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THE SOCIAL DIMENSION OF PUBLIC DEBT AND DEBT POLICY

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Abstract. The relevance of the study is determined by the growing debt burden on public finances and the need to consider how the consequences of debt and fiscal decisions are distributed across social groups and generations. The purpose of the article is to substantiate the social consequences of public debt and debt policy by identifying the channels through which the fiscal burden is distributed, identifying vulnerable groups, developing an approach to public accountability, and outlining the potential use of artificial intelligence for assessing distributional effects. The object of the study is public debt and debt policy as components of public finance, while the subject comprises the social-distributional, intergenerational, institutional, and digital dimensions of their impact. The methodological framework combines systems, comparative, distributional, and institutional analysis, as well as Eurostat data on public debt, social risk, social protection, and inequality in EU countries. The study systematizes six channels through which debt policy affects social outcomes and demonstrates that the debt level alone does not determine the social result, since the structure of fiscal policy, the scale of social protection, labour-market conditions, inequality, and institutional capacity are also important. An original social vulnerability matrix based on the logic of "exposure – sensitivity – adaptive capacity" is proposed, along with a distributional impact assessment to ex ante explain the social consequences of the most significant debt-policy decisions. Artificial intelligence is defined as a supporting tool for data integration, risk group identification, scenario analysis, and monitoring, under a human-in-the-loop principle. The practical value of the findings lies in their potential use when updating debt-strategy provisions and designing fiscal-consolidation programs.

Keywords: public debt; public finance; social expenditure; fiscal burden; social vulnerability; inequality; public accountability; artificial intelligence.

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Анотація. Актуальність дослідження зумовлена зростанням боргового навантаження на державні фінанси та необхідністю врахувати, як боргові й фіскальні рішення впливають на те, як наслідки розподіляються між соціальними групами та поколіннями. Метою статті є обґрунтування соціальних наслідків державного боргу та боргової політики шляхом визначення каналів розподілу фіскального навантаження, ідентифікації вразливих груп, формування підходу до публічної відповідальності та окреслення можливостей використання штучного інтелекту для оцінювання розподільчих ефектів. Об'єктом дослідження є державний борг і боргова політика як складові державних фінансів, а предметом – соціально-розподільчі, міжпоколінні, інституційні та цифрові аспекти їхнього впливу. Методологічну основу становлять системний, порівняльний, розподільчий та інституційний аналіз, а також дані Eurostat щодо державного боргу, соціального ризику, соціального захисту та нерівності в країнах ЄС. У результаті систематизовано шість каналів соціального впливу боргової політики та показано, що рівень боргу сам по собі не визначає соціальний результат, оскільки суттєве значення мають структура фіскальної політики, масштаби соціального захисту, ринок праці, нерівність і інституційна спроможність. Запропоновано авторську матрицю соціальної вразливості «експозиція – чутливість – адаптивна спроможність» і оцінку розподільчих наслідків для попереднього пояснення соціальних наслідків найбільш значущих боргових рішень. Визначено роль штучного інтелекту як допоміжного інструменту інтеграції даних, ідентифікації груп ризику, сценарного аналізу та моніторингу за принципом human-in-the-loop. Практична цінність результатів полягає в можливості їх використання під час актуалізації положень боргової стратегії та програм фіскальної консолідації.

Ключові слова: державний борг; державні фінанси; соціальні видатки; фіскальне навантаження; соціальна вразливість; нерівність; публічна відповідальність; штучний інтелект.

Introduction. Public debt performs a dual role in the modern system of public finance. On the one hand, government borrowing enables the smoothing of budgetary imbalances, the financing of anti-crisis measures, the support of investment, and the continuity of key state functions during periods of economic, security, and social shocks. On the other hand, debt accumulation and rising debt-servicing costs constrain fiscal space and intensify competition between debt payments and financing current societal needs. According to the International Monetary Fund, global public debt in 2025 amounted to slightly less than 94% of world GDP and, under the baseline projection, may reach 100% of GDP as early as 2029 (International Monetary Fund, 2026). Under such conditions, debt sustainability is increasingly difficult to assess solely by the state's ability to meet its financial obligations on time; equally important are the social costs at which such sustainability is achieved and how the corresponding burden is distributed across different population groups.

The social dimension of public debt is manifested through budgetary and macroeconomic channels, whereby the need to finance the deficit and service accumulated liabilities translates into concrete changes for households. These include higher tax burdens, reductions or slower growth in social transfers, constraints on expenditure for health care, education and other public services, lower public investment, inflation-induced erosion of incomes, and changes in labour-market conditions. According to UNCTAD, in 2024 net interest payments on public debt in developing countries reached USD 921 billion, while 3.4 billion people lived in countries that spent more on interest payments than on health or education (UNCTAD, 2025). During 2018–2024, rising interest costs reduced fiscal space for development in 99 countries with a combined population of approximately 5.5 billion people (UNCTAD, 2026). This confirms that the consequences of the debt burden are not only macrofinancial but also directly social.

At the same time, the fiscal burden associated with public debt is distributed unevenly across the population. The same fiscal-consolidation decision may have fundamentally different consequences depending on household income, consumption structure, dependence on social transfers and public services, employment status, age, and capacity to adapt to changing economic conditions. Increases in indirect taxes tend to affect low-income households relatively more strongly, whereas reductions in transfers or deterioration in access to public services have the greatest impact on groups with limited capacity to offset such losses using private resources. Research on the distributional effects of fiscal consolidation shows that different combinations of tax and expenditure measures differ substantially in their impact on inequality, while cuts in transfers and public services can disproportionately worsen the position of low-income groups (Rawdanowicz, Wurzel, & Christensen, 2013). Therefore, debt-policy assessment requires a shift from an aggregate "cost to the budget" perspective towards an analysis of how social costs and benefits are distributed.

