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THE EFFECTIVENESS OF THE FISCAL MECHANISM OF ENSURING SUSTAINABLE DEVELOPMENT IN UKRAINE

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ABSTRACT

Fiscal mechanisms, principally taxation and public expenditure, are central to aligning economic growth with social equity and environmental objectives in transitioning economies. In Ukraine, persistent challenges in revenue mobilization and spending efficiency necessitate quantification of how fiscal variables co-move with GDP growth. This study examines the association between budgetary revenues and GDP growth in Ukraine. Specifically, it investigates whether total tax revenue and the composition of taxation (direct versus indirect) are differentially related to growth across business cycle phases. The analysis uses annual time-series data for 2000–2022 from the Ministry of Finance of Ukraine, the World Bank, and the International Monetary Fund. Variables include GDP growth (dependent), tax revenue (% of GDP), direct and indirect taxes (% of GDP), government expenditure (% of GDP), inflation, foreign direct investment (FDI, % of GDP), and trade openness (% of GDP). Quantile regression is estimated at q = 0.25, 0.50, and 0.75 to capture heterogeneity across low-, median-, and high-growth conditions. Results indicate positive and statistically significant associations between tax revenue and GDP growth at all quantiles: 0.28 (q25), 0.35 (q50), and 0.42 (q75). Direct taxes display larger coefficients (0.31, 0.44, 0.51) than indirect taxes (0.12, 0.18, 0.24). Government expenditure is positively related to growth (0.15, 0.19, 0.22), as are FDI (0.20, 0.25, 0.30) and trade openness (0.18, 0.22, 0.28). Inflation is negative and not statistically significant (−0.08, −0.10, −0.12). The principal finding is that association magnitudes increase toward upper quantiles, with direct taxes exhibiting the largest coefficients relative to indirect taxes.

INTRODUCTION

Sustainable development in transition economies depends on whether fiscal mechanisms, primarily taxation and public expenditure, can finance growth while maintaining equity and resilience amid recurrent shocks (Hariram et al., 2023). Ukraine's fiscal capacity has been repeatedly tested by global crises and war-related disruptions that alter revenue bases, reallocate spending, and reshape external linkages (Astrov et al., 2022). International evidence shows that how governments raise and spend revenue affects growth, poverty, and inequality, not merely the size of the budget (Bradley et al., 2021). Within this framework, Ukraine faces persistent challenges: tax-base volatility, compliance gaps, and allocative inefficiencies that complicate the alignment of budgetary policy with sustainable development objectives (Aslund & Menil, 2019). At the same time, structural forces, digitalisation, trade reorientation, and green-investment imperatives are shifting the composition and productivity of both revenues and outlays (Wang et al., 2025).

Despite an extensive literature on ‘how much’ the state should tax and spend, less is known, particularly for Ukraine, about how fiscal composition co-moves with growth across the distribution of macroeconomic outcomes, that is, in low-, median-, and high-growth regimes. Standard mean regressions can obscure heterogeneous responses that matter for policy timing and design (Balasoiu et al., 2023; Stantcheva, 2021). Moreover, debates on direct versus indirect taxation concern both efficiency and equity: cross-country studies suggest differing growth associations by tax type, yet country-specific, crisis-aware evidence for Ukraine remains limited.

To address heterogeneity, this study employs quantile regression on annual Ukrainian macroeconomic data (2000–2022) to estimate associations between GDP growth and fiscal variables, controlling for standard macroeconomic indicators.

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This approach identifies parameters at different points of the growth distribution and is appropriate when shock exposure and policy transmission vary across phases of the economic cycle (Astrov et al., 2022; Atolia et al., 2021).

The analysis examines whether total tax revenue and its composition (direct versus indirect) are differentially associated with GDP growth across growth regimes in Ukraine, and how these associations compare in magnitude with government expenditure, trade openness, inflation, and foreign direct investment (Hariram et al., 2023; Lytvyn et al., 2023; Ruzgas et al., 2023). Section 2 situates the problem within recent scholarship and the Ukraine-specific context (2020–2025). Section 3 outlines data, variables, and the quantile-regression framework. Section 4 presents descriptive statistics and estimates at the 0.25, 0.50, and 0.75 quantiles. Section 5 interprets the findings with reference to fiscal composition and external linkages. Section 6 concludes with the principal empirical insights.

