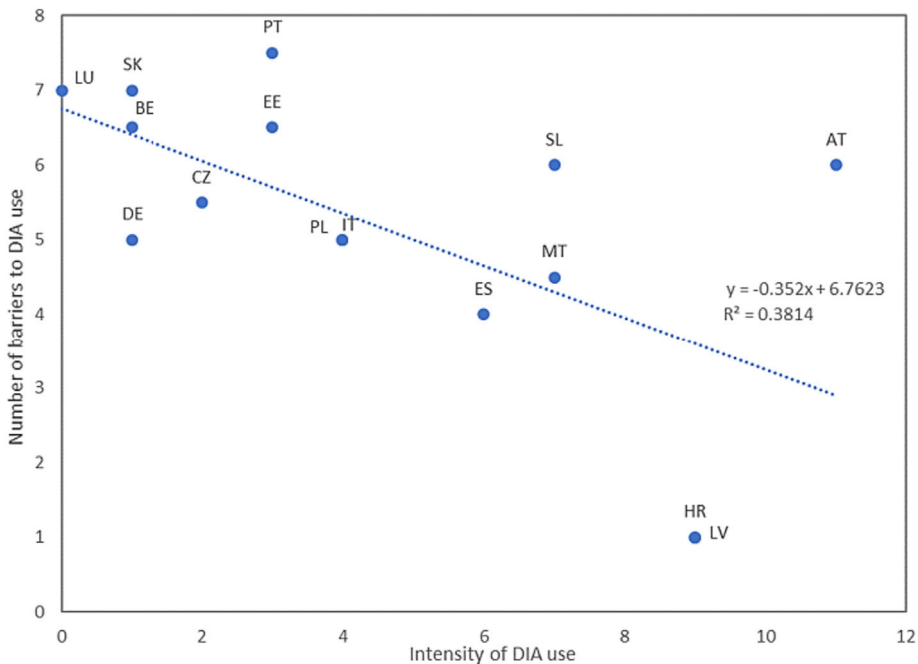
Note: Equation and R squared of the best-fit linear regression line are included in the figure. The analysis refers to the 2019–2020 fiscal years.

Figure 7: Relationship Between the Intensity of DIA Use (*x*-axis) and the Degree To Which Member States Would Be More or Less Comfortable With Implementing A Set of Proposals for Expanding Their Use of DIA in the DPB or the Budgeting Process (*y*-axis). [Colour figure can be viewed at wileyonlinelibrary.com]
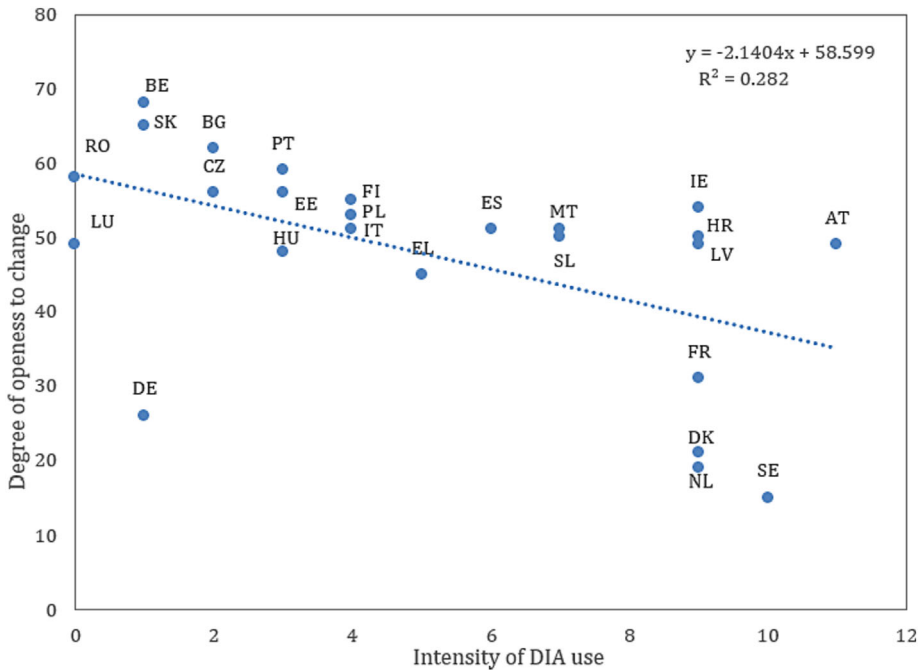
Note: Equation and R squared of the best-fit linear regression line are included in the figure. The analysis refers to the 2019–2020 fiscal years.

