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Indexing wages to inflation in the EU: Fiscal drag and benefit erosion effects

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European Commission

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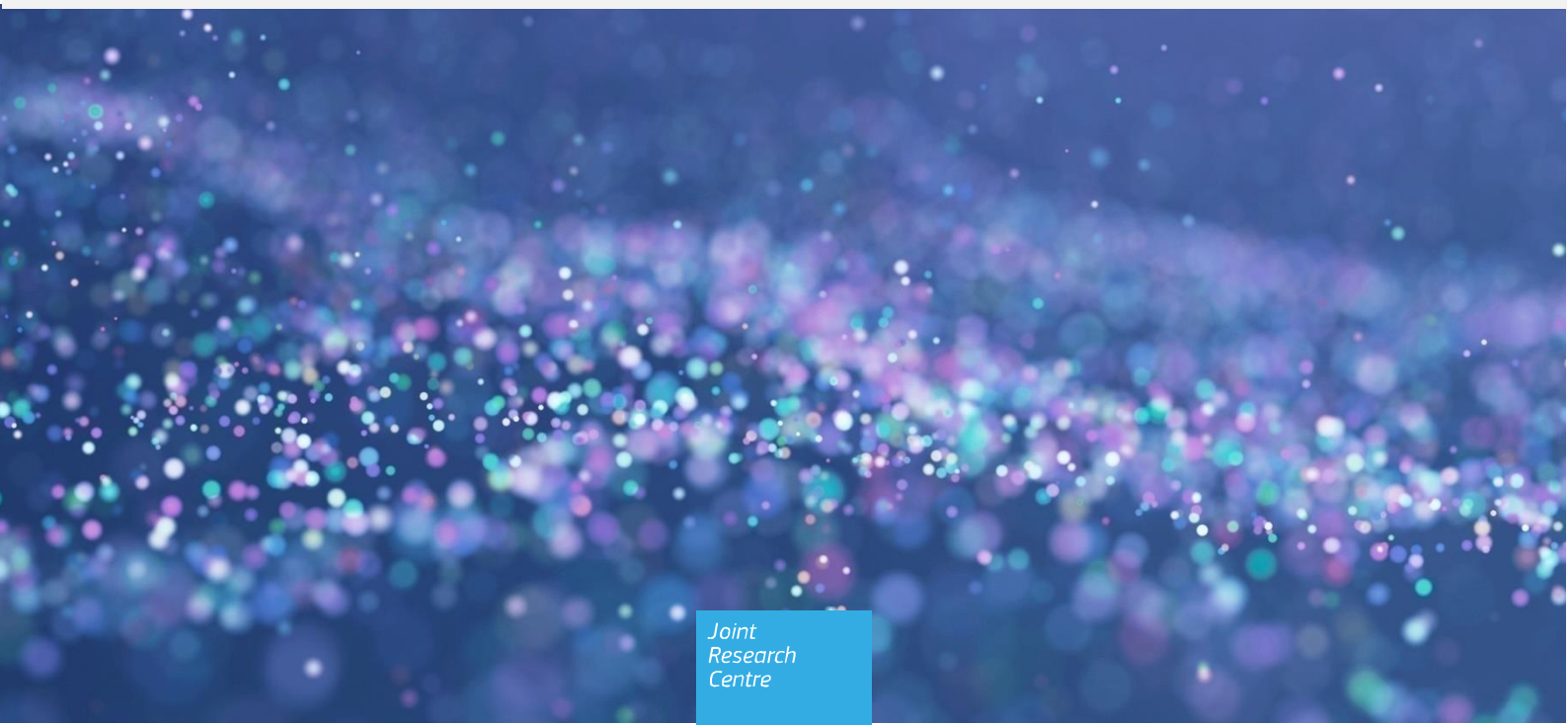

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Contents

Abstract

In 2022 inflation hit European economies in a severe way. To protect the purchasing power of households, EU Member States adopted a series of exceptional fiscal policy measures. In this paper, we turn our focus on wage indexation, a policy option that has been relatively less explored in the relevant literature. The objective of the research is to analyse the (first-order) fiscal and distributional impact of wage indexation and of its two main subsequent effects, fiscal drag and benefit erosion. Using EUROMOD, the tax-benefit microsimulation model for the EU, we construct three hypothetical scenarios with uniform/diversified inflation shocks and with/without compensation schemes for the income losses caused by benefit erosion. We find that the budgetary impact of wage indexation varies widely among European countries. Interestingly, we also observe that in most countries, the relative magnitude of fiscal drag and benefit erosion is not affected by the magnitude of the increase in employment income. Our estimates suggest that in almost half of the countries, fiscal drag and benefit erosion cause an implicit increase in government revenues sufficient to finance an indexation of benefits and pensions to the inflation of that year. The latter would be associated with a substantial decrease in income inequality in the vast majority of EU Member States. Finally, we discuss how the existing automatic indexation adjustments embedded in EU countries' personal income tax schedules affect the magnitude and distributional implications of fiscal drag.

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Executive summary

In 2022, inflation rates increased in many countries all over the world. To protect households and limit the impact of the increase in input costs for firms, EU Member States adopted an array of exceptional fiscal policy programmes. Those included price subsidies/caps, income support measures as well as indexation policies.

In this paper we attempt to analyse wage indexation as a policy option to protect the purchasing power of households. In the short run, implementing wage indexation policies has two well-known, and largely unintended, consequences: fiscal drag and benefit erosion. Fiscal drag refers to a situation in which earnings growth may push more taxpayers into higher tax brackets and, therefore, it leads to a proportionally higher tax burden due to the progressivity of the system. If benefits are related to wages, a wage indexation policy could also lead to benefit erosion if benefits are not indexed in the same way wages are.

The methodology followed includes a counterfactual microsimulation analysis. Three hypothetical scenarios are constructed: in the first one, we assume that employment incomes increase by 5% in all EU countries; in the second one, employment incomes increase by the forecasted GDP-based inflation for 2022; in the third scenario we assume the same employment income increase as in scenario 2 and that, additionally, all benefit and pension recipients receive a compensation that is proportional to the forecasted increase in prices. Finally, we examine the performance of the existing automatic indexation adjustments embedded in Member States' personal income tax schedules.

Our results suggest that a significant part of the simulated increase in wages is taken away due to fiscal drag and benefit erosion. As a result, the rise in disposable income generated by wage indexation is less than proportional. We also observe that in most countries the relative magnitude of fiscal drag and benefit erosion is not affected by the magnitude of the increase in employment income. The compensation mechanism simulated in scenario 3 is found to be inequality decreasing and, in almost half of the EU countries, could be financed with the extra revenues generated by fiscal drag. Finally, we demonstrate that the existing indexation mechanisms are able to reduce the magnitude of fiscal drag, without fully alleviating it, leaving scope for possible policy improvements.

1 Introduction

In 2022, inflation rates increased in many countries all over the world. In the European Union, the average annual rate measured by the harmonised index of consumer prices (HICP) rose from 5.6% in January 2022 to 10.4% in December of the same year. This magnitude of increase was largely unprecedented in advanced economies since the 1970s (Beer et al., 2023). The average figure hides that the surge in consumer prices hit some countries more severely than others. This is true especially for the Baltic countries, where annual HICP rate exceeded 20% in the second part of the year (Eurostat, 2023).

Inflation is relevant for understanding inequality because it can have a disproportionate impact on different groups within a society and, hence, further widen the gap between the rich and the poor (Amores, Basso et al., 2023; Jaravel, 2021). In an inflationary environment, unevenly rising prices distort the purchasing power of recipients and payers of fixed interest rates and reduce the purchasing power of consumers. To protect households and limit the impact of the increase in input costs for firms, EU Member States adopted an array of exceptional fiscal policy programmes. Those included price subsidies/caps, income support measures as well as indexation policies. In 2022, the net budgetary cost of measures to mitigate the impact of high energy prices was estimated at 1.2% of GDP in the EU (EC Autumn Forecast, 2023). Until that year, these kinds of policy responses to inflation were largely non-existent in the EU, and their impact still remains relatively unexplored.[1]

In this paper, we attempt to analyse wage indexation as a policy option to protect the purchasing power of households. This option was heavily used in the high-inflation context of the 1970s, but was later disregarded, as it was held responsible for the subsequent stagflation of the early 1980s. However, recent research suggests that the wage indexation mechanisms currently in place in EU countries are unlikely to trigger the price-wage spirals of the past (Checherita-Westphal, 2022; Koester & Grapow, 2021). The main reasons are related to the limited share of employees covered by such mechanisms and the fact that energy prices are typically excluded from the price index to which wages are adjusted (Matsaganis & Theodoropoulou, 2022). Hence, this policy option has returned on the table as a possible way of offsetting the negative impact of inflation for households and has triggered important questions concerning its impact on public finances and economic efficiency. Our main objective is to explore the fiscal and distributional outcomes of a mechanism of indexation of employment income to inflation in all EU countries.

In the short run, implementing wage indexation policies has two well-known, and largely unintended, consequences: fiscal drag and benefit erosion. Fiscal drag refers to a situation in which earnings growth may push more taxpayers into higher tax brackets, and therefore it typically leads to a proportionally higher tax burden due to the progressivity of the system. In principle, this can be overcome by the use of appropriate indexation rules in the tax system of a country. In the absence of such rules, fiscal drag can alter the desired level of progressivity and redistribution of the tax system (Fuenmayor et al., 2005). It is also an important channel via which inflation affects tax revenues (Immervoll, 2005).[2] The lack of benefit indexation rules (both in terms of benefit amounts and in terms of income thresholds used in the design of means-tested benefits) may lead to decreasing real values of social benefits and/or loss of benefit eligibility, a situation which is known as benefit erosion.

The methodology followed to explore the (first-order) impact of wage indexation, and its subsequent fiscal drag and benefit erosion effects, relies on a set of counterfactual scenarios. Three hypothetical scenarios are constructed: in the first one, we assume that employment incomes increase by 5% in

[1] An assessment of the distributional impact of the price cap policies introduced in 2023 in Germany, the Netherlands and Austria is presented in Amores, Christl, et al. (2023).

[2] Immervoll (2005) lists three main channels of interaction between inflation and tax revenues. First, when inflation is high, a long collection lag can reduce the real value of the tax revenue and lead to unequal treatment of taxpayers, depending on whether they pay as they earn, or self-assess their incomes once a year. Second, income taxes are assessed in nominal terms and, therefore, ignore the deterioration of the purchasing power of consumers with respect to the period for which tax liabilities are calculated. The third channel, the most relevant for this analysis, is the fiscal drag: the erosion of the real value of tax-bracket limits.

all EU countries.[3] In the second one, employment incomes increase by the forecasted GDP-based inflation for 2022. In the third scenario we assume the same employment income increase as in scenario 2 and assume, additionally, that all benefit and pension recipients receive a compensation which is proportional to the forecasted increase in prices, namely a scenario in which an attempt at offsetting benefit erosion takes place. To perform this analysis we rely on EUROMOD, the tax-benefit microsimulation model for the EU. Finally, the paper also attempts to examine the performance of the existing automatic indexation adjustments embedded in Member States' personal income tax (PIT) schedules.

We aim to contribute to the existing literature in three ways. First, by assessing the impact of wage indexation on the tax-benefit systems of all EU Member States. European and international organisations such as the OECD (OECD, 2023) and the IMF (IMF, 2023) have emphasised the significant distortionary effects that fiscal drag and benefit erosion can have on economies. This topic has however attracted only limited empirical investigation (Immervoll, 2005; Fuenmayor, 2005) and, to the best of our knowledge, an ex-ante policy assessment relying on a framework ensuring comparable analysis across countries as presented here has never been done for the EU. Analysing the EU yields a wide cross-country diversity in terms of tax-benefit features and underlying wage distributions. In turn, the analysis helps to identify countries that are most susceptible to fiscal drag and benefit erosion and those where the relative impact of those matters is more limited. Second, we report potential losses in disposable income due to fiscal drag and quantify their distributional and budgetary effects. Third, we try to explore the effective impact of existing indexation mechanisms by tracking the effect of countries' PIT legislation related to automatic indexation and measuring their effectiveness in mitigating the impact of fiscal drag.