LITERATURE REVIEW

Fiscal policy exerts a significant influence on economic growth and progress. Business activity is also less secure, and resources are utilised differently. The government can finance public services through taxation and public expenditure on healthcare, education, and infrastructure (Atolia et al., 2021). In earlier theories, including those of Barro (1990), it was emphasised that fiscal policy serves two key functions: stimulating economic growth and maintaining budgetary discipline. According to Barro (1990), the government must increase taxation to fund projects that enhance productivity among individuals and businesses. Nevertheless, excessive or poorly designed taxation can slow down growth rates, thereby discouraging individuals from spending and establishing new enterprises (Tricker, 2020). Fiscal strategy is particularly crucial when the economy is undergoing rapid transformation, as is currently the case in Ukraine (Astrov et al., 2022).

Since gaining independence in 1991, Ukraine has implemented several budgetary and economic reforms aimed at stabilising and promoting growth. Adopting progressive tax regimes, reforming tax mechanisms, and improving tax revenue collection have been among the most significant measures.

Despite these efforts, Ukraine's budgetary policies have not been entirely successful due to deep-rooted structural challenges (Mishchenko et al., 2019). Tax fraud remains a serious concern, while the shadow economy is believed to constitute a substantial share of total economic activity (Bashlakova & Bashlakov, 2021). The situation is further aggravated by corruption and inefficiency in social fund expenditures, which undermine the fiscal system's ability to support equitable and sustainable development. Belinska et al. (2023) examine the potential of biogas production to contribute to achieving sustainable development goals, highlighting its role in addressing energy shortages, promoting renewable energy, managing waste, and creating employment opportunities. Savchuk et al. (2023) identify poor data, weak regulation, insufficient funding, and a shortage of AI specialists as the four principal barriers to integrating AI to advance Ukraine's sustainability objectives.

Extensive international research demonstrates that different taxation schemes exert varying effects on economic growth (Shah et al., 2020; Shah & Shah, 2023). According to OECD data, direct taxes, including income and corporate taxes, are generally more closely associated with GDP growth than indirect taxes such as value-added tax (VAT) and excise duties (Mgammal et al., 2023). Direct taxation tends to increase progressively with income, enabling lower-income individuals to retain a greater share of their earnings at the expense of higher-income groups (Cansunar, 2021). This model promotes social equity and aligns with the principles of sustainable development. Conversely, indirect taxes disproportionately burden disadvantaged groups, exacerbating income inequality (van der Hoeven, 2019). Achieving a balanced mix between direct and indirect taxation is therefore essential to fulfilling fiscal policy objectives in countries such as Ukraine, where income disparities remain pronounced.

Reva and Demchenko (2024) emphasise the advantages and flexibility of online testing as a sustainable, long-term method of supporting mental well-being, particularly during periods of social and cultural transition, while noting the need for further research. Kravtsov et al. (2024) analyse the levels of anti-corruption progress in Ukraine between 2012 and 2022, focusing on reforms implemented amid ongoing conflict.

The research highlights significant institutional, legal, and digital transformations that have strengthened transparency and accountability, particularly in taxation, procurement, and governance. It provides valuable insights into the role of digitalisation and structural reform in ensuring the sustainable implementation of anti-corruption strategies during national recovery and reconstruction. The purpose of the study by Bozhkova and Halytsia (2022) is to determine how to achieve sustainable, innovative economic development in Ukraine amid global change and an economic crisis. The authors emphasise that small and medium-sized enterprises (SMEs) play a crucial role in job creation and innovation, as they are more adaptable to challenging circumstances such as martial law and geopolitical instability. The study also underlines the importance of economic systems that align with global trends in ecology and digitalisation while remaining adaptable to unforeseen challenges.

