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Thinking Policy Together

Kenya Tax Model: Value Added Tax Simulation Analysis

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Key Highlights

- Adjusting the standard Value Added Tax (VAT) rate by two percentage points up or down has opposing effects on the Gross Domestic Product (GDP) and household welfare.
- Increasing the standard VAT rate from 16 per cent to 18 per cent would increase the total government revenue, which in turn increases government spending, including public investment that serves to crowd-in private investment. As a result, overall GDP is enhanced mainly by growth in manufacture of capital goods. Similar results are observed from a reduction in VAT differential rate, which is the difference between the standard pronounced VAT rate and the actual calculated VAT rate. Lowering VAT rate to 14 per cent has opposite effects of lowering government revenue and dampening of GDP resulting from reduced public spending.
- That said, an increased VAT rate erodes household welfare, especially for the urban poor who are not able to easily substitute vatable products with non-market products. The real consumption declines and the number of the people who are poor and undernourished worsens. The impact on the rural population is limited, because it is easy to substitute vatable products with non-market products. However, for reducing VAT rate to 14 per cent, there would be improved household welfare, with the number of the poor decreasing and food security improving.
- The policy option is a trade-off between raising tax revenue and reducing poverty while promoting food security. If the focus is only on raising more revenue to the government, adjusting the VAT rate upwards has certainly the desired effect, but to cushion the negative effect on the urban poor and the undernourished, the increase in VAT rate should be accompanied by enhanced public investments and targeted social welfare programmes.

1. Introduction

Taxation can be used as a policy tool to influence economic behaviour, promote equity and achieve developmental goals. However, taxation can result in undesired outcomes if not well designed and implemented. Distortionary tax may adversely affect consumption, private sector investment (Adam and Bevan, 2014) and household welfare (de la Feria and Swistak, 2024). Kenya faces a similar trade-off between generating sufficient tax revenue to finance government programmes such as the Bottom-Up Economic Transformation Agenda (BETA) and mitigating potential adverse effects on domestic production and household welfare.

The Value Added Tax (VAT) contributes about 30 per cent of Kenya's total tax revenue (National Treasury, 2024). The average share of VAT to GDP for Kenya was 4.6 per cent between 2013/14 and 2023/24, comparable to that of East African Community (EAC) countries and Sub-Saharan African at 4.5 per cent (World Bank, 2024; East Africa Revenue Authorities Technical Committee, 2024), but lower than the 6.7 per cent for South Africa and the 5.2 per cent for lower-middle-income economies. VAT is a broad-based consumption tax, with tax incidence largely falling on the final consumers, and therefore any VAT policy changes have potential economy-wide implications. This is compounded by the fact that VAT is a regressive tax, meaning that low-income households spend a higher proportion of their income on vatable products compared to high income earners. The VAT in Kenya is currently imposed at a standard rate of 16 per cent, with certain essential goods, particularly primary agricultural produces, and services as VAT exempt or zero-rated.

This policy brief presents VAT simulation results using a recently developed Kenya Tax Model, which is a dynamic Computable General Equilibrium (CGE) Model. Three scenarios are evaluated: A downward adjustment of VAT rate to 14 per cent, an increase to 18 per cent, and lowering of VAT differential rates by 25 per cent. These scenarios are articulated within Kenya's Medium

Term Revenue Strategy, 2023; upward adjustment to 18 per cent reflecting a scenario of adjusting to the standard VAT rates for other EAC countries, and downward adjustment to 14 per cent as a possible avenue to mobilize more revenues through expanded tax base and enhanced compliance (Government of Kenya, 2023).

2. VAT Simulation Methodology

The Kenya Tax Model is based on the International Food Policy Research Institute's (IFPRI's) Rural Investment and Policy Analysis (RIAPA) model, an economy-wide country-level modelling tool. At the core of RIAPA is an economy-wide dynamic Computable General Equilibrium (CGE) model that simulates the functioning of a market economy, including markets for products and factors that include land, labour, and capital (Breisinger, Keenan, Mbuthia, and Njuki, 2023). The RIAPA model also includes a set of microsimulation modules that are used to assess potential impacts of policy and public investment scenarios on multiple development outcomes such as household incomes, poverty and the agrifood systems.

The database of Kenya Tax Model is the 2021 Kenya Social Accounting Matrix (SAM). SAM is an economy-wide representation of a country's economic structure capturing all income and expenditure flows among producers, consumers, the government, and the rest of the world during a particular year. The standard 2021 SAM is further modified using disaggregated tax data from the Kenya Revenue Authority that reflects the current tax framework.