Our results show that there is potential for a significant part of an increase in wages, driven by inflation, to be offset by fiscal drag and benefit erosion in the EU countries. As a result, the rise in disposable income generated by wage indexation is less than proportional. Putting in place measures that compensate for the impact of benefit erosion would prevent increases in inequality and, in almost half of the EU countries, could be entirely financed with the extra revenues generated by fiscal drag. Finally, we demonstrate that the indexation mechanisms that are in place in some EU countries contain but do not supress the fiscal drag, pointing at scope and need for further policy action to contain adverse impact of high inflation episodes.

The paper is organised as follows. Section 2 provides a brief overview of the related literature. In Section 3 we proceed by illustrating the methodology of the analysis and the data used. Section 4 illustrates the main results of the research. Conclusions follow in Section 5.

[3] Note that 5% broadly represents the average inflation across the EU during the recent surge in inflation in 2022.

2 Literature review

According to Tanzi et al. (1987), there are several interaction mechanisms between inflation and fiscal aggregates. The most intuitive is the one that acts on primary public expenditures and tax revenues. Governments can expect an increase in tax revenues through two channels. First, a higher rate of inflation mechanically increases revenues from VAT and other indirect taxes that are proportional to prices. Second, nominal increases in employment income and firm profits translate into higher revenues from personal income tax and corporate income tax. On the other hand, public expenditure generally increases too. It happens not only due to higher price of goods and services purchased by the state, but also because compensations of public employees and pensions are typically indexed to inflation (Attinasi et al., 2016).

The macroeconomic effects of wage indexation, notably its impact on inflation, have attracted significant economic research interest since the 1970s. In his analysis of the oil price shock of 1974, Fischer (1983) noted a potential for wage indexation to cause higher inflation. However, in a cross-sectional analysis of forty countries he found no evidence that countries with some form of wage indexation experienced (relatively) higher inflation in the aftermath of the oil shock. In the 1990s, Ball and Cecchetti (1991) devised a model of staggered wage setting to analyse the implications increasing the proportion of wage contracts covered by indexation. According to their findings, increased prevalence of wage indexation can lead to more inflation. A different result was however reported by Holland (1995), who examined the link between inflation and wage indexation in the post-war USA, using information concerning cost-of-living adjustments in collective bargaining agreements, finding that there was no evidence that wage indexation affected inflation in the USA.

Cost-of-living adjustments in the USA have also been analysed by Ragan and Bratsberg (2000). They note that a long period of low inflation decreased the relevance of such mechanisms. However, a return of inflationary volatility could trigger a resurgence of increased relevance of such mechanism via increased wage indexation coverage across workers. This result was confirmed by Ascari et al. (2011).

Most of the research on wage indexation focusses on the United States. However, some form of automatic adjustment of wages to prices exists also among a significant group of countries in the European Union. The debate on the merit of adopting such mechanism resurfaced recently, in a context of persistently higher inflation in many economies. For example, Matsaganis and Theodoropoulou (2022) suggested extending indexation as a possible measure to protect real incomes. Moreover, they stress that this measure would be less distortive than other measures enacted by some European countries to counteract the negative effects of inflation (such as price caps and price subsidies).

According to Koester & Grapow (2021), four indexation regimes can be distinguished across euro area (EA) countries: (a) an automatic indexation regime that only applies to around 3% of private sector employees in the EA in 2021[4]; (b) a regime in which indexation is embedded in a formal wage negotiation mechanism that concerns around 18% of private sector employees in the EA; (c) a regime where indexation only applies to minimum wages that involves around 18% of private sector workers in the EA; and (d) a regime in which there are no formal wage indexation rules. This regime applies to around 60% of private sector employees in the EA in 2021. The authors also note that the likelihood of those schemes triggering second-order effects in the context of the recent inflationary episode is very limited, as most of them use inflation measures that exclude the energy component of inflation.

A conceptual framework linking inflation, wage increases and fiscal drag has been laid out by Lee (2009). According to his work, fiscal drag can make tax systems less progressive. This occurs because inflation reduces the real values of the non-indexed tax brackets. Consequently, taxpayers end up being taxed with higher marginal rates (a phenomenon called bracket creep) even if they maintain

[4] The few countries where automatic wage indexation rules apply to a large share of private sector employees are Belgium, Cyprus, Malta and Luxembourg.

their real income constant (e.g. when wage indexation takes place following and increase in inflation). In addition, because of inflation, the real value of cash benefits, tax-free allowances, flat-rate tax deductions, and tax credits decreases (contributing to the phenomenon called benefit erosion).

Microsimulation is commonly used to illustrate fiscal drag and benefit erosion dynamics under alternative scenarios. An early example is Immervoll (2005), who analysed the sensitivity of the tax-benefits systems of Germany, the Netherlands and UK. His results showed that the erosion of nominal tax parameters reduced the progressivity of the tax-benefit system in all countries under examination. Immervoll et al. (2006) used EUROMOD to assess the sensitivity of poverty rates to several macroeconomic changes, including the growth of gross earnings. Their results showed that, without indexation of tax thresholds, the tax burden increases while benefit incomes fall relative to market incomes. Sutherland et al. (2008) analysed the consequence of extending for 20 years the existing indexation policies for tax-benefit parameters in the UK. According to their results, doing this would have increased significantly child poverty while reducing the poverty rate of the elderly. Investigating the case of Brazil, Levy (2010) concluded that the progressivity of the country's tax system would decrease in the absence of appropriate adjustments of tax parameters to inflation. Paulus et al. (2020) analysed actual indexation rules in a selection of European countries over one decade. The authors concluded that poverty and inequality are significantly decreased when countries put in place the uprating (i.e. indexing) of nominal tax parameters to avoid fiscal drag and benefit erosion.

3 Methodology and data

In this work we make use of EUROMOD, the open-source tax-benefit microsimulation model for the EU.[5] The model uses survey data on gross incomes, labour market status and other characteristics of the individuals and households, which it then applies to the tax and benefit rules in place in order to simulate direct taxes, social insurance contributions and entitlements to cash benefits. The components of the tax–benefit system that cannot be simulated (for example, those depending on prior contributions such as pensions) are read off the model's underlying input data. The latter are drawn from the 2019 EU-SILC (2018 income reference period), a dataset which is specifically designed to provide detailed information on income distribution and social inclusion.

One important advantage of microsimulation in general, and EUROMOD in particular, is attribution. The model can be used to disentangle the effects of each policy, or other economic developments separately, taking into account the complex ways in which taxes interact with benefits and with each other. A direct analysis of actual data cannot do this equally well. Moreover, significant efforts have been made to address the issues of tax evasion and benefit non-take-up in order to enhance the credibility and accuracy of this work. Detailed information about the countries for which such adjustments have been implemented can be found in Maier et al. (2022).

EUROMOD has been validated both at micro and macro level and has been tested in numerous applications. Examples of such applications include, among others, several studies on the distributional impact of tax-benefit systems and on how policies have shaped income distributions over time, disentangling income changes due to policy reforms from changes due to evolution of market incomes and changes in populations' underlying characteristics, introducing new EU-wide policies and stress-testing the welfare state. For a comprehensive overview, see Sutherland and Figari (2013).

The tax-benefit systems used in the **baseline** simulation refer to those in place as of June 2021, as coded in EUROMOD.[6] The methodological strategy that was followed to explore the impact of wage-indexation-driven fiscal drag and benefit erosion includes a counterfactual analysis in which the baseline scenario is compared with three hypothetical scenarios:

- **Scenario 1** assumes that employment incomes increase by 5% in all EU countries.[7] The aim of this scenario is to highlight that equal inflation (and full wage indexation in all countries) has different implications across countries, due to differences in tax-benefit systems.
- **Scenario 2** assumes that employment incomes increase by the forecasted GDP-based inflation for 2022, based on the Autumn 2022 EC forecast. The aim of this scenario is to account for the fact that inflation differed across countries in 2022 (while still retain the assumption of full wage indexation in all countries).
- **Scenario 3** assumes the same employment income increase as in Scenario 2. Additionally, we assume that all benefits and pensions increase by the forecasted CPI-based inflation for

[5] Detailed information about EUROMOD can be found in https://euromod-web.jrc.ec.europa.eu/.

[6] For more information about the different tax-benefit policies simulated in EUROMOD for each country, see the latest EUROMOD Country Reports: https://euromod-web.jrc.ec.europa.eu/resources/country-reports.

[7] In this work wages and employment income have the same meaning (and are hence used interchangeably), as hours of work do not change.

2022 (based on the Autumn 2022 EC forecast), to illustrate the impact of milder benefit erosion.

In scenarios 1 and 2, all tax-benefit policies are kept constant, i.e. same as in the baseline scenario. This way, it is possible to isolate the distributional and budgetary impact of the fiscal drag and benefit erosion caused by the 2021 tax-benefit structure across EU Member States under different inflation scenarios, while assuming full wage indexation.[8] In scenario 3, we also (partly) offset benefit erosion, and estimate the fiscal and distributional effects of this intervention.[9] The analysis is static, in the sense that it does not attempt to capture any behavioural adjustments of individuals in response to changes in incomes, tax liabilities and benefits received.

More formally, let f(Y,P) denote a distribution of household disposable income as a function of developments in market incomes (Y) and government policies (P). The fiscal and distributional impact of the simulated scenarios (say s_i) versus the baseline (say b), can be denoted as:

$D_1 = f(Y_{s1}, P_b) - f(Y_b, P_b)$

$D_2 = f(Y_{s2}, P_b) - f(Y_b, P_b)$

$D_3 = f(Y_{s2}, P_{s3}) - f(Y_b, P_b)$

where P_{s3} denotes a policy system with the same taxation policies as in the baseline, but with the inflation-indexed benefit policies described in scenario 3. The forecasted GDP and CPI-based inflation for 2022 used for the construction of the counterfactual scenarios can be found in the Appendix (Table A.1).

[8] Note that in all simulated scenarios benefit erosion solely occurs because income thresholds of means-tested benefits are kept fixed at their baseline levels.

[9] We offset benefit erosion caused by the loss of the real value of benefits due to inflation, but we do not offset benefit erosion caused by the lack of indexation of means-tested benefits' income thresholds.

4 Results

4.1 Budgetary impact and other fiscal estimates

Tables 1 and 2 report the impact of scenarios 1 and 2, respectively, on total direct tax revenues, employers and employees SIC revenues, expenditure on means-tested benefits and mean equivalised disposable income.[10] They also illustrate the budgetary impact of wage indexation under the two scenarios. In this work, the government budget is defined as the sum of direct taxes and social insurance contribution (SIC) minus pensions, civil servants' increase in salaries (due to wage indexation), means-tested benefits and non means-tested benefits. Due to data limitations, changes in indirect taxation are beyond the scope of analysis (EU-SILC provides no information on consumption). The budgetary impact is computed as the difference compared to the baseline, for each scenario, and reported as a percentage of GDP.

The most important findings can be summarised as follows. First, the analysis confirms the theoretical prediction of a positive impact of fiscal drag and benefit erosion on the government budgetary position. However, this impact seems to be highly heterogeneous among the EU Member States, reflecting differences in governments' revenues structures. Looking at scenario 1, the estimated budgetary impacts vary from 0.5% of GDP in the case of Malta to 1.57% of GDP in the case of Belgium.[11] The magnitude of these impacts greatly depends on the absolute values of revenues from direct taxes and SIC in the baseline scenario; countries with high initial levels of direct tax and SIC revenues tend to experience larger increases in revenues and larger decreases in expenditures due to fiscal drag and benefit erosion, respectively. Intuitively, a larger revenue-to-GDP ratio gives more scope for large fiscal drag effects, while, similarly, a larger expenditure-to-GDP gives more scope for large benefit erosion effects.[12] Take, for instance, Belgium, France and Austria, three countries where the public budget is more impacted by fiscal drag and benefit erosion. They are also the three countries with highest tax-to-GDP ratios in the EU, according to Eurostat (2022).[13] The opposite holds for Malta and Ireland. Intuitively, when two countries with similar GDPs but different tax-benefit systems are compared, we would expect the country with the higher tax revenues to experience a higher budgetary increase (in absolute terms) because of fiscal drag. In turn, this would lead to a relatively larger budgetary effect for this country.

The estimated increases in direct tax revenues also vary widely among EU countries in scenario 1: from 3.8% in Greece to 9.3% in Croatia. In 17 out of the 27 countries the increases in direct tax revenues are found to be higher than 6%, i.e. higher than the assumed indexation of wages to inflation, indicating that fiscal drag has a significant role in the majority of countries. The estimated increases in employers and employees SIC vary from 0% in the case of Denmark (as contributions to Denmark's supplementary labour market pension scheme are fixed amounts that do not depend on employment income) to 5.8% in the case of Belgium. In 21 out of the 27 EU Member States the SIC revenue increases are (almost) proportional to the employment income increases, varying from 4.1% to 5.8%. Deviations from full proportionality are due to the existence of lower/upper thresholds in the design of those policies.