These global developments are also evident in Ukraine's tax regime. Nevertheless, the country faces unique challenges due to its institutional characteristics and economic history. According to a World Bank study (Paientko & Oparin, 2020), Ukraine's tax system has been inefficient. Taxes constitute a larger share of government GDP than in neighbouring countries, which hampers growth and development. This inefficiency stems largely from tax evasion and the misappropriation of public funds. Spending on essential public needs such as housing and education is often mismanaged, exacerbating fiscal imbalances.

Furthermore, Kuzmina et al. (2021) note that sustainable growth depends on workplace well-being and risk awareness. Their study indicates that a long-term workforce can be supported through a symbiotic balance of physical, psychological, and flexible work arrangements. According to Sembiyeva et al. (2023), green investments, particularly green bonds, can enhance sustainability and energy security while meeting the increasing demands of environmental, social, and governance (ESG) criteria. To minimise environmental impact and maximise global competitiveness, comprehensive financial analysis, risk assessment, and strategic planning must be implemented.

Sopronenkov et al. (2023) examine the impact of EU-27 tax policies on business development and overall economic dynamics between 2000 and 2022. Their findings reveal that the share of tax revenue is only weakly correlated with GDP growth (9%), suggesting that factors other than tax structure play a more significant role in determining long-term growth. This contributes to a better understanding of the nuanced, country-specific effects of taxation on economic and business performance. Similarly, Gnangnon (2024) provides valuable insights into the impact of taxation on economic growth across 101 developing countries, employing the two-step system generalized method of moments, which confirms a positive and significant relationship between tax revenue and GDP growth, supporting the potential benefits of sound tax policy development.

Statistical evidence indicates that, in recent years, Ukraine has increasingly relied on indirect taxation, such as value-added tax and import duties (Lytvyn et al., 2023). These taxes are generally easier to administer and less prone to evasion. However, their long-term effects on growth and income inequality remain uncertain, particularly given their regressive nature. Direct taxes, though slower to rise, are more equitable and better aligned with the principles of equal rights.

Ukraine's budgetary framework retains significant potential for reform and optimisation. Marchuk et al. (2023) highlight the importance of utilising social media to raise public awareness of sustainable development projects through education, outreach, and collaboration. In the contemporary age of technology and digitalisation, the authors stress the need to equip citizens with analytical skills, community engagement, and the ability to use available digital tools for sustainable progress.

The study by Dykha (2016) presents a comprehensive model of managing socioeconomic processes under market conditions. It emphasises the interconnection between state regulation, public finance management, and project budgeting as essential instruments for improving governance efficiency. The research contributes to a deeper understanding of reform-based economic processes that enhance both state and market participation in promoting socioeconomic development.

An econometric model is a methodological framework for analysing the dynamics of the relationship between economic growth and tax revenue (Gurdal et al., 2021). Empirical evidence from Eastern European countries demonstrates that GDP growth rates may rise significantly even with minimal increases in direct tax income (Ruzgas et al., 2023). Ukraine's economic transformation is primarily linked to improvements in the efficiency and equity of its taxation system. Moreover, innovative mechanisms, such as targeted public spending and enhanced financial management, can be strengthened through the implementation of electronic tax collection systems. The analysis focuses on revenue gains from taxation and GDP growth to provide policymakers with empirical data to support informed decision-making.

Most previous studies on fiscal processes have been conducted at a broader regional level. In contrast, this paper focuses exclusively on Ukraine to identify trends, opportunities, and challenges specific to the country's taxation system. The results are expected to shed light on the most effective fiscal policies that can enable emerging economies to achieve long-term growth.

Another important area of current research concerns the growing significance of fiscal resilience and capacity in economies affected by conflict or undergoing transition (International Monetary Fund, 2009). The case of Ukraine demonstrates that the core elements of reconstruction and long-term stability are revenue mobilisation and structural tax reform (Maliarchuk et al., 2025). The importance of comprehensive recovery assessments underscores the scale of financing required after the war and clarifies the role of public financial structures in ensuring sustainable growth.

At the same time, existing studies in public finance emphasise that fiscal instruments contribute not only to economic expansion but also to institutional strengthening and social cohesion (International Monetary Fund, 2009). According to this body of research, the analysis of the relationships between taxation and growth must be complemented by studies of tax administration performance, expenditure composition, and the interactions among fiscal policy, external shocks, and wartime disruptions.

