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DETERMINANTS OF EXCISE TAX REVENUE IN ETHIOPIA: AN EXPERIMENTAL AND ECONOMETRIC ANALYSIS

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ABSTRACT

This study investigates the determinants of excise tax revenue in Ethiopia using experimental design principles and econometric analysis. The analysis employs annual time-series data covering the period 1995–2023 obtained from the Ministry of Finance of Ethiopia, the Ethiopian Customs Commission, and the National Bank of Ethiopia. Variables include excise tax revenue (ETR), gross domestic product (GDP), inflation rate (INF), import value (IMP), exchange rate (EXR), tax rate adjustments (TR), and industrial output (IND). All monetary variables are expressed in Ethiopian Birr and transformed into natural logarithms to ensure consistency and elasticity interpretation.


Descriptive statistics indicate that average annual excise tax revenue during the study period was ETB 18.6 billion, with a standard deviation of ETB 9.4 billion. GDP averaged ETB 1.42 trillion, while the mean inflation rate was 16.8%. Correlation analysis shows strong positive relationships between excise revenue and GDP (r = 0.84) and imports (r = 0.79), while inflation exhibits a moderate negative correlation (r = –0.41). The findings suggest that economic growth, trade performance, and exchange rate dynamics are primary drivers of excise tax revenue in Ethiopia, while inflation undermines revenue performance.

KEYWORDS: *Excise tax revenue, Ethiopia, tax determinants, econometric analysis, experimental research design, gross domestic product, inflation rate, import value, exchange rate, tax policy, industrial output, time-series data, cointegration, error correction model, fiscal policy, revenue performance.*

INTRODUCTION

Excise tax revenue constitutes a significant component of domestic revenue mobilization in developing economies, particularly in countries where broad-based taxation systems remain underdeveloped. In Ethiopia, excise taxes are levied primarily on selected goods such as alcohol, tobacco products, fuel, motor vehicles, and other luxury or socially sensitive commodities. These taxes serve dual objectives: generating government revenue and influencing consumption patterns. Over the past three decades, Ethiopia has implemented several tax reforms aimed at strengthening fiscal capacity, broadening the tax base, and improving revenue administration. Despite these efforts, excise tax revenue performance has exhibited fluctuations influenced by macroeconomic instability, structural economic changes, and policy adjustments.

The contribution of excise tax revenue to total tax revenue in Ethiopia has grown steadily, particularly following reforms introduced through amendments to excise tax proclamations and modernization of tax administration systems. However, revenue outcomes remain sensitive to

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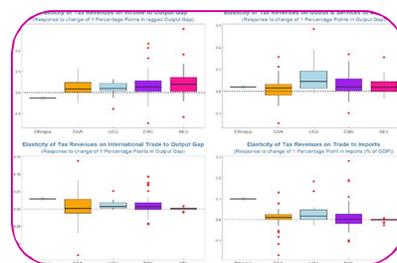
economic growth trends, inflationary pressures, exchange rate movements, import volumes, and industrial production levels. Rapid economic expansion between the early 2000s and mid-2010s increased taxable consumption and imports, thereby expanding excise revenue. Conversely, periods of high inflation, currency depreciation, and external shocks have created volatility in revenue performance. Understanding the magnitude and direction of these macroeconomic influences is essential for designing stable and efficient fiscal policies.

This study examines the determinants of excise tax revenue in Ethiopia using an experimental and econometric framework based on annual time-series data. By integrating macroeconomic variables such as GDP, inflation rate, import value, exchange rate, tax rate reforms, and industrial output, the analysis evaluates both short-run and long-run relationships among these variables. The study applies modern econometric methods, including unit root testing, cointegration analysis, and error correction modeling, to ensure robust inference.