Socially vulnerable groups require particular attention, including low-income households, pensioners, the unemployed, families with children, persons with disabilities, citizens who are highly dependent on public services, and, in situations of war or large-scale crises, internally displaced persons and other groups with limited capacity to compensate independently for a loss of income or public support. Vulnerability to debt and fiscal decisions should be assessed by combining the degree of exposure to a specific measure, sensitivity to its consequences, and the household's adaptive capacity. The intergenerational dimension is also important: borrowing allows shifting part of the cost of current decisions into future periods, but it may also transfer the costs of servicing and repaying accumulated debt to future taxpayers. The generational accounting approach assesses the long-term fiscal burden on current and future generations (Auerbach, Gokhale, & Kotlikoff, 1991), while recent research confirms that demographic change, tax structures, public expenditure, and debt may generate substantially different trajectories of such burdens (Uchida & Ono, 2024).

Under these conditions, public accountability in debt policy should encompass more than the formal disclosure of the amount of public debt, its structure, or debt-servicing costs. It entails the

capacity of public institutions to explain how decisions concerning borrowing, fiscal consolidation, and debt servicing affect different social groups; who bears the highest direct and indirect costs; what compensatory mechanisms are provided for the most vulnerable; and how long-term consequences for future generations are taken into account. The OECD emphasizes that, in an environment of high debt and intensifying competition for budgetary resources, fiscal sustainability increasingly depends on clear communication of social trade-offs, citizen engagement, and trust in budgetary institutions (OECD, 2026b). Thus, the legitimacy of debt policy is determined not only by the state's capacity to secure financing but also by the transparency and fairness of the distribution of the associated social costs.

The development of digital technologies creates additional opportunities for this type of analysis. Artificial intelligence can be used to process large volumes of budgetary, tax, social, and household microdata, identify groups with heightened sensitivity to specific fiscal decisions, model alternative distributional-impact scenarios, and monitor actual social consequences (Petrukha et al., 2025). In this article, AI is considered not as a tool for automatically making debt policy decisions but as a means of supporting ex ante and ex post assessments of their social impact. At the same time, the use of such tools requires control over the risks of algorithmic bias, insufficient model explainability, unequal representation of social groups in the data, and dilution of institutional accountability. The OECD emphasizes that AI can improve the quality of public decision-making, but unverified data, algorithmic opacity, and excessive reliance on automated outputs may exacerbate inequality and reduce citizens' trust (OECD, 2025a). Digital analytics should therefore strengthen, rather than replace, public accountability (Shevchuk et al., 2026).

Despite the substantial body of research on debt sustainability, fiscal consolidation, inequality, and intergenerational distribution, these areas are often analyzed separately. The complex relationship between public debt, specific debt-policy mechanisms, channels for distributing the fiscal burden, the vulnerability of social groups, and the accountability of public institutions for these consequences remains insufficiently systematized. A further research gap concerns the use of AI specifically to assess the social and distributional consequences of debt policy decisions, rather than solely to forecast debt or financial risks. The purpose of the article is to provide a theoretical and applied substantiation of the social consequences of public debt and debt policy by systematizing the channels through which the fiscal burden is distributed, identifying the most vulnerable groups, assessing intergenerational effects and public accountability, and outlining opportunities for the responsible use of AI in analyzing the distributional impact of debt-policy decisions. The study addresses three interrelated questions: through which channels debt policy is transformed into social consequences; which groups are most vulnerable to different forms of fiscal adjustment; and how institutional and digital mechanisms can improve the transparency, justification, and public accountability of debt policy.

Literature Review. The theoretical debate on the social burden of public debt focuses on whether borrowing creates additional future costs or primarily changes the intertemporal distribution of taxes and public expenditure. In Modigliani's (1961) classical approach, debt may reduce future capital and income, whereas Barro's (1979) tax-smoothing model views borrowing as a mechanism for distributing the fiscal burden across periods and avoiding abrupt tax changes. This leads to a key conclusion for the present study: social consequences are determined not by the debt level itself, but by the reasons for borrowing, the uses of borrowed resources, and the way in which future obligations are serviced.

The intergenerational aspect of this issue is captured by the concept of generational accounting, which holds that the conventional deficit does not fully reflect the distribution of net taxes and transfers between current and future generations (Auerbach, Gokhale, & Kotlikoff, 1991). Recent studies confirm that debt, demographic structure, and the system of public expenditure jointly shape future fiscal burdens (Uchida & Ono, 2024). At the same time, the relationship is bidirectional:

inequality and social demand for redistribution can also affect the debt trajectory, which means that debt policy should be assessed as part of a broader mechanism for distributing social costs and benefits (Bartak, Jabłoński, & Tomkiewicz, 2022; Tran-Xuan, 2026).

The empirical literature identifies two principal mechanisms through which debt burdens generate social effects. The first is the crowding out of socially significant expenditure, whereby higher debt and greater debt-servicing costs may constrain financing for education, health care, transfers, and investment in human capital (Lora & Olivera, 2007). The second operates through fiscal-consolidation measures. Studies by Ball et al. (2013), Woo et al. (2013), and the OECD (Rawdanowicz, Wurzel, & Christensen, 2013) show that the impact of consolidation on inequality depends on its composition: different changes in taxes, transfers, and public expenditure produce different distributional outcomes.