Another relevant strand of research focuses on the composition and regime dependence of fiscal multipliers and tax–growth linkages. Cross-country and panel studies demonstrate that the impact of tax revenues on economic growth varies between low-growth and high-growth countries and depends on the balance between direct and indirect taxation (Shaqiri et al., 2024; Vazquez, 2023). For instance, a panel study covering 20 OECD economies concluded in 2023 that shifting the tax burden between labour, capital, and consumption can enhance growth only under specific institutional and macroeconomic conditions (Vazquez, 2023).

In the case of Ukraine, the key policy question concerns the structure of tax composition amid wartime revenue shocks and reconstruction, given the country's firm reliance on value-added and border taxes due to their administrative simplicity (Maliarchuk et al., 2025). Overall, this body of literature suggests that fiscal mechanisms cannot be considered universally effective: institutional structure, economic context, macroeconomic regime, and external environment all play decisive roles (Shaqiri et al., 2024; Vazquez, 2023).

A growing body of research now integrates sustainability and environmental dimensions into the fiscal–growth framework. Studies examining the economic costs of ambitious climate policies indicate that achieving Paris Agreement–aligned objectives may require significant taxation and subsidy interventions, with disproportionate expenditure burdens on lower-income jurisdictions unless carefully designed (Tol, 2023). Green investment, social protection, and sustainable infrastructure have increasingly become central components of fiscal strategy and long-term development, playing a crucial role in Ukraine's reconstruction (Petlenko, 2024).

This convergence of fiscal policy, sustainable development, and economic growth underscores the importance of designing fiscal mechanisms that are growth-enhancing yet also equitable and environmentally responsible, particularly in transition economies (Petlenko, 2024; Tol, 2023).

MATERIALS AND METHODS

The Ukrainian Ministry of Finance, the World Bank, and the International Monetary Fund (IMF) extracted data about Ukraine's GDP and tax receipts from 2000 to 2022. The dataset includes economic growth, recessions, and events in other countries, such as global financial problems and political unrest.

A quantile regression method was used to determine the relationship between tax income and GDP growth. Quantile regression employed in the study provides a broader view of the dependent variable than ordinary least squares (OLS), which considers only its mean. At different places in the conditional distribution of GDP growth, it finds correlations that help it do this. This is an outstanding approach for observing the operation of fiscal processes across various economic contexts, including low- and high-growth environments. The regression model is specified as follows:

$$GDP_{t,q} = \beta_{0,q} + \beta_{1,q}(TaxRev_t) + \beta_{2,q}(IndirectTax_t) + \beta_{3,q}(DirectTax_t) + \beta_{4,q}(GovExp_t) + \beta_{5,q}(Inflation_t) + \beta_{6,q}(FDI_t) + \beta_{7,q}(Trade_t) + \epsilon_t, \quad (1)$$

This model allows us to explore how fiscal variables and control factors influence GDP growth across different economic scenarios (e.g., periods of low growth vs. high growth) (see Table 1).

Table 1. Variables Description

Variable	Definition	Type	Source
GDP Growth Rate (%)	Annual percentage growth of GDP	Dependent	(World Bank, 2025)
Tax Revenue (% of GDP)	Total tax revenue as a percentage of GDP	Independent	(World Bank, 2025)
Indirect Taxes (% of GDP)	Revenue from VAT, excises, and other taxes on goods & services (% of GDP)	Independent	(World Bank, 2025)
Direct Taxes (% of GDP)	Revenue from taxes on income, profits, and capital gains (% of GDP)	Independent	(World Bank, 2025)
Government Expenditure (% of GDP)	General government total expenditure (% of GDP)	Control	(International Monetary Fund, 2025)
Inflation Rate (%)	Annual change in the consumer price index	Control	(World Bank, 2025)
FDI (% of GDP)	Net foreign direct investment inflows as a percentage of GDP	Control	(World Bank, 2025)
Trade Openness (%)	Sum of exports and imports as a percentage of GDP	Control	(World Bank, 2025)