[10] Equivalised disposable income is defined as the total disposable income of a household adjusted for the household composition by taking into account economies of scale. In Eurostat wording, it is the 'total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults; household members are equivalised or made equivalent by weighting each according to their age, using the so-called modified OECD equivalence scale'. This scale assigns a weight of 1 to the household head, 0.5 to other adults (14 year-old or older) and 0.3 to children (younger than 14). The result of the calculation is attributed to every member of the household.

[11] Note that the average impact of 0.2 (i.e. on average 1% for an inflationary shock of 5%) is in line with evidence reported in the literature – see e.g. Attinasi et al. (2016).

[12] More specifically, larger revenue shares or expenditure shares give rise to larger effects even measured in proportion of GDP due to non-linearity effects – i.e. more potent fiscal drag and benefit erosion effects in proportion of GDP as those shares increase.

[13] The figure reported by Eurostat combines all taxes (not just personal income tax) and social security contributions.

On the benefit side, means-tested benefits are on average reduced by 1.9%.[14] The reduction is most prominent in the case of Czechia (-5.9%), followed by Croatia (-3.6%), and less prominent in the case of Hungary, where the reduction is close to zero. The most important reason behind the significant reductions in means-tested benefits is the existence of several income thresholds and benefit levels in these policies.

Changes in mean equivalised disposable income depend on a number of factors, apart from the changes in employment income and the resulting changes in the above-mentioned tax-benefit instruments; those include the composition of income sources in the population (e.g. employment income earners vs self-employed, pensioners, unemployed/inactive, etc.) as well as the household structure of each population. In scenario 1, they are estimated to vary from 1.8% in the case of Italy and Greece to slightly more than 3%, in the case of Estonia, Romania, Latvia, Hungary and Bulgaria. We can thus observe that simulated wage increases are not automatically translated into disposable income increases of the same magnitude, as they only affect a specific segment of the population and a significant part of them is taken away by the tax-benefit system.

In scenario 2, employment incomes are assumed to increase by 5.2% on average,[15] but this time with great variability across countries, with increases ranging from around 2% to 3% in the cases of France and Portugal to close to 10% in the cases of Poland, Bulgaria and Romania. Those increases are based on the GDP-related inflation developments of all EU countries. The findings of this scenario point at patterns similar to those shown for the scenario 1. In particular, the budgetary impact range from 0.5 to 1.6 is similar to that shown for scenario 1, which, interestingly, suggests that the dispersion in inflation in 2022 may not have substantially increased the dispersion in budgetary developments. On average, direct tax revenues increase by 6.3%, with the most important increases estimated in Czechia, Estonia and Slovakia (above 10%). Revenues from SIC increase by 4.7% on average, closely following the increase in wages. Expenditure in means-tested benefits decreases by 2% on average and mean equivalised disposable income goes up by 2.9%.

Table 1. Budgetary impact (as % of GDP), relative budgetary impact and percentage change in direct taxes, SIC, means-tested benefits & disposable income – Scenario 1

Country	Empl. income	Budgetary impact	Relative budgetary impact	Direct taxes	SIC	Means-tested benefits	Disposable income
AT	5	1.3	25.5	7.3	4.4	-0.8	2.2
BE	5	1.6	31.4	6.3	5.8	-0.6	2
BG	5	0.6	12.8	4.5	4.1	-1.5	3.4
CY	5	0.9	17.4	8.2	4.5	-2.3	2.9
CZ	5	0.8	16.7	8.1	4.9	-5.9	2.9
DE	5	1.1	22.6	6.9	3.3	-2.8	2.7
DK	5	1	20.5	3.9	0	-1.2	2.7
EE	5	1	20	6.7	4.9	-1.6	3.2
EL	5	0.5	10.7	3.8	4.9	-2	1.8
ES	5	0.9	17.8	7	3.5	-1	2.6
FI	5	1.3	25.1	5.4	5	-1.6	2.3
FR	5	1.3	25.6	4.2	5.6	-2.2	2.5
HR	5	0.8	15	9.3	5.1	-3.6	2.9

[14] Note that the means-testing of those benefits is assumed to happen without any time lag. In reality, the incomes accounted for in the means-testing may have a significant time lag.

[15] In line with the calibration retained under scenario 1.

HU	5	0.6	12.1	4	5.1	-0.1	3.3
IE	5	0.6	12.2	6.6	5.4	-1.1	2.4
IT	5	1	20	4.6	4.3	-1.3	1.8
LT	5	0.9	17.9	6	4.9	-2.4	2.8
LU	5	0.7	13.4	6.4	3.9	-3	2.5
LV	5	1.1	21.4	6.2	4.8	-1.6	3.3
MT	5	0.5	10	8.2	2.6	-1.5	2.9
NL	5	1	19.4	8.2	3.4	-1.6	2.4
PL	5	0.7	14.5	4.3	4.7	-0.9	2.9
PT	5	1	20.5	6.1	5	-2.5	2.5
RO	5	0.7	14	4.8	5	-1.2	3.2
SE	5	1.3	25.9	5.6	5	-1.6	2.7
SI	5	1.1	21.4	6.9	4.7	-3	2.7
SK	5	0.9	18.5	8.2	5	-3.4	2.9

Source: Own elaboration using EUROMOD version I4.0+.

Note: Countries are ranked alphabetically.

Table 2. Budgetary impact (as % of GDP), relative budgetary impact and percentage change in direct taxes, SIC, means-tested benefits & disposable income – Scenario 2

Country	Empl. income	Budgetary impact	Relative budgetary impact	Direct taxes	SIC	Means-tested benefits	Disposable income
AT	3.4	0.9	25.5	5	3	-0.6	1.5
BE	4.5	1.4	31.3	5.7	5.2	-0.5	1.8
BG	9.5	1.4	12.7	8.6	7.6	-3	6.4
CY	4.5	0.8	17.4	7.4	4.1	-2.1	2.6
CZ	7.4	1.2	16.7	12	7.3	-8.5	4.3
DE	5.4	1.2	22.6	7.5	3.6	-3	3
DK	3.3	0.7	20.5	2.5	0	-0.8	1.8
EE	8.1	1.6	20	10.9	7.9	-2.5	5.2
EL	4.8	0.5	10.7	3.7	4.7	-1.9	1.7
ES	3.7	0.5	17.9	5.1	2.6	-0.7	1.9
FI	3.8	1	25.1	4.1	3.8	-1.2	1.7
FR	2.2	0.6	25.6	1.8	2.5	-1.1	1.1
HR	3.8	0.6	15.1	7	3.9	-3	2.2
HU	5.6	0.7	12.1	4.5	5.7	-0.1	3.7
IE	4.8	0.6	12.2	6.4	5.2	-1	2.3
IT	3.1	0.6	20	2.9	2.7	-0.8	1.1
LT	7.4	1.3	17.8	8.9	7.2	-3	4.1
LU	4	0.7	13.4	5.1	3.2	-2.5	2
LV	7.2	1.5	21.4	9	7	-2.2	4.7
MT	2.8	0.7	10.3	4.6	1.5	-0.8	1.6

NL	3.8	0.7	19.5	6.2	2.6	-1.3	1.8
PL	10	1.2	14.5	8.6	9.4	-1.9	5.8
PT	2.9	0.6	20.5	3.5	2.9	-1.5	1.5
RO	9.5	1.3	14	9.1	9.5	-2.4	6.1
SE	4.3	1.1	25.9	4.8	4.3	-1.4	2.3
SI	3.3	0.3	21.4	4.6	3.1	-2	1.8
SK	6.6	1.2	18.6	10.8	6.7	-3.9	3.9

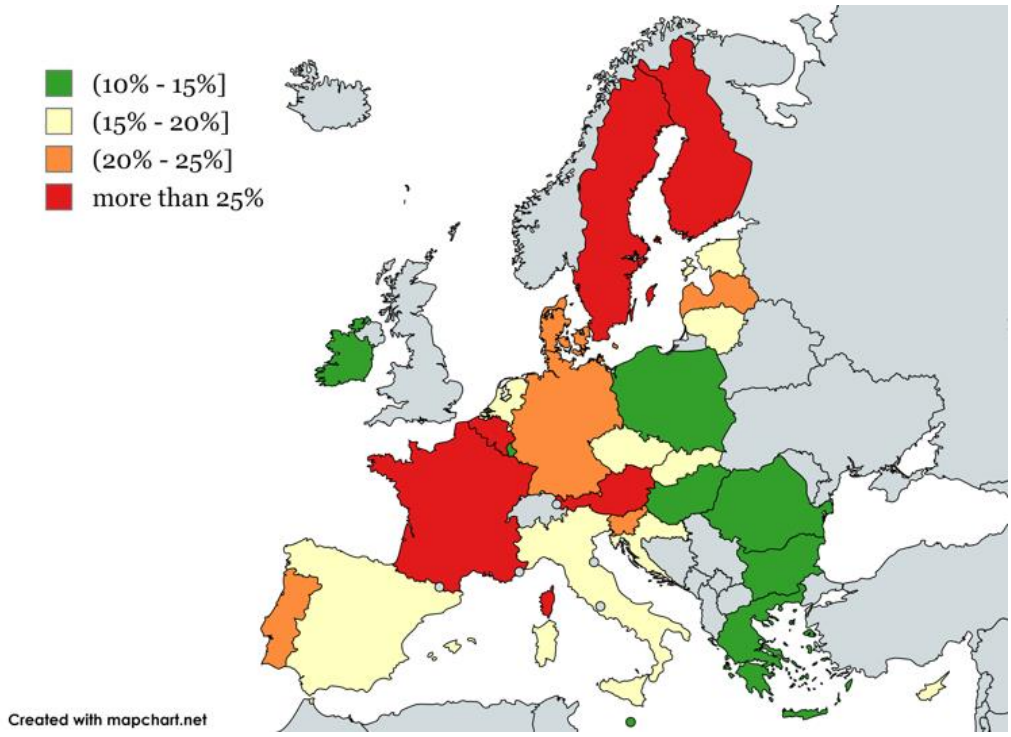
Source: Own elaboration using EUROMOD version I4.0+.

Note: countries are ranked alphabetically.

Figure 1 provides a visual representation of the varying budgetary effect of fiscal drag and benefit erosion across the EU. Countries are grouped according to the ratio of budgetary impact to the change in employment income. The resulting relative budgetary impact falls within a range of approximately 10% to 31% for all countries in both scenarios. The first group, shown in green in Figure 1, includes countries where the relative budgetary impact ranges from 10% to 15%. This indicates that an x% increase in employment income results in a relative budgetary impact between 10% and 15% of that increase. For example, in Scenario 1, the 5% increase in wages would lead to an increase in the budget ranging between 0.5% and 0.75% of the country's GDP. The same logic applies to the countries in the other three groups depicted in Figure 1.

Interestingly, our results suggest that the relative budgetary impact does not vary significantly across the two scenarios, as the countries consistently fall within the same group. In fact, comparing Tables 1 and 2 we see that the relative budgetary impact is often identical in the two scenarios, with the largest difference found in Malta, at just 0.3 percentage points. The countries where fiscal drag and benefit erosion are found to have the highest relative budgetary effect are Belgium, Sweden, France, Austria and Finland.

Figure 1. Relative budgetary effect (scenarios 1 &2)



Source: Own elaboration using EUROMOD version I4.0+ and mapchart.net.