The potential impacts of various tax scenarios are measured against the results of a baseline in which Kenya's economy grows following the recent trends and VAT rate is consistent with that before any tax policy change. The standard VAT rate before any change is 16 per cent in the baseline, while the simulations consider increasing or decreasing the rate by 2 percentage points in 2025, keeping at the changed rate onward in 2026-2028. The potential impact in each year starting in 2025 until 2028 is the difference between the outcomes before the change (16%) and after the change (±2 percentage points) in VAT rates.

The growth in the model's baseline comes from labour and population growth, land expansion, capital accumulation, and sectoral Total Factor Productivity (TFP) growth. While the growth rates of skilled labour supply, TFP, and land expansion are exogenous, capital accumulation and total supply of less skilled labour grow endogenously, affected by investment profitability and demand for labour.

The growth rates for capital accumulation and less skilled labour supply in various tax scenarios can differ from the baseline, driven by changing demand for less skilled labour and investment profitability under different VAT scenarios. The model isolates the potential impact from other macroeconomic factors such as exchange rate, foreign inflows, among others, by exogenously keeping these macroeconomic variables at the same level in both the baselines and all tax scenarios.

The model runs for the period of 2021-2028 and the VAT is identical in the first four years (2021-2024) between baseline and tax scenarios. From 2025 onwards to 2028, the tax scenario considers changes in the VAT. The differences between baseline and the tax scenarios across a set of social and economic indicators come from changing VAT as direct or indirect impacts of VAT policy.

Additionally, the model runs a third scenario to measure the potential impact of reducing VAT differential rate by 25 per cent. The VAT differential rate is the difference between the standard pronounced VAT rate of 16 per cent and the actual product-level VAT rate calculated using the VAT collections. The differential rate may be due to sector aggregation, the treatment of informal sector and measurement errors. However, the current analysis does not explore which of these sources may contribute to the observed VAT differential rate.

3. Impacts of Adjusting VAT Rates and Reducing VAT Tax Differentials

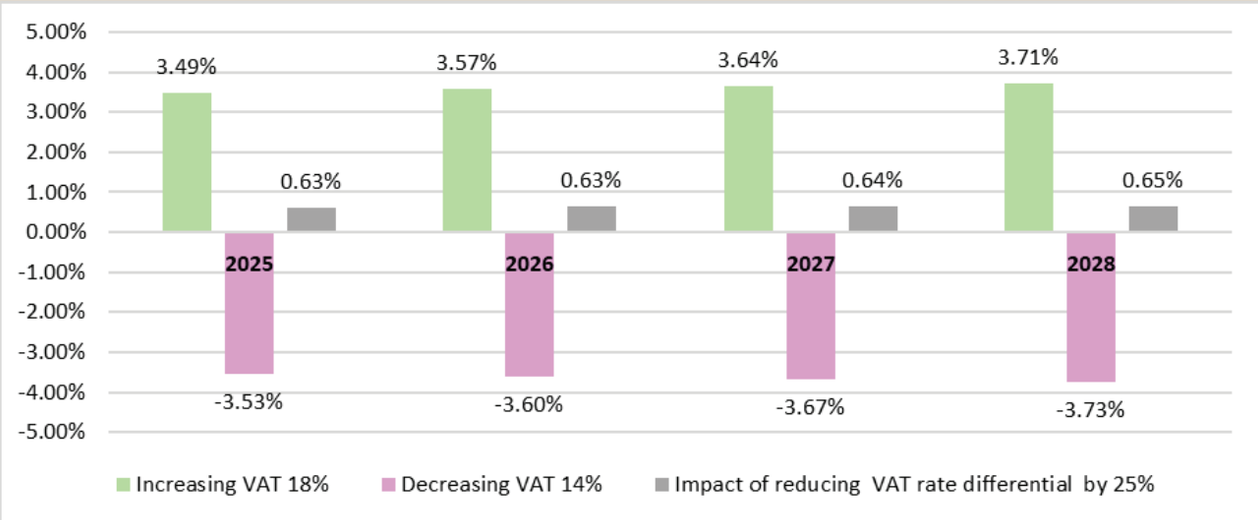
3.1 Impacts on Government Revenue

Increasing VAT rate from 16 per cent to 18 per cent translates to increasing total VAT revenue by about 12.5 per cent, if all VAT revenues were effectively collected. For the increase of VAT rate to 18 per cent, the total government revenue (including tax and non-tax revenues) increases by 3.49 per cent in 2025 from its baseline level and an average of 3.64 per cent in the subsequent years of 2026-2028 (Figure 1). Reducing the VAT rate to 14 per cent is likely to reduce total government revenue by 3.53 per cent in 2025 and by an average of 3.67 per cent in 2026-2028. However, it is possible for such a decrease in VAT rate to improve government revenue if businesses proportionately reduce the price of vatable products, in turn increasing consumer spending. In addition, tax revenue will increase if the reduction in tax rate is accompanied by enhanced compliance and expanded tax base. Additionally, reducing the VAT rate differentials by 25 per cent will result in an increase in government revenue by 0.63 per cent in 2025 and an average increase of 0.64 per cent in the subsequent years.