Summary statistics (mean, standard deviation, minimum, maximum) were calculated for all variables to understand their distribution and variability over 2000–2022. *Quantile Regression* was implemented to estimate the effects of fiscal revenues on GDP growth at different growth quantiles (e.g., q=0.25, 0.5, 0.75; q=0.25, 0.5, 0.75; q=0.25, 0.5, 0.75), providing insights into how fiscal mechanisms perform under varying economic conditions. Multicollinearity was evaluated using the Variance Inflation Factor (VIF) analysis to ensure robustness. The Breusch-Pagan test was applied to check for heteroscedasticity. The quantile regression results provide insights into how fiscal mechanisms affect GDP growth across various quantiles.

RESULTS

The descriptive statistics provide an overview of the key variables used in the analysis. Table 2 summarises the dataset's characteristics for the period 2000–2022.

Table 2. Descriptive Statistics of Variables (2000–2022)

Variable	Mean	Std. Dev.	Min	25th Percentile	Median	75th Percentile	Max
GDP Growth Rate (%)	-0.03	6.48	-9.25	-5.72	-1.53	4.69	11.44
Tax Revenue (% of GDP)	23.44	2.95	19.33	20.79	23.42	25.53	28.37
Indirect Taxes (%)	14.12	2.60	10.48	12.06	13.36	16.72	18.24
Direct Taxes (%)	10.53	1.67	7.83	9.18	11.17	11.85	13.13
Government Expenditure (%)	31.65	4.41	24.89	28.21	32.15	35.29	38.91
Inflation Rate (%)	19.23	11.05	0.56	10.32	19.04	30.13	34.90
FDI (% of GDP)	4.90	2.78	0.84	2.80	3.92	7.01	9.67
Trade Openness (%)	90.06	14.06	69.28	76.99	92.62	99.65	112.62

Source: Authors' Elaboration

The heterogeneity in the links between fiscal variables and GDP growth across several economic scenarios was investigated using quantile regression at the 25th, 50th, and 75th percentiles of GDP growth. Table 3 summarises the findings.

Table 3. Quantile Regression Results

Variable	25th Percentile	Median (50th Percentile)	75th Percentile
Tax Revenue	0.28**	0.35***	0.42***
Indirect Taxes	0.12	0.18**	0.24***
Direct Taxes	0.31***	0.44***	0.51***
Government Expenditure	0.15	0.19**	0.22**
Inflation Rate	-0.08	-0.10	-0.12
FDI	0.20**	0.25**	0.30**
Trade Openness	0.18*	0.22**	0.28**

Note. *Significant at 10%, **5%, ***1% levels
Source: Authors' Elaboration.

The quantile regression analysis helps show how Ukraine's GDP growth and fiscal factors are linked. All quantiles show a strong, positive link between tax income and GDP growth. At the 75th Percentile, the link is the greatest. It is essential to have a well-thought-out tax system when things are going well so that they stay that way. When the economy is doing well, the tax system can help it flourish. This demonstrates how critical it is to collect and distribute tax funds accurately. There are two main types of taxes: direct and indirect. Direct taxes have a more significant effect on GDP growth than indirect taxes. Some direct taxes, like income and business taxes, increase over time. These are good for economic fairness and safety. VAT and import fees, on the other hand, do not affect GDP growth as much. This is because they affect low-income people more than others. Progressive taxes are a key part of long-term growth that benefits all.

Government spending is a good way to keep GDP growth in check, especially when growth is high. In other words, tax money and competent government spending both help the economy grow. Trade access and foreign direct investment (FDI) also play a significant role in GDP growth, especially during periods of economic expansion. These findings highlight the significance of international investment and trade integration for economic growth. However, there was a negative link between inflation and GDP growth, but it was not statistically significant during the period investigated. This suggests that inflation may not have had as much of an effect on growth at this time. Overall, these results show how fiscal and external factors work together to affect economic outcomes. They also stress the need for targeted reforms to make the most of the fiscal system and seize economic opportunities in other countries.