Accordingly, the social effects of debt policy are transmitted through tax, expenditure, macroeconomic, and intertemporal channels. Higher taxes change disposable income and consumption; reductions in transfers and services affect households according to their dependence on public support; fiscal adjustment may alter employment and wages; and delayed consolidation shifts part of the burden into the future. A proper assessment must therefore consider not only the scale of adjustment but also the specific set of instruments, their sequencing, and their social profile.

Traditional inequality indicators do not fully capture the social cost of debt-policy decisions because the same fiscal shock can have different consequences for different households. For the purposes of this article, social vulnerability is treated as a combination of three characteristics: exposure to a specific measure, sensitivity to a loss of income or services, and adaptive capacity. This logic helps explain why households experiencing the same formal decline in income may face fundamentally different welfare outcomes.

Higher risk is typically observed among low-income households, the unemployed, pensioners, families with children, persons with disabilities, and people who are heavily dependent on public services. In conditions of war or a large-scale crisis, this group also includes populations already affected by an external shock, such as displaced persons. Distributional asymmetry also depends on the policy instrument: indirect taxes may disproportionately affect low-income groups, reductions in targeted payments concentrate losses among recipients, whereas progressive taxes and targeted compensation can mitigate the social cost of consolidation (Woo et al., 2013; IMF, 2014).

International approaches to public debt management traditionally associate policy quality with transparency, a clear allocation of responsibilities, and accountability (International Monetary Fund & World Bank, 2014). This is insufficient for analysing social consequences. Public accountability should also explain which groups bear the main costs of debt and fiscal decisions, what protection mechanisms are envisaged for groups that are disproportionately affected, and how current decisions relate to future benefits and obligations. Financial accountability is therefore complemented by distributional and intergenerational dimensions.

Digital technologies and artificial intelligence can strengthen such assessment by integrating budgetary, tax, demographic, and social data, identifying risk groups, and comparing alternative scenarios before and after the implementation of fiscal measures. At the same time, the OECD (2025a) emphasizes the risks of biased data, insufficient explainability, and excessive reliance on automated outputs. AI should therefore be regarded as a tool supporting distributional impact assessment rather than as a source of a normative decision on the “fair” distribution of burdens (Petrukha et al., 2026). The research gap lies precisely in the need to integrate debt sustainability, social vulnerability, intergenerational distribution, public accountability, and AI-assisted analysis within a single framework, which is developed in the following sections.

Aim. The aim of the article is to provide a comprehensive substantiation of the social consequences of public debt and debt policy by identifying the channels through which the fiscal burden is distributed across social groups and generations, identifying the most vulnerable groups,

and developing an approach to public accountability for the distributional consequences of debt-policy decisions. Particular attention is paid to the potential of artificial intelligence as a tool supporting the assessment of the social and distributional effects of debt policy while preserving human oversight and institutional accountability.

Methodology. The study is theoretical, applied, and comparative in nature. Its methodological logic is based on the premise that the social consequences of public debt are transmitted through the channels of debt financing and servicing, including taxation, changes in public expenditure, inflation and interest-rate effects, and the intertemporal transfer of fiscal burdens. Systems analysis, comparative analysis, classification, grouping, and structural-logical modelling are used to systematize these channels.

The empirical component is based on comparable data for the 27 EU Member States over 2019–2024. The principal sources are Eurostat Government Finance Statistics and EDP statistics (ESA 2010), EU-SILC, and ESSPROS; IMF and OECD materials are used as supplementary sources. The analysis covers public debt as a percentage of GDP, interest expenditure, social-protection expenditure, AROPE, and indicators of income inequality. Countries are compared in terms of debt burden and debt-servicing costs, after which differences in social indicators are assessed. The comparison is descriptive and is not used to establish direct causality.

Social vulnerability is assessed using three characteristics: exposure to a specific fiscal measure, sensitivity to its consequences, and adaptive capacity. On this basis, a vulnerability matrix for major population groups is developed and linked to the channels through which the fiscal burden is transmitted. Artificial intelligence is considered as a supporting tool for distributional analysis, including the integration of budgetary and social data, identification of risk groups, and scenario-based assessment of consequences. Responsibility for final debt-policy decisions remains with public institutions in accordance with the human-in-the-loop principle.

Results. The results are presented as a sequence of interrelated analytical generalizations, ranging from the identification of channels through which public debt and debt policy are transformed into social consequences to the assessment of the distribution of the fiscal burden across social groups, the construction of a vulnerability matrix, the definition of requirements for public accountability, and the role of artificial intelligence in distributional analysis. The empirical context is used to examine the central proposition that the debt level alone does not determine social outcomes, since the consequences also depend on the structure of fiscal policy, social protection, labour-market conditions, and the institutional capacity of the state.

Channels through which public debt is transformed into social consequences. The first result is the systematization of the mechanism by which debt-policy decisions are translated into social outcomes. Government borrowing can generate positive social effects when it finances stabilization measures, critical infrastructure, or income protection during a crisis. However, debt accumulation and higher debt-servicing costs increase future demand for budgetary resources and intensify competition between interest payments, social expenditure, and investment. Social effects therefore arise not directly from the debt-to-GDP ratio but through specific tax, expenditure, and macrofinancial decisions.