3.2 Total Investment/Investment to GDP Ratio

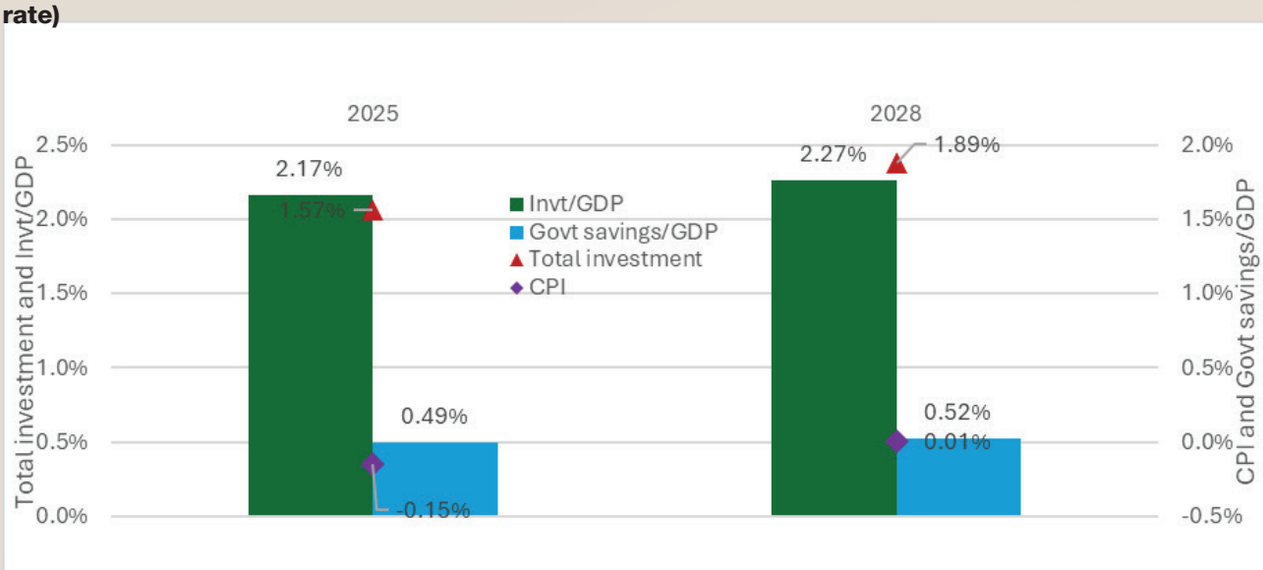
The impact of change in tax rate on investment will eventually impact the overall economy. The impact is analysed using four selected macroeconomic indicators in Figure 2: CPI (consumer price index) and ratio of government savings (or investment) to GDP measured by the right-side y-axis; total investment and ratio of total investment in GDP shown by the left-side y-axis. All indicators are measured as per cent changes against their baseline level. As expected, total investment increases by 1.57 per cent in 2025 and 1.89 per cent in 2028, shown as the red triangle points in Figure 2. These are driven by increased government revenue that supports public investment, and in turn crowd-in private investment. Moreover, the ratio of investment to GDP rises by 2.17 per cent and 2.27

Figure 1: Government revenue: % difference from the baseline (2025-2028)



Source: Kenya Tax Model Simulation Results

Figure 2: Impact on investments and selected macroeconomic indicators; 2025 and 2028 (18% VAT rate)