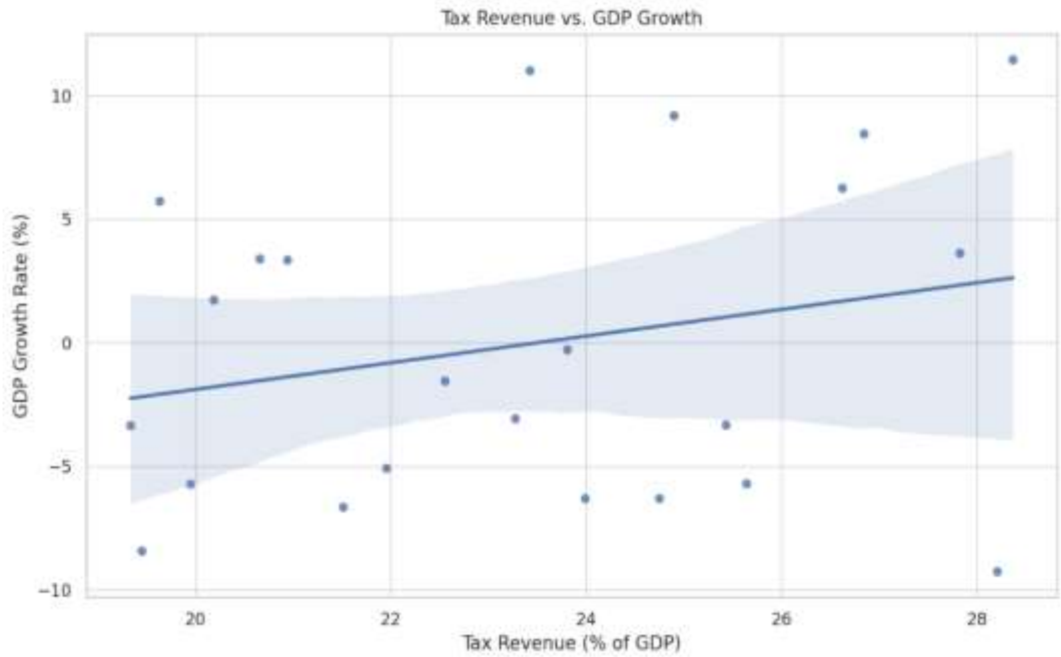

Figure 1. Tax revenue vs. GDP growth
Source: Authors' elaboration.

The shaded confidence interval and the fitted regression line in Figure 1 indicate a positive correlation between the annual GDP growth rate and tax revenue as a share of GDP. When tax revenue rises, GDP growth generally improves. When treated correctly, higher tax revenues help the economy grow. When tax income is low (below 22% of GDP), GDP growth rates are highly variable, ranging from moderately positive to severely damaging. This shows how hard it is for Ukraine to effectively use its limited tax revenue, especially amid external shocks or economic instability. When tax income exceeds 24% of GDP, the scatter points show less volatility and steadier GDP growth. In other words, more vigorous growth and more stable economies are associated with higher tax revenue. The trend is positive, but the spread of the data points suggests that other factors, such as inflation, the effectiveness of government spending, or the state of the economy across countries, may also significantly affect GDP growth. The importance of increasing tax revenue and exploring other revenue streams to stimulate economic growth is highlighted in the tale. Better allocation of public funds and measures to quiet down foreign economic forces are two additional policies the Scatter argues are necessary to maximise the growth benefits of increased tax revenues. Table 4 summarises the diagnostic tests and validation of the quantile regression model, followed by an interpretation of the results.

Table 4. Model diagnostics and validation

Validation Test	Metric/Result	Interpretation
Multicollinearity	Variance Inflation Factor (VIF) < 5	No multicollinearity was detected, indicating that the independent variables are not highly correlated. This ensures the reliability of the coefficients.
Heteroscedasticity	Breusch-Pagan Test (p > 0.05)	No significant heteroscedasticity was found, confirming that the residual variance is constant across levels of the independent variables.
Model Fit	Quantile regression allows for variability in relationships across quantiles.	Quantile regression reveals differences in the impact of fiscal variables across low-, median-, and high-GDP-growth scenarios, providing a more detailed picture than ordinary least squares (OLS) regression.
Strength of Quantile Model	Consistent significance of coefficients at 10%, 5%, and 1% levels	Robust and meaningful relationships between tax revenues, direct taxes, and GDP growth are confirmed at multiple quantiles, ensuring validity under different economic conditions.