To systematize the mechanisms identified, Table 1 summarizes six principal channels through which debt-policy decisions can affect population welfare. For each channel, the transmission mechanism, the main groups bearing the burden, and the most likely social outcome are presented. This format makes it possible to separate the existence of debt itself from the specific way in which the need to finance or service it is translated into tax, expenditure, and macrofinancial changes.

As shown in Table 1, the most direct social effects arise when debt pressures are translated into expenditure consolidation, tax adjustment, or higher financing costs. At the same time, the magnitude of each channel depends on the design of the specific measure. For example, the same amount of budgetary savings may have very different social effects depending on whether cuts affect

general administrative expenditure, public investment, or targeted transfers to low-income households. Assessing the consequences therefore requires more than identifying the relevant channel; the entire chain from the debt-policy decision to the final social outcome must be traced.

Table 1

Main channels through which public debt and debt policy affect social outcomes

Channel	Transmission mechanism	Main bearers of the burden	Possible social outcome
Debt servicing	Increase in the share of interest payments in the government budget	Recipients of social services; future government budgets	Risk of crowding out social and investment expenditure
Tax adjustment	Higher taxes or contributions to stabilize public finances	Households and businesses, especially groups with low adaptive capacity	Lower disposable income; changes in consumption and employment
Expenditure consolidation	Cuts in transfers, subsidies, public services, or investment	People dependent on public support and services	Higher risk of poverty and inequality; reduced access to services
Inflation channel	Combination of fiscal imbalances, financing conditions, and price shocks	Households with fixed incomes and low savings	Lower purchasing power and real incomes
Financial conditions	Higher sovereign risk premia and interest rates raise borrowing costs	Borrowers, small and medium-sized enterprises, households with loans	Constraints on investment, housing affordability, and employment
Intergenerational channel	Transfer of part of current costs to future fiscal policy and government budgets	Younger and future generations	Changes in available fiscal space and the structure of future public services

Source: systematized by the authors based on International Monetary Fund (2026), G.H. Hong et al. (2026), World Bank (2024) and OECD (2026a).

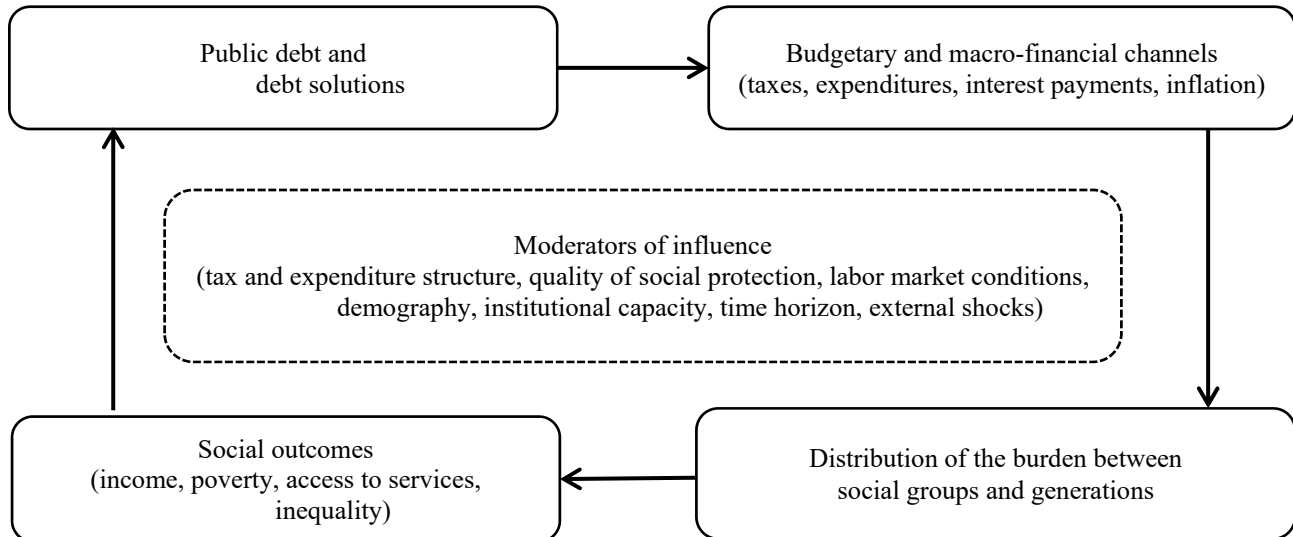
For this purpose, Figure 1 presents a generalized sequence through which debt-policy decisions are transformed into social outcomes and identifies moderating factors that may strengthen or weaken this relationship. The visualization shows that the debt indicator is only the starting point, whereas the actual distributional effect is formed at the intermediate stages of budgetary and macrofinancial policy.

The proposed scheme makes it possible to separate the debt factor from the mechanism through which its social effects are transmitted. The same debt level may be associated with different consequences depending on whether adjustment is implemented through progressive or regressive taxation, whether targeted transfers are protected, how accessible public services remain, and how rapidly consolidation takes place. IMF research shows that incorporating distributional considerations may justify a more gradual optimal consolidation path, while well-targeted transfers can mitigate the social costs of stabilization (Tran-Xuan, 2026; Hong et al., 2026).