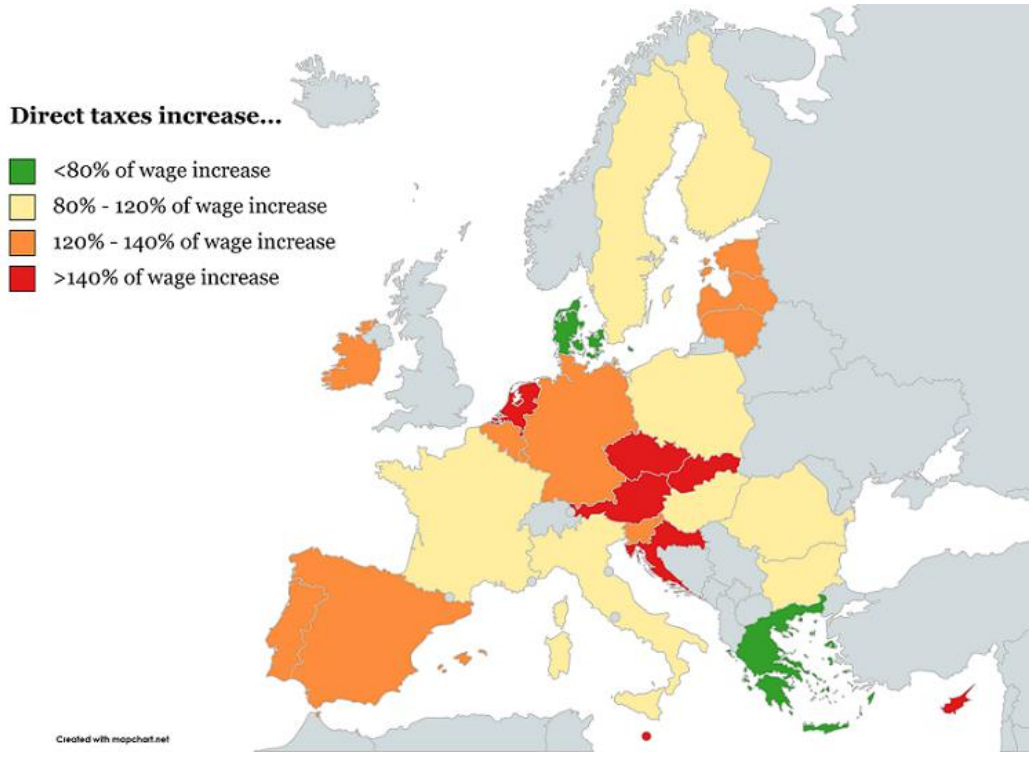
In Figure 2 countries are grouped according to the relative incidence of fiscal drag in scenarios 1 and 2. In the first category, we place countries in which an increase in employment income by a target of x% (in scenario 1 this target is uniform for all countries and equal to 5%) causes direct tax increases by less than 80% of this target (i.e. less than 4% in scenario 1). In the second category, we allocate counties where an x% wage increase causes direct tax increases of approximately the same magnitude, i.e. between 80% and 120% of the employment income increase (i.e. from 4% to 6% in scenario 1). In the third category, we place countries in which a wage increase by a target of x% induces direct tax hikes of 120%-140% of this target (i.e. 6%-7% in scenario 1). In the last category, we allocate the countries with tax systems that are most prone to fiscal drag, i.e. in which an x% increase in wages causes direct tax increases by more than 140% of this target (i.e. more than 7% in scenario 1).

In Figure 3 countries are grouped according to the relative incidence of benefit erosion in scenarios 1 and 2. In the first category, we allocate countries where an x% increase in employment income causes relatively small decreases in the spending for means-tested benefits, i.e. less than 30% of the employment income increase. In the second category, we place countries where an x% increase in employment income causes decreases in means-tested benefits' spending that are between 30% and 60% of the employment income increase. In the third category, we allocate the countries with the largest estimated benefit erosion effects, i.e. where an x% increase in employment income causes a more than 60% decrease in means-tested benefits' spending. The percentages of direct tax/means-tested benefit increases/decreases can be found in the Appendix (Table A.2).

Noteworthy is also the fact that non-linearities that are inherent in the tax-benefit systems of all EU countries do not significantly manifest themselves in terms of the relative impact of the fiscal drag or benefit erosion.[16] Looking at Table A.2 and Figures 3 and 4, we observe that in the vast majority of countries the relative magnitude of fiscal drag or benefit erosion is not affected by the magnitude of the simulated employment income increases. For example, an increase in employment income in Poland by a factor of 5% is estimated to cause the country's direct taxes to increase by 85.1% of this factor; an increase in employment income by 10% is causing Polish direct taxes to increase by 85.8% of this factor. This finding was also confirmed by running a sensitivity analysis in which employment incomes rise according to an updated forecast (the Summer 2022 EC HICP forecast). This forecast implied a sharper increases in 2022 of 9.5% on average (i.e. almost double the size of the increase assumed in scenario 1), with increases ranging from 5.6% in Malta to 17% in Estonia and Lithuania. The sensitivity analysis based on those figures confirmed that the relative magnitude of fiscal drag/benefit erosion is not affected by the magnitude of the simulated inflation and related employment income increases (e.g. an increase in employment income in Estonia by a factor of 5% is estimated to cause the country's direct taxes to increase by 134% of this factor; an increase in employment income by 17% is estimated to cause Estonia's direct taxes to increase -again- by 134% of this factor).

[16] Non-linearities are caused by various factors, such as the existence of progressive tax schedules, tax allowances, tax credits, lower/upper limits of taxes/SIC/benefits, means-testing thresholds etc.

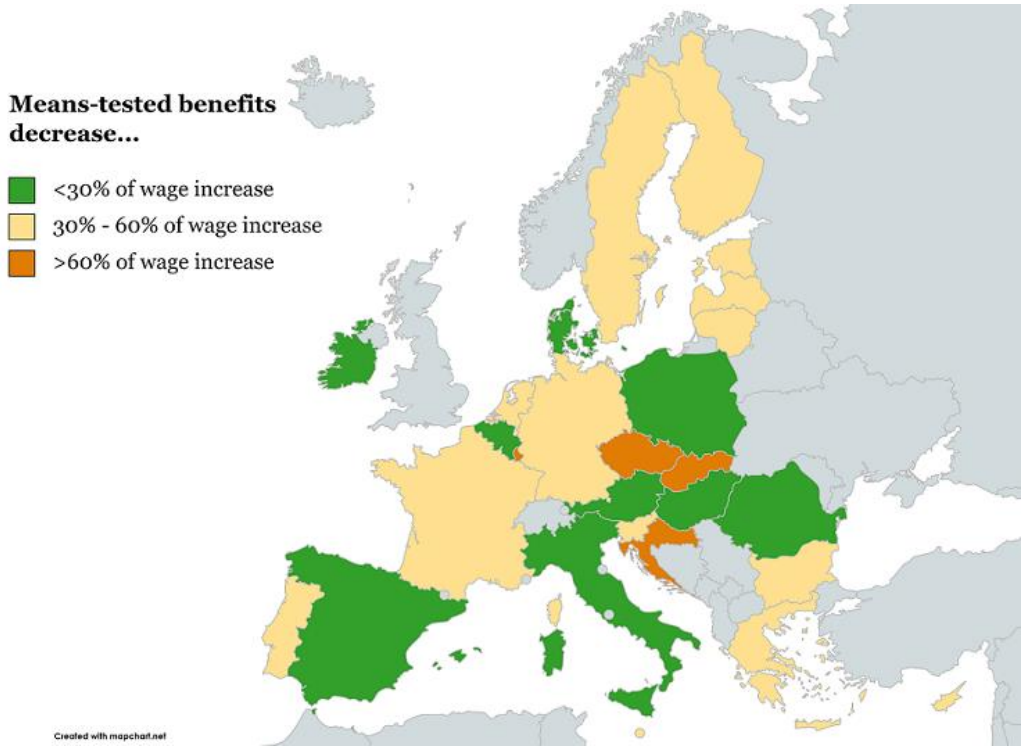
Figure 2. Magnitude of fiscal drag in EU countries (scenarios 1 & 2)



Source: Own elaboration using EUROMOD version I4.0+ and mapchart.net.

Note: the countries in which direct tax revenue increase is more than 120% of employment income increase are LT, PT, LV, BE, LU, IE, EE, DE, SI, ES, AT, CZ, SK, NL, MT, CY, HR (in ascending order of Scenario 1).

Figure 3. Magnitude of benefit erosion in EU countries (scenarios 1 & 2)



Source: Own elaboration using EUROMOD version I4.0+ and mapchart.net.

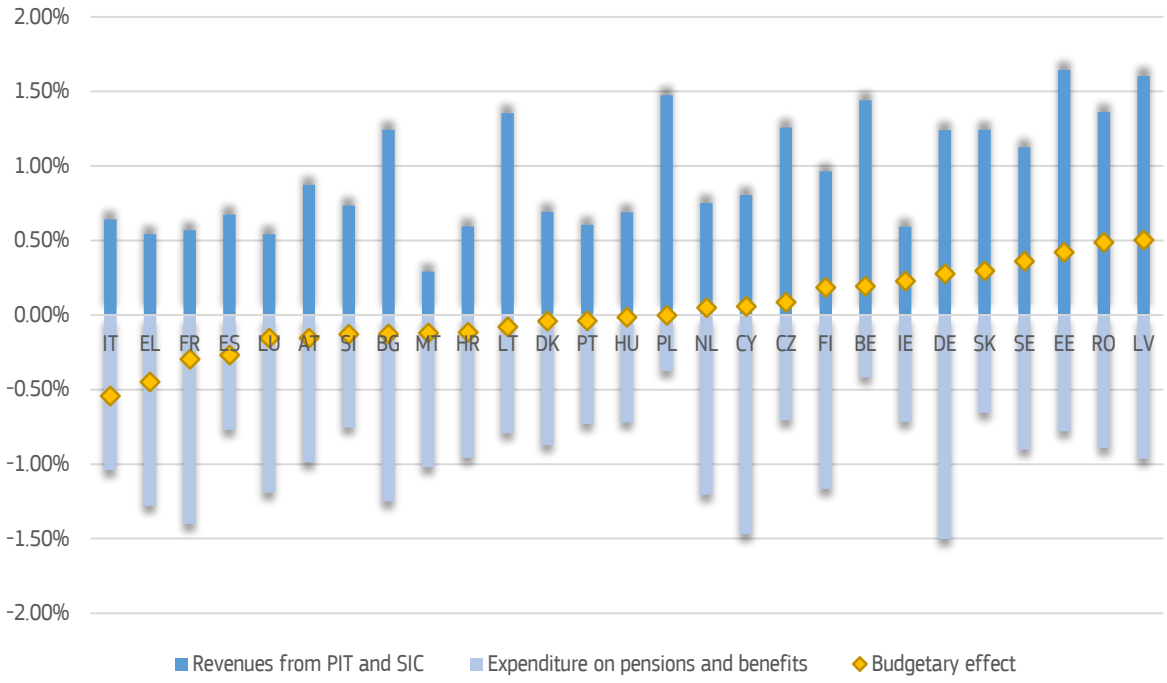
Note: Slovenia is the only country that changes category from scenario 1 to scenario 2, as means-tested benefits go up from 59.4% to 61.9% of the target change in employment income. Please note that in the graph it is depicted as solely belonging to the second category.

The countries in which means-tested benefits decrease more than 60% of employment income increase are LU, SK, HR and CZ (in ascending order of Scenario 1).

Scenario 3 assumes the same employment income increase as in scenario 2. The main difference with respect to the latter is that in this new scenario the benefits (including pensions) are assumed to increase by 7.5% on average, in line with forecasted CPI-based inflation for 2022, hence keeping their real value intact implying no benefit erosion anymore. This way, we attempt to evaluate the effect of combining two out of the three main options available to policy makers to mitigate the impact of inflation on households: targeted income support (via indexation of pensions and benefits to inflation) and wage indexation (which is assumed to hold under all scenarios). The use of microsimulation in general, and EUROMOD in particular, allows us to account for the complex ways in which taxes interact with benefits and pensions, as well as with each other. It also allows to account for the different tax treatment of the various income sources.

Figure 4 suggests that in almost half of EU Member States, the fiscal space generated by wage indexation via fiscal drag (dark blue bars) is sufficient to finance a policy of full indexation of pensions and cash benefits (light blue bars). In the case of Latvia and Romania, the structure of the labour market combined with the counties' pension/benefit systems in place creates a budgetary surplus of approximately 0.5% of GDP. On the contrary, the countries where the indexation of pensions and benefits produces significant fiscal deficits are Italy and Greece. This is due to the large number of pension recipients (compared to wage earners) in those two countries.

Figure 4. Budgetary impact (% of GDP) – Scenario 3



Source: Own elaboration using EUROMOD version I4.0+.