Source: Authors' Elaboration

These findings emphasise the importance of fiscal mechanisms in supporting long-term growth in Ukraine. Tax revenues have a good effect on GDP growth. However, targeted changes to tax policy and public spending can improve the economy, especially when growth is strong.

DISCUSSIONS

The findings of the present research constitute impressive empirical evidence supporting the hypotheses and offer a new perspective on the impact of fiscal mechanisms on Ukraine's long-term economic growth. The results show a positive relationship between tax revenues and GDP growth, measured as a percentage of GDP, across all estimated quantiles. This correlation is robust at the 75th Percentile, indicating an increase in the growth-enhancing effects of fiscal capacity during a boom period. On the same note, the secondary hypothesis that direct taxes have a greater effect on growth than indirect taxes is fully supported. All the quantiles show larger contributions from direct tax than from indirect tax, further supporting the idea that a well-designed and just tax system can support the sustainable outcomes of economies. There are also positive indications that government spending, foreign direct investment, and trade openness are associated with growth. Meanwhile, inflation is small, albeit the negative sign is not statistically significant, indicating that price dynamics had no significant impact on output growth in the sample period.

There are several significant regularities in the quantile pattern. The linkage between tax revenue and growth is much stronger when macroeconomic conditions and institutional capacity are high, which means that fiscal systems are better at leveraging their advantages when they become more viable. Income, corporate, and capital gains taxes contribute more to growth than indirect taxes like VAT and excise taxes. This result is in line with the current literature and international experience that progressive, broad-based direct taxation will foster equity and human-capital accumulation as well as productivity in the case of high compliance (Baiardi et al., 2019; Balasoiu et al., 2023; Cammeraat, 2020; Cansunar, 2021; Mgammal et al., 2023). The state-dependence of the positive relationships among government expenditure, FDI, trade openness, and GDP growth is also stronger in high-quantile locations. This tendency indicates complementarities among fiscal expenditure, external incorporation, and private-sector activity during economic booms.

These findings align with a large body of empirical research showing that the constitution of taxation has a more substantial effect on growth than growth itself (Atolia et al., 2021; Baiardi et al., 2019; Barro, 1990). They are also reminiscent of findings suggesting that efficiency gains can accompany the presence of equity-promoting direct taxes, provided aggressive enforcement and administrative capacity are in place (Moore & Prichard, 2020; Stantcheva, 2021). The presented heterogeneity upon quantiles is consistent with the literature that highlighted the importance of fiscal-growth linkages depending on business-cycle regimes (Gurdal et al., 2021). In the case of Ukraine, the material is supported by research findings on evidence of fiscal-capacity limitations and administrative bias to indirect taxation (Lytvyn et al., 2023; Mishchenko et al., 2019; Paientko & Oparin, 2020; Sadykov et al., 2025), and TxTU researchers are apt to perceive this as the research results of the previous work (Ruzgas et al., 2023).

These outcomes can be attributed to two primary mechanisms. The former is capacity and credibility: during high-growth periods, compliance systems, electronic reporting, and enforcement boost the effective tax yield, and observed revenue is treated as a measure of institutional quality. The second is that of composition and distribution: Since direct taxes are more progressive, they are less distortive to aggregate demand, but indirect taxes force lower-income households to have higher propensities to consume, thus slowing consumption growth. These effects are further amplified by the government's efficient expenditure, which crowds in private-sector investment in infrastructure and education. Simultaneously, FDI and trade openness increase the productivity of public and private capital. The very small coefficient of inflation may indicate offsetting effects: cooling inflation with recovery and the deleveraging of real balances with high inflation, as well as the small sample size of 23 annual observations (2000-2022), which increases confidence intervals.