Distribution of the fiscal burden and the EU empirical context. The empirical analysis uses indicators for the 27 EU Member States over 2019–2024, while the main comparable social cross-section is based on 2024 data. This choice reflects the fact that new EU-SILC legislation took effect in 2021 and breaks in time series were recorded for a number of countries. Consequently, direct comparison of social indicators over the entire period requires caution (Eurostat, 2026a). A wider time horizon remains informative for debt dynamics. EU debt declined to 77,5% of GDP at the end of 2019, rose sharply to 89,5% in 2020, and stood at 80,7% of GDP at the end of 2024 (Eurostat, 2025a).

According to Eurostat's latest second EDP notification for 2024, the highest debt-to-GDP ratios were recorded in Greece (154,2%), Italy (134,9%), France (113,2%), Belgium (103,9%), and Spain (101,6%), whereas the lowest were observed in Estonia (23,5%), Bulgaria (23,8%), and Luxembourg (26,3%) (Eurostat, 2025a). At the same time, 21,0% of the EU population was at risk of poverty or social exclusion (AROPE). The highest values were observed in Bulgaria (30,3%),

Romania (27,9%), Greece (26,9%), Spain and Lithuania (25,8% each), while the lowest were recorded in Czechia (11,3%), Slovenia (14,4%), the Netherlands (15,4%), Poland (16,0%), and Ireland (16,7%) (Eurostat, 2025b).



Source: developed by the authors.

Figure 1. Mechanism through which debt-policy decisions are transformed into social outcomes

To illustrate the ambiguity of the relationship between debt burden and social outcomes, Table 2 presents a sample of EU countries with different combinations of debt-to-GDP and AROPE. The purpose of this comparison is neither to rank countries nor to establish causality, but to demonstrate that high or low debt levels may coexist with fundamentally different levels of social risk.

Table 2

Illustrative profiles of debt burden and social risk in selected EU countries, 2024

Country	Debt, % of GDP	AROPE, %	Analytical profile*
Bulgaria	23,8	30,3	Lower debt/high social risk
Romania	54,8	27,9	Lower debt/high social risk
Greece	154,2	26,9	High debt/high social risk
Spain	101,6	25,8	High debt/high social risk
Lithuania	38,0	25,8	Lower debt/high social risk
Czech Republic	43,3	11,3	Lower debt/low social risk
Slovenia	66,6	14,4	High debt/low social risk
Netherlands	43,7	15,4	Lower debt/low social risk
Poland	55,1	16,0	Lower debt/low social risk
Ireland	38,3	16,7	Lower debt/low social risk

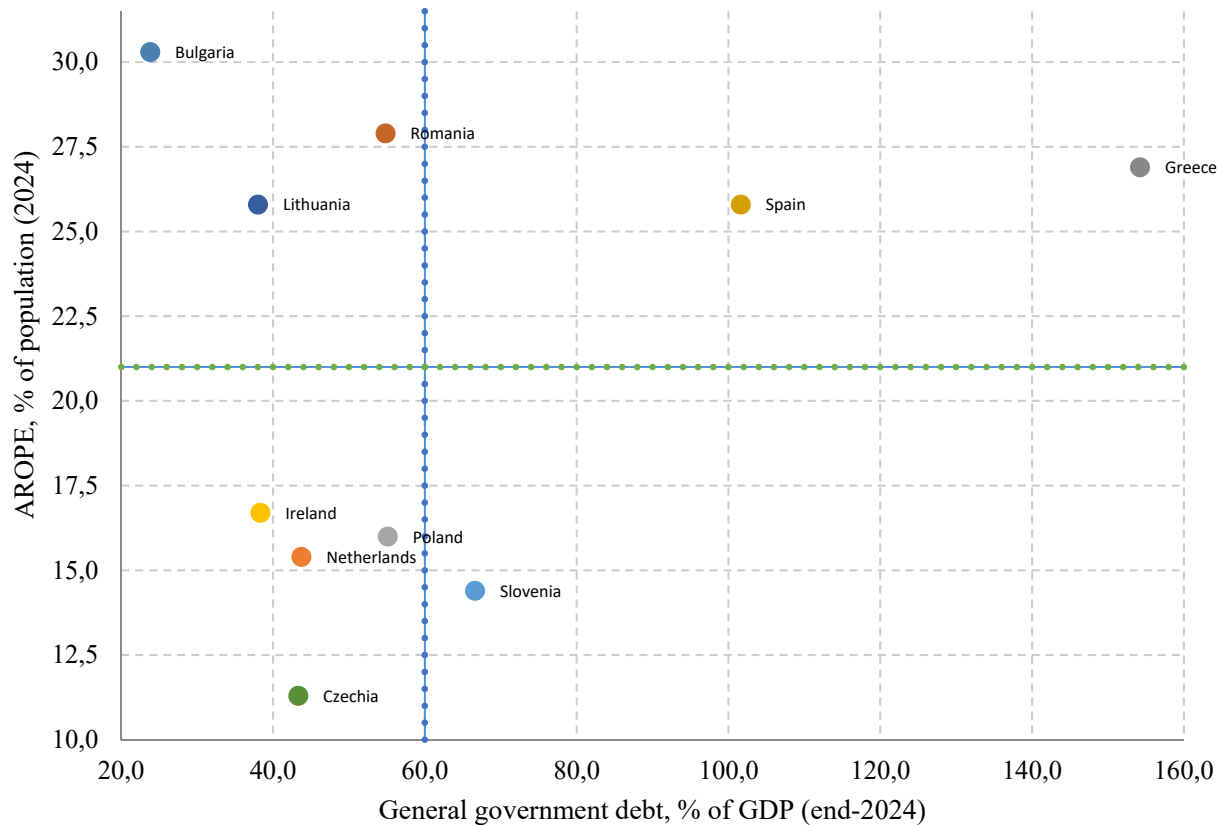
Source: compiled by the authors based on Eurostat (2025a, 2025b).