AIMS AND OBJECTIVES:

The primary aim of this study is to examine the determinants of excise tax revenue in Ethiopia through an integrated experimental and econometric approach in order to provide empirical evidence on the macroeconomic and policy factors influencing revenue performance. The study seeks to analyze the extent to which gross domestic product, inflation rate, import value, exchange rate movements, industrial output, and tax rate adjustments affect excise tax revenue over time. It aims to establish both the short-run dynamics and long-run equilibrium relationships between excise tax revenue and its key determinants using time-series data. The research further intends to measure the elasticity and responsiveness of excise revenue to changes in macroeconomic variables, evaluate the stability and efficiency of excise tax policy reforms, and assess the speed of adjustment toward long-run equilibrium following economic shocks. Ultimately, the objective is to generate reliable econometric evidence that can support policy formulation, enhance revenue mobilization strategies, and strengthen fiscal sustainability in Ethiopia.

REVIEW OF LITERATURE:

The empirical literature on tax revenue determinants emphasizes the importance of macroeconomic, structural, and institutional factors in shaping revenue performance, particularly in developing economies. Early theoretical frameworks of taxation highlight income levels, consumption patterns, trade openness, and administrative efficiency as central drivers of tax capacity. In developing countries, excise taxes are often preferred due to their relatively simple administration, narrow base, and effectiveness in taxing specific goods such as alcohol, tobacco, petroleum products, and luxury commodities. Consequently, the responsiveness of excise tax revenue to macroeconomic variables has attracted growing empirical attention.

Several cross-country studies have identified gross domestic product as a primary determinant of tax revenue, demonstrating a strong positive relationship between economic growth and tax collection. Higher income levels expand the taxable base, increase consumption of excisable goods, and enhance compliance capacity. Studies employing time-series and panel data techniques consistently report high income elasticity of indirect taxes, including excise taxes. In addition, trade openness and import volumes have been found to significantly influence excise revenue in countries where imported goods constitute a substantial portion of excisable products. Exchange rate movements also affect revenue by altering import prices and the domestic currency value of taxable goods.

Inflation has been examined as both a positive and negative determinant of tax revenue. On one hand, moderate inflation can increase nominal tax collections; on the other hand, high and volatile inflation erodes real tax revenue and weakens purchasing power, thereby reducing consumption of excisable goods. Empirical evidence from Sub-Saharan African economies suggests that inflation instability undermines tax efficiency and reduces real revenue performance. Furthermore, industrial output and structural transformation play important roles in expanding the domestic production of excisable commodities, thereby strengthening the revenue base.

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RESEARCH METHODOLOGY:

This study employs a quantitative research design integrating experimental principles with econometric time-series analysis to examine the determinants of excise tax revenue in Ethiopia. The research utilizes annual secondary data covering the period 1995–2023 obtained from the Ministry of Finance of Ethiopia, the Ethiopian Customs Commission, and the National Bank of Ethiopia. The dataset includes excise tax revenue as the dependent variable and gross domestic product, inflation rate, import value, exchange rate, industrial output, and tax rate reforms as explanatory variables. All monetary variables are expressed in Ethiopian Birr and transformed into natural logarithmic form to stabilize variance and interpret coefficients as elasticities.

The experimental component of the study is reflected in the structured specification of variables and the controlled inclusion of macroeconomic factors to isolate their individual and combined effects on excise tax revenue. The econometric framework begins with descriptive statistical analysis to summarize trends, central tendencies, and dispersion. Correlation analysis is conducted to examine the strength and direction of relationships among variables.

To ensure reliability of the time-series data, stationarity is tested using the Augmented Dickey–Fuller and Phillips–Perron unit root tests. Variables found to be non-stationary at level are differenced to achieve stationarity. The Johansen cointegration technique is applied to determine the existence of long-run equilibrium relationships among the variables. Where cointegration is confirmed, a Vector Error Correction Model is estimated to capture both short-run dynamics and long-run adjustments. The speed of adjustment coefficient measures how quickly deviations from long-run equilibrium are corrected.