Figure 7 shows the relationship between the intensity of DIA use and the degree to which EU MSs would be more open to change regarding the intensity of DIA use or are more comfortable with the status quo with respect to expanding DIA use in the budgeting process. This is plotted along the *y*-axis and represents the level of agreement with 15 items, representing the number of developments that could help to introduce DIA in the budgeting process. The scatter plot shows a clear negative relationship: a higher frequency of DIA use tends to be associated with less willingness to expand DIA use.

This result is largely driven by a cluster of countries in the bottom-right quadrant (France, Denmark, the Netherlands and Sweden), which already have a high intensity of DIA use and are comfortable with what is already being done. On the other hand, several of the MSs with a lower intensity of DIA use would be fairly open to change, such as receiving help and advice on how to expand DIA use. Furthermore, amongst MSs with a lower intensity of DIA use, Germany is an outlier, being the only MS in the bottom-left quadrant. This exception could be explained by the fact that the documents drafted at the federal level are aggregations of what has been done at the Länder level and that the central government cannot impose a specific analysis requirement on the Länder government.

V. Suggestions for Increasing DIA and Concluding Comments

The findings presented regarding obstacles and enabling factors lead to key suggestions for increasing the use of DIA in the budgetary process across the EU. These suggestions were discussed during the interviews, and a summary of the discussions is provided here below.

Interviews suggested that the EC should provide MSs with more feedback regarding non-inclusion or limited inclusion of DIA in official documents. The EC could provide (non-binding) guidance on how DIA could be performed as officials of some MSs expressed interest in receiving such guidance. Some interviewed experts suggested that raising the issue at the ECOFIN would increase the momentum to expand in this area. These actions should not apply to all but mostly focus on MSs carrying out little DIA, to increase compliance with Article 6(3d) of EU Regulation No 473/2013, without posing an additional administrative burden on those who already perform extensive DIA. Our interviews also show that, on average, officers from countries with little DIA are among those most receptive to expanding their current practices.

Regarding DIA tools, there are basic procedures that all MSs could undertake if they are not already doing so. All MSs should have a dedicated team capable of performing DIA during the budget process. The level of expertise could start from very basic ones, for instance, making use of EUROMOD Online, which is specifically designed so that non-experts can use it with minimal guidance and enables DIA analysis for a limited range of policy reforms.[12]

For those MSs that are not yet using a microsimulation model, training a small number of staff members is strongly suggested. If this is not possible, the institution could consider using external experts, perhaps from academia. Once countries have established the capacity for using microsimulation models, more advanced modelling techniques can offer further insights. These include extending the microsimulation model with a labour supply model or a macroeconomic model.[13]

Most of these suggestions to the MSs can be structured into a possible EU Common Framework for DIA use in official documents, which could serve as guidance to MSs interested in expanding their use of DIA as well as in ensuring its quality (also with the potential benefit of contributing to harmonising DIA results across MSs). This Framework, which could provide MSs with more orientation on how to approach and (further) engage in DIA, can be structured along two levels, basic and advanced, which respectively provide suggestions reflecting good practices for DIA and best practices for DIA. The basic level can be primarily meant for those MSs that have not conducted any DIA yet (or that have little DIA expertise) and can be fulfilled by using the EUROMOD model or even simply EUROMOD Online. The advanced level can be aimed at those MSs that already conduct some DIA and that are interested in expanding their DIA use or in further improving its quality. It suggests, for instance, the use of richer data and more sophisticated modelling techniques.

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[12]EUROMOD Online is available at: https://euromod-web.jrc.ec.europa.eu/info-euromod-online. The tool runs the full EUROMOD model from a server, including all the features of the tax-benefit system, though the user is only able to alter selected key policy categories. Among other features, it allows users to simulate changes to rates and bands for personal income tax and social insurance contributions providing detailed results in terms of revenue and distributional impacts.
[13]Narazani et al. (2021) present a labour supply extension to a microsimulation model. Discussions of linking microeconomic and macroeconomic models can be found in Peichl (2009) and Bourguignon and Bussolo (2013).

MSs rely on data produced and validated by the national statistical institute, possibly in collaboration with Eurostat, which are broadly considered to be timely and of good quality. More interaction with the data-producing authorities is however suggested. A recurrent suggestion concerning the quality of DIA produced is that the experts conducting the analysis should be given sufficient time and resources to carry it out: currently, in most MSs the DBP is defined only hours before the October 15 deadline, allowing no time for a valid DIA, even if tools, expertise and data would allow it. Related to this, some experts pointed to the possibility of additional training and workshops on DIA, which would allow an exchange of best practices and ideas with other practitioners around the EU.