* Benchmark: 60% of GDP for debt and EU average AROPE 21.0%.

Table 2 shows that there is no single "debt" profile of social vulnerability. The sample includes both countries with high debt and high AROPE, as well as countries with relatively low debt but increased social risk, as well as countries where a significant debt burden is combined with low AROPE. Therefore, to interpret social consequences, it is necessary to take into account not only the debt stock, but also the ability of the social protection system, tax policy and labor market to mitigate fiscal shocks.

To better illustrate this heterogeneity, the data in Table 2 are plotted in Figure 2 in the coordinates "government debt – AROPE". This form is not used as a statistical test, but allows us to

visually see the dispersion of countries between different combinations of debt and social burden and thereby emphasize the need to analyze additional institutional and distributional factors.



Source: constructed by the authors based on Eurostat (2025a, 2025b).

Figure 2. Debt burden and risk of poverty or social exclusion in selected EU countries

The comparison reveals different combinations: Greece and Spain combine high debt with elevated AROPE, while Bulgaria and Lithuania exhibit high social risk despite relatively low debt; Slovenia, by contrast, has debt above 60% of GDP and one of the lowest AROPE rates. Important moderating factors include the scale and structure of social protection and the initial level of inequality. In 2024, social-protection expenditure in the EU amounted to 27,3% of GDP, ranging from 32,5% in Finland, 31,9% in France, and 31,8% in Austria to 12,4% in Ireland, 13,4% in Malta, and 16,6% in Hungary (Eurostat, 2025c). The EU Gini coefficient was 29,4; the highest values were recorded in Bulgaria (38,4), Lithuania (35,3), and Latvia (34,2), while in Slovakia, Czechia, and Slovenia it was below 25 (Eurostat, 2025e). This confirms the need to interpret the social outcomes of debt policy through a combination of fiscal and institutional parameters rather than debt levels alone.

Social vulnerability matrix for debt policy. The third result is the development of a social vulnerability matrix based on the logic of "exposure – sensitivity – adaptive capacity". Exposure characterizes the direct effect of a tax, expenditure, or price measure; sensitivity reflects the scale of the potential welfare loss; and adaptive capacity captures the ability to compensate for that loss through savings, private services, changes in employment, or other income sources. This framework enables a shift from a homogeneous concept of "the population" to a differentiated assessment of social effects.

Based on this logic, Table 3 presents an original social vulnerability matrix for the main population groups. The matrix is not a mechanical rating scale; its purpose is to identify in advance

those groups for which a particular debt or fiscal policy measure requires an in-depth distributional impact assessment before a decision is taken.

Table 3

Social vulnerability matrix to debt and fiscal policy measures

Social group	Typical exposure	Sensitivity	Adaptive capacity	Priority for evaluation
Low-income households	Indirect taxes, inflation, transfers	High	Low	Very high
Unemployed and households with low work intensity	Social benefits, employment, services	High	Low	Very high
Families with children and single parents	Transfers, education, care, consumption taxes	High	Low/medium	High
Pensioners and people on fixed incomes	Inflation, indexation, healthcare	High	Low/medium	High
Persons dependent on public services	Reduction in availability or quality of services	High	Low	Very high
Middle-income households	Income taxes, credit rates, services	Medium	Medium	Average
Youth and future generations	Future taxes, investments, employment, fiscal space	Medium/high	Depends on the horizon	High

Source: developed by the authors; vulnerability logic is consistent with EU-SILC, World Bank distributional analysis, and OECD social protection analysis approaches.

The matrix indicates that the highest priority for ex ante assessment should be given to groups that combine high exposure and sensitivity with low adaptive capacity. Low-income households, the unemployed, and people critically dependent on public services may therefore experience disproportionately large losses even when the average effect of a measure on the population as a whole appears limited. For young people and future generations, by contrast, the key issue is not so much current exposure as the time horizon and the accumulation of deferred fiscal obligations.

EU statistics confirm the need for such differentiation. In 2024, 24,2% of children under 18 were at risk of poverty or social exclusion, exceeding the average for the EU population as a whole. Eurostat also records substantially higher social risk among the unemployed, people with low levels of education, and other groups with limited adaptive capacity (Eurostat, 2025d; Eurostat, 2026b). The same nominal expenditure cut or tax increase may therefore have a different social cost depending on the group affected by the measure.

Public accountability for the distributional consequences of debt-policy decisions. The fourth result is an expanded interpretation of public accountability in debt policy. Traditional transparency focuses on debt levels, maturity profiles, borrowing costs, and refinancing risks. The proposed approach supplements this with an obligation for the state to explain the expected distribution of social costs: who gains and who loses from a specific decision; which groups have the lowest capacity to adapt; whether compensatory mechanisms are envisaged; how the decision affects the intergenerational balance; and whether alternative ways of achieving the same fiscal objective have been considered.

In practical terms, the preparation of medium-term debt and fiscal decisions should include a concise distributional impact statement. It may contain a baseline scenario, a list of social groups, expected direct and indirect effects, risks to access to critical services, compensatory measures, and indicators for subsequent monitoring. This does not replace macrofinancial debt-sustainability analysis but adds a social criterion for assessing the quality of the decision.