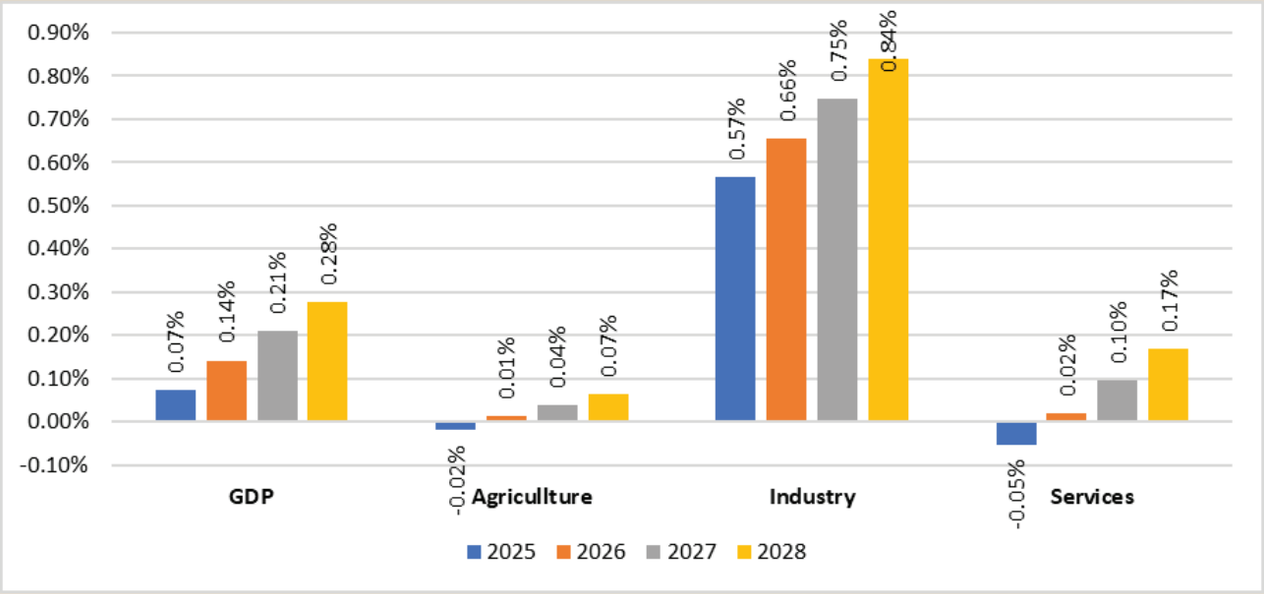
Source: Kenya Tax Model Simulation Results

per cent in 2025 and 2028, respectively (green bars in Figure 2). Further, government savings to GDP ratio rises modestly by 0.49 per cent and 0.52 per cent in 2025 and 2028, respectively (blue bars in Figure 2), suggesting improvements in government revenue that supports public investment. Further, the CPI declined by 0.15 per cent in 2025, but marginally increase by 0.01 per cent in 2028. An increase in VAT initially dampens demand while producers increase supply, thus putting downward pressure on prices and hence the initial decline in CPI.

3.3 Overall and Sectoral GDP Impacts

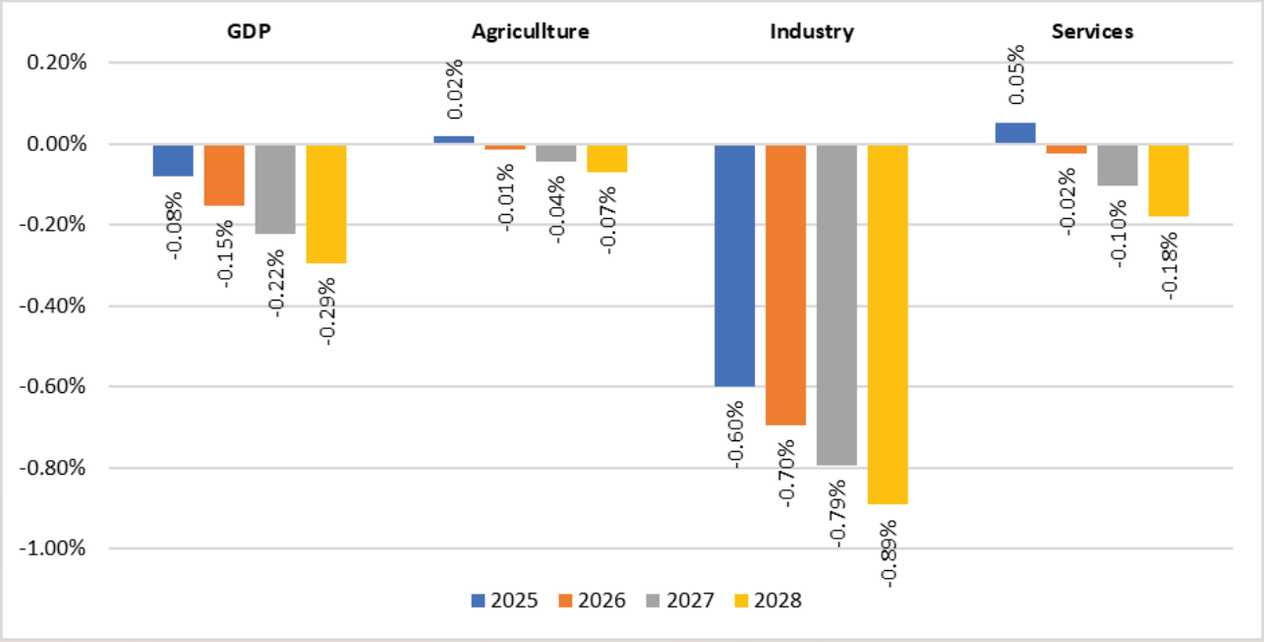
The broad impacts on the economy are first measured by total and sectoral GDP. The impact of a 2-percentage points change in VAT rate on GDP is modest. As shown in Figures 3 and 4, adjusting the VAT rate from 16 to 18 per cent or to 14 per cent affects total GDP by less than 1 per cent. Increasing VAT rate to 18 per cent is expected to increase total GDP by 0.07 per cent in 2025 from its baseline level, while lowering VAT rate to 14 per cent reduces total GDP slightly in 2025. In the subsequent years, the overall GDP consistently increases by an average of 0.21 per cent when VAT rate rises to 18 per cent (Figure 3). With more tax revenue, the government can mobilize resources to finance key infrastructure projects that serve to crowd-in private investments by enhancing the business environment