4.2 Distributional impact

Figures 5, 6, 7a and 7b present the impact of the three scenarios on income inequality and poverty. The inequality indicator used is the Gini coefficient of equivalised disposable income.[17] The poverty indicator used is the at-risk-of-poverty (AROP) rate, setting the fixed poverty line at 60% of the median equivalised disposable income of the baseline scenario.[18]

Our main findings are as follows. Scenario 1, which assumes a uniform 5% increase in employment income, implies relatively small increases in the Gini coefficient for all EU countries (1% on average), ranging from 0.2% in Portugal to 2% in Slovakia and Czechia. This increase in inequality is driven by the fact that the assumed wage increase (due to indexation to the assumed 5% inflationary shock) rather concerns individuals at the middle/upper end of the income distribution than individuals at the lower end of the distribution, as the latter rely relatively more on non-wage income (i.e. social benefits, pensions, etc.), which is assumed not to be indexed.[19]

Scenario 2, which accounts for the effective GDP-related inflation as forecasted for 2022, implies more diverse increases in employment income across countries. The Gini coefficient increases by 1.2% on average, with the countries witnessing the strongest inflation rates being typically also those posting the largest increases in the Gini coefficient (i.e. CZ, PL, SK, RO and EE).

In scenario 3, in which, on top of the differentiated wage increase, all benefits and pensions go up by the forecasted CPI-based inflation, the Gini coefficient goes down by 0.8% on average, driven by the benefits/pensions increases. The decrease exceeds 1% in 10 EU countries. RO is the only country in which the Gini coefficient goes up by approximately 1%. This is due to the fact that in this country the –mostly regressive– impact of wage increases on distribution outweighs the –mostly progressive– impact of increases in benefits and pensions.

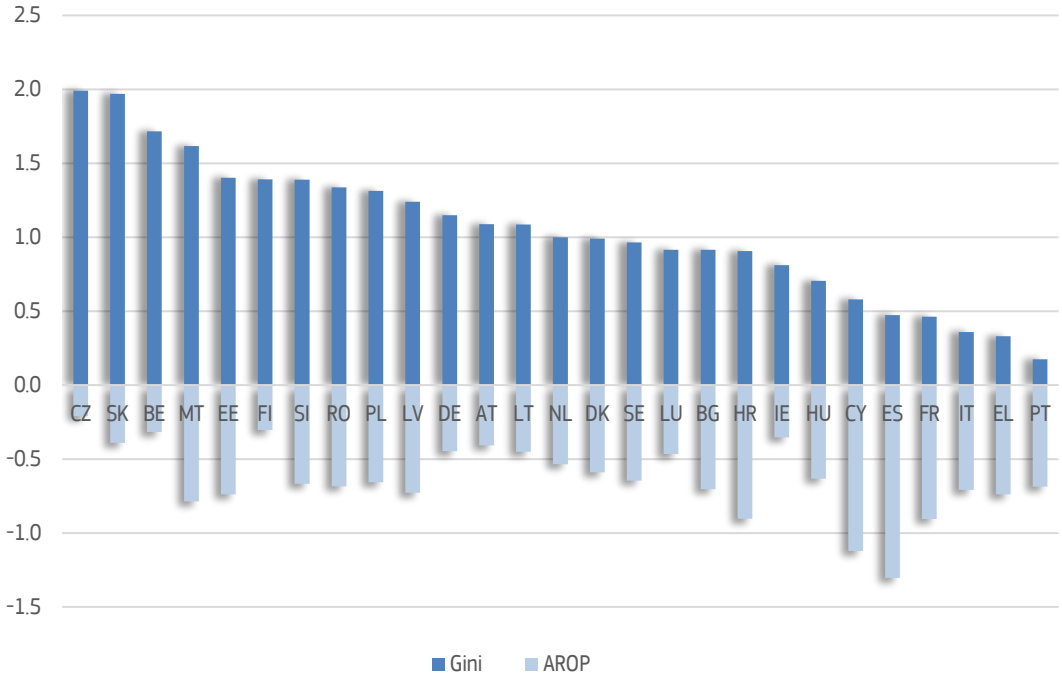
As regards poverty, modest decreases in the AROP rate are estimated for all EU countries in scenarios 1 and 2 (0.6 percentage points decrease in the indicator, on average across the EU), again reflecting the fact that wage-earners, which are assumed to benefit from indexation, represent a larger share of the higher income groups. Lower income groups rely relatively more on benefits, assumed not (yet) to be indexed, thereby bearing most of the burden linked to benefit erosion. This finding is consistent with the literature on the distributional impact of increases in the minimum wage (Atkinson et al., 2017). Yet contrasting results are reported under scenario 1, with significant reductions in the AROP rate in the case of Spain and Cyprus (1.3 and 1.1 percentage points respectively), indicating the existence of a relatively important share of wage-earners at the bottom of the income distribution for those two countries. In scenario 3, the indexation of benefits and pensions to inflation has a very significant impact on poverty; the AROP rate is estimated to decrease by as much as 2.5 percentage points on average across the EU countries. In 6 countries (EE, PL, LT, BG, CY and LV), the decrease in the AROP rate exceeds 3 percentage points.

[17] This indicator is designed to capture in particular effects on the middle segment of the income distribution (Cowell, 2000).

[18] Results on AROP with a floating poverty line are presented in the Appendix (Table A.3).

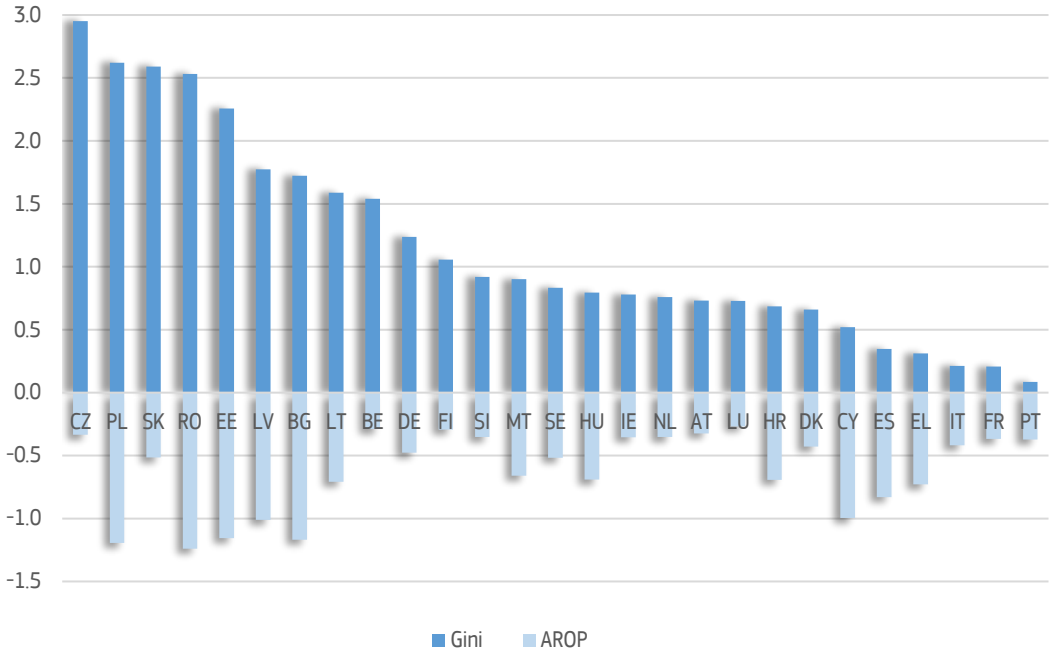
[19] The estimated changes in the distributional estimates result from a combination of factors, which include the proportion of wage earners in the overall population of a country, their position in the income distribution, the progressivity of the tax system and the design of the benefit system of each country.

Figure 5. Changes in Gini (%) and AROP (ppts) – Scenario 1



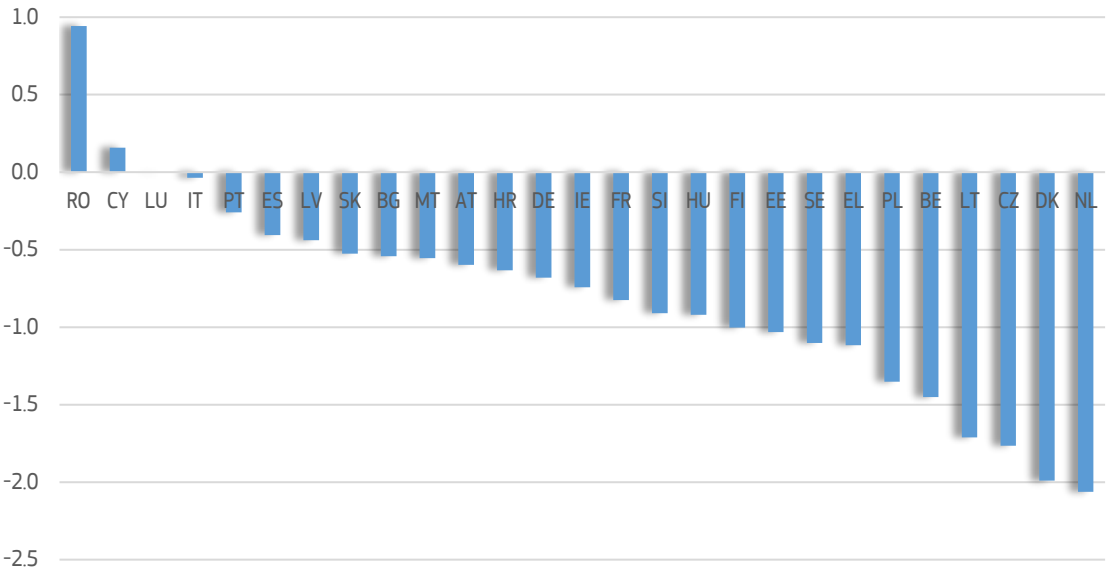
Source: Own elaboration using EUROMOD version I4.0+.

Figure 6. Changes in Gini (%) and AROP (ppts) – Scenario 2



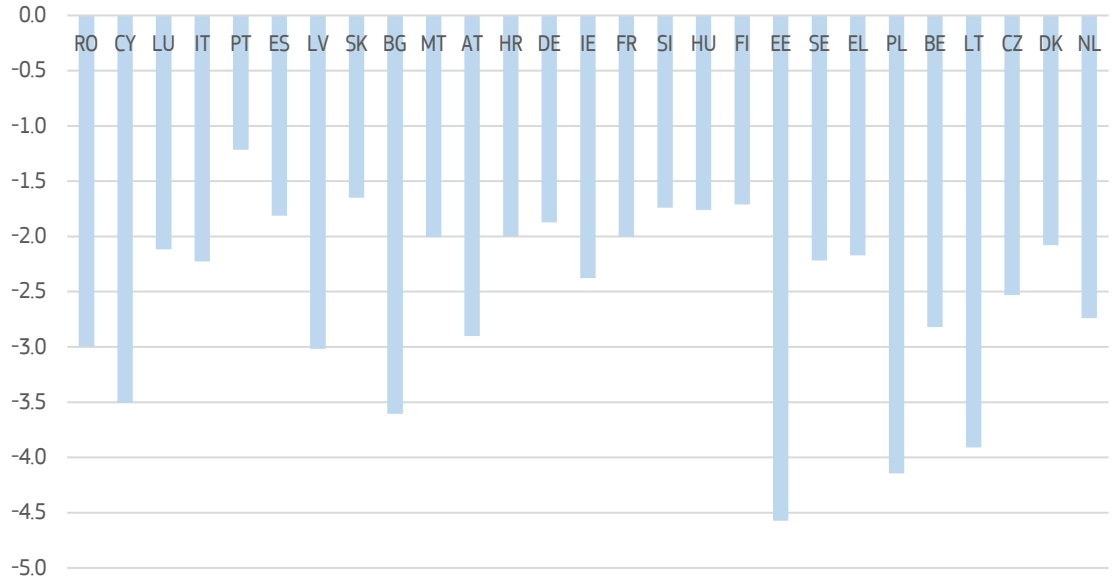
Source: Own elaboration using EUROMOD version I4.0+.

Figure 7a. Changes in Gini (%) – Scenario 3



Source: Own elaboration using EUROMOD version I4.0+.

Figure 7b. Changes in AROP (ppts) – Scenario 3



Source: Own elaboration using EUROMOD version I4.0+.

4.3 Focusing on wage earners

In this section, the analysis is restricted to employees. To enhance comparison of results across countries we solely focus on Scenario 1, describing the implication of a uniform 5% increase of employment income across countries. Employees are defined as individuals whose employment income is at least two thirds of their total income in the baseline. Table A.4 in the Appendix summarises the share of employees across quintiles of disposable income in each EU country.