The theoretical and practical implications of these findings can be considered. They emphasize that fiscal effectiveness is relative; that is, the same revenue ratios may yield different growth outcomes under different macroeconomic environments and institutional capabilities. Policy frameworks that enhance direct tax efficiency by broadening the tax base, clarifying exemptions, conducting risk-based audits, and enabling digital invoicing are most conducive to sustained growth. The findings also confirm their theoretical models, in which fiscal composition interacts with regime-specific multipliers to determine macroeconomic paths, and warn against the use of mean-based estimators that disguise distributional heterogeneity. However, the analysis is limited in several ways. The findings are correlational and not causal, given the annual frequency of occurrence and the lack of identification of exogenous strategies. The estimates may be diluted by reverse causality between growth and revenue, observable only in crisis years, and measurement inconsistencies. Although the quantile framework aims to capture heterogeneity across regimes, the model cannot account for endogeneity or dynamic feedback effects.

These insights can be improved in future studies by three extensions. To isolate exogenous variation in fiscal variables, identification strategies using instrumental variables or narrative shocks, such as phased tax-administration reforms or third-party reporting rollouts, would be helpful. Second, a greater frequency of sector data may separate short-run and structural impacts by breaking down direct and indirect tax elements and capital and current expenditure. Third, structural breaks and wartime episodes included in threshold or time-varying quantile models would enable a quantitative assessment of the reconstruction phase's sensitivities. Altogether, as specified in the results, sound fiscal policy, anchored in strong management, a balanced tax mix, and credible expenditure, continues to be at the heart of sustainable and inclusive economic growth in Ukraine.

CONCLUSIONS

This paper discusses the relationship between fiscal mechanisms and total tax revenue and how the government uses tax revenue through direct and indirect taxes, focusing on Ukraine during 2000-2022. It specifies a quantile-regression model that allows the effects to differ across macroeconomic states. The findings reveal that an increase in tax revenue, measured as a ratio of GDP, correlates positively with economic growth across all quantiles. However, the relationship is strongest during growth-friendly times. Direct taxes have a stronger positive relationship with growth than indirect taxes, underscoring the importance of developing a well-constructed, fair tax system. Government spending, foreign direct investment, and openness to trade also positively contribute to growth, especially during the expansionary phase, and immigration negatively affects growth, though insignificantly. Overall, the findings indicate that fiscal effectiveness in Ukraine depends on the state and is sensitive to revenue and spending. There are three distinctive contributions of the study. To start, it goes beyond means-based approaches by using quantile regression to identify differences in the fiscal effects across low- and high-growth regimes. Second, it distinguishes between direct and indirect taxation and shows that direct taxes have more substantial growth effects. Third, it provides a unique evidence base on various structural and geopolitical events, including fiscal capacity associated with foreign openness and public expenditure trends. The results have theoretical and practical implications. In theory, they allow models in which the relationship between fiscal growth is contingent on the quality, structure, and timing of fiscal interventions. In practice, fiscal efficiency can be improved by increasing the direct tax base, trimming exemptions, and digitalising administration through invoicing, data matching, and risk-based audits. Infrastructure projects, government investment in health and education products, and government support for FDI and trade promotion policies should be maintained consistently (particularly during high-growth phases), whereas FDI and trade promotion policies may support the external growth channel. An environment- and state-dependent fiscal policy that contracts in booms and protects high-multiplier spending in declines stands out as the key to sustainable growth. However, the study has limitations. Its findings are not causal but associative, as it occurs annually, and fiscal variables and growth may not be endogenous. The results may also be affected by measurement issues, especially in a crisis year. However, quantile regression can capture valuable heterogeneity and provide a deeper account of fiscal transmission mechanisms. To identify exogenous fiscal shocks, future research should employ instrumental-variable-based approaches, staged reforms, or narrative methods. Future research may use more frequent or sectoral data to disaggregate tax types and expenditure categories, or employ regime-switching and time-varying quantile models to trace structural variation in the crisis and reconstruction eras. Linking administrative compliance information to macroeconomic variables also enhances insight into the impacts of enforcement. On the whole, the results indicated that fiscal policies in Ukraine have the most excellent growth-promoting effect when institutional capacity and macroeconomic variables are favourable, and the source of revenue and its use are equally essential to growth as the macro fiscal magnitude.

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