Figure 3: GDP impacts from increasing VAT rate to 18%



Source: Kenya Tax Model Simulation Results

Figure 4: GDP impacts from reducing VAT rate to 14%



Source: Kenya Tax Model Simulation Results

and increasing demand for investment goods produced locally.

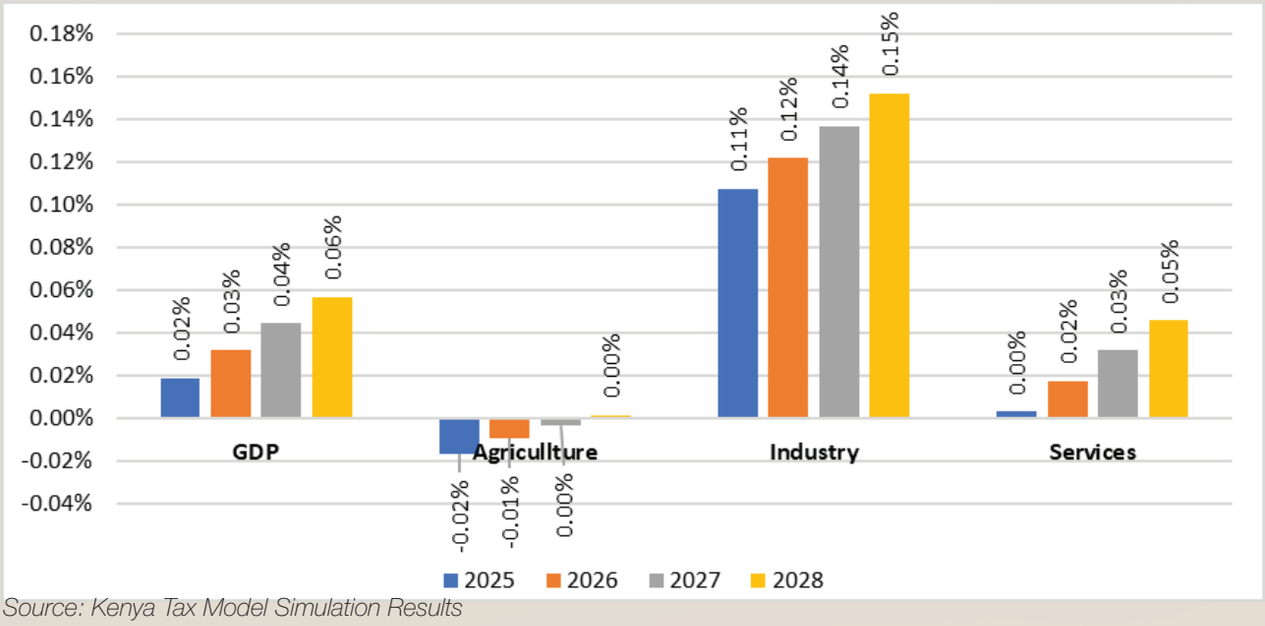
At the sector level, the immediate impact of an increase in VAT rate to 18 per cent is a decline in agriculture sector and services sector[1]GDP, slightly by 0.02 per cent and 0.05 per cent, respectively in 2025. However, by 2028, the agriculture sector GDP instead increases by 0.07 per cent from the baseline and the services sector GDP increases more by 0.17 per cent. This impact results from increased government investment, which offsets the initial negative effects on agriculture and services, and enhanced demand from the growing manufacturing sector.