Artificial intelligence as a tool for assessing social and distributional effects. The fifth result is the identification of the functional role of artificial intelligence within the proposed system. Unlike the use of AI for public-debt forecasting or debt-portfolio optimization, its role in this article is limited to supporting distributional analysis. AI can integrate budgetary, tax, social, and microdata; identify groups at elevated risk; help compare alternative scenarios; analyse large volumes of regulatory and budgetary documents; and support ex post monitoring of actual outcomes. The OECD highlights the

potential of AI for predictive analytics, better targeting of social programs, and improved quality of public decisions, while simultaneously emphasizing risks related to biased data, opacity, digital exclusion, and excessive reliance on automated outputs (OECD, 2025a, 2025b).

The specific areas in which AI can support such assessment are systematized in Table 4. For each function, the practical analytical application is compared with the characteristic risk and the corresponding safeguard. This distinction is important because technological capability and appropriate managerial use are not the same: the same AI function may improve the quality of analysis or, in the absence of proper controls, create new risks for vulnerable groups.

Table 4

Directions for using AI to assess the social consequences of debt policy

AI function	Analytical application	Key risk	Required safeguard
Data integration	Combining budget, tax, social and microdata	Low quality or inconsistent data	Data standards, validation and traceability of sources
Vulnerability detection	Finding groups at high risk of losing income or access to services	Algorithmic bias	Discrimination and representativeness testing
Scenario analysis	Comparing the distributional consequences of alternative tax and expenditure measures	False accuracy and model risk	Stress scenarios, alternative models, expert review
NLP document analysis	Identifying changes in budget programs, benefits, rules, and social guarantees	Incorrect interpretation of legal norms	Legal and substantive verification
Monitoring consequences	Identifying deviations of actual social indicators from expectations	False signals and data drift	Regular validation and quality control
Public communication	Preparation of structured dashboards and explanations for stakeholders	Simplification or manipulative presentation	Disclosure of methodology, sources and uncertainties

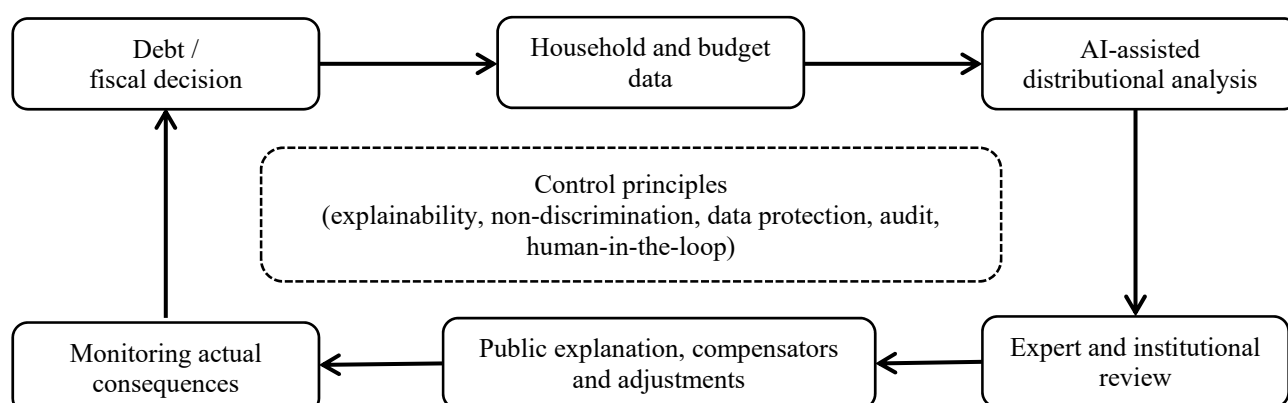
Source: systematized by the authors based on OECD (2025a, 2025b) and World Bank (2026).

Table 4 shows that the potential of AI is greatest at stages where large volumes of heterogeneous data must be integrated, atypical combinations of risks identified, or scenarios compared rapidly. At the same time, each advantage has a corresponding risk: more precise targeting may turn into algorithmic discrimination, automated document analysis may result in incorrect interpretation of legal provisions, and simplified public communication may conceal model uncertainty. AI-assisted analysis should therefore operate only within a formalized accountability framework.

The relationship between the analytical capabilities of AI and institutional accountability is summarized in Figure 3. Unlike a linear "data – model – decision" scheme, the proposed framework is cyclical: AI-generated analytical results undergo expert and institutional review, are communicated to the public, and actual outcomes are fed back into the system as a basis for adjusting policy and analytical models.

The proposed cycle establishes a fundamental boundary for automation: AI can expand the information base but cannot itself be a subject of public accountability. Final decisions regarding the composition of consolidation, tax changes, social compensation, and the acceptable distribution of risks must remain with authorized public institutions. The central conditions for the use of AI are a human-in-the-loop approach, explainability, model documentation, personal-data protection, testing for discriminatory effects, and the possibility of independent audit.

Overall, the findings form an integrated approach to the social assessment of debt policy: public debt is examined through the channels of actual redistribution; consequences are assessed differentially across social groups and generations; public accountability includes both ex ante explanation of distributional effects and subsequent monitoring; and AI is used as a supporting analytical tool rather than a substitute for institutional judgement.



Source: developed by the authors.