Devised with this perspective in mind, the suggestions in this paper are designed to support a fruitful DIA-related collaboration between EC and EU MSs, which are tailored to their needs, capabilities, and experience with DIA. This supports and confirms what Atkinson (2009) suggested nearly 15 years ago. As regards the findings of this study, the next steps would be – while also taking into account the points on DIA in the European Pillar of Social Rights Action Plan – to communicate them further to the MSs and to discuss with them how to best implement the study's suggestions, starting, for instance, by setting up workshops on DIA in EU or single MSs.

Regarding the inclusion of DIA in budgetary documents, most interviews highlight that the more frequently it features, the more central it becomes to the budgetary process. Where DIA is widely used, the benefits are recognised, such as avoiding adopting measures that may cause a negative social reaction due to adverse distributional impacts. DIA has a clear role to play in the understanding and potential reduction of economic inequality and to evaluate the actual impact of specific reforms and investments. Raising awareness of the advantages of performing DIA analysis is important to empower citizens and policy makers and make them more knowledgeable of the distributional consequences of proposed policies. DIA plays a crucial role in evidence-based policy-making, enabling the implementation of successful policies and ensuring the credibility of policy actions. This significance is particularly relevant as the EU and its MSs strive for socially fair digital and green transitions while grappling with challenges associated with the increasing cost of living. As stated by the European Commission (2022a, p. 1), 'Europe's unique social market economy is the bedrock of its prosperity' and the comprehensive utilization of DIA is a crucial element in achieving the objective of leaving no one behind.

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Data availability statement

The text mining analysis performed using official documents and the software R can be easily replicated as all documents are publicly available. We are happy to share the code used for the first part of our analysis. To this aim, we created a folder in GoogleDrive where all relevant files can be downloaded: https://drive.google.com/drive/folders/1LclDAh7789Dicg8VG62DpWiv6srOQz4T?usp=sharing. This folder contains a file for basic instructions (Readme.txt), a file with the R script (text_mining_code. Rmd) and all input files downloaded from the EC website and used in the analysis. Please bear in mind that the whole folder is rather large (about 250 MB). As for the data obtained through interviews by the research team and collaborators with EU Member States' Ministry officials, we cannot share them as many of the interviewees preferred to maintain anonymity. However, we are happy to publish the list of the interviews dates as follows:

Member state	Organization	Date of the (online) interview
AT	Ministry of Finance	18 February 2021
BE	FPS Policy and Support & Ministry of Finance	25 March 2021
BG	Ministry of Finance	24 March 2021
CY	Ministry of Finance	12 January 2021
CZ	Czech Fiscal Council & Ministry of Finance	4 March 2021
DE	Ministry of Finance & Fraunhofer Institute for Applied Information Technology	25 January 2021
DK	Ministry of Finance	14 January 2021
EE	Ministry of Finance	30 March 2021
EL	Council of Economic Advisors	12 January 2021
ES	Ministerio de Hacienda	15 March 2021
FI	Ministry of Finance	5 March 2021
FR	Ministry of Finance	25 February 2021
HR	Ministry of Finance	28 January 2021
HU	Ministry of Finance	8 January 2021
IE	Department of Finance	13 January 2021
IT	Ministry of Economy and Finance	19 January 2021
LT	Ministry of Finance	19 January 2021
LU	Ministry of Finance	15 January 2021
LV	Ministry of Finance	22 January 2021
MT	Ministry for Finance and employment	7 January 2021
NL	Ministry of Finance & Ministry of Social Affairs and Employment	29 January 2021
PL	Ministry of Finance	4 March 2021
PT	Ministry of Finance	9 February 2021
RO	Ministry of Finance	8 April 2021
SE	Ministry of Finance	5 February 2021
SK	Ministry of Finance	14 January 2021
SL	Ministry of Finance	15 January 2021

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Figure S1. The yearly timeline of the European and National Semesters. Source: https://tinyurl.com/2cvdafcv

Table S1. List of DIA Keywords for text-mining.

Table S2. DIA presence (at least one DIA occurrence) ten official budget-related documents at national level (years 2019-2020).

Table S3. Pre-defined possible issues mentioned to the interviewed persons to identify the obstacles that prevent the use of DIA in the DBP/budgeting process (Number of barriers to DIA use).

Table S4. Pre-defined factors that could help the use of DIA in the budgeting process (Degree of openness to change).