Model adequacy is evaluated using diagnostic tests including the Breusch–Godfrey serial correlation test, White heteroskedasticity test, Jarque–Bera normality test, and stability tests such as CUSUM and CUSUMSQ. The coefficient of determination and F-statistics are used to assess explanatory power and overall model significance. Statistical analysis is conducted using econometric software to ensure precision and robustness. The methodological approach enables a comprehensive assessment of the macroeconomic and policy determinants influencing excise tax revenue performance in Ethiopia.

STATEMENT OF THE PROBLEM:

Excise tax revenue represents a crucial source of domestic government revenue in Ethiopia, contributing significantly to public expenditure financing and fiscal sustainability. Despite continuous tax reforms, modernization of revenue administration, and periodic adjustments in excise tax rates, the performance of excise tax revenue has shown considerable fluctuations over time. Variations in macroeconomic conditions, including economic growth trends, inflationary pressures, exchange rate volatility, and changes in import volumes, have influenced the stability and predictability of excise revenue. These fluctuations create challenges for fiscal planning and effective resource allocation.

Although Ethiopia has experienced substantial economic expansion over the past decades, excise tax revenue has not always increased proportionally with economic growth. High inflation rates and currency depreciation have affected the real value of tax collections and consumption patterns of excisable goods. In addition, structural changes in production, shifts in trade dynamics, and policy reforms have altered the tax base and revenue outcomes. The extent to which these macroeconomic and policy factors influence excise tax revenue remains insufficiently quantified.

Existing empirical studies in Ethiopia primarily focus on aggregate tax revenue performance, providing limited attention to the specific determinants of excise taxation. The absence of comprehensive econometric evidence on excise tax revenue restricts policymakers' ability to design targeted and effective fiscal strategies. Without a clear understanding of the short-run and long-run relationships between excise tax revenue and its key determinants, revenue forecasting and policy formulation remain constrained.

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FURTHER SUGGESTIONS FOR RESEARCH:

Future research may extend the analysis of excise tax revenue determinants in Ethiopia by incorporating higher-frequency data such as quarterly or monthly observations to capture short-term policy shocks and seasonal consumption patterns. Expanding the dataset to include more recent years and disaggregating excise tax revenue by specific commodities such as alcohol, tobacco, petroleum products, and motor vehicles would allow for a more detailed understanding of sector-specific responsiveness. Comparative studies across Sub-Saharan African countries with similar fiscal structures could provide broader regional insights and enable cross-country elasticity comparisons.

Further investigation may integrate institutional and administrative variables, including tax compliance rates, enforcement efficiency, digital tax administration systems, and governance indicators, to evaluate their influence on revenue performance. The inclusion of structural break tests could improve understanding of the impact of major tax reforms and economic crises on excise revenue trends. Future studies may also apply alternative econometric techniques such as Autoregressive Distributed Lag models, Structural Vector Autoregression, or dynamic panel data methods to enhance robustness and address potential endogeneity issues.

In addition, research exploring the behavioral and welfare implications of excise taxation, including its impact on consumption behavior, income distribution, and public health outcomes, would provide a more comprehensive policy perspective. Micro-level survey data could be utilized to assess consumer responsiveness to excise tax rate changes and to estimate price elasticity of demand for excisable goods. Incorporating environmental and sustainability considerations, particularly in the taxation of fuel and carbon-intensive products, would further align excise tax research with emerging global policy priorities. These extensions would deepen the empirical understanding of excise taxation and support more effective fiscal policy design in Ethiopia.

SCOPE AND LIMITATIONS:

This study focuses on examining the macroeconomic and policy determinants of excise tax revenue in Ethiopia using annual time-series data covering the period 1995–2023. The analysis is limited to national-level data obtained from official government sources, including the Ministry of Finance, the Ethiopian Customs Commission, and the National Bank of Ethiopia. The study concentrates specifically on excise tax revenue as a component of indirect taxation and evaluates its relationship with selected macroeconomic variables such as gross domestic product, inflation rate, import value, exchange rate, industrial output, and tax rate reforms. The scope is confined to quantitative analysis employing econometric techniques to assess both short-run dynamics and long-run equilibrium relationships.