Figure 3. AI-supported public-accountability framework for the social consequences of debt policy

Discussion. The findings extend the traditional approach to public debt assessment, which primarily focuses on debt sustainability, borrowing costs, and refinancing risks. The theoretical approaches of F. Modigliani (1961), R.J. Barro (1979), and generational accounting show that debt changes the intertemporal and intergenerational distribution of taxes, expenditure, and resources. The present study complements this logic with a social dimension: the key issue is not only whether the state can service its debt, but also which instruments are used to secure this capacity and which social groups ultimately bear the main burden. This is consistent with research on fiscal consolidation, which shows that distributional consequences depend on the composition of tax and expenditure measures (Ball et al., 2013; Woo et al., 2013; Rawdanowicz, Wurzel & Christensen, 2013). More recent work by M. Tran-Xuan (2026) further shows that taking redistribution motives into account may imply a more gradual optimal path of debt stabilization.

The illustrative comparison of EU countries confirms that the level of public debt cannot serve as a stand-alone indicator of social risk. High debt and elevated AROPE in some countries coexist with low debt and significant social vulnerability, as well as with relatively high debt combined with a low risk of poverty or social exclusion. This does not establish causality, but it points to the role of moderating factors: the structure of social protection, income distribution, employment, the quality of public services, and the nature of budgetary adjustment. In this context, the "exposure – sensitivity – adaptive capacity" matrix functions as an intermediate analytical link between an aggregate fiscal decision and its impact on specific social groups.

The proposed expansion of the concept of public accountability aligns with the current evolution of public finance management approaches. Traditional IMF and World Bank recommendations emphasize transparency, allocation of responsibilities, reporting, and risk management; however, under conditions of high debt and complex fiscal trade-offs, these are insufficient to ensure the social legitimacy of decisions. The OECD (2026b) links the restoration of public finances to citizens' understanding of budgetary trade-offs, participation, and trust. The proposed distributional impact statement can therefore be viewed as a practical complement to traditional debt reporting. Alongside the budgetary cost of a decision, it should show who bears its social costs and what compensatory mechanisms are envisaged.

A separate element of the scientific novelty is the inclusion of artificial intelligence not in the automatic formulation of debt policy but in the system for assessing its social and distributional consequences. This is consistent with OECD (2025b), which considers AI a tool for predictive analytics and for improving the effectiveness of social programs, while also emphasizing the risks of biased data, insufficient explainability, and automation bias. In the proposed model, an algorithm may help identify vulnerable groups and compare scenarios, but it should not determine what constitutes a normatively acceptable distribution of social burdens. A human-in-the-loop approach, model

auditing, data protection, and the explainability of outputs are therefore conditions for the legitimate use of AI.

The principal distinction of the proposed approach from previous studies lies in its integration of debt sustainability, channels of fiscal redistribution, social vulnerability, intergenerational accountability, and AI-assisted analysis into a single framework. This allows the quality of debt policy to be interpreted more broadly than as the minimization of cost and risk: it should also consider the distribution of social consequences, the ability of vulnerable groups to adapt, and the quality of public explanation of decisions. At the same time, the empirical component does not establish a causal effect of debt on poverty or inequality, while the vulnerability matrix and the AI-supported framework are conceptual in nature. Further research should test them using household microdata and quantitative fiscal-consolidation scenarios.

Conclusion. The study confirms that the social consequences of public debt and debt policy cannot be assessed solely through the debt-to-GDP ratio, debt-servicing costs, or formal debt sustainability. What is decisive is the set of tax, expenditure, macrofinancial, and intertemporal mechanisms through which debt policy decisions translate into changes in population welfare and in how the corresponding burden is distributed across social groups and generations. Six principal channels of such impact are systematized: debt servicing, tax adjustment, expenditure consolidation, the inflation channel, changes in financial conditions, and the intergenerational transfer of burdens. The illustrative comparison of EU countries shows that the same or similar debt levels may be associated with different social outcomes depending on the structure of fiscal policy, social protection, labour-market conditions, inequality, and the institutional capacity of the state.

The second result is the development of an original social vulnerability matrix based on the logic of "exposure – sensitivity – adaptive capacity". It makes it possible to move from assessing impacts on "the population as a whole" to the ex ante identification of groups for which specific tax or expenditure measures may generate disproportionately high social costs. Particular attention should be paid to low-income households, the unemployed, families with children, persons with fixed incomes, and citizens critically dependent on public services; the burden on younger and future generations constitutes a separate dimension.

The third result is an expansion of the concept of public accountability in debt policy. It is proposed that traditional debt transparency be supplemented by a concise distributional impact statement explaining which groups receive benefits or bear the main costs, what compensatory measures are envisaged, and how actual social consequences will be monitored. A further element of scientific novelty is the identification of artificial intelligence as a supporting tool for such analysis, including the integration of budgetary, tax, and social data, identification of risk groups, scenario comparison, and monitoring of outcomes. Normative choices and ultimate accountability should nevertheless remain with public institutions in accordance with the human-in-the-loop principle.

The practical significance of the proposed approach lies in its potential use in preparing medium-term debt strategies, fiscal consolidation programs, and assessments of changes in taxes and public expenditure. At the same time, the empirical comparison is descriptive and does not establish direct causality between debt, poverty, and inequality, while the vulnerability matrix and the AI-supported framework require further quantitative validation. A promising direction for further research is to test the proposed framework using household microdata and to model alternative fiscal-consolidation scenarios.

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