Wage earners are also categorised in quintiles according to their relative employment income.[20] In this way we can investigate the impact of fiscal drag across the wage distribution and, in particular, the change in the amounts of personal income tax paid by the poorer and by the richer wage earners.

The case of Czechia is used to illustrate results (Table 3). In the top half of the table, we find the increase in personal income taxes (PIT) paid by all groups in Scenario 1 with respect to the baseline. The proportional increase in PIT is highest for individuals in the first quintile and decreases across the wage distribution. The poorest wage workers end up paying 29.3% more in PIT, compared to a 9.9% average increase for the population as a whole.

Another way of looking at this is to consider the share of the total amount of PIT revenues paid by each quintile. In the bottom half of Table 3, the share of PIT paid by workers in each quintile of the wage distribution is reported. In Czechia the first quintile (Q1) contributes 1.5% of the total 4.7 billion EUR collected in the baseline, against 49.1% contributed by the last quintile (Q5). In Scenario 1, not only the total sum of PIT revenues is higher, but it is also split differently between individuals in different quintiles. The share contributed by poorest workers increases by 0.3 percentage points (from 1.5% to 1.8%), while the share contributed by the richest decreases by 0.8 percentage points.

Results for all countries are summarised in Figure 9. The figure describes the change in the share of total PIT paid by taxpayers in the first and in the last quintile of the wage distribution. The redistribution of the shares favours the richest quintile in 21 out of 27 countries. In these countries, individuals with higher employment income end up paying a smaller share of the total PIT revenues after the increase in wages. In countries like Austria, Croatia and the Netherlands, the share contributed by the fifth quintile decreases by more than 1.5 percentage points. Conversely, in France and Sweden the richest wage earners in Scenario 1 pay a larger share of PIT revenues than in the baseline (0.3 and 0.5 percentage points increase respectively).

Figure 8 shows cross country-patterns and related details (full results in Table A.5) reflecting cross-country particularities in terms of PIT schedules. For instance, in Austria, Croatia and the Netherlands (i.e. where the decrease in the share of PIT revenues contributed by the richest is higher), the employment income of Q5 earners in the baseline scenario already places them in the highest tax bracket of personal income tax. This means that, after the 5% increase in wages, the amount of PIT due will increase proportionally. The increase would be more than proportional if wage indexation pushed them into a higher bracket, and their additional income became (at least partly) subject to a higher marginal tax rate. Specifically in Croatia, where the share of PIT paid by the richest quintile decreases the most (-1.5 percentage points), the lowest employment income in Q5 is approximately 17,500 EUR in the baseline, significantly above the lower bound of the highest tax bracket (approximately 4,000 EUR in 2021). Therefore, for these individuals the additional income earned in Scenario 1 is subject to the same marginal tax rate than the income of the baseline.

France is one of the countries in which the richest taxpayers end up contributing a larger share of total PIT revenues in Scenario 1. Here, the fifth quintile of the employment income distribution starts at approximately 52,800 EUR. An employee earning this amount in 2021 would pay the marginal tax rate corresponding only to the third out of the five tax brackets of the French personal income tax.

[20] Quintiles are fixed on the baseline scenario.

The wage increase, therefore, pushes many of those taxpayers into the fourth or the fifth bracket in Scenario 1.

Finally, Bulgaria illustrates the case of a country with a flat personal income tax schedule. This is reflected in the results, as the shares of PIT contributed by the first and the last quintile (and of the other quintiles, as shown in Table A.4) do not change. Additional incomes are subject to the same rate, regardless of the position of taxpayers in the distribution of employment income.

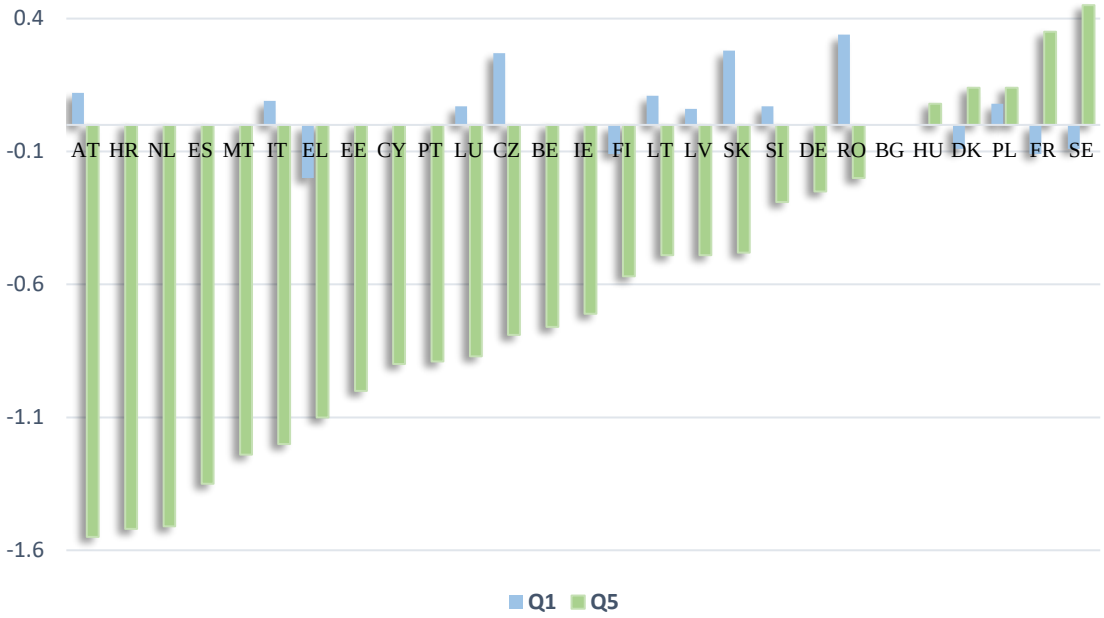
Table 3 Effect of fiscal drag on the amount of income tax paid by wage quintile in Czechia (yearly amounts, EUR)

	Czechia		
	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	69,685,473	90,077,875	29.3
Quintile 2	498,606,956	568,642,321	14.1
Quintile 3	695,634,292	769,738,645	10.6
Quintile 4	1,110,311,576	1,220,104,066	9.9
Quintile 5	2,290,929,488	2,476,655,501	8.1
All	4,665,167,548	5,125,218,350	9.9
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	1.5	1.8	0.3
Quintile 2	10.7	11.1	0.4
Quintile 3	14.9	15.0	0.1
Quintile 4	23.8	23.8	0.0
Quintile 5	49.1	48.3	-0.8
All	100.0	100.0	0.0

Source: Own elaboration using EUROMOD version I4.0+.

Note: The population is restricted to wage earners, as defined in section 4.3.

Figure 8. Percentage point change in the share of personal income tax paid by the first and the fifth quintile of the distribution of employment income



Source: Own elaboration using EUROMOD version I4.0+.

Note: The population is restricted to wage earners, as defined in section 4.3.

4.4 Existing automatic indexation mechanisms

Until now this research has examined how a wage indexation policy would affect the fiscal and redistributive mechanisms built in the PIT systems of countries under the assumption of unadjusted PIT schedules. In this section, we explore the impact of the automatic indexation mechanisms embedded in those schedules, i.e. if a country's legislation requires that PIT monetary parameters (such as tax brackets, tax allowances or tax credits) are automatically linked to inflation. According to the existing evidence, most EU countries do not index or automatically adjust their PIT policy parameters in a statutory (i.e. non-ad-hoc) way (Balasundharam et al, 2023; EUROMOD Country Reports). Out of the 17 EU countries in which the increase in direct tax revenues in Scenarios 1 and 2 is more than 120% of the employment income increase (i.e. orange and red countries of Figure 3), only four had such adjustments in place in 2022: Belgium, Germany, the Netherlands and Slovakia. Since 2023, Austria also joined this group of countries.

In order to quantify the fiscal and distributional impact of the existing mechanisms, a new counterfactual scenario is built, in which we combine the actual 2022 (or 2023, in the case of Austria) PIT schedule of those countries with the second scenario, i.e. the scenario in which employment incomes increase by the forecasted GDP-based inflation for 2022 (by 3.4% in Austria, 4.5% in Belgium, 5.4% in Germany, 3.3% in the Netherlands and 6.6% in Slovakia).

Our findings suggest that the newly-legislated automatic adjustments in Austria's PIT system are able to over-compensate for the fiscal drag effects caused by a 3.4% increase in employment incomes. In Belgium and Germany, the mechanisms in place compensate for almost half of the fiscal drag effect; in the Netherlands and Slovakia they compensate for around 15% of the fiscal drag

caused by the above-mentioned employment income increases.[21] The increase in the Gini index with respect to the baseline ranges from 0.9% in the Netherlands to 2.6% in Slovakia. It is slightly larger compared to Scenario 2 in Austria, Germany, and the Netherlands, suggesting that the upper part of the income distribution is benefitting relatively more from the adjustment mechanisms in place. The difference between the two scenarios is very close to zero in Belgium and Slovakia, for different reasons; in Slovakia, because the adjustment of the tax-benefit parameters is quite small compared to the increase in employment incomes, and in Belgium because all the spectrum of the income distribution seems to be benefiting from the indexation of the tax brackets. Finally, compared to the baseline, the decreases in AROP are larger in this scenario with respect to Scenario 2. The additional poverty decreases range from 0.1 percentage point in the Netherlands to 0.5 percentage points in Austria. This suggests that even imperfect indexation mechanisms can have a positive impact on poverty.

[21] For Belgium, this is due to the fact that tax brackets adjust once per year using the previous year's inflation rate. In Slovakia the basic personal allowance is anchored to the Minimum Living Standard (MLS), which is adjusted each year according to inflation; in 2022 the MLS increased by 1.5%, whereas the forecasted GDP-inflation was equal to 6.6%.

5 Concluding remarks

Until the early 1980s, wage indexation policies were frequently used as a way to protect the purchasing power of households. In the context of the current inflationary shock, several forms of wage indexation policies have been advocated in EU countries to counteract the negative effect of the growth in consumer prices. This study sets out to explore the first-order effects of wage indexation through its fiscal drag and benefit erosion channels. We investigate how exposed are EU tax and benefit systems to those phenomena, in a context of high inflation, where wage indexation regains a relevant role from a policy perspective. EUROMOD, the tax-benefit microsimulation model of the EU, is used to construct a set of hypothetical scenarios to help illustrate the differentiated impact of inflation across EU countries, which reflects differences in their tax-benefit structures. Such 'what if' scenarios can provide valuable benchmarks to which real policies can be compared to.

We first assess the impact of wage indexation -and its subsequent fiscal drag and benefit erosion effects- on the public budget. The latter is defined as the sum of direct taxes and social insurance contributions, minus pensions, means-tested benefits and non means-tested benefits. Our results confirm the theoretical predictions regarding the role of fiscal drag and benefit erosion on public finances, estimating a net positive budgetary impact in all EU countries. The magnitude of the budgetary impact varies greatly among countries and depends on the absolute value of direct taxes and social insurance contributions in the baseline scenario.

Moreover, the non-linearities that are embedded in the tax-benefit systems of EU countries do not significantly manifest themselves in terms of the relative impact of fiscal drag or benefit erosion.

Results on the third counterfactual scenario show that in almost half of the countries, fiscal drag and benefit erosion cause an increase in the public budget sufficient to finance a full indexation of benefits and pensions to inflation. Enacting the latter would be associated with a significant decrease in income inequality in most EU Member States.

Finally, to highlight the impact of inflation on wage distribution, we focus on wage earners in different quintiles of the wage distribution. Our results show that, in most countries, the share of total income tax paid by the richest employees would be smaller after the uniform increase in wages than in the baseline. This pattern can be mostly explained by the structure of personal income tax schedules in each country. In countries where the richest wage earners are in the highest tax brackets in the baseline, their contribution to total income tax revenues decreases following an inflationary shock. Conversely, if the wage increase of higher wage earners would still push a substantial amount of them into a higher tax bracket, their contribution would increase. Yet, in practice, this effect appears limited given existing tax thresholds.