Increased investment from enhanced tax revenue has an immediate benefit to the manufacturing sector, while non-manufacturing sub-sectors[2] of the industry

[1] Agriculture sector consists of growing of crops, animal production, fishing and forestry; industry sector consists of manufacturing, construction, mining and quarrying, energy production and water supply; while services sector consist of government activities, transport, finance, and all other private activities that do not produce material goods – including wholesale and retail trade, accommodation and food services, information and communication, among others.

[2] Non-manufacturing industrial sectors include construction, mining and quarrying, and utilities.

Figure 5: Impact of reducing VAT rate differential by 25%



Source: Kenya Tax Model Simulation Results

sector benefit little. This results in the overall industrial sector GDP increasing by 0.57 per cent in 2025 and further increase by an average of 0.75 per cent in the subsequent years. The main contributing factor is the increase in capital investment that helps the construction sector and various manufacturing sub-sectors producing capital goods to grow immediately in year 2025 and in the following years as they meet the investment needs. The manufacturing sub-sectors producing mainly consumer goods such as processed food products benefit little.

The simulation results from reducing the VAT rate to 14 per cent, as presented in Figure 4, shows negative but modest effects on total GDP, which decreases by 0.08 per cent immediately in 2025 and by an average of 0.22 per cent in subsequent years. In fact, the impact of reducing VAT rate to 14 per cent (lowering tax revenue) is an opposite mirror image of the impact of increasing the VAT rate to 18 per cent (increasing tax revenue) in both the overall and sectoral GDPs. However, the impact on the overall and sectoral GDP are slightly more pronounced in this scenario than the case of increasing VAT rate to 18 per cent, because of the increased negative contributions of the industrial sector to total GDP over time.

The simulation analysis also estimated the impact of a 25 per cent reduction in VAT differential rates. The results in Figure 5 show that the overall GDP, the industry sector

GDP and services sector GDP consistently increase in 2025 and subsequent years, and by 0.06 per cent, 0.15 per cent and 0.05 per cent, respectively, in 2028. However, the agricultural sector GDP declines by 0.02 per cent in 2025 and slowly recovers in the subsequent years. The impact on agriculture GDP is mainly an indirect effect through economic linkages, as VAT is not collected on most primary agricultural products.

3.4 Household Welfare Impacts

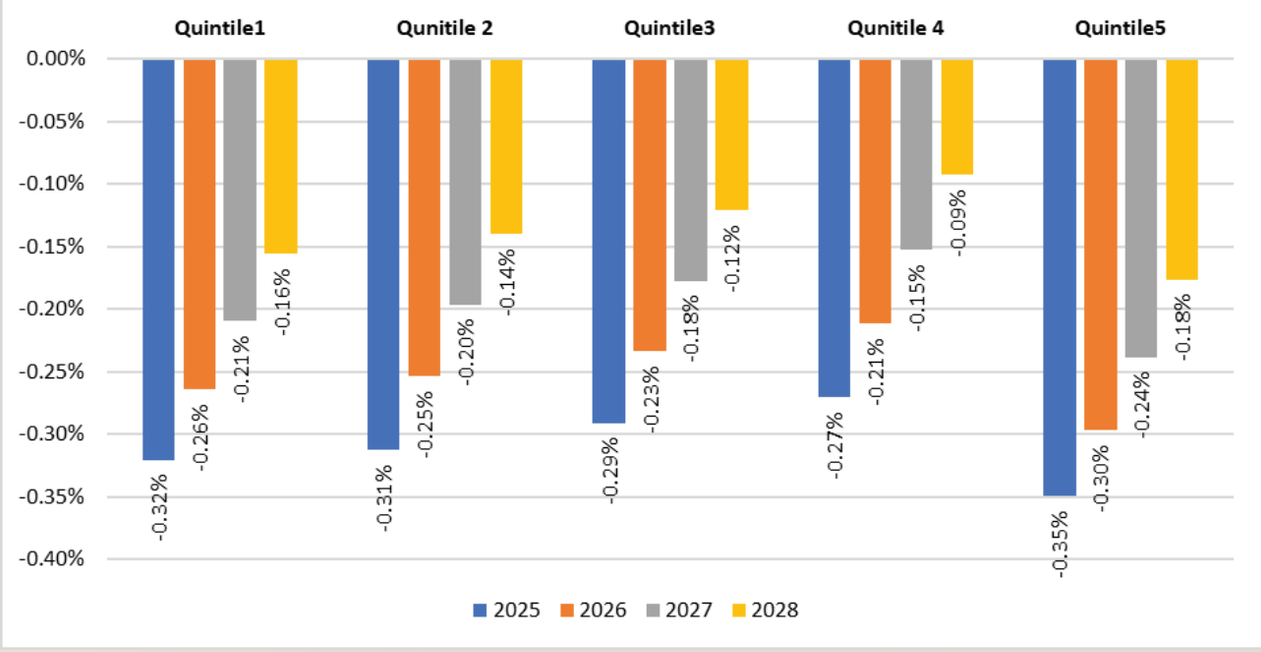
Figure 6 shows the impact on household incomes. The immediate impact in 2025 is larger than that in 2028 under the rising VAT rate scenario. The results suggest that while increasing VAT rate generates more revenue for the government; the household incomes, measured by their total real consumption, are negative but modest. When the public and private investments increased, capital returns allocated from firms to households were reduced and used to finance increased investment. Increased investment was met by increased production of capital goods manufactured locally, which often uses more capital and less labour, lowering the economy-wide labour demand. These two factors negatively affect households' real incomes and therefore total consumption.