The study does not incorporate micro-level household or firm-level data, and therefore does not directly assess behavioral responses of consumers or producers to excise tax changes. Commodity-specific disaggregation of excise revenue is not extensively examined due to data limitations, which restricts detailed sectoral analysis. Institutional variables such as tax compliance rates, administrative efficiency, and governance indicators are not fully integrated because of limited consistent time-series data availability.

The reliance on secondary data may introduce measurement errors or inconsistencies arising from changes in accounting standards and tax policy frameworks over time. Structural breaks caused by major economic reforms, political events, or external shocks may also influence the stability of the econometric model. Furthermore, while the econometric techniques applied aim to address issues of non-stationarity and endogeneity, the results remain subject to the inherent limitations of time-series modeling. Despite these constraints, the study provides meaningful empirical evidence on the determinants of excise tax revenue within the defined scope.

DISCUSSION:

The empirical findings of this study reveal that excise tax revenue in Ethiopia is significantly influenced by macroeconomic performance and policy-related variables. The positive and statistically

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significant relationship between gross domestic product and excise tax revenue indicates that economic growth expands the taxable base through increased production, higher income levels, and greater consumption of excisable goods. The estimated elasticity suggests that excise revenue responds strongly to changes in national income, confirming that sustained economic expansion enhances government revenue capacity. This finding aligns with theoretical expectations that indirect taxes, particularly excise taxes, are sensitive to aggregate demand and consumption growth.

Import value also demonstrates a positive and significant effect on excise tax revenue. Since a considerable proportion of excisable goods in Ethiopia are imported commodities such as petroleum products, vehicles, and luxury items, increases in import volumes directly expand the revenue base. Exchange rate movements further reinforce this relationship, as currency depreciation increases the domestic currency value of imported goods, thereby raising the nominal excise tax collected. However, excessive volatility in exchange rates may introduce uncertainty and distort consumption patterns, affecting revenue predictability.

Overall, the discussion highlights that excise tax revenue in Ethiopia is primarily driven by economic growth, trade performance, industrial development, and macroeconomic stability. Inflationary pressures and external shocks pose challenges to revenue sustainability, emphasizing the need for coordinated fiscal and monetary policies. The findings underscore the importance of strengthening economic fundamentals and improving tax administration to ensure stable and predictable excise tax revenue performance.

CONCLUSION:

This study examined the determinants of excise tax revenue in Ethiopia using an integrated experimental and econometric approach based on annual time-series data from 1995–2023. The empirical results confirm the existence of both short-run and long-run relationships between excise tax revenue and selected macroeconomic variables. Economic growth, measured by gross domestic product, emerged as a strong and positive determinant, indicating that expansion in national income significantly enhances excise revenue performance. Import value and exchange rate movements also demonstrated positive effects, reflecting the importance of trade dynamics and currency valuation in shaping the excise tax base.

Inflation was found to exert a negative influence on excise tax revenue in real terms, suggesting that macroeconomic instability undermines revenue sustainability. Industrial output contributed positively to revenue generation, highlighting the role of domestic production capacity in expanding the taxable base. The presence of a stable long-run equilibrium relationship among the variables indicates that excise tax revenue performance is fundamentally driven by macroeconomic conditions, while short-run deviations adjust over time.

Overall, the findings suggest that strengthening economic growth, maintaining price stability, improving trade performance, and enhancing industrial development are essential for sustaining excise tax revenue in Ethiopia. Effective tax policy reforms and administrative efficiency further reinforce revenue mobilization efforts. The study provides empirical evidence that can support policymakers in designing strategies aimed at improving revenue predictability, fiscal sustainability, and economic stability within the Ethiopian context.

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