A certain amount of caution is called for when interpreting these results. First, the research does not account for any second-order effects of changes in employment incomes, such as changes at the extensive or the intensive margin of labour supply. However, second order effects of wage indexation policies may be limited, as observed by Koester & Grapow (2021). The distributional (and fiscal) impact of such second order changes however remains a matter deserving more empirical investigation with effects that may vary considerably, depending on their location in the income distribution (i.e. affecting low or high-income earners) and on whether they lead to increased or decreased levels of employment. Second, as in the first and second scenarios, all policies are kept constant, the results of those scenarios do not account for any existing indexation rules of the tax-benefit systems. This is, of course, a stylised assumption. As seen in the previous section, only a handful of EU countries have systematic indexation rules that can reduce the magnitude and the adverse distributional effects of PIT-driven fiscal drag; most Member States still lack automatic indexation and adapt their personal income tax policies in ad hoc ways, if at all (Beer et al., 2023). Yet this stylised assumption allows us to highlight the importance of the tax-benefit indexation issue, as it allows us to identify the countries whose tax-benefit systems are most prone to fiscal drag and benefit erosion. In other words, in order to get the most out of wage indexation in those countries, this policy would have to be associated to transparent indexation rules for the whole tax-benefit

system, or other ad-hoc compensation mechanisms that shelter employees from the adverse effects of fiscal drag and benefit erosion.

Keeping in mind the above-mentioned caveats, this research aims at offering a detailed approximation of the first-order fiscal and distributional impact of wage indexation policies in all EU Member States. Given the public interest in the question addressed and the potential scope for improving policies currently in place, this analysis illustrates that research based on microsimulation provide a sound and informed way to identify policy gaps and, in the present case, scope for developing policies that are better suited to mitigate the impact of high inflation on European households.

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List of abbreviations and definitions

AROP	At-risk-of-poverty
CPI	Consumer price index
EU	European Union
EU-SILC	EU Statistics on Income and Living Conditions
HICP	Harmonised index of consumer prices
OECD	Organisation for Economic Co-operation and Development
PIT	Personal income tax
SIC	Social insurance contributions
VAT	Value added tax

List of figures

List of tables

Annex

Table A.1. Inflation forecast

Country	CPI inflation	GDP inflation
BE	7.8	4.5
BG	11.9	9.5
CZ	11.7	7.4
DK	5.1	3.3
DE	6.5	5.4
EE	11.2	8.1
IE	6.1	4.8
EL	6.3	4.8
ES	6.3	3.7
FR	4.9	2.2
HR	6.1	3.8
IT	5.9	3.1
CY	5.2	4.5
LV	9.4	7.2
LT	12.5	7.4
LU	6.8	4.0
HU	9.0	5.6
MT	4.5	2.8
NL	7.4	3.8
AT	6.0	3.4
PL	11.6	10.0
PT	4.4	2.9
RO	8.9	9.5
SI	6.1	3.3
SK	9.8	6.6
FI	4.5	3.8
SE	5.3	4.3

Source: AMECO (Autumn 2022 vintage).

Table A.2 Change in direct taxes and means-tested benefits (MTB) as % of change in employment income – Scenarios 1 and 2

	Scenario 1			Scenario 2		
Country	Change in employment income (1)	Change in direct taxes as % of (1)	Change in MTB as % of (1)	Change in employment income (2)	Change in direct taxes as % of (2)	Change in MTB as % of (2)
EL	5.0	76.3	40.6	4.8	76.2	39.0
DK	5.0	77.3	23.2	3.3	77.1	25.2
HU	5.0	80.9	1.8	5.6	80.9	1.8
FR	5.0	83.0	44.1	2.2	82.3	50.3
PL	5.0	85.1	18.9	10.0	85.8	19.3
BG	5.0	90.4	30.2	9.5	90.5	32.0
IT	5.0	92.9	25.2	3.1	92.6	25.5
RO	5.0	96.0	23.3	9.5	95.7	25.5
FI	5.0	108.4	31.3	3.8	108.1	31.5
SE	5.0	112.2	32.5	4.3	111.8	32.9
LT	5.0	120.7	47.2	7.4	120.8	40.6
PT	5.0	122.1	50.7	2.9	120.6	49.8
LV	5.0	124.3	31.1	7.2	124.5	30.9
BE	5.0	126.6	11.3	4.5	126.5	11.1
LU	5.0	127.1	60.3	4.0	126.8	61.8
IE	5.0	133.0	21.0	4.8	132.9	21.2
EE	5.0	134.5	31.1	8.1	134.4	30.8
DE	5.0	137.9	55.4	5.4	138.0	55.1
SI	5.0	138.8	59.4	3.3	138.6	61.9
ES	5.0	139.0	19.3	3.7	138.8	19.7
AT	5.0	146.6	16.1	3.4	146.1	17.2
CZ	5.0	161.3	117.9	7.4	162.2	114.4
NL	5.0	163.0	32.6	3.8	162.5	33.2
SK	5.0	163.1	68.4	6.6	163.4	59.2
MT	5.0	164.6	30.7	2.8	164.5	27.4
CY	5.0	164.7	45.4	4.5	164.3	46.4
HR	5.0	186.0	71.4	3.8	183.1	77.8

Source: Own elaboration using EUROMOD version I4.0+.

Note: Countries are ranked according to the magnitude of the change in direct taxes in Scenario 1.

Table A.3. Changes in percentage points of the at risk of poverty rates calculated using a floating poverty line

Country	Scenario 1	Scenario 2	Scenario 3
BE	0.6	0.6	-0.8
BG	0.5	1.0	-0.3
CZ	0.5	0.8	-0.4
DK	0.7	0.5	-0.6
DE	0.5	0.5	-0.1
EE	0.7	1.2	-0.3
IE	0.7	0.7	-0.4
EL	0.1	0.1	-0.6
ES	0.2	0.0	-0.1
FR	0.8	1.0	-0.2
HR	0.5	0.3	-0.1
IT	0.1	0.0	-0.6
CY	0.8	0.6	-0.5
LV	0.4	0.6	-0.4
LT	0.7	0.9	-0.4
LU	0.4	0.3	-0.1
HU	0.6	0.7	0.1
MT	0.4	0.1	-0.5
NL	0.7	0.5	-1.4
AT	0.1	0.0	-0.5
PL	0.5	1.0	0.0
PT	0.5	0.2	-0.2
RO	0.4	0.9	0.6
SI	0.8	0.5	0.0
SK	0.9	0.9	0.1
FI	0.8	0.6	-0.3
SE	0.9	0.8	-0.2

Source: Own elaboration using EUROMOD version I4.0+.

Table A.4. Percentage of individuals earning prevalently employment income in each quintile of the disposable income distribution calculated in the baseline

Country	Q1	Q2	Q3	Q4	Q5	ALL
BE	0.2	39.0	24.0	65.6	81.6	41.3
BG	0.0	30.9	41.4	64.8	76.6	42.5
CZ	0.1	23.1	29.2	69.5	80.7	39.9
DK	5.6	44.0	43.8	76.0	77.1	49.3
DE	0.8	44.2	48.5	67.0	78.9	47.9
EE	3.6	35.1	42.7	79.9	87.5	49.8
IE	0.1	40.1	37.2	70.4	76.2	41.0
EL	0.2	27.6	25.6	46.0	48.5	25.5
ES	1.9	47.1	46.2	63.2	66.2	42.8
FR	0.1	34.8	47.4	62.2	64.9	41.2
HR	0.1	10.4	25.8	68.9	77.0	35.8
IT	0.1	15.2	23.5	51.4	55.6	28.1
CY	0.6	32.1	50.4	69.2	70.0	43.2
LV	1.1	25.4	41.7	78.4	87.9	46.9
LT	0.1	26.4	42.7	73.5	78.2	43.8
LU	0.3	29.0	63.1	65.8	70.7	44.5
HU	1.1	38.9	41.3	65.9	74.0	43.3
MT	0.0	30.4	43.3	65.9	80.0	43.8
NL	3.5	48.2	42.3	66.9	72.1	46.6
AT	1.1	43.2	50.4	59.6	70.2	44.9
PL	0.1	22.2	32.4	64.7	76.5	37.8
PT	0.2	24.7	48.4	72.4	65.0	40.7
RO	0.0	1.3	27.8	55.7	85.2	34.0
SI	0.1	11.8	37.3	69.7	81.3	40.0
SK	0.3	18.2	31.8	71.6	87.7	41.2
FI	7.4	28.8	37.2	71.5	77.5	44.5
SE	0.4	40.8	42.0	80.4	83.7	49.4

Source: Own elaboration using EUROMOD version I4.0+.

Table A.5. Effect of fiscal drag on the amount of income tax paid by wage quintile (yearly amounts, EUR)

	Belgium		
	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	51,429,396	74,465,604	44.8
Quintile 2	2,555,042,544	2,960,005,728	15.9
Quintile 3	6,788,848,920	7,486,781,184	10.3
Quintile 4	11,001,359,496	11,976,554,604	8.9
Quintile 5	24,793,743,108	26,526,746,592	7.0
All	45,190,422,528	49,024,555,008	8.5
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	0.1	0.2	0.0
Quintile 2	5.7	6.0	0.4
Quintile 3	15.0	15.3	0.3
Quintile 4	24.3	24.4	0.1
Quintile 5	54.9	54.1	-0.8
All	100.0	100.0	0.0
	Bulgaria		
	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	100,538,864	105,222,029	4.7
Quintile 2	224,484,662	235,465,861	4.9
Quintile 3	325,566,484	341,645,384	4.9
Quintile 4	508,489,492	533,429,491	4.9
Quintile 5	1,132,605,308	1,189,981,597	5.1
All	2,291,684,816	2,405,744,350	5.0
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	4.4	4.4	0.0
Quintile 2	9.8	9.8	0.0
Quintile 3	14.2	14.2	0.0
Quintile 4	22.2	22.2	0.0
Quintile 5	49.4	49.5	0.0
All	100.0	100.0	0.0
	Denmark		
	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	2,191,841,841	2,263,565,230	3.3
Quintile 2	6,751,761,962	7,107,310,812	5.3
Quintile 3	10,167,733,564	10,736,992,397	5.6
Quintile 4	13,237,901,228	13,984,927,288	5.6
Quintile 5	25,184,126,988	26,693,181,594	6.0

All	57,533,364,408	60,785,975,042	5.7
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	3.8	3.7	-0.1
Quintile 2	11.7	11.7	-0.1
Quintile 3	17.7	17.7	0.0
Quintile 4	23.0	23.0	0.0
Quintile 5	43.8	43.9	0.1
All	100.0	100.0	0.0

Germany

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	3,089,194,092	3,431,713,752	11.1
Quintile 2	18,180,895,992	20,160,607,092	10.9
Quintile 3	37,378,475,628	40,904,622,828	9.4
Quintile 4	63,223,543,200	68,728,215,228	8.7
Quintile 5	144,911,954,724	156,865,553,076	8.3
All	266,784,055,296	290,090,704,896	8.7
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	1.2	1.2	0.0
Quintile 2	6.8	6.9	0.1
Quintile 3	14.0	14.1	0.1
Quintile 4	23.7	23.7	0.0
Quintile 5	54.3	54.1	-0.3
All	100.0	100.0	0.0

Estonia

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	17,344,356	18,829,128	8.6
Quintile 2	75,577,284	86,147,880	14.0
Quintile 3	206,887,896	227,351,604	9.9
Quintile 4	404,562,228	440,584,284	8.9
Quintile 5	813,499,320	857,470,404	5.4
All	1,517,871,072	1,630,383,360	7.4
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	1.1	1.1	0.0
Quintile 2	5.0	5.3	0.3
Quintile 3	13.6	13.9	0.3
Quintile 4	26.6	27.0	0.4
Quintile 5	53.6	52.6	-1.0
All	100.0	100.0	0.0

Ireland

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	89,365,548	99,382,848	11.2
Quintile 2	698,398,164	791,553,276	13.3
Quintile 3	2,081,391,444	2,314,389,684	11.2
Quintile 4	4,588,641,504	5,028,035,268	9.6
Quintile 5	13,349,156,004	14,292,388,512	7.1
All	20,806,952,448	22,525,750,272	8.3
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	0.4	0.4	0.0
Quintile 2	3.4	3.5	0.2
Quintile 3	10.0	10.3	0.3
Quintile 4	22.0	22.3	0.3
Quintile 5	64.2	63.5	-0.7
All	100.0	100.0	0.0

Greece

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	61,549,956	61,604,232	0.1
Quintile 2	85,371,600	88,735,848	3.9
Quintile 3	227,761,764	279,763,956	22.8
Quintile 4	605,405,496	692,861,064	14.4
Quintile 5	2,037,648,576	2,220,941,088	9.0
All	3,017,737,344	3,343,906,176	10.8
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	2.0	1.8	-0.2
Quintile 2	2.8	2.7	-0.2
Quintile 3	7.6	8.4	0.8
Quintile 4	20.1	20.7	0.7
Quintile 5	67.5	66.4	-1.1
All	100.0	100.0	0.0