The poorest household group whose incomes come from less skilled labour and the richest household group who received disproportionally more income from capital returns were affected the most. However, the negative household income effects become smaller over time, because increased initial investment in 2025 starts to generate additional production capacity that results in hiring of more labour and generating more capital return incomes to households.

3.5 Poverty Impacts

Figure 7 shows the number of the poor, nationally and grouped by urban and rural households. In 2025, the number of poor people increases by 100,529 people from the baseline level while in 2028 the number is likely to increase by a lower number of 51,860 people, an indication that increased investment from the collected revenue mitigates the negative poverty impact in the medium-term than its immediate effect. The result is also consistent with a relatively large negative impact on the poorer households' incomes from rising VAT rate. The increased number of poor people is mainly in urban areas, while the poverty is almost unchanged in rural areas, consistent with a smaller negative impact on the agricultural sector GDP.

Figure 6: Household consumption impact from increase in VAT rate to 18% (% changes in growth rate from the baseline, 2025-2028)

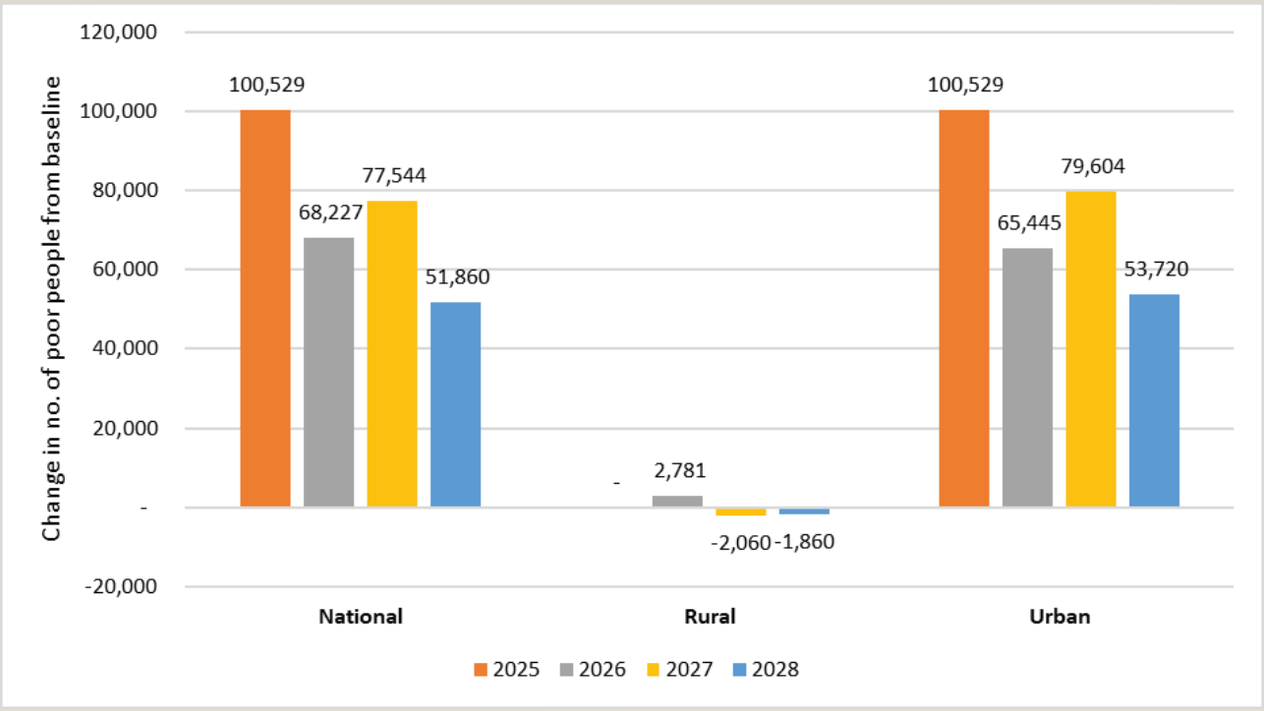


Source: Kenya Tax Model Simulation Results

3.6 Food Security Impacts

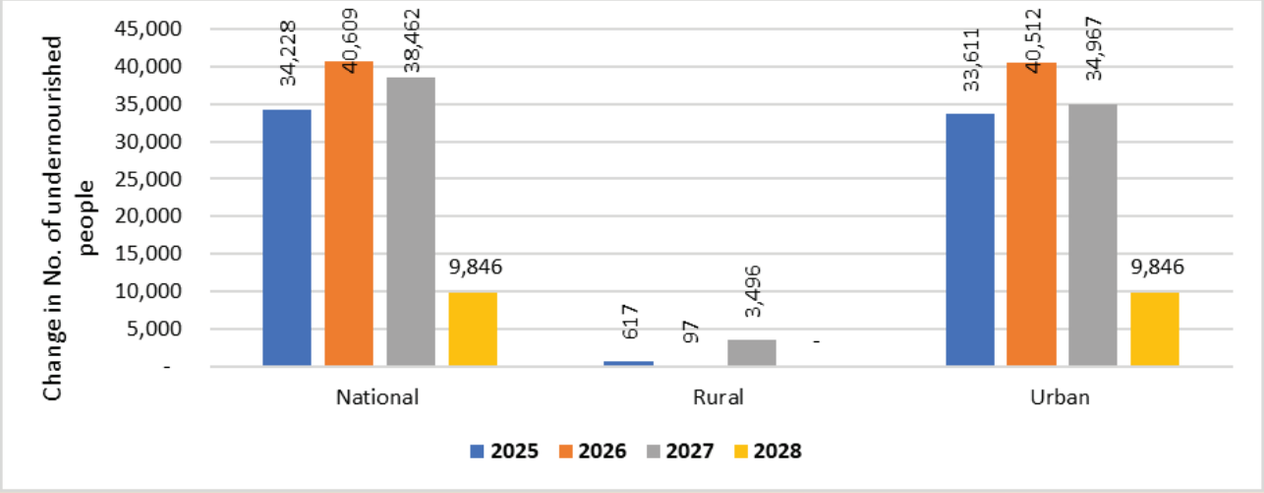
The results for food security outcomes–undernourished population–is similar in terms of direction as that of the poverty impacts. The worst affected due to VAT increase are the urban households, who may face difficulties substituting processed vatable products with non-market products such as fresh produce. Also, the immediate impact is larger than years that follow since, over time, the urban households may also be able to device means to diversify their nutrition or supply channels for non-market products could deepen.

Figure 7: Poverty outcomes from increasing VAT to 18% (differences in number of the poor from the baseline, 2025-2028)



Source: Kenya Tax Model Simulation Results

Figure 8: Differences in the number of undernourished people from the baseline (2025–2028)



Source: Kenya Tax Model Simulation Results

4. Conclusion and Recommendations

The economy-wide simulation analysis showed that increasing VAT rate to 18 per cent has a modest positive impact on overall GDP. The total GDP increase results from increased GDP in the industrial sector. However, impacts on the agricultural and services sectors are marginal. The benefit to the industrial sector is from increased investment that benefits the construction and capital goods manufacturing sub-sectors. When government investment increases, there is crowding-in of private investment. Lowering VAT rate to 14 per cent has opposite effects of lowering government revenue and dampening of GDP due to reduced public spending.

The analysis also reveals that reducing the VAT rate differential by 25 per cent has a similar but more modestly positive impact on government revenue compared with raising VAT rate by 2 percentage points. On household welfare, increasing VAT rate to 18 per cent increases the number of the urban poor and undernourished when their real incomes are negatively affected. Rural households whose incomes depend more on agriculture are affected less. Lowering VAT rate to 14 per cent has opposite effects of improving household welfare, with the number of the poor decreasing and food security improving.

The policy option is a trade-off between raising more tax revenue and promoting welfare, such as reducing poverty and food security. If the focus is only on raising more government revenue, the government could consider adjusting the VAT rate upwards, but to cushion its negative effect on the urban poor and the undernourished population, this should be accompanied by increased public investments and targeted social welfare programmes. To address the challenge of sector aggregation, which emanates from VAT treatment of the different sectors resulting in VAT rate differentials, there is a need to rationalize VAT expenditures based on evidence of their solid effectiveness in promoting investments and social protection.

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