Spain

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	165,882,444	180,573,300	8.9
Quintile 2	344,973,396	371,684,628	7.7
Quintile 3	1,838,735,304	2,671,714,800	45.3
Quintile 4	11,302,151,172	12,621,527,172	11.7
Quintile 5	41,575,609,536	44,929,843,164	8.1
All	55,227,353,088	60,775,342,080	10.1
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline

Quintile 1	0.3	0.3	0.0
Quintile 2	0.6	0.6	0.0
Quintile 3	3.3	4.4	1.1
Quintile 4	20.5	20.8	0.3
Quintile 5	75.3	73.9	-1.3
All	100.0	100.0	0.0

France

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	4,968,239,988	5,166,327,024	4.0
Quintile 2	11,864,328,096	12,476,489,136	5.2
Quintile 3	16,751,774,184	17,830,090,896	6.4
Quintile 4	23,896,471,188	25,496,623,428	6.7
Quintile 5	67,911,824,136	73,068,195,696	7.6
All	125,392,637,952	134,037,725,184	6.9
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	4.0	3.8	-0.1
Quintile 2	9.5	9.3	-0.1
Quintile 3	13.4	13.3	-0.1
Quintile 4	19.1	19.0	0.0
Quintile 5	54.2	54.5	0.3
All	100.0	100.0	0.0

Croatia

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	3,303,952	3,447,999	4.4
Quintile 2	12,858,974	19,115,816	48.7
Quintile 3	69,326,892	84,191,453	21.4
Quintile 4	192,710,800	219,176,085	13.7
Quintile 5	653,807,598	712,919,396	9.0
All	932,008,233	1,038,850,742	11.5
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	0.3	0.3	0.0
Quintile 2	1.4	1.8	0.5
Quintile 3	7.4	8.1	0.7
Quintile 4	20.7	21.1	0.4
Quintile 5	70.2	68.6	-1.5
All	100.0	100.0	0.0

Italy

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline

Quintile 1	-199,975,452	-125,397,312	-37.3
Quintile 2	4,710,656,424	5,626,368,780	19.4
Quintile 3	11,031,826,452	12,362,785,740	12.1
Quintile 4	18,366,180,600	20,464,141,092	11.4
Quintile 5	56,379,590,220	60,547,077,180	7.4
All	90,288,279,552	98,874,974,208	9.5
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	-0.2	-0.1	0.1
Quintile 2	5.2	5.7	0.5
Quintile 3	12.2	12.5	0.3
Quintile 4	20.3	20.7	0.4
Quintile 5	62.4	61.2	-1.2
All	100.0	100.0	0.0

Cyprus

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	1,350,888	1,358,064	0.5
Quintile 2	3,224,316	3,333,300	3.4
Quintile 3	4,037,244	4,220,316	4.5
Quintile 4	27,681,960	36,935,748	33.4
Quintile 5	529,509,096	581,159,136	9.8
All	565,803,504	627,006,576	10.8
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	0.2	0.2	0.0
Quintile 2	0.6	0.5	0.0
Quintile 3	0.7	0.7	0.0
Quintile 4	4.9	5.9	1.0
Quintile 5	93.6	92.7	-0.9
All	100.0	100.0	0.0

Latvia

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	26,409,636	29,555,724	11.9
Quintile 2	132,531,756	146,660,892	10.7
Quintile 3	275,543,400	297,780,720	8.1
Quintile 4	470,143,800	503,645,040	7.1
Quintile 5	1,111,707,000	1,178,307,768	6.0
All	2,016,335,616	2,155,950,144	6.9
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	1.3	1.4	0.1
Quintile 2	6.6	6.8	0.2

Quintile 3	13.7	13.8	0.1
Quintile 4	23.3	23.4	0.0
Quintile 5	55.1	54.7	-0.5
All	100.0	100.0	0.0

Lithuania

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	53,306,244	60,991,536	14.4
Quintile 2	288,489,696	316,730,772	9.8
Quintile 3	539,522,520	580,055,232	7.5
Quintile 4	874,593,216	931,742,952	6.5
Quintile 5	1,838,793,252	1,940,192,820	5.5
All	3,594,705,024	3,829,713,408	6.5
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	1.5	1.6	0.1
Quintile 2	8.0	8.3	0.2
Quintile 3	15.0	15.1	0.1
Quintile 4	24.3	24.3	0.0
Quintile 5	51.2	50.7	-0.5
All	100.0	100.0	0.0

Luxemburg

	Baseline	SCENARIO 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	4,612,308	7,725,588	67.5
Quintile 2	90,045,468	106,761,636	18.6
Quintile 3	298,345,740	338,036,940	13.3
Quintile 4	795,338,556	871,835,064	9.6
Quintile 5	2,408,898,036	2,581,984,980	7.2
All	3,597,240,192	3,906,344,064	8.6
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	0.1	0.2	0.1
Quintile 2	2.5	2.7	0.2
Quintile 3	8.3	8.6	0.4
Quintile 4	22.1	22.3	0.2
Quintile 5	67.0	66.1	-0.9
All	100.0	100.0	0.0

Hungary

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	338,699,870	352,272,407	4.0
Quintile 2	838,202,079	876,874,890	4.6

Quintile 3	1,151,901,845	1,205,963,706	4.7
Quintile 4	1,445,235,319	1,515,246,279	4.8
Quintile 5	2,356,532,829	2,474,729,610	5.0
All	6,130,572,176	6,425,087,143	4.8
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	5.5	5.5	0.0
Quintile 2	13.7	13.6	0.0
Quintile 3	18.8	18.8	0.0
Quintile 4	23.6	23.6	0.0
Quintile 5	38.4	38.5	0.1
All	100.0	100.0	0.0

Malta

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	462,576	749,856	62.1
Quintile 2	13,467,648	16,750,668	24.4
Quintile 3	48,113,652	56,255,544	16.9
Quintile 4	108,936,900	121,694,304	11.7
Quintile 5	334,813,560	362,278,620	8.2
All	505,794,336	557,728,992	10.3
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	0.1	0.1	0.0
Quintile 2	2.7	3.0	0.3
Quintile 3	9.5	10.1	0.6
Quintile 4	21.5	21.8	0.3
Quintile 5	66.2	65.0	-1.2
All	100.0	100.0	0.0

Netherlands

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	178,108,872	183,888,144	3.2
Quintile 2	522,078,948	583,113,804	11.7
Quintile 3	1,950,916,668	2,336,251,668	19.8
Quintile 4	7,067,581,212	8,440,228,392	19.4
Quintile 5	31,872,413,988	34,857,264,060	9.4
All	41,591,098,368	46,400,747,520	11.6
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	0.4	0.4	0.0
Quintile 2	1.3	1.3	0.0
Quintile 3	4.7	5.0	0.3
Quintile 4	17.0	18.2	1.2

Quintile 5	76.6	75.1	-1.5
All	100.0	100.0	0.0

Austria

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	-306,935,796	-316,233,216	3.0
Quintile 2	50,333,196	196,346,940	290.1
Quintile 3	1,913,920,908	2,264,592,648	18.3
Quintile 4	4,341,783,804	4,910,636,388	13.1
Quintile 5	14,507,535,132	15,848,032,128	9.2
All	20,506,636,800	22,903,374,336	11.7
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	-1.5	-1.4	0.1
Quintile 2	0.3	0.9	0.6
Quintile 3	9.3	9.9	0.6
Quintile 4	21.2	21.4	0.3
Quintile 5	70.8	69.2	-1.6
All	100.0	100.0	0.0

Poland

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	1,051,506,401	1,138,412,137	8.3
Quintile 2	2,459,852,621	2,621,141,521	6.6
Quintile 3	3,482,777,370	3,692,652,538	6.0
Quintile 4	4,959,080,608	5,244,372,063	5.8
Quintile 5	10,931,037,634	11,679,794,809	6.8
All	22,884,254,741	24,376,372,488	6.5
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	4.6	4.7	0.1
Quintile 2	10.8	10.8	0.0
Quintile 3	15.2	15.1	-0.1
Quintile 4	21.7	21.5	-0.2
Quintile 5	47.8	47.9	0.1
All	100.0	100.0	0.0

Portugal

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	93,346,812	98,673,420	5.7
Quintile 2	220,472,364	264,342,888	19.9
Quintile 3	619,833,180	711,003,084	14.7
Quintile 4	1,613,844,708	1,803,305,088	11.7

Quintile 5	7,753,159,392	8,354,448,336	7.8
All	10,300,656,384	11,231,772,672	9.0
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	0.9	0.9	0.0
Quintile 2	2.1	2.3	0.2
Quintile 3	6.0	6.3	0.3
Quintile 4	15.7	16.1	0.4
Quintile 5	75.3	74.4	-0.9
All	100.0	100.0	0.0

Romania

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	431,879,488	473,717,728	9.7
Quintile 2	755,651,448	802,971,957	6.3
Quintile 3	905,872,810	949,037,927	4.8
Quintile 4	1,218,888,741	1,277,392,490	4.8
Quintile 5	1,783,612,811	1,869,726,871	4.8
All	5,095,905,258	5,372,847,166	5.4
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	8.5	8.8	0.3
Quintile 2	14.8	14.9	0.1
Quintile 3	17.8	17.7	-0.1
Quintile 4	23.9	23.8	-0.1
Quintile 5	35.0	34.8	-0.2
All	100.0	100.0	0.0

Slovenia

	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	124,769,460	136,574,940	9.5
Quintile 2	222,897,372	243,567,732	9.3
Quintile 3	341,165,964	371,576,952	8.9
Quintile 4	525,777,312	567,449,088	7.9
Quintile 5	1,266,770,976	1,359,621,804	7.3
All	2,481,381,120	2,678,790,528	8.0
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	5.0	5.1	0.1
Quintile 2	9.0	9.1	0.1
Quintile 3	13.8	13.9	0.1
Quintile 4	21.2	21.2	0.0
Quintile 5	51.0	50.8	-0.3
All	100.0	100.0	0.0

	Slovakia		
	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	95,345,676	111,363,528	16.8
Quintile 2	275,555,700	306,533,568	11.2
Quintile 3	422,877,372	464,722,380	9.9
Quintile 4	577,035,504	627,033,840	8.7
Quintile 5	1,016,036,016	1,097,391,528	8.0
All	2,386,850,304	2,607,044,928	9.2
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	4.0	4.3	0.3
Quintile 2	11.5	11.8	0.2
Quintile 3	17.7	17.8	0.1
Quintile 4	24.2	24.0	-0.1
Quintile 5	42.6	42.1	-0.5
All	100.0	100.0	0.0

	Finland		
	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	366,449,088	372,497,928	1.6
Quintile 2	1,264,757,280	1,408,514,016	11.4
Quintile 3	2,643,256,884	2,925,646,572	10.7
Quintile 4	4,449,557,568	4,847,455,512	8.9
Quintile 5	10,976,934,144	11,747,328,372	7.0
All	19,700,955,648	21,301,443,072	8.1
	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	1.9	1.8	-0.1
Quintile 2	6.4	6.6	0.2
Quintile 3	13.4	13.7	0.3
Quintile 4	22.6	22.8	0.2
Quintile 5	55.7	55.2	-0.6
All	100.0	100.0	0.0

	Sweden		
	Baseline	Scenario 1	Difference
	Total taxes paid	Total taxes paid	% of Baseline
Quintile 1	1,107,991,870	1,147,727,500	3.6
Quintile 2	4,428,193,507	4,689,153,050	5.9
Quintile 3	6,748,528,110	7,179,451,864	6.4
Quintile 4	9,280,254,408	9,976,615,230	7.5
Quintile 5	23,092,014,360	25,065,274,215	8.6
All	44,656,983,840	48,058,220,856	7.6

	% tax paid in each quintile	% tax paid in each quintile	P.p. w.r.t. Baseline
Quintile 1	2.5	2.4	-0.1
Quintile 2	9.9	9.8	-0.2
Quintile 3	15.1	14.9	-0.2
Quintile 4	20.8	20.8	0.0
Quintile 5	51.7	52.2	0.5
All	100.0	100.0	0.0

Source: Own elaboration using EUROMOD version I4.0+.

Note: The population is restricted to wage earners, as defined in section 4